

A HISTORICAL RECONSTRUCTION OF THE KOMAN LANGUAGE FAMILY

by

MANUEL ALEJANDRO OTERO

A DISSERTATION

Presented to the Department of Linguistics  
and the Graduate School of the University of Oregon  
in partial fulfillment of the requirements  
for the degree of  
Doctor of Philosophy

September 2019

DISSERTATION APPROVAL PAGE

Student: Manuel Alejandro Otero

Title: A Historical Reconstruction of the Koman Language Family

This dissertation has been accepted and approved in partial fulfillment of the requirements for the Doctor of Philosophy degree in the Department of Linguistics by:

Doris L. Payne	Chairperson
Spike Gildea	Core Member
Scott DeLancey	Core Member
Stephen Dueppen	Institutional Representative

and

Janet Woodruff-Borden	Vice Provost and Dean of the Graduate School
-----------------------	--

Original approval signatures are on file with the University of Oregon Graduate School.

Degree awarded September 2019

© 2019 Manuel Alejandro Otero  
This work is licensed under a Creative Commons  
**Attribution-NonCommercial-NoDerivs (United States) License.**

## DISSERTATION ABSTRACT

Manuel Alejandro Otero

Doctor of Philosophy

Department of Linguistics

September 2019

Title: A Historical Reconstruction of the Koman Language Family

This dissertation is a historical-comparative reconstruction of the Koman family, a small group of languages spoken in what now constitutes the borderlands of Ethiopia, Sudan and South Sudan. Koman is comprised five living languages: Gwama, Opo, Komo, Uduk, and the previously unidentified Dana language.

The Koman family has been relatively understudied though it has figured prominently in large-scale classifications of the Nilo-Saharan super family. These classifications are radically distinct, given the paucity of research on Koman as a whole at the time. Some current scholars even question Koman's genetic affiliation to Nilo-Saharan entirely.

One main issue in high-level classifications is the lack of low-level reconstructions of families established with verifiable sound correspondences coupled with morphological evidence to support the internal structure of a given family. This dissertation addresses this issue by reconstructing the basic phonology, including segmental and suprasegmental domains, and tracing the evolution from Proto-Koman down through the nodes to the modern-day sound systems. In addition, some of the core lexicon and morphology is reconstructed to Proto-Koman and to the subnodes.



The data for this dissertation was collected in the field from native speakers of all of the living Koman languages including from previously undocumented varieties. In an effort to make the analyses as faithful to the data as possible, all of the data and all of the correspondence sets employed to reconstruct proto-sounds are provided in the Appendices. Further, an etymological wordlist of lexica reconstructed to distinct nodes within the family is also provided.

While Koman's affiliation to the purported Nilo-Saharan super family is still under debate, the overarching aim of this dissertation is to provide a conservative reconstruction of Proto-Koman which will hopefully serve future Koman scholars as well as those interested in higher-level genetic classifications of East African languages.

## CURRICULUM VITAE

NAME OF AUTHOR: Manuel Alejandro Otero

### GRADUATE AND UNDERGRADUATE SCHOOLS ATTENDED:

University of Oregon, Eugene

School of Visual Arts, New York

### DEGREES AWARDED:

Doctor of Philosophy, Linguistics, 2019, University of Oregon  
Bachelor of Fine Arts, 1994, School of Visual Arts, New York

### AREAS OF SPECIAL INTEREST:

Functional Linguistics  
Descriptive Linguistics  
Historical-Comparative Linguistics  
Nilo-Saharan Languages

### PROFESSIONAL EXPERIENCE:

Graduate Teaching Fellow, University of Oregon, Eugene, OR, 2011–2019

Instructor of Spanish, International Community School of Addis Ababa,  
Addis Ababa, Ethiopia, 2010

TEFL and Spanish Instructor, Madrid, Spain, 1997–2005

GRANTS, AWARDS, AND HONORS:

Doctoral Dissertation Award: *Documenting the endangered Koman languages and their linguistic relationships*. National Science Foundation, Documenting Endangered Languages Program, BCS 1628750, 2016

Jaqueline Schachter Outstanding Conference Presentation Award, University of Oregon Department of Linguistics, 2016

Global Oregon International Research Fund, University of Oregon, 2016

Graduate Conference Travel Awards, University of Oregon Department of Linguistics, 2013–2017

PUBLICATIONS:

- Otero, Manuel A. *accepted*. Associated motion, direction and (exchoative) aspect in Ethiopian Komo. *Studies in Language*.
- Otero, Manuel A. 2018. Directional verb morphology in Ethiopian Komo. In Helga Schröder, & Prisca Jerono (eds.), *Nilo-Saharan issues and perspectives*, 165-177. Köln: Rüdiger Köppe Verlag.
- Otero, Manuel A. 2018. Aspects of Ethiopian Komo (morpho-)phonology. *Linguistic Discovery* 16(2). 136-178.
- Otero, Manuel A. 2015. [+ATR] dominant vowel harmony except when it's not? Evidence from Ethiopian Komo. In Ruth Kramer, Elizabeth C. Zsiga, & One Tlale Boyer (eds.), *Selected Proceedings of the 44th Annual Conference on African Linguistics*, 212-220. Somerville, MA: Cascadilla Proceedings Project.
- Otero, Manuel A. 2015. Dual number in Ethiopian Komo. In Angelika Mietzner, & Anne Storch (eds.), *Nilo-Saharan: Models and descriptions*, 123-134. Köln: Rüdiger Köppe Verlag.
- Otero, Manuel A. 2015. Nominal morphology and 'topic' in Ethiopian Komo. In Osamu Hieda (ed.), *Information Structure and Nilotic Languages*, 19-35. Tokyo: Research Institute for Languages and Cultures of Asia and Africa.

## ACKNOWLEDGMENTS

Our families, communities and civilizations are built, nourished and maintained when we all come together. This project has been no exception.

I am first and foremost grateful to all of the Koman people who welcomed me into their homes and lives. It has been an unforgettable experience, one which gives me faith in humanity during these disparaging times in which minority communities are singled out and condemned for the excesses of those in power, both at home and abroad.

I have worked with so many speakers of Koman languages over the years that I fear there are too many to name individually. I thank them all here. I must also recognize my deep appreciation and mourning for the loss of Somali Pogi, my friend and first Komo teacher who passed unexpectedly at a young age. All of us who have worked on the Komo literacy project will never forget your earnest dedication and warm smile. May you rest in peace.

This dissertation could not have been realized without the patience and guidance of my advisor and mentor, Doris Payne. I am truly honored to have been your student and will remember our discussions and trips abroad fondly. Much appreciation must be given to the Linguistics Department of the University of Oregon. It has truly been a life-changing experience. I am ever grateful to Spike Gildea, Scott DeLancey, Melissa Baese-Berk, Tyler Kendall, Charlotte Vaughn and Volya Kapatsinski. I would also like to thank Prof. Stephen Dueppen for serving on my committee.

I also could not be writing these words without the support of my colleagues both at the University of Oregon and abroad. I thank Don Killian for so many conversations and help over so many years. I also thank Paul Olejarczuk for his friendship,

collaboration, and for all of the epic gentleman's dinners, which I hope will continue as we part ways from Eugene. I am extremely grateful to Richard Griscom for all of his help- I wish you well! I also thank Jaime Peña, Shahar Shirtz, Amos Teo, Matt Stave, Sara Pacchiarotti, Krishna Boro, Becky Paterson, Justin Walker and so many others that have come and gone. Much love goes out to the Wozny family for their enduring support. I am also grateful to Wendy James, Douglas Johnson and Alfredo González Ruibal. If I have forgotten to mention you, please know that in my true fashion, I have left writing these words until the last minute, my last day in Eugene.

I am grateful to SIL Ethiopia for allowing me to work as a consultant on the Komo language literacy project. This was my first foray into the field. I admire the fact that we could set our beliefs aside in order to work for a common goal. I must recognize Andreas Neudorf, Fekadu Derresse, Anne-Christie Hellenthal, Nate Bremer, Joshua and Joelle Goldberg, Joshua Smolders, Andreas Joswig, Joshua Smolders, Colleen and Michael Ahland, among others. Many thanks and blessings to you all.

Lastly and most importantly, I dedicate this work to my wife, partner, best friend and hiking partner, mi amor, Becki Quick. I would not be here in this lawn chair on the corner of our house writing the acknowledgments of a dissertation if it weren't for your enduring love and spirit. I feel blessed to have met you on that bus in Spain so many years ago and since then, my life has only become more enriched when I am with you. We did it! Now onto the next chapter of our lives. Por último, reconozco el apoyo que he recibido por parte de mis padres y de mi familia tras los años. Cariño para los vivos y para los difuntos, que en paz descansen.

para Becki

## TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION .....	1
1.1 The Koman people .....	4
1.1.1 Issues in nomenclature of Koman groups.....	10
1.1.2 Population of Koman groups today.....	18
1.2 Koman classification.....	21
1.2.1 Koman external classification.....	21
1.2.2 Koman internal classification .....	23
1.2.3 Current Koman classification .....	27
1.3 Methods and the database .....	30
II. TYPOLOGICAL OVERVIEW .....	34
2.1 Phonological comparanda .....	35
2.1.1 Overview of Koman consonants .....	36
2.1.2 Overview of Koman vowels and Advanced Tongue Root harmony .....	37
2.1.3 Overview of Koman tone.....	39
2.1.4 Gwama .....	40
2.1.5 Komo phonology .....	47
2.1.6 Uduk phonology .....	56
2.1.7 Opo.....	76

Chapter	Page
2.1.8 Dana.....	85
2.2 Morphosyntactic comparanda.....	93
2.2.1 Koman independent pronouns.....	97
2.2.2 Koman nominal morphology.....	98
2.2.3 Koman verb morphology.....	132
III. RECONSTRUCTION OF PROTO-KOMAN PHONOLOGY.....	158
3.1 Proto-Koman (PKMN) tone.....	158
3.1.1 PKMN tone categories based on synchronic tone distribution.....	160
3.1.2 A historical scenario for the evolution of PKMN tone.....	165
3.1.3 PKMN tone and non-stop consonants.....	168
3.1.4 PKMN tone residue.....	169
3.1.5 Observations on tonogenesis in Pre-Koman.....	173
3.2 Proto-Koman (PKMN) consonants.....	174
3.2.1 PKMN bilabial obstruents.....	176
3.2.2 PKMN interdental stops.....	183
3.2.3 PKMN alveolar stops and alveolar affricate ejective.....	189
3.2.4 Palatal consonants.....	196
3.2.5 PKMN velar stops.....	200
3.2.6 PKMN fricatives.....	205



Chapter	Page
3.2.7 PKMN *r and *l .....	210
3.2.8 PKMN nasal consonants .....	211
3.2.9 PKMN glides .....	213
3.2.10 PKMN consonant residue .....	215
3.3 Proto-Koman (PKMN) vowels .....	217
3.3.1 PKMN high vowels .....	219
3.3.2 PKMN [-high] vowels *ε, *ɔ and *a .....	226
3.3.3 Consonant-glide sequences and diphthongs.....	227
IV. PHONOLOGICAL RECONSTRUCTION OF KOMAN SUBNODES .....	229
4.1 Gwama.....	229
4.1.1 Gwama consonants .....	230
4.1.2 Gwama vowels and tone.....	232
4.2 Proto-Central Koman (PCTRL).....	233
4.2.1 PCTRL consonants .....	234
4.2.2 A note on *Ṭ and *Ḑ in PCTRL .....	237
4.2.3 PCTRL vowels and tone.....	240
4.3 Proto-Komo-Uduk (PKOUD).....	242
4.3.1 PKOUD consonants .....	242
4.3.2 PKoUd vowels and tone .....	245

Chapter	Page
4.4 Komo .....	245
4.4.1 Komo consonants .....	246
4.4.2 Komo vowels and tone .....	248
4.5 Proto-Uduk (PUD) phonology.....	249
4.5.1 PUD consonants.....	249
4.5.2 PUD vowels and tone .....	251
4.6 Chali Uduk .....	252
4.6.1 Chali Uduk consonants .....	252
4.6.2 Chali Uduk vowels and tone .....	254
4.7 Yabus Uduk.....	254
4.7.1 Yabus Uduk consonants .....	255
4.7.2 Yabus Uduk vowels and tone.....	257
4.8 Proto-Dana-Opo (PDAOP) phonology .....	258
4.8.1 PDAOP consonants.....	258
4.8.2 PDAOP vowels and tone .....	261
4.9 Dana .....	262
4.9.1 Dana consonants.....	262
4.9.2 Dana vowels and tone .....	264
4.10 Proto-Opo (POP).....	265

Chapter	Page
4.10.1 POP consonants .....	265
4.10.2 POP vowels and tone .....	268
4.11 Opo .....	269
4.11.1 Opo consonants.....	269
4.11.2 Opo vowels and tone .....	272
 V. RECONSTRUCTION OF PROTO-KOMAN PRONOMINAL AND DEICTIC	
MORPHOLOGY .....	273
5.1 Reconstruction of Koman pronominal elements .....	274
5.1.1 PKMN 1SG reconstructed forms .....	276
5.1.2 1PL reconstructed forms .....	278
5.1.3 PKMN 2SG reconstructed forms.....	281
5.1.4 PKMN 2PL *ʊm(a).....	283
5.1.5 PKMN 3SG reconstructed forms .....	284
5.1.6 PKmn 3PL *hɔn(i).....	288
5.2 Reconstruction of Koman nominal gender/number morphology.....	289
5.2.1 PKMN singular nominal morphology .....	289
5.2.2 PKMN plural nominal gender morphology.....	291
5.3 Reconstruction of PKMN demonstrative elements .....	293
5.4 Reconstruction of Koman Deictic Directional (DD) verb morphology.....	294

Chapter	Page
VI. CONCLUSION.....	299
APPENDICES	
A. ABBREVIATIONS .....	301
B. ETYMOLOGICAL WORDLIST.....	303
C. TONE CORRESPONDENCE SETS .....	582
D. PKMN CONSONANT CORRESPONDENCE SETS .....	589
E. PKMN VOWEL CORRESPONDENCE SETS .....	613
F. COMPLETE DATASET.....	622
REFERENCES CITED .....	724

## LIST OF FIGURES

Figure	Page
1. Bender's (1996) Nilo-Saharan classification .....	1
2. Ehret's (2001) Nilo-Saharan classification .....	2
3. Map of the living Koman languages.....	8
4. Map of Koman language areas in James (1975:87).....	9
5. Distribution of Uduk communities in James (1968:18) .....	17
6. Distribution of <i>Mao</i> and <i>Komo</i> ethnic terms in the <i>Mao-Komo Special Woreda</i> .....	20
7. Greenberg's (1963) Nilo-Saharan classification.....	21
8. Bender's (1983:286) internal classification of Koman .....	25
9. Koman internal classification from the Global Lexicostatistical Database .....	26
10. Proposed Koman internal classification based on results of this study.....	28
11. Koman tree generated with Lingpy software distance measurements.....	29
12. Gwama contrastive vowel inventory.....	44
13. Ethiopian Komo vowel system.....	52
14. Uduk contrastive vowel inventory .....	71
15. Opo contrastive vowel inventory .....	83
16. Dana contrastive vowel inventory .....	91

## LIST OF TABLES

Table	Page
1. Cognacy rates from the current database calculated with LingPy .....	30
2. Gwama contrastive consonant inventory .....	41
3. Distribution and allophones of Gwama obstruents.....	42
4. Distribution and allophones of Gwama sonorants .....	43
5. Ethiopian Komo contrastive consonant inventory .....	49
6. Distribution and allophones of Komo stops and sibilants .....	51
7. Chali Uduk contrastive consonant inventory .....	59
8. Killian’s (2015:20) Chali Uduk contrastive consonant inventory .....	60
9. Distribution and allophones of Chali Uduk voiceless plosives.....	62
10. Distribution and allophones of Chali Uduk voiced, ejective and implosive obstruents .....	62
11. Yabus Uduk contrastive consonant inventory.....	65
12. Distribution and allophones of Yabus Uduk voiceless plosives.....	66
13. Distribution and allophones of Yabus Uduk implosives, ejectives and voiced plosives .....	68
14. Distribution and allophones of Yabus Uduk .....	70
15. Opo contrastive consonant inventories .....	78
16. Distribution and allophones of Opo plosives, implosives and affricates.....	80
17. Dana contrastive consonant inventory .....	87
18. Distribution and allophones of Dana plosives.....	89
19. Koman independent personal pronominals .....	97
20. Lowland Gwama independent and possessive pronouns .....	100

Table	Page
21. Lowland Gwama pronominal demonstrative enclitics .....	102
22. Lowland Gwama nominal gender/number proclitics .....	103
23. Ethiopian Komo independent and possessive pronouns.....	107
24. Komo pronominal demonstrative enclitics .....	109
25. Ethiopian Komo nominal gender/number proclitics.....	111
26. Sudanese Komo nominal gender/number proclitics (Burns 1947:12).....	115
27. Chali Uduk and Yabus Uduk independent and possessive pronouns .....	116
28. Chali Uduk pronominal demonstrative bases.....	117
29. Chali Uduk pronominal demonstrative configurations.....	118
30. Dana independent, possessive and bound pronominals.....	122
31. Dana demonstrative enclitics.....	123
32. Dana nominal gender/number proclitics .....	125
33. Independent pronouns in four Opo varieties.....	127
34. Possessive pronominal enclitics in four Opo varieties .....	128
35. Bilugu Opo demonstrative enclitics .....	129
36. Opo third person demonstrative pronouns .....	130
37. Bilugu Opo human nominal gender/number proclitics.....	131
38. Lowland Gwama independent and bound pronominals .....	134
39. Ethiopian Komo independent and bound pronominals.....	137
40. Chali Uduk independent pronouns and argument indexing verb morphology.....	140
41. Yabus Uduk independent pronouns and argument indexing verb morphology .....	143
42. Dana independent and bound pronominals .....	145

Table	Page
43. Bilugu Opo independent and bound pronominals.....	147
44. Koman Deictic Directional morphemes .....	149
45. Tone patterns in PKMN correspondence sets .....	161
46. PKMN bilabial stops correspondence sets.....	164
47. Evolution of Koman tone in PKMN cognates.....	167
48. Proto-Koman (PKMN) consonant inventory .....	175
49. Schematic for PKMN correspondence sets .....	176
50. PKMN *p <sup>h</sup> correspondence set.....	177
51. PKMN *p correspondence set.....	178
52. PKMN *b correspondence set.....	179
53. PKMN *b̥ correspondence set.....	181
54. PKMN *p' correspondence set.....	182
55. PKMN *t <sup>h</sup> correspondence set .....	184
56. PKMN *t̥ correspondence set.....	185
57. PKMN *d̥ correspondence sets .....	186
58. PKMN *t' correspondence sets .....	188
59. PKMN *t <sup>h</sup> word-final correspondence set.....	190
60. PKMN *t correspondence set.....	191
61. PKMN *d correspondence sets .....	191
62. PKMN *d̥ correspondence set.....	193
63. PKMN *t' correspondence set.....	194
64. PKMN *s' correspondence set.....	195
65. PKMN *c correspondence set .....	196



Table	Page
66. PKMN *ɟ correspondence set.....	197
67. PKMN *c' correspondence set.....	200
68. PKMN *k <sup>h</sup> correspondence set.....	201
69. PKMN *k correspondence sets .....	202
70. PKMN *g correspondence sets .....	203
71. PKMN *k' correspondence sets .....	205
72. PKMN *s correspondence sets.....	206
73. PKMN *ʃ correspondence set.....	208
74. PKMN *h correspondence set.....	210
75. PKMN *r and *l correspondence sets.....	210
76. PKMN *m and *n correspondence sets.....	211
77. PKMN *ɲ correspondence set.....	212
78. PKMN *ŋ correspondence set.....	213
79. PKMN *w correspondence set.....	214
80. PKMN *j correspondence set .....	214
81. PKMN *Ṱ and Ḑ correspondence set .....	215
82. PKMN *i and *ɪ correspondence sets .....	220
83. PKMN *u correspondence set.....	222
84. PKMN *ʊ correspondence set.....	225
85. PKMN *ɛ, *ɔ and *a correspondence sets .....	226
86. Gwama phonological innovations.....	231
87. Proto-Central Koman (PCTRL) consonant inventory .....	234
88. Proto-Central Koman (PCtrl) phonological innovations.....	235

Table	Page
89. PCTRL *Ṭ and Ḑ correspondence set.....	237
90. Tone categories in PCTRL correspondence sets and the distribution with stop onsets .....	242
91. Proto-Komo-Uduk (PKOUD) consonant inventory.....	243
92. Proto-Komo-Uduk (PKoUd) phonological innovations.....	243
93. Komo phonological innovations.....	246
94. Proto-Uduk (PUD) consonant inventory.....	249
95. Proto-Uduk (PUd) phonological innovations.....	250
96. Chali Uduk phonological innovations.....	253
97. Yabus Uduk phonological innovations.....	255
98. Proto-Dana-Opo (PDAOP) consonant inventory.....	259
99. Proto-Dana-Opo (PDaOp) phonological innovations.....	259
100. Dana phonological retentions.....	263
101. Proto-Opo (POP) consonant inventory.....	265
102. Proto-Opo (POp) phonological innovations.....	266
103. Opo phonological innovations.....	270
104. PKMN reconstructable independent personal pronouns.....	275
105. Additional reconstructable pronominal elements.....	276
106. Reflexes of PKMN 1SG *aGa.....	276
107. Reflexes of PKMN 1SG *na.....	277
108. Reflexes of PCTRL 1SG *má ~ *ám.....	278
109. Koman 1PL independent pronouns.....	279

Table	Page
110. Reflexes of 1PL in Komo-Uduk (KOUD).....	280
111. Reflexes of 1PL in Gwama, Dana and Opo .....	281
112. Reflexes of PCTRL 2SG *aj .....	281
113. Reflexes of a questionable PKMN 2SG ?*aik.....	282
114. Reflexes of PKMN 2SG *mini.....	283
115. Reflexes of PKMN 2PL *um(a).....	284
116. Reflexes of PKMN 3N *han ~ hm.....	285
117. Reflexes of PKMN 3SG.F *haɓ.....	286
118. Reflexes of PKMN 3SG.M *had(i) .....	287
119. Reflexes of PKMN 3PL *hɔn .....	289
120. PKMN reconstructed singular nominal morphology.....	290
121. PCTRL singular nominal morphology? .....	291
122. Koman plural nominal (gender) morphology .....	291
123. PKMN plural nominal (gender) morphology .....	292
124. Koman proximal demonstrative enclitics .....	293
125. Koman medial demonstrative enclitics .....	293
126. Koman Deictic Directional 1 (DD1) morphemes .....	295
127. Koman Deictic Directional DDØ and DD2 morphemes .....	296

CHAPTER I  
INTRODUCTION

This dissertation is a historical-comparative reconstruction of the Koman family, a small group of languages spoken in the borderlands of Ethiopia, Sudan and South Sudan. This language family has been relatively understudied though it has figured prominently in large-scale classifications of the Nilo-Saharan super family (Bender 1971, 1989, 1996; Ehret 2001). One of the motivations for this project was comparing how prior scholars situated Koman within Nilo-Saharan (NS). Consider the following Nilo-Saharan classifications. In Figure 1, Bender’s (1996) classification situates Koman in what he refers to as the “core” of Nilo-Saharan. In Figure 2, Ehret’s (2001) classification situates Koman as one branch in a binary split from Proto-Koman.

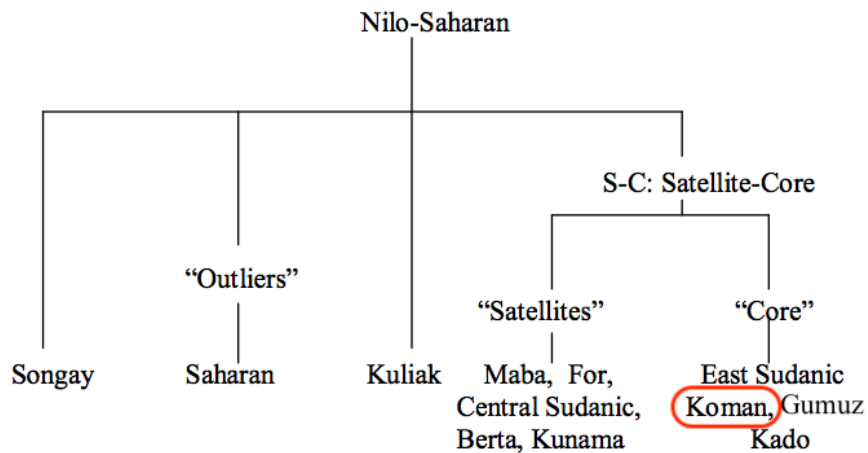


Figure 1 Bender’s (1996) Nilo-Saharan classification (adapted from C. Ahland 2012:24)

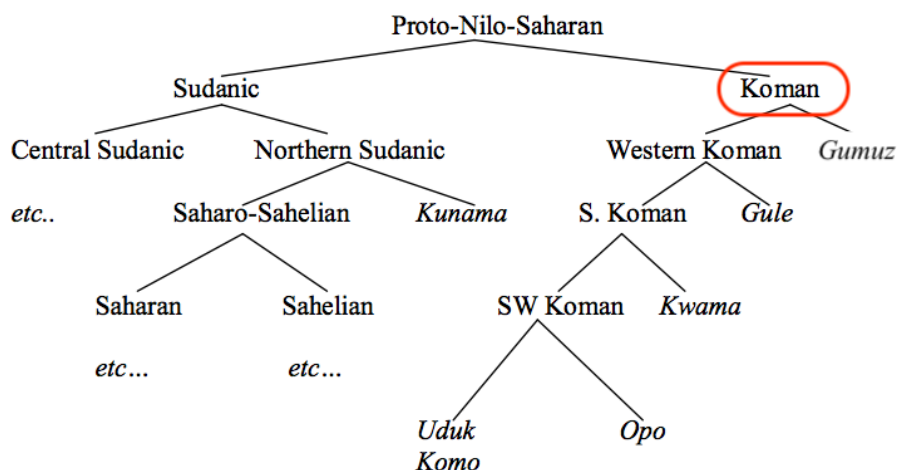


Figure 2 Ehret's (2001) Nilo-Saharan classification (adapted from C. Ahland 2012:25)

These classifications and other attempts at constructing a genealogical tree of Nilo-Saharan employed very little data on Koman, given the paucity of research on Koman as a whole at the time. Our understanding of Koman has drastically evolved since the early 2010's with ongoing research continuing to the time of this writing.

One of the issues with prior reconstructions of Koman was the fact that it was assumed that Koman is of Nilo-Saharan stock. This is still under debate and some prominent scholars currently consider Koman a family that is independent from Nilo-Saharan (e.g. Dimmendaal 2011, 2018, *to appear*) while others question the validity of Nilo-Saharan as a whole (Güldemann 2018). Nevertheless, the status of Koman as a genetic unit has not been disputed, though possible peripheral members, such as Gule and Gumuz have been questioned.

The main arguments for classifying Koman as an independent family (i.e. not within Nilo-Saharan) has been the relative lack of data and analyses on individual Koman languages. This is coupled with classifications which *a priori* assumed Koman to fit

within Nilo-Saharan, which often led to cherry-picking supposed cognates from particular Koman languages in order to validate proposed high-level sound correspondences at distinct nodes within the Nilo-Saharan family tree. The field of historical linguistics in Africa in general lacks low-level reconstructions of families established with verifiable sound correspondences as well as morphological evidence to support the internal structure of a given family. For instance, Vossen's (1982) reconstruction of Eastern Nilotic is one prominent example of a substantive historical work on a tight-knit language family.

In light of these issues, this project aims to provide phonological and some lexical and morphological reconstruction of Koman. I employ firsthand data collected in the field from native speakers of all of the living Koman languages including from previously undocumented varieties. I also incorporate and synthesize prior research from Koman scholars. In terms of the reconstruction, I take an ultra-conservative methodological stance and do not assume Koman to be related to any other language or language family. I focus only on "nuclear" Koman; i.e. the living languages and varieties that undisputedly comprise the family.

One main aim is to provide a reconstruction of the basic phonology, including segmental and suprasegmental domains, and trace the evolution from Proto-Koman down through the nodes to the modern-day sound systems. I also reconstruct some of the core lexicon and morphology to Proto-Koman and to the subnodes. I recognize that the comparative method employed here can make some controversial assumptions about the nature of family trees (e.g. that clean splits necessarily represent a separation of people groups). The historical evolution of people groups can take place gradually and linguistic innovations can spread across these groups over time. Thus, the family

tree of Koman proposed here is a formalization or schematization of the linguistic innovations that defined and separated the Koman people groups.

In this dissertation, I strive to make my analyses as faithful to the data as possible and I also try to make the all of my data available to the reader. I provide all of the data and all of the correspondence sets employed to reconstruct proto-sounds in the Appendices. I also provide an etymological wordlist of lexica reconstructed to distinct nodes within the family.

Before embarking on the reconstruction, in §1.1 I discuss some of the history of the Koman people and some of the issues in identification and classification of speakers of Koman languages in the literature. In §1.2 I discuss the classification of the Koman family as a linguistic unit. The methods and the database employed for this study are discussed in §1.3. Chapter II provides phonological and morphological sketches of all of the languages and varieties employed in this study. Chapter III is a reconstruction of Proto-Koman segmental and suprasegmental phonology and lexica. Chapter IV reconstructs the phonology and lexica at each subnode down to the modern-day language varieties. Chapter V reconstructs some core-Koman morphology. An etymological wordlist of the reconstructed lexicon is provided in Appendix B and all of the correspondence sets employed in this study are presented in Appendix C-E. Appendix F contains the full dataset employed in this study organized alphabetically by meaning.

### 1.1 The Koman people

This section provides a brief overview of the history of the people groups who speak what are now considered to be the living languages of the Koman family. For

clarity, I employ the term “people” for groups who speak the same language and share similar socio-cultural principles and practices (Johnson 2016:20). The term “people” here is akin to an ethnic group, though I recognize that the concept of an ethnic group is controversial and complex, certainly with regards to speakers of Koman languages (Jedrej 2004). I also recognize that employing the idea of a “same language,” which means either a single language or a cluster of mutually intelligible dialects, is generally problematic, given that definitive criteria in establishing the difference between language and dialect beyond judgments of mutual intelligibility is highly complex (Good & Cysouw 2013).

The Koman family is comprised five living languages: Gwama (ISO 693-3 code *kmq*), Opo (ISO 693-3 code *lgn*), Komo (ISO 693-3 code *xom*), Uduk (ISO 693-3 code *udu*), and Dana (no existing ISO code). The extinct language Gule (ISO 693-3 code *gly*), purported to also pertain to Koman in Greenberg’s (1963) classification, does not form part of this study (see §1.2.2). All of the living Koman languages have at least two varieties with the exception of Dana, a recently identified Koman language (Otero 2016). Aside from being virtually undocumented, Dana has not been recognized in the literature as a distinct language, but rather peripherally as a distant dialect within the Opo cluster (see §1.1.1.2). Lemi (2010) cites Dana as one of seven mutually intelligible dialects of Opo, five of which are spoken in South Sudan. Nonetheless, he provides no data on the dialects. Mellese (2017:3) states that Dana is the most distinct variety of Opo but recognizes that the degrees of mutual intelligibility among the Opo dialects remains to be investigated. My preliminary research suggests Dana is a first split from Proto-Dana-Opo (cf. §1.2.3).



Koman languages have been spoken for centuries if not millennia along what now constitutes the borderland of Ethiopia, Sudan and South Sudan (Fernández 2004). This particular borderland is demarcated by an escarpment of rock wall which falls from the Western Ethiopian highlands to the verdant lowlands of Ethiopia and further extends to the (South) Sudanese Nile valley. The forests of the Ethiopian and Sudanese lowlands are studded with mountain ranges, hills and dramatic inselbergs. Recent archaeological studies have discovered that the rock inselbergs were used as shelters as far back as the Middle Stone Age (González-Ruibal 2014, Fernández et al. 2007) and González-Ruibal (p.c.) has uncovered archeological remains of Koman communities that inhabited the area around Bambassi (Ethiopia) at least 2,000 years ago.

This borderland has served as a refuge for Koman-speaking peoples and other minority groups fleeing oppression and enslavement from both sides of the border (James 1968, 1979, 1980; Triulzi 1982 *inter alia*). The history of Koman peoples, at least that of the past two centuries, has been fraught with struggle and strife. Koman speakers have been enslaved by Arab and Abyssinian forces and raided by the Nuer. Over centuries, this has led to the fragmenting of Koman communities as groups scattered into the mountains and valleys of the borderlands in a constant struggle for self-preservation. In describing the history of minority groups such as Koman in the Benishangul-Gumuz Regional State of western Ethiopia, the ethno-archaeologists González-Ruibal and Fernández-Martínez (2007:14–15) conclude,

“[...] at the end of the day, it is all a matter of power. The traditional ethnic hierarchy of the region could be described as follows: historically the most oppressed and disempowered groups are those labelled Mao and Komo. Some groups related to this ethnic cluster were probably wiped out by slave raids in the

late 19th century and nowadays only their ethnic names and some dispersed and confusing data are preserved in the literature (Negaso Gidada 2001:61-91). The Mao and Komo were continually expelled from their lands and today they inhabit the most inhospitable and marginal frontier areas of Benishangul.”

Koman’s history of being dominated and subjugated unfortunately continues in some part to the present. In Western Ethiopia, land grabbing is rampant, and many groups are being pushed out of ancestral territories (Meckelburg 2014). Ongoing war and strife for the last decade in South Sudan has led to forced migration of minority groups to refugee camps (UNHCR 2016). Many of the Koman groups in Sudan and South Sudan are currently found either in the midst of war or fleeing to refugee camps in Ethiopia, Kenya or Uganda. There are also small populations of Uduk refugees living in the United States since fleeing war in Sudan the mid 1990’s.

A map of the areas in which Koman languages are spoken is in Figure 3. Note that “Tw’ampa” refers to the Uduk varieties, “Kwama” to the Gwama varieties and “Opoo” to the Opo varieties and what I suspect is also Dana. The Uduk varieties are spoken in the Blue Nile State of Sudan. The southernmost patch of Uduk in Figure 3 represents the Yabus Uduk variety, where they live alongside the Komo, and the Western Nilotic languages Jum Jum and Mabaan, among others. The river traversing from Sudan into Ethiopia in this area is the Yabus River. This map predates the creation of South Sudan in 2011. The border of South Sudan and Ethiopia is roughly at the latitude of Begi.



Figure 3 Map of the living Koman languages (from Killian 2015:6)

The map in Figure 3, which Killian attributes to an unpublished manuscript by Roger Blench, appears to have been adapted from the map in James (1975:80) seen below in Figure 4. Note that in Figure 4, “Shita” refers to the Opo varieties and Dana. I suspect that the “Shita” group identified near the Daga River are speakers of Dana and possibly other Opo varieties (see §1.1.1.2).

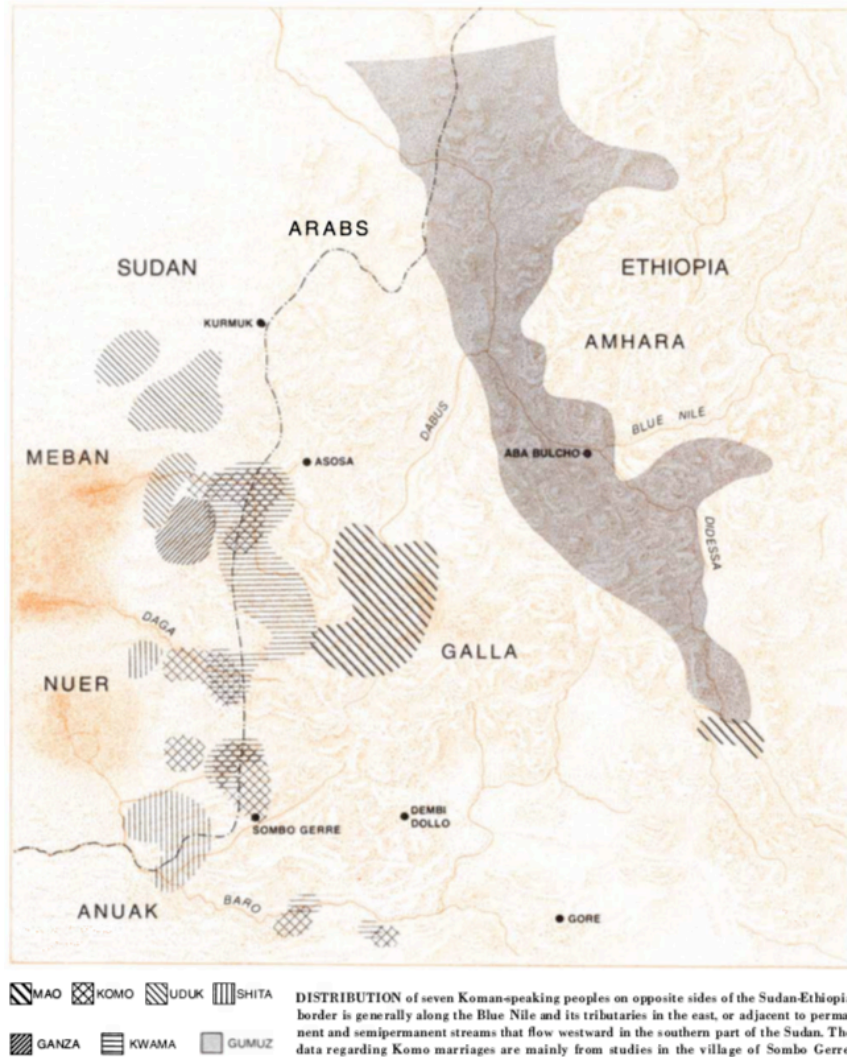


Figure 4 Map of Koman language areas in James (1975:87)

Multilingualism among speakers of Koman languages has been the norm historically and this continues to the present. James (1975:84-85) observes that Koman people have had long links with the Oromo and Amhara of Ethiopia as well as with the Arabs and Nilotes of Sudan. James notes that Koman people groups have retained their languages and their way of life despite their violent history of being the victims of the slave trade from both sides of the border. Nonetheless, she observes that Arabic and/or Oromo is spoken across the Koman hamlets (predominantly by men). James also

observes that Koman speakers further south are also fluent in Anuak (also known as Anywa).<sup>1</sup> The following subsections discuss some issues in identifying Koman people groups and languages in the literature.

#### 1.1.1 Issues in nomenclature of Koman groups

The endonyms and exonyms for Koman peoples and the names for languages they speak also have a complicated history (e.g. Bryan 1945, James 1981). The literature on Koman, including historical, anthropological and linguistic is fraught with countless terms for individual communities as well as blanket terms for one or more language groups. This has led to an unfortunate history of mis-identifying Koman languages and Koman dialect groups.

Some of the earliest accounts of speakers of Koman languages date back to the Dutch explorer Juan María Schuver's travels in 1881-1882 along what then constituted the Ethiopia-Sudan borderlands (James et al. 1996). From his extensive travels, Schuver encountered many people groups with differing ethnonyms for speakers of Koman languages.<sup>2</sup> At the end of the 19th century, according to Schuver, *Koma* or *Goma* was a blanket term for speakers of what are modernly Komo, Gwama, Dana and Opo. James et al. (1996:xc-xcii) provide an insightful summary of the wordlists that Schuver collected during that period mapped onto the terms they identified for Koman languages in 1996. Since 1996, some of the terms employed for Koman-speaking people

---

<sup>1</sup> The Komo speakers residing in the Pokung village of the Gambela region often intermarry with the Anuak. I encountered many Komo who spoke Anuak there but Anuak people that spoke Komo were not as common, if practically non-existent.

<sup>2</sup> James et al.'s (1996:xl) sketch map of Schuver's travels indicates a round trip from Famaka, Sudan (approximately 11°18'00"N, 34°44'00"E) to as far south as Gobo, Ethiopia (approximately 8°56'11.27"N, 34°31'59.68"E).

groups have been refined. The following sections trace the histories of the nomenclature used for Koman peoples and Koman languages in the literature and update them with the current knowledge of Koman languages and language groups.

#### 1.1.1.1 Gwama and Komo terms in the literature

Some terms seen for modern-day speakers of Gwama in the literature are *Gwama*, *Kwama*, *North Koma*, *South Koma*, and *Gogwama*, among others.<sup>3</sup> James (1980:67) states that she and M. Lionel Bender decided to employ the term *Kwama* for the modern-day Gwama speakers. Bender (1971:222) classifies modern-day Gwama into *North Koma* and *South Koma*, though Bender (1975:67) notes that this division may be unjustified. Note that “Koma” is employed by native speakers in the Sudanese side of the border while “Komo” is used in the Ethiopia.

Currently, Gwama is classified into mutually intelligible Highland and Lowland Gwama varieties, which display some lexical and grammatical variation (Zealelem 2005, Joelle Goldberg 2015, Küspert 2015). The Highland Gwama speakers inhabit the area around Tongo, in the plateau above the escarpment, and speakers of the Lowland variety reside further west in the lowlands. Highland Gwama speakers can identify as *Mao* or *Begi Mao*, as they live in proximity with Omotic Mao speakers (M. Ahland 2012) or *Sit Shwala* ‘black people’. The Lowland speakers by contrast, identify either as *Gwama* or *Komo* though they recognize their language as entirely distinct from Komo (Küspert 2015, Meckelberg 2016). Incidentally, Schuver’s wordlist of *Koma/Goma*

---

<sup>3</sup> *Gogwama* is most likely from Komo *gò=gwàmá* PL=gwama ‘Gwama people’.

collected in the village of Boshu in Ethiopia, at the end of the 19th century reproduced in James et al. (1996:329), corresponds to the Gwama data I have collected.<sup>4</sup>

Terms in the literature used to describe what constitute modern-day speakers of the Komo language are: *Komo*, *Koma*, *Goma*, *Kwama*, *Gokwom*, *Kwom*, *Komo of Daga*, *Hayahaya*, and *Burun*.<sup>5</sup> The two terms that are widely used today are *Koma*, which is used in South Sudan and Sudan, while *Komo* is used in Ethiopia. In Ethiopia, *Komo* can be used to identify both the people and the language spoken by the Komo. But politically, *Komo* is employed for both Komo and Gwama speakers (Küspert 2015, Meckelburg 2016). Intermarriage between Komo and Gwama speakers is very common in Ethiopia though it is unclear whether the intermarriage is with both Highland and Lowland varieties of Gwama. There is evidence that at least in Ethiopia, there has been sustained contact between Komo and Gwama since that last century if not longer (Meckelberg 2016).

Bender (1975) provides some insight on the history of the nomenclature used for modern-day Komo. Bender recognizes the problems of nomenclature and adopts the name *Komo* from Wendy James. He also recognizes that *Komo* and *Koma* are used by outsiders, especially the Oromo, for Komo as well as for speakers of other Koman languages. Bender (1975:63) observes that the term *Central Koma* employed in Bender (1971) is the same language described by Burns (1947), namely modern Komo. Further, Bender (1975) states that the term *Komo of Daga* is “inaccurate,” though he does not

---

<sup>4</sup> James et al. (1996:xci) note that *Boshu* may have been a Komo-speaking village as it was a Komo clan name at the time of their publication. *Boshu* also appears as a Komo clan name in my data.

<sup>5</sup> Corfield (1938:128) notes that in Sudan (from the Dota to the Jokau rivers), the term *Koma* was being employed for at least two language groups at the time of his writing.

expand upon what he means by this.<sup>6</sup> Bender (1975) observes that the *Shita* (i.e., Kigille Opo and possibly other Opo varieties) refer to the Komo as *mēdin*. I assume this is Corfield's (1938) *Madiin*, which data corresponds to my Komo data. Further, in my data, the Dana ethnonym for the Komo people is *māḍin*, which has no discernable etymology in Dana (or Komo) to my knowledge.

#### 1.1.1.2 Dana and Opo terms in the literature

James et al. (1996:334) observes, “while most Koman groups are ‘hill’ people, the *Shyita* are associated with the lowlands and with cattle pastoralism.”<sup>7</sup> As noted earlier, *Shyita* is one of the blanket terms used to identify Opo (and most likely Dana) groups in the literature. In the literature, the terms *Shita*, *Shyita*, *Ciita*, *Ansita*, *Po*, *T'apo*, among others, are employed for what is now known to be Opo and/or Dana. Note that the Kigile Opo word for ‘person’ is *fità*, which undoubtedly corresponds to the terms *Shita*, *Shyita*, *Ciita*, *Ansita* found in the historical and anthropological literature.

In Corfield's (1938) exploration of what he referred to as “Koma” country in what now constitutes the Sudan/South Sudan border with Ethiopia, he comes across several *Koma* ethnic groups, which to him do not appear to speak the same language. Corfield collected wordlists, conducted interviews, and identified two *Koma* groups: the *Madin*

---

<sup>6</sup> In my estimation, *Komo of Daga* may have either been a name for modern-day Dana or for the Komo speakers who inhabited Daga. If it is the latter, then the expression *Komo of Daga* can be taken as evidence that Komo speakers did in fact live in Daga and, as a result, were most likely in contact with Dana speakers.

<sup>7</sup> An interesting point here is that an Opo ethnonym for the Komo, who have historically resided in mountainous territory, are compounds meaning ‘those who fly up mountains’. To illustrate, the Komo ethnonym in Pame Opo is *bì=pāj zàw* PL=fly rock – lit. ‘Those who fly (up and over) mountains’. Note the Opo use the same term for ‘rock/stone’ and ‘mountain’.



and the *Ciita*. The graphemes <C> and <c> employed by Corfield (1938) for linguistic data represents a voiceless (alveo)palatal fricative [ç].<sup>8</sup>

Corfield further subdivides *Ciita* into three dialect groups based on the proximity of the speech varieties: *Kusgilo*, *Kigelle* and the *Buldiit*. For Corfield, *Kusgilo* and *Kigelle* are closely related given the similarity he observed in speech. Further, the *Kusgilo* and *Kigelle* lived in proximity to one another around Daga Post (modern day Dajo, South Sudan). Corfield distinguishes *Buldiit* as a distinct dialect group, who lived further west from the *Kigile* and *Kusgilo* group citing greater variation (Corfield 1938:130).

The Dana lexical data collected for this study correspond to Corfield's *Buldiit* variant of *Ciita*. Anecdotally, Corfield (1938:129) also observes that, "the people of *Buldiit* replied that they were Dana, but this turned out to be the name of the area in which they lived."

In the late 1800's, the Dutch explorer Schuver collected a wordlist of a language spoken by his slave which Schuver calls *Gambiel* or *Kilai* (James et al. 1996). *Kilai* refers to the area in which his slave lived prior to being bought. In 1996, Wendy James identifies Schuver's *Gambiel/Kilai* language as *Shiyta* (James et. al 1996:xc).<sup>9</sup> According to James, the term *Gambiel* is named after the Oromo word for *Gambela*, a regional state of southwest Ethiopia (*ibid* 1996:334). Nevertheless, Schuver's wordlist of *Gambiel/Kilai* corresponds to my Dana data.

---

<sup>8</sup> Corfield employs the English digraph <sh> to explain the phonetic representation of his use of <C> and <c> in his wordlists.

<sup>9</sup> Whether Schuver's *Kilai* is at all related to *kíná(j)*, a term used by Komo, Gwama, Yabus Uduk and Dana speakers today as an ethnic term for Opo speakers, is uncertain at this point.

I find it noteworthy that both Schuver and Corfield found Dana to be a distinct speech community. Even though they were not trained linguists, their intuitions appear to be in the right direction. My Opo consultants, who are native Pame Opo speakers bilingual in Bilugu Opo, recognize that for them at least, Dana is not mutually intelligible with the Opo varieties they speak. Komo and Gwama speakers I interviewed recognize the Dana ethnicity and language as distinct from the Opo varieties. Komo and Gwama consultants distinguish the *kíná* ‘Opo’ from the *dāná* ‘Dana’. Further, the Yabus Uduk also distinguish between the *c<sup>h</sup>ínaj* ‘Opo’ and *púr* ‘Dana’. Returning to Schuver, he observes that “the self-name of speakers is sometimes distinguished as *Ciita* or *Ansita*; the people are termed *Kina* or *Kena* by Komo speakers, *Pur* by Uduk speakers, *Kogo* or *Pau* by the Oromo, some as *Lango* by the Anuak, others as *Cai Buldiit* by the Nuer (James et al. 1996:334)”.

There is little doubt that Dana is closely related to the varieties of the modern-day Opo cluster. Many current linguists who have worked on Opo varieties have considered Dana as a variety of Opo, though few have actually collected Dana data. Lemi (2010), Mellese (2017) and Smolders (*forthcoming*) suggest, albeit loosely, that Dana and the Opo varieties form a dialect continuum. While this may turn out to be true, at least historically, it is yet to be definitively established.

In discussing Dana’s history of nomenclature, we inevitably delved into Opo’s history but I now discuss Opo more specifically. In the earlier literature, Bender (1975) employed the term *Shita* and later adopted *Opo* (1983-2000) for what constitutes modern-day Opo. The most recent work on Opo, Smolders (*forthcoming*), identifies seven dialects, within which he includes Dana. The Bilugu and Modin varieties are

spoken in the Gambella Regional State, while Pame, Modin, Kigile, Pilakoy and Bikol are spoken in the Upper Nile State of South Sudan.

By examining the autonyms employed by the distinct varieties, we see where some of the terms in the linguistic (and historical) literature came from. The Bilugu and Modin varieties employ the term *pò* ‘people’ as an autonym, the Kigile and Pilakoy use *Jità* ‘people’ and Pame employs *zità*. Thus, the terms *Shita*, *Shyita*, *Ciita*, *Ansita* likely came from researchers working with South Sudanese varieties, while *Opo*, *Upo*, *Opo*, *Opuoo* derive from the Ethiopian varieties. In keeping with the linguistic literature, I follow Bender (1983) and Smolders and employ *Opo* as a general term for the Opo varieties though, for now, I treat Dana as a distinct language until proven otherwise.

#### 1.1.1.3 Uduk terms in the literature

The Uduk varieties have the least terminological confusion of any of the Koman groups. Further, Uduk is by far the most studied people and language of the Koman family. Wendy James has produced detailed anthropological and historical accounts of the Uduk in an extensive collection of work dating from the 1970’s until the time of this writing. Early wordlists date back to Evans Pritchard (1932) in his exploration of the inhabitants of the Blue and White Nile areas in 1926.

All of the Uduk varieties are spoken in the Blue Nile State in Sudan. James (1979), Killian (2015) and my consultants identify three Uduk varieties: Chali Uduk, Bonya (or Bellila) Uduk, and Yabus Uduk. According to my consultants, the Chali and Bonya varieties are very close and easily mutually intelligible, while the Yabus variety is more distant (see also James 1979 and Killian 2015). The geographical distribution of the Uduk varieties in 1968, which holds to the present day, is seen in Figure 5. Note that

Central Uduk corresponds to Chali Uduk, which is in proximity to Bellila Uduk (or Bonya Uduk). Belatoma Uduk corresponds to modern-day Yabus Uduk, spoken along the Yabus river in Sudan.

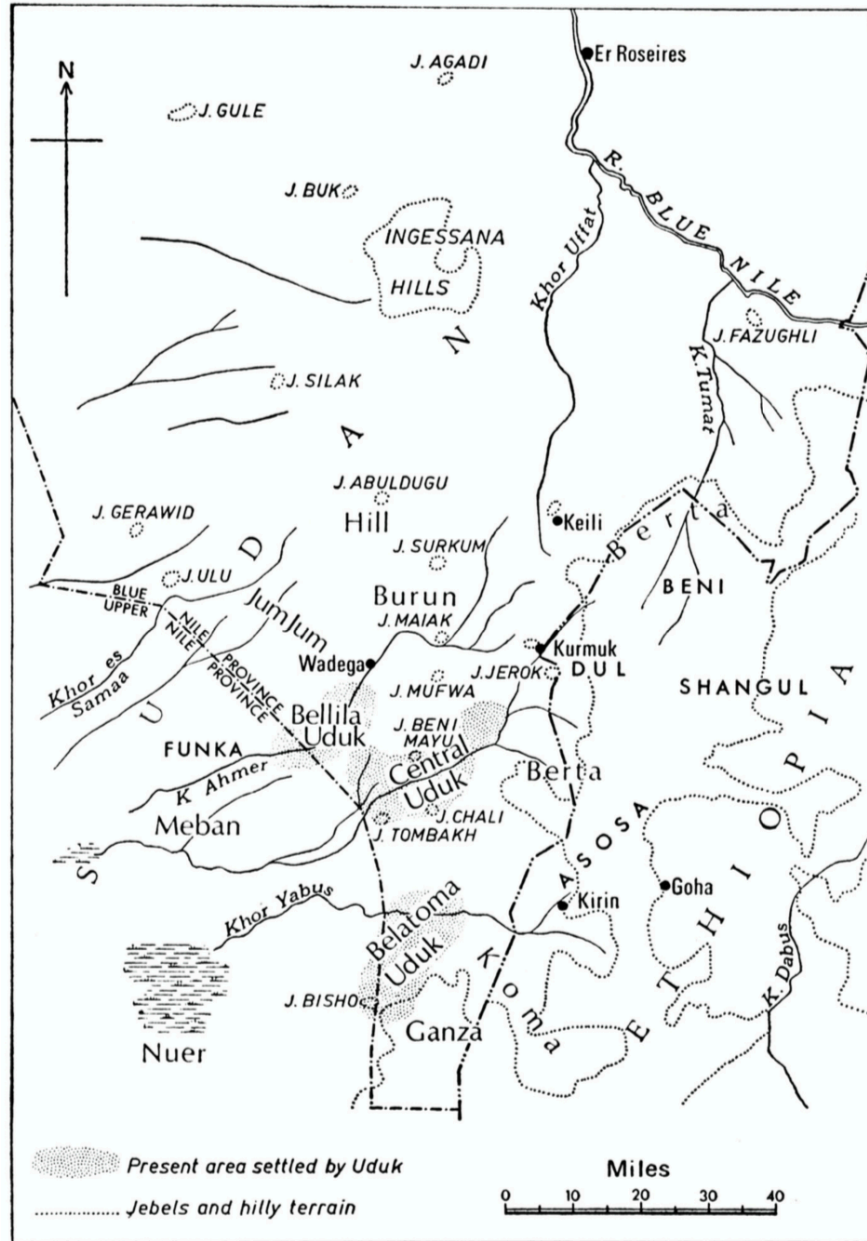


Figure 5 Distribution of Uduk communities in James (1968:18)

The Uduk cluster is the only Koman language that is not spoken in Ethiopia excluding the Uduk in Ethiopian refugee camps or other emigrant locales, particularly in the U.S.

This terminological confusion for the majority of the Koman languages continues well into the 2010's as noted by Küspert (2015), who attempts to unravel the *Komo*, *Gwama*, *Kwama*, *Mao* terms employed for several Koman and Omotic groups of western Ethiopia. While Küspert makes significant progress in identifying the language and people group names internally and externally, he observes that even in 2015, the picture is not as clear as one would like it to be. We turn now to a discussion of how issues such as the identification of people groups has hindered determining the population of Koman communities.

#### 1.1.2 Population of Koman groups today

Determining the population of Koman speakers has been historically challenging for a number of reasons including the nomenclature issue addressed in the preceding section. These continue to be challenges to the present day. A major issue has been the result of mis-identifying ethnic groups, lumping groups together, and/or not identifying a group altogether (James 1981). Moreover, these difficulties are coupled with the fact that many Koman communities inhabit rural areas, communicable only by footpaths, and often intermarry with other Koman groups as well as larger groups including the Oromo and Anuak. To make matters more complicated, Sudanese and South Sudanese population estimates of Koman groups other than the Uduk are not presently available.

A widely used figure employed in recent editions of the *Ethnologue* (e.g. Lewis, Simons & Fennig 2015; Simons & Fennig 2018) is a population estimate of 60,000-

100,000 Koman speakers. This figure, which was originally taken from James (1975), includes the Gumuz whose population vastly outnumbers that of any Koman group (C. Ahland 2012) and whose linguistic genetic affiliation to Koman is still under debate (see §1.2).<sup>10,11</sup> Bender's (1997:211) population estimates of Koman groups taken from the 1988 version of the *Ethnologue* (Grimes 1988) and Bender's own data seem closer to the current situation with respect to the Uduk (11,000), Opo (2,000-5,000) and Gwama (15,000).<sup>12</sup> Bender (1997) estimates 4,500 Komo, which I assume to include the Ethiopian and Sudanese populations. Hudson's (2004) survey of the 1994 Ethiopian census lists roughly 1,500 ethnic Komo and 140 ethnic Gwama.

Another major issue that impacts determining the populations of Komo and Gwama speakers in Ethiopia is ethnic self-identification within the larger cultural context. In the Lowlands of Ethiopia, Komo and Lowland Gwama speakers self-identify as ethnically *Komo*, while speakers of Highland Gwama (*t'wa sit fwala*) who inhabit the highlands often self-identify either via their clan name *Kuro* or *Kirin*, or as ethnically *Mao* (Küspert 2015:8). In the highlands of Western Ethiopia, Highland Gwama speakers are in contact with speakers of Omotic languages such as Northern Mao, Seze and Hozo (M. Ahland 2012, Küspert 2015). The map in Figure 6 provides a rough overview of the distribution of the "official" ethnic terms employed by the Ethiopian government in

---

<sup>10</sup> The 2007 Ethiopian census cites 163,781 Ethnic Gumuz (FDCREPC 2008:44), which is higher than all of the living Koman groups combined.

<sup>11</sup> If Koman and Gumuz are indeed genetically related, the split goes back to Pre-Proto-Koman (e.g. Bender 1983, 1997, 2008; Ehret 2001). This study of Koman does not include Gumuz, and any of my references to Koman languages do not include Gumuz unless stated explicitly.

<sup>12</sup> Bender (1996) employs the term *Kwama* for modern-day Gwama. Note that in Bender (1996), Dana was either subsumed within Opo or not counted at all.

Küspert’s sociolinguistic survey of the *Mao-Komo Special Woreda* (district) of Western Ethiopia.



Figure 6 Distribution of *Mao* and *Komo* ethnic terms in the *Mao-Komo Special Woreda* of Western Ethiopia (from Küspert 2015:9)

This confusion in identifying Komo versus Gwama people is evident in the census data from Ethiopia. The 2007 Ethiopian census lists 7,773 ethnic *Komo* and 73 ethnic *Qewama* (sic), the latter of which I assume to be Gwama (FDCREPC 2008:44–45). Meckelburg (2016:190–191) compares the Ethiopian census data from 1994 and 2007 and notes that Gwama (listed as *Kewama* and *Qewama* in the two different census, respectively) is virtually absent in the census when, in fact, the Gwama significantly outnumber the Komo in Ethiopia.<sup>13</sup>

<sup>13</sup> Meckelburg (2016:63) estimates the Gwama population at about 20,000 in Ethiopia. Note that Meckelburg identifies and groups together Lowland and Highland varieties of Gwama in his estimate.

In my estimate, the Koman languages vary significantly in terms of population. Uduk is the largest (approx. 20-25,000; Killian 2015), followed by Gwama (approx. 15,000; Siebert & Bryant 2007), Komo (approx. 2,000 in Ethiopia; Hudson 2004; Meckelberg 2016; and 2,000–5,000 in Sudan; Davies 1960, Theis 1995). Lemi (2010) cites 980 Opo in Ethiopia though Smolders (p.c) estimates around 2,000 total. The population of Dana speakers is unknown at present.

## 1.2 Koman classification

This section discusses issues of the classification of Koman family’s internal structure as well as its purported affiliation to larger genetic groups.

### 1.2.1 Koman external classification

The Koman family figured as one of six main branches in Greenberg’s (1963) initial proposal of Nilo-Saharan as an African super-family, presented in Figure 7. Greenberg based his classification on 48 pieces of grammatical evidence, plus mass comparison of the lexicons. Since his initial classification, the genetic affiliation and internal structure of the Koman family has been under scrutiny (e.g. Bender 1983, 1997; Ehret 2001).

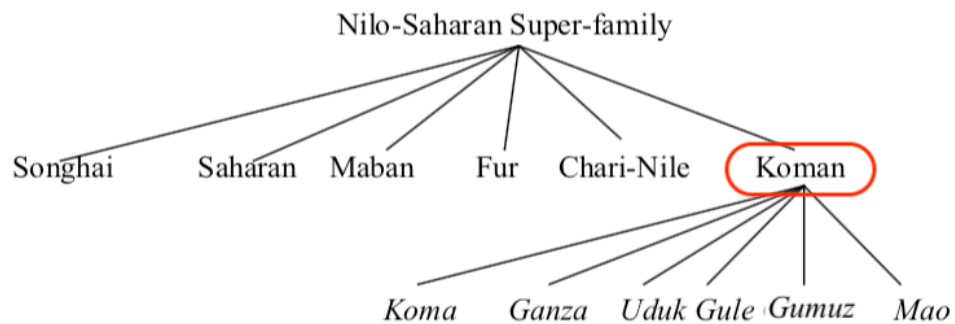


Figure 7 Greenberg’s (1963) Nilo-Saharan classification (adapted from C. Ahland 2012:22)



Bender's (1971) external Koman classification within Nilo-Saharan (NS) is in line with Greenberg (1963), though Bender's internal structure of Koman is distinct from Greenberg's. Within his "Koman" family, Bender includes what he calls the "Koma languages" – Gumuz, Northern Mao and the Nara-Surma languages – though he acknowledges that "whether these are really coordinate branches of one grouping or whether they are related in some different way remains to be seen when more data is available" (Bender 1971:193).

Bender's "Koma" languages are split into two subgroups: *Nuclear Koma* contains *Langa* (a modern-day variety of Opo, most likely either Modin or Bilugu), *Central Koma* (modern-day Sudanese Komo), and Uduk.<sup>14</sup> Bender's *Peripheral Koma* subgroup contains North Koma and South Koma (what are most likely the modern-day Highland and Lowland Gwama varieties).

Bender (1983) reconstructs what he calls "proto-orthodox-Koman" based on what he deems to be the five central languages of the family: Gwama, Komo, Uduk, Opo and Gule.<sup>15</sup> Bender (1991, 1994) groups his orthodox-Koman and Gumuz as a single genetic unit ("Komuz") within the "core" of Nilo-Saharan (cf. Figure 1). However, Bender (1996:63) recants his earlier proposal of a "Komuz" family stating, "current work shows them to be quite independent grammatically and lexically (except for lexical borrowings) and not standing in any special genetic relationship." Koman maintains its position within the core of NS in Bender (1996, 2000).

---

<sup>14</sup> I assume Bender's Komo is the Sudanese variety. One indicator is that Bender's (1971:273) Komo word for 'road, path' is *k<sup>h</sup>wa*, which is identical to Burns' (1947:6) word for 'road, path' in Sudanese Komo. The Ethiopian Komo consultants employed in this study also recognize the distinct pronunciations of 'road, path' in that the Sudanese Komo use *kwa* whereas the Ethiopian Komo use *kɔmə*.

<sup>15</sup> Bender used the term "Anej" for what is currently referred to as Gule.

Ehret (2001), by contrast with Bender, reconstructs Koman as one branch of an initial binary split from Proto-Nilo-Saharan (PNS), with a possible time-depth of around 10,000 BP. Ehret claims that a large piece of evidence for this split is the absence of Greenberg's (1981) "moveable -k" in Koman, which is found in the rest of Nilo-Saharan. Another piece of evidence for Ehret was the multiplicity of consonants which he analyzed as reconstructing to PNS, for which he drew largely from Chali Uduk, which exhibits one of the most extensive consonant inventories in Koman. Ehret (2001) includes both Gule and Gumuz in higher level nodes within a single genetic unit he refers to as "Koman" (cf. Figure 2).

The classification of Koman (in its many senses) within a larger genetic unit such as Nilo-Saharan is far from settled. Given the paucity of data, Dimmendaal (2014, 2018, *to appear*) considers Koman to be an independent family until further research comes to light. The following subsection further discusses the internal structure of Koman and discusses Gule and Gumuz.

### 1.2.2 Koman internal classification

All of the relevant literature at least recognizes a genetic grouping of the languages employed in the reconstruction in this study: Gwama, Komo, Uduk and Opo. The Dana language, which has figured in wordlists collected by explorers, has most likely not formed part of any substantive linguistic work on Koman classification seen thus far. The two remaining languages and/or cluster of languages included in previous reconstructions, Gule and Gumuz, are briefly discussed below. I then turn to Koman-internal (i.e. *sans* Gule and Gumuz) classification.

Gule, an extinct language also known in the literature as *Anej* and *Hamej*, was spoken in Jebel Gule in the Blue Nile State of Sudan (James 1979:13). There is very little data collected on this language aside from wordlists in Marno (1874), Seligmann (1912), and Evans-Pritchard (1932). One main piece of evidence supporting an affiliation of Gule to Koman is a sound correspondence /f/ in Koman to /f/ in Gule, though this occurs only in a handful of words. Seligmann (1912) gathered a bit of grammatical data which seems to indicate a correspondence in grammatical gender. Güldemann (2018:292) observes that while this is promising evidence, the scant data makes Gule almost impossible to classify.

The issue of whether Gumuz, a dialect cluster newly referred to as *Baga* (C. Ahland p.c., Güldemann 2018), forms a genetic unit with Koman is yet to be resolved.<sup>16</sup> M. Lionel Bender changed opinions on the status of “Komuz” (Koman + Gumuz) over his career. In his most recent work, Bender (2000) classifies them as distinct genetic units within Nilo-Saharan. Ehret (2001) includes Gumuz and Koman as a genetic unit, though Dimmendaal (2014) does not. Ahland (2010, 2013) attempts to link Koman and Gumuz via one sound correspondence in a handful of words between Gumuz and only Gwama. Güldemann (2018:298) observes that while this evidence may be promising, it does not justify positing a genetic link between Gumuz and Koman and he calls for a full-scale reconstruction of both proto-languages. I remain agnostic on the position of a Koman-Baga genetic link in this dissertation.

While proposals about Koman’s affiliation to Nilo-Saharan has varied over the history of research, proposals about the internal structure of what I refer to as Koman

---

<sup>16</sup> See Güldemann (2018:293–294) for discussion of the term *Baga* for what was formerly called Gumuz.

in the narrow sense (i.e. the living Koman languages employed in this study: Gwama, Komo, Uduk, Opo and Dana) has remained unchanged.<sup>17</sup> The classifications in Bender (1971, 1983, 1991, 1996, 2000) and Ehret (2001) are identical with respect to the internal structure of Koman (without Dana). They concur that the first branch from Proto-Koman is Gwama followed by a split into a Komo-Uduk branch and an Opo branch. To illustrate, Bender's (1983) internal classification of Koman, seen in Figure 8, is identical to Ehret's (2001) in Figure 2.<sup>18</sup>

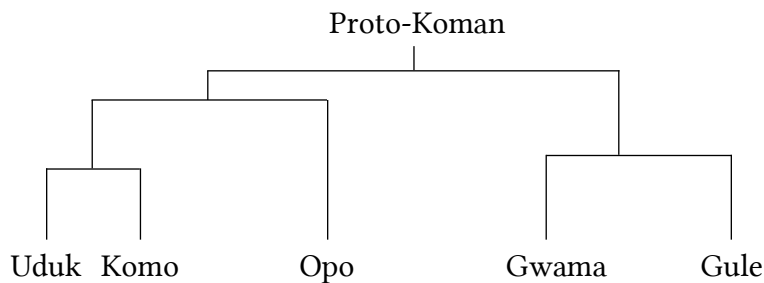


Figure 8 Bender's (1983:286) internal classification of Koman

More recent lexicostatistical methods produce similar results regarding internal Koman subgrouping. Starostin's (2011-2016) online Global Lexicostatistical Database (OLD) is a compendium of annotated Swadesh wordlists of the world's languages. Users can consult the website to produce trees generated from Starostin's lexicostatistical analyses of the wordlists. An example of the Koman genetic tree based on 110 lexical

---

<sup>17</sup> Dana has not been identified as a distinct language in any prior reconstructions of Koman. I don't believe Bender collected any Dana data given the fact that the Dana consonant inventory is markedly distinct from the Opo varieties I have encountered, and Bender's work does not reflect such complexity.

<sup>18</sup> I have adjusted Bender's language names in Figure 8 to reflect the current nomenclature.

items generated by the Global Lexicostatistical Database is in Figure 9.<sup>19</sup> Note that Gule is included in this version of Koman. Also note that in Figure 9, *Kwama* refers to Lowland Gwama while *Begi Mao* is Highland Gwama. The numbers along the top of the figure represent glottochronological dating in millennia (0.00 = beginning of the 1st century A.D., 1.00 = 1000 A.D., and so on).

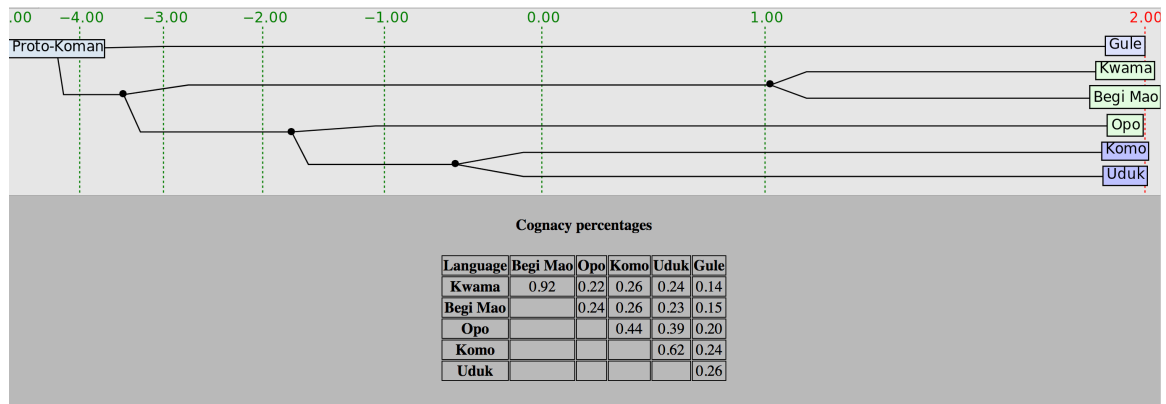


Figure 9 Koman internal classification from the Global Lexicostatistical Database (Starostin 2011-2016)

The cognacy percentages (i.e. percentages of pairwise retentions of cognates) employed to create the Starostin subgrouping is seen below the tree in Figure 9. Note that Gwama (Lowland Gwama) and Begi Mao (Highland Gwama) share 92% of the lexicon, while Gwama and Opo share only 22%. The main point here is not a discussion of lexicostatistical methods but rather that, over the body of research, proposals about the internal structure of Koman have remained fixed. One interesting point in Starostin’s (2011-2016) Koman tree is that it was calculated with assumptions about a

<sup>19</sup> Starostin (2011-2016) employs the following sources for his classification: Gwama (Zealelem 2005), Opo (van Siflhout 2013), Komo (Krell 2011, Otero 2014, Otero et al. 2015), Uduk (Beam & Cridland 1970, Thelwall 1983, Killian 2015), Gule (Lejean 1865, Seligmann 1912) and (Bender 1983, Corfield 1938, Wedekind & Wedekind 2002) for general Koman.

conservative rate of lexical replacement: 5% loss every millennium (i.e. 5 items from a 100-word Swadesh list replaced every 1000 years). Calculation of lexical replacements is beyond the scope of this dissertation, but it is noteworthy to point out that according to these assumptions about lexical replacement, Starostin's tree suggests Koman (or Proto-Koman) was spoken around 6,000 years ago, Proto-Gwama split roughly 5,000 years ago, followed by the binary split of what I refer to as Central Koman into the two remaining branches Komo-Uduk and Opo, roughly 4,500 before the time of this writing.

The following subsection discusses the Koman internal structure that I propose in this study. I discuss how the new Koman data support previous internal classifications of Koman and I provide a more nuanced subgrouping with respect to the inclusion of Dana as well as individual language varieties.

### 1.2.3 Current Koman classification

Determining the status of Koman with respect to larger genetic units is not the aim of this dissertation. In fact, in this study, I assume that, for the time being, Koman consists only of Gwama, Komo, Uduk, Dana and Opo and their varieties. Henceforth, I employ the term *Koman* to strictly mean the living Koman languages employed in this study. To help the reader throughout the rest of the dissertation, Figure 10 presages the results (conclusions – not presuppositions) of the study. It contains the Koman subgrouping of all of the languages and dialects argued for in this study. The internal structure I propose based on the reconstruction here turns out to be identical to prior classifications with the exception of Dana, which I propose was a split from Proto-Opo. The branch lengths in this tree are not significant nor are there any assumptions about time depth in this representation. In Figure 10, “P” represents “proto”.

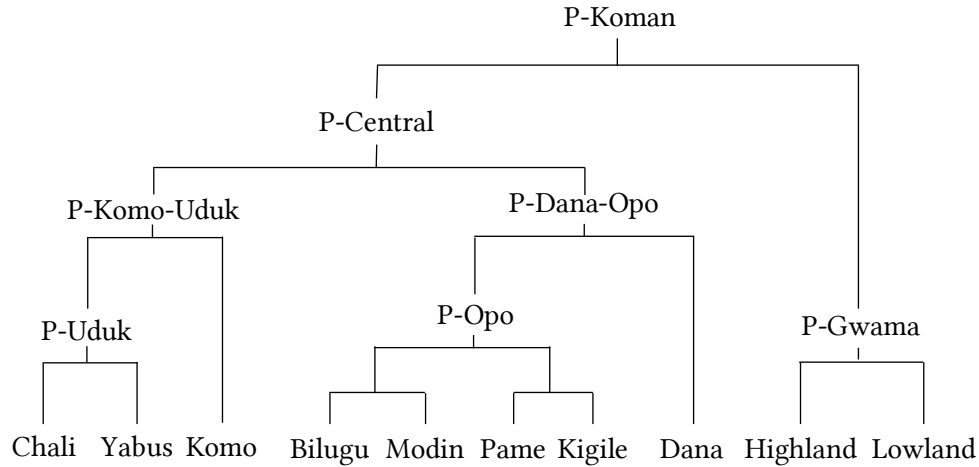


Figure 10 Proposed Koman internal classification based on results of this study

For ease, I employ the term “Proto-Central Koman” to describe the node which from which Proto-Komo Uduk and Proto-Dana-Opo diverged. I also recognize that the history of the Opo varieties may not be as distinct as represented in this tree. The Opo varieties may have evolved in a dialect continuum, which a tree model may not necessarily capture. That said, this subgrouping of the Opo dialects reflects shared similarities as well as shared innovations.

Figure 11 contains a Koman tree generated with LingPy, a Python programming language suite designed for historical linguistics (List et al. 2018). This tree was constructed based on my current database and employing my cognacy judgments. LingPy employs similar lexicostatistical methods as those of the Global Lexicostatistical Database discussed in §1.2.2. Note that the internal structure of Koman generated from LingPy using my data is identical to prior proposed Koman subgroupings with respect to the branching of the major languages/language clusters (i.e. Gwama, Komo and Uduk).

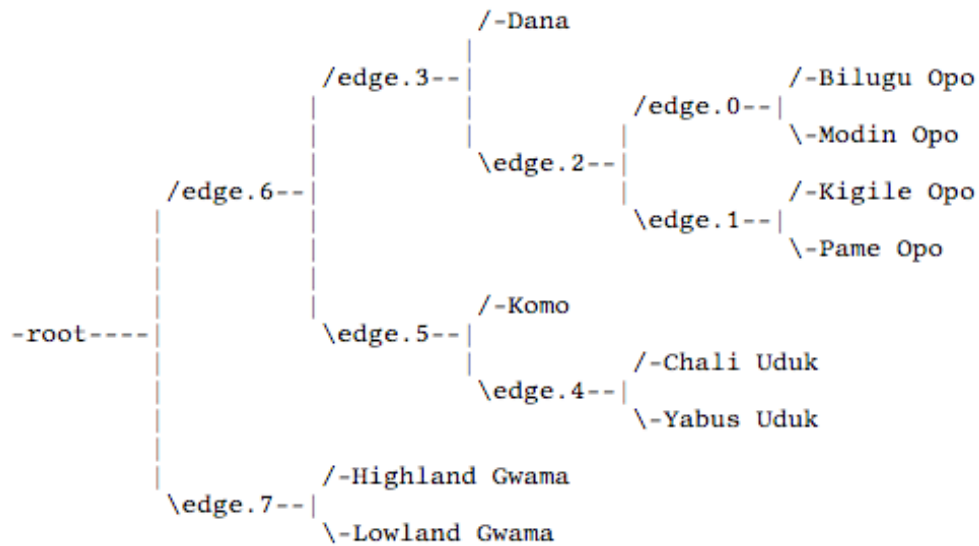


Figure 11 Koman tree generated with Lingpy software distance measurements (List et al. 2018)

In Figure 11, the edges (or nodes) are calculated with respect to cognate retention (i.e. maximum similarity) to create distances between pairs. From here, we can interpret that the Bilugu and Modin Opo varieties are the closest (edge.0) followed by the Kigile and Pame Opo varieties (edge.1). Taken together, the Opo varieties form a subgroup (edge.2), as does the Dana-Opo branch (edge.3). Next, we see the Uduk varieties forming a subgroup (edge.4) followed by a Komo-Uduk subgroup (edge.5). The Dana-Opo and Komo-Uduk branches form a subgroup, what I call Central Koman (edge.3). Lastly, the most distant subgroup consists of the Gwama varieties (edge.7). The percentages of shared cognates used in LingPy to output the tree in Figure 11 are seen in Table 1.



Table 1 Cognacy rates from the current database calculated with LingPy (List et al. 2018)

		Gwama		Komo	Uduk		Dana	Bil	Opo	
		Hi	Lo		Yab	Cha			Mod	Pam
Gwama	Lo	97								
Komo		45	47							
Uduk	Yab	36	36	65						
	Cha	35	37	66	91					
Dana		37	38	63	51	52				
	Bil	36	38	65	49	51	79			
Opo	Mod	36	37	64	49	50	79	98		
	Pam	37	38	65	48	50	81	95	96	
	Kig	36	38	64	48	50	84	93	95	97

While this dissertation does not aim to make any claims about lexicostatistical methods in language classification, it is important to note that all of the proposed internal classifications of Koman (without Gule or Baga) are identical. While lexicostatistics is grounded in assumptions about cognacy rates as a means of identifying relatedness, shared innovations in phonology and morphology are also classically considered to be fundamental in determining relatedness. Innovations in phonology and morphology also support this classification, as described in Chapter III and Chapter IV. I turn now to an outline of the database and the methods employed in this study.

### 1.3 Methods and the database

In this dissertation, I follow the general tenets of the comparative method (Bloomfield 1973 [1933], Campbell 1998, Trask 1996, *inter alia*) in reconstructing the Koman family. I focus mainly on reconstructing proto-phonemes, tonemes/tone categories, and lexicon and morphology. It is understood that forms, and in some cases

the meanings that they represent, are subject to diachronic change. It is my imperative to uncover the archaic patterns that emerge as languages change over time.

I collected the data employed in this study between 2011-2018 over many fieldtrips. Komo, Opo, Dana and Gwama data were collected in various locations in Ethiopia and the Uduk data were collected in Salt Lake City from Uduk refugees who fled Sudan in the 1990's. A main aim was to obtain as much data from as many varieties of Koman languages as possible. Many of the specific varieties documented here have had very little prior academic treatment, while others were previously completely undocumented. I have also consulted all available published and unpublished works, as well as consulted in personal communication with other scholars working on Koman languages.<sup>20</sup> The reconstruction of Proto-Koman and the subnodes in this study is based on the lexical database and grammatical elicitation that I have compiled by combining my data with all these other resources.

My field data was collected phonetically and entered into a spreadsheet in a rough phonetic transcription. From there, phonological representations were refined over time across various elicitation sessions. This is to say that my ear became more finely adjusted to the nuances of the segmental and suprasegmental features of the various systems as I worked more with the speakers. My aim was to first capture the maximum systematic phonetic detail in each variety, in order to describe the major surface structures and the (morpho)phonological processes that underlie these patterns of surface realization. With this knowledge, I was able to build more informed

---

<sup>20</sup> I must again acknowledge and thank my fellow Koman researchers Anne-Christie Hellenthal, Don Killian, Justin and Joelle Goldberg and Joshua Smolders for sharing their insights and data with me.

phonological representations of the segments and tone. It was these phonological representations that I employed in the reconstruction.<sup>21</sup>

Aside from lexical items, I elicited basic declarative sentences from many of the varieties. I examined the core nominal and verbal morphology, which I describe in §2.2.

In order to remain as faithful to the data as possible, I adhere to the following principles when establishing cognate sets and reconstructing to particular nodes. First, in order to confidently reconstruct a given lexeme to Proto-Koman (PKMN), I take the stance that there must be a reflex in Gwama and at least in one language of the Central Koman branch. A high confidence level is given to cognates found in Gwama and in the both branches of Central Koman. One caveat to reconstructing to PKMN is if cognates are only found in Komo and Gwama. Given the fact that these two groups have been in contact in Ethiopia for what appears to be several generations if not hundreds of years, there is a high possibility of contact influence. As such, I proceed with caution with cognates that are unique just to Komo and Gwama. Second, in order to reconstruct to Proto-central Koman (PCTRL), I take the stance that there must be reflexes in both branches: Komo-Uduk and Dana-Opo. Likewise, cognates must be in Komo and at least one variety of Uduk in order to reconstruct to Proto-Komo-Uduk (PKOUD). The same principle is applied to reconstructing to Proto-Dana-Opo (PDAOP), i.e., there must be a cognate in Dana and at least one variety of Opo.

While this method intends to tread a cautious path in reconstructing to PKMN, it does not account for possible PKMN losses in Gwama that are retained in the lower

---

<sup>21</sup> The term “phonological representation” employed here specifically refers to an internally reconstructed form. I do not make any claims about cognitive phonological representation.

nodes of other branches. By a less cautious methodology, the number of actual PKMN cognates would be higher than what I posit here. I follow these methodological criteria for clarity and to be conservative, that is, quite certain that any conclusions I posit will stand the test of time.

After culling the database for cognates and excluding problematic data such as multi-word entries with no corresponding entry in another language or variety, I reconstruct 240 etyma to PKMN, 229 etyma to PCTRL (that are not also in PKMN) 66 to PKOUD (that are not also in PCTRL), and 89 to PDAOP (that are not also in PCTRL). Across these cognates, I employ the comparative method to reconstruct Koman phonology and lexica.

An etymological wordlist is provided in Appendix B and the full dataset is in Appendix F.

I also dedicate a part of this study to reconstructing some core Koman morphology, including pronominals and deictic directional verb morphology. The main aim is that this reconstruction will ultimately serve not only those interested in Koman languages and the histories of their peoples, but also those interested in higher-level genetic classification in East African language families. A secondary aim is to guide future synchronic research in individual Koman languages and language varieties.

CHAPTER II  
OVERVIEW OF KOMAN PHONOLOGY AND MORPHOLOGY

Even though Koman has figured in language classifications of Nilo-Saharan in the last several decades (e.g. Bender 1971, 1983, 1994 *inter alia*; Ehret 2001), the Koman languages have historically received little treatment in the literature. The main exception is the Chali variety of Uduk, which has a grammar sketch from the last century (Stevenson 1942), a detailed phonological sketch (Thelwall 1983), and a more recent and very comprehensive description of the phonology and morphosyntax (Killian 2015). The Yabus variety of Uduk is virtually undescribed, though there is a brief outline of the phonology and some texts in Killian (2015).

Historical linguists, such as M. Lionel Bender, employed these and other short works coupled with some field notes to compile and reconstruct Proto-Koman (Bender 1983, 1994). While these efforts were groundbreaking in the field, the descriptions of individual Koman languages were still somewhat rudimentary. For instance, the only data on the Komo at the time was a short grammar sketch compiled by a missionary in Sudan (Burns 1947) and there was virtually nothing written on Gwama and Opo. This led to limited analyses which were employed in historical classifications. For example, Bender (1983) reconstructs Proto-Koman with a five-vowel contrastive system because he analyzed the Koman languages at the time with five-vowel systems. We now know that seven-vowel systems with Advanced Tongue Root (ATR) harmony are seen in almost all of the living Koman languages (e.g. Otero 2015, Justin Goldberg 2018, Smolders *forthcoming*) and I reconstruct a seven-vowel system to Proto-Koman (§3.3).

Further, all of the Koman languages exhibit contrastive tone. Tone reconstruction (and its impact on the synchronic and/or diachronic phonological systems) has not been treated in any historical classification of Koman.

It wasn't until late in the first decade of the 2000's that comprehensive work on describing Koman languages began. In Ethiopia, this was largely due to literacy initiatives of minority languages sponsored by the Ethiopian national and regional governments. The Ethiopian government sponsored mother-tongue education projects which required field linguists to describe and codify previously undescribed and unwritten languages to be used in early childhood education. The aim was for children of minority languages to become literate in their mother tongue. The Gwama and Komo language projects in western Ethiopia began in early 2011 (Hellenthal & Kutsch-Lojenga 2011, Kutsch-Lojenga & Otero 2011a-b) and continue to the time of this writing. Since the turn of the century, more descriptions of Komo and Gwama by Ethiopian and international scholars has continued to enrich the field of Koman studies (Hellenthal 2005, 2018; Zelealem 2005; Teshome 2008; Lemi 2010; Kievet & Robertson 2012; van Silfhout 2013, Killian 2015, *to appear*; Otero 2015a-b, 2018, 2019; Mellese 2017; Justin Goldberg 2018; Joelle Goldberg 2018; Smolders *forthcoming*; among others).

## 2.1 Phonological comparanda

The Koman languages all display rich phonological systems in both the segmental and suprasegmental domains. Koman phonemic consonant inventories typically contrast in three to five places of articulation across three to five manners. Koman languages generally exhibit a seven-vowel contrastive inventory with *Advanced Tongue Root* (ATR) contrast and harmony, as well as three to four level tones and

contour tones. The following sections examine the phonology of the Koman varieties employed in this study. I begin with overall patterns seen across Koman with regard to consonants, vowels and tone and then move on to individual phonological sketches.

### 2.1.1 Overview of Koman consonants

Koman consonant inventories range from 22 to 34 contrasting phonemes. In Chali Uduk and Dana, which belong to the two branches of Central Koman, stops contrast in five places of articulation: bilabial, interdental, alveolar, palatal and velar, as well as in four manners of articulation: voiced, voiceless aspirated, voiceless unaspirated, and ejective. One noteworthy feature is glottalized pulmonic and non-pulmonic consonants. All of the Koman languages have ejective stops in at least the bilabial, alveolar and velar places of articulation /p', t', k'/ and the Uduk, Dana, and Opo varieties also display a palatal ejective stop /c'/ or an alveopalatal ejective affricate /tʃ/. Gwama, Komo and Dana also exhibit an ejective alveolar fricative /s'/ and the Yabus Uduk contrastive inventory contains a rare alveopalatal fricative ejective /ʃ'.

Of crucial importance to the historical reconstruction of Koman are the allophonic processes among the consonant systems across the languages. Given the fact that some of the languages have extensive consonant inventories, examining their synchronic distributions and allophonic processes provides insight into the historical evolution.

Koman languages tend to favor closed syllables at the root edge and CVC roots are very common, especially in verb roots.<sup>22</sup> Complex onsets are limited to consonant plus glide sequences /Cw/ and /Cj/ though these largely only occur before /a/. Complex

---

<sup>22</sup> I recognize that this is not a quantitative observation but rather an overall impression.

codas are typically nasals plus consonant /NC/. Overall, there is a tendency for word-final devoicing and hence loss of a phonological voicing contrast.<sup>23</sup>

Koman languages are by and large suffixing, and vocalic elements in the suffixes can provide an insight into the behavior of word-final consonants in an intervocalic environment across morpheme boundaries. There is considerable variation in the allophonic realizations of intervocalic consonants; lenition and voicing are common for stops and ejectives. Further, one peculiar tendency in Koman languages is the delayed release of either voiced stops or ejective consonants word-finally before a pause. Delayed release is realized by a full closure followed by a pause, and a less intense burst or release. This peculiar articulatory gesture is found across all of the branches. In order to capture the synchronic variation, the distributions of word-initial, intervocalic and word-final consonants are examined for the languages in this study for which data was collected.

### 2.1.2 Overview of Koman vowels and Advanced Tongue Root harmony

All of the living Koman languages, with the exception of the Uduk cluster, exhibit a seven-vowel contrastive inventory /i, ɪ, ε, a, ɔ, ʊ, u/, with phonemic Advanced Tongue Root [ATR] contrast in the high vowels. The Uduk varieties only display a five-vowel phonemic inventory /i, ε, a, ɔ, u/ and no contrastive ATR feature. One distinct feature of the Koman languages, which was most likely inherited from Proto-Koman, is ATR vowel harmony (§3.3). Synchronically, all of the Koman languages with seven-vowel inventories exhibit distinct types of ATR vowel harmony.

---

<sup>23</sup> Dimmendaal (*forthcoming*) observes that in Nilo-Saharan, word-final voicing contrasts are common in the eastern zones (Ethiopia, Sudan, South Sudan, Kenya and Tanzania) but not elsewhere in the phylum.



Casali (2008:497) observes that ATR harmony systems are often found in the Niger-Congo and Nilo-Saharan languages of sub-Saharan Africa.<sup>24</sup> ATR vowel harmony is a type of feature assimilation in which vowels in certain contexts must agree on the value of the [ $\pm$ ATR] feature. The domain of harmony is typically the word and the assimilatory processes generally occur across morpheme boundaries involving roots (or stems), affixes and clitics. Traditionally, two types of ATR harmony processes are distinguished: *dominant-recessive* and *stem-controlled* or *root-controlled* (Kirchner 1993, Clements 2000, Baković 2000). In a dominant-recessive system, the feature that is considered ‘dominant’ (most frequently [+ATR]) spreads to the ‘recessive’ vowels of the opposite feature (typically [-ATR]) in roots/stems and/or affixes/clitics. In a stem-controlled system, neither feature is dominant, and affixes “harmonize” (or assimilate) to the ATR feature of the root or stem to which they are attached, regardless of its [ATR] specification.

Casali’s (2003) typological survey of 110 languages found a direct correlation between the phonemic vowel inventory and the type of ATR harmony system displayed. The specific criterion is whether or not the phonemic ATR contrast is in the [+high] vowels. According to Casali (2008:520), languages with ATR contrast in the [+high] vowels, such as the Koman languages with contrastive seven-vowel inventories, overwhelmingly display [+ATR] dominant-recessive harmony. This is partially the case in Komo, which exhibits anticipatory (leftward-spreading) [+ATR] dominant harmony in one domain, but Komo also exhibits progressive (rightward-

---

<sup>24</sup> While tongue root harmony systems are overwhelmingly found in Africa, they have also been described in languages beyond the African continent such as Karajá (Macro-Jê; Ribeiro 2000, 2002) and Even (Northern Tungusic; Aralova 2015).

spreading) [-ATR] dominant harmony in another domain (Otero 2015a, Olejarczuk et al. 2019). Further, the remaining Koman languages with contrastive ATR exhibit stem-controlled harmony involving only the [+high] vowels.

### 2.1.3 Overview of Koman tone

In the suprasegmental domain, the Koman languages all display contrastive tone. A language with tone is defined here as “one in which the indication of pitch enters into the lexical realization of at least some morphemes” (Hyman 2001:1368). Koman languages all exhibit at least three distinct contrastive tone levels (L)ow, (M)id and (H)igh. The Opo cluster is unique in that it has innovated an extra-high (XH) tone, and thus has four contrastive level tones (Smolders 2017, *forthcoming*, p.c.).

Koman languages also exhibit (R)ising and (F)alling contours in their contrastive tonal inventories. These contours can be analyzed as contrastive unitary tonemes. Vowel length is not contrastive in Koman languages and the TBU is a vowel (or a vocalic mora). All of the tones, including the level tones and contour tones, can occur on a single vowel nucleus. In some languages, the contour tones can appear to have a slightly longer duration than the level tones, though this could be a historical result from the abutting of two vowels of differing level tones. This process is also seen synchronically across morpheme boundaries. For instance, compare the data from Komo in (1). In (1a), the verb *wɔ̀* ‘die’ occurs with a L tone and a phonetically “short” vowel as compared to (1b), in which it occurs with the H tone -*ɔ́* DD1 morpheme and as a result, surfaces with a rising tone and a phonetically “longer” vowel.

- (1)
- |    |                  |                         |
|----|------------------|-------------------------|
|    | Komo             |                         |
| a. | <i>wɔ̀</i> [wɔ̀] | b. <i>wɔ́-ɔ́</i> [wɔ́:] |
|    | die              | die.DD1                 |

Tone plays a prominent role in the reconstruction of Proto-Koman. The following subsections provide brief phonological sketches for each language cluster. I discuss the contrastive consonant, vowel and tone inventories and any significant morphophonological processes that impact the reconstruction. Some of the phonological sketches provide descriptions of heretofore undescribed Koman language varieties.

#### 2.1.4 Gwama

The Highland and Lowland varieties of Gwama employed in this study are spoken in the Benishangul-Gumuz Regional State of western Ethiopia. The varieties are mutually intelligible with some slight differences in the phonology and lexicon. Data and analysis in the following Gwama phonological sketch comes from fieldwork and from descriptions of the Lowland Gwama variety (cf. Hellenthal & Kutsch Lojenga 2011, Kievet & Robertson 2012, Goldberg et al. 2017).

##### 2.1.4.1 Gwama contrastive consonant inventory

The Gwama varieties exhibit the fewest consonants of all of the living Koman languages. The contrastive inventory for both Highland and Lowland varieties consists of 22 consonants, seen in Table 2. Plosives and fricatives contrast across three places of articulation (bilabial, alveolar and velar) and across three manners of articulation (voiceless, voiced and ejective). Note that Gwama is the only living Koman language that does not display contrastive implosives.

Table 2 Gwama contrastive consonant inventory

	Bilabial	Alveolar	Alveo-palatal	Palatal	Velar	Glottal
voiceless	p	t			k	
voiced	b	d			g	
ejective	p'	t'			k'	
voiceless		s	ʃ			h
voiced		z				
ejective		s'				
nasal	m	n			ŋ	
lateral		l				
trill/flap		r				
approximant	w			j		

Previous descriptions of the Gwama consonant inventory have differed slightly but not significantly. Bender (1983:264) proposes a 22-consonant phonemic inventory that lacks a velar nasal but includes a voiceless labiodental fricative, the latter of which is not contrastive; Bender most likely mistranscribed [ɸ] as [f]. The former is an allophone of the voiceless bilabial stop /p/ in intervocalic position, which has also been observed by Hellenthal (2005) (see 2.1.4.2 below). Zelealem's (2005) unpublished sketch of Highland Gwama proposes two additional consonants to Bender's (1983) inventory, a palatal nasal and a velar nasal.<sup>25</sup> More recent in-depth studies of Gwama propose the same contrastive inventory seen in Table 2 (Hellenthal 2005, Hellenthal & Kutsch

---

<sup>25</sup> Zelealem (2005) does not provide any phonological evidence for a phonemic voiceless labiodental fricative.

Lojenga 2011, Kievet & Robertson 2012, Amare 2013, Goldberg et al. 2017, Justin Goldberg 2018).<sup>26</sup>

#### 2.1.4.2 Gwama consonant distribution and allophones

Table 3 contains the distribution and allophones of the Gwama obstruents across bilabial, alveolar and velar places of articulations, contrasting in three manners of articulation: voiceless plosive, voiced plosive and ejective. The three-way manner contrast is maintained in word-initial position, though Goldberg (2018) observes that it is partially neutralized in intervocalic position as the ejectives /p', t', k'/ can be realized as plain voiced obstruents [b, d, g]. Further, he observes that the three way contrast is also neutralized word-finally as voiced obstruents do not occur in this position. Further, ejectives are optionally unreleased in word-final position, a very common trait of Koman ejective realization. Lastly, Gwama voiceless stops are phonetically aspirated in all positions and can lenite to fricatives intervocalically.

Table 3 Distribution and allophones of Gwama obstruents

	#__	V__V	__#		#__	V__V	__#
/p/	p <sup>h</sup>	p, p <sup>h</sup> , $\phi$	p <sup>h</sup>	/s/	s	s	s
/t/	t <sup>h</sup>	t, t <sup>h</sup>	t <sup>h</sup>	/z/	z	z	–
/k/	k <sup>h</sup>	k, k <sup>h</sup> , x	k <sup>h</sup>	/s'/	s'	s', z	s'
/b/	b	b, $\beta$	–	/p'/	p'	p', b	p', p <sup>̣</sup>
/d/	d	d, r	–	/t'/	t'	t', d	t', t <sup>̣</sup>
/g/	g	g, $\gamma$	–	/k'/	k'	k', g	k', k <sup>̣</sup>
/f/	f	f	f	/h/	h	h	–

<sup>26</sup> The palatal nasal is analyzed as an allophone of the alveolar and velar nasal before front vowels (Hellenthal 2005, Hellenthal & Kutsch Lojenga 2011, Goldberg et al. 2017).

Table 4 contains the distribution and allophones of the sonorants in word-initial, intervocalic and word-final positions. The bilabial and alveolar nasals can occur in all positions, while the velar nasal is restricted to intervocalic and final positions. The liquids can occur in all positions.

Table 4 Distribution and allophones of Gwama sonorants

	#__	V__V	__#		#__	V__V	__#
/m/	m	m	m	/l/	l	l	l
/n/	n	n	n	/r/	r	r	r
/ŋ/	–	ŋ	ŋ				
/w/	w	w	w	/j/	j	j	j

Consonant-glide combinations (Cw and Cj) are attested in Gwama though they are restricted to root-initial position. Cw sequences typically occur before /a/, though they can also occur before front vowels. In my database, I have 33 instances of Cw before /a/ and 14 instances before a front vowel. Cj sequences are less common (only 12 in my database) and they only occur before /a/. Goldberg et al. (2017) note that only /dj/, /fj/, and /zw/ do not occur.

#### 2.1.4.3 Gwama vowels

Both Highland and Lowland Gwama exhibit a contrastive seven-vowel inventory with ATR contrast in the high vowels. Vowel length is not contrastive in monosyllabic monomorphemic roots (Goldberg et al. 2017, Justin Goldberg 2018). The complete contrastive vowel inventory is given in Figure 12.

	front	central	back	
[+high]	i		u	[+ATR]
	ɪ		ʊ	[-ATR]
[-high]	ɛ		ɔ	[-ATR]
		a		[-ATR]

Figure 12 Gwama contrastive vowel inventory

Examples of contrast in Gwama vowels are in (2).

- (2)
- |     |     |             |
|-----|-----|-------------|
| /i/ | sí  | ‘bone’      |
| /ɪ/ | sí  | ‘fall’      |
| /ɛ/ | fɛ̃ | ‘slaughter’ |
| /a/ | sā  | ‘flirt’     |
| /ɔ/ | só  | ‘stab’      |
| /ʊ/ | só  | ‘pierce’    |
| /u/ | sū  | ‘same (be)’ |

Gwama displays what Casali (2003, 2008), among others, refer to as *root-controlled* ATR harmony. In Gwama, root-controlled ATR harmony occurs in the high vowels at the level of the phonological word (Hellenthal & Kutsch Lojenga 2011, Goldberg et al. 2017). In this process, high vowels in affixes assimilate to the ATR value of the root. Gwama displays both prefixes and suffixes, all of which harmonize to the ATR value of the root to which they are attached. Goldberg et al. (2017) refer to this as [+ATR] dominant root-controlled harmony given the fact that only [+ATR] is spread, though it is important to note that in the Gwama system, affixes containing [+high] vowels are [-ATR].

To illustrate the Gwama ATR harmony system, the following data contain verb roots of contrasting ATR values inflected with the 3SG.M suffix /-ní/, which contains a [+high, -ATR] vowel /i/. The roots in (3) contain [+high, -ATR] vowels /ɪ, ʊ/, and the

roots in (4) contain [-high, -ATR] vowels /ε, a, ɔ/. In all of these examples, the root and suffix vowels all surface as [-ATR].

- (3) a. *tĩ-ní-tĩndí* [tĩníndí] b. *s'óp-ní-s'óp* [s'ópní's'óp]  
 be.fat-3SG.M~RED be.cold-3SG.M~RED  
 'He is fat.' 'It's cold.'
- (4) a. *wǎ-ní-wǎ* [wǎníwǎ] b. *lòs-ní-lòs* [lòsnílòs]  
 break-3SG.M~RED choose-3SG.M~RED  
 'It is broken.' 'He chooses.'
- c. *fè-ní-fè* [fɛnífɛ]  
 slaughter-3SG.M  
 'He slaughters.'

Compare this to (5), in which the roots contain a [+high, +ATR] vowel /i, u/. In (5), the [-ATR] suffix vowel in -ní 3SG.M assimilates to the [+ATR] value of the [+high, +ATR] root vowel.

- (5) a. *dwi-ní-dwi* [dwinídwi] b. *bűf-ní-bűf* [bűfníbűf]  
 buy-3SG.M~RED fart-3SG.M~RED  
 'He buys.' 'He farts.'

Root controlled ATR harmony is also seen across morpheme boundaries on nouns occurring with the proclitic /ǔ=/ DEF.M. This clitic surfaces as [-ATR] when the root vowel is [-ATR], as in (6a); but if the root is [+ATR], the vowel of the clitic assimilates to [+ATR] and surfaces as [u], as in (6b).



- (6) a.  $\bar{o}$ =kānā [ōkānā]                      b.  $\bar{o}$ =sízì [ūsízì]  
DEF.M=dog                                      DEF.M=crocodile  
 'the dog'    'the crocodile'  
 (adapted from Goldberg et al 2017:33)

Hellenthal & Kutsch Lojenga (2011:2) and Goldberg et al. (2017:32) also describe what appears to be anticipatory (leftward-spreading) [+ATR] dominant harmony in which the [+high, +ATR] vowels /i, u/ cause the [-high, -ATR] vowels /ε, a, ɔ/ to surface as [+ATR] allophones [e, ə, o], respectively. Hellenthal & Kutsch Lojenga (2011:2) describe the allophones in this process as *gradient realizations* though they provide no evidence to support these claims. Goldberg et al. (2017:32) provide three examples of monomorphemic roots, reproduced here in (7). They argue that [+ATR] dominant harmony is anticipatory in that [+ATR] spreading occurs in (7a-b) but not in (7c) because in (7c), the [+high, +ATR] vowel precedes the [-high, -ATR] vowel. Note that (7b) is a borrowing and (7a) is also used in Komo, which does in fact exhibit [+ATR] dominant harmony (cf. §2.1.5.3, Otero 2015, Olejarczuk et al. 2019). I did not find any evidence for this [+ATR] dominant harmony in my field research in Gwama.

- (7) a. /sàlìjà/ [səlìjà] 'corn beer'  
 b. /là múnú/ [ləmúnù] 'lemon'  
 c. /bìdó/ [bìdó] 'sheep'

Previous Gwama researchers have noted that phonetic vowel nasalization can arise from the presence of a preceding or following nasal consonant, though they also recognize a small set of lexemes that contain nasal vowels without nasal consonants (Hellenthal 2005:9, Zelealem 2005:4, Hellenthal & Kutsch Lojenga 2011:7, Goldberg et al. 2017). Nasalized vowels, if indeed considered phonemic, are very rare and some may

have arisen from the historical presence of a nasal vowel which has subsequently been lost. Some examples of Gwama lexemes with nasal vowels are *twā̃* ‘forehead’, *kễ* ‘smell’, and *zî̃* ‘green’.

#### 2.1.4.4 Gwama Tone

Both varieties of Gwama display contrastive tone. There are three level tones (L, M, H) as well as a rising contour tone (R). Goldberg et al. (2017) analyze the rising contour tone as phonetically LM.<sup>27</sup> The three level tones as well as the rising tone can occur on a single vowel nucleus in a monomorphemic word as seen in the near minimal group in (8). Tone in Gwama is quite stable throughout the system; there are no significant tonal processes that occur across morpheme or word boundaries, nor is there downstepping or downdrifting at the level of the utterance.

(8)	H	<i>sí</i>	‘bone’
	M	<i>sīt</i>	‘person’
	L	<i>síl</i>	‘heavy (be)’
	R	<i>sīs</i>	‘cane rat’

#### 2.1.5 Komo phonology

Komo is spoken in villages along both sides of the border between Ethiopia and (South)Sudan. The majority of the ±1,500 Komo speakers in Ethiopia are found in remote villages of the Mao-Komo Special Woreda (district) of the Benishangul-Gumuz Regional State of western Ethiopia. Further, about 200 speakers reside in and around the village of Pokung in the Gambella Regional State of southwest Ethiopia. Komo

---

<sup>27</sup> Hellenthal & Kutsch Lojenga (2011) observe that falling contour tones are marginal, at best.

speakers are also found in and around the village of Yabus, a town in the Blue Nile State of Sudan.<sup>28</sup> There appears to be minimal dialectal variation between the Ethiopian and Sudanese varieties of Komo, though no definitive study has been conducted. Ethiopian Komo speakers all indicate that the Sudanese variety is mutually intelligible though they cite some minor lexical differences. The Komo employed in this study is solely the Ethiopian variety.

The first data on Komo are wordlists collected in the Sudan in the late 1800's by explorer Juan María Schuver (James et al. 1996) and Corfield (1938). The first linguistic analysis is by the missionary Burns (1947), who provides an unpublished grammatical sketch also containing didactic material of the Komo spoken in Yabus, Sudan.<sup>29</sup> Tucker & Bryan's (1966:356–362) Komo sketch is an aggregate of Burns (1947) and Corfield (1938). Bender (1983, 1989, 1994) examine aspects of Komo phonology within the larger Koman and Nilo-Saharan perspective, employing prior analyses by others as well as his own fieldwork. Teshome (2008) is a short phonological description of Ethiopian Komo. The Komo literacy project in the Benishangul-Gumuz region has produced several unpublished manuscripts on Ethiopian Komo phonology and lexicon (Kutsch Lojenga & Otero 2011a–b). More current works on Komo phonology and phonetics include Otero (2015a, 2018b) and Olejarczuk et al. (2019).

---

<sup>28</sup> I was not able to travel to (South)Sudan given the ongoing armed conflict in the area. All of the information about Sudanese Komo is from Burns (1947) and from Komo and Yabus Uduk consultants.

<sup>29</sup> Burns also translated the Gospel of John and the Gospel of Mark into Komo employing a working Komo orthography. Burns' grammatical sketch is quite comprehensive. He gives an overview of the phonology and basic morphosyntax that is much in line with my data and analyses of Ethiopian Komo.

### 2.1.5.1 Komo consonants

The Komo contrastive consonant inventory contains 23 phonemic consonants, seen in Table 5. There is a three-way contrast for plosives in the bilabial, alveolar and velar places of articulation and a three-way contrast in manner of articulation, which includes plain, ejective and implosive obstruents. This inventory is largely consistent with previous analyses of Komo, with the exception of the velar nasal and the glottal stop, which are marginally contrastive.<sup>30</sup>

Table 5 Ethiopian Komo contrastive consonant inventory<sup>†</sup>

	Bilabial	Alveolar	Alveo- palatal	Palatal	Velar	Glottal
voiceless	p	t			k	(ʔ)
voiced	b	d			g	
ejective	p'	t'			k'	
implosive	ɓ	ɗ				
voiceless		s	ʃ			h
voiced		z				
ejective		s'				
nasal	m	n			(ŋ)	
lateral		l				
trill/flap		r				
approximant	w			j		

<sup>†</sup> Parentheses indicate marginally contrastive consonants.

Burns (1947) and Bender (1983) propose an identical consonant inventory to the current analysis with the exception of the velar nasal, which is not contrastive in their analyses. Similarly, Tesfaye (2015) includes the velar stop but lacks the velar nasal and

<sup>30</sup> See Otero (2018b) for further details on the status of the velar nasal and glottal stop.

Teshome (2008) presents a 24-consonant inventory which lacks a bilabial implosive but includes a phonemic velar nasal, glottal stop and a voiceless bilabial fricative – the latter of which I consider to be an allophonic surface realization [β] of intervocalic /b/.

#### 2.1.5.2 Komo consonant distribution and allophones

In terms of distributional restrictions, the implosive series is restricted to word-initial position. All of the of the contrastive consonants can occur in word-initial, intervocalic and word-final position.<sup>31</sup>

Table 6 contains a complete distribution of the allophones of the stops and sibilants in word-initial, intervocalic and word-final positions. The voiceless stops /p, t, k/ can be realized with aspiration in all three positions [p<sup>h</sup>, t<sup>h</sup>, k<sup>h</sup>], and the bilabial and velar stops can lenite to voiceless fricatives intervocalically [ɸ, x]. The voiced bilabial and velar stops /b, g/ can lenite to voiced fricatives intervocalically [β, ɣ], and the voiced alveolar stop /d/ can be articulated as a flap intervocalically [ɾ]. All of the voiced stops are realized with a delayed release word-finally before a pause. The ejective stops are always articulated with glottal release word-initially [p', t', k'] and can be realized as voiced stops [b, d, g] intervocalically. In word-final position, the ejective stops are unreleased. The ejective sibilant /s'/ is realized with glottal release in initial and final positions and can either be realized with glottal release or as a voiced fricative intervocalically [z].<sup>32</sup>

---

<sup>31</sup> The contrastive glottal stop only occurs in word-final position and the velar nasal only occurs in medial and final positions.

<sup>32</sup> Otero (2018b) notes that word-final ejectives in monomorphemic noun roots behave distinctly from word-final ejectives in monomorphemic verb roots. Noun roots preserve the laryngeal feature while in verb roots, ejectives are optionally unreleased word-finally and neutralize with voiced non-ejective allophones intervocalically.

Table 6 Distribution and allophones of Komo stops and sibilants

	#__	V__V	__#		#__	V__V	__#
/p/	p, p <sup>h</sup>	p, p <sup>h</sup> , φ	p <sup>h</sup>	/s/	s	s	s
/t/	t, t <sup>h</sup>	t, t <sup>h</sup>	t <sup>h</sup>	/z/	z	z	z
/k/	k, k <sup>h</sup>	k, k <sup>h</sup> , x	k <sup>h</sup>	/s'/	s'	s', z	s'
/b/	b	b, β	b'	/p'/	p'	p', b	p', p'
/d/	d	d, r	d'	/t'/	t'	t', t, d	t', t'
/g/	g	g, γ	g'	/k'/	k'	k', g	k', k'

### 2.1.5.3 Komo vowels

Komo exhibits a seven-vowel /i, ɪ, ε, a, ɔ, ʊ, u/ contrastive inventory distinguished by the feature of Advanced Tongue Root (ATR), seen in Figure 13. The phonetic allophones are enclosed in brackets. The Komo system exhibits phonemic ATR contrast in the [+high] vowels. Further, three [−high, +ATR] vowels [e, o, ə] occur on the surface as allophones of the three [−high, −ATR] vowels /ε, ɔ, a/, respectively, as a result of anticipatory [+ATR] harmony.<sup>33</sup> Evidence for the ‘basic’ status of [−ATR] is the fact that the vowels [e, o, ə] do not occur in monosyllabic monomorphemic roots and only occur in a specific environment which contains a [+high, +ATR] vowel /i, u/.

<sup>33</sup> Burns (1947) proposes a ten-vowel inventory including seven oral vowels /i, e, ε, a, ɔ, o, u/ and three nasal vowels /ĩ, ẽ, ã/. Nasal vowels, if they are indeed phonemic, are at best marginally phonemic and are always followed by a nasal consonant. Tesfaye (2015) proposes a nine vowel /i, e, ε, ɪ, ə, o, ʊ, u/ system though he does not provide any evidence for phonemic [−high, −ATR] vowels [e, ə, o], considered allophones in my analysis, nor do I find any evidence for a central vowel [ɪ].

[+ATR]			[-ATR]	
[+high]	i	u	ɪ	ʊ
[-high]	[e]	[o]	ɛ	ɔ
	[ə]		a	

Figure 13 Ethiopian Komo vowel system

Komo exhibits two distinct types of ATR harmony. Anticipatory [+ATR] dominant harmony is seen in monomorphemic roots and across morpheme boundaries from suffix to root. This process spreads [+ATR] leftward from a [+high, +ATR] vowel /i, u/ to a [-high, -ATR] vowel /ɛ, a, ɔ/, causing the latter to surface as [e, ə, o]. The data in example (9) show three monomorphemic monosyllabic verbs containing each of the three [-high, -ATR] vowels /ɛ, a, ɔ/ in the root. Each verb occurs with a deictic directional (DD) suffix containing both [+high, +ATR] vowels /i, u/, followed by a person marking suffix. In every case, [-ATR] root vowels surface as [+ATR] allophones [e, ə, o]. Anticipatory [+ATR] harmony is further evidenced in (9a-c) by the fact that the suffix -à 1PL.IN, which is to the right of the [+ATR] suffix -úk DD2, does not assimilate to [+ATR] and surface as [ə].

- (9) a. *gēm-úk-à* [gēmúkà]  
weed-DD2-1PL.IN  
‘We weeded.’
- b. *bàb-úk-à* [bàbúkà]  
bury-DD2-1PL.IN  
‘We buried.’
- d. *gēm-í-r* [gēmír]  
weed-DDØ-3SG.M  
‘He weeds.’
- e. *bàb-í-r* [bàbír]  
bury-DDØ-3SG.M  
‘He buries.’

- |    |  |    |  |
|----|--|----|--|
| c. | <i>kóp-úk-à</i> [kópúkà]<br>bale-DD2-1PL.IN<br>'We baled.' | f. | <i>kóp-í-r</i> [kópír]<br>bale-DDØ-3SG.M<br>'He bales' |
|----|--|----|--|

The same anticipatory [+ATR] dominant harmony seen across morpheme boundaries in (9) also occurs in monomorphemic words as in (10). The result of this harmony process is three non-contrastive allophones [e, ə, o] of /ε, a, ɔ/, respectively.

- |      |  |                              |
|------|--|------------------------------|
| (10) | /ε/ <i>bèzí</i> [bèzí] 'be thin'       | <i>mèí</i> [mèí] 'chase'     |
|      | /a/ <i>pāí</i> [pāí] 'liver'           | <i>gàbút</i> [gàbút] 'gruel' |
|      | /ɔ/ <i>kósí</i> [kósí] 'bread (trad.)' | <i>gòdùm</i> [gòdùm] 'sow'   |

The data in (11) show that the spreading of [+ATR] is strictly anticipatory, as an initial [+high, +ATR] vowel does not spread its [+ATR] feature rightward to a following [-high, -ATR] vowel. This particular vocalic environment remains disharmonic for the ATR feature.

- |      |  |
|------|--|
| (11) | /ε/ <i>dúré</i> [dúré] 'louse'         |
|      | /a/ <i>dibàl</i> [dibàl] 'grasshopper' |
|      | /ɔ/ <i>mílō</i> [mílō] 'flute'         |

The second type of ATR harmony in Komo only involves the high vowels /i, ɪ, ʊ, u/. This process is progressive, spreading [-ATR] rightwards from a [+high, -ATR] /ɪ, ʊ/ root vowel to a [+high, +ATR] suffix vowel /i, u/, causing the latter to surface as [-ATR]. The data in (12) display monomorphemic monosyllabic verb roots occurring with the identical vocalic suffixes seen on the verbs which spread [+ATR] in (9). The



difference is that the verb roots in (12) contain a [+high, –ATR] vowel /i, ɔ/, which spreads [–ATR] rightward to the [+high, +ATR] suffix vowels. Note how in progressive [+ATR] dominant spreading, the same vowels that were the *triggers* of [+ATR] harmony in one domain are the *targets* of [–ATR] harmony in another domain.

- |      |    |                     |          |    |                    |         |
|------|----|---------------------|----------|----|--------------------|---------|
| (12) | a. | <i>fít-úk-à</i>     | [fítókà] | d. | <i>fít-í-r</i>     | [fítír] |
|      |    | whistle-DD2-1PL.IN  |          |    | whistle-DDØ-3SG.M  |         |
|      |    | ‘We whistled.’      |          |    | ‘He whistles.’     |         |
|      | b. | <i>bòd-úk-à</i>     | [bòdókà] | e. | <i>bòd-í-r</i>     | [bòdír] |
|      |    | unthatch-DD2-1PL.IN |          |    | unthatch-DDØ-3SG.M |         |
|      |    | ‘We unthatched.’    |          |    | ‘He unthatches.’   |         |

Komo exhibits two fully productive ATR harmony processes (Otero 2015, 2018b). Recall that Casali’s (2003, 2008) typology of African ATR systems proposes that languages with ATR contrast in the high vowels tend to exhibit dominant-recessive ATR harmony, which is typically exemplified by [+ATR] affix vowels causing [–ATR] stem vowels to assimilate to [+ATR]. Komo does indeed exhibit anticipatory (leftward-spreading) [+ATR] dominant harmony, which conforms to Casali’s proposed typology. But Komo also exhibits progressive (rightward-spreading) [–ATR] dominant harmony. Taken together, these two harmony systems ultimately call into question the notion that only one ATR feature can be dominant in a given language.

In a recent acoustic study of the Komo ATR system, Olejarczuk et al. (2019) provide phonetic evidence for the two distinct types of ATR harmony described in Otero (2015a). Olejarczuk et al. (2019) analyzed recording of verb paradigms inflected with distinct suffixes from twelve native speakers of Komo and examined the acoustic correlates of anticipatory and progressive ATR harmony. While the acoustic results are

not empirical proof of ATR harmony, the results confirm the transcriptions of the vowels in both harmony processes. Olejarczuk et al. (2019) found that while *F1* was the most reliable acoustic correlate in establishing ATR contrasts in the Komo system, other cues such as voice-quality and vowel duration also play an important role.

#### 2.1.5.4 Komo tone

Komo displays three level tones – (L)ow, (M)id and (H)igh – as well as (R)ising and (F)alling contour tones.<sup>34</sup> Minimal tone pairs are seen in (13). The level and contour tones can occur on a single vowel nucleus though contour tones can result from two vowel nuclei of differing level tones coming together at a morpheme boundary.

(13)	L	bàm	‘move (as a herd)’	H	bám	1SG.POSS
	M	bā	DEM.F	R	bǎ	‘father’
	L	ɸì	‘mountain’	F	ɸî	‘eye’
	M	dā	Q	F	dâ	‘mother’
	M	jī	‘axe’	R	jǐ	‘water’

Overall, tone is quite stable in Komo: there is no evidence of downstep or downdrift in prosodic words or even across longer sentences. The functional load of tone is moderate in the lexicon, more present in the verbal system where tonal suppletion in verb roots is a means of distinguishing nominal and verbal number.<sup>35</sup>

---

<sup>34</sup> Burns (1947) claims there are four level tones in Sudanese Komo though I find no evidence of this in Ethiopian Komo. I also briefly worked with a Komo speaker from Sudan and did not encounter four level tones. The modern-day Opo varieties clearly display four level tones (Smolders 2017; also see §2.1.7 of this dissertation).

<sup>35</sup> See Otero (2015b) for a description of the interaction between tone in the verb and participant indexing as a means of dual and/or paucal participant number marking.

Another aspect of Komo verbs that is of tangential relevance to the historical reconstruction are verb tone classes. There are four main tone classes for monosyllabic roots, which are established by comparing the tone of a non-finite bare root, such as what follows an inflected auxiliary, with that of a finite root inflected with Deictic Directional (DD) and person-indexing suffixes. The four root-level tone classes are H, M, L<sub>1</sub> and L<sub>2</sub>. The H and M roots maintain their tone when inflected with additional morphology. The L tone roots split into two categories: one set retains a L tone and the other surfaces as M tone (set L<sub>1</sub> and L<sub>2</sub> respectively). The examples in (14) contain CVC verb roots of the four tone classes (H, M, L<sub>1</sub>, L<sub>2</sub>) inflected with /-í/ 2SG to form the imperative. Note that the M, H and L<sub>1</sub> roots retain the root tone when inflected and the suffix tone remains H; while the in the L<sub>2</sub> class, both the stem and suffix are realized as M.

(14)	class	root	+ /-í/ 2SG	gloss
	H	<i>bóg</i>	<i>bógí</i>	‘wait’
	M	<i>tōn</i>	<i>tōní</i>	‘pass’
	L <sub>1</sub>	<i>dùm</i>	<i>dùmí</i>	‘hit’
	L <sub>2</sub>	<i>kèd</i>	<i>kēdī</i>	‘push’

### 2.1.6 Uduk phonology

The Uduk dialect cluster of languages is spoken in the Blue Nile State of the Sudan. There are two close northern varieties, Chali Uduk and Bonya Uduk and a more divergent southern dialect, Yabus Uduk. James (1979), Thelwall (1983) and Killian (2015) as well as my consultants observe that the northern varieties are very close and there is “scarcely a problem of mutual understanding” (James 1979:263). By contrast, the southern dialect, which has been historically spoken along the Yabus river in Belatoma

and in the town of Yabus, is recognized as the most divergent dialect in the literature as well as by my consultants. James (1979:263) notes that the southern variety, what my consultants refer to as Yabus Uduk, is “markedly different” in the sound system and the lexicon.

The degree of mutual intelligibility between the northern and southern varieties has yet to be empirically investigated. When asked informally about the differences between the two, Chali and Yabus Uduk speakers note significant differences in the sound systems, grammar and in the lexicon. With regards to mutual intelligibility, both Killian (2015) and I observe that Chali speakers find it “challenging” to understand Yabus Uduk speech. By contrast the Yabus consultants I worked with say they can understand the Chali variety. Whether or not this reported difference in intelligibility is system internal, due to diverging structural properties of the varieties, and/or whether it is a social matter of prestige as Chali is the dominant variety, remains to be investigated. Also note that the Uduk orthography, which has been used in schools and in Bible translations in Sudan since the 1960s as well as in refugee camps, is of the northern Chali variety.

The first linguistic study of Uduk phonology is Stevenson’s (1942) unpublished grammar sketch of the Chali variety. Interestingly, Stevenson never actually conducted fieldwork but used notes collected by the missionaries Malcom and Enid Forsberg who began working with the Uduk for the Sudan Interior Mission (SIM) in Chali in 1941. Tucker & Bryan’s (1966) short survey of Uduk is based on Stevenson (1942). The first detailed study of Uduk phonology is Thelwall’s (1983) phonological sketch of Chali Uduk. Thelwall employed data collected from a native speaker in Khartoum from 1968-1971. Thelwall (1983:323) notes that his phonological analysis does not differ

significantly from the Chali Uduk orthography created by the Sudan Interior Mission. This orthography was used to write Beam & Cridland's (1970) Chali Uduk dictionary (first drafted as a manuscript in 1956). Chali Uduk phonology is also discussed in Killian (2015), which only differs significantly from the aforementioned studies in the phonemic consonant inventory, which is discussed below in (§2.1.6.1).

The Yabus Uduk variety has received very little attention in the linguistic literature. The only prior work on the phonology is Killian's (2015:305–306) note on the phonemic consonants and vowel inventories. Killian also includes several glossed texts in Yabus Uduk in an appendix. The following sections provide phonological sketches for the Chali and Yabus varieties based on my data and previous analyses. I focus on the synchronic phonemic inventories and lay out allophonic processes that are integral to the systems.

#### 2.1.6.1 Chali Uduk contrastive consonant inventory

The Chali Uduk variety has the most phonemic consonants of any living Koman language. Prior descriptions of the Chali Uduk consonant inventory differ significantly: Stevenson (1942) provides an inventory of 31 consonants, while Killian (2015) proposes an inventory of 55 contrastive consonants.<sup>36</sup> My analysis of the Chali Uduk consonant inventory is consistent with Thelwall (1983) and the Uduk orthography employed in Beam & Cridland (1970 [1956]). I analyze 34 contrastive phonemic consonants, which are presented in Table 7. The plosive series robustly contrasts in five places of

---

<sup>36</sup> It is not clear whether Stevenson's inventory is a phonemic and/or a phonetic representation of the consonant system as he includes several sounds which are considered to be allophones of the current contrastive inventory. To his credit, Stevenson does recognize the shortcomings of his description and calls for a more in-depth investigation, given the fact that he hadn't ever heard the Uduk language.

articulation: bilabial, interdental, alveolar, palatal and velar. The glottal stop is marginally contrastive in word-final (pre-pause) position. Further, the obstruents contrast in five manners of articulation: voiceless aspirated, voiceless unaspirated, voiced, ejective and implosive.<sup>37</sup>

Table 7 Chali Uduk contrastive consonant inventory<sup>†</sup>

	Bilabial	Inter-dental	Alveolar	Alveo-palatal	Palatal	Velar	Glottal
unaspirated	p	t̪	t		c	k	(?)
aspirated	p <sup>h</sup>	t̪ <sup>h</sup>	t <sup>h</sup>		c <sup>h</sup>	k <sup>h</sup>	
ejective	p'	t̪'	t'		c'	k'	
voiced	b	d̪	d		ʃ	g	
implosive	ɓ		d̥				
fricative			s	ʃ			h
nasal	m		n		ɲ	ŋ	
lateral			l				
trill/flap			r				
approximant	w				j		

<sup>†</sup>Parentheses indicate a marginally contrastive phoneme.

Killian's (2015:20) contrastive consonant inventory of 55 consonants is presented in Table 8. The major difference between Killian's proposal and the current analysis is that Killian adds a partial series of phonemic labialized consonants.

<sup>37</sup> Chali Uduk, along with Dana, are the only Koman languages that contrast interdental and alveolar stops across four manners of articulation.

Table 8 Killian's (2015:20) Chali Uduk contrastive consonant inventory<sup>†</sup>

	Bilabial	Dental	Alveolar	Post-alveolar	Palatal	Velar	Glottal
unaspirated	p	t̪	t		c	k	ʔ
labialized	p <sup>w</sup>	(t̪ <sup>w</sup> )			c <sup>w</sup>	k <sup>w</sup>	
aspirated	p <sup>h</sup>	t̪ <sup>h</sup>	t <sup>h</sup>		c <sup>h</sup>	k <sup>h</sup>	
labialized	p <sup>hw</sup>		(t <sup>hw</sup> )		c <sup>hw</sup>	k <sup>hw</sup>	
ejective	p'	t̪'	t'		c'	k'	
labialized			t' <sup>w</sup>		c' <sup>w</sup>	k' <sup>w</sup>	
voiced	b	d̪	d		ʃ	g	
labialized	b <sup>w</sup>		d <sup>w</sup>		ʃ <sup>w</sup>	g <sup>w</sup>	
implosive	ɓ		d̪				
labialized	ɓ <sup>w</sup>		d̪ <sup>w</sup>				
fricative			s	ʃ			h
labialized				ʃ <sup>w</sup>			
nasal	m		n		ɲ	ŋ	
labialized	(m <sup>w</sup> )				(ɲ <sup>w</sup> )	ŋ <sup>w</sup>	
lateral			l				
trill/flap			r				
approximant	w				j		

<sup>†</sup> Parentheses indicate “rare or marginal phonemes” (Killian:2015:20).

Killian proposes seventeen contrastive labialized consonants (including labialized voiceless unaspirated, labialized implosive and labialized velar nasal, among others) and four marginally contrastive labialized consonants. Killian's analysis is problematic for several reasons. First, it increases the inventory of 34 contrastive consonants by 21. Second, it proposes a rather phonologically unbalanced system: of the 31 possible labialized consonants in his inventory, there are 10 gaps of unattested labialized consonants (i.e., /p<sup>w</sup>, t̪<sup>hw</sup>, t̪<sup>w</sup>, d̪<sup>w</sup>, t<sup>w</sup>, s<sup>w</sup>, n<sup>w</sup>, l<sup>w</sup>, r<sup>w</sup>, h<sup>w</sup>/ are unattested).<sup>38</sup> Further, Killian

<sup>38</sup> This is assuming that all of the 34 consonants, with the exception of /ʔ, j, w/, are “labializable”.

(2015:23–24) recognizes that the labialized consonants have a limited distribution. They can only occur before the vowel /a/ in word-initial position.<sup>39</sup> The alternative proposed here is a consonant-glide sequence (Cw) rather than a series of labialized consonants. Further, there is no evidence to reconstruct a labialized series of consonants at any node within Koman.

#### 2.1.6.2 Chali Uduk consonant distribution and allophones

The distribution of Chali Uduk consonants is discussed in Thelwall (1983) and Killian (2015). Killian (2015) also discusses allophonic processes such as intervocalic lenition and word-final delayed release of pulmonic and non-pulmonic consonants. All of the contrastive Chali Uduk consonants can occur in word-initial position. The nasals, lateral, trill, fricatives /s, ʃ/ can occur in all positions and do not exhibit any significant allophonic variation. The glottal fricative /h/ only occurs word-initially and intervocalically.

Table 9 contains the distributions and allophonic realizations of the voiceless aspirated and unaspirated plosives in word-initial, intervocalic and word-final positions. The voiceless bilabial, palatal and velar aspirated plosives can lenite to voiceless fricatives intervocalically as well as word-finally. The voiceless unaspirated series does not occur word-finally resulting in complete neutralization of contrast between voiceless aspirated and voiceless unaspirated plosives in this position.

---

<sup>39</sup> Killian additionally notes that his proposed labialized consonants can also occur word-medially in compounds.



Table 9 Distribution and allophones of Chali Uduk voiceless plosives

	#__	V__V	__#		#__	V__V	__#
/p <sup>h</sup> /	p <sup>h</sup>	p <sup>h</sup> , φ	p <sup>h</sup> , φ	/p/	p	p	–
/t̥ <sup>h</sup> /	t̥ <sup>h</sup>	(t̥ <sup>h</sup> ) <sup>†</sup>	t̥ <sup>h</sup>	/t̥/	t̥	t̥	–
/t <sup>h</sup> /	t <sup>h</sup>	t <sup>h</sup>	t <sup>h</sup>	/t/	t	t	–
/c <sup>h</sup> /	c <sup>h</sup>	c <sup>h</sup> , ç	c <sup>h</sup> , ç	/c/	c	c	–
/k <sup>h</sup> /	k <sup>h</sup>	k <sup>h</sup> , x, h	k <sup>h</sup> , x, h	/k/	k	k	–

<sup>†</sup> Not attested in my data but attested in Thelwall (1983:332)

The distribution and allophones of the voiced, ejective and implosive obstruents are in Table 10.

Table 10 Distribution and allophones of Chali Uduk voiced, ejective and implosive obstruents

	#__	V__V	__#		#__	V__V	__#
/b/	b	b, b	b, b'	/d/	d	d, d	d, d'
/p'/	p'	p', b	(p') <sup>†</sup>	/b/	b	b, β	–
/t̥'/	t̥'	t̥'	t̥'	/d̥/	d̥	d̥	–
/t'/	t'	(t') <sup>‡</sup>	–	/d/	d	d	–
/c'/	c'	c', ʃ	c', c'	/j/	ʃ	ʃ, ʒ	–
/k'/	k'	k'	k', k', ?	/g/	g	g, γ	–

<sup>†</sup> Unattested in my data and in Killian (2015); of restricted distribution in Thelwall (1983:332)

<sup>‡</sup> Unattested in my data and of “restricted distribution” in Thelwall (1983:332)

The implosives can be realized as implosives or as plain voiced stops intervocally and they can also optionally be realized with a delayed glottal release word-finally. This word-final delayed glottal release also occurs in allophonic realizations of the

ejectives.<sup>40</sup> The only voiced stops occurring in word-final position are the implosives; the plain voiced stops are restricted to initial and medial positions.

One point of discrepancy across analyses, noted earlier, is Killian's (2015) proposed (partial) series of labialized consonants, which Thelwall (1983) and I analyze as consonant-glide sequences. Killian's (2015:24) arguments for proposing a labialized series of consonants are due to consonant-tone restrictions, depressor consonant effects, and syllable onset restrictions. Killian observes that one main restriction is that voiced consonants in syllable onsets cannot be followed by a M tone, but voiceless onsets can be followed by a M tone (see §2.1.6.6 for discussion of depressor consonants).<sup>41</sup> Killian notes that when in syllable onset, the labiovelar glide /w/ patterns with the voiced obstruents with regard to tone restrictions but the tones following his "labialized" consonants pattern with respect to the onset (e.g. /g/ or /w/ cannot occur with a following M tone, but /k/ and /k<sup>w</sup>/ can occur with a M tone). He argues that if his proposed labialized consonants were a Cw sequence, then the tone rules should be governed by the glide that precedes the vowel not by the initial consonant (e.g. per Killian, /kw/ should *not* be followed by a M tone since presumably /w/ would count as "voiced". If we treat Killian's unitary "labialized" consonant as a Cw sequence instead, Killian's analysis holds: voiced onsets cannot occur with a M tone and voiceless onsets can.

---

<sup>40</sup> Delayed glottal release of ejectives involves a complete closure and delayed burst. This is a very common allophonic realization for word-final ejectives in the living Koman languages.

<sup>41</sup> Beam & Cridland (1970) do have instances of w-initial words with M tones in their dictionary. None of the 22 w-initial words in my database occur with a M tone vowel immediately after /w/.

Appealing to economy, Killian (2015) argues that if one were to analyze his unitary labialized consonants instead as a consonant + glide sequence, it would necessitate positing a syllable of the CGV type; his stance is that Uduk is a language without complex onsets. Further he notes that, “If one takes the approach that these are consonant sequences, the tone restrictions would result in an additional 30 or so rules for each consonant sequence, and justifications would have to be made for the vowel-consonant interactions (Killian 2015:24).” Unfortunately, Killian does not provide examples of any rules or explain in detail what he specifically means by “vowel-consonant interactions”.

The current analysis and Thelwall (1983) do not posit a series of labialized consonants but rather treat a consonant-glide (Cw) syllable onset as a sequence of two consonants that can only occur before /a/. Within other Koman languages, Cw sequences restricted to occurring before the vowel /a/ are very common; they have been analyzed not as labialized consonants but rather as Consonant-glide sequences also in Gwama (Hellenthal & Kutsch Lojenga 2011) and Komo (Kutsch-Lojenga & Otero 2011, Otero 2018b).

### 2.1.6.3 Yabus Uduk consonant inventory

The only prior work on Yabus Uduk is a brief note on the contrastive consonants and vowels in Killian (2015:305–306). The following analyses here are based on my own fieldwork and Killian (2015).

The Yabus Uduk inventory consists of 34 contrastive consonants including the glottal stop, which is contrastive only in word final position (Table 11). There is a 4-way contrast in manner of articulation for plosives across bilabial, alveolar, palatal and velar

places of articulation. Yabus Uduk exhibits contrastive aspiration in voiceless stops but lacks the interdental series of stops that is present in the northern varieties.

Table 11 Yabus Uduk contrastive consonant inventory

	Bilabial	Alveolar	Alveo- palatal	Palatal	Velar	Glottal
unaspirated	p	t		c	k	ʔ
aspirated	p <sup>h</sup>	t <sup>h</sup>		c <sup>h</sup>	k <sup>h</sup>	
ejective	p'	t'		c'	k'	
voiced	b	d		ʃ	g	
implosive	ɓ	ɗ				
voiceless		s	ʃ			h
voiced		z	ʒ			
ejective		s'	ʃ'			
nasal	m	n		ɲ	ŋ	
lateral		l				
trill/flap		r				
approximant	w			j		

With respect to glottalic consonants, Yabus Uduk exhibits a full ejective series across bilabial, alveolar, palatal and velar places of articulation, as well as bilabial and alveolar implosives. Further, there are two fricative ejectives, an alveolar /s'/ and a rare palatal fricative ejective /ʃ'/, the latter of which is articulated with clear frication before the glottal burst. Yabus Uduk also exhibits a voicing contrast among the alveolar fricatives /s, z/ as well as in the (alveo-)palatal fricatives /ʃ, ʒ/.

By contrast to the proposed 34-consonant inventory in Table 11, Killian (2015:306) proposes a contrastive inventory of 50 consonants for Yabus Uduk, though he indicates that his inventory is based on a limited amount of research. What differentiates Killian's inventory from the inventory proposed here are is the lack of a voiced palatal

fricative in Killian’s inventory plus his 17 additional labialized consonants /p<sup>w</sup>, p<sup>hw</sup>, b<sup>w</sup>, b<sup>w</sup>, t<sup>w</sup>, d<sup>w</sup>, c<sup>w</sup>, c<sup>hw</sup>, c<sup>w</sup>, f<sup>w</sup>, f<sup>w</sup>, k<sup>w</sup>, k<sup>hw</sup>, k<sup>w</sup>, g<sup>w</sup>, ŋ<sup>w</sup>/. Killian does not provide any evidence for the partial series of labialized consonants nor does he mention whether they are restricted to occurring before the vowel /a/, as he mentions for the Chali variety.

#### 2.1.6.4 Yabus Uduk consonant distribution and allophones

This section outlines the distribution of the Yabus Uduk consonant system as well as the allophonic variation in word-initial, intervocalic and word-final positions within the phonological word. The distribution of voiceless aspirated and unaspirated plain stops is seen in Table 12. All of the voiceless aspirated stops, with the exception of the voiceless alveolar stop /t<sup>h</sup>/, can lenite to voiceless fricatives in intervocalic and word-final positions. The five-way contrast in manner of articulation for plosives seen in word-initial position is reduced to a three-way contrast in word-final position; voiceless unaspirated stops can occur in initial and intervocalic positions, but not word-finally.

Table 12 Distribution and allophones of Yabus Uduk voiceless plosives

	#__	V__V	__#		#__	V__V	__#
/p <sup>h</sup> /	p <sup>h</sup>	p <sup>h</sup> , φ	p <sup>h</sup> , φ	/p/	p	p	–
/t <sup>h</sup> /	t <sup>h</sup>	t <sup>h</sup>	t <sup>h</sup>	/t/	t	t	–
/c <sup>h</sup> /	c <sup>h</sup>	c <sup>h</sup> , ç	c <sup>h</sup>	/c/	c	c	–
/k <sup>h</sup> /	k <sup>h</sup>	k <sup>h</sup> , x	k <sup>h</sup> , x	/k/	k	k	–

To illustrate the intervocalic lenition of the voiceless aspirated stops, the data in (15) contain word-final aspirated stops occurring with a vocalic suffix. All of the voiceless

aspirated stops lenite to fricatives intervocalically with the exception of the voiceless alveolar stop.

- (15) a. /tūp<sup>h</sup>/    *áhā tūp<sup>h</sup>-á*    *k'wà*    [áhā tūφá k'wà]  
    1SG pierce-1SG    gourd  
    'I pierce a gourd.'
- b. /bàt<sup>h</sup>/    *áhā bàt<sup>h</sup>-á*    *fùm*    [áhā bàt<sup>h</sup>á fùm]  
    1SG hunt-1SG    animal  
    'I hunt animals.'
- c. /dǔrīc<sup>h</sup>/    *dǔrīc<sup>h</sup>-ām=pém*    [dǔrīçāmpém]  
    young.people-ASS=1SG.POSS  
    'my young people'
- d. /ʃɔk<sup>h</sup>/    *áhā ʃɔk<sup>h</sup>-á*    *mā*    [áhā ʃɔxá mā]  
    1SG stir-1SG    porridge  
    'I stir the porridge.'

Table 13 contains the distribution and allophones of the implosives, voiced plosives and the obstruent ejectives. Note that in Yabus Uduk, the implosives are restricted to word-initial position. The ejectives all occur in word-initial position, though they have distinct distributions medially and word-finally. The bilabial ejective is very infrequent in the database, only occurring in three words and only in initial position. The alveolar ejective only occurs in initial or medial position. By contrast, the palatal and velar ejectives occur in initial and final positions. Further, the palatal ejective is realized as a voiced fricative and the velar ejective can also be realized as a voiced stop intervocalically. The voiced plosives are realized as unreleased or with a delayed release

word-finally.<sup>42</sup> The voiced palatal stop is unattested in word-final position in my database.

Table 13 Distribution and allophones of Yabus Uduk implosives, ejectives and voiced plosives

	#__	V__V	__#		#__	V__V	__#
/b/	ɓ	–	–	/d/	d	–	–
/p/	pʼ	–†	–†	/b/	b	b	bʼ
/t/	tʼ	tʼ	–†	/d/	d	d	dʼ
/c/	cʼ	ɟ	cʼ	/j/	ɟ	ɟ	–
/k/	kʼ	kʼ, g	kʼ	/g/	g	g	gʼ
/s/	sʼ	sʼ, z	sʼ	/ʃ/	ʃ	ʒ	ʃʼ

† Unattested in my data though possibly likely to occur.

The data in (16) contain word-final alveolar, palatal and velar ejectives inflected immediately with a vowel-initial suffix. The ejectives are realized as voiced stops intervocalically across morpheme boundaries.

- (16) a. /ʃitʼ/    *áhā ʃitʼ-á mē*                    [áhā ʃídá mē]  
                   1SG tether-1SG goat  
                   ‘I tie up the goat.’
- b. /tʰúcʼ/    *tʰúcʼ-ām-pém*                    [tʰúɟāmpém]  
                   work-ASS-1SG.POSS  
                   ‘my work’
- c. /tʰūkʼ/    *áhā tʰūkʼ-á ɪs*                    [áhā tʰūgá ɪs]  
                   1SG turn-1SG body  
                   ‘I turn around.’

<sup>42</sup> This seen in the numeral *múzèd* ‘five’, which can be realized as [múzèdʼ] or [múzèʔ] in Yabus Uduk. Note that it is cognate with *múḡèd* in Chali Uduk.

Evidence for the intervocalic voicing of the fricative ejectives is seen in (17). Word final fricative ejectives are realized as voiced fricatives intervocalically across morpheme boundaries.

- (17) a. /kàs'/     *kàs'-ām-pém*                     [kàzāmpém]  
    husband-ASS-1SG.POSS  
    'my husband'
- b. /bíf'/     *bíf'-ām-pém*                     [bízāmpém]  
    fishhook-ASS-1SG.POSS  
    'my fishhook'

The distribution and allophones of the fricatives and sonorants is seen in Table 14. The voiceless fricatives (plain and ejective) occur in all positions, with the exception of the glottal fricative, which does not occur word-finally. The alveolar ejective fricative can also be realized as a plain voiced fricative intervocalically, while the voiceless alveopalatal fricative ejective is realized as a voiced postalveolar fricative. Lastly, the nasals, lateral, trill and glides can occur in all positions and there is no significant allophonic variation.



Table 14 Distribution and allophones of Yabus Uduk  
plain fricatives and sonorants

	#__	V__V	__#		#__	V__V	__#
/s/	s	s	s	/z/	z	z	–
/ʃ/	ʃ	ʃ	ʃ	/ʒ/	ʒ	ʒ	–
				/h/	h	h	–
/m/	m	m	m	/r/	r	r	r
/n/	n	n	n	/l/	l	l	l
/ɲ/	ɲ	ɲ	ɲ	/w/	w	w	w
/ŋ/	ŋ	ŋ	ŋ	/j/	j	j	j

#### 2.1.6.5 Uduk contrastive vowels

Stevenson (1944) proposes a 10-vowel system in Chali Uduk consisting of seven peripheral vowels /i, e, ε, a, ɔ, o, u/ and three central vowels /i, ə, ɐ/. Excluding the central vowels, Stevenson’s inventory is representative of a current-day seven-vowel system with ATR contrast in the mid-vowels (cf. Casali 2008:503).<sup>43</sup> By contrast, Thelwall (1983) proposes a five-vowel phonemic inventory /i, e, a, o, u/ and Killian (2015:32) proposes a distinct five-vowel system /i, ε, a, ɔ, u/.<sup>44</sup> Taken together, Thelwall and Killian’s inventories combined yield Stevenson’s (1942) inventory minus the central vowels. Killian (2015:32) states that surface forms of /i ε a ɔ u/ in Chali Uduk extend into [i, ɪ, ε, e, a, ʌ, ɔ, o, ʊ, u].<sup>45</sup>

<sup>43</sup> Recall that the other living Koman languages have a contrastive seven-vowel system /i, ɪ, ε, e, a, ɔ, ʊ, u/. This is the system I reconstruct to Proto-Koman.

<sup>44</sup> Note that Killian employs the graphemes <e> and <o> to represent /ε/ and /ɔ/, respectively.

<sup>45</sup> Killian employs the symbols [i, ʌ] for what I transcribe as [ɪ, ʊ], the [+high, –ATR] vowels.

In Yabus Uduk, by contrast, Killian (2015:306) proposes a “tentative” seven-vowel system with ATR contrast as well as three [+ATR] allophones [e, ʌ, o] of /ε, a, ɔ/, respectively, though he provides no evidence to support these claims. I find no evidence for a seven-vowel contrastive inventory in Yabus Uduk, though phonetically the Uduk vowel space does seem to extend through the range of the seven vowel systems as discussed for Chali Uduk.<sup>46</sup> In Figure 14, I propose a five-vowel contrastive inventory for the Chali and Yabus Uduk varieties.

	FRONT	CENTRAL	BACK
HIGH	i		u
MID	ε		ɔ
LOW		a	

Figure 14 Uduk contrastive vowel inventory

The living Uduk varieties have lost phonemic ATR contrast in the high vowels and the reflexes of Proto-Koman (PKMN) \*ɪ and \*ʊ in cognate lexemes correspond to synchronic Uduk /i, ε/ and /u, ɔ/ respectively. On the surface, reflexes of historical \*ɪ can be realized phonetically as [i, ɪ, e] while reflexes of \*ʊ could be realized as [u, ʊ, o]. See §3.3 for discussion of the PKMN vowel system.

#### 2.1.6.6 Uduk tone

Chali Uduk displays three contrastive level tones as well as contrastive rising and falling contour tones. The only prior studies of Uduk tone is of the Chali variety.

Although Stevenson (1942) recognizes tone in the language, he does not investigate it

---

<sup>46</sup> I recognize that a more detailed study of the Yabus Uduk vowels is warranted.

fully. Beam & Cridland's (1970 [1956]) dictionary marks tone on all of the lexical entries. In their dictionary, level tones occur only on a single vowel nucleus while the contour tones, typically rising, are always transcribed with two sequential vowels of the same quality and differing tone heights. Killian's (2014) tone transcriptions of Beam & Cridland's lexical entries are very similar with one notable exception discussed further below.<sup>47</sup>

Killian (2015) is by far the most in-depth treatment of Chali Uduk tone. He investigates lexical and grammatical tone as well as the complex system of tonal aspectual marking in inflected verbs. Killian (2015:40) analyzes four of what he calls "basic" tonemes, L, M, H, LH and three "rare" tonemes, MH, HL and HM. He provides a near-minimal septuplet of these tonemes on single vowel nuclei in monosyllabic words as evidence though the HL and HM entries are Arabic borrowings.<sup>48</sup> Further, in Killian's (2015:45) list of tonemes in polysyllabic words, there are only two examples of HM and MH— both of which are found in names of species of birds. In sum, Killian proposed three contrastive level tonemes (L, M, H), two contrastive rising tonemes (LH, MH) and two contrastive falling tonemes (HL, HM). I did not find evidence for phonemic contrast for LH vs. MH or HL vs. HM as a unitary toneme on a single vowel nucleus. I find only one contrastive R(ising) tone and one contrastive F(alling) toneme. If such fine-grained contour tone distinctions are realized as Killian describes, I suspect

---

<sup>47</sup> I am grateful to Don Killian for providing me with his updated version of the Beam & Cridland dictionary.

<sup>48</sup> Killian (2015:40) states that MH, HL and HM "occur only rarely, but are possible in both mono- and disyllabic nominal roots" and "LM and ML contours do not appear in any lexeme roots".

they are phonetic, not phonological.<sup>49</sup> Killian (2015) does not mention tone in Yabus Uduk and I analyze this variety also with three contrastive level tones, one contrastive rising and one contrastive falling contour toneme.

One of Killian (2015)'s major contributions with regard to the tone in Uduk has largely to do with its interaction with the consonant system. In Chali Uduk, Killian (2015:42) observes the following co-occurrence restrictions for (word-initial) consonants and the tone of the immediately following vowel in monosyllabic and polysyllabic words:

- (18)
- a. No syllable beginning with a voiceless onset occurs with a L tone.
    1. Vowel-initial roots are included in this category, as they optionally begin with a glottal stop.
    2. Implosives also are included in this category.
  - b. No syllable beginning with a voiced onset occurs with a M tone.
  - c. Voiced plosives can only occur with L or LH tones.
  - d. Voiced sonorants can occur with L, LH, or H tones; the sonorant can be either a syllable onset with a following vowel, or it may be a as syllabic TBU.

I find the same distributions in Chali Uduk as those observed by Killian, though I have only examined the distribution of the tones in word-initial syllables. In Beam & Cridland (1970), by contrast, all word-initial voiced consonants can occur with a following L, H or rising tone. Lexemes transcribed with contour tones in Beam and Cridland (1970) are rare and the rising contour tone is always transcribed as a MH across two adjacent identical vowels such as in *dāáp<sup>h</sup>án* 'beggar' and *dāátú* 'evil eye' (*ibid* 1970:56). All of the transcriptions of H tones after voiced stop in Beam and Cridland are rising contour tones in Killian (2014). One question is whether these H

---

<sup>49</sup> By comparison, no other Koman language has two contrasting sets of rising or falling tones on monosyllabic monomorphemes (e.g. LH vs. MH, or HL vs. ML).

tones were realized as a level H tone at the time of Beam & Cridland's fieldwork and have since become a rising contour tone, or whether they were realized as contour tones and just not perceived as such.<sup>50</sup> This is the only discrepancy between Beam & Cridland's (1970) and Killian's (2014) transcriptions; all of the other observations put forth by Killian in (18) hold for Beam & Cridland's work.

Phonologically, it appears that the voiced plosives (the implosives are not included in this class) and the voiceless plosives are in complementary distribution with regard to the tone on a following vowel. Voiced stops can only occur with a L or LH tone, while voiceless stops can only occur with M or H tone. These observations are employed by Killian as evidence of a historical depressor consonant effect as well as for proposing a series of labialized consonants (see discussion above in §2.1.6.1). Killian (2015:43) argues that pre- or proto-Uduk only displayed two level tones (L and H). He hypothesizes that the voiced consonants (excluding implosives) functioned as depressor consonants and lowered the L tone to an extra L tone which, over time, phonologized into a new tone level, raising the total to the three level tones that he finds synchronically (L, M, H).<sup>51</sup>

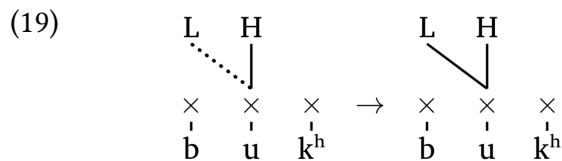
Killian posits a subsequent sound change to explain the LH contour tone seen synchronically after voiced plosives and some sonorants. He argues that, following voiced plosives and sonorants, some H tones underwent L-tone insertion which created a LH contour. By this he suggests that the synchronic LH contour tones were

---

<sup>50</sup> Impressionistically, I found it difficult to hear the rising contour tone following voiced stops at times, though when asked, the speakers would clearly whistle a rising tone.

<sup>51</sup> It appears that Ehret (2001) predates Killian's analysis of Uduk tone. Ehret (2001:60) proposes the following sound change in Uduk:  $*(C_1)\check{v}(C) > (C_1)\check{v}(C)$  where  $C_1 = [+voice/-glottal]$ ;  $> (C_1)\bar{v}(C)$  elsewhere.

historically all H tones. Killian’s (2015:43) example is reproduced in (19). He argues that the verb *būk<sup>h</sup>* ‘pull out’ was historically H tone \**búk*, which underwent L-tone insertion, which gave rise to the synchronic LH tone. While there is no evidence to prove this, it is interesting when examining the data from Beam & Cridland (1970), in which they transcribed H tones after voiced sonorants and plosives, which correspond to LH in Killian (2014) and in my data.



The Chali Uduk verb system is particularly revealing with respect to the tone distribution. Killian (2015:44) observes that Chali Uduk employs tonal alternations on the verb root to mark aspect – perfective (PFV) and imperfective (IPFV). He groups the Uduk verbs into five classes based on the behavior of the tone of the root when expressing either aspect. I have reproduced Killian’s (2015:44) tone classes in (20) and I also include the consonants that can occur as the word-initial syllable onset.

	Class	PFV	IPFV	Consonants in word-initial syllable onset
(20)	1	M	H	voiceless consonant, implosive
	3	H	M	voiceless consonant, implosive
	2	L	LH	voiced plosive, sonorant
	4	LH	L	voiced plosive, sonorant
	5	H	L	sonorant

Notice that class 1 and class 3 only occur with a voiceless consonant or implosive syllable onset. Class 2 and class 4 comprise the voiced plosives and sonorants, and class

5 has only sonorants. If the LH contour were indeed a historical \*H tone, the tone classes could be condensed into four classes, as seen in (21). Classes 4 and 5 could be collapsed into one. Notice that the distribution of the tone classes also patterns with the complementary distribution of the consonant in the syllable onset – Classes 1 and 2 have initial syllables with strictly voiceless consonants and implosives while classes 3 and class 4/5 have voiced consonants.

	Class	PFV	IPFV	Consonants in word-initial syllable onset
(21)	1	M	H	voiceless consonant, implosive
	3	H	M	voiceless consonant, implosive
	2	L	*H	voiced plosive, sonorant
	4, 5	*H	L	voiced plosive, sonorant

Killian’s (2015) hypothesis of a historical depressor consonant effect in a prior stage of Uduk actually extends further back in the history of the Koman languages. Killian’s intuitions are correct though in §3.1.2, I propose that voiced plosives functioned as depressor consonants not only at a Pre-Uduk stage, but more precisely prior to this, in a Proto-Koman stage.

### 2.1.7 Opo

Opo is cluster of language varieties that are spoken along both sides of the border of southwest Ethiopia and South Sudan. The Bilugu and Modin varieties are spoken in Ethiopia, while the Pame, Kigile, Pilakoy and Bikol varieties are spoken in South Sudan. The degree of mutual intelligibility among these varieties has not been studied in detail though the Ethiopian varieties are mutually intelligible. Lastly, many researchers include Dana as a variety of Opo though there has not been any description of Dana

prior to this dissertation. I discuss Dana phonology in §2.1.8 and propose that Dana split from Proto-Opo Dana in §4.9.

Opo phonology has received very little treatment in the linguistic literature until recently. Bender (1983) provides a very brief sketch, though he does not specify the variety (or varieties) in his study. Lemi (2010) and van Silfhout (2013) outline aspects of the phonology of Ethiopian varieties (presumably Bilugu and/or Modin Opo), and Mellese (2017) provides the most in-depth analysis of Bilugu Opo, though a full detailed study is needed. In the following subsections, I provide an overview of the consonant, vowels and tone of some of the Opo varieties.<sup>52</sup>

#### 2.1.7.1 Opo consonants

The Opo varieties exhibit 26-28 contrastive consonants. This inventory, seen in Table 15, includes the glottal stop and the palatal nasal, which are marginally contrastive. Bilabial, alveolar and velar obstruents contrast in four manners of articulation: voiceless aspirated, voiceless unaspirated, ejective and voiced. The alveopalatal affricates contrast in voiceless, ejective and voiced manners of articulation. Further, all varieties display bilabial and alveolar implosives. All of the varieties contain a voiceless alveolar fricative /s/ and, in my data, only the Pame variety displays a voiced counterpart /z/. The phonological status of the alveopalatal fricative /ʃ/ in the Kigile variety is unresolved. At present it is unknown whether [ʃ] is contrastive or in free variation with the voiceless alveolar fricative [s] in Kigile Opo.<sup>53</sup>

---

<sup>52</sup> I am grateful to Joshua Smolders who hosted me and who I worked alongside during the Opo fieldwork. Much of the analysis presented here was reviewed and discussed together.

<sup>53</sup> The Kigile Opo data was elicited from native Pame Opo speakers who are bilingual in the Bilugu varieties. They have knowledge of the Modin and Kigile varieties, but I was unable to conclude whether there is a phonemic contrast between /s/ and /ʃ/ in the Kigile variety. Smolders (*forthcoming*) states that



Table 15 Opo contrastive consonant inventories

	Bilabial	Alveolar	Alveo-palatal	Velar	Glottal
unaspirated	p	t	tʃ	k	(ʔ)
aspirated	p <sup>h</sup>	t <sup>h</sup>		k <sup>h</sup>	
ejective	p'	t'	tʃ'	k'	
voiced	b	d	dʒ	g	
implosive	ɓ	ɗ			
voiceless		s	ʃ <sup>†</sup>		h
voiced		z <sup>‡</sup>			
nasal	m	n	(ɲ)	ŋ	
lateral		l			
trill/flap		r			
approximant	w		j		

<sup>‡</sup>Only occurs in the Pame variety.

<sup>†</sup>Only occurs in the Kigile variety.

The inventory in Table 15 differs slightly from those proposed by previous researchers. Bender's (1983:265) contrastive inventory of 22 consonants lacks an aspirated series of stops, implosives, and either velar or palatal nasals, though he includes a labiodental fricative.<sup>54</sup> Lemi (2010:4), van Silfhout (2013) and Mellese (2017) propose somewhat similar inventories which include contrastive implosives, though they lack a contrastive aspirated series of stops.<sup>55</sup> Mellese (2017:20–21) analyzes three contrastive dental stops /t̪, t̪', d̪/ in addition to the alveolar series, though I find no

---

in the Bilugu, Modin and Pame varieties, [ʃ] is an allophone of [s] before the [+high, +ATR] vowels /i, u/ but there is no phonological contrast between /ʃ/ and /s/ in these varieties.

<sup>54</sup> The labiodental fricative, which is not phonemic, is most likely the allophone [ɸ] of /p<sup>h</sup>/. Bender notes that the implosives, which he transcribes in phonetic brackets, can only occur word-initially; likewise for the velar nasal, which can only occur word-finally.

<sup>55</sup> van Silfhout (2013) recognizes [p<sup>h</sup>, k<sup>h</sup>], though she treats them as allophones of [p, k].

evidence of an interdental (or dental) series in Opo.<sup>56</sup> The contrastive inventory proposed here is more in line with Smolders (2017, *forthcoming*), who analyses a contrastive series of aspirated/unaspirated voiceless stops.<sup>57</sup> In terms of the (alveo-)palatal obstruents, Bender (1983), van Silfhout (2013), Mellese (2017) and Smolders (*forthcoming*) analyze them as stops, while Lemi (2010), Smolders (2017) analyze them as alveopalatal affricates. These consonants /tʃ, tʃʰ, dʒ/ are articulated as affricates – i.e., a closure, followed by a burst with significant frication.<sup>58</sup> The phonetic realization of these affricates differs significantly from the contrastive palatal stops in Dana and Chali Uduk. In these Dana and Chali Uduk, the palatal obstruent series is articulated further back in the palatal region, much more reminiscent of stops than of affricates. Further, in terms of the phonological system, I do not find any evidence of a contrastive aspirated alveopalatal stop in synchronic Opo.<sup>59</sup> Lastly, only Smolders (*forthcoming*) proposes a phonemic voiceless labiovelar semivowel /ɰ/ (in the Bilugu and Modin varieties), though I analyze it as a consonant-glide sequence /hw/ as it only occurs before /a/ and patterns with other Cw sequences (see (23) below).

---

<sup>56</sup> Note that Dana does indeed exhibit a contrastive interdental series of plosives (see §2.1.8)

<sup>57</sup> Neither Smolders (p.c.) nor I have found any evidence for contrastive (or even phonetic) dental or interdental stops in Opo. Dana, the most closely related language/most divergent dialect does indeed exhibit a contrastive interdental series of stops.

<sup>58</sup> Joshua Smolders (p.c.), a linguist who is currently working with Opo language speakers in Ethiopia, proposes that the (alveo-)palatal consonants /tʃ, tʃʰ, dʒ/ can be realized as stops or affricates depending upon the speaker. He notes that older speakers realize these consonants as palatal stops while the younger speakers realize them as alveo-palatal affricates.

<sup>59</sup> Smolders (*forthcoming*) indicates that the status of the voiceless aspirated palatal stop /c<sup>h</sup>/ is uncertain, as it has only been observed to be contrastive at morpheme boundaries; he unfortunately does not provide examples. Further, Smolders (2017) does not analyze an aspirated alveopalatal affricate /tʃ<sup>h</sup>/ in his Bilugu Opo wordlist.

### 2.1.7.2 Opo consonant distribution and allophones

All of the Opo consonants can occur in word-initial position. Further, the fricatives, nasals, lateral, trill/flap and glides can occur in all positions. One exception is the voiceless glottal fricative, which can only occur in word-initial and intervocalic positions. The distribution and allophones in initial, intervocalic and final positions of the plosives, implosives and affricates is seen in Table 16. The aspirated stops can occur in all positions. The voiceless unaspirated stops, voiced stops and the bilabial and velar ejectives can be unreleased word-finally. The implosives do not occur in word-final position.

Table 16 Distribution and allophones of Opo plosives, implosives and affricates

	#__	V__V	__#		#__	V__V	__#
<b>/p<sup>h</sup>/</b>	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>	<b>/p/</b>	p	p, b	p, p̣
<b>/t<sup>h</sup>/</b>	t <sup>h</sup>	t <sup>h</sup>	t <sup>h</sup>	<b>/t/</b>	t	t, d	t, ṭ
<b>/k<sup>h</sup>/</b>	k <sup>h</sup>	k <sup>h</sup>	k <sup>h</sup>	<b>/k/</b>	k	k, g	k, ḳ
				<b>/tʃ/</b>	tʃ	tʃ, dʒ	tʃ
<b>/p̣/</b>	p̣	p̣ (b*)	p̣, p̣	<b>/b/</b>	b	b	ḅ
<b>/ṭ/</b>	ṭ	ṭ, (d*)	ṭ	<b>/d/</b>	d	d	ḍ
<b>/ḳ/</b>	ḳ	ḳ, (g*)	ḳ, ḳ	<b>/g/</b>	g	g	g̣
<b>/tʃ̣/</b>	tʃ̣	tʃ̣, dʒ	tʃ̣	<b>/dʒ/</b>	dʒ	dʒ	dʒ̣
<b>/ḅ/</b>	ḅ	b	–	<b>/ḍ/</b>	ḍ	d	–

\* Does not appear in my data, though it is likely to occur.

Opo employs reduplication and partial reduplication of verb stems to make distinctions in number of participants and/or number of events (cf. Smolders *forthcoming*). The behavior of the obstruents in intervocalic position can be viewed in

monomorphemic words and across morpheme boundaries in (partially) reduplicated verb stems. The implosive stops are always realized as voiced stops intervocalically in verbal reduplication. The voiceless unaspirated, voiced and ejective stops and affricates can occur in intervocalic position in monomorphemic roots. Across morpheme boundaries in (partially) reduplicated verb stems, the voiceless unaspirated stops and can also surface as voiced stops. Some examples of reduplication in verb stems are seen in (22).

(22)	<i>/p/</i>	<i>pàj</i>	‘be.wide.SG’	<i>pī</i>	‘throw.SG’
		<i>pāpáj</i>	‘be.wide.PL’	<i>pībí</i>	‘throw.PL’
	<i>/t/</i>	<i>tél</i>	‘hammer.SG’	<i>tī</i>	‘tie.SG’
		<i>tētēl</i>	‘hammer.PL’	<i>tìdí</i>	‘tie.PL’
	<i>/tʃ/</i>	<i>tʃár</i>	‘think.SG’	<i>tʃót</i>	‘pierce.SG’
		<i>tʃātʃār</i>	‘think.PL’	<i>tʃōdzót</i>	‘pierce.PL’
	<i>/k/</i>	<i>kál</i>	‘bypass.SG’	<i>káw</i>	‘be.strong.SG’
		<i>kākāl</i>	‘bypass.PL’	<i>kàgáw</i>	‘be.strong.PL’
	<i>/tʰ/</i>	<i>tʰó</i>	‘be.fat.SG’		
		<i>tʰōtʰō</i>	‘be.fat.PL’		
	<i>/tʃʰ/</i>	<i>tʃʰém</i>	‘be.sweet.SG’	<i>tʃʰē</i>	‘shave.SG’
		<i>tʃʰétʃʰém</i>	‘be.sweet.PL’	<i>tʃʰédzé</i>	‘shave.PL’
	<i>/kʰ/</i>	<i>kʰáj</i>	‘be.good.SG’		
		<i>kʰākʰáj</i>	‘be.good.PL’		

In the first column, the initial consonant surfaces identically as when it is in a reduplicated stem. In the second column, the initial consonant surfaces as voiced in the reduplicated stem. I do not have any examples of reduplicated /p/ nor do I have any

examples of intervocalic /t, k'/ being realized as voiced [d, g] in reduplicated stems or otherwise.

Like the other Koman languages, Opo displays consonant+labiovelar glide (Cw) onsets word-initially (or syllable initially) before the vowel /a/. Some examples from Biligu Opo are given in (23).

(23)	<i>bwájè</i>	‘color’	<i>gwàlí</i>	‘bean’
	<i>dwàr</i>	‘hunt in group’	<i>à=dʒwàlà</i>	‘potato’
	<i>d̄wāk’</i>	‘earwax’	<i>hwàn</i>	‘four’
	<i>k’wāt’</i>	‘tick’	<i>ʔwáj</i>	‘dog’

### 2.1.7.3 Opo contrastive vowels

In my data, the Opo varieties all exhibit a seven-vowel phonemic inventory with Advanced Tongue Root (ATR) contrast in the [+high] vowels. This analysis is consistent with Mellese (2017) and Smolders (2017, *forthcoming*, p.c.) though other scholars have proposed different systems.<sup>60</sup> Bender (1983) proposes a five-vowel /i, e, a, o u/ system, and van Sijfhout (2013:23) proposes a seven-vowel /i, ɪ, e, ε, a, ɔ, u/ system with ATR contrast that lacks the [+high, –ATR] vowel /ɨ/. Lemi (2010:9) proposes a somewhat unbalanced nine-vowel /i, e, ɪ, ə, a, o, ɔ, ʊ, u/ system with two front vowels, three central vowels, and four back vowels.

---

<sup>60</sup> Smolders (*forthcoming*) notes that the mid vowels /ε, ɔ/ tend to be realized quite high (e.g. as [e, o]). He proposes that the Biligu, Pama and Modin varieties have a set of lower [–ATR] phonemes /ɛ, ɔ/ which occur only in words borrowed from Nuer and Anuak.

	front	central	back	
[+high]	i		u	[+ATR]
	ɪ		ʊ	[-ATR]
[-high]	ɛ		ɔ	[-ATR]
		a		[-ATR]

Figure 15 Opo contrastive vowel inventory

Some evidence for a seven-vowel contrastive system is seen below in (24).

(24)	/i/	<i>sī</i>	‘beer’
	/ɪ/	<i>sí</i>	‘rain’
	/ɛ/	<i>sē</i>	‘tooth’
	/a/	<i>sá</i>	‘eat (soft food)’
	/ɔ/	<i>só</i>	‘run.PL’
	/ʊ/	<i>sō</i>	‘buy.SG’
	/u/	<i>sūg</i>	‘wake’

Opo displays root-controlled ATR harmony among the [+high] vowels. In this process, a [+high, -ATR] affix vowel /ɪ, ʊ/ will assimilate to [+ATR] [i, u] when a [+high, +ATR] vowel /i, u/ occurs in the stem to which it is attached. This process is seen when comparing verbs inflected with the Deictic Directional (DD) suffix /-(w)ó/ DD1, whose vowel is [+high, -ATR], to those occurring with /-(j)á/ DD2, whose vowel /a/ does not undergo or trigger harmony. Consider the data from the Bilugu variety in (25), which contains verb stems with all seven of the contrastive vowels in the bare form as well as inflected with /-(w)ó/ DD1 and /-(j)á/ DD2. Note that the vowel in the suffix /-(w)ó/ DD1 becomes [ú] when the root vowel is [+ATR] /i, u/, as in the entries for ‘fart.SG’ and ‘exit.SG’.

(25)	stem	-(j)á DD2	-(w)ó DD1	meaning	
	/i/	tísi	[tísa]	[tísu]	‘fart.SG’
	/ɪ/	gìl	[gìlá]	[gìló]	‘see.SG’
	/ɛ/	k’ērēm	[k’ērēmá]	[k’ērēmó]	‘burp.SG’
	/a/	hátʃ	[hátʃá]	[hátʃó]	‘chew.SG’
	/ɔ/	k’ósó	[k’ósá]	[k’ósó]	‘kill.SG’
	/ɔ̄/	sō	[sōjá]	[sōwó]	‘buy.SG’
	/u/	p <sup>h</sup> út’	[p <sup>h</sup> út’á]	[p <sup>h</sup> út’ú]	‘exit.SG’

Lastly, Mellese (2017) proposes three [–high, +ATR] allophones [e, ə, o] of /ɛ, a, ɔ/, respectively. He argues that Opo displays [+ATR] dominant harmony from suffix to stem, though neither myself nor the aforementioned Opo scholars claim similar findings.

#### 2.1.7.4 Opo tone

In the suprasegmental domain, one defining feature of the Opo cluster is the presence of four contrastive level tones. While all previous work on Opo recognized a tone system to varying degrees, the most in-depth analysis of tone is Smolders (2017, *forthcoming*, p.c.).<sup>61</sup> Smolders analyzes low, mid, high and extra-high (L, M, H, XH) level tones as well as rising and falling contour tones. Smolders observes that the XH tone level only occurs on /i, a, u/, while all other tones can occur on any vowel. Evidence for the four level tone contrast on monosyllabic monomorphemes is seen in (26).

(26)	XH	p’ís	‘disregard’
	H	p <sup>h</sup> í	‘drink.SG’
	M	pī	‘throw.SG’
	L	pì	‘year’

---

<sup>61</sup> Bender (1983:265) notes “distinctive tone is probable”, Lemi (2010:9) cites “at least low and high tones”, van Silfhout (2013:36) states that Opo has “at least a high and a low tone” but she transcribes three phonetic tone levels in some lexemes, and Mellese (2017:44–45) analyzes three level tones. I agree with Smolders in that Opo displays four phonemic tone levels.

Grammatical tone plays a crucial part of the Opo verb system. Opo employs tone alternations in verb stems as one means to make distinctions in the number of participants in an event as well as in the number of events, or *pluractionality* (cf. Newman 1990). Smolders' (*forthcoming*) study details the tonal alternations in verb stems along with other morphophonological means of expressing number in verbs. To illustrate, example (27) contains the singular (SG) and plural/pluractional (PL(U)) verb stem forms for monosyllabic verbs in Bilugu Opo found in my database. Tonal alternations functioning as a means to contrast number in verbs is a common strategy in the languages of the Central Koman branch.

(27)	SG	PL(U)	SG	PL(U)	gloss
	L	H	<i>pɔ̌j</i>	<i>pɔ́j</i>	'hide oneself'
	L	M	<i>jàl</i>	<i>jāl</i>	'return'
	L	R	<i>k<sup>h</sup>è̌m</i>	<i>k<sup>h</sup>ě̌m</i>	'cut (with sickle)'
			<i>t<sup>h</sup>ò̌r</i>	<i>t<sup>h</sup>ǒ̌r</i>	'hit'
	M	R	<i>kō̌r</i>	<i>kǒ̌r</i>	'climb'
			<i>tī̌ŋ</i>	<i>tǐ̌ŋ</i>	'aim at'
	M	H	<i>p<sup>h</sup>ā̌j</i>	<i>p<sup>h</sup>á̌j</i>	'fly'
			<i>tʃò̌p<sup>h</sup></i>	<i>tʃó̌p<sup>h</sup></i>	'squat'
	M	XH	<i>pīt</i>	<i>pít</i>	'fat, healthy (be)'
			<i>tūn</i>	<i>tún</i>	'raise, bring up'
	XH	M	<i>ũp<sup>h</sup></i>	<i>ūp<sup>h</sup></i>	'wash oneself'

### 2.1.8 Dana

In Corfield's (1938) exploration into the so-called "Koma" people of the Ethio-Sudan borderlands, he comes across several ethnic groups that he called "Koma" that don't appear to speak the same language. As such, he proposes two groups, the *Madin* and



the *Ciita*. The latter group he further subdivides into three dialect groups: *Kusgilo* and *Kigelle*, whose speech is almost identical, and the *Buldiit*, who live further west and whose speech shows greater variation. According to Corfield (1938:129) “The people of *Buldiit* replied that they were Dana, but this turned out to be the name of the area in which they lived.” Corfield’s *Buldiit* data correspond to my Dana data.

The issue of whether Dana constitutes its own language (i.e. whether it is mutually unintelligible with any variety of Opo) is yet to be determined empirically. I have chosen to treat Dana as a distinct language based on the following criteria: The Dana recognize their language to be mutually unintelligible with the Opo varieties (and the Opo do as well). Other Koman groups such as the Komo and Gwama recognize the Dana people and their language (*dānā*) as being distinct from the Opo people and their language (*kinā*). Lastly, the Dana consonant inventory is vastly distinct from the Opo varieties and exhibits an interdental/alveolar contrast in plosives otherwise found only in the Chali variety of Uduk.<sup>62</sup>

#### 2.1.8.1 Dana contrastive consonant inventory

The Dana contrastive consonant inventory is seen in Table 17.

---

<sup>62</sup> Anecdotally, I had a Dana speaker talk in Dana to an Opo speaker who is fluent in the Bilugu and Pame varieties of Opo. The Opo speaker informed me that he could not understand the Dana language and the Dana speaker confirmed this.

Table 17 Dana contrastive consonant inventory

	Bilabial	Inter-dental	Alveolar	Alveo-palatal	Palatal	Velar	Glottal
aspirated	p <sup>h</sup>	t̪ <sup>h</sup>	t <sup>h</sup>			k <sup>h</sup>	
unaspirated	p	t̪	t		c	k	(ʔ)
ejective	p'	t̪'	t'		c'	k'	
voiced	b	d̪	d		ʃ	g	
implosive	ɓ		ɗ				
voiceless			s	ʃ			h
voiced			z				
ejective			s'				
nasal	m		n			ŋ	
lateral			l				
trill/flap			r				
approximant	w				j		

Dana displays 35 contrastive consonants, including the glottal stop, which is of marginal status. In the plosive series, Dana exhibits a 4-way contrast in manner of articulation across four places of articulation: bilabial, interdental, alveolar and velar, though a contrastive voiceless aspirated palatal stop /c<sup>h</sup>/ is lacking.

Some evidence for consonant contrast in word-initial position is given in (28).

## (28) Contrast examples in word-initial position

/p <sup>h</sup> , p, p', b, b/	/h, ʔ/
<i>p<sup>h</sup>ád</i> 'fly (v)'	<i>hâm</i> 'yawn'
<i>páḍá</i> 'cross (v)'	<i>ʔjá</i> 'go, walk'
<i>p'át'á</i> 'white (be)'	
<i>bál</i> 'flirt'	
<i>bár</i> 'fall'	
/t <sup>h</sup> , t, t', d/	/t <sup>h</sup> , t, t', d, d/
<i>t<sup>h</sup>ád</i> 'hunger'	<i>t<sup>h</sup>áp<sup>h</sup></i> 'plaster (v)'
<i>táj</i> 'sun'	<i>táj</i> 'break'
<i>t'ád</i> 'dull (be)'	<i>t'ámà</i> 'maybe'
<i>dā</i> 'go, walk'	<i>dā</i> polar interrogative
	<i>dáb</i> 'adhere'
/k <sup>h</sup> , k, k', g/	/c, c', g/
<i>k<sup>h</sup>àb</i> 'wind (n)'	<i>cà</i> 'dig'
<i>kàm</i> 'find'	<i>c'àc'</i> 'chest'
<i>k'ámá</i> 'eat (hard things)'	<i>ǰámò</i> 'spear type'
<i>gàm</i> 'toss'	
/s, ʃ, s', z/	/m, n, ŋ/
<i>sám</i> 'baboon'	<i>mámà</i> 'carry on back'
<i>ǰàmó</i> 'mother's brother'	<i>náḍà</i> 'cut, divide'
<i>s'ámá</i> 'blood'	<i>ŋwān</i> 'four'
<i>zàlít<sup>h</sup></i> 'tendon'	
<i>hâm</i> 'yawn'	
/l, r/	/j, w/
<i>lájī</i> 'miscarry'	<i>ǰá</i> 'come'
<i>rág</i> 'stir'	<i>wâr</i> 'absent (be)'

## 2.1.8.2 Dana consonant distribution and allophonic variation

The distribution of allophones in initial, intervocalic and final positions of the (non-glottalic) plosive series is seen in Table 18. The five-way contrast in place of articulation across three manners of articulation is maintained in word-initial and intervocalic

positions, with the exception of [c<sup>h</sup>], which is an allophone of /c/ in intervocalic and word-final positions. In intervocalic position there are bilabial voiceless aspirated and voiced plosives, and the voiceless palatal stop can lenite to fricatives in fast speech.<sup>63</sup> By contrast, in word-final position, voiced stops are realized as voiceless aspirated stops.

Table 18 Distribution and allophones of Dana plosives

	#__	V__V	__#		#__	V__V	__#
/p <sup>h</sup> /	p <sup>h</sup>	p <sup>h</sup> , φ	p <sup>h</sup>				
/p/	p	p	p <sup>h</sup>				
/b/	b	b, β	p <sup>h</sup>				
/t <sup>h</sup> /	t <sup>h</sup>	t <sup>h</sup>	t <sup>h</sup>	/t <sup>h</sup> /	t <sup>h</sup>	t <sup>h</sup>	t <sup>h</sup>
/ṭ/	ṭ	ṭ	t <sup>h</sup>	/t/	t	t	t <sup>h</sup>
/ḍ/	ḍ	ḍ	t <sup>h</sup>	/d/	d	d	t <sup>h</sup>
				/k <sup>h</sup> /	k <sup>h</sup>	k <sup>h</sup>	k <sup>h</sup>
/c/	c	c	c <sup>h</sup>	/k/	k	k	k <sup>h</sup>
/j/	ʃ	ʃ	c <sup>h</sup>	/g/	g	g, γ	k <sup>h</sup>

Dana displays a productive process of verbal derivation; it is employed to distinguish nominal and/or verbal number. The singular form of a verb root is typically of a (C)VC(V) shape. The derived plural or pluractional form can involve a tone shift with an additional final vowel copied from the root (e.g. *ṭél* ‘pound.SG’ vs. *ṭélé* ‘pound.PL’) or partial reduplication (e.g. *ṭòr* ‘hit.SG’ vs. *ṭòdòr* ‘hit.PL’). The data in (28) contain monomorphemic verb roots in the singular form (SG) with a (C)VC shape occurring with all of the plosives except for /t, k/. Each verb also occurs in the

<sup>63</sup> In general, the palatal plosives are realized more as affricates – articulated with closure, burst and some frication. The range of frication is gradient, with the palatal ejective displaying the least amount of frication, and the voiceless aspirated palatal stop displaying the most frication.

plural/plurational (PL(U)) form, in which the final consonant of the singular form occurs in intervocalic position and the three-way contrast in manner holds. Interestingly, the voiceless unaspirated /p, t, k/ stops in word-final position in verbs are very infrequent in my data.

(29)	SG		PL(U)		
/p <sup>h</sup> /	<i>úp<sup>h</sup></i>	[úp <sup>h</sup> ]	<i>ùp<sup>h</sup>ú</i>	[ùp <sup>h</sup> ú]	‘wash oneself’
/p/	<i>t<sup>h</sup>áp</i>	[t <sup>h</sup> áp <sup>h</sup> ]	<i>t<sup>h</sup>àp</i>	[t <sup>h</sup> àp <sup>h</sup> ]	‘kick’
/b/	<i>wàb</i>	[wàp <sup>h</sup> ]	<i>wàbí</i>	[wàbí]	‘fan (v)’
/t <sup>h</sup> /	<i>k<sup>h</sup>ót<sup>h</sup></i>	[k <sup>h</sup> ót <sup>h</sup> ]	<i>k<sup>h</sup>òt<sup>h</sup>ó</i>	[k <sup>h</sup> òt <sup>h</sup> ó]	‘weed, prepare earth’
/t/	–		–		
/d/	<i>búd</i>	[bút <sup>h</sup> ]	<i>búdúd</i>	[búdút <sup>h</sup> ]	‘tall (be)’
/t̥ <sup>h</sup> /	<i>kát̥<sup>h</sup></i>	[kát̥ <sup>h</sup> ]	<i>kàt̥<sup>h</sup>í</i>	[kàt̥ <sup>h</sup> í]	‘protect’
/t̥/	<i>sòt̥</i>	[sòt̥ <sup>h</sup> ]	<i>sòt̥ó</i>	[sòt̥ó]	‘remove quickly’
/ɖ/	<i>séɖ</i>	[séɖ <sup>h</sup> ]	<i>sèɖé</i>	[sèɖé]	‘deny, not take’
/c/	<i>kàc</i>	[kàc <sup>h</sup> ]	<i>kōcá</i>	[kōɟá]	‘ascend’
/ʃ/	<i>gáʃ</i>	[gác <sup>h</sup> ]	<i>gàʃí</i>	[gàʃí]	‘sow seeds’
/k <sup>h</sup> /	<i>dâk<sup>h</sup></i>	[dâk <sup>h</sup> ]	<i>dàk<sup>h</sup>í</i>	[dàk <sup>h</sup> í]	‘finish’
/k/	–		–		
/g/	<i>t<sup>h</sup>ág</i>	[t <sup>h</sup> ák <sup>h</sup> ]	<i>t<sup>h</sup>àgí</i>	[t <sup>h</sup> àgí]	‘transplant’

The remaining consonants display very few distributional restrictions and limited allophony. The implosives /ɓ, ɗ/ can occur in all three positions though they are phonetically unreleased word-finally. The fricatives, nasals, trill, lateral and glides can occur in all positions with the exception of /h/, which only occurs word-initially.

Consonant-glide sequences are very limited in Dana. Consonant+labiovelar glide sequences (Cw) occur mostly after velars and before the vowel /a/, though here are few instances of Cw before /i/. There is only one consonant+glide sequence involving a palatal glide in my data, *ʔjâ* ‘go, walk.SG’.

### 2.1.8.3 Dana contrastive vowels

Dana exhibits a seven-vowel contrastive inventory with an ATR contrast in the high vowels /i, ɪ, ε, a, ɔ, ʊ, u/, seen in Figure 16. The only co-occurrence restriction observed in disyllabic monomorphemic roots is that [+high] vowels of opposing ATR values cannot co-occur. All other combinations are attested in disyllabic words. Phonetically, the mid vowels /ε, ɔ/ have a wide range of articulation, often sounding higher [e, o], especially when the vowel occurs as a nucleus for high tone, though there is no evidence of any productive ATR harmony system creating [e, o] allophones of /ε, ɔ/ in Dana.

	FRONT	CENTRAL	BACK	
[+high]	i		u	[+ATR]
	ɪ		ʊ	[-ATR]
[-high]	ε		ɔ	[-ATR]
		a		[-ATR]

Figure 16 Dana contrastive vowel inventory

Dana does not exhibit extensive morphology in general, though it does seem to exhibit what appears to be root-controlled ATR harmony among the [+high] vowels. This is seen by comparing the surface forms of the vowels in monosyllabic verb stems when they occur with the Deictic Directional (DD) suffixes: /-í/ DD1 and /-á/ DD2. Dana verb stems are largely of the (C)VC(V) shape and the final vowel can either be replaced by these morphemes or it can undergo a tonal alternation (H to M).

Consider the data in (30) which contains verb stems with each of the seven contrastive vowels occurring with the DD suffixes. Notice how all of the stems retain

their initial vowel when occurring with /-á/ DD2. The only exceptions are verbs containing /a/, which becomes /ʊ/ when inflected with DD2. The DD1 morpheme /-í/ assimilates to [+ATR] [i] when preceded by a [+high, +ATR] vowel /i, u/. This morpheme surfaces as [-ATR] [ɪ] when preceded by a [-ATR] vowel /ɪ, ɛ, ɔ, ʊ/. What is extremely peculiar about the Dana system is that the DD1 morpheme surfaces as [+ATR] [i] in roots containing /a/ as the first vowel.<sup>64</sup>

(30)	stem	-á DD2	-í DD1	gloss
/i/	<i>ísá</i>	[ísā]	[ísī]	‘ripe (be)’
/ɪ/	<i>pídá</i>	[pídā]	[pídí]	‘be good’
/ɛ/	<i>dēm</i>	[dēmá]	[dēmí]	‘cook, stew’
/a/	<i>hás’</i>	[hós’ā]	[hás’ī]	‘chew’
/ɔ/	<i>tór</i>	[tórā]	[tórī]	‘slaughter’
/ʊ/	<i>k’ós’</i>	[k’ós’ā]	[k’ós’ī]	‘dry (be)’
/u/	<i>būd</i>	[būdá]	[būdí]	‘tall (be)’

#### 2.1.8.4 Dana tone

Dana displays three contrastive tone levels (L, M, H) as well as a falling (F) contour tone on a single vowel nucleus. Evidence for the tonal contrast is seen in (31).

(31)	H	<i>dám</i>	‘thing’
	M	<i>dā</i>	‘go.SG’
	L	<i>dà</i>	‘what’
	F	<i>dâ</i>	‘go.PL’

<sup>64</sup> An explanation for why this occurs is beyond the scope of this paper and warrants further investigation. My data points to the fact that this behavior is not idiosyncratic to this root. The DD1 morpheme surfaces as [+ATR] [-i] on all verbs containing /a/ as the first vowel in my data, even disyllabic roots that contain a final /ɪ/ such as t̥’àd̥í ‘blunt.SG’ is t̥’ad̥-í with DD1.

Tone plays an important role in the verb system. Dana employs tonal alternations on verb roots and stems to mark nominal number of participants as well as verbal number, or pluractionality (cf. Newman 1990). The general pattern for monosyllabic verb roots is seen in (32). Most common is the alternation between L and H. The M/H and F/LH alternations are less frequent in the database overall.<sup>65</sup>

(32)	SG	PL(U)	SG	PL(U)	gloss
	L	H	<i>bàk'</i>	<i>bák'</i>	'hide oneself'
			<i>p<sup>h</sup>àḍ</i>	<i>p<sup>h</sup>áḍ</i>	'fly'
	H	L(H)	<i>t<sup>h</sup>áp</i>	<i>t<sup>h</sup>áp</i>	'plaster (with mud)'
			<i>óg</i>	<i>ógó</i>	'avenge'
	M	H	<i>nāŋ</i>	<i>náŋ</i>	'long, tall (be)'
			<i>k<sup>h</sup>ɔr</i>	<i>k<sup>h</sup>ɔr</i>	'arrogant (be)'
	F	L.H	<i>dâg</i>	<i>dâgí</i>	'finish'
			<i>kâ</i>	<i>kâgá</i>	'refuse'

## 2.2 Morphosyntactic comparanda

While this dissertation does not aim to reconstruct Koman syntax, a brief overview of the basic syntactic patterns in the living Koman languages is provided before examining nominal and verbal morphology. Koman languages by and large exhibit AVP/SV word order in declarative main clauses.<sup>66</sup> All of the languages with the exception of the Dana-Opo (DAOP) branch employ S/A argument indexing morphology on finite verbs to varying degrees. The robustness of verbal argument indexation in

<sup>65</sup> I recognize that this is not an exhaustive study of all of the possible tonal alternations in Dana verbs.

<sup>66</sup> Following Comrie (1989), I define A arguments as the most agent-like participants of transitive/ditransitive clauses, P arguments as the most patient-like participant of a transitive verb, and S as the single argument of an intransitive verb. Bender (1994) analyzes all of the Koman languages as having canonical AVP word order in main clause transitive constructions.



Gwama and Komo allows for more flexibility in word order. As such, PVA constructions are also possible in these languages. Further, in Gwama and Komo, up to three arguments can be indexed on the verb and a fully finite verb can constitute a clause as seen in (33) and (34).

- (33) Gwama (Lowland)
- |    |  |    |   |
|----|--|----|---|
| a. | <i>ǔhāj pāt-ná-b~pāt</i><br>3SG.M touch-3SG.M-3SG.F~RED<br>'He touches her.' | b. | <i>pāt-ná-b~pāt</i><br>touch-3SG.M-3SG.F~RED<br>'He touches her.' |
|----|--|----|---|
- 
- (34) Komo
- |    |  |    |   |
|----|--|----|---|
| a. | <i>fèr-kú-r gùbí gá=hàp'</i><br>sweep-DD2-3SG.M house BEN=3SG.F<br>'He swept the house for her.' | b. | <i>fèr-kú-r-g-áp'-ī</i><br>sweep-DD2-APPL-3SG.F.-3N<br>'He swept it for her.' |
|----|--|----|---|

Killian (2015) describes Chali Uduk as a V2 (verb second) language with a flexible word order with respect to A and P arguments in declarative main clause grammar. Consider the data in (35), in which AVP and PVA constructions are employed. Word order and argument indexation generally follow a nominative-accusative pattern throughout the Koman languages, though Killian (2015) analyzes Chali Uduk as having ergativity in the argument marking on the verb in a particular PVA construction, seen in (35b).<sup>67</sup>

---

<sup>67</sup> I employ Killian's (2015) glossing of nominal and verbal morphology in this dissertation. See §2.2.3.1.3 for an overview of Chali Uduk ergativity and Killian (2015) for a detailed description.

- (35) Chali Uduk
- |    |                            |            |            |    |                            |                   |             |
|----|----------------------------|------------|------------|----|----------------------------|-------------------|-------------|
| a. | <i>wàtí</i>                | <i>dìt</i> | <i>gùb</i> | b. | <i>gùb</i>                 | <i>dìt-ā</i>      | <i>wàtí</i> |
|    | man                        | sweep.PFV  | house      |    | house                      | sweep.PFV-CL1.ERG | man         |
|    | ‘The man swept the house.’ |            |            |    | ‘The man swept the house.’ |                   |             |
- (Killian 2015:70–71)

The Koman languages all employ auxiliary verbs for negation. In Gwama and the Komo-Uduk (KOUD), the negative auxiliary precedes the lexical verb [AUX V (NP)] and is optionally followed by a direct object. Gwama and Komo index the S/A argument on the negative auxiliary and the lexical verb can optionally occur with a Deictic Directional suffix, as seen below in (36) and (37) respectively.

- (36) Gwama (Lowland)
- |             |              |           |            |
|-------------|--------------|-----------|------------|
| <i>ṽhāj</i> | <i>dèb-è</i> | <i>fè</i> | <i>njã</i> |
| 3SG.M       | NEG-3SG.M    | slaughter | goat       |
- ‘He didn’t slaughter a goat.’

- (37) Komo
- |                |              |           |               |
|----------------|--------------|-----------|---------------|
| <i>bāf-í-r</i> | <i>tér-ó</i> | <i>dě</i> | <i>á=gùbí</i> |
| NEG-DDØ-3SG.M  | carry.SG-DD1 | thing     | LOC=house     |
- ‘He didn’t carry the thing into the house.’ (Speaker is inside the house)

One unique innovation in the Dana-Opo (DAOP) branch is seen in the order of the direct object and lexical verb in a transitive negative construction. In these languages, the direct object occurs between the negative auxiliary and the lexical verb [AUX NP V], as seen in (38).

- (38) Bilugu Opo
- |                 |           |                         |
|-----------------|-----------|-------------------------|
| <i>ār=dōk’ó</i> | <i>sī</i> | <i>p<sup>h</sup>í-ó</i> |
| 3SG.M=NEG       | beer      | drink-DD1               |

‘He didn’t drink beer (at another location)’.

Interestingly, oblique phrases in negative constructions are treated the same as canonical direct objects in Dana and Opo. In (39a), the oblique constituent *ádáʃó* ‘in Dajo’ follows the lexical verb in the affirmative, while in (39b), it follows the negative auxiliary and precedes the lexical verb.

- (39)
- |    |                      |             |               |  |    |                            |            |               |             |
|----|----------------------|-------------|---------------|--|----|----------------------------|------------|---------------|-------------|
| a. | Dana                 |             |               |  | b. |                            |            |               |             |
|    | <i>hāp’</i>          | <i>pʰɛ̃</i> | <i>á=dáʃó</i> |  |    | <i>hāp’</i>                | <i>k’à</i> | <i>á=dáʃó</i> | <i>pʰɛ̃</i> |
|    | 3SG.F                | live        | LOC=D.        |  |    | 3SG.F                      | NEG        | LOC=D.        | live        |
|    | ‘She lived in Dajo.’ |             |               |  |    | ‘She didn’t live in Dajo.’ |            |               |             |

With respect to other order features, Koman languages employ prepositions (as seen in (39)), possessive constructions follow a possessed–possessor order and demonstratives follow the noun.<sup>68</sup> Thus, the family dominantly displays head-initial syntactic constructions. In §2.2.1 I give an overview of Koman independent pronouns, and in §2.2.2 I describe core nominal morphology in each language or language group. This includes the morphology employed in Koman nominal number/gender systems (cf. Smolders *forthcoming*; Killian 2015, *to appear*) as well as independent pronominals and demonstratives. In §2.2.3, I discuss core Koman verbal morphology, focusing on bound pronominal argument indexing and deictic directional morphology.

---

<sup>68</sup> See §2.2.2 for descriptions of possessive constructions and demonstratives in the individual languages.

### 2.2.1 Koman independent pronouns

Table 19 contains the independent pronominals of the living Koman languages. Language varieties within each cluster have been collapsed and variation in forms within a language group is indicated in the footnotes.<sup>69</sup>

Table 19 Koman independent personal pronominals

	Gwama	Komo	Uduk	Dana	Opo
1SG	<i>gà</i>	<i>ākā</i>	<i>áhā</i>	<i>āgā</i>	<i>āgā</i>
2SG	<i>īk</i>	<i>àj</i>	<i>é</i>	<i>āj</i>	<i>āj</i>
3SG.M	<i>ōhāj / ōhāl*</i>	<i>hàr</i>	<i>ádi / hádi†</i>	<i>hār</i>	<i>òtà‡ / wàr‡§</i>
3SG.F	<i>hāp'</i>	<i>hàp'</i>	<i>ádi / hádi†</i>	<i>hāp'</i>	<i>bā‡</i>
3NH	–	<i>hìn ~ hàn</i>	<i>ádi / hádi†</i>	<i>hān</i>	<i>nà‡</i>
1PL.IN	<i>mīnì</i>	<i>ānà</i>	<i>ánā</i>	<i>mīnā</i>	<i>mìnà</i>
1PL.EX	<i>mà</i>	<i>āmòn</i>	<i>ámān / âm†</i>	<i>mānā</i>	<i>mànà</i>
2PL	<i>ōm</i>	<i>òm</i>	<i>úm</i>	<i>ōmā</i>	<i>ōmā</i>
3PL	<i>hōn</i>	<i>hòn</i>	<i>únī / húnī†</i>	<i>hōn</i>	<i>bijà‡</i>

\* This form occurs in the Highland Gwama variety.

† This form occurs in the Yabus Uduk variety.

‡ This form cannot occur independently (cf. Smolders *forthcoming*, §2.2.2.5.1)

§ This form only occurs in the Kigile variety.

All of the languages distinguish singular and plural number across 1st/2nd/3rd persons as well as clusivity in the 1st person plural. Most of the languages express two to three genders in the third person singular with the exception of Uduk, which employs a single form. The Opo 3rd person forms in Table 19 cannot occur as standalone

<sup>69</sup> In Table 19, “Gwama” comprises both Highland and Lowland varieties, “Uduk” comprises the Chali and Yabus varieties, and “Opo” comprises the Bilugu, Modin, Pame and Kigile varieties.

pronouns but they serve as base forms for demonstratives and relativizing enclitics (Smolders *forthcoming* and §2.2.2.5.1 of this dissertation).

### 2.2.2 Koman nominal morphology

Nominal morphology occurs to varying degrees across the Koman languages. Many subclasses of noun words in Koman languages have ‘general number’ meaning that singular or plural is not inherent in the noun form (Corbett 2001). If a Koman language does express number morphologically on the noun, it is always realized by prefixes or proclitics. Further, Koman nominal number morphology is often conflated with class/gender, meaning that some of the languages exhibit portmanteau morphemes expressing both gender and number. Following Corbett (1991:1), who cites Hockett (1958:231), “genders are classes of nouns reflected in the behavior of words”. The criteria here is whether the gender of a given noun can result in agreement or indexation of particular morphosyntactic features on other elements of the grammar. The Koman languages that do exhibit productive nominal gender systems exhibit agreement in the argument indexing morphology in the verbal system and on demonstratives.

Bender (1994:45–46) briefly analyzes and compares some the Koman nominal morphology (what he calls “noun formatives”).<sup>70</sup> He observes that Koman languages distinguish masculine and feminine gender and that only Uduk also distinguishes what he calls “neuter” gender. Recent papers by Koman scholars have investigated the nominal number and gender systems in Chali Uduk (Killian 2015, *to appear*), Bilugu

---

<sup>70</sup> Bender’s analysis here assumes a higher Komuz (Koman + Gumuz) genetic node situated within Nilo-Saharan.

Opo (Mellese 2017, Smolders *forthcoming*) and Gwama (Zealelem 2005, Kievet & Roberston 2012, Goldberg et al. 2017) to differing extents. This study draws largely from these works as well as from elicited fieldwork.

There are two types of nominal number systems in the family, a “general number” (i.e. unspecified for number) for all nominals, and one that distinguishes number only for human nouns (cf. Killian 2015 and Smolders *forthcoming*). These systems will be detailed in subsections below. Morphological number encoding is also widely attested in some Koman languages though there are some idiosyncrasies.

To illustrate, some examples of a singular/plural number opposition in basic (i.e. underived) human nominals realized through suppletion or via morphological means are seen in (40). Note that most of the languages have suppletive roots for the plural forms of ‘man’ and ‘woman’, while Gwama employs the plural feminine proclitic /ī=/ (in ‘woman’ vs. ‘women’) and the masculine plural proclitic /mā=/ (in ‘man’ vs. ‘men’). Note also that Komo and to a certain extent Dana employ a cognate masculine singular proclitic /jε= ~ jī=/ to mark the singular in ‘man’.

(40)	Gwama	Komo	Chali Uduk	Dana	Bilugu Opo
‘woman’	<i>kíkjàtâ</i>	<i>bāmít</i>	<i>à=ḃóm</i>	<i>ḃāp<sup>h</sup>ā</i>	<i>ḃāp<sup>h</sup>â</i>
‘women’	<i>ī=kíkjàtâ</i>	<i>ōp</i>	<i>ūp<sup>h</sup></i>	<i>ōp<sup>h</sup></i>	<i>ōp<sup>h</sup>ō</i>
‘man’	<i>kíkīzì</i>	<i>jī=gwàz</i>	<i>wàṭí</i>	<i>jē=kàz</i>	<i>ō=kàdz</i>
‘men’	<i>mā=kíkīzì</i>	<i>gwàz</i>	<i>gwàṭ<sup>h</sup></i>	<i>kwàz</i>	<i>bàdz</i>

As stated earlier, many of the Koman number proclitics are portmanteau morphemes that also express gender. Further, some researchers have analyzed the number/gender morphemes as functionally extending into other grammatical domains

such as definiteness and case marking.<sup>71</sup> The number/gender systems for each of the language groups are discussed in the following subsections.

### 2.2.2.1 Gwama nominal morphology

#### 2.2.2.1.1 Gwama independent and possessive pronouns

Table 20 contains the independent and possessive pronominals in the Lowland variety of Gwama. Clusivity in 1PL is distinguished, as is masculine and feminine grammatical gender. Note that the plural possessive pronouns strongly resemble the independent forms while the singular forms vary in their resemblance to the independent pronominals.

Table 20 Lowland Gwama independent and possessive pronouns

	Independent	Possessive
1SG	<i>gà</i>	<i>=nā</i>
2SG	<i>īk</i>	<i>=ké</i>
3SG.M	<i>ōhāj</i>	<i>=dé</i>
3SG.F	<i>hāp'</i>	<i>=dáp'</i>
1PL.IN	<i>mīnì</i>	<i>=mīnì</i>
1PL.EX	<i>mà</i>	<i>=má</i>
2PL	<i>ōm</i>	<i>=kóm</i>
3PL	<i>hōn</i>	<i>=bón</i>

The Gwama possessive pronominal enclitics occur within a noun phrase. They connect to a noun with an intervening associative (ASS) enclitic *=á* and are within a

---

<sup>71</sup> See Killian (2015) for Uduk gender/case marking morphology and Goldberg et al. (2017) for Gwama definite marking on nouns.

complex NP headed by that noun as schematized in (41). The complete possessive pronoun paradigm is seen in (42).

(41) [N=*á*=POSS.PRO]<sub>NP</sub>

(42)	1SG	<i>bīt=á=nā</i>	‘my bird’
	2SG	<i>bīt=á=ké</i>	‘your (sg.) bird’
	3SG.M	<i>bīt=á=dé</i>	‘his bird’
	3SG.F	<i>bīt=á=dáp’</i>	‘her bird’
	1PL.IN	<i>bīt=á=mī̀nì</i>	‘our (inclusive) bird’
	1PL.EX	<i>bīt=á=má</i>	‘our (exclusive) bird’
	2PL	<i>bīt=á=kóm</i>	‘your (pl.) bird’
	3PL	<i>bīt=á=bón</i>	‘their bird’

While it appears that the associative morpheme is lexicalizing with the possessive enclitics, *=á* ASS is also fully productive in constructions that do not contain the possessive enclitics. The associative morpheme is employed in constructions to link two nouns as seen in (43a-b) or a noun and a modifying non-finite verb as seen in (43c).

- (43) a. *ō̄=pwǎŋ=á=séne*    *hɔ̀-ní*    *zì*    *sīsē*    *kíná*  
DEF.M=road=ASS=one    go-3SG.M    resemble    be.uphill    like.that  
 ‘A certain road goes up like that.’ (Goldberg et al. 2017:49)
- b. *ō̄hāj*    *hàj*    *í=k’wás=á=ímí*  
3SG.M    COP.3SG.M    LOC=back=ASS=cow  
 ‘He is in front of the cow.’ (Goldberg et al. 2017:75)
- c. *sānzā=á=hú~húnù*    *dà-nī-à*    *fám*  
animal=ASS=REDUP~be.sick    NEG-1SG-3N    want  
 ‘I don’t want a sick animal.’ (Goldberg et al. 2017:54)



2.2.2.1.2 Gwama deictic enclitics

Table 21 contains the Lowland Gwama pronominal demonstratives, adapted from Goldberg et al. (2017:44). The pronominal enclitic demonstratives distinguish two genders (masculine and feminine) in the singular and three distances from the origo (proximal, medial and distal).

Table 21 Lowland Gwama pronominal demonstrative enclitics (Goldberg et al. 2017:44)

	PROXIMAL	MEDIAL	DISTAL
M.SG	=è	=tè	=nĩ
F.SG	=ɔ̀	=tɔ̀	=nũ
PL	=nɔ̀n	=tɔ̀n	=nɔ̀n

The demonstrative enclitics can occur in noun phrases headed by a lexical noun, such as in (44), or on another independent pronominal demonstrative root, such as *mín* DEM.RT in (45).<sup>72</sup> Note that in (44b), the feminine copula co-occurs with the feminine demonstrative; taken together these morphemes express a biologically feminine bovine.

- (44) a. *bèrmét'á=tè*  
hat=DEM:MED.M  
‘that hat’
- b. *ím=tɔ̀*      *àp'=tũ*  
bovine=DEM:MED.F      COP.3SG.F=be.tall  
‘That cow is tall.’  
(Goldberg et al. 2017:44)
- (45) a. *ū=sīt*      *mín=è=gélè*  
DEF.M=person      DEM.RT=DEM:MED.M=*gélè*  
‘that man there’  
(Goldberg et al. 2017:44)
- b. *mā=sītkwì*      *mín=nũn*  
M.PL=farmer      DEM.RT=PL.DIST  
‘Those farmers’  
(Goldberg et al. 2017:46)

<sup>72</sup> Goldberg et al. (2017) analyze the morpheme *gélè* as having a discourse-related function that requires further investigation.

### 2.2.2.1.3 Gwama nominal gender/number morphology

Gwama has been described as having a productive nominal classification system that distinguishes singular and plural number crosscut with a three-way gender distinction (masculine, feminine and neuter/non-human) in the singular and a two-way distinction (masculine, feminine) in the plural (Hellenthal 2005, Zelealem 2005, Goldberg et al. 2017). The full paradigm of Lowland Gwama gender/number proclitics, summarized from Goldberg et al. (2017), is in Table 22. Note that the feminine singular morpheme *p'ā* F.SG is no longer productive and only occurs in words that are synchronically monomorphemic. Thus, for singular nouns, feminine gender is “unmarked” in the sense that some nouns have lexicalized the historical feminine gender prefix while masculine gender is overtly coded on the noun.

Table 22 Lowland Gwama  
nominal gender/number proclitics

	SG	PL
F	(p'ā ~ p'ā)*	ī=
M	ō=	mā=
N	à=†	–

\*Lexicalized, no longer productive  
† Restricted distribution

Goldberg et al. (2017) propose that the proclitic *ō=* M.DEF on animate nouns also marks definiteness. An example of a singular male human referent, marked with the masculine singular definite proclitic *ō=*, and triggering verbal masculine singular agreement for the A (marked by *-ní*) is seen in (46).

- (46)      *ō=wāl*    *hō-ā*    *kām-ní*    *bō*  
M.DEF=boy    go-SV    find-3SG.M    hole  
‘The boy went and found a hole.’      (Goldberg et al. 2017:43)

Interestingly, the proclitic  $\bar{\sigma}$ = M.DEF also appears on inanimate referents, such as *k'óŋ* ‘bottle’ in (47), which is an excerpt from a text. At the second mention of this bottle, it is marked with  $\bar{\sigma}$ = M.DEF. Note also that *p'ábǒŋgó* ‘frog’, which occurs with the lexicalized feminine singular proclitic /p'a/, also occurs with  $\bar{\sigma}$ =. This suggests that the biological masculine gender information in  $\bar{\sigma}$ = is being bleached and that the function of  $\bar{\sigma}$ = is extending beyond marking of (biological) gender into a discourse function of marking definiteness of animates and inanimate referents. Another possibility is that the proclitic  $\bar{\sigma}$ = M.DEF is expanding from marking “masculine” gender to marking “animate” or even some more abstract noun class. This requires further study.

- (47)       $\bar{\sigma}$ =*k'óŋ-ā*      *zê-gí*       $\bar{\sigma}$ =*p'ábǒŋgó*  
M.DEF=bottle-REL sit-DD2 M.DEF=frog  
‘... the bottle in which the frog sat’ (Goldberg et al. 2017:52)

There are also nouns in Gwama that appear to have lexicalized the  $\bar{\sigma}$ = M.DEF morpheme. These include kin terms and some animal names. Some examples are given in (48).

- (48)       $\bar{\sigma}$ *dók*      ‘weaver bird’       $\bar{\sigma}$ *bàbá*      ‘father’  
          $\bar{\sigma}$ *bár*      ‘heron’       $\bar{\sigma}$ *máfí*      ‘sister’s husband’

Goldberg et al. (2017) note that the singular neuter (N) proclitic /à=/ has a more limited distribution, only occurring in non-verbal predicate constructions and right-dislocated constructions in which the neuter referent occurs after the verb as a full NP,

and is indexed on the verb with the singular neuter object marking. Examples of this are in (49).<sup>73</sup>

- (49) a. *m̄in=kwàns'*    *à=hànt'à*  
 thing=write    N=be.big  
 'The book is big.' (Goldberg et al. 2017:39)
- b. *∅-kǎf-à~kǎf*                      *à=t'õt'õmò*  
 2SG-close-3SG.N~REDUP    N=door  
 'Close it, the door!' (Goldberg et al. 2017:40)

The feminine singular morpheme /*p'ā-*/, which is cognate across Koman, is no longer productive in Gwama. This morpheme has been lexicalized in Gwama in at least certain kin terms and animals names. Examples of the lexicalized feminine /*p'ā-*/ morpheme are in (50).

- (50)    *p'àbǎngó*            'frog'                                      *p'āmàf*    'wife'  
           *p'āpèngè*            'frog (sp.)'

With respect to plural marking on nominals, Goldberg et al. (2017) observe that there is a clear distinction in biological gender for human referents and less so for animal referents. Human masculine plural referents occur with *mā=* M.PL and feminine plural referents occur with *ī=* F.PL, as seen in (51).<sup>74</sup> Hellenthal (p.c) notes that the

---

<sup>73</sup> Goldberg et al. (2017) do not comment on whether the singular neuter nominal proclitic also marks definiteness, though a cognate morpheme in Komo does appear to fulfill such a function (see Otero 2015c and §2.2.2.2.3 below).

<sup>74</sup> Goldberg et al. (2017:76) note that the expression of definiteness is not as prominent with the plural morphemes as it is with *õ=* M.DEF.

Highland Gwama speakers are using *mā*= M.PL as a general plural marker for all genders.

(51)	<i>sīt</i>	‘person’	<i>mā=sīt</i>	‘people (M.PL)’
	<i>kàkà</i>	‘grandmother’	<i>ī=kàkà</i>	‘grandmothers’
	<i>p’wākām</i>	‘sister’	<i>ī=p’wākām</i>	‘sisters’

When the plural proclitics are employed on non-human animate referents such as animals, the feminine plural appears to mostly express feminine biological gender while the masculine morpheme does not necessarily express masculine biological gender. Some nouns can only occur with either the masculine or feminine proclitic such as in (52a), while other nouns can occur with either plural proclitic as in (52b). It is not clear in (52b) whether either plural proclitic expresses biological gender for the referent ‘frogs’.

(52)	a.	<i>wāṅā</i>	‘chicken’	<i>ī=wāṅā</i>	‘hens’
	b.	<i>p’àbǎngó</i>	‘frog’	<i>mā=p’àbǎngó</i>	‘frogs’
				<i>ī=p’àbǎngó</i>	

#### 2.2.2.2 Komo nominal morphology

Of the living Koman languages, Komo has the least nominal morphology. Biological gender in humans and other animates is indexed on the verb and in demonstratives, but nouns receive very little marking on the whole compared to the other Koman systems.

### 2.2.2.2.1 Komo independent and possessive pronouns

Table 23 contains the Ethiopian Komo independent and possessive pronominals. Note that the third person forms distinguish three genders: masculine, feminine and neuter/non-human.

Table 23 Ethiopian Komo independent and possessive pronouns

	Independent	Possessive
1SG	<i>ākā</i>	<i>bám</i>
2SG	<i>àj</i>	<i>bīnī</i>
3SG.M	<i>hàr</i>	<i>bír</i>
3SG.F	<i>hàp'</i>	<i>bíp'</i>
3N	<i>hìn ~ hàn</i>	<i>bín</i>
1PL.IN	<i>ānà</i>	<i>bānà</i>
1PL.EX	<i>āmò̀n</i>	<i>bābò̀n</i>
2PL	<i>òm</i>	<i>bóm</i>
3PL	<i>hò̀n</i>	<i>bón</i>

Burns (1947:14) states that in Sudanese Komo all of the independent pronominals can optionally occur with what he calls a “pronominal distinguishing suffix” /-ná/I have also observed the same in Ethiopian Komo though I have not been able to find the difference in meaning between a bare pronoun and one occurring with /-ná/ (e.g. 1SG *ākā* vs. *ākāná*).

In Komo, the possessive pronouns occur immediately after possessed nouns with no intervening or additional morphology.<sup>75</sup> Examples of the possessive pronouns are seen in (53).<sup>76</sup>

(53)	1SG	<i>gùbí bám</i>	‘my house’
	2SG	<i>gùbí bīní</i>	‘your (sg.) house’
	3SG.M	<i>gùbí bír</i>	‘his house’
	3SG.F	<i>gùbí bíp’</i>	‘her house’
	1PL.IN	<i>gùbí bānà</i>	‘our (ex.) house’
	1PL.EX	<i>gùbí bābòn</i>	‘our (ex.) house’
	2PL	<i>gùbí bóm</i>	‘your (pl.) house’
	3PL	<i>gùbí bón</i>	‘their house’

The possessive enclitics appear to be built on the morpheme *bā* which exists synchronically in Komo and functions as a demonstrative and/or as a possessive morpheme with lexical possessors, as seen in (54a-b), respectively. In Sudanese Komo, Burns (1947:20) transcribes alternate forms of *bám* 1SG.POSS as disyllabic [*bā?ám*] with a M.H tone melody or as monosyllabic [*bǎm*] with a rising tone. This suggests that *bám* 1SG.POSS could have been historically bimorphemic, where the initial segment was the possessive morpheme, attached to a 1SG pronominal element (i.e. *bā=ám* POSS=1SG > *bám* ‘my’).

---

<sup>75</sup> The possessive pronouns are becoming clitics. I have chosen to transcribe them as independent morphemes following Burns (1947) and given the fact that the vowels in these morphemes do not undergo ATR harmony.

<sup>76</sup> Burns’ original transcription of *bám* 1SG.POSS is [běm]. His grapheme <e> corresponds to what I analyze as /ɪ/. Further, for some morphemes within a language, there can be allomorphs in which the vowel /a/ can vary with /ɪ/. One example is the locative proclitic in Komo, which can be realized as /á=/ or /í=.

- (54) a. *gùbí=bā*  
house=DEM.PROX  
‘this house’
- b. *gùbí bā à=sòmálè*  
house POSS ID.SG=S.  
‘Sumale’s house’

#### 2.2.2.2.2 Komo pronominal demonstratives

The Ethiopian Komo pronominal demonstratives are seen in Table 24. This paradigm distinguishes masculine and feminine genders across four distances from the origo: proximal, medial, distal and remote. The remote distance, which is employed when the referent is out of sight (and known to be very distant), is a compound of the medial demonstrative plus the morpheme *wífítîn*, which is of unknown origin or meaning.<sup>77</sup> The demonstratives do not distinguish number and can be employed with singular or plural referents. The demonstrative *=bā*, briefly discussed in the preceding sections, indicates a proximal referent and can be used for all genders.

Table 24 Komo pronominal demonstrative enclitics

	PROXIMAL	MEDIAL	DISTAL	REMOTE
M	<i>=bā, =nĩ</i>	<i>=dĩ</i>	<i>=dítîn</i>	<i>=dìwífítîn</i>
F	<i>=bā, =nǎĩ</i>	<i>=dǎĩ</i>	<i>=dǎtîn</i>	<i>=dǎwífítîn</i>

Some examples of Komo demonstrative enclitics are seen in (55). Note that ‘goat’ occurs with the proclitic /à=/ ID.SG, which is discussed below in §2.2.2.3.

<sup>77</sup> This morpheme *wífítîn* appears to contain the verb *fít* ‘be.far’ in which the alveolar ejective has weakened to a plain stop. Speakers often lengthen the final vowel emphatically.



(55)		PROXIMAL	MEDIAL	DISTAL	REMOTE
<i>gùbí</i>	‘house’	<i>gùbí=bā</i>	<i>gùbí=dĩ</i>	<i>gùbí=dítîn</i>	<i>gùbí=diwífítîn</i>
		<i>gùbí=nĩ</i>			
<i>mé</i>	‘goat’	<i>à=mé=bā</i>	<i>à=mé=dòĩ</i>	<i>à=mé=dòtîn</i>	<i>à=mé=dòwífítîn</i>
		<i>à=mé=nòĩ</i>			

What appear to be reduced forms of the medial demonstratives can function as relativizing particles. The relativizers *dì* REL.M and *dò* REL.F are employed for singular masculine and feminine referents, respectively.<sup>78</sup> The relativizers follow the head noun and agree in gender, as seen in (56).

- (56) a. *à=sòmáɛ, hàr dì k'ēw-kú-r dĕ=bā*  
 ID.SG=S. 3SG.M REL.M write-DD2-3SG.M thing=DEM.PROX  
 ‘Sumale, he is the one who wrote this thing here.’
- b. *à=bāmít dò tā-p'-g-ák jèn*  
 ID.SG=girl REL.F COP-3SG.F-APPL-1SG oil  
 ‘I (really) desire this woman. (lit. This woman who (is) oil to me)’

#### 2.2.2.2.3 Komo nominal gender/number morphology

Like the other Koman languages, Komo expresses general number for non-human referents, meaning that singular or plural is not specified at the root level, as seen in (57a). Some nouns denoting human referents are lexically specified for singular and plural number, as seen in (57b).

<sup>78</sup> Note that the masculine medial demonstrative enclitic has a rising tone and the feminine demonstrative occurs with a final /i/, differently from the relativizers.

- (57) a. *k'áw* 'dog(s)'      *gùbí* 'hut(s)'      *k'óp* 'head(s)'  
 b. *bāmít* 'girl'      *jībā* 'person'      *gībā* 'people'

Morphological number specification in Komo can occur by employing nominal enclitics and/or by argument indexation on the verb (§2.2.3.1.2). The only morphemes fulfilling any number and/or gender marking on nominals in Ethiopian Komo are presented in Table 25.

Table 25 Ethiopian Komo nominal gender/number proclitics

ID.SG	<i>à=</i>	M.SG.HUM	<i>jī=</i>
		F.SG.HUM	<i>bā(bī)=</i>
ID.PL	<i>gò=</i>	F.SG(HUM)	<i>bā=†</i>
		PL.HUM	<i>gī=</i>

<sup>†</sup>Very limited distribution and lexicalized. Can be employed with human and non-human animate referents.

Komo has two productive derivational proclitics which derive human singular nominal referents: *jī=* M.SG.HUM and *bā(bī)=* F.SG.HUM. These morphemes can derive nominals from verbs, as in (58a-b) and (59a-b); or they can be employed to specify a singular member of an ethnic group, as seen in (58c) and (59c).

- (58) a. *jī=kót*  
 M.SG.HUM=farm(v.)  
 'male farmer'
- b. *jī=swǎ-r-à*  
 M.SG.HUM=be.old-3SG.M-ADJZ  
 'old man'
- c. *jī=kòmò*  
 M.SG.HUM=komo  
 'male Komo person'
- (59) a. *bābī=kót*  
 F.SG.HUM=farm(v.)  
 'female farmer'
- b. *bābī=swǎ-p'-à*  
 F.SG.HUM=be.old-3SG.F-ADJZ  
 'old woman'
- c. *bābī=kòmò*  
 F.SG.HUM=komo  
 'female Komo person'

The morpheme *gī*= PL.HUM can derive human referents from verbs, as in (60a), but it cannot be employed for plural ethnic group members, shown by (60b). For plural human ethnic group referents, the morpheme *gò*= PL is employed, as in (60c).

- (60) a. *ōm tā-m gī=kót dā*      b. \**gī=kòmò*  
 2PL      COP-2PL PL.HUM=farm      Q  
 ‘Are you farmers?’
- c. *gò=kòmò*  
 ID.PL=komo  
 ‘Komo people’

The lexemes *jībā* ‘person’ and *gībā* ‘people’ could historically have been composed via a combination of *jī*= M.SG.HUM and *gī*= PL.HUM plus *bā* DEM.SG. Note that modernly, *bā*(*bī*)= F.SG.HUM can occur on both of these lexemes to derive singular and plural feminine human referents, as seen in (61).

- (61) a. *bābī=jībā*                      b. *bābī=gībā*  
 F.SG.HUM=person                      F.SG.HUM=people  
 ‘woman’                                      ‘women’

Synchronically, the only obligatory singular gender marking is *à*= ID.SG or *bā*= F.SG on male and female human proper names, as seen in (62). This is the only productive instance of the *bā*= F.SG morpheme.

- (62) a. *à=sōmále*                      b. *bā=wálāp’*  
 ID.SG=S.                                      F.SG=W.  
 ‘Somale’ (man’s name)                      ‘Walap’ (woman’s name)

The two feminine markers in Ethiopian Komo /*bā*=/ and /*bā*(*bī*)/ appear to be historically related given the similarity in phonological shape, though one form clearly contains a bilabial stop and the other a bilabial implosive. Further, both forms correspond to \**ba* in cognates denoting feminine referents across Koman.<sup>79</sup> Interestingly, both morphemes have become lexicalized in a handful of Komo words. The *bā*= F.SG morpheme has become lexicalized in some kin terms and names for animals, as seen in (63); while /*bā*=/ only occurs lexicalized in some Komo kin terms, as seen in (64).<sup>80</sup>

- (63) *bākāká* ‘female ego’s husband’s mother’s/father’s sister’ (older than ego)  
*bāʔájí* ‘female ego’s husband’s mother’s/father’s sister’ (younger than ego)  
*bābáf* ‘female ego’s husband’s brother’s wife’  
*bāk’òmák* ‘centipede’  
*bāt’órsá* ‘woodpecker’

- (64) *bàk’òmàn* ‘sister’  
*bâ* ‘daughter’  
*bás’ómá* ‘father’s sister’

In discourse, the morphemes *à*= ID.SG and *g’ò*= ID.PL are used for referents that are identifiable or known to the hearer.<sup>81</sup> These clitics never appear on new referents introduced in discourse or on referents which the speaker believes that the hearer

---

<sup>79</sup> See §5.2 for a reconstruction of PKMN / \**ba*/.

<sup>80</sup> Note that the tones vary in the /*bā*/ morpheme: M, L and F. I do not have a synchronic or a historical explanation for this tonal variation at present.

<sup>81</sup> See Otero 2015c for discussion.

cannot identify. Komo speakers employ these nominal clitics on core arguments to reactivate previously mentioned referents across a span of discourse and/or to disambiguate the unique identity of referents. An example from a text is seen in (65). In (65a), the first mention of *k'áw* 'dog(s)' occurs independently, while in the second mention in (65b), it occurs with the *gò=* ID.PL proclitic. This proclitic signals to the hearer that these are the particular dogs that were mentioned prior.

- (65) a. *mà gīmíf-∅=gì,      òl-ī-n      k'áw      bón*  
 SUB    get.up.PL-3PL=gì    call-DD∅-3PL    dog    3PL.POSS  
 'After they got up, they called their dogs.'
- b. *gò=k'áw    pá-ó-n      fāp'-ī-n      sìn*  
 ID.PL=dog    run.PL-DD1-3PL    hit-DD∅-3PL    tail  
 'The dogs ran (towards them) wagging (their) tails.'

The number gender markers in Sudanese Komo described by Burns (1947:12) are presented in Table 26.<sup>82</sup> The Sudanese Komo forms in Table 26 largely correspond to the Ethiopian Komo forms seen in Table 25 with two exceptions.<sup>83</sup> Burns identifies *opi-* F.PL.HUM specifically as a feminine plural prefix and *ke-* PL.HUM as a plural prefix only for human referents. These plural prefixes stand in opposition to *go-* PL (what I identify

---

<sup>82</sup> To Burns' glosses, I have added HUM 'human' in the glosses of the forms that can only be employed for human referents.

<sup>83</sup> I have retained Burn's (1947) original transcriptions of these morphemes with one exception. Burns employs <y> for the palatal glide which I transcribe with the IPA grapheme <j> to maintain consistency throughout this dissertation. Note that Burn's vowel transcriptions in which he employs <e> and <o> largely correspond to what I analyze as /ɪ/ and /ʊ/, respectively.

as *gɔ̀*= PL), which can be employed for human referents as well as non-human animate referents.<sup>84</sup>

Table 26 Sudanese Komo nominal gender/number proclitics  
(Burns 1947:12)

M.SG.HUM	<i>je-</i>	F.SG	<i>ba-</i>
		F.SG.HUM	<i>bapi-</i>
PL	<i>go-</i>		
PL.HUM	<i>ke-</i>	F.PL.HUM	<i>opi-</i>

Burns' (1947) prefix *opi-* F.HUM.PL can be analyzed as consisting of the noun *ɔ̄p* 'women' and the associative morpheme *-ī* ASS. Komo productively employs an associative construction to link two noun roots into a compound noun, as seen in (66).

- (66) *fùm-ī-lǎw*  
 animal-ASS-home  
 'domestic animal'

### 2.2.2.3 Uduk nominal morphology

#### 2.2.2.3.1 Uduk independent and possessive pronouns

The independent and possessive pronouns in Chali Uduk and Yabus Uduk are presented in Table 27. The Yabus Uduk 3rd person independent pronouns retain an initial voiceless glottal fricative, which has been lost in Chali Uduk.<sup>85</sup> The plural

<sup>84</sup> Burns does not have any examples of *go-* PL on non-animate referents.

<sup>85</sup> See §5.1 for a reconstruction of the Koman pronominal system.

possessive pronouns display variation in the initial bilabial consonant: Chali has an initial voiced stop while Yabus has an initial voiceless unaspirated stop.

	Independent		Possessive	
	Chali	Yabus	Chali	Yabus
1SG	<i>áhā</i>	<i>áhā</i>	<i>pém</i>	<i>pém</i>
2SG	<i>é</i>	<i>é</i>	<i>pīní</i>	<i>pīní</i>
3SG	<i>ádī</i>	<i>hádī</i>	<i>pídī</i>	<i>pádī</i>
1PL.IN	<i>ánā</i>	<i>ánā</i>	<i>bānà</i>	<i>pānà</i>
1PL.EX	<i>ámān</i>	<i>âm</i>	<i>bâm</i>	<i>pâm</i>
2PL	<i>úm</i>	<i>úm</i>	<i>búm</i>	<i>púm</i>
3PL	<i>únī</i>	<i>húnī</i>	<i>búnī</i>	<i>púnī</i>

The Uduk possessive pronouns follow the possessed head noun. The pronominal possessive morphemes are in the process of cliticization. One piece of evidence is that nouns ending in vowels insert what Killian (2015:119) calls an “associative nasal” consonant that agrees in place of articulation with the initial consonant of the possessive pronoun. This is seen in (67b) as compared to (67a); the head noun in (67a) ends in a consonant and does not receive the associative nasal.

- (67) a. *mèd' pīní*  
hand 1SG.POSS  
‘your hand’
- b. *à=mùgú-m=pém*  
CL2=friend-ASS=1SG.POSS  
‘my friend’  
(data adapted from Killian 2015:119)

### 2.2.2.3.2 Chali Uduk pronominal demonstratives

By far the most extensive study of demonstratives in any Koman language is Killian’s (2015:149–166) work on Chali Uduk. The current study only touches upon what Killian (2015:149) refers to as *adnominal demonstratives*, or those “which are lexically nominal and may either head an NP or modify another noun.” Chali Uduk pronominal demonstratives are polymorphemic. Killian identifies three adnominal submorphemes that serve as bases (or bound roots that cannot occur independently) from which the demonstratives are constructed. Killian’s adnominal (pronominal) demonstrative submorphemes (bases) are seen in Table 28. The two singular forms differ semantically in proximity, while the plural form can be used for all distances.

Table 28 Chali Uduk pronominal demonstrative bases  
(adapted from Killian 2015:150)

DISTANCE	SG	PL
<i>Proximal</i>	<i>já</i>	<i>gwǎ</i>
<i>Non-proximal</i>	<i>ǰǎ</i>	<i>gwǎ</i>

According to Killian (2015), these pronominal demonstrative bases combine with two other sets of morphemes to distinguish four distances from the origo: proximal, medial, remote and distal. Killian (2015:151) proposes two classes of complex demonstrative words, presented in Table 29. These demonstrative words are combinations of the pronominal demonstrative bases occurring with what Killian calls “submorphemes that mark distance”, followed by a final “configuration morpheme”.



Table 29 Chali Uduk pronominal demonstrative configurations  
(Adapted from Killian 2015:151–153)

DISTANCE	Base SG/PL	DEM affix	Class 1 Class 2	Example	Gloss
PROXIMAL	<i>já / gwǎ</i>	<i>-n</i>	<i>-ān</i> <i>-ē</i>	<i>jánsān</i>	DEM.PROX.SG.1
		<i>-nh</i>		<i>gwǎnsān</i>	DEM.PROX.PL.1
		<i>-ns</i>		<i>jánsē</i>	DEM.PROX.SG.2
		<i>-h</i>		<i>gwǎnsē</i>	DEM.PROX.PL.2
		<i>-s</i>			
MEDIAL	<i>ǰǎ gwǎ</i>	<i>-d</i>	<i>-ān</i> <i>-ē</i>	<i>ǰǎdān</i>	DEM.MED.SG.1
		<i>-t</i>		<i>gwǎdān</i>	DEM.MED.PL.1
		<i>-nt</i>		<i>ǰǎdē</i>	DEM.MED.SG.2
				<i>gwǎdē</i>	DEM.MED.PL.2
REMOTE	<i>ǰǎ gwǎ</i>	<i>-t</i>	<i>-ān ~ -ā:n</i> <i>-ē ~ -ε:</i>	<i>ǰǎtā:n</i>	DEM.REM.SG.1
				<i>gwǎtā:n</i>	DEM.REM.PL.1
		<i>-t:</i>		<i>ǰǎtē:</i>	DEM.REM.SG.2
				<i>gwǎtē:</i>	DEM.REM.PL.2
DISTAL	<i>ǰǎ gwǎ</i>	<i>-t</i>	<i>-ān</i> <i>-ē:</i>	<i>ǰǎtā:n</i>	DEM.DIST.SG.1
				<i>gwǎtā:n</i>	DEM.DIST.PL.1
		<i>-t:</i>		<i>ǰǎtē:</i>	DEM.DIST.SG.2
				<i>gwǎtē:</i>	DEM.DIST.PL.2

The labels in first column of Table 29 indicate the distance from the origo expressed by the entire demonstrative word. The second column contains the the SG/PL base forms presented in Table 28. These base forms can combine with the morphemes in the third column labeled “DEM affix”.<sup>86</sup> The fourth column contains the “configuration” morphemes for the two configuration classes *-ān* Class 1 and *-ē* Class 2. Lastly, examples of demonstrative words and glosses are in the final two columns.

<sup>86</sup> The “DEM affix” column contains the forms in Killian’s (2015:151) Table 7.2 titled “Submorphemes marking distance distinctions”.

The complex demonstrative words are sensitive to distances from the speaker as well as from the addressee. Killian (2015:150) states that “Class 1” demonstratives are employed when the speaker and addressee are equidistant from the referent, while “Class 2” demonstratives are employed when the degrees of separation from the speaker, addressee and referent vary.

Further, Killian (2015:154) analyzes a set of anaphoric adnominal demonstratives employed for movement away from a deictic center as well as for anaphoric reference in discourse. The basic forms are *jín* DEM.ANAPH.SG and *gǔn* DEM.ANAPH.PL. Killian (2015:95) also discusses two “definite generic nouns” which are “used to replace other nouns known or understood by context”. The forms are *ji* DEF.GEN.SG and *kū* DEF.GEN.PL. Killian states that they “resemble pronominal anaphoric demonstratives but are not lexically related.”

#### 2.2.2.3.3 Uduk gender/number morphology

Like the other Koman languages, Chali and Yabus Uduk also display general number for non-human referents, though for some nouns denoting human referents, number can be specified either by lexical suppletion or via the proclitic *ī*= PL. Some examples of lexical suppletion and morphological plural marking in Chali Uduk are in (68).

- (68) a. *wàtí* ‘man’      *k’wàní* ‘men’  
 b. *kúm* ‘mother’      *ī=kúm* ‘mothers’

One of the most distinguishing features of the Chali Uduk and Bonya Uduk varieties are complex systems of what Killian (2015) calls nominal “gender”. In these gender

systems, distinct classes of nouns trigger distinct morphological agreement patterns in other areas of the grammar. The Chali Uduk and Bonya Uduk systems are entirely different from the gender systems in all other Koman languages primarily given that the Chali and Bonya systems are not based in biological gender. I only provide a brief overview of the Chali Uduk gender system and invite the reader to consult Killian (2015, *to appear*) for details.

Killian (2015:67) argues that all Chali Uduk nouns fall into two classes: Class 1 and Class 2. Further, he analyzes Chali Uduk gender agreement as also being conflated with case marking on nouns in transitive declarative clauses. Further, the class of a postverbal noun has an effect on whether the verb takes argument indexing morphology. In terms of morphological marking on the noun, class 1 nouns are always unmarked while class 2 nouns take a proclitic  $\dot{a}$ = CL2 in isolation and/or as a clause-initial (preverbal) noun. Postverbal class 2 nouns can trigger two types of agreement patterns depending on whether they are A or P arguments.

To illustrate, in (69)a, an AVP construction, the class 2 noun  $k'\acute{a}$  'dog' is the preverbal A argument (marked with the  $\dot{a}$ = CL2 proclitic) and  $\text{ʃ}\acute{e}$  'elephant' is a class 1 noun (unmarked) functioning as the postverbal P argument.<sup>87</sup> In (69)b, a PVA construction, the postverbal A argument  $k'\acute{a}$  'dog' occurs with the proclitic  $m\bar{a}$ = CL2.ERG, which Killian (2015) analyzes as the ergative case marker for class 2 nouns. We see two distinct markers of class 2 nouns in these constructions. In (69)c, a AVP construction, class 2  $k'\acute{a}$  'dog' is the postverbal P argument and occurs with  $\bar{a}$ = CL2.ACC,

---

<sup>87</sup> Class 1 nouns are unmarked in clause-initial (preverbal) position as well as in isolation.

which Killian analyzes as an accusative case marker for class 2 nouns.<sup>88</sup> Note also that in this construction, the verb indexes the subject while the verb is unmarked in (69)a-b.

- (69) Bonya Uduk
- |    |                              |              |            |    |                              |              |               |
|----|------------------------------|--------------|------------|----|------------------------------|--------------|---------------|
|    | <b>A</b>                     | <b>V</b>     | <b>P</b>   |    | <b>P</b>                     | <b>V</b>     | <b>A</b>      |
| a. | <i>à=k'á</i>                 | <i>k'ɔ̄f</i> | <i>ʃɛ̀</i> | b. | <i>ʃɛ̀</i>                   | <i>k'ɔ̄f</i> | <i>mā=k'á</i> |
|    | CL2=dog                      | kill         | elephant   |    | elephant                     | kill         | CL2.ERG=dog   |
|    | ‘The dog kills an elephant.’ |              |            |    | ‘The dog kills an elephant.’ |              |               |
- 
- |    |                             |                         |          |
|----|-----------------------------|-------------------------|----------|
|    | <b>A</b>                    | <b>V</b>                | <b>P</b> |
| c. | <i>ʃɛ̀</i>                  | <i>k'ɔ̄f-ɔ̄d̄=ā=k'á</i> |          |
|    | elephant                    | kill-3SG=CL2=dog        |          |
|    | ‘The elephant kills a dog.’ |                         |          |

We have seen that the Chali Uduk gender system is sensitive to the class of noun serving as A or P argument as well as the position of the noun with respect to the verb. Gender agreement is seen on the noun and it also impacts whether the verb indexes the A argument. The Chali and Bonya Uduk gender systems have many other agreement targets which are well beyond the scope of this dissertation. Killian (2015) notes that the Yabus Uduk variety does not exhibit the gender system found in the Chali and Bonya varieties, which I also confirm. The unique gender system in Chali and Bonya Uduk appears to be a significant Proto-Chali-Bonya-Uduk innovation.

---

<sup>88</sup> This morpheme is phonologically bound to the preceding verb.

## 2.2.2.4 Dana nominal morphology

### 2.2.2.4.1 Dana independent and possessive pronouns

The independent and possessive pronouns in Dana are presented in Table 30. Dana, like Komo, displays three genders in pronouns: masculine, feminine and neuter/non-human. Unlike the Opo cluster, Dana has a set of independent third person pronouns, which are cognate across the family (§2.2.2.5). The possessive pronouns, with the exception of 1SG and 2SG, are cliticized forms of the independent pronouns.

Table 30 Dana independent, possessive and bound pronominals

	Independent	Possessive
1SG	<i>āgā</i>	<i>=ínà</i>
2SG	<i>āj</i>	<i>=mīn</i>
3SG.M	<i>hār</i>	<i>=īr</i>
3SG.F	<i>hāp’</i>	<i>=īp’</i>
3N	<i>hān</i>	<i>=īn</i>
1PL.IN	<i>mīnā</i>	<i>=mīnā</i>
1PL.EX	<i>mānā</i>	<i>=mānā</i>
2PL	<i>ōmā</i>	<i>=mō</i>
3PL	<i>hōn</i>	<i>=mōn</i>

Examples of possessive pronominal enclitics in data from texts are in (70)-(71). Note that an epenthetic palatal glide [j] is inserted between the final vowel of *góp<sup>h</sup>à* ‘basket’ and the possessive enclitic *=īr* 3SG.M.POSS in (70).

- (70) *jè=ṭón*    *jó*    *pún*    *góp<sup>h</sup>à=jīr*    *nì=sīs*  
 M.SG=be.big    come.SG    search    basket=3SG.M.POSS    REL=be.lost.SG  
 ‘The elder came to look for his basket that was lost.’



(73) *nā jètón=nì t<sup>h</sup>ījāt<sup>h</sup>*  
 COP M.SG=be.big=DEM.PROX be.old.SG  
 ‘This elder is old.’

(74) *hōn bó-wà-gár dō=īnà á=mà kèngèl=īr*  
 3PL put-DD2-APPL:3SG.M thing=DEM LOC=on bicycle=3SG.M.POSS  
 ‘They put these things on his bicycle for him.’

It also appears that the proximal demonstrative =*nì* DEM.PROX can be employed as a relativizer. Evidence from a text excerpt is in (75). Note that what appears to be the proximal demonstrative =*nì* DEM.PROX employed as a relativizer occurs with a rising tone as compared to the pronominal demonstrative enclitic which has a low tone.

(75) *hān kòt jètón dē nī p’ót<sup>h</sup>à mángà*  
 3N have.SG M.SG=be.big one REL pick.PLU mango  
 ‘There is an old man who is picking mangos.’

#### 2.2.2.4.3 Dana nominal number/gender morphology

The Dana number/gender derivational proclitics are in Table 32. The proclitics distinguish masculine and feminine biological gender only in the singular. The plural proclitic can be employed for both genders. It appears that these proclitics are also employed derivationally to derive human referent nominals (though this requires further investigation).

Table 32 Dana nominal  
gender/number proclitics

M.SG	<i>jĕ=</i>
F.SG	<i>jò=</i>
PL	<i>kē=</i>

The Dana proclitics can derive nouns from verb roots, as seen in (76) with the verb root *k<sup>h</sup>ʒ<sub>t</sub><sup>h</sup>* ‘farm’.

- (76) a. *hār nā jĕ=k<sup>h</sup>ʒ<sub>t</sub><sup>h</sup> fō*  
 3PL COP PL=farm grass  
 ‘He is a farmer.’
- b. *hāp’ nā jò=k<sup>h</sup>ʒ<sub>t</sub><sup>h</sup> fō*  
 3SG.F COP F.SG=farm grass  
 ‘She is a farmer.’
- c. *hōn nā kē=k<sup>h</sup>ʒ<sub>t</sub><sup>h</sup> fō*  
 3PL COP PL=farm grass  
 ‘They are farmers.’

Some Dana lexemes appear to contain a lexicalized prefixal element /à-/ , a nominal formative which is found across Koman.<sup>91</sup> Dana lexemes containing the lexicalized /à-/ element include animal and plant names, kin terms and inanimate objects. Some examples are seen in (77).

<sup>91</sup> Cognate /à-/ prefixes are productive in Chali and Bonya Uduk (cf. §2.2.2.3.3) and are semi-productive in Komo (cf. §2.2.2.2.3). Further, the /à-/ morpheme is lexicalized in kin terms, and in plant and animal terms in all of the Koman languages with the exception of Gwama.



(77)	<i>àbɔŋk'ɔʔ</i>	‘frog’	<i>àmádɔ̄</i>	‘nephew/niece’
	<i>àkīf</i>	‘antelope’	<i>àbórâŋ</i>	‘cloth’
	<i>àdwák<sup>h</sup></i>	‘weaver bird’	<i>àdɔ̄j</i>	‘moon’
	<i>àkíl</i>	‘cattle egret’		

In my database, there are also a few Dana lexemes that contain what appears to be a lexicalized feminine prefix /bā-/, which is also cognate across Koman. The Dana lexemes containing /bā-/ are mostly female kin terms and a few bird species, as seen in (78).

(78)	<i>bāgɔ̄l:ā</i>	‘kite bird’	<i>bāmó</i>	‘sister’
	<i>bājírɔ̄ŋ</i>	‘bee-eater bird’	<i>bāsôm</i>	‘father’s sister’
	<i>bākīlɔ̄ʔ</i>	‘fish eagle’	<i>bākòm</i>	‘mother’s sister’

#### 2.2.2.5 Opo nominal morphology

##### 2.2.2.5.1 Opo independent and possessive pronouns

The independent pronouns from the four Opo varieties employed in this study are presented in Table 33. The Opo independent pronouns distinguish three genders in the singular and clusivity in the 1st person plural.<sup>92</sup> All of the pronouns are identical across the varieties with the exception of the 3rd person forms, which vary.<sup>93</sup> Note that the 3rd

---

<sup>92</sup> The 3N category subsumes non-human animate and inanimate referents. This category is 3NH (non-human) in Smolders (*forthcoming*).

<sup>93</sup> Mellese (2017:55) also identifies *muna* 3PL, a distinct 3rd person plural independent pronoun that I have not encountered.

person forms in Table 33 are bound roots that cannot occur independently and must combine with distinct modifiers, such as demonstrative enclitics; these are discussed in below in §2.2.2.5.2.<sup>94</sup>

Table 33 Independent pronouns in four Opo varieties

	Bilugu	Modin	Pame	Kigile
1SG	<i>āgā</i>	<i>āgā</i>	<i>āgā</i>	<i>āgā</i>
2SG	<i>āj</i>	<i>āj</i>	<i>āj</i>	<i>āj</i>
3SG.M	<i>òtà†</i>	<i>òtà†</i>	<i>wàr†</i>	<i>ò†</i>
3SG.F	<i>bā†</i>	<i>bā†</i>	<i>bā†</i>	<i>bā†</i>
3N	<i>nà† / hà†</i>	<i>ní †</i>	<i>nà†</i>	<i>nà†</i>
1PL.IN	<i>mìnà</i>	<i>mìnà</i>	<i>mìnà</i>	<i>mìnà</i>
1PLEX	<i>mànà</i>	<i>mànà</i>	<i>mànà</i>	<i>mànà</i>
2PL	<i>ōmā</i>	<i>ōmā</i>	<i>ōmā</i>	<i>ōmā</i>
3PL	<i>bìjà†</i>	<i>bìjà†</i>	<i>bìjà†</i>	<i>bìjà†</i>

† This form cannot occur independently.

The Opo possessive pronominal enclitics are presented in Table 34. The possessive pronominals cliticize to the right of a noun. Note that the 1st and second plural possessive enclitics are cliticized versions of the independent pronominals with tonal modifications. The possessive enclitics all exhibit H or XH tones, while the independent pronouns have L or M tone. Note also that the 3rd person possessive forms are cognate with Koman independent pronouns outside of the Opo branch.<sup>95</sup>

<sup>94</sup> Smolders (*forthcoming*) also shows how these pronominal bound morphemes combine with an associative suffix and a relativizing enclitic.

<sup>95</sup> See §5.1 for reconstruction of Koman pronominals.

Table 34 Possessive pronominal enclitics in four Opo varieties

	Bilugu	Modin	Pame	Kigile
1SG	= <i>(í)má</i>	= <i>(í)má</i>	= <i>(í)má</i>	= <i>ímá</i>
2SG	= <i>míní</i>	= <i>míní</i>	= <i>mǐn</i>	= <i>mǐn</i>
3SG.M	= <i>ír</i>	= <i>ír</i>	= <i>ír</i>	= <i>ír</i>
3SG.F	= <i>íb</i>	= <i>íb</i>	= <i>íb</i>	= <i>íb</i>
3N	= <i>ín</i>	= <i>ín</i>	= <i>hín</i>	= <i>jín</i>
1PL.IN	= <i>mǐná</i>	= <i>mǐná</i>	= <i>mǐná</i>	= <i>mǐná</i>
1PL.EX	= <i>máná</i>	= <i>máná</i>	= <i>máná</i>	= <i>máná</i>
2PL	= <i>mwá</i>	= <i>mwá</i>	= <i>mwá</i>	–†
3PL	= <i>món</i>	= <i>món</i>	= <i>món</i>	= <i>món</i>

† This form failed to be elicited.

Some examples of possessed nouns are in (79). Note that the initial vowel of the possessive enclitic /í/ can either elide following a high vowel as in (79b) or it can coalesce to [ɛ] following /a/ as in (79c).

- (79) Bilugu Opo
- a. *àdwák<sup>h</sup>=ímá*  
 weaver=1SG.POSS  
 ‘my weaver (bird)’
- b. *àhǔ=má*  
 fish.sp=1SG.POSS  
 ‘my fish (sp.)’
- c. *dzùgà=ír* [dzùgér]  
 name.SG=3SG.M.POSS  
 ‘his name’

#### 2.2.2.5.2 Opo pronominal demonstratives

Table 35 contains the Opo demonstrative enclitics, adapted from Smolders’ (forthcoming) Bilugu Opo data combined with some data from the three other varieties I

elicited for this study. Bilugu Opo distinguishes three distances from the origo: proximal, medial and distal.<sup>96</sup> Neither gender nor number are distinguished in the demonstratives.

Table 35 Bilugu Opo demonstrative enclitics

	PROXIMAL	MEDIAL	DISTAL
Bilugu	=ín̄	=ín̄	=ín̄ t̄ír̄
Modin	=ín̄	=ín̄ =ínt̄in̄‡	–
Pame	=ín̄	=ín̄ =íj̄ē†	–
Kigile	–	=íj̄ē†	–

– Unable to elicit this form.

† This form is only employed to form 3SG.M, 3SG.F, and 3PL independent pronouns.

‡ This form is only employed to form 3SG.F and 3PL independent pronouns.

Table 36 contains the 3rd person demonstrative pronouns, which are formed from the pronominal bound roots seen in Table 33 and the demonstrative enclitics seen in Table 35. Many of the forms have undergone vowel coalescence at morpheme boundaries. For instance, roots ending in /a/ followed by enclitics beginning with /ɪ/ will coalesce to [ɛ]. This is seen in Bilugu *b̄én̄* 3SG.F.PROX which can be decomposed into /b̄ā + ín̄/ as seen in Modin Opo *b̄áín̄* 3SG.F.PROX.<sup>97</sup> Some of the varieties exhibit

<sup>96</sup> It is very likely that the remaining Opo varieties can also distinguish three distances though this remains to be investigated.

<sup>97</sup> See Smolders (*forthcoming*) for further details in Bilugu Opo.

two distinct enclitics employed for different genders or persons. For instance, in Modin Opo, the medial demonstrative enclitic =*ínī* MED.1 is employed for 3SG.M and for 3SG.N, while the medial demonstrative enclitic =*íntīn* MED.2 is employed for 3SG.F and 3SG.N.<sup>98</sup>

Table 36 Opo third person demonstrative pronouns

PERSON	variety	PROXIMAL	MEDIAL
3SG.M	Bilugu	<i>òténō</i>	<i>òténī</i>
	Modin	<i>òtínō</i>	<i>òtínī</i>
	Pame	<i>wàrénō</i>	<i>wàréē</i>
	Kigile	–	<i>òjē</i>
3SG.F	Bilugu	<i>bénō</i>	<i>bénī</i>
	Modin	<i>bínō</i>	<i>bājéntīn</i>
	Pame	<i>báínō</i>	<i>báíjē</i>
3N	Bilugu	<i>nénō</i>	<i>nénī</i>
		<i>hénō</i>	<i>hénī</i>
	Modin	<i>nínō</i>	<i>nínī</i>
		<i>nàínō</i>	<i>nàī</i>
3PL	Bilugu	<i>bìjénō</i>	<i>bìjénī</i>
	Pame	<i>bìjénō</i>	<i>bìjénī</i>
	Modin	<i>bìínō</i>	<i>bìíntīn</i>
	Kigile	–	<i>bìíjē</i>

#### 2.2.2.5.3 Opo nominal number/gender morphology

The Opo varieties have the most productive number/gender morphological system of any of the Koman languages. Smolders (*forthcoming*) is an in-depth study of number in Bilugu Opo, though he also discusses number in other Opo varieties. Smolders analyzes two distinct number encoding systems at the lexical level: human referents are specified for singular and in some cases plural number (and there are morphological

<sup>98</sup> The MED.1 and MED.2 glosses are subsumed under MEDIAL in Table 36.



- b. *tʃɛ̀gɛ̀* ‘be big (PL.)’      *bì=tʃɛ̀gɛ̀* ‘elders’

Outside of the system described above, the Opo kin system contains one productive plural morpheme *ɔ̄-* PL, which can be employed on masculine or feminine referents as in (81).<sup>101</sup> Note that this morpheme only differs in tone from masculine singular morpheme *ɔ̂=* M.SG.

- (81) a. *hàm* ‘brother’      *ɔ̄-hàm* ‘brothers’  
 b. *ḃām* ‘sister’      *ɔ̄-hàm* ‘sisters’

This concludes the presentation of nominal and NP-related grammatical morphology. In the next section, I turn to Koman verb morphology.

### 2.2.3 Koman verb morphology

Two salient morphological features of Koman verbs are argument indexing by way of bound pronominal suffixes and deictic directional verb suffixes. Another significant feature of the verb in the languages of the Central Koman branch (i.e. all languages except Gwama) is the expression of nominal and verbal number in the verb. “Nominal number” here specifically refers to participant number while “verbal number” refers to the number of events, or pluractionality (cf. Newman 1990).<sup>102</sup>

---

<sup>101</sup> Whether this morpheme is cognate with Komo *gɔ̂=* PL remains to be determined.

<sup>102</sup> The marking of number in the verb appears to have been a significant Proto-Central Koman innovation. The strategies observed to mark number in the verb are suppletion, partial reduplication of the verb stem, tonal alternation and combinations therein. Opo and Dana by far exhibit the most productive processes for marking number in the verb, followed by Komo. Uduk exhibits some suppletive roots that express participant number, and Uduk is the only Koman language that uses tonal alternations in the verb root to make aspectual distinctions (Killian 2015).

All of the Koman languages have paradigms of Deictic Directional (DD) verb morphology which, depending on the semantic profile of the root to which they are attached, can express a range of functions including direction of motion, associated motion, and exchoative aspect (Otero 2018, *accepted*). The bound pronominal argument indexing morphology is discussed in §2.2.3.1.2 and the deictic directional systems are discussed in §2.2.3.2.

#### 2.2.3.1 Koman argument indexing verb morphology

Languages with robust bound pronominal argument indexing morphology, such as Komo and Gwama, obligatory index S/A arguments on finite verbs in declarative main clause grammar. The Uduk varieties exhibit argument indexing on the verb, though not as extensively as in Gwama and Komo. The Dana-Opo branch displays the least argument indexing of all of the Koman languages. However, this branch is currently innovating argument indexing verb morphology. The following subsections describe argument indexing morphology in the individual Koman languages.

##### 2.2.3.1.1 Gwama argument indexing verb morphology

The Gwama varieties exhibit robust argument indexing morphology on the verb. Table 38 contains the Lowland Gwama bound pronominal suffixes alongside the independent pronouns for comparison. In many instances, the bound forms appear to have cliticized from the independent pronouns coupled with phonological erosion. The Gwama bound pronominal paradigms follow a nominative-accusative pattern in declarative main clauses: Set I indexes S/A arguments and Set II indexes P arguments (J.



Goldberg 2018).<sup>103</sup> On finite verbs in main clauses, Gwama must index S/A arguments and can optionally index P.

Table 38 Lowland Gwama independent and bound pronominals

	Independent	Set I (S/A)	Set II (P)
1SG	<i>gà</i>	<i>-nī</i>	<i>-gà</i>
2SG	<i>īk</i>	<i>-gí</i>	<i>-ì</i>
3SG.M	<i>ōhāj</i>	<i>-ní</i>	<i>-è</i>
3SG.F	<i>hāp'</i>	<i>-á /-bí †</i>	<i>-àp'</i>
3N	–	–	<i>-à</i>
1PL.IN	<i>mīnì</i>	<i>-nì</i>	<i>-nì</i>
1PL.EX	<i>mà</i>	<i>-mī</i>	<i>-mà</i>
2PL	<i>ōm</i>	<i>-mí</i>	<i>-òm</i>
3PL	<i>hōn</i>	<i>-bí</i>	<i>-òn</i>

<sup>†</sup> The variation in form depends on the preceding deictic directional morpheme (cf. Joelle Goldberg 2018)

We noted earlier (§2.2.2.1.3) that the biological gender of human referents is indexed on nouns, verbs and demonstratives in Lowland Gwama (Goldberg et al. 2017:39).

Verbal indexing morphology also agrees in gender with human referents that function as core arguments, as shown in (82). Note that the verb indexes 3SG.M when the subject is male in (82a), and 3SG.F when the subject is female in (82b).

- (82)
- |  |   |
|--|---|
| <p>a. <i>kíkīzì gòs-ní~gòs</i><br/> man run-3SG.M~RED<br/> ‘A man runs.’</p> | <p>b. <i>kíkjàtā gòs-á~gòs</i><br/> woman run-3SG.F~RED<br/> ‘A woman runs.’<br/> (Goldberg et al. 2017:39)</p> |
|--|---|

<sup>103</sup> Joelle Goldberg (2018) labels the bound pronominal sets “Set I” and “Set II”. She observes idiosyncrasies with the person marking paradigm, specifically that negative auxiliaries index S arguments with P (Set II) morphemes.

Goldberg et al. (2017:40) also note that some non-human animate referents can trigger both masculine and feminine gender verb indexation in the singular, as seen in (83). Note that none of the referents in (82) and (83) carry nominal number morphology, and all are translated as indefinite.

- |      |    |   |    |   |
|------|----|---|----|---|
| (83) | a. | <i>k'ík'íf k̄s-ní~k̄s</i><br>tortoise say-3SG.M~RED<br>'A tortoise said...' | b. | <i>k'ík'íf ḡòs-á~ḡòs</i><br>tortoise run-3SG.F~RED<br>'A tortoise runs.'<br>(Goldberg et al. 2017:40) |
|------|----|---|----|---|

Given the richness of Gwama argument indexing morphology, a fully finite verb can constitute a clause. A full paradigm for the transitive verb *kóp* 'hit' indexing a 3PL A argument with the Set I suffix *-bí* 3PL and the full range of P arguments marked by the Set II suffixes is in (84).

- |      |    |   |    |  |
|------|----|---|----|--|
| (84) | a. | <i>kóp-bí-gà~kóp</i><br>hit-3PL-1SG~RED<br>'They hit me.'     | f. | <i>kóp-bí-nì~kóp</i><br>hit-3PL-1PL.IN~RED<br>'They hit us.'   |
|      | b. | <i>kóp-bí-ì~kóp</i><br>hit-3PL-2SG~RED<br>'They hit you.'     | g. | <i>kóp-bí-mà~kóp</i><br>hit-3PL-1PL.EX~RED<br>'They hit us.'   |
|      | c. | <i>kóp-bí-è~kóp</i><br>hit-3PL-3SG.M~RED<br>'They hit him.'   | h. | <i>kóp-bí-òn~kóp</i><br>hit-3PL-2PL~RED<br>'They hit you all.' |
|      | d. | <i>kóp-bá-àp'~kóp</i><br>hit-3PL-3SG.F~RED<br>'They hit her.' | i. | <i>kóp-bí-òn~kóp</i><br>hit-3PL-3PL~RED<br>'They hit them.'    |
|      | e. | <i>kóp-bí-à~kóp</i><br>hit-3PL-3N~RED<br>'They hit it.'       |    |  |

Gwama employs an applicative morpheme *gá*= APPL to mark BENEFACTIVE or RECIPIENT semantic roles. This morphemic form can occur as a benefactive proclitic on a noun phrase (i.e. as a preposition), as seen in (85a); or it can occur in the verb as an applicative, where it follows the S/A suffix as in (85b). Note that in (85b), the Gwama verb marks three participants (3PL, 3SG.F, and 3N), which is possible only when the *-gá* APPL morpheme occurs on an otherwise transitive verb.

- (85) a. *á-bí t̄ɔp t̄ám gá=hàp'*  
 INT-3PL harvest honey BEN=3SG.F  
 'They will harvest honey for her.'
- b. *t̄ám, fám-bí-gá-àp'-à~fám*  
 honey search-3PL-APPL-3SG.F-3N~RED  
 'Honey, they searched for it for her.'

In affirmative imperative constructions, the addressee argument is indexed by a prefix if 2PL but is unmarked if 2SG. Examples with intransitive and transitive verb are in (86a-b) and (86c-d), respectively. Note that 2SG is unmarked (but shown here by a zero to clarify the contrast with 2PL).

- (86) a.  $\emptyset$ -*sī~sēl*  
 2SG-RED~climb  
 'Climb!'
- b. *mí-gì~gòs*  
 2PL-RED~run  
 'Run!'
- c.  $\emptyset$ -*kòf-á~kòf*  
 2SG~kill-3SG.N~RED  
 'Kill it!'
- d. *mí-kòf-á~kòf*  
 2SG~kill-3SG.N.DD1~RED  
 'Kill it (and then come)!'  
 (Goldberg et al. 2017:62)

### 2.2.3.1.2 Komo argument indexing verb morphology

Of the Koman languages, Komo displays the richest system of morphological argument indexation on the verb.<sup>104</sup> Table 23 contains the full paradigms of Ethiopian Komo bound pronominal argument suffixes alongside the independent pronouns for comparison.<sup>105</sup>

Table 39 Ethiopian Komo independent and bound pronominals

	Independent	Set I (S/A) <sup>†</sup>	Set II (A) <sup>‡</sup>	Set III (P)
1SG	<i>ākā</i>	-( <i>n</i> ) <i>á</i>	- <i>g</i>	- <i>āk</i>
2SG	<i>àj</i>	- <i>í</i>	- <i>é</i>	- <i>ē</i>
3SG.M	<i>hàr</i>	- <i>r</i>	- <i>r</i>	- <i>ār</i>
3SG.F	<i>hàp'</i>	- <i>p'</i>	- <i>p'</i>	- <i>āp'</i>
3N	<i>hìn ~ hàn</i>	- <i>n</i>	- <i>n</i>	- <i>ī ~ in</i>
1PL.IN	<i>ānà</i>	-( <i>n</i> ) <i>à</i>	-( <i>n</i> ) <i>àn</i>	- <i>ānà</i>
1PL.EX	<i>āmò'n</i>	-( <i>n</i> ) <i>á</i> ~ -( <i>n</i> ) <i>ám</i>	-( <i>n</i> ) <i>án</i>	- <i>ām ~ -ān</i>
2PL	<i>òm</i>	- <i>m</i>	- <i>m</i>	- <i>òm</i>
3PL	<i>hòn</i>	- <i>n</i>	∅	- <i>òn</i>

<sup>†</sup> This set is employed only when just one argument is indexed in the verb.

<sup>‡</sup> This set is employed only when more than one argument is indexed in the verb.

It is evident that almost all of the bound pronominals are reduced forms of the independent pronouns, which have become phonologically eroded over time. One notable exception is Set I *-(n)á* 1SG, which does not bear a resemblance to the corresponding synchronic independent pronoun. Also the Set II and Set III markers are

<sup>104</sup> I find no difference between the verb morphology in Ethiopian Komo from the Sudanese variety described by Burns (1947).

<sup>105</sup> The nasals (in parentheses) in the 1PL suffixes surface only after a vowel.

clearly phonologically reduced forms of the independent pronouns. There appears to be (at least synchronic) free variation between a bilabial and alveolar nasal in the Set I and Set II 1PLEX suffixes as well as in the Set III 3N suffixes.

Komo must index S/A arguments on all finite verbs in main clauses. If only one argument is indexed on the verb (either S or A), then the Set I markers are employed. If more than one argument is indexed in the verb, then the Set II markers are employed for the A argument and the Set III markers are employed for the P argument. Consider the 1st person singular bound pronominal indexing in (87). In (87a), 1SG is the A argument, realized by a preverbal independent pronoun as well as by the Set I bound pronominal verb marker *-ná* 1SG. In (87b), a Set II 1SG bound pronominal *-g* 1SG is employed as the verb also indexes a 3SG.M P argument. In (87c), the Set III P argument bound pronominal *-āk* is employed.

- (87) a. *ākā tūs-ó-ná hār*  
           1sg    push-DD1-1SG 3SG.M  
           ‘I push him.’
- b. *tūs-ó-g-ār*  
                   push-DD1-1SG-3SG.M  
                   ‘I push him.’
- c. *tūs-ó-r-āk*  
                   push-DD1-3SG.M-1SG  
                   ‘He pushes me.’

Komo can also index three participants on the verb. This is typically realized when the *-gá* APPL morpheme licenses a third argument, increasing the overall valence by one. The *=gá* morpheme can either occur as an prepositional proclitic on a noun or free pronoun outside of the verb, as in (88a); or it can function as an applicative *-gá* within the inflected verb, as in (88b). Inside the verb, *-gá* APPL occurs immediately after the S/A

bound pronominal suffix. In (89), *-gá* occurs on the intransitive verb *ī* ‘go.PL’ and increases the valence to two.

(88) a. *ākā p'ór-á ǰf gá=hàp'*  
 1SG throw-1SG stone GOAL=3SG.F  
 ‘I throw a stone to her.’

b. *ākā p'ór-á-gá-p'-ì*  
 1SG throw-1SG-APPL-3SG.F-3N  
 ‘I throw it to her.’

(89) a. *ānà ī-nà-g-ár kòmà jángú*  
 1PL.IN go.PL-1PL.IN-APPL-3SG.M to Y.  
 ‘We’re going to Yangu for him.’

#### 2.2.3.1.3 Uduk argument indexing verb morphology

Argument indexation on the verb in Uduk is by far the least transparent of the Koman languages. Chali and Bonya Uduk exhibit a unique morphological argument indexing system on the verb that is sensitive to the position of independent NP arguments with respect to the verb, as well as the gender class of the postverbal NP argument (Killian 2015).<sup>106</sup>

Table 40 contains the independent pronouns and the argument indexing suffixes in Chali Uduk, adapted from Killian (2015). Killian analyzes two distinct types of verb agreement suffixes, which I have labeled for convenience as “Set 1” and “Set 2” in Table 40. Occurrence of the optional elements in the Set 1 suffixes depends on whether the

---

<sup>106</sup> See Killian (2015) and §2.2.2.3.3 for Uduk nominal gender classes.

verb root to which they attach ends in a vowel or a consonant.<sup>107</sup> According to Killian (2015), the Set 2 suffixes grammaticalized from the independent pronouns preceded by the gender Class 2 morpheme *-ā* CL2.ACC.<sup>108</sup>

Table 40 Chali Uduk independent pronouns and argument indexing verb morphology (adapted from Killian 2015)

	Independent	SET 1 (S/A)	SET 2 (ERG)
1SG	áhā	-(n)á	-kāʔ
2SG	é	-(V)n	-ě
3SG	áďi	-(V)ď	-ăďi
1PL.IN	ánā	-(n)à	-ănā
1PL.EX	ámān	-(n)á	-âm
2PL	úm	-(V)n	-ŭm
3PL	únī	-(V)n	-ŭnī

In all of the Uduk varieties, core arguments must be realized as independent NPs or free pronouns and these arguments can be simultaneously indexed on the verb morphologically. The only exception is when postverbal A arguments are indexed on the verb employing the Set 2 suffixes, which is discussed below in this section. Killian (2015) observes that in Chali Uduk, argument indexing with the Set 1 suffixes only occurs in SV/AVP clauses.<sup>109</sup> In SV clauses, the single argument is indexed on the verb with a Set 1 suffix. In AVP clauses, 1st person (singular and plural) are always indexed

<sup>107</sup> For the Set 1 suffixes, the nasals in parentheses only occur after vowel-final roots and the (V) indicates that a vowel identical to the root vowel occurs after consonant-final roots. Further, the tone of all of the suffixes can vary, with the exception of the 1st person suffixes which always surface as the forms seen in Table 40. See Killian (2015) for details.

<sup>108</sup> According to Killian, the rising contour tone on the initial vowel of the suffix is a result of the coalescence of a gender morpheme, which is M tone, with the initial vowel of the pronominal suffix, which is H tone.

<sup>109</sup> Note that the Set 1 suffixes cannot be used pronominally.

on the verb while the indexing of all other persons depends upon the gender class of the postverbal argument. To illustrate, consider the data in (90) which contain AVP clauses with postverbal nouns of both gender classes. Examples (90a-g) contain Class 1 postverbal arguments; note that indexing on the verb only occurs for the first person – no other persons are indexed on the verb. By contrast, the postverbal arguments in (90h-n) are Class 2 nouns and now the preverbal argument is always indexed on the verb. While the examples in (90) do not appear to be semantically transitive clauses, this verb indexation pattern behaves identically to that found in more “prototypical” transitive clauses. See Killian (2015) for evidence.

- (90) Chali Uduk
- |    |                           |                    |           |    |                           |                    |                           |
|----|---------------------------|--------------------|-----------|----|---------------------------|--------------------|---------------------------|
| a. | <i>áhā</i>                | <i>gŭs-á</i>       | <i>pā</i> | h. | <i>áhā</i>                | <i>gŭs-á</i>       | <i>ā=wác<sup>hā</sup></i> |
|    | 1SG                       | run.SG.IPFV-1SG    | home      |    | 1SG                       | run.SG.IPFV-1SG    | CL2.ACC=fast              |
|    | ‘I am running home.’      |                    |           |    | ‘I am running fast.’      |                    |                           |
| b. | <i>é</i>                  | <i>gŭs</i>         | <i>pā</i> | i. | <i>é</i>                  | <i>gŭs-ún</i>      | <i>ā=wác<sup>hā</sup></i> |
|    | 2SG                       | run.SG.IPFV        | home      |    | 2SG                       | run.SG.IPFV-2SG    | CL2.ACC=fast              |
|    | ‘I am running home.’      |                    |           |    | ‘I am running fast.’      |                    |                           |
| c. | <i>ádī</i>                | <i>gŭs</i>         | <i>pā</i> | j. | <i>ádī</i>                | <i>gŭs-úd</i>      | <i>ā=wác<sup>hā</sup></i> |
|    | 3SG                       | run.SG.IPFV        | home      |    | 3SG                       | run.SG.IPFV-3SG    | CL2.ACC=fast              |
|    | ‘He/she is running home.’ |                    |           |    | ‘He/she is running fast.’ |                    |                           |
| d. | <i>ánā</i>                | <i>són-à</i>       | <i>pā</i> | k. | <i>ánā</i>                | <i>són-à</i>       | <i>ā=wác<sup>hā</sup></i> |
|    | 1PL.IN                    | run.PL.IPFV-IPL.IN | home      |    | 1PL.IN                    | run.PL.IPFV-IPL.IN | CL2.ACC=fast              |
|    | ‘We are running home.’    |                    |           |    | ‘We are running fast.’    |                    |                           |
| e. | <i>âm</i>                 | <i>són-á</i>       | <i>pā</i> | l. | <i>âm</i>                 | <i>són-á</i>       | <i>ā=wác<sup>hā</sup></i> |
|    | 1PL.EX                    | run.PL.IPFV-IPL.EX | home      |    | 1PL.EX                    | run.PL.IPFV-IPL.EX | CL2.ACC=fast              |
|    | ‘We are running home.’    |                    |           |    | ‘We are running fast.’    |                    |                           |
| f. | <i>úm</i>                 | <i>só</i>          | <i>pā</i> | m. | <i>úm</i>                 | <i>só-n</i>        | <i>ā=wác<sup>hā</sup></i> |
|    | 2PL                       | run.PL.IPFV        | home      |    | 2PL                       | run.PL.IPFV-2PL    | CL2.ACC=fast              |
|    | ‘You are running home.’   |                    |           |    | ‘You are running fast.’   |                    |                           |



- |    |                          |             |           |    |                          |                 |                           |
|----|--------------------------|-------------|-----------|----|--------------------------|-----------------|---------------------------|
| g. | <i>únī</i>               | <i>só</i>   | <i>pā</i> | n. | <i>únī</i>               | <i>só-n</i>     | <i>ā=wác<sup>h</sup>ā</i> |
|    | 3PL                      | run.PL.IPFV | home      |    | 3PL                      | run.PL.IPFV-3PL | CL2.ACC=fast              |
|    | ‘They are running home.’ |             |           |    | ‘They are running fast.’ |                 |                           |

According to Killian (2015:197–198), the Chali Uduk Set 2 suffixes only occur in PVA clauses in which solely the A argument is indexed on the verb.<sup>110</sup> The data in (91) from the Bonya variety of Uduk support Killian’s claims about the distribution of the Set 2 suffixes. Note that in the Bonya variety, all of the argument indexing suffixes with the exception of 1SG co-occur with a formative *-ī*, which occurs immediately after the root and whose function or status is unknown at present.<sup>111</sup>

- (91) Bonya Uduk
- |    |                               |                      |    |                             |                  |
|----|-------------------------------|----------------------|----|-----------------------------|------------------|
| a. | <i>ʃĕ</i>                     | <i>k’ɔf-kāʔ</i>      | e. | <i>ʃĕ</i>                   | <i>k’ɔf-âm</i>   |
|    | elephant                      | kill.PFV-1SG         |    | elephant                    | kill.PFV-IPL.EX  |
|    | ‘I killed the elephant.’      |                      |    | ‘We killed the elephant.’   |                  |
| b. | <i>ʃĕ</i>                     | <i>k’ɔf-ě</i>        | f. | <i>ʃĕ</i>                   | <i>k’ɔf-ī=ūm</i> |
|    | elephant                      | kill.PFV-2SG         |    | elephant                    | kill.PFV-ī-2PL   |
|    | ‘You killed the elephant.’    |                      |    | ‘You killed the elephant.’  |                  |
| c. | <i>ʃĕ</i>                     | <i>k’ɔf mā=ʃí</i>    | g. | <i>ʃĕ</i>                   | <i>k’ɔf-ī=ūn</i> |
|    | elephant                      | kill.PFV CL2.ERG=3SG |    | elephant                    | kill.PFV-ī-3PL   |
|    | ‘He/she killed the elephant.’ |                      |    | ‘They killed the elephant.’ |                  |
| d. | <i>ʃĕ</i>                     | <i>k’ɔf-ī=ánā</i>    |    |                             |                  |
|    | elephant                      | kill.PFV-ī-IPL.IN    |    |                             |                  |
|    | ‘We killed the elephant.’     |                      |    |                             |                  |

<sup>110</sup> Killian does not provide any evidence for this claim besides the Set 2 forms seen in Table 40.

<sup>111</sup> As such, I have glossed this morpheme as *-ī*.

Table 41 contains the Yabus Uduk independent pronouns alongside the verb indexing suffixes. The Yabus Uduk variety exhibits the same Set 1 suffixes seen in the Chali and Bonya varieties though Yabus has a high front vowel in the second and third person suffixes after a consonant-final verb root, whereas Chali and Bonya insert a vowel copied from the root.

Table 41 Yabus Uduk independent pronouns and argument indexing verb morphology

	Independent	SET 1 (S/A)
1SG	áhā	-(n)á
2SG	é	-(i)n
3SG	hádi	-(i)d
1PL.IN	ánā	-(n)à
1PL.EX	ámān	-(n)á
2PL	úm	-(i)n
3PL	únī	-(i)n

The Yabus variety does not exhibit a nominal gender system like the Chali and Bonya varieties. Recall that in transitive clauses, the gender of the postverbal argument has a bearing on whether or not the verb indexes the A argument in Chali and Bonya Uduk. The Yabus variety by contrast, always indexes the S/A on every verb. Elicited Yabus Uduk examples containing parallel data to the Chali data in (90) are presented in (92).

- (92) Yabus Uduk
- a. *áhā gűs-á pā*                      h. *áhā gűs-á kāŋ=wácā*  
 1SG    run.SG.IPFV-1SG    home                      1SG    run.SG.IPFV-1SG    OBL=fast  
 ‘I am running home.’                      ‘I am running fast.’

- |   |   |
|---|---|
| <p>b. <math>\acute{e}</math> <i>gŭs-ín</i> <i>pā</i><br/>2SG run.SG.IPFV-2SG home<br/>'I am running home.'</p>          | <p>i. <math>\acute{e}</math> <i>gŭs-ín</i> <i>kāŋ=wácā</i><br/>2SG run.SG.IPFV-2SG OBL=fast<br/>'I am running fast.'</p>          |
| <p>c. <math>\acute{ádī}</math> <i>gŭs-íd</i> <i>pā</i><br/>3SG run.SG.IPFV-3SG home<br/>'He/she is running home.'</p>   | <p>j. <math>\acute{ádī}</math> <i>gŭs-íd</i> <i>kāŋ=wácā</i><br/>3SG run.SG.IPFV-3SG OBL=fast<br/>'He/she is running fast.'</p>   |
| <p>d. <math>\acute{ánā}</math> <i>són-à</i> <i>pā</i><br/>1PL.IN run.PL.IPFV-IPL.IN home<br/>'We are running home.'</p> | <p>k. <math>\acute{ánā}</math> <i>són-à</i> <i>kāŋ=wácā</i><br/>1PL.IN run.PL.IPFV-IPL.IN OBL=fast<br/>'We are running fast.'</p> |
| <p>e. <math>\acute{ám}</math> <i>són-á</i> <i>pā</i><br/>1PL.EX run.PL.IPFV-IPL.IN home<br/>'We are running home.'</p>  | <p>l. <math>\acute{ám}</math> <i>són-á</i> <i>kāŋ=wácā</i><br/>1PL.EX run.PL.IPFV-IPL.IN OBL=fast<br/>'We are running fast.'</p>  |
| <p>f. <math>\acute{ūm}</math> <i>só-n</i> <i>pā</i><br/>2PL run.PL.IPFV-2PL home<br/>'You are running home.'</p>        | <p>m. <math>\acute{ūm}</math> <i>só-n</i> <i>kāŋ=wácā</i><br/>2PL run.PL.IPFV-2PL OBL=fast<br/>'You are running fast.'</p>        |
| <p>g. <math>\acute{únī}</math> <i>só-n</i> <i>pā</i><br/>3PL run.PL.IPFV-3PL home<br/>'They are running home.'</p>      | <p>n. <math>\acute{únī}</math> <i>só-n</i> <i>kāŋ=wácā</i><br/>3PL run.PL.IPFV-3PL OBL=fast<br/>'They are running fast.'</p>      |

#### 2.2.3.1.4 Dana bound pronominal argument indexing morphology

The Dana bound pronominal indexing enclitics, alongside the independent pronouns, are presented in Table 30. Dana does not obligatorily index S/A arguments on the verb, though optional P argument indexing is possible via the pronominal enclitics. The P-indexing enclitics are identical in form to the independent pronouns with the exception of 3SG and 3PL, in which the initial voiceless glottal fricative has been lost.

Table 42 Dana independent and bound pronominals

	Independent	Bound (P)
1SG	<i>āgā</i>	= <i>āga</i>
2SG	<i>āj</i>	= <i>āj</i>
3SG.M	<i>hār</i>	= <i>ār</i>
3SG.F	<i>hāp'</i>	= <i>āp'</i>
3N	<i>hān</i>	= <i>ān</i>
1PL.IN	<i>mīnā</i>	= <i>mīnā</i>
1PL.EX	<i>mānā</i>	= <i>mānā</i>
2PL	<i>ōmā</i>	= <i>ōmā</i>
3PL	<i>hōn</i>	= <i>ōn</i>

The Dana data in (93) contain declarative main clauses in which the P argument is indexed pronominally on the verb.

- (93) a. *hāp'* *k<sup>h</sup>rw=āgā* *pì t̥is*  
 3SG.F give.SG=1SG cow three  
 'She gave me three cows.'
- b. *hāp'* *k<sup>h</sup>rw=āj* *pì t̥is*  
 3SG.F give.SG=2SG cow three  
 'She gave you three cows.'
- c. *hāp'* *k<sup>h</sup>rw=ār* *pì t̥is*  
 3SG.F give.SG=1SG cow three  
 'She gave me three cows.'
- d. *hāp'* *k<sup>h</sup>rw=āp'* *pì t̥is*  
 3SG.F give.SG=1SG cow three  
 'She gave me three cows.'
- e. *hāp'* *k<sup>h</sup>rw=mānā* *pì t̥is*  
 3SG.F give.SG=1PL.IN cow three  
 'She gave us three cows.'
- f. *hāp'* *k<sup>h</sup>rw=mīnā* *pì t̥is*  
 3SG.F give.SG=1PL.EX cow three  
 'She gave us three cows.'
- g. *hāp'* *k<sup>h</sup>rw=ōmā* *pì t̥is*  
 3SG.F give.SG=2PL cow three  
 'She gave you all three cows.'
- h. *hāp'* *k<sup>h</sup>rw=ōn* *pì t̥is*  
 3SG.F give.SG=3PL cow three  
 'She gave them three cows.'

Dana has a prepositional proclitic morpheme *gá* that can occur on NPs to mark a recipient or beneficiary participant, as in (94a). This morpheme can also occur within

the verb as an applicative, as in (94b). Note that the form *-gáp'* APPL.3SG.F in (94b) is composed of *-gá* APPL plus the bound pronominal P argument marker *-áp'* 3SG.F.

- (94) a. *hāp' dēd pì tis gá=ísà*  
           3SG.F send cow three BEN= I.  
           'She sent Isa three cows.'
- b. *hāp' dēd-á-gáp' pì tis*  
           3SG.F send-DD2-APPL.3SG.F cow three  
           'She sent her three cows.'

#### 2.2.3.1.5 Opo bound pronominal argument indexing morphology

The Bilugu Opo independent and bound pronominals are in Table 43. The bound S/A proclitics only occur when the arguments are realized pronominally and cannot co-occur with full NPs.<sup>112</sup> The Bilugu Opo bound forms are synchronically cliticized independent pronouns with the exception of the third person forms. Recall that this distinction also occurs in the possessive pronominal enclitic paradigm (§2.2.2.5.1).

---

<sup>112</sup> The Opo system is distinct from Komo and Gwama whose bound S/A pronominals are required on every finite verb regardless of whether the arguments also occur as independent NPs.

Table 43 Bilugu Opo independent and bound pronominals

	Independent	Bound (S/A)	Bound (P)
1SG	<i>āgā</i>	<i>āgā</i>	= <i>āga</i>
2SG	<i>āj</i>	<i>ī=</i>	= <i>āj</i>
3SG.M	<i>òtà†</i>	<i>ār=</i>	= <i>ār</i>
3SG.F	<i>bā†</i>	<i>āb=</i>	= <i>āb</i>
3N	<i>nà† / hà†</i>	<i>ān=</i>	= <i>ān</i>
1PL.IN	<i>mìnà</i>	<i>mìnà</i>	= <i>mìnà</i>
1PL.EX	<i>mànà</i>	<i>mànà</i>	= <i>mànà</i>
2PL	<i>ōmā</i>	<i>ōmā</i>	= <i>ōmā</i>
3PL	<i>bijà†</i>	<i>ōn=</i>	= <i>ōn</i>

† This form cannot occur independently

The Opo pronominal S/A markers cliticize to the main lexical verb when the argument is pronominal, as seen in (95). If tense/aspect verb morphology occurs in the clause, such as the morpheme =*á* INT, the S/A markers cliticize to the tense/aspect morphology. This is seen in (96).<sup>113</sup>

- (95) a. *āb=sá mà*  
 3SG.F=eat.SG food  
 ‘She ate food.’
- b. *āb=sá mà*  
 3SG.F=eat.SG food  
 ‘He ate food.’
- c. *ōn=ùsà mà*  
 3SG.M=eat.PL food  
 ‘They ate food.’
- (96) a. *āb=á sá mà*  
 3SG.F=INT eat.SG food  
 ‘She will eat food.’
- b. *āb=á sá mà*  
 3SG.F=INT eat.SG food  
 ‘He will eat food.’

<sup>113</sup> The (future) Intentative grammatical category, which expresses future intent or desire, is realized morphologically in all Koman languages though not all forms are cognate.

- c.  $\bar{o}n=\acute{a}$        $\grave{u}s\grave{a}$        $m\grave{a}$   
 3SG.M=INT    eat.PL    food  
 ‘They will eat food.’

The morpheme *gá* in Bilugu Opo can be employed to mark a recipient or benefactor. It can occur on a noun phrase, as seen in (97a), or it can fuse with a bound pronominal outside of the verb, as in (97b). Note that the form *gár* BEN.3SG.M is composed of *gá* + *ār* 3SG.M, with which it which has coalesced. The *gá* morpheme can also occur in the verb as an applicative, as in (97c), and it can be followed by a bound pronominal enclitic in the verb as, in (97d).

- (97) a.  $\bar{a}b=s\bar{o}$        $p\grave{i}$   $t\grave{u}s\grave{u}$        $g\acute{a}=\grave{o}t\acute{o}n$       b.  $\bar{a}b=s\bar{o}$        $p\grave{i}$   $t\grave{u}s\grave{u}$        $g\acute{a}r$   
 3SG.F=buy.SG    cowthree    BEN=man      3SG.F=buy.SG    cow three    BEN.3SG.M  
 ‘She bought the man three cows.’      ‘She bought him three cows.’
- c.  $\bar{a}b=s\bar{o}=g\acute{a}r$        $p\grave{i}$   $t\grave{u}s\grave{u}$       d.  $\bar{a}b=s\bar{o}=g\acute{a}r=\bar{a}n$   
 3SG.F=buy.SG=APPL.3SG.M    cowthree      3SG.F=buy.SG=APPL.3SG.M=3N  
 ‘She bought him three cows.’      ‘She bought them for him.’

### 2.2.3.2 Koman Deictic Directional (DD) verb morphology

Deictic Directional (DD) verb morphology is a core feature of the Koman verb system. The Koman DD systems consist of two to three suffixes that occur immediately on the verb stem (Otero 2017, *under revision*). These suffixes are presented in Table 44. Note that all of the languages have two DD morphemes with the exception of Komo, which has three.<sup>114</sup> The parentheses in the Dana and Opo forms indicate epenthetic

---

<sup>114</sup> The Komo DDØ morpheme is devoid of any semantic material though it stands in morphological opposition to the other DD morphemes. It is treated as the unmarked form of the verb as compared to the

glides that surface when suffixed onto a vowel-final verb. While all of the DD suffixes may not be cognate in form, they display remarkably similar idiosyncratic behavior.

Table 44 Koman Deictic Directional morphemes

	Gwama (Lowland)	Komo (Ethiopia)	Uduk (Chali)	Dana	Opo (Bilugu)	Opo (Pame)
DD1	-í	-ú	-í	-(j)í	-(w)ú	-(j)ú
DD2	-gí	-úk/-kú	-kú/kí	-(j)á	-(j)á	-(j)á
DDØ	-	-í / -á	-	-	-	-

- indicates a bare or unmarked form of the verb

The Koman DD morphology exhibit a range in functions when collocated with verb roots of distinct semantic profiles (cf. Otero 2018, *accepted* on Komo specifically). On verbs of motion, the DD suffixes express DIRECTION (or the trajectory) of motion relative to a deictic reference point. The Dana examples in (98) contain the verb *pój* ‘run.PL’ inflected with both the deictic directional morphemes. Observe that motion towards the 1st person is expressed by *-ī* DD1 in (98a), and motion towards the second person is expressed by *-wa* DD2 in (98b).<sup>115</sup> Compare these to the bare form (uninflected) of the verb in (98c) in which no direction is specified.

---

other Koman languages which do not display a DDØ morpheme a can employ a verb devoid of a DD morpheme in a clause.

<sup>115</sup> The labels DD1/DD2 are employed mnemonically as they encode motion towards the 1st and 2nd persons, respectively.



- (98) Dana
- a. *hōn-í pój-ī*  
 3PL-PROG run.PL-DD1  
 ‘They are running (to me).’
- b. *hōn-í pój-wà*  
 3PL-PROG run.PL-DD2  
 ‘They are running (to you).’
- c. *hōn-í pój*  
 3PL-PROG run.PL  
 ‘They are running.’ (direction unspecified)

Identical behavior is seen on the Lowland Gwama motion verb *tindì* ‘roll’ in (99) and on the Komo verb *pók* ‘cross’ in (100).

- (99) Gwama (Lowland)
- a. *mā=pīdìn tindì-í-bá~tindì*  
 PL=stone roll-DD1-3PL~RED  
 ‘The stones roll (towards me).’
- b. *mā=pīdìn tindì-bí-gí~tindì*  
 PL=stone roll-3PL-DD2~RED  
 ‘The stones roll (towards you).’
- c. *mā=pīdìn tindì-bí~tindì*  
 PL=stone roll-3PL~RED  
 ‘The stones roll.’ (direction unspecified)
- (100) Komo
- a. *ó-r pók-ó s’ó*  
 INT-3SG.M cross-DD1 river  
 ‘He will cross the river (towards me).’
- b. *ó-r pók-kó s’ó*  
 INT-3SG.M cross-DD2 river  
 ‘He will cross the river (towards you).’
- c. *ó-r pók-∅ s’ó*  
 INT-3SG.M cross-DD∅ river  
 ‘He will cross the river.’ (direction unspecified)

Creissels et al. (2008:148) observe that directional morphemes attached to the verb are common in Nilo-Saharan.<sup>116</sup> A traditional view of verbal directionality posits a binary opposition between motion *towards* and motion *away* from a particular deictic center or point of reference. *Hither*, *centripetal* and *ventive* are terms commonly employed to describe motion toward a reference point, while *thither*, *itive*, *andative* and *centrifugal* describe motion away from a given reference point (e.g. Dimmendaal (2003) for Nilotic and Surmic, Payne 2013 for Maa, Kiessling (2007) for Datooga). The default deictic reference point is most commonly the speaker. Thus, an Itive/Ventive contrast typically codes the direction of motion towards a speaker GOAL and away from a speaker SOURCE. However, the Koman languages show that the morphological expression of “*towards* a reference point” can have two distinct deictic goals: either the speaker or the addressee. Further, this is not in morphological opposition to ‘away’. The data in (98)-(100) above show that one set of Koman DD suffixes expresses motion towards the speaker, while the other set expresses motion towards the addressee.

A second function of the Koman DD morphology is to express ASSOCIATED MOTION (AM), which is commonly defined as an event of translational motion coded in the verb by a morpheme other than the lexical main verb root (Koch 1984; Wilkins 1989, 1991). In Koman, associated motion is generally expressed by the DD suffixes on dynamic verbs whose lexical roots do not contain inherent motion (e.g. ‘kill’, ‘drink’, ‘build’ etc.).<sup>117</sup> To illustrate, consider the Dana examples in (101), which employ the same DD

---

<sup>116</sup> This also includes languages that express directional meanings by changes in root-vowel length, vowel quality, and/or tone (e.g. Dinka (W. Nilotic), as reported by Andersen 2012a, b).

<sup>117</sup> The term “dynamic” here is employed to contrast with stative. Koman languages all have stative as well as dynamic verbs. The deictic directional morphemes which have distinct semantic effects with the two classes of verbs.

morphemes seen in (98). In (101a), the DD1 morpheme expresses that the subject will come to the speaker’s location after the event of the lexical verb root has been realized (in this case, the slaughtering of a goat). In (101b), the DD2 morpheme expresses that the subject will go to the hearer’s location after the event of the lexical verb root has been realized. Compare these to the unmarked form of the verb in (101c), in which no additional motion event is included in the meaning of the verb word.

- (101) Dana
- |    |                              |                  |           |    |                              |                  |           |
|----|------------------------------|------------------|-----------|----|------------------------------|------------------|-----------|
| a. | <i>hār-í</i>                 | <i>ṭ’òd-ī</i>   | <i>mē</i> | b. | <i>hār-í</i>                 | <i>ṭ’òd-á</i>   | <i>mē</i> |
|    | 3SG.M-PROG                   | slaughter.SG-DD1 | goat      |    | 3SG.M-PROG                   | slaughter.SG-DD2 | goat      |
|    | ‘He is slaughtering a goat.’ |                  |           |    | ‘He is slaughtering a goat.’ |                  |           |
|    | (and then will come here)    |                  |           |    | (and then will go to you)    |                  |           |
- 
- |    |                              |              |           |
|----|------------------------------|--------------|-----------|
| c. | <i>hār-í</i>                 | <i>ṭ’òd</i> | <i>mē</i> |
|    | 3SG.M-PROG                   | slaughter.SG | goat      |
|    | ‘He is slaughtering a goat.’ |              |           |

In the Bilugu Opo data in (102), we see the same behavior as in Dana – associated motion arises when the deictic directional morphemes occur with dynamic verb roots that do not inherently express motion. Further, the DD2 morphemes express AM toward the addressee.

- (102) Opo (Bilugu)
- |    |                             |           |    |                             |           |
|----|-----------------------------|-----------|----|-----------------------------|-----------|
| a. | <i>ār=t<sup>h</sup>áp-ó</i> | <i>kù</i> | b. | <i>ār=t<sup>h</sup>áp-á</i> | <i>kù</i> |
|    | 3SG.M=plaster-DD1           | hut       |    | 3SG.M=plaster-DD2           | hut       |
|    | ‘He plastered the hut.’     |           |    | ‘He plastered the hut.’     |           |
|    | (then came here)            |           |    | (then left towards you)     |           |
- 
- |    |                           |           |
|----|---------------------------|-----------|
| c. | <i>ār=t<sup>h</sup>áp</i> | <i>kù</i> |
|    | 3SG.M=plaster             | hut       |
|    | ‘He plastered the hut.’   |           |

The coding of associated motion is an integral part of the Koman DD system, where AM is expressed even when the lexical verb is negated. To illustrate, consider the Komo data in (103). Notice that negation has scope over the lexical verb event but not over the AM component expressed by the DD morphemes. In Koman, DD2 expresses AM towards the addressee only in the Dana-Opo branch. In the remaining languages (Gwama, Komo, Uduk), DD2 expresses AM directed away from the point of reference.

- (103) Komo
- |    |                                     |               |           |    |                                 |                |           |
|----|-------------------------------------|---------------|-----------|----|---------------------------------|----------------|-----------|
| a. | <i>bāf-í-n</i>                      | <i>t'òr-ú</i> | <i>mé</i> | b. | <i>bāf-í-n</i>                  | <i>t'òr-úk</i> | <i>mé</i> |
|    | NEG-DDØ-3PL                         | slaughter-DD1 | goat      |    | NEG-DDØ-3PL                     | slaughter-DD2  | goat      |
|    | ‘They didn’t slaughter a goat.’     |               |           |    | ‘They didn’t slaughter a goat.’ |                |           |
|    | (at other location, then came here) |               |           |    | (they left)                     |                |           |
- 
- |    |                                 |             |           |
|----|---------------------------------|-------------|-----------|
| c. | <i>bāf-í-n</i>                  | <i>t'òr</i> | <i>mé</i> |
|    | NEG-DDØ-3PL                     | slaughter   | goat      |
|    | ‘They didn’t slaughter a goat.’ |             |           |

The Koman languages provide counterevidence to an implicational hierarchy proposed for associated motion systems in Guillaume (2016), namely that the Koman systems only express AM ‘subsequent’ to the lexical root event, and do not express ‘concurrent’ nor ‘prior’ AM (cf. (101)-(103)).

In some African languages, it appears that Direction (of motion) and Associated Motion are often expressed by the same coding material; this is observed primarily when taking the semantic profile of the verb into account (see Belkadi 2015, 2016 for an

overview).<sup>118</sup> For instance, Mietzner (2012:171) argues that in certain Southern Nilotic languages deictic directional morphemes can also express an “altrilocal” or ‘other place’ function when occurring on a (potentially non-motion) lexical verb. In this case, the event denoted by the verb root can be construed as having occurred at a distinct location from that of the speech act or primary reference point. Similarly, Keissling (2007:128) describes “altrilocality” in Datooga (S. Nilotic), providing evidence that the ‘centrifugal’ extension on non-motion verbs indicates that the event denoted by the lexical verb root took place at a location that is not the deictic center. Alamin et al. (2012) use the term “alloying” to describe AM in Tima (Niger-Congo) in which the ventive marker codes deictic direction on motion verbs and subsequent associated motion (on non-motion verbs).

In a typological study of 20 languages from the four African phyla, Belkadi (2016:46) observes that such morphology with lexical motion roots all trigger directional readings, while the same morphology with lexical verbs describing certain (non-motion) activities trigger associated motion readings. She also observes that the distinction between motion and non-motion lexical verbs and their subsequent behavior (i.e. deictic direction or AM) is not categorical but rather gradient, depending largely on the semantic verb class. Belkadi (2016:64) proposes a tentative ranking of some lexical verb classes and the likelihood of whether an AM or directional reading would occur, reproduced here in (104). She proposes that verb classes on the left

---

<sup>118</sup> Prior attestations of what do appear to be AM systems in African languages are found scattered within descriptions of directional systems (Serzisko 1988, Reh 1996, Heath 2005, Bourdin 2006, Andersen 2012a, b, Payne 2013, Storch 2014, Kramer 2017 *inter alia*).

extreme are more likely to derive a directional reading while the classes towards the right extreme or more likely to derive an AM interpretation.<sup>119</sup>

(104) Path Motion > Motion > Causative motion> Perception> (Natural phenomena and bodily secretions?) > Activities not involving motion > States (adapted from Belkadi 2016:64)

Komanists have also observed the overlapping of direction, associated motion and aspectual functions coded by the same morpheme(s) on different classes of verbs. Burns (1947) describes “aspectual suffixes which also can also code direction” in Sudanese Komo. More recently, Hellenthal (2018) describes directional/associated motion in the Lowland Gwama DD system, and Killian (2015) does likewise for Chali Uduk, and Otero (2018, *accepted*) for Ethiopian Komo. In sum, the Koman DD systems exhibit an overall tendency for coding of direction of motion on intransitive motion verbs and AM on dynamic (non-motion) verbs as seen above in (98)-(100) and (101)-(103), respectively.

Across the Koman family, stative verbs are the least predictable and display a variety of nuanced meanings when combined with the DD morphology. In Gwama and Komo, DD1 on a stative verb retains the AM component directed towards the addressee as in (105a) and (106a), while DD2 expresses “exchoativity”, in which the subject has “left the state” or is “no longer in the state”. Examples of exchoativity in Gwama and Komo are seen in (105b) and (106b), respectively.

---

<sup>119</sup> The only example of what appears to be a stative verb in Belkadi’s study is *ɪŋg* ‘stay’ in Kenga (Nilotic), which expresses an AM interpretation with ventive marking (2016:62 *ex 36b*).

- (105) Gwama (Lowland)
- |    |  |    |  |
|----|--|----|--|
| a. | <i>zè tĩnd-í-ná~tĩdí</i><br>PROG be.fat-DD1-3SG.M~RED<br>‘He was becoming fat.’<br>(at another location, then came here) | b. | <i>zè tĩn-ní-gí~tĩdí</i><br>PROG be.fat-DD2-3SG.M~REDt<br>‘He was becoming fat.’<br>(He is no longer fat.) |
|----|--|----|--|
- 
- (106) Komo
- |    |   |    |  |
|----|---|----|--|
| a. | <i>máŋgà p’èl-ó-n í=jángú</i><br>mango be.red-DD1-3PL LOC=J.<br>‘(The) mangos were red in Yangu.’<br>(then were brought here) | b. | <i>máŋgà p’èl-kú-n í=jángú</i><br>mango be.red-DD2-3PL LOC =J.<br>‘(The) mangos were red in Yangu.’<br>(They are no longer red.) |
|----|---|----|--|

Deictic directional morphology on stative verbs in the Dana-Opo branch functions a bit differently than in Komo and Gwama. The examples in (107) and (108) contain data from Dana and Bilugu Opo with the DD morphemes on the verb ‘be tall’. In both languages, the DD1 morpheme behaves identically to the DD1 category in Gwama and Komo, expressing AM towards the speaker, as seen in (107a) and (108a). The DD2 morpheme, by contrast, strongly expresses AM to the addressee in Dana, as seen in (107b); but it is not allowed with stative roots in Bilugu Opo, as seen in (108b).<sup>120</sup>

- (107) Dana
- |    |   |    |   |
|----|---|----|---|
| a. | <i>hār-â būd-í</i><br>3SG.M-INT be.tall.SG-DD1<br>‘He will get tall.’<br>(then come here) | b. | <i>hār-â būd-á</i><br>3SG.M-INT be.tall.SG-DD2<br>‘He will get tall.’<br>(then go to you) |
|----|---|----|---|

---

<sup>120</sup> The Opo consultants rejected the DD2 morpheme on almost all of the stative verbs I attempted to elicit.

- c. *hār-â būd*  
 3SG.M-INT be.tall.SG  
 ‘He will get tall.’

(108) Opo (Bilugu)

- a. *ār=sík’-ó*  
 3SG.M=be.tall.SG-DD1  
 ‘He got tall.’  
 (then came here)

- b. \**ār=sík’-á*  
 3SG.M=be.tall.SG-DD2  
 (ungrammatical)

- c. *ār=sík’*  
 3SG.M=be.tall.SG  
 ‘He is tall.’

This concludes the overview of synchronic Koman morphology. The next chapter begins the reconstruction of Proto-Koman phonology.



CHAPTER III  
RECONSTRUCTION OF PROTO-KOMAN PHONOLOGY

This chapter presents a reconstruction of Proto-Koman (PKMN) phonology. I discuss the phonological innovations that took place in the segmental and suprasegmental domains, in light of the analyses proposed by Bender (1983). One notable issue is the role of tone in the reconstruction of PKMN phonology. In §3.1, I provide an overview of tone and discuss its diachronic relationship to reconstructing word-initial (syllable onset) stop consonants. I move on to PKMN consonants in §3.2. To conclude, I discuss PKMN vowels and ATR harmony in §3.3. In Chapter IV, I discuss the phonological innovations of each subnode.

### 3.1 Proto-Koman (PKMN) tone

A major aim of this phonological reconstruction is to reconstruct PKMN segments. Yet in doing so, it has become apparent that tone plays a significant role in the development of Koman consonants. There is historical interaction in Koman between tone and consonants specifically seen in word-initial stops and the feature [ $\pm$ voice]. For instance, in a particular word-initial correspondence sets, the Komo-Uduk branch exhibit /b, d, g/ corresponding to /p, t, k/ (respectively) in Gwama and the Dana-Opo branch. Bender (1983:283) notes these correspondence sets and reconstructs PKMN voiced stops \*b, \*d, \*g which are retained as voiced in the Komo-Uduk branch and “devoice” in the remaining branches, though he does not offer a motivation for the devoicing. I agree with Bender’s analysis and propose that the motivation for these changes (e.g. \*b > p) in Gwama and Dana-Opo are directly related to tone. As such, a

discussion of Proto-Koman tone is imperative before discussing the reconstruction of segments.

Additionally, a word-initial voicing contrast exists in all of the Koman languages though in the Uduk cluster, Killian (2015) observes the following synchronic consonant-tone restrictions for Chali Uduk: in syllable onsets, voiceless obstruents can only occur with M or H tones and voiced obstruents can only occur with L or LH (Rising) tones (§2.1.6.6). The fact that Uduk word-initial (syllable onset) voiced and voiceless obstruents are in complementary distribution with tones is of crucial importance to the reconstruction of PKMN tone as well as the reconstruction of word-initial stops.

Bender (1983:285) claims insufficient documentation of tone in Koman languages at the time of his writing to be able to reconstruct tone in PKMN, though he does presume that “proto-Koman was probably tonal”. Given the historical consonant-tone interactions in Koman, I must discuss the historical evolution of tone and stops in tandem. In this dissertation, I focus specifically on word-initial (syllable onset) consonants and the tone of the following vowel nucleus. In §3.1.1, I establish tone correspondence sets and look for correlations in the distribution of these tone correspondence sets with respect to word-initial stop onsets. In §3.1.2, I sketch out a historical scenario for the evolution of Koman tone in tandem with word initial consonants. In §3.1.3 I briefly examine tone and non-stop onsets and lastly, in §3.1.4, I discuss the exceptions to the main tone patterns and their implications for the historical scenario of consonant-tone evolution.

### 3.1.1 PKMN tone categories based on synchronic tone distribution

All of the living Koman languages exhibit contrastive tone with at least three level tones (Low, Mid, High) as well as (R)ising and (F)alling contour tones (§2.1). Tone in Koman languages is generally stable in noun roots, meaning that noun words generally never alter their tone. By contrast, in all of the languages in the Central Koman branch, tonal alternations or tonal suppletion in verb roots is employed to mark nominal/verbal number or aspect.<sup>121</sup> The functional load of grammatical tone is by far more prevalent in verbs than in nouns. The fact that verb root tone can vary must be taken into account when reconstructing tone categories. I employ the term tone “categories” as a neutral term to refer to reconstructed pitch realization on a single vowel nucleus. Given the diachronic development of tone and stop onset in Koman we shall see that a reconstructed tone category can be phonemic or allophonic. Determining exactly at what stage a particular tone category became phonemic can be challenging at times. As such, I employ tone category as a more general term.

Examining the tone of syllable nuclei following word-initial syllable onset stop consonants yields three major tone correspondence patterns. The three tone correspondence sets, labeled “A, B, C”, are seen in Table 45. In Set A and Set C, all languages exhibit synchronic H or L tone correspondences, respectively.<sup>122</sup> In

---

<sup>121</sup> Komo uses tonal suppletion in verb roots to mark number of the S/A argument. Dana and Opo employ tonal suppletion to mark nominal and verbal number. Uduk employs tonal alternations to mark aspect. It is unclear whether suppletive tone in verbs was an innovation of PCTRL Koman.

<sup>122</sup> A R tone (phonetically LH) in Uduk will correspond to H across the remaining languages when the word-initial consonant is a voiced stop. Also, Opo innovated an XH tone by splitting \*H > XH on [+high, +ATR] /i, u/ vowel nuclei and retaining H elsewhere. See §3.1.2 for discussion.

correspondence Set B, Gwama, Uduk and Opo display M tone while Dana and Komo have L tone.<sup>123</sup>

Table 45 Tone patterns in PKMN correspondence sets

Set	Gwama	Komo	Uduk	Dana	Opo
A	H	H	H	H	H
B	M	L	M	L	M
C	L	L	L	L	L

To illustrate, the data in (109) contain cognates from each of the three tone correspondence sets. The full data employed in establishing the tone correspondence sets can be found in Appendices C1-3.

(109)	Tone Set	Gwama	Komo	Uduk	Dana	Opo	Meaning
	A	táp'	táb	t <sup>h</sup> áb	t <sup>h</sup> áp	t <sup>h</sup> áp	'kick'
	B	pāj	pàj	p <sup>h</sup> āj	p <sup>h</sup> ād	p <sup>h</sup> āj	'fly (v.)'
	C	tàm	dàm	ḍàm	tàm	tàm	'honey'

The tone distributions in Table 45 suggest reconstructing three tone categories to PKMN given the three tone correspondence sets (A, B, C). Yet, the examination of how the tone correspondence sets distribute relative to word-initial stops in PKMN cognates yields more nuanced correspondence patterns. Here, it is important to highlight that it is the distribution of word-initial *reconstructed* consonants and reconstructed tone categories that is being examined. When doing so, the data suggest that reconstructed tones are generally in complimentary distribution relative to voicing of the initial

---

<sup>123</sup> Recall that Dana and Komo belong to distinct branches of Central Koman.

reconstructed consonant. The distribution tendencies between word-initial stop onsets in PKMN cognates and the tone patterns in Table 45 are presented in (110).

- (110) a. Tone correspondence Set A robustly occurs with reconstructed voiceless stop onsets and very marginally with reconstructed voiced stop onsets.
- b. Tone correspondence Set B only occurs with reconstructed voiceless stop onsets.
- c. Tone correspondence Set C only occurs with reconstructed voiced stop onsets.

Examples of reflexes with word-initial stops in tone correspondence Sets A-B are in

(111). Note that all reflexes occur with word-initial voiceless onsets, which crucially also reconstruct as voiceless consonants.

(111)	Tone Set	Gwama	Komo	Uduk	Dana	Opo	Meaning
a.	A	táp'	táb	t <sup>h</sup> áb	t <sup>h</sup> áp	t <sup>h</sup> áp	'kick'
b.	A	kús'	kós'	k <sup>h</sup> ús'	k <sup>h</sup> ós'	k <sup>h</sup> ótʃ'ó	'dry'
f.	B	pāj	pàj	p <sup>h</sup> āj	p <sup>h</sup> àḍ	p <sup>h</sup> āj	'fly (v.)'
g.	B	kāgā	kàʔ	k <sup>h</sup> āʔ	k <sup>h</sup> àk'à	k <sup>h</sup> āk'ā	'bitter'

Tone correspondence Set C, in which all languages exhibit synchronic L tone, only occurs with reconstructed voiced stops.<sup>124</sup> Some examples of reflexes in PKMN tone correspondence Set C are in (112).<sup>125</sup> Observe that not all word-initial consonants in the

<sup>124</sup> PKMN tone correspondence Set C can also occur in reflexes with other voiced consonants though I limit the analysis to stops, given the fact that their evolution is directly integrated with tone. See §3.1.3 for discussion of PKMN tone and word-initial consonants that are not stops.

<sup>125</sup> The voiced alveolar fricatives in the Gwama and Komo reflexes of 'grind wet' are the result of spirantization before high front vowels.

reflexes in (112) are synchronically voiced, though the onset consonant correspondences in (112) reconstruct to voiced stops.

(112)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
a.	*gàm	kàm	gàm	gàm	kàm	kàm	‘find, meet’
b.	*ḡàm	tàm	dàm	ḡàm	ṭàm	tàm	‘honey’
c.	*ḡim	zìṅā	zìm	ḡim	ṭim	tìm	‘grind wet’

One crucial pattern in reconstructing tone and word-initial stops is what is seen in (112): tone Set C reflexes have word-initial voiced stops in the Komo-Uduk branch that correspond with word-initial voiceless unaspirated stops in the Dana-Opo branch and in Gwama. This represents two independent innovations of PKMN  $*C_{[+voice, -aspirated]} > *C_{[-voice, -aspirated]}$  in Proto-Dana-Opo and in Proto-Gwama. I propose that this split was historically conditioned by tone, or that, more succinctly, word-initial stops and the tone of the following vowel evolved as a unit, or constellation so to speak.

To examine this more in detail, we must look at the correspondence sets for a full stop series to see the how the tone correspondences pattern. Table 46 contains the correspondence sets for word-initial  $*p^h$ ,  $*p$  and  $*b$ .<sup>126</sup> As mentioned in (110), PKMN word-initial consonant correspondence sets 1 and 2 only occur before tone correspondence sets A and B.

---

<sup>126</sup> Note that Komo and Gwama independently merged all of the voiceless unaspirated and voiceless aspirated stops across all places of articulation (§4.1.1).

Table 46 PKMN bilabial stops correspondence sets

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo				
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig	
1	*p <sup>h</sup>	p	p	p	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>
2	*p	p	p	p	p	p	p	p	p	p	p	p
3a	*b	p	p	b	b	b	p	p	p	p	p	p
3	*b	b	b	b	b	b	b	b	b	b	b	b

The primary split \*b > \*p in Proto-Gwama and Proto-Dana-Opo is reflected in PKMN \*b set 3a in Table 46. PKMN \*b correspondence set 3a only occurs with tone correspondence Set C, in which all languages exhibit synchronic L tone.<sup>127</sup> Some cognates from consonant correspondence set 3a (and tone set C) are seen in (113).<sup>128</sup>

(113)	Tone Set	Gwama	Komo	Uduk	Dana	Opo	Meaning
a.	C	pòm	bú	bwà	pùmá	pǔmá	‘pregnant’
b.	C	pòp’	bòb	–	–	pòj	‘skulk’
c.	C	pìt	bìt	bìt <sup>h</sup>	–	–	‘toss’
e.	C	pàj	bàjá	bè	–	pàj	‘wide’

Now that we have outlined the major tone correspondences and their distributions with word-initial stop onsets, a historical scenario for the evolution of tone in Koman is discussed in subsection §3.1.2.

<sup>127</sup> This correspondence between voiceless unaspirated and voiced stops occurs across all of the stops and is not limited to the bilabial place of articulation. Further, the correspondence set is limited to word-initial position.

<sup>128</sup> Note that there are exceptions such as Komo *bú* in (113a), which means ‘pregnant’ or ‘swell’ and may not be cognate for two reasons: word initial \*b does not generally correspond to [b] and Komo has a H tone when all others have L tone. Another exception is the Komo reflex in (113e), which contains an initial [b] yet it does correspond in L tone.

### 3.1.2 A historical scenario for the evolution of PKMN tone

The distributions of synchronic tone (i.e. tone correspondence sets A-C) coupled with the distributions of word-initial stops point to a historical scenario in which PKMN had three tone categories. Two of these tones (Set B and Set C) were in complementary distribution with respect to the voicing of the onset stop consonant as outlined in (110). We can consider the reconstructed tone categories instantiated by tone Set B and Set C as allotones in PKMN. These allotones are discussed more in detail in this section, though first we turn to an earlier stage in Koman's history.

In order to explain the distributions of tone and initial stops in PKMN, I reconstruct two tone categories to an earlier stage in PKMN, that is, to a Pre-Proto-Koman stage. Pre-Proto-Koman (P-PKMN) had two contrastive level tone categories. These P-PKMN tone categories were realized phonetically by two level pitches of contrasting F<sub>0</sub>, labeled here as **\*\*H** and **\*\*L** for simplicity. I argue that these two P-PKMN tone categories evolved into the three synchronic level tones seen across the family predominantly via a split in **\*\*L** following voiced stop word-initial onsets. I provide a brief sketch in (114) wherein P-PKMN **\*\*L** > PKMN **\*L**. PKMN **\*L** has two allotones, one Low allotone which is realized phonetically [L] (which corresponds to Tone Set B) and another Low allotone which is realized phonetically as Extra-Low [XL] (which corresponds to tone Set C). These allotones of PKMN **\*L** eventually phonologize into modern M and L tones, which I subsequently discuss in detail.



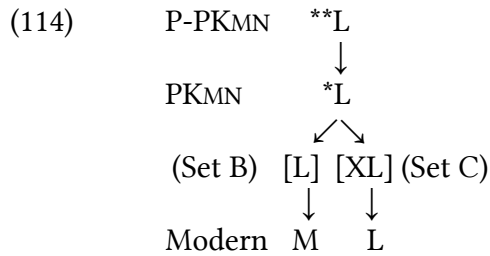


Table 47 contains a possible diachronic evolution of Koman tone in the environment following word initial onset stops. For clarity, I employ the bilabial graphemes <p<sup>h</sup>, p, b> as a schematized representation for all stops across four points of articulation (bilabial, interdental, alveolar, velar).<sup>129</sup> Given the fact that there is a direct correlation between the proto-tone category and voicing/aspiration of the proto-stop onset, I employ these graphemes followed by a tone symbol (i.e. L, H, etc.) to represent an initial consonant-tone “constellation”. For instance, in the first row of Table 47, \*\*p<sup>h</sup>\*\*H represents a constellation of any word-initial voiceless pre-proto-aspirated stop followed by pre-proto \*\*H tone.<sup>130</sup> This P-PKMN \*\*p<sup>h</sup>\*\*H constellation evolved into PKMN \*P\*H and into synchronic Gwama pH. I have also included a column of PKMN allotones to illustrate the allotonic realization of the reconstructed PKMN tone categories.

---

<sup>129</sup> To clarify, in Table 47, \*p<sup>h</sup> represents all reconstructed voiceless unaspirated stops, \*p represents all reconstructed voiceless aspirated stops, and \*b represents all reconstructed voiced stops.

<sup>130</sup> Recall that \*\*H tone represents the reconstructed tone category instantiated by the synchronic tone correspondence set A in which all languages display H tone.

Table 47 Evolution of Koman tone in PKMN cognates

Onset	SET	P-PKMN		PKMN	PKMN allotones		Pre Gwama	Pre- Komo	Uduk	Dana	Opo
*p <sup>h</sup>	A	**p <sup>h</sup> **H	>	*p <sup>h</sup> *H	[p <sup>h</sup> H]	>	pH	pH	p <sup>h</sup> H	p <sup>h</sup> H	p <sup>h</sup> H p <sup>h</sup> XH
	B	**p <sup>h</sup> **L	>	*p <sup>h</sup> *L	[p <sup>h</sup> L]	>	pM	pL	p <sup>h</sup> M	p <sup>h</sup> L	p <sup>h</sup> M
*p	A	**p**H	>	*p*H	[pH]	>	pH	pH	pH	pH	pH pXH
	B	**p**L	>	*p*L	[pL]	>	pM	pL	pM	pL	pM
*b	A	**b**H	>	*b*H	[bH]	>	bH	bH	bR	bH	bH
	C	**b**L	>	*b*L	[bXL]	>	pL	bL	bL	pL	pL

Table 47 shows that in P-PKMN, all initial stops had two contrastive tone categories, \*\*H and \*\*L. Over time the initial voiced stops acted as depressor consonants and lowered the F0 of the following vowel, creating an extra-low register in PKMN (\*b\*\*L > \*b\*L [bXL]). During the PKMN stage, three \*L allotones coexist: one allotone with a lower F0 following voiced stops (\*b\*L [bXL]) and two allotones with a higher F0 following voiceless onsets (\*p<sup>h</sup>\*L [p<sup>h</sup>L] and \*p\*L [pL]). When the \*b\*L allotone eventually phonologizes, three tone levels become contrastive: \*H > H is realized with a higher pitch than the M tone that arises from the \*L > M following voiceless onsets. This historical scenario yields three contrastive level tones in Gwama, Uduk and Opo.<sup>131</sup> Further, Proto-Gwama and Proto-Dana-Opo split PKMN voiced \*b\*L and merge with voiceless unaspirated /pL/.

Proto-Uduk (PUD) does not undergo the devoicing seen in Gwama and Dana-Opo. In the pitch register following voiced onsets, PKMN \*H tone becomes synchronic Rising tone in PUD: \*b\*H > bR.

<sup>131</sup> See §2.1.6.6 for discussion of Uduk tone.

One more tone split must be described. The final column of the  $**p^{h**}H$  row in Table 47 contains a Proto-Opo innovation of an extra-high tone (XH) by splitting POP  $*p^{h*}H$ . This split  $*p^{h*}H > p^hXH$  only occurred in nuclei that contained a [+high, +ATR] vowel /i, u/. Some examples illustrating this split are in (115) and the full set of correspondences are provided in Appendix C2.

(115)	Gwama	Komo	Uduk	Dana	Opo	Meaning
a.	ís	íʃ	ís	ísá	íśá	‘ripen’
b.	pīs	píʃ	píʃ	píʃ	píś	‘disregard’
c.	tǒkǒ	túk	túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>	‘acacia’
d.	wút	wút	út <sup>h</sup>	–	hút <sup>h</sup>	‘ostrich’

This historical tone scenario accounts for much of the data and yields the contrastive level tones seen in the modern languages with the exception of Komo and Dana. Recall that while  $*L > M$  following voiceless onsets (i.e. PKMN  $*p^{h*}L > p^hM$  and PKMN  $*p^*L > pM$ ) in the rest of the family, this did not occur in Komo and Dana. In Komo and Dana, the correspondences yield PKMN  $*L > L$  following all stop onsets (cf. Table 47). At present, I cannot account for how Komo and Dana developed a third level tone seen modernly in these languages and I leave this question for further research.

### 3.1.3 PKMN tone and non-stop consonants

We have seen that Koman tone and word-initial stop onsets exhibit a strong correlation diachronically. Non-stop word-initial consonants in terms of voicing and tone yields similar patterns to those described for the PKMN stops. Voiced onsets, including nasals, glides and the lateral generally occur with a tone set C

correspondence set, which correlates with the voiced stop onsets (116). There is no evidence for devoicing of sonorants.

(116)	Gwama	Komo	Uduk	Dana	Opo	Meaning
a.	màm	màmá	màm	màmá	màmā	‘carry on back’
b.	màf	màf	màf	màf	màs	‘wife, marry’
d.	àlàpé	lèpé	lèp <sup>h</sup> é	lèp <sup>h</sup> é	àlèp <sup>h</sup> é	‘claves’
e.	nàbòŋà	nàbòŋà	–	nàbòŋgò	nàbòŋgò	‘pelican (sp.)’
f.	wàsà	wàfāk’	wàsá	–	–	‘hail, ice’
g.	wàs’	wàs’	wàf	wàc’à	wàtʃ’à	‘fish’
h.	wàp’	wàp’	wàb	–	–	‘boar’
i	jì	jèk	jèk <sup>h</sup>	–	–	‘sow seeds’

#### 3.1.4 PKMN tone residue

Every historical reconstruction contains some residue and this reconstruction of PKMN tone is no exception. This section addresses some key residual issues in the reconstruction of PKMN tone categories. The major tone correspondences were discussed in §3.1.1 and their relationship to word-initial stop consonants as well as a historical scenario for the evolution of P-PKMN tone categories were discussed in §3.1.2. These analyses were based on the three major tone correspondence sets which exhibit consistent patterning (Table 47). Further, the independent innovations in Proto-Gwama and Proto-Dana-Opo of devoicing initial voiced stops and merging with voiceless unaspirated stops after the tone split creating the [XL] allotone of PKMN \*L strengthens the likelihood of word-initial voiced stops acting as depressor consonants; this eventually resulted in the phonologization of three level tones. However, this doesn’t account for all of the data.

In terms of PKMN tone, some residual issues with word-initial stops are: i. Cognates in tone Set C in which both or either Gwama and/or Dana-Opo do not exhibit devoicing, ii. residual tone “correspondences” with very few members, iii. cognate sets which do not display reconstructable tone patterning. I recognize that these issues cannot be solved here and require further investigation. Nevertheless, I elaborate on these issues in order to provide a foundation for future efforts at reconstructing PKMN tone.

There are a handful of cognates in which a word-initial voiced stop onset precedes L tone. This occurs in Gwama and the Dana-Opo branch, which contradicts the analysis presented in §3.1.2 that these languages devoiced word-initial voiced stops in tone set C contexts (\*L [XL] for convenience). One issue is the reliability of the cognates that display this exceptional pattern as the cognates are usually plant, animal, or place names, which could have been borrowed. Some examples are seen in (117).

(117)	Gwama	Komo	Uduk	Dana	Opo	Gloss
a.	bàbá	bǎ	àbàbá	–	àbá	‘father’
b.	ūdùmì	dùmè		dùmáj	dùmàj	‘tree (sp.)’
c.	gùs	gùf	gùs	–	–	‘run, flow’
d.	gǎnpá	–	ǎp <sup>h</sup> á	–	–	‘throwing club’

While the Dana-Opo branch always exhibits a voiceless unaspirated stop with tone correspondence set C (\*L [XL]), with the exception of the cognates in (117), the Gwama cluster displays more erratic behavior. Gwama does indeed exhibit historical devoicing of voiced stops before the \*L [XL] allotone but there are cases in which what appear to be cognates do not exhibit this change. These reflexes are seen in (118).

(118)	Gwama	Komo	Uduk	Dana	Opo	Gloss
a.	bùfùl	bùf	bùf	–	pùsà	‘belly’
b.	būs’	–	bùt̚	–	p <sup>h</sup> ùt̚f	‘choke’
c.	dàlís’	dìl	dìl	–	tìlí	‘stomp’
d.	gìm	–	jìm	–	–	‘stuff, pack in’
e.	gòs	gùf	gùs	–	–	‘run, flow’
f.	gjànpá	–	jàp <sup>h</sup> á	–	–	‘throwing club’

Recall that following voiceless stops, Dana and Komo retain PKMN \*L > L tone while all other languages shift PKMN \*L > M tone. Evidence for this tone pattern requires reflexes in Dana and Komo in order to determine whether they exhibit a synchronic L tone that corresponds to M tone in the other languages. There are four cognates, which all contain reflexes with M tone, seen in (119).<sup>132</sup> While I can offer no explanation, I do not believe four reflexes constitutes enough evidence to posit an additional proto-tone category. Note also that Dana unexpectedly exhibits H tone in ‘fear’.

(119)	Gwama	Komo	Uduk	Dana	Opo	Gloss
a.	*t’wānk’	bādāgí	dāk <sup>h</sup>	dāgí	dāgí	‘scorpion’
b.	t’wā	t’ā	t’wā	t̚’āʔá	t’ā	‘mouth’
c.	p’ík’ín	p’īn	t’īp’īn	p’īnā	p’īnā	‘ash’
d.	kwāgà	kōg	k <sup>h</sup> ōk’	k <sup>h</sup> ók	k <sup>h</sup> ōgó	‘fear’

Lastly, there are cognates that do not show any reconstructable patterning in tone. Some patterns may reflect erratic behavior in one intermediate proto-language, as in (120), in which no general tone correspondence can be found.

<sup>132</sup> Note that Dana exhibits M tone in (119d) and the full Gwama reflex in (119a) is a reduplicated form *t’wānkīt’wānk’* ‘scorpion’

(120)	Gwama	Komo	Uduk	Dana	Opo	Gloss
	M	H	H	H	H	
a.	kīl	à+kīl	céɲ	akíl	kíl	‘cattle egret’
	H	H	M	H	H	
b.	síʔ	ǰúmák’	sīmāʔ	ǰój	sój	‘bone’

Overall, there appears to be more inconsistency in synchronic tone correspondences with word-initial non-stop consonants than there is with word-initial stop consonants as seen in (121).<sup>133</sup> No robust tone pattern can be found for the former.

(121)	Gwama	Komo	Uduk	Dana	Opo	Gloss
	M	M	H	M	L	
a.	s’ē	s’ēʔ	ǰé	k’ē	tǰè	‘tooth’
	H	H	M	L	H	
b.	sóm	ǰóm	sām	sòm	sōm	‘warm oneself’
	M	L	M	L	L	
c.	ǰǰ̄	ǰǰ̄nǰ	ǰūǰ	ǰǰ̄	sǰ̄sǰ̄	‘nose’

Overall the data suggest a strong correspondence between word-initial stop onsets and historical tone. This is seen not only by the fact that historical tone categories can be clearly reconstructed following word-initial stop onsets but also by the subsequent independent innovations of stop devoicing robustly in PDAOP and marginally in PGW. While the historical scenario proposed here is not without exceptions, and there is

---

<sup>133</sup> I realize that this is an impressionistic observation that requires further research.

residue that cannot be accounted for, the notion of a consonant-tone constellation is crucial to reconstructing consonants and tone in Koman.

### 3.1.5 Observations on tonogenesis in Pre-Koman

Voicing in word-initial stops among other obstruents has been well documented as interacting with the pitch realization of the following vowel. This can ultimately result in historical contrastive pitch, or tone, as Hombert (1978:78) observes:

“The development of contrastive tones on vowels due to the loss of a voicing distinction on obstruents in prevocalic position is probably the most well documented type of tonogenesis. When such a development occurs, a relatively lower pitch register develops on vowels following the previously voiced series, and a relatively higher pitch is found after the previously voiceless or voiceless aspirated series. This process can lead to a multiplication by two of the number of tones. If the language is atonal, it will have two tones after this development; an already existing two-tone system can be transformed into a four-tone system, and so on.”

In a study of tonogenesis in Chadic, Wolff (1987:199) observes that “the voicing distinction of syllable-initial obstruents plays the all-decisive role in assigning pitch realizations to following vowels”. Further, while “[...] the voicing distinction is still phonologically operative in these languages, there is no indication whatsoever that the contrast between voiced and voiceless obstruents, for instance, is being given up.” This observation appears to parallel at least one stage in the history of Pre-Koman tone in which there is a strong correlation between the voicing of the word-initial (syllable onset) stop and the tone of the following vowel.<sup>134</sup> While this dissertation does not aim to reconstruct tonogenesis in Pre-Koman, the historical scenario for the evolution of

---

<sup>134</sup> At present, there does not appear to be a relationship between the final consonant of a (CVC) root and the tone on the preceding vowel, though I recognize this requires further investigation.



tone and the interaction with stop onsets discussed in §3.1.2 does harken to Wolff's observations in Chadic. I leave this issue for future research. We now turn to focus more specifically on the reconstruction of PKMN consonants.

### 3.2 Proto-Koman (PKMN) consonants

The proposed Proto-Koman consonant inventory is in Table 48. A total of 29 consonants can be reconstructed not including four marginal consonants. One noteworthy observation is the reconstruction of an interdental stop series, with the exception of \*tʰ for which there is marginal evidence. Bender (1983) did not reconstruct an interdental series of stops and attributed the interdental series seen modestly in Chali Uduk as an Uduk innovation. Bender did not have data from Dana, which exhibits interdental stops that correspond to Chali Uduk interdental stops. Another important result is the reconstruction of a series of voiceless aspirated stops, where Bender (1983) only reconstructed \*kʰ. Note, however, that \*cʰ cannot be reconstructed. Other notable features of the PKMN consonant inventory include ejective stops in all five places of articulation as well as a voiceless alveolar fricative/affricate ejective \*s'.

Table 48 Proto-Koman (PKMN) consonant inventory  
(Parentheses indicate marginally reconstructable phonemes)

*p <sup>h</sup>	(*t <sup>h</sup> )	(*t <sup>h</sup> )		*k <sup>h</sup>
*p	*t	*t	*c	*k
*b	*d	*d	*ʃ	*g
*p'	*t'	*t'	*c'	*k'
*ɓ		*d'		
	*T	*s	*ʃ	*h
	*D			
		*s'		
*m		*n	(*ɲ)	(*ŋ)
		*l		
		*r		
*w			*j	

The history and development of word-initial PKMN consonants has undergone a number of noteworthy innovations, some of which were a function of the tone in the syllable nucleus, as described in §3.1. In the following subsections I examine each proto-phoneme individually and discuss the pertinent PKMN innovations.

I provide correspondence sets for each proto-phoneme, according to the schema seen in Table 49. The first column indicates a “correspondence set number” that is unique to a particular correspondence set.<sup>135</sup> This is followed by the reconstructed proto-phoneme. Under each language or language cluster, I indicate the varieties such as “Lowland” (Lo), “Yabus” (Yab), etc.<sup>136</sup>

<sup>135</sup> Sets 1-5 comprise the bilabial stops, sets 6-9 are interdental, sets 10-15 are alveolars, sets 16-18 are palatals, sets 19-22 are velars, sets 23-25 are the voiceless fricatives, sets 26-27 are the lateral and trill, sets 28-31 are nasals, and sets 32-33 are glides.

<sup>136</sup> The language varieties are as follows: Lo= Lowland Gwama, Hi= Highland Gwama, Yab= Yabus Uduk, Cha= Chali Uduk, Bil= Bilugu Opo, Mod= Modin Opo, Pam= Pame Opo, Kig= Kigile Opo.

Table 49 Schematic for PKMN correspondence sets

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
<i>n</i>	*C	C	C	C	C	C	C	C	C	C	C

After discussing a correspondence set, I provide a short set of data to illustrate the correspondence. In the illustrative data sets, I do not indicate the specific language variety for issues of space (e.g. Lowland Gwama), but the appendices provide all of the data used to establish every correspondence set. Thus, if the reader wishes to identify the particular variety of a particular lexical reflex, this information can be found in the appendices. Further, the reader can find there the data employed in reconstructing every consonant in this study.

### 3.2.1 PKMN bilabial obstruents

The proto-Koman bilabial obstruent series contrasts across five manners of articulation: voiceless aspirated, voiceless unaspirated, voiced, ejective and implosive. The following five bilabial obstruents can be confidently reconstructed to PKMN \*p<sup>h</sup>, \*p, \*b, \*p', \*ɓ. Uduk, Dana and Opo are the most conservative languages, retaining all of the PKMN bilabial obstruents. Komo and Gwama exhibit parallel mergers of the voiceless aspirated and voiceless unaspirated bilabial stops: \*p<sup>h</sup> + \*p > p.<sup>137</sup> Further, Gwama merged the bilabial implosive with the bilabial ejective \*ɓ > \*p'.

<sup>137</sup> To be clear the grapheme <p> employed as the result of the merger does not represent a voiceless unaspirated consonant rather the merger of voiceless unaspirated and voiceless aspirated. Gwama and Komo do not display contrastive aspiration.

### 3.2.1.1 PKMN \*p<sup>h</sup>

A voiceless aspirated bilabial stop \*p<sup>h</sup> can be reconstructed to PKMN in word initial/medial and word-final positions. The PKMN \*p<sup>h</sup> correspondence set 1 is seen in Table 50. Reflexes of PKMN \*p<sup>h</sup> are retained as [p<sup>h</sup>] in all of the languages except for Komo and Gwama, which independently merged PKMN \*p<sup>h</sup> > \*p.<sup>138</sup>

Table 50 PKMN \*p<sup>h</sup> correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
1	*p <sup>h</sup>	p	p	p	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>	p <sup>h</sup>

Some cognates containing reflexes of PKMN \*p<sup>h</sup> are seen in (122) and the full set of cognates containing reflexes of \*p<sup>h</sup> can be seen in Appendix D1.

(122)

PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
*p <sup>h</sup> àḍ	pāl	pàj	p <sup>h</sup> ē	p <sup>h</sup> àḍ	p <sup>h</sup> āj	‘fly (v.)’
*p <sup>h</sup> uj	pī	pì	p <sup>h</sup> í	p <sup>h</sup> ùj	p <sup>h</sup> ú	‘blow (with mouth)’
*úp <sup>h</sup>	óp	úp	úp <sup>h</sup>	úp <sup>h</sup>	úp <sup>h</sup>	‘bathe’

### 3.2.1.2 PKMN \*p

A voiceless unaspirated stop \*p can be confidently reconstructed to PKMN in correspondence set 2 seen in Table 51. Uduk, Dana and Opo retain [p] reflexes of \*p while Komo and Gwama merge \*p > \*p<sup>h</sup>.<sup>139</sup>

<sup>138</sup> Whether or not these mergers in Komo and Gwama were also the result of close contact is undeterminable at present.

<sup>139</sup> Gwama and Komo exhibit independent mergers of all \*C<sup>h</sup> > C stop consonants and as a result, are the only Koman languages that do not exhibit synchronic contrastive aspiration.

Table 51 PKMN \*p correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
2	*p	p	p	p	p	p	p	p	p	p	p

Some word initial reflexes of \*p are in (123). As alluded to in §3.1, historical PKMN tone plays a factor in the development of word-initial \*p. All word-initial reflexes of \*p for which tone can be reconstructed exhibit PKMN tone correspondence Set A or Set B.<sup>140</sup> Recall that in tone set A, all languages have synchronic H tone, as seen in (123a-b).<sup>141</sup> In tone set B, all word-initial reflexes of PKMN \*p in Dana and Komo have L tone corresponding to M elsewhere, as seen in (123c).<sup>142</sup> It is important to mention here that there are no reflexes of word-initial PKMN \*p that reconstruct to PKMN tone correspondence set C, in which all languages exhibit synchronic L tone. The full set of \*p reflexes is provided in Appendix D.2.

(123)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
a.	*pít <sup>h</sup>	pít	pít	–	pít <sup>h</sup>	–	‘vagina’
b.	*píj	pīs	píj	píj	píj	pís	‘disregard’
c.	*pàD	pāt	pāt	pār	–	–	‘crawl, touch’

<sup>140</sup> See §3.1 for discussion of PKMN tone.

<sup>141</sup> Also recall that the XH tone in Opo in (123b) is the result of a POP innovation which split \*H > XH tone on [+high, +ATR] vowel nuclei /i, u/, and > H elsewhere

<sup>142</sup> I cannot explain the H tone in Dana in (123c) though the rest of the languages exhibit the PKMN tone Set B correspondence which reconstructs to the \*L tone category in PKMN.

Gwama and Komo share many cognates with an initial /p/ that do not have cognates in the other languages. As such, determining whether the initial voiceless bilabial stops in these lexemes are reflexes of PKMN \*p<sup>h</sup> versus \*p is not possible given the fact that a reflex in a language that retains contrastive aspiration is the indicator of the correspondence set to which the reflex belongs. Another possibility is that these lexemes were innovations in either Komo or Gwama that were then borrowed through contact, though this remains to be investigated.

### 3.2.1.3 PKMN \*b

A voiced bilabial stop \*b can be reconstructed to PKMN in the two correspondence sets seen in Table 52. While the existence of two correspondence sets suggest reconstructing two proto-phonemes, the conditioning for these two PKMN \*b correspondence sets in word-initial position is the reconstructed tone category of the following vowel nucleus.

Table 52 PKMN \*b correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
3	*b	b	b	b	b	b	b	b	b	b	b
3a	*b	p	p	b	b	b	p	p	p	p	p

The two \*b correspondence sets appear to be in complementary distribution with respect to the proto-tone categories with which they occur. To illustrate, word-initial reflexes in \*b correspondence set 3 can occur before PKMN tone correspondence set A,

in which all languages exhibit H tone except for Uduk which exhibits R tone, as seen in (124).<sup>143</sup>

(124)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*bángwà	bánɡà	bánkò	bǎngò	–	–	‘cannabis’
	*bár	bár	bár	–	bár	bár	‘heron’

By contrast, reflexes in the PKMN \*b correspondence set 3a, in which voiced bilabial stops in Komo and Uduk correspond to voiceless unaspirated stops in Gwama and the DAOP branch, only occur with PKMN tone correspondence set C, in which all languages exhibit synchronic L tone. Recall that PGW and PDAOP split and merged word-initial \*b > p in tone set C and retained /b/ elsewhere. Some cognates containing reflexes of PKMN \*b are in (125); the full set of reflexes is provided in Appendix D3a.

(125)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*bit <sup>(h)</sup>	pìt	bìt	bìt	–	–	‘toss’
	*bwaŋ(a)	pwǎŋ	–	bwàj	–	–	‘path, towards’
	*bɔ́b	pòp’	bòb	–	–	pòj	‘skulk’

#### 3.2.1.4 PKMN \*ɓ

All of the living Koman languages with the exception of the Gwama varieties exhibit bilabial and alveolar implosives. A bilabial implosive \*ɓ can be confidently reconstructed to PKMN. All of the languages have retained a bilabial implosive reflex /ɓ/ of PKMN \*ɓ with the exception of Gwama, which merged PKMN \*ɓ with \*p’.

---

<sup>143</sup> Exceptions to this observation are discussed in the section on PKMN tone residue in §3.1.4.

Table 53 PKMN \*b correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
4	*b	p'	p'	b	b	b	b	b	b	b	b

Some cognates containing reflexes of word-initial PKMN \*b are seen in (126) and the full set of correspondences is provided in Appendix D4.

(126)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*bɪɖa	p'ɪl	bà	bā	bɪɖà	bɪjā	'neck'
	*bɪt'	p'í	bís'	bít'	–	–	'strong'
	*bɔŋk'ɔ	(p'à-)bɔŋɔ	(bā-)bɔŋk'ɔ	–	(à-)bɔŋk'ɔ	(à-)bɔŋk'ɔ	'frog'

Synchronically, implosives are restricted to word-initial position in most of the Koman languages, with the exception of Chali and Bonya Uduk, which exhibit implosives in all positions. Exceptional intervocalic implosives outside of Uduk can be attributed to historical implosives in word-initial position which became intervocalic due to the lexicalization of a gender prefix. This is seen in some of the reflexes of 'frog' in (126). The reflexes of 'frog' contain synchronic intervocalic bilabial implosives in Komo, Dana and Opo but historically the root was \*bɔŋk'ɔ, to which gender/number prefixes lexicalized. Note that in the Gwama lexeme \*(p'à-)bɔŋɔ, the \*b reflex is realized as /b/ intervocalically.<sup>144</sup>

<sup>144</sup> See §2.1.4.2 for a description of intervocalic voicing of ejectives in Gwama and see §2.2 for a description of Koman number/gender morphology.



### 3.2.1.5 PKMN \*p'

A bilabial voiceless ejective \*p' can be reconstructed to PKmn, based on correspondence set 5, seen in Table 54. PKMN \*p' is retained in word-initial position as /p'/ in all of the languages. In word-final position, /p'/ is retained in all languages except the Uduk cluster. In word-final position, reflexes of \*p' are often realized as unreleased or even delayed release, often resulting in full closure that lasts several seconds.<sup>145</sup>

Table 54 PKMN \*p' correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
5	*p'	p'	p'	p'	p'	p'	p'	p'	p'	p'	p'

Selected reflexes of \*p' are seen in (127) and the full set of reflexes are provided in Appendix D5.<sup>146</sup>

(127)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Concept
	*(t'i)p'lk'Iɲ(a)	p'ik'in	p'in	t'ip'ɪɲ	p'imā	p'inā	'ash'
	*p'ɔt'(a)	p'ót	p'òt'	–	p'òt'hà	p'òt'ā	'pick'
	*wɔp' ~ hɔp'	hǒbòs'	wòp'	k <sup>h</sup> òbòs'	hòp'	hòp'	'sip liquid'

The realization of the reflexes of \*p' in intervocalic position is more unpredictable—some languages exhibit intervocalic /p'/ while others exhibit /b/ reflexes. Voicing of

<sup>145</sup> It is common in the Koman languages for glottalized consonants to be unreleased in word-final position, especially in careful elicited speech. This has also been described in Chali Uduk (Killian 2015), Lowland Gwama (Goldberg 2018), and Komo (Otero 2018b).

<sup>146</sup> My Uduk consultants provided *t'ip'ɪɲ* 'ash' while Beam & Cridland (1970) and Killian (p.c.) have *p'ɪɲ*. I employ parentheses to indicate the discrepancy. The source of the initial segment *t'ɪ* in my transcription remains unknown.

ejective stops in intervocalic position appears to be an ongoing phonetic process in some of the Koman languages.

### 3.2.2 PKMN interdental stops

The only Koman languages that display a synchronic contrastive interdental series of stops are in two main branches of Central Koman: Dana from the DAOP branch and the Chali and Bonya Uduk varieties of the KOUD branch.<sup>147</sup> Synchronically, these stops are clearly interdental – articulated with the tongue between the teeth during closure followed by a release which may have some minor frication. Koman may have developed the interdental stops via contact with Western Nilotic. Phonemic interdental stops contrasting with alveolar stops are attested in all three branches of Western Nilotic, some of which are spoken in areas contiguous with Koman speakers.<sup>148</sup>

Given the fact that only two Koman languages display contrastive interdental stops, a particular challenge for reconstructing interdental stops to PKMN is finding cognates in Chali Uduk and Dana words that contain interdental reflexes. While such apparent cognates do occur, one must also weigh the validity of a proposed PKMN cognate against possible borrowing or contact. All of this taken into account, there does seem to be enough evidence for the following PKMN interdental stops: \*t̪, t̪ʰ and d̪. Evidence for reconstructing a voiceless aspirated interdental stop \*t̪ʰ to PKMN is less convincing.

---

<sup>147</sup> I was unable to precisely determine whether Bonya Uduk exhibits interdental stops as my time with a Bonya consultant was limited. The Bonya and Chali varieties are very close and I expect that Bonya does in fact display contrastive interdental stops, though I have opted to not include Bonya in this study due to unreliable data.

<sup>148</sup> Contrastive interdental stops are attested in the Southern Burun branch in Mabaan (Andersen 1999a) and Jumjum (Andersen 2004), in the Northern Burun branch in Kurmuk (Andersen 2007) and Mayak (Andersen 1999b), in the Dinka-Nuer branch in Agar Dinka (Andersen 1987a) and in Nuer (Huffman 1929), as well as in the Luo branch in Päre (Andersen 1988). Andersen (1987b) also describes contrastive interdental stops in Lulubo, a Central Sudanic language spoken in South Sudan.

### 3.2.2.1 PKMN \*t̥<sup>h</sup>

There is scant evidence for reconstructing \*t̥<sup>h</sup> to PKMN. Given that Chali Uduk and Dana are the only languages exhibiting interdental stops, a voiceless aspirated interdental stop reflex /t̥<sup>h</sup>/ must occur in at least one of the languages to even consider reconstructing \*t̥<sup>h</sup>. If \*t̥<sup>h</sup> were to be reconstructed, the correspondence set is seen in Table 55. The Uduk and Opo varieties merge \*t̥<sup>h</sup> with t<sup>h</sup>, while Gwama and Komo independently eventually merge all of the voiceless (aspirated and unaspirated) interdentals and alveolar stops \*t̥<sup>h</sup> > t<sup>h</sup> > t > t̥ > t.<sup>149</sup>

Table 55 PKMN \*t̥<sup>h</sup> correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
6	*t̥ <sup>h</sup>	t	t	t	t <sup>h</sup>	t <sup>h</sup>	t̥ <sup>h</sup>	t <sup>h</sup>	t <sup>h</sup>	t <sup>h</sup>	t <sup>h</sup>

In my database, there are no cognates that contain interdental [t̥<sup>h</sup>] in both Chali Uduk and Dana. The only PKMN cognates with word-initial /t̥<sup>h</sup>/ reflexes in Dana are seen in (128). Of the two that have word-initial /t̥<sup>h</sup>/, only ‘kick’ contains a reflex in Chali Uduk. Note that in ‘kick’, Chali Uduk displays a voiceless aspirated alveolar word-initial reflex /t̥<sup>h</sup>/. Given the paucity of data, I tentatively reconstruct \*t̥<sup>h</sup> to PKMN.

(128)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*t̥ <sup>h</sup> u	tū	–	–	t̥ <sup>h</sup> úwà	t̥ <sup>h</sup> újhá	‘spit (v.)’
	*t̥ <sup>h</sup> áb	táp’	táb	t̥ <sup>h</sup> áb	t̥ <sup>h</sup> áp	t̥ <sup>h</sup> áp	‘kick’
	*pít̥ <sup>h</sup>	pít	pít	–	pít̥ <sup>h</sup>	–	‘vagina’

<sup>149</sup> See §4 for a more detailed discussion of the evolution of consonants in each Koman subnode.

### 3.2.2.2 PKMN \*t̥

A voiceless interdental stop can be reconstructed to PKMN based on the correspondence set in Table 56. In \*t̥ set 7, Dana and Chali Uduk retain /t̥/ reflexes while all other languages merge reflexes of \*t̥ with reflexes of \*t.

Table 56 PKMN \*t̥ correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
7	*t̥	t	t	t	t	t̥	t̥	t	t	t	t

The most solid evidence for reconstructing a single voiceless unaspirated interdental stop \*t̥ is if both Chali Uduk and Dana exhibit voiceless interdental stop /t̥/ reflexes. Further evidence to support PKMN \*t̥ is if the remaining languages exhibit alveolar stops. The two \*t̥ cognates that have reflexes with interdental stops in both Chali Uduk and Dana and also have corresponding voiceless alveolar stops elsewhere in the family are seen in (129). It is crucial to note that none of the \*t̥ reflexes can be reconstructed to PKMN tone set C, which only occurred following voiced stops (§3.1).

(129)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*t̥úk <sup>(h)</sup> (u)	tǒkò	túk	t̥úk <sup>h</sup>	t̥úk <sup>h</sup>	t̥úk <sup>h</sup>	‘acacia’
	*t̥(ɔ)t̥ <sup>(h)</sup> ɔd	twéj	tó	t̥óɔ	ɔt̥ <sup>h</sup> ó	ótó	‘grind (second grind)’

There are two cognates with [t̥] reflexes in Dana corresponding to /t̥/ elsewhere except Gwama, which exhibits /s/, as seen in (130). There does not appear to be any conditioning outside of possible spirantization before a high front vowel in (130)a, but that does not account for (130)b. As such, these Gwama reflexes are treated as

idiosyncratic \*t̥ and \*s mergers. All of the data employed in reconstructing \*t̥ can be found in Appendix D7.

(130)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
a.	*t̥t̥	sít	tít	tít <sup>h</sup>	t̥t̥ <sup>h</sup>	títí	‘roughen stone (for grinding)’
b.	*t̥Ub(a)	só	–	t̥p <sup>h</sup>	t̥úbá	t <sup>h</sup> úbá	‘pierce’

### 3.2.2.3 PKMN \*ḍ

A voiced interdental stop \*ḍ can be reconstructed to PKMN based on the correspondence sets seen in Table 57. PKMN \*ḍ correspondence set 8 can be reconstructed to initial, medial and final positions, while set 8a only occurs in word-initial/syllable onset position. For word-initial reflexes, these two \*ḍ correspondence sets are in complimentary distribution with respect to the historical tone of the following vowel nucleus, which is described below.

Table 57 PKMN \*ḍ correspondence sets

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
8	*ḍ	d	d	d	d	ḍ	ḍ	d	d	d	d
8a	*ḍ	t	t	d	d	ḍ	t̥	t	t	t	t

In PKMN \*ḍ set 8, Chali Uduk and Dana retain /ḍ/ while mergers of \*ḍ with /d/ occur elsewhere. Some reflexes of \*ḍ in correspondence set 8 in initial and final positions are seen in (131); the full set of reflexes are provided in Appendix D8. In word-initial position, set 8 is limited to cognates which do not reconstruct to PKMN tone set C, in

which all languages exhibit L tone synchronically (§3.1.1). In medial/final position there is evidence for overall weakening [ḍ > d > r > l > j > Ø] though there does not appear to be a consistent pattern. Note that word-final devoicing and/or elision is common across Koman.

(131)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*ḍerk'és'	dērgés'	–	ḍèrès	ḍérk'és	–	'slip (v.)'
	*sud(i)	fól	fùʔí	sū	sùḍ	swī	'beer'
	*gUḍUm	kòróóm	gùdúm	–	gùḍùm	kùdùmà	'pig'

The reflexes in PKMN \*ḍ set 8a only occur with PKMN tone set C, in which all languages have L tone (§3.1.2). Historically, word-initial stops tone lowered the F0 on the following vowel in this PKMN \*L correspondence set. Subsequent to this, PGW and PDAOP independently devoiced the word-initial voiced stops occurring with this lowered tone and merged them with the voiceless unaspirated stops. This pattern occurs across all of the voiced stop series. Some reflexes of \*ḍ from set 8a are seen in (132) and the full set is provided in Appendix D8a. Note that Gwama, Komo and Yabus Uduk spirantize reflexes of \*ḍ > z before high front vowels, as seen in 'strain'.

(132)	PKMN	Gwama	Komo	Uduk (Yabus)	Uduk (Chali)	Dana	Opo	Meaning
	*ḍàm	tàm	dàm	dàm	ḍàm	tâm	tàm	'honey'
	*ḍim	zìṅā	zìm	zìm	ḍim	tìm	tìm	'strain'

### 3.2.2.4 PKMN \*t̥

An interdental ejective \*t̥ can likely be reconstructed to PKMN based on the correspondence sets in Table 58. PKMN \*t̥ set 9 occurs only in word-initial/syllable onset position, while set 9a occurs only in word-final position.

Table 58 PKMN \*t̥ correspondence sets

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
9	*t̥	t̥	t̥	t̥	t̥	t̥	t̥	t̥	t̥	t̥	t̥
9a	*t̥	t̥	t̥	t̥	d	d̥	t̥	t̥	t̥	t̥	t̥

Given the limited data available for \*t̥ reflexes in word-initial (syllable onset) position, it tentatively appears that Dana retains an interdental ejective reflex /t̥/ while elsewhere in the family \*t̥ > t̥. Note that according to these data, it appears that in Chali Uduk, \*t̥ forms part of a chain shift wherein \*t̥ > t̥ and \*s̥ > t̥.<sup>150</sup> The word-initial or syllable onset reflexes of \*t̥ are in (133) and the full set of data is in Appendix D9.

(133)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*t̥wa	t̥wā	t̥wā	t̥ā	t̥āʔá	t̥ā	‘mouth’
	*t̥wI	t̥wí	–	–	t̥wī	–	‘enter’
	*hat̥is	hāt̥iʃ	--	--	hát̥is	hāt̥is	‘sneeze’
	*t̥en	s̥in	s̥én	t̥én	t̥én	t̥én	‘alone, abstain’

<sup>150</sup> See §3.2.3.6 for discussion of PKMN \*s̥.

In word-final position, PUD shifts \*t̥ > d which leads to a merger in Yabus Uduk of reflexes of \*d̥ with those of \*d. Some examples of cognates with word-final \*t̥ reflexes are seen in (134) and the full set of data is provided in Appendix D9a.

(134)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*s̥t̥'	f̥it'	f̥it'	s̥id'	s̥it'	s̥it'	'far (be)'
	*m̥t̥'	mit'	–	m̥ed'	m̥et'	mit'í	'hand'
	*k'wànt̥'	k'wānt'íkwānt'	k'wàt'	k'wād'	k'wàt'	k'wāt'	'tick'

### 3.2.3 PKMN alveolar stops and alveolar affricate ejective

A full series of alveolar stops can be reconstructed in word-initial position to PKMN with the exception of \*t<sup>h</sup>, which can be marginally reconstructed in word-final position only. There is robust evidence for reconstructing an alveolar affricate/fricative ejective \*s'.

#### 3.2.3.1 PKMN \*t<sup>h</sup>

An aspirated alveolar stop \*t<sup>h</sup> cannot be reconstructed to PKMN in word-initial position, though what appear to be reflexes of PKMN \*t can tentatively be reconstructed in word final position, as seen in correspondence set 10 in Table 59. This correspondence set does not instill much confidence in PKMN \*t<sup>h</sup> for two important reasons. First, word-final devoicing (and subsequent aspiration) is common among all of the languages and the reflexes of word-final \*t<sup>h</sup> could in fact be reflexes of \*t, \*t̥, \*t̥<sup>h</sup> or \*d.<sup>151</sup> Lastly, \*t<sup>h</sup> correspondence set 10 does not contain any cognates in Dana. Recall

---

<sup>151</sup> Note that phonological contrast between voiced and voiceless stops across the languages varies and for some languages, adding a vowel-initial suffix to a root containing a word-final aspirated stop can



that in PKMN \*t<sup>h</sup>, Dana retains the interdental aspirated stop while Chali Uduk merges \*t<sup>h</sup> > t<sup>h</sup>. With these facts taken into account, reconstructing \*t to PKMN remains tentative at best.<sup>152</sup>

Table 59 PKMN \*t<sup>h</sup> word-final correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
10	*t <sup>h</sup>	t	t	t	t <sup>h</sup>	t <sup>h</sup>	–	t <sup>h</sup>	t <sup>h</sup>	t <sup>h</sup>	t <sup>h</sup>

Some cognates containing reflexes of PKMN \*t<sup>h</sup> in word-final position are seen in (135) and the full set of cognates is provided in Appendix D10.

(135)	PKMN	Gwama	Komo	Uduk	Opo	Meaning
	*bit <sup>(h)</sup>	pìt	bìt	bít <sup>h</sup>	–	‘toss’
	*wut <sup>h</sup>	wùt	wùt	?út <sup>h</sup>	hút <sup>h</sup>	‘ostrich’
	*kUt <sup>h</sup>	gōt	kùt	kūt <sup>h</sup>	–	‘short (be)’

### 3.2.3.2 PKMN \*t

A voiceless unaspirated alveolar stop \*t can be reconstructed to PKMN via the correspondence set seen in Table 60. In \*t correspondence set 11, Komo and Gwama independently merge reflexes of PKMN \*t with reflexes of PKMN \*t<sup>h</sup> and /t/ is retained elsewhere in the family (§3.2.3.1).

---

surface as a voiced stop. I have done my best to keep track of this variation, but I do recognize my possible shortcomings in transcriptions.

<sup>152</sup> Note also that in the PCTRL \*t<sup>h</sup> correspondence set 10, there are a few cognates in Dana but not in Chali Uduk. I can only confidently reconstruct \*t to the PUD and POP subnodes. See §4 for discussions of PCTRL, PUD and POP phonology.

Table 60 PKMN \*t correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
11	*t	t	t	t	t	t	t	t	t	t	t

Some cognates containing reflexes of PKMN \*t in word initial position are seen in (136); the full set of reflexes is seen in Appendix D11. Note that the tone on the vowel following all initial \*t reflexes cannot be reconstructed to PKMN tone set C, as this tone correspondence set only occurred with historical word-initial voiced stops (§3.1).

(136)	Gloss	PKMN	Gwama	Komo	Uduk	Dana	Opo
	‘tall (be)’	*tUr	tũ	tól	túr	–	–
	‘shake (sth.)’	*tEŋ(g)(E)	tīgī	–	–	téŋ	tíŋhá

### 3.2.3.3 PKMN \*d

There is solid evidence for reconstructing a voiced alveolar stop \*d to PKMN, based on the two correspondence sets in Table 61. In \*d set 12 all languages retain a /d/ reflex of \*d, while in set 12a, Gwama and the Dana-Opo branch exhibit /t/ corresponding to /d/ in the Komo-Uduk branch. These two correspondence sets are in complementary distribution word-initially with respect to the historical tone on the following vowel.

Table 61 PKMN \*d correspondence sets

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
12	*d	d	d	d	d	d	d	d	d	d	d
12a	*d	t	t	d	d	d	t	t	t	t	t

Word-initial reflexes in \*d set 12 all occur with synchronic H tone or reconstructed PKMN tone set A. Some examples are seen in (137); the full set of cognates with reflexes for this correspondence set are seen in Appendix D12.

(137)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*dóʝè	dóʝè	dóʝè	–	dóʝè		‘pipe’
	*dwak <sup>h</sup>	dwâk	dôk	–	dwák <sup>h</sup>	dwák <sup>h</sup>	‘bird_weaver’

Word-initial reflexes in \*d set 12a all occur with synchronic L tone which can be reconstructed to PKMN tone set C. All of the word-initial voiced stops that reconstruct with tone set C became devoiced and merged with the voiceless unaspirated stops. Some examples of \*d reflexes from \*d correspondence set 12a are seen in (138); the full set is provided in Appendix 12a.

(138)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*tOt	töt	dôt	döt <sup>h</sup>	–	tõtó	‘ask’
	*dùc’á	tùs’	dùs’	–	tùc’á	–	‘urine_1, urinate_1’
	*djalIs’	dàlIs’	dìl	dìl	–	tìlì	‘stomp’

### 3.2.3.4 PKMN \*d

An alveolar implosive \*d can be reconstructed to PKMN based on the correspondence set in Table 62. In word-initial position, all of the languages retain /d/ reflexes of \*d and Gwama merges \*d with t’.<sup>153</sup>

<sup>153</sup> Anecdotally, in working with Gwama speakers that are fluent in Komo in a Komo literacy project, the Gwama speakers would often write a Komo alveolar implosive with an alveolar ejective grapheme. In general, I observed that Gwama speakers who are fluent in Komo found it difficult to perceive the implosive [d] and [b] sounds in Komo, often mistaking them for [t’] and [p’], respectively.

Table 62 PKMN \*d correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
13	*d	t'	t'	d	d	d	d	d	d	d	d

Cognates with word-initial [d] reflexes of \*d are seen in (139) and the full data set is provided in Appendix D13.

(139)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*d(w)ank'I	t'wānk'	dāgí	dwāk <sup>h</sup>	dāgí	dāgí	'scorpion'
	*dar(a)	t'ájà	dār	dār	dēd	dēr	'send someone'

In medial and final positions there is considerable variation in the realization in PKMN \*d reflexes.<sup>154</sup> There does not seem to be a strong enough pattern to posit mergers at any node or language in particular, but rather an overall tendency for deglottalization followed by general phonetic weakening. Some examples are provided in (140). A word-final /d/ in Chali Uduk usually corresponds to /t, d, r, l/ in the rest of the family and there can be weakening to /j/. Note that there are no cognates that reconstruct to PKMN in which both Chali Uduk and Dana retain /d/ reflexes of \*d, but there are many cognates that do at the PCTRL node. Further, Chali Uduk merges \*t̥ with /d/ in word-final position (see §3.2.2.4).

<sup>154</sup> Recall that only Chali Uduk and Dana retain /d/ in initial non-initial positions, while the rest of the family is restricted to /d/ in word-initial position only. See §2.1 for synchronic phonological descriptions.

(140)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*wVd	wět	wàl	wád	wâl	–	‘become (angry)’
	*burbud	bùrbūt	–	bűd	bűrk’ùs	bűrk’ùs	‘dust’
	*k <sup>h</sup> ád(a)	kálá	kár	k <sup>h</sup> ăd	k <sup>h</sup> átá	k <sup>h</sup> átá	‘open’

One example of a full range of reflexes of medial/final \*d is seen in the cognate 3SG.M independent pronouns in (141). There appears to be a diachronic pathway of weakening \*d > d > r > l > j.

(141)	PKMN	Gwama (Lo)	Gwama (Hi)	Komo	Uduk (Yabus)	Uduk (Chali)	Dana	Gloss
	*had(i)	hāl	hāj	hàr	hádī	ádī	hār	3SG.M

### 3.2.3.5 PKMN \*t'

A voiceless alveolar ejective can be marginally reconstructed to PKMN. There are only two cognates with possible \*t' reflexes in initial position and four in medial/final position. Given the fact that Dana and Chali Uduk exhibit phonological contrast between /t'/ and /t̥'/ (Dana also exhibits contrastive /s'/), reflexes in one or both of these languages are crucial in determining the validity of reconstructing \*t' to PKMN. A proposed correspondence set for \*t' is seen in Table 63.

Table 63 PKMN \*t' correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
14	*t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'

Some cognates with reflexes of \*t' are seen in (142); and the full set of relevant cognates is in Appendix D14. Note that there is only one cognate with reflexes in all of the languages, 'salt (made from ash)'.<sup>155</sup>

(142)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*t'af	t'áf	t'áf	t'áf	t'áf	t'ás	'salt (made from ash)'
	*t'wan(k)a ~ t'wan(k)a	t'āṅà	–	t'wák <sup>h</sup>	–	–	'cut (split in half lengthwise)'

### 3.2.3.6 PKMN \*s'

There is robust evidence for reconstructing an alveolar voiceless fricative/affricate ejective \*s' to PKMN. The correspondence set for \*s' is seen in Table 64. Gwama, Komo, Dana and Yabus Uduk retain a /s'/ reflex of \*s' while Opo merges \*s' with tʃ'. Chali Uduk merges \*s' with /tʃ'/ as part of a chain shift involving \*tʃ' and \*t' (§4.6).

Table 64 PKMN \*s' correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
15	*s'	s'	s'	s'	s'	tʃ'	s'	tʃ'	tʃ'	tʃ'	tʃ'

Some cognates with reflexes of \*s in initial and final positions are seen in (143); the full set of correspondences is in Appendix D15.

<sup>155</sup> The gloss 'salt (made from ash)' is a substance traditionally made from the remains of burning a specific tree or plant. This results in a substance with which the Koman people season their food.

(143)	PKMN	Gwama	Komo	Uduk (Yabus)	Uduk (Chali)	Dana	Opo	Meaning
	*s'ík	s'í	s'ík	s'íʔ	t̥'ík <sup>h</sup>	–	tʃ'ígí	'rat'
	*s'a	s'à	s'ā	s'ā	t̥'ā	s'ówà	tʃ'ǎ	'light (fire)'
	*k <sup>h</sup> ós'	kús'	kós'	k'ús'	k <sup>h</sup> út̥'	kós'	k <sup>h</sup> ótʃ'ós'	'dry (be)'

### 3.2.4 Palatal consonants

Only three palatal consonants can be reconstructed to PKMN. However, the evidence is not as robust as one would expect given the abundance of palatal consonants in both branches of Central Koman. Even though the Uduk varieties and Dana each exhibit a contrastive voiceless aspirated palatal stop /c<sup>h</sup>/, there is no evidence to reconstruct \*c<sup>h</sup> to PKMN. Further, /c<sup>h</sup>/ appears to have been an independent innovation in PUD and Dana.<sup>156</sup>

#### 3.2.4.1 PKMN \*c

A voiceless unaspirated palatal stop \*c can tentatively be reconstructed to PKMN, though there are few cognates overall. Reconstructing \*c seems plausible given that /c/ occurs in the two main branches of Central Koman: in the Uduk cluster of the KOUD branch as well as in all of the languages of the DAOP branch. The correspondence set for PKMN \*c is seen in Table 65.

Table 65 PKMN \*c correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
16	*c	s/ʃ	s/ʃ	s	c	c	c	tʃ	tʃ	tʃ	tʃ

<sup>156</sup> See §4.5 for PUD phonology and §4.9 for historical Dana phonology.

Some cognates that contain reflexes of PKMN \*c are in (144); the full set of relevant cognates is in Appendix D16. While most of the languages retain /c/ reflexes, Komo merges \*c with /ʃ/ and Gwama merges \*c with /ʃ/ and \*c with /s/. I find no conditioning for the Gwama mergers at present.

(144)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*cwálá	swálá	sá	cwá	cájáʔ	tʃá	‘tree’
	*càk <sup>h</sup> O	sàkó	sàkó	–	–	tʃàk <sup>h</sup> ó	‘grandfather’
	*cà	ʃà	–	–	cà	tʃà	‘dig’

### 3.2.4.2 PKMN \*ʃ

There is some evidence for reconstructing a voiced palatal stop \*ʃ to PKMN based on the correspondence set seen in Table 66. The Dana-Opo branch retains a voiced (alveo-)palatal stop while Komo and Gwama independently shift \*ʃ > z, and Yabus Uduk shifts \*ʃ > ʒ. Note there are no PKMN \*ʃ correspondences with reflexes in Chali Uduk. Bender (1983:284) notes the unexplained residue of /z/, which appears especially initially in Komo often corresponding to /c/ or /ʃ/ in other languages.

Table 66 PKMN \*ʃ correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
17	*ʃ	z	z	z	ʒ	–	ʃ	dʒ	dʒ	dʒ	dʒ

Some cognates with \*ʃ reflexes are in (145) and the full set of relevant cognates is in Appendix D17.



(145)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*ɟàrú	zèrú	zèrú	zàrú	ɟèrú	dzèrú	‘stork’
	*ɟana	sjàná	zènā	–	–	dzèná	‘sorghum’
	*ɟaŋg(ɔ)aj	zǎgó	zǎgó	ɟwǎŋgì	ɟàŋwèj	dzǎŋó	‘Nuer’

### 3.2.4.3 A note on PKMN \*c, \*ɟ and tone

One issue in the reconstructed plain palatal stop series is the fact that the historical tone correspondences seen with other voiced stops do not appear to hold for the palatal stops. All other voiced stop reflexes exhibit word-initial (syllable-onset) correspondences between voiced stops in the Komo-Uduk branch and voiceless unaspirated in the Dana-Opo branch and in Gwama. This occurs only when the tone of a particular etymon reconstructs to PKMN tone set C. As discussed in §3.1. Historically, in tone set C, the “low” tone following a voiced stop became phonetically lower than the “low” tone following a voiceless stop onset. This distinction in pitch eventually phonologized, which gave rise to contrastive three level tones. Synchronically, all reflexes of PKMN tone set C exhibit L tone.

The issues with the reconstructed palatal stops \*c and \*ɟ are twofold. First, voiceless \*c reflexes occur in correspondence sets which all exhibit synchronic L tone and in which we would expect a voiced onset in Komo such as (146a). Second, there are L tone reflexes in Dana and Opo that do not exhibit voiceless onsets, such as those seen in (145) and repeated here in (146b-d).

(146)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
a.	*càk <sup>h</sup> O	sàkó	sàkó	–	–	tʃàk <sup>h</sup> ó	‘grandfather’
b.	*jàrú	zèrú	zèrú	zàrú	jàrú	dzèrú	‘stork’
c.	*jana	sjànà	zènā	–	–	dzèná	‘sorghum’
d.	*jaŋg(ɔ)aj	zǎgó	zǎgó	zǎŋgì	jàŋwèj	dzǎŋó	‘Nuer’

Note also that, unlike the bilabial, interdental and alveolar plain stops, the palatal stops can correspond to fricatives outside of the Dana-Opo branch. Perhaps the palatal stop series were not stops but rather affricates as seen in modern-day Opo. As such, the voiced affricate \*dʒ did not form part of the PKMN proto-tone set C. This would explain the synchronic tone distribution of \*c and \*j reflexes. Further, the correspondence between proto-affricates and fricatives seems articulatorily more likely. Further, we see that \*c’ ejective reflexes also correspond with fricative and affricate ejectives.

#### 3.2.4.4 PKMN \*c’

There is ample evidence for reconstructing a voiceless palatal ejective \*c’ to PKMN. The correspondence set for \*c’, seen in Table 67, contains some unique innovations. PKMN \*c’ in is retained as /c’/ in Dana and the Uduk branch and as /tʃ’/ in Opo. Yabus Uduk subsequently merges \*c’ with /ʃ’/.<sup>157</sup> Both Komo and Gwama merge \*c’ with /s’/ independently.

---

<sup>157</sup> All cognates containing a /c’/ in Yabus Uduk are reflexes of \*k’ that palatalized before front vowels. See §3.2.5 for discussion.

Table 67 PKMN \*c' correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
18	*c'	s'	s'	s'	ʃ	c'	c'	tʃ'	tʃ'	tʃ'	tʃ'

Examples of cognates with word-initial and word-final reflexes of \*c' are seen below in (147).<sup>158</sup> The full set of cognates containing reflexes of \*c' can be found in Appendix D18.

(147)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*c'ε	s'ē	s'ēʔ	c'é	k'ē	tʃ'è	'ear'
	*c'ɔ(t'ɔ)l	s'ót'ó	–	c'ɔc'ɔlɔc'	c'òʔ	tʃ'ɔ	'drip'
	*Bmc'	bīns'	bíns'	bíc'	bíc'	bítʃ'	'fishhook'
	*wàc'à	wàs'	wàs'	wàc'	wàc'à	wàtʃ'à	'fish'

### 3.2.5 PKMN velar stops

Four velar stop consonants can be reconstructed to PKMN: \*k<sup>h</sup>, \*k, \*g, \*k'. One notable innovation in Proto-Uduk is a primary split via the palatalization of PKMN velar stops before front vowels. All synchronic Uduk lexemes that contain a velar stop followed by a front vowel are reflexes of erstwhile velar stops. Interestingly, there are no reflexes of \*k<sup>h</sup> in Uduk which split and merged with \*c<sup>h</sup> before front vowels that can be reconstructed to PKMN. Recall that \*c<sup>h</sup> cannot be reconstructed to PKMN. The following subsections outline the history and development of the PKMN velar series of consonants.

<sup>158</sup> I cannot account for the initial /k'/ in Dana in 'ear'.

### 3.2.5.1 PKMN \*k<sup>h</sup>

A voiceless aspirated velar stop \*k<sup>h</sup> can be confidently reconstructed to PKMN in word-initial, medial and word-final positions. The correspondence set for PKMN \*k<sup>h</sup> is seen in Table 68. Note that all of the languages retain aspirated /k<sup>h</sup>/ reflexes while Komo and Gwama independently merge \*k<sup>h</sup> with reflexes of \*k.

Table 68 PKMN \*k<sup>h</sup> correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
19	*k <sup>h</sup>	k	k	k	k <sup>h</sup>	k <sup>h</sup>	k <sup>h</sup>	k <sup>h</sup>	k <sup>h</sup>	k <sup>h</sup>	k <sup>h</sup>

Some cognates containing reflexes of PKMN \*k<sup>h</sup> are seen below in (148). Note that there are no cognates containing word-initial \*k<sup>h</sup> reflexes that form part of PKMN tone correspondence set C (§3.1). If tone can be reconstructed in cognates with word-initial \*k<sup>h</sup> reflexes, they will only correspond to PKMN tone set A or B. The full set of cognates with \*k<sup>h</sup> reflexes is provided in Appendix D19.

(148)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*k <sup>h</sup> ak'a	kāgā	kà?	k <sup>h</sup> ā?	k <sup>h</sup> àk'à	k <sup>h</sup> āk'ā?	'bitter (be)'
	*k <sup>h</sup> ós'	kús'	kós'	k'ús'	kós'	k <sup>h</sup> ótʃ'ó	'dry (be)'
	*k <sup>h</sup> ád(a)	kálá	kár	k <sup>h</sup> ád'	k <sup>h</sup> átá	k <sup>h</sup> átá	'open'

### 3.2.5.2 PKMN \*k

A voiceless unaspirated velar stop \*k can be confidently reconstructed to PKMN in word-initial, medial and word-final positions. There are two correspondence sets for PKMN \*k in Table 69. In \*k correspondence set 20, all languages retain voiceless

unaspirated /k/ reflexes while Komo and Gwama independently merge reflexes of \*k and \*k<sup>h</sup> into one synchronic velar stop /k/, which is synchronically unspecified for aspiration.

Table 69 PKMN \*k correspondence sets

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
20	*k	k	k	k	k	k	k	k	k	k	k
20a	*k	k	k	k	c	c	k	k	k	k	k

Cognates containing reflexes of \*k from correspondence set 20 are seen in (149) and the full set of relevant cognates is provided in Appendix D20.

(149)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*kum(bi)	kùmbì	kúm	kūm	kúmā	kǔmá	‘cover (v.)’
	*kO(j)	kù	kò	kō	kòj	kwē	‘cry’

PKMN \*k correspondence Set 20a reflects a Proto-Uduk innovation wherein all \*k reflexes palatalized before front vowels causing a split and merger of \*k > \*c as seen in (150) and in Appendix D20a.<sup>159</sup> Synchronically, there are no lexemes in Uduk which contain a velar stop followed by a front vowel, indicating a complete merger.

(150)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*kEɲ	kīl	kíl	céɲ	kíl	kíl	‘cattle egret’
	*k <sup>(h)</sup> ínáj	kíná	kíná	c <sup>h</sup> ínáj	kínáj	–	‘Opo’

<sup>159</sup> I cannot account for why the Uduk reflex of \*k is aspirated [c<sup>h</sup>] in ‘Opo’ instead of the expected [c]. This particular reflex is from the Yabus Uduk variety.

### 3.2.5.3 PKMN \*g

A voiced velar stop \*g can be reconstructed to PKMN in word initial, medial and final positions. Table 70 contains the correspondence sets that reconstruct to \*g. Word initially and word-medially, \*g is retained in all of the languages as /g/ as seen in \*g correspondence set 21. PKMN \*g correspondence set 21a only occurs in word-initial position and the correspondence between voiced /g/ and voiceless unaspirated /k/ represents individual innovations in the PGW and PDAOP branches wherein they merged \*g with \*k. The conditioning factor for these two \*g correspondence sets in word-initial position is the historical tone of the following vowel nucleus.

Table 70 PKMN \*g correspondence sets

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
21	*g	g	g	g	g	g	g	g	g	g	g
21a	*g	k	k	g	g	g	k	k	k	k	k

Voiced velar stop reflexes of \*g are retained as /g/ in word-initial or syllable onset position when either the historical tone correspondence is PKMN tone set A (in which all languages exhibit H tone) as in (151a), or when the tone cannot be reconstructed but crucially no reflexes exhibit L tone as in (151b). See Appendix D21 for the full set of \*g reflexes.

(151)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
a.	*gólɪla	gól:ā	bāgólɪlā	–	bāgól:ā	bāgólól	‘bird (yellow-billed kite or black kite)’
b.	*gafa	gáfà	–	gāfá?	gáf	gātɸ	‘belt, sash’

Word-finally, \*g is often devoiced to /k<sup>h</sup>/ or elided altogether as in (152). There is an overall tendency for word-final devoicing in Koman.

(152)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*k <sup>h</sup> OG	kók	–	k <sup>h</sup> ú?	k <sup>h</sup> ég	kêk	‘giraffe’
	*hag(a)	há?	hág	há?	–	hágá	‘have sex’

PKMN \*g correspondence set 21a is by far the most robust, but is limited to word-initial position. In this set voiced /g/ reflexes in the KOUD branch correspond to voiceless unaspirated /k/ elsewhere. This correspondence set is conditioned by the historical tone of the following vowel nucleus. PKMN \*g set 21a only occurs with tone correspondence set C, in which all languages modernly exhibit L tone (§3.1). Some examples of \*g correspondence set 8a are in (153) and the full set of relevant cognates is in Appendix D8a.

(153)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*gàm	kàm	gàm	gàm	kàm	kàm	‘find, meet’
	*gUḍUm	kòróḿ	gùdúm	–	kùḍùm	kùdùmà	‘pig’

#### 3.2.5.4 PKMN \*k’

A voiceless ejective \*k’ can be reconstructed to PKMN in word-initial, medial and final positions. The correspondence set for PKMN \*k’ is in Table 71.

Table 71 PKMN \*k' correspondence sets

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo				
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig	
22	*k'	k'	k'	k'	k'	k'	k'	k'	k'	k'	k'	k'

All languages retain /k'/ in initial position as seen in (154).

(154)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Gloss
	*k'ama	k'ā	k'á	k'á	k'ámá	k'ámá	'eat (hard food)'
	*k'ós	k'úf	k'óʃ	k'ús	k'ós	k'ósó	'throat'
	*k'Oʃ	k'óʃ	k'óʃ	k'óʃ	k'óʃ	k'ósó	'kill'

In word final position, there is evidence for \*k' weakening to a glottal stop, or eliding altogether as seen in (155). Intervocally, reflexes of \*k can often voice to /g/ or elide completely. This is seen in 'bitter (be)' in (155), in which Dana and Opo preserve the intervocalic /k'/ reflex of \*k, Gwama has voiced it to /g/ and Komo and Uduk have elided the segment at the word edge. There does not seem to be a consistent pattern in any of the languages to suggest a robust historical merger of \*k and \*g in intervocalic position. All of the cognates with reflexes of PKMN \*k' are provided in Appendix D22.

(155)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*p <sup>h</sup> ák'á	pák	pá	p <sup>h</sup> ā	p <sup>h</sup> ák'á	p <sup>h</sup> ák'	'hoof, shoe'
	*sók'a	swījā	sō	sú	sók'à	sōk'á	'two'
	*k <sup>h</sup> ak'a	kāgā	kà	k <sup>h</sup> ā	k <sup>h</sup> àk'à	k <sup>h</sup> āk'ā	'bitter (be)'

### 3.2.6 PKMN fricatives

Three voiceless fricatives \*s, \*ʃ and \*h can be confidently reconstructed to PKMN. Most of the languages exhibit retentions of each proto-phoneme. A notable exception



involves a chain shift in Proto-Komo whereby \*s merged with /ʃ/ and \*c merged with /s/. Proto-Gwama also displays primary splits in word-initial \*s and \*ʃ reflexes conditioned by the quality of the following vowel. The following subsections discuss these innovations in detail.

### 3.2.6.1 PKMN \*s

The correspondence sets that reconstruct to PKMN \*s are seen in Table 72. Despite two \*s correspondence sets, there does not appear to be evidence to justify two distinct proto-phonemes. Some of the innovations can be explained either diachronically or language-internally at the modern stage.

Table 72 PKMN \*s correspondence sets

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
23	*s	ʃ	ʃ	ʃ	s	s	s	s	s	s	s
23a	*s	s	s	ʃ	s	s	s	s	s	s	s

It appears that Komo innovated a chain shift of \*s > ʃ and then \*c > s word-initially (§4.4.1). Gwama splits \*s and merges with ʃ in set 23 and retains /s/ in set 23a. The only conditioning for Gwama \*s > ʃ word-initially appears to be the following vowel. Word-initially, Gwama \*s > ʃ occurs only before the [+high, -ATR] vowels /ɪ, ʊ/ and PGW retains /s/ before [-high, -ATR] vowels as seen in (156).

(156)	SET	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	23	*sud(i)	fól	fùlí	sū	sùḍ	swī	‘beer’
	23	*sìt̥	fīt̥	fīt̥	sīḍ	sìḥ	sīt̥	‘far (be)’
	23	*sɔm	fōfóm	fóm	súm	sómó	sómó	‘python’
	23a	*s(w)am	sóm	fóm	sām	sòm	sóm	‘warm oneself’
	23a	*sóp	só	–	só	–	sóp	‘stab’
	23a	*sɛl	sēl	–	sē	–	–	‘climb’

While the word-initial \*s reflexes in Gwama appear to follow a pattern, the word-final \*s reflexes are more difficult to explain given the fact that Gwama exhibits both /s/ and /f/ reflexes of \*s. I cannot account for the word-final split and merger of \*s in Gwama. Some examples of both reflexes occurring before /ɔ, ɪ/ are seen in (157). See Appendix D23 and D23a for all of the cognate sets employed to reconstruct PKMN \*s.

(157)	PKmn	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*(j)Es	jīs	īf	īs	ès	ēs	‘body’
	*jEsI	ífī	jèf	jès	sì?	–	‘slippery’
	*gÛs	gòs	gùf	gùs	–	–	‘run (SG)_1, flow, bleed’
	*t̥Us	dōf	tūf	tūs	–	–	‘cotton, thread’

Lastly there are two cognates which do not follow either pattern, which are seen in (158). In these correspondences, every language retains /s/. I cannot offer an explanation for these cognates and attribute this to idiosyncratic behavior.

(158)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Gloss
	*sok’a	swijā	sō	sú	sók’á	sōk’á	‘two’
	*k <sup>(h)</sup> is	kīs	kīs	cés	kís	k <sup>h</sup> ís	‘tree_sp. (mahogany, Trichilia emetica)’

### 3.2.6.2 PKMN \*ʃ

A voiceless (alveo)palatal fricative \*ʃ can be reconstructed to PKMN based on the two correspondence sets seen in Table 73. The KOUD branch and Dana from the DAOP branch retain a [ʃ] reflex, while Gwama splits and merges \*ʃ with s. This conditioned split in Gwama is described below. In the Opo branch, Bilugu, Modin and Pame Opo varieties merge \*ʃ with \*s. It appears that in some instances, Kigile Opo retains /ʃ/ though this has yet to be definitively determined.<sup>160</sup>

Table 73 PKMN \*ʃ correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
24	*ʃ	ʃ	ʃ	ʃ	ʃ	ʃ	ʃ	s	s	s	s/ʃ
24a	*ʃ	s	s	ʃ	ʃ	ʃ	ʃ	s	s	s	s/ʃ

Correspondence set 24 is by far the most robust of the two PKMN \*ʃ correspondence sets with about twenty cognates in word-initial position. Some examples are seen in (159) and the full set of cognates can be found in Appendix D24. Note that in \*ʃ set 24, all of the initial /ʃ/ reflexes in Gwama precede a front vowel, either a [+high, –ATR] vowel /i, ɨ/ or a [–high, –ATR] vowel /ɛ/.<sup>161</sup>

<sup>160</sup> In my database, the Kigile Opo reflexes are mostly [ʃ] in correspondence sets 24 and 24a. In the twelve cognates which contain a word-initial Kigile Opo reflex from sets 24 and 24a, eight occur with [ʃ] and four occur with [s]. This is why the [s/ʃ] symbol occurs in the Kigile Opo slot. My consultants were not first-language Kigile Opo speakers and were often not sure whether a particular lexeme contained [s] or [ʃ].

<sup>161</sup> There appears to be one exception in Gwama, \*ʃi ‘tooth’, which contains [+high, +ATR] /i/ following the initial /ʃ/. The rest of the family has /ɛ/ reflexes in ‘tooth’. In Komo, there is a remnant of a plural suffix /-i/ which appears in *fɛʔi* ‘teeth’, which is synchronically pronounced [ʃɛʔi ~ ʃɛi]. A plausible scenario for Gwama could have been \*ʃɛʔi > ʃi via the loss of the internal glottal stop and the coalescence of the vowel.

(159)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*fɔnf	fɔ̃f	fɔ̃nf	fùf	fɔ̃f	fòf	‘nose’
	*fOk’(VN)	fɔ̃gòn	fùwèn	fɔ̃k’ɔ̃m	fùk’náj	fùk’én	‘louse’
	*fɔ(n)k’	fɔ̃nk’	fɔ̃	fúʔ	fùk’	fùk’	‘tendon, vein’
	*fE	fī	fĕ	fĕ	fĕ	fĕ	‘tooth’

Cognate set 24a reflects a Gwama innovation in which a primary split \*f > s occurred word-initially. Some examples are provided in (160). The only conditioning factor here in Gwama is that word-initial /s/ reflexes of \*f occur either before a [+high, +ATR] vowel /i, u/ or a [-high, -ATR] vowel /ɔ/. This is in complementary distribution with the retention of \*f as /f/ before /ɪ, ʊ/.

(160)	PKMN	Gwama	Komo	Uduk	Dana	Opo (Kigile)	Meaning
	*fum(a)	sūm	fùm	fūm	fùmà	fūm	‘meat, animal’
	*fUImak’	síʔ	fúmák’	sīmāʔ	fój	sój	‘bone’
	*fuk’(i)	sūgì	fùg	fūk’	fùg	fùg	‘wake (trs.)’
	*fɔnk’	sɔ̃nk’	fɔ̃g	fɔ̃k’	fɔ̃g	–	‘foot or leg’

It is tempting to try generalizing the Gwama split of \*f based solely in the [ATR] quality of the following vowel. The /f/ retention only occurs before [-ATR] vowels and the \*f > s split occurs before [+ATR] vowels /i, u/. The problem is the Gwama cognate *sɔ̃nk’* ‘foot, leg’ in which initial /s/ occurs before [-ATR] /ɔ/. However, there are cases in which \*wa > /ɔ/ across the family. If this /wa/ sequence were historically a diphthong \*ua which occurred with an initial [+ATR] /u/, then the initial /s/ in Gwama would follow the generalization: word-initial \*f > s before [+ATR] and /f/ is retained elsewhere (i.e. before [-ATR] vowels). This distribution also fits the Gwama split \*s > f, which only occurs before [-ATR] /ɪ, ʊ/ as seen above in §3.2.6.1.

### 3.2.6.3 PKMN \*h

A voiceless glottal fricative can be confidently reconstructed to PKMN in word-initial position via the correspondence set in Table 74. All branches retain /h/ reflexes.

Table 74 PKMN \*h correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
25	*h	h	h	h	h	h	h	h	h	h	h

Some examples of reflexes of \*h are in (161) and the full set of reflexes is provided in Appendix D25.

(161)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*hag(a)	háʔ	hág	háʔ		háɡá	‘have sex’
	*has’	hās’i	hás’	hát’	hás’	hátʃ’	‘trample, ruminant’
	*hɔn(i)	hɔ̃n	hɔ̃n	húnī	hɔ̃n	–	3SG.M

### 3.2.7 PKMN \*r and \*l

An alveolar trill \*r and an alveolar liquid \*l can be reconstructed to PKMN via the correspondence sets seen in Table 75.

Table 75 PKMN \*r and \*l correspondence sets

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
26	*r	r	r	r	r	r	r	r	r	r	r
27	*l	l	l	l	l	l	l	l	l	l	l

Some examples of \*r and \*l reflexes are seen in (162) and the full sets are seen in Appendices D26 and D27, respectively.

(162)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*rOk <sup>(h)</sup> Oɲ	rókòn	rókòn	rúgùɲ	rók <sup>h</sup> òn	rókōn	‘corner’
	*lilí	lílí	lílí		líl	lílí	‘sink (v.)’

### 3.2.8 PKMN nasal consonants

A bilabial nasal \*m and an alveolar nasal \*n can confidently be reconstructed to PKMN. There is marginal evidence for \*ɲ and \*ŋ. Bender (1983) notes that \*ɲ and \*ŋ were later developments.

#### 3.2.8.1 PKMN \*m and \*n

The bilabial \*m and alveolar \*n nasals easily reconstruct to PKMN. All of the languages retain /m/ and /n/ reflexes in initial, medial and final positions. The correspondence sets for \*m and \*n are in Table 76.

Table 76 PKMN \*m and \*n correspondence sets

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
28	*m	m	m	m	m	m	m	m	m	m	m
29	*n	n	n	n	n	n	n	n	n	n	n

Some examples of \*m and \*n reflexes are in (163) and the full sets are provided in Appendices D28-29.

(163)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*mVs'	mìs'	mòs'	múṭ'ē	mút'	mìs'à	'shut, close eyes'
	*nék <sup>h</sup>	nék	à+nék	nék <sup>h</sup>	ník <sup>h</sup>	ník <sup>h</sup>	'bird (sp.)'

### 3.2.8.2 PKMN \*ɲ

Only the Uduk varieties exhibit a contrastive palatal nasal synchronically. There is some evidence for reconstructing a palatal nasal to PKMN, though only in word-final or word-medial position. The correspondence set for \*ɲ is seen in Table 77. Only Uduk retains /ɲ/ while all others merge \*ɲ > n.

Table 77 PKMN \*ɲ correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
30	*ɲ	n	n	n	ɲ	ɲ	n	n	n	n	n

The only PKMN cognates containing a /ɲ/ in Uduk are seen in (164). Note that /l/ corresponds to /ɲ/ in 'cattle egret' and that Uduk initial /c/ < \*k before front vowels (§3.2.5.2). At best, \*ɲ is a marginal proto-phoneme.

(164)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*rOk <sup>(h)</sup> Oɲ	rókòn	rókòn	rúgùɲ	rók <sup>h</sup> òn	rókōn	'corner'
	*(t'i)p'lk'Iɲ(a)	p'ík'ín	p'ín	t'ip'īɲ	p'īnā	p'īnā	'ash'
	*k <sup>h</sup> àɲ	kīn	–	k <sup>h</sup> āɲ	–	–	'light (the way)'
	*kEɲ	kīl	kíl	céɲ	kíl	kíl	'cattle egret'

### 3.2.8.3 PKMN \*ŋ

There is some marginal evidence in favor of reconstructing a velar nasal \*ŋ to PKMN. The correspondence set in Table 78 shows retentions of [ŋ] in Uduk and in the Dana-Opo branch, a merger \*ŋ with g in Komo and a partial merger of \*ŋ with \*g in Proto-Gwama (PGW).

Table 78 PKMN \*ŋ correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
31	*ŋ	ŋ/g	ŋ/g	g	ŋ	ŋ	ŋ	ŋ	ŋ	ŋ	ŋ

The cognates showing reflexes of a proposed PKMN \*ŋ are limited and always involve a voiced velar stop. Some examples of such cognates with potential \*ŋ reflexes are in (165); the complete set of relevant cognates can be found in Appendix D31.

(165)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*waŋa	wāŋā	wàgá	ŋwá	–	–	‘chicken’
	*gàŋ(a)	kē	gàg	–	kàŋà	kàŋà	‘smell (v.)’
	*jaŋg(ɔ)aj	zǎgó	zǎgó	zǎŋgì	jàŋwèj	dzǎŋó	‘Nuer’

### 3.2.9 PKMN glides

#### 3.2.9.1 PKMN \*w

A labiovelar glide \*w can be confidently reconstructed to PKMN in word-initial position only. The correspondence set for PKMN \*w is in Table 79. All languages retain /w/ in word-initial position.



Table 79 PKMN \*w correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
32	*w	w	w	w	w	w	w	w	w	w	w

Some examples of cognates containing reflexes of PKMN \*w are in (166) and the full set is seen in Appendix D31.

(166)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*wàc'à	wàs'	wàs'	wàc'	wàc'à	wàtʃ'à	'fish'
	*was(ik')	wàʃi	wàʃik'	–	wás	wàs	'boil, bubble up'
	*wasak'	wàsà	wàʃāk'	wàsá?	–	–	'hail, ice'

### 3.2.9.2 PKMN \*j

A voiced palatal glide \*j can be tentatively reconstructed to PKMN in word-initial position based on the correspondence set in Table 80. If \*j is to be reconstructed, it would be retained in all branches but and merged with \*dʒ in Proto-Opo (§4.10).

Table 80 PKMN \*j correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
33	*j	j	j	j	j	j	j	dʒ	dʒ	z	ʃ

There are very few cognates that contain reflexes of \*j. Some are in (167) and the full set is in Appendix D33. If this analysis is accurate, the data here suggest fortition of PKMN \*j to POP \*dʒ in word-initial position. Another analysis is that this correspondence set represents \*ʃ, which independently weakened to /j/ outside of Opo.

(167)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*jidE	ìjáʔ	jĩ	jìdʔéʔ	jìʔí	dʒì	‘water’
	*jEk <sup>h</sup>	jì	jèk	jèk <sup>h</sup>	–	–	‘sow seeds’
	*jàgàl	jàgì	–	–	–	dʒìk’āj	‘sweat’

### 3.2.10 PKMN consonant residue

There are some minor correspondences for which a proto-phoneme cannot be definitively reconstructed. These and other issues are outlined in the following subsections.

#### 3.2.10.1 PKMN interdental stop residue: \*Ṭ and \*Ḑ

There are two residual correspondences involving interdental stops, seen in Table 81. Whether or not these proposed correspondences genuinely reflect additional (interdental) proto-phonemes is yet to be determined. I employ \*Ṭ and \*Ḑ as temporary placeholders to represent these correspondences.

Table 81 PKMN \*Ṭ and \*Ḑ correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
34	*Ṭ	ʃ	ʃ	s/z	s	ṭ	s	tʃ	tʃ	tʃ	tʃ
35	*Ḑ	s/z	s/z	z	–	–	ḑ	dʒ	dʒ	z	s/ʃ

In the \*Ṭ reflexes, Chali Uduk /ṭ/ corresponds to Dana /s/, Opo /tʃ/, Gwama /ʃ/ and Komo /z/.<sup>162</sup> The only two potential cognates are in (168), but it is extremely difficult to

<sup>162</sup> Note that the Komo reflex occurs with L tone which could suggest either a historical voiced consonant or that Komo irregularly voiced this particular consonant in this particular word.

reconstruct the proto-phoneme as all of the initial consonant reflexes appear to reconstruct to distinct correspondence sets. Perhaps this \*ṽ correspondence set actually reconstructs to \*c<sup>h</sup>, for which we have no correspondence set or perhaps the \*ṽ and \*ṽ correspondence sets reconstruct to a single PKMN \*ṽ proto-phoneme for which there was an unconditioned split. Nevertheless, taken together, the \*ṽ and \*ṽ correspondences at least support the likelihood of a PKMN voiceless interdental proto-phoneme.

(168)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
a.	*ṽ(n)G	ʃǒnk'	zòg	ṽṽ <sup>h</sup>	sòk <sup>h</sup>	tʃògʷ	'guinea fowl'
b.	*ṽOl(a)	ʃò	–	ṽṽ	–	tʃójà	'descend'

The two cognates with PKMN \*ṽ reflexes are seen in (169). Observe that /ḍ/ in Dana corresponds to /dz/ in Bilugu and Pame Opo, /z/ in Modin Opo and Gwama, and /ʃ/ in Kigile Opo before L tone in 'eye'. Similar correspondences are seen in 'person' with the exception of Gwama which exhibits /s/, though with M tone in this descendent morpheme.

(169)	PKMN	Gwama	Komo	Uduk	Dana	Opo (Bil)	Opo (Pam)	Opo (Mod)	Opo (Kig)	Meaning
	*ṽE	zì	–	ē	ḍè	dzè	dzè	zè	ʃè	'eye'
	*ṽiṽa	sīt	–	–	ḍiṽà	–	–	zità	ʃità	'person'

The elements in these two proposed correspondence sets are erratic, though show some patterning of fricatives and/or affricates with interdental stops. Whether this motivates reconstructing one or two additional proto-phonemes is yet to be determined.

### 3.2.10.2 A note on PKMN \*z

There is only one cognate which may begin to suggest reconstructing a voiced alveolar fricative \*z to PKMN, seen in (170). Given the fact that there are no other potential cognates with this set of correspondences, reconstructing \*z to PKMN is questionable. Bender (1983) proposes that /z/ surfaces in the modern languages due to independent innovations, though this is puzzling given that Gwama, Komo, Yabus Uduk, Dana and Modin Opo all exhibit a contrastive /z/ synchronically.

(170)	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*zjafa(j)	zét	zjànt'á	–	zāṭ <sup>h</sup> ē	džèrà	'chili pepper'

### 3.3 Proto-Koman (PKMN) vowels

All of the modern Koman languages with the exception of the Uduk cluster exhibit a contrastive seven-vowel inventory /i, ɪ, ε, a, ɔ, ʊ, u/, with phonemic Advanced Tongue Root (ATR) contrast in high vowels (Hellenthal & Kutsch Lojenga 2011, Killian 2015, Smolders *forthcoming*, Otero 2018b, inter alia). Further, all of the languages with seven-vowel inventories exhibit active ATR harmony (cf. §2.1.2).

Prior reconstructions of the Proto-Koman vowel system propose five contrastive vowels \*i, \*e, \*a, \*o, \*u (cf. Bender 1983, Ehret 2001). Ehret (2001:43) sustains that Proto-Nilo-Saharan (PNS) exhibited seven short vowels (\*i, \*e, \*ε, \*a, \*ɔ, \*o, \*u) and their long counterparts, which simplified into five vowels in Koman.<sup>163</sup> These significant contributions to Proto-Koman reconstruction were carried out without detailed study of

---

<sup>163</sup> Ehret (2001) assumes that Koman descended from Proto-Nilo-Saharan, an issue that is still under debate (cf. Dimmendaal 2011 and Güldemann 2018 for opposing views).

Koman vowel systems. In his reconstruction of PKMN phonology, Bender (1983) analyzes five vowels in each of the modern Koman languages. Ehret's (2001) work on PKMN drew largely from Chali Uduk, which only exhibits five contrastive vowels. Neither scholar was informed of the active ATR harmony systems found in all of the Koman languages save the Uduk cluster. This led to reconstructions which do not stand up in the light of current analyses (Hellenthal & Kutsch Lojenga 2011; Goldberg et al. 2017; Otero 2015, 2018b, Olejarczuk et al. 2019, Smolders *forthcoming*), and in some cases these faulty analyses impacted their higher-level reconstructions, as is the case with Ehret's (2001) analysis of how the PKMN vowel system evolved from Proto-Nilo-Saharan. My aim here is not to criticize these earlier reconstruction attempts given the data at hand at the time, but rather to highlight how important it is to have detailed knowledge of synchronic systems in order to conduct a valid historical reconstruction.

In light of Koman language documentation and description, all of the synchronic and diachronic evidence points to a PKMN seven vowel system with ATR contrast in the high vowels \*i, \*ɪ, \*ɛ, \*a, \*ɔ, \*ɔ̄, \*u. There is no evidence for a synchronic nor historical vowel length contrast in Koman. The correspondence sets are by and large stable, especially in the [-high] vowels, where all languages generally exhibit retentions. In the [+high] vowels, by contrast, there are identical reflexes in correspondence sets which allow us to reconstruct \*i, \*ɪ, \*ɔ̄ and \*u. But, there are correspondence sets in which Gwama has a high vowel of opposing ATR value to that found in Central Koman languages (i.e.. Gwama /ɪ/ corresponding to /i/ in all of Central Koman and vice versa). These issues are discussed in the following subsections. All of the cognate sets employed in the reconstruction of PKMN vowels are in Appendix E.

### 3.3.1 PKMN high vowels

PKMN had two sets of contrasting front and back high vowels distinguished by the ATR feature, giving a total of four proto-high vowels: \*i, \*ɪ, \*u and \*ʊ. Reflexes of these vowels are seen in the synchronic phonemic inventories of all Koman languages with the exception of the Uduk cluster, which merged \*i with \*ɪ and \*u with \*ʊ.<sup>164</sup> The correspondence sets for high vowels suggest splits in either PGW or PCTRL as, for instance, /u/ can correspond with /u/ in one set but with /ʊ/ in another. The same holds for /i, ɪ/. There do not appear to be any conditioning factors for these splits though examining tone and reflexes of \*s and \*ʃ give some insight into possible directionality. The reconstruction of PKMN high vowels are discussed in the following subsections.

#### 3.3.1.1 PKMN \*i and \*ɪ

The three correspondence sets for PKMN high front vowels are in Table 82. The data suggest reconstructing only two proto high front vowels distinguished by the feature [ATR]: \*i and \*ɪ. In set V1, all languages retain [+high, +ATR] /i/ reflexes and in set V2, all languages retain [+high, -ATR] /ɪ/ reflexes. PUD merges \*i with \*ɪ into one contrastive vowel /i/.

---

<sup>164</sup> In the synchronic Uduk varieties, both Killian (2015) and I recognize that /i, u/ can be realized phonetically as [i, e, ɪ] and [u, o, ʊ] respectively. The different phonetic vowels in each set appear to be in free variation in Uduk.

Table 82 PKMN \*i and \*ɪ correspondence sets

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
V1	*i	i	i	i	i	i	i	i	i	i	i
V2	*ɪ <sub>1</sub>	ɪ	ɪ	ɪ	i	i	ɪ	ɪ	ɪ	ɪ	ɪ
V2a	*ɪ <sub>2</sub>	ɪ	ɪ	i	i	i	i	i	i	i	i

Reconstruction of sets V1 and V2 is straightforward as two proto-phonemes \*i and \*ɪ. The question is what to reconstruct for correspondence set V2a, in which /ɪ/ in Gwama corresponds to /i/ in Central Koman. There are two correlates that might provide an indicator of the vowel quality at a certain stages of evolution:

- (i) Whether or not the Opo varieties exhibit a XH tone reflex.
- (ii) The Gwama reflexes of \*s and \*ʃ.

Recall that a POP innovation in tone was a split \*H > XH on [+high, +ATR] vowel nuclei (§3.1.2). Thus, if modern Opo exhibits XH tone on a high vowel, it must have been \*i or \*u in POP or in a previous stage. Second, recall the Gwama word-initial innovations: \*s > ʃ before [+high, –ATR] vowels /ɪ, ʊ/ (§3.2.6.1) and \*ʃ > s before [+high, +ATR] vowels /i, u/ (§3.2.6.2). Analyzing the ATR value of the vowels following word-initial reflexes of \*s and \*ʃ may also provide a clue to the ATR value of the proto-vowel. While these diagnostics will not solve the puzzle entirely, they at least provide insights into vowel quality at certain nodes.

I discuss the tone evidence first. Example (171) contains cognates from each of the three correspondences sets in Table 82. Each of these sets reconstruct to PKMN tone set A, which gave rise to synchronic H tone across the family. Note that in set V1, Opo exhibits XH tone and the vowel reconstructs to \*i. By contrast, in set V2, Opo exhibits

H tone on reconstructed \*ɪ. In set V2a, in which Gwama exhibits /ɪ/ and Proto-Central Koman exhibits /\*i/, Opo exhibits XH tone. This suggest that the vowel was at least /\*i/ in PCTRL though it does not solve the issue of directionality (i.e. whether PGW retained \*ɪ and PCTRL split \*ɪ > \*i, or vice versa).

(171)	Set	Gwama	Komo	Uduk	Dana	Opo	Meaning
	V1	hírók'	(bā-)jírók'	–	(bā-)jíróŋ	(bā-)jírōk'	'bird (bee-eater)'
	V2	sít	tít	tít <sup>h</sup>	tít <sup>h</sup>	títí	'roughen stone'
	V2a	ís	íf	ís	ísá	ísá	'ripen'

I now turn to evidence related to \*s and \*ʃ. The Gwama reflexes of \*s and \*ʃ in (172a) show the Gwama innovation of \*s > ʃ before /ɪ/. This vowel correspondence is set V2, which reconstructs to \*ɪ with /ɪ/ reflexes across the family (and \*ɪ > i in Uduk). In (172b), Gwama retains PKMN \*ʃ as /ʃ/ before /ɪ/, though this is vowel correspondence set V2a in which Central Koman exhibits /i/. The question of whether (172b) reflects PKMN \*ɪ, in which Gwama retains \*ʃ before /ɪ/ with a subsequent change of PKMN \*ɪ > PCTRL \*i or whether (172b) reflects PKMN \*i with Gwama innovating PKMN \*i > ɪ cannot be definitively determined. There is a strong likelihood that (172b) was /i/ in PCTRL as all languages of this branch exhibit /i/ and Opo innovates \*H > XH tone, the latter of which only occurs on /i/ and /u/.

(172)	Set	PKMN	Gwama	Komo	Uduk	Dana	Opo	Meaning
a.	V2	*sít̪'	ʃít'	ʃít'	síd	sít̪'	sít'	'far (be)'
b.	V2a	*ʃint' ~ ʃint'	ʃint'	ʃin	ʃin	ʃinà	síná	'blow nose'



### 3.3.1.2 PKMN \*u and \*ɔ

Synchronically the Koman languages with seven-vowel inventories only display two contrastive high back vowels of /u, ɔ/. Nevertheless, there are four correspondence sets that relate to high back vowels, presented in Table 83 and Table 84. In two of the sets, all of the languages retain /u/ and /ɔ/, which can easily reconstruct to \*u and \*ɔ, respectively. Though in the remain two correspondence sets, Gwama /u/ corresponds to /ɔ/ in Central Koman and Gwama /ɔ/ corresponds to /u/ in Central Koman. I argue that these latter correspondence sets do not reconstruct to two additional vowels but rather reflect innovations in either Gwama or Central Koman: the issue here is to determine whether Central Koman or Gwama split \*u and \*ɔ.

We first consider the correspondence sets in Table 83. Though there are two correspondence sets here, there is evidence that \*u<sub>1</sub> and \*u<sub>2</sub> reconstruct to a single proto-phoneme. Assuming that PKMN had a seven vowel inventory, at present I am unable to determine whether Gwama preserves the PKMN vowel system and the changes happened in PCTRL or if the changes in vowels occurred in PGW and the PKMN vowels are retained in PCTRL.

Table 83 PKMN \*u correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
V3	*u <sub>1</sub>	u	u	u	u	u	u	u	u	u	u
V3a	*u <sub>2</sub>	ɔ	ɔ	u	u	u	u	u	u	u	u

In PKMN \*u<sub>1</sub> set V3, all languages retain /u/ while in set V3a, /ɔ/ in Gwama corresponds to /u/ in Central Koman. Deciding whether set V3a reflects an \*u > ɔ

innovation in Central Koman or an \* $\upsilon$  > u innovation in Gwama is challenging but there is one piece of evidence that may shed light on these correspondences, which involves ATR vowel quality and tone.

Recall the POP innovation of splitting \*H > XH on [+high, +ATR] vowel nuclei (§3.1 f). In PKMN \* $u_1$  set V3, Opo exhibits synchronic XH tone when the PDAOP tone is \*H. To illustrate, consider the data in (173) in which all languages exhibit /u/ reflexes. Here, Dana exhibits H tone and Opo exhibits XH tone. In these reflexes it is clear that POP split \*H > XH on a /u/ nucleus. Further evidence is that there are no reflexes in the \* $u_1$  correspondence set in which the POP tone category is \*H and Opo *does not* exhibit XH tone. To be clear, this means that there are no reflexes in correspondence set V3 in which at least Dana exhibits H tone and Opo does not exhibit XH tone. This suggests that the tone was at least H at the DAOP node if not further back in Koman history. The fact that all languages retain /u/ reflexes of \*u plus the tonal split \*H > XH in Opo provide solid evidence to reconstruct PKMN \*u for set V3 \* $u_1$ .

(173)	Set	Gwama	Komo	Uduk	Dana	Opo	Meaning
	V3	wūt	wūt	út <sup>h</sup>	–	hūt <sup>h</sup>	‘ostrich’
	V3	tū	–	–	t <sup>h</sup> úwà	t <sup>h</sup> újhá	‘spit (v.)’
	V3	jàhú	jàhú	–	àhút <sup>h</sup>	àhú	‘fish (sp.)’
	V3	kùmbì	kúm	kūm	kúmā	kúmá	‘cover (v.)’

When examining \* $u_2$  correspondence set V3a, in which / $\upsilon$ / in Gwama corresponds to /u/ in all other languages, we see identical patterning with regard to tone. Also in this set, if the proto-tone category is PKMN \*H or POP \*H, Opo always exhibits XH tone as seen in (174). This fact favors an analysis in which PGW split and merged \*u with \* $\upsilon$  in syllable nuclei which were of PKMN \*H or corresponded to POP \*H tone.

(174)	*u Set	Gwama	Komo	Uduk	Dana	Opo	Meaning
	V3a	óp	úp	úp <sup>h</sup>	úp <sup>h</sup>	úp <sup>h</sup>	‘bathe’
	V3a	tǒkò	túk	à-túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>	‘acacia’
	V3a	kǒǒ	ūs	–	húǒ	úǒ	‘smoke out’

While there is a correlation between XH tone in Opo and a proposed \*u reflex in which PKMN \*u > PGW \*ɔ, this only accounts for the reflexes in tone set A correspondence sets (i.e. sets that reconstruct to PKMN \*H). This is to say that there are many reflexes in both of the PKMN \*u correspondence sets that exhibit tones other than H. While PKMN \*u<sub>1</sub> (Set V3) can be confidently reconstructed to \*u, there is no apparent conditioning factor for either an analysis of \*u > ɔ or \*ɔ > u innovations for \*u<sub>2</sub> (Set V3a). Consider the data in (175) which contain reflexes from both PKMN \*u correspondence sets. The reflexes here all exhibit L tone which evolved from the PKMN \*L tone category. In these data, there does not appear to be a conditioning for a change such as PKMN \*u > Gwama /ɔ/, though this was most likely the case given the evidence presented for cognates that reconstruct to PKMN \*H tone and that there are two correspondence sets which reconstruct to PKMN \*ɔ. All of the data for PKMN \*u correspondence sets V3 and V3a are seen in Appendix EV3 and EV3a respectively.

(175)	*u Set	Gwama	Komo	Uduk	Dana	Opo	Meaning
a.	V3	bùfùl	bùǒ	bùǒ	–	pùsà	‘belly’
b.	V3a	kòróǒm	gùdúm		kùdùm	kùdùmà	‘pig’

There are two additional high back vowel correspondence sets, which I propose are reflexes of PKMN \*ɔ. These are seen in Table 84. Note that the distribution of reflexes patterns identically to the correspondences for \*u in Table 83, though with opposing

ATR values: in \* $\upsilon$  set V4 set all languages retain / $\upsilon$ / reflexes and in set V4a / $\upsilon$ / in Central Koman corresponds to /u/ in Gwama.

Table 84 PKMN \* $\upsilon$  correspondence set

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
V4	* $\upsilon_1$	$\upsilon$	$\upsilon$	$\upsilon$	$\upsilon$	$\upsilon$	$\upsilon$	$\upsilon$	$\upsilon$	$\upsilon$	$\upsilon$
V4a	* $\upsilon_2$	u	u	$\upsilon$	$\upsilon$	$\upsilon$	$\upsilon$	$\upsilon$	$\upsilon$	$\upsilon$	$\upsilon$

Interestingly, there are no reflexes in either of these \* $\upsilon$  correspondence sets in which Opo exhibits XH tone. This is good evidence that there are reflexes in which Opo exhibits H tone and these reflexes are all reconstruct to PKMN \*H tone. In (176a), all languages exhibit / $\upsilon$ / reflexes and H tone. In (176b), / $\upsilon$ / in Central Koman corresponds to /u/ in Gwama and all languages exhibit H tone. If this were \*u, then we would expect XH tone in Opo but that is not the case. This is a strong indicator that set V4a reflects a Gwama split \* $\upsilon$  > u given the fact that Opo split \*H > XH only on /i, u/ vowel nuclei. Again, this does not account for the data in which H tone is not present.

(176)	Set	Gwama	Komo	Uduk	Dana	Opo	Meaning
a.	V4	ʔó̄p	k'ó̄p	k'úp <sup>h</sup>	k'óp <sup>h</sup>	k'ó̄p	'head'
b.	V4a	kús'	kós'	k <sup>h</sup> ús'	k <sup>h</sup> ós'	k <sup>h</sup> ótʃ'ó̄	'dry (be)'

The \*u and \* $\upsilon$  correspondences (SetV3a and Set V4a) taken together strongly suggest two developments in Gwama: \*u >  $\upsilon$  and \* $\upsilon$  > u, respectively, yet there does not appear to be any segmental conditioning, at least synchronically. The only indicator of directionality of these splits is when Opo exhibits synchronic XH tone. Given the fact

that Opo split \*H on [+high, +ATR] vowel nuclei /i, u/, vowel correspondence sets in which Opo exhibit XH provide evidence for \*u (and \*i). This combined with a reconstructed \*H tone category provides even stronger evidence for reconstructing \*u in Set V3a.

### 3.3.2 PKMN [-high] vowels \*ε, \*ɔ and \*a

Three [-high] vowels can be reconstructed to PKMN, \*ε, \*ɔ and \*a through three correspondence sets seen in Table 85. These proto-vowels are generally retained in all languages.

Table 85 PKMN \*ε, \*ɔ and \*a correspondence sets

Set	PKMN	Gwama		Komo	Uduk		Dana	Opo			
		Lo	Hi		Yab	Cha		Bil	Mod	Pam	Kig
V5	*ε	ε	ε	ε	ε	ε	ε	ε	ε	ε	ε
V6	*ɔ	ɔ	ɔ	ɔ	ɔ	ɔ	ɔ	ɔ	ɔ	ɔ	ɔ
V7	*a	a	a	a	a	a	a	a	a	a	a

Some cognates demonstrating each [-high] proto-vowel are seen in (177) and the full data is provided in Appendices E5-7.

(177)	*Vowel	Gwama	Komo	Uduk	Dana	Opo	Meaning
	*ε	s'ē	s'ēŋ	ʃé	k'ē	tʃ'è	'ear'
	*ε	zèrú	zèrú	zàrú	ʃèrú	dʒèrú	'stork (maribou)'
	*ɔ	gɔk'óʃ	gɔnk'í	gɔk <sup>h</sup>	kògò	kògò	'skin or bark'
	*ɔ	sɔŋk'	ʃòg	ʃòk'	ʃòg	–	'foot'
	*a	kàm	gàm	gàm	kàm	kàm	'find, meet'
	*a	pāj	pàj	p <sup>h</sup> āj	p <sup>h</sup> àd	p <sup>h</sup> āj	'fly (v.)'

While the correspondences for \*ε and \*ɔ seem regular, there are cognates in which some reflexes exhibit distinct vowels so establishing a proto-phoneme proves more challenging. Some examples are seen in (178). In these probable cognates there are correspondences between /i ~ ɪ ~ ε/ and /ɔ ~ ʊ/ though there do not appear to be any patterns to this variability that would warrant reconstructing a distinct proto-phoneme. I attribute these alternations to the general nature of variability in vowels over time.

(178)	Gwama	Komo	Uduk	Dana	Opo	Meaning
	jīs	īf	īs	ès	ēs	‘body’
	mìt’	mít’	mèd	mèt’	mìt’í	‘hand’
	sī	s’è	c’ē	s’èḍ <sup>h</sup>	tʃ’ē	‘shave’
	ʃóʃṵʃṵ	ʃṵí	ʃṵ	ʃṵʔṵ	sò	‘grass’

### 3.3.3 Consonant-glide sequences and diphthongs

The only scholar to propose a series of contrastive labialized consonants is Killian (2015) for Chali Uduk. The only complex onset that is exhibited by all of the living Koman languages is Cwa, in which an initial Consonant is followed by what can be analyzed as a labiovelar glide or a high back vowel. When it is analyzed as a glide the /w/ segment crucially does not carry tone. Occasionally, the vowel following the Cw sequence will have a contour tone. This suggest that at least historically, some synchronic Cw sequences developed from a diphthong, i.e. a high back vowel followed by \*a (e.g. \*ua or \*ʊa).

There are some cognates that contain /wa/ in Gwama and Uduk but /a/ in Komo and Dana-Opo as seen in (179). These cognates are all nouns and the Cw sequence may

be explained through metathesis of an initial gender prefix \* $\bar{v}$ - and the initial consonant of the noun root, such that \* $\bar{v}$ -Ca > C $\bar{v}$ a > Cwa.

(179)	Gwama	Komo	Uduk	Dana	Opo	Meaning
	swálá	sá	cwá	cáǰáʔ	tǰá	‘tree’
	twā̄	tàg	–	tàg	bī+t <sup>h</sup> āg	‘forehead’
	t’wā	t’ā	t’wā	t’āʔá	t’ā	‘mouth’
	pwǎǰà	–	bwàj	–	–	‘path, towards’

There are also correspondences in noun cognates that do not exhibit the pattern of /wa/ in Gwama and Uduk but /a/ in Komo and Dana-Opo in (179), as seen in (180).

(180)	Gwama	Komo	Uduk	Dana	Opo	Meaning
	k’wǎnt’íkwǎnt’	k’wàt’	k’wǎd’	k’wǎt’	k’wāt’	‘tick’
	kwám	kàm	kām	āmó	hàm	‘brother’
	$\bar{v}$ +dók	à+dók	–	à+dwák <sup>h</sup>	à+dwák <sup>h</sup>	‘weaver bird’

While this does not rule out the possibility of a PKMN set of labialized consonants, the data do not show robust correspondences supporting such a hypothesis either. This parallels Bender’s (1983:285) assessment that “no convincing case for labialized consonants is apparent, so I treat C<sup>w</sup>V as *Cui*, *Cue*, *Cuo*, *Cwa* (the last is by far the most frequent).”

This concludes the discussion of PKMN phonology. In the following chapter, I discuss the phonology of each subnode descending from PKMN to the modern languages.

## CHAPTER IV

### PHONOLOGICAL RECONSTRUCTION OF KOMAN SUBNODES

The following subsections reconstruct the core phonology of the Koman subnodes. I discuss the consonants, vowels and tone at each node down to the synchronic languages and/or languages varieties. Within each subsection, I lay out the innovations that characterize each node. I provide a schematized evolution of all consonants from PKMN to the particular node under scrutiny. I begin with the evolution of modern-day Gwama and then turn to Proto-Central Koman. From there I discuss the Komo-Uduk branch: Komo, Proto-Uduk and its modern varieties, Chali Uduk and Yabus Uduk. I then turn to the Dana-Opo branch and examine Proto-Dana-Opo followed by Dana, Proto-Opo and the modern Opo varieties.

#### 4.1 Gwama

Proto-Gwama (PGW) is one initial split from Proto-Koman. In the following subsections I treat Gwama as a single language given the proximity of the varieties. Thus, when referring to Gwama in the following subsections, I specifically mean both Highland and Lowland varieties.

Gwama shows the most reductions in the consonant system of any Koman language. Several innovations that characterize this branch are the loss of PKMN implosives as well as interdental and palatal obstruents. Gwama also exhibits independent devoicing of word-initial voiced stops before PKMN \*L. Another unique set of innovations are PKMN \*s > ʃ / \_ V[+high, -ATR] and PKMN \*f > s / \_ V[+high, +ATR]. In terms of the morphology, Gwama innovates some of the participant indexing of core



arguments on verbs as well as an elaborate system of partial reduplication of the verb stem. The phonological innovations are discussed in the following subsections.

#### 4.1.1 Gwama consonants

Synchronically Gwama has the smallest consonant inventory of any modern Koman language, with 21 phonemes. The synchronic Gwama consonant inventory is presented in Table 2 and reproduced here in (181). What characterizes modern Gwama is the array of independent mergers which occurred at a Proto-Gwama (PGW) stage. These involve a loss of the PKMN three-way phonological contrast in VOT in stops.

(181)

p	t	k	(ʔ)
b	d	g	
p'	t'	k'	
	s		
	z	f	h
	s'		
	n		
m	l	(ŋ)	
	r		
w		j	

Synchronically, Gwama voiceless stops are phonetically aspirated at least in syllable onset and coda positions. This is not an indication of a historical aspiration as reflexes of both unaspirated and aspirated stops are aspirated synchronically in these positions. Another significant series of PGW innovations were the independent mergers of the interdental and alveolar obstruent series. This includes plain and ejective stops. Gwama is also the only Koman language that does not display implosives synchronically, as a result of mergers with ejectives. The complete set of PGW innovations and the reflexes in modern Gwama are seen in Table 86 and some notable details are discussed below.

Table 86 Gwama phonological innovations

SET	PKMN		PGW		Gwama	Observations
1	*p <sup>h</sup>	>	*p	>	p	Merger
2	*p	>	*p	>	p	Merger
3	*b	>	*b	>	b	Retention: elsewhere (see 3a)
3a	*b	>	*p	>	p	Split: only initial in tone set C
4	*b̄	>	*p'	>	p'	Merger (also [b] medial)
5	*p'	>	*p'	>	p'	Retention: initial and final, [p' and b] medial
6	*t <sup>h</sup>	>	*t	>	t	Merger
7	*t	>	*t	>	t	Merger
8	*d	>	*d	>	d	Merger: not in tone set C
8a	*d̄	>	*t	>	t	Merger: only initial before tone set C
9	*t'	>	*t'	>	t'	Merger
10	(*t <sup>h</sup> )	>	*t	>	t	Merger: only word-final
11	*t	>	*t	>	t	Merger
12	*d	>	*d	>	d	Retention: not in tone set C
12a	*d	>	*t	>	t	Split: only initial in tone set C
13	*d'	>	*t'	>	t'	Merger
14	*t'	>	*t'	>	t'	Retention
15	*s'	>	*s'	>	s'	Retention
16	*c	>	*s	>	s	Merger: no conditioning for either [s] or [ʃ] (cf.23a)
16	*c	>	*ʃ	>	ʃ	Merger: no conditioning for either [s] or [ʃ] (cf. 23)
17	*ʃ	>	*z	>	z	Shift
18	*c'	>	*s'	>	s'	Merger
19	*k <sup>h</sup>	>	*k	>	k	Merger
20	*k	>	*k	>	k	Merger
21	*g	>	*g	>	g	Retention: not before tone set C
21a	*g	>	*k	>	k	Merger: only initial before tone set C
22	*k'	>	*k'	>	k'	Retention
23	*s	>	*ʃ	>	ʃ	Split: initial / _V [+high, -ATR] [ɪ, ʊ]
23a	*s	>	*s	>	s	Retention: elsewhere (see 23)
24	*ʃ	>	*ʃ	>	ʃ	Retention: initial / _V [ɪ, ε, ʊ]
24a	*ʃ	>	*s	>	s	Split: initial / _V [ɪ, ɔ, u]
25	*h	>	*h	>	h	Retention: only initial
26	*r	>	*r	>	r	Retention
27	*l	>	*l	>	l	Retention
28	*m	>	*m	>	m	Retention
29	*n	>	*n	>	n	Retention
30	(*ɲ)	>	*n	>	n	Merger
31	(*ŋ)	>	*ŋ	>	ŋ	Retention: only medial
31	(*ŋ)	>	*g	>	g	Merger: only medial, no conditioning
32	*w	>	*w	>	w	Retention
33	*j	>	*j	>	j	Retention
34	(*ɿ)	>	*ʃ	>	ʃ	Merger: / _ V[+high, -ATR] [ʊ] and R or L tone
35	(*ɿ̄)	>	*s	>	s	Merger: / _ V[+high, +ATR] [ɪ] and M or H tone
35	(*ɿ̄)	>	*z	>	z	/ _ V[+high, +ATR] [ɪ] and L tone

The evolution of the PKMN palatal stops have an interesting history in PGW, one which suggests a chain shift involving the alveolar and alveopalatal fricatives. PGW underwent two primary splits in PKMN \*s and \*ʃ. In syllable onset position, these splits were conditioned by the vowel of the syllable nucleus. In Gwama, PKMN \*s > PGW \*ʃ before [+high, -ATR] [ɪ, ʊ] and [s] was retained elsewhere in this position while PKMN \*ʃ > PGW \*s before [+high, +ATR] [i, u] and [ɔ]. These splits allowed for the palatal stops to merge as PKMN \*c > PGW \*s/\*ʃ though no conditioning is apparent for either the [s] or [ʃ] reflex. With regard to the voiced palatal stop, PGW innovates \*ʒ > z and the palatal ejective merges with the alveolar fricative/affricate ejective PKMN \*c' > PGW \*s'. This series of innovations led to the loss of a PKMN palatal stop series in PGW.

The questionable PKMN proto-phonemes (\*Ṭ, \*Ḍ), only found in onsets, also correspond to PGW fricatives. These correspondences, while thin, nonetheless exhibit similar outcomes to the PKMN palatals. The PGW reflexes appear to be conditioned by the ATR value of the following vowel and also tone in some cases. For instance, PKMN \*Ṭ > PGW \*ʃ before [-ATR] [ʊ] parallels \*s > \*ʃ before [-ATR] [ɪ, ʊ] and \*Ḍ > \*s before [+ATR] [i] parallels \*ʃ > \*s before [i, u].

#### 4.1.2 Gwama vowels and tone

PGW exhibited a seven-vowel contrastive inventory /i, ɪ, ε, a, ɔ, ʊ, u/ which exhibited some unique innovations, specifically with regard to the high vowels /i, ɪ, ʊ, u/. Recall that retentions or splits of PKMN \*s and \*ʃ in onset position were conditioned largely by the ATR value of the following vowel with [s] correlating with [+high, +ATR] and [ʃ] correlating with [+high, -ATR].

The Gwama varieties synchronically exhibit stem-controlled ATR harmony only in the high vowels. An identical system is seen in the Dana-Opo branch and this would either suggest a retention of this harmony system in both branches from PKMN, or two independent innovations. Given that Komo is the only language exhibiting ATR harmony in the Komo-Uduk branch, it seems likely that the stem-controlled ATR system was inherited in PGW.<sup>165</sup>

Gwama most likely inherited a PKMN tone system that contained three level reconstructed categories. These three tone categories evolved into the three level tones seen modernly in the Gwama varieties (see §3.1 for discussion). The development of three level tones from an erstwhile tone system containing two level tones was specifically due to the interaction with voiced stop onsets. These voiced stop onsets functioned as depressor consonants and lowered the F<sub>0</sub> of the following vowel nucleus. and ultimately gave rise to three level tones. A subsequent and independent PGW innovation was to devoice some stop onsets and merge them with voiceless stop onsets. This can be seen throughout the Gwama lexicon though there are exceptions to this pattern, which are discussed in §4.1.1.

#### 4.2 Proto-Central Koman (PCTRL)

Proto-Central Koman (PCTRL) consists of all of the living Koman languages with the exception of the Gwama branch. In order to reconstruct cognates to PCTRL, there must at least be a reflex in the Komo-Uduk branch that corresponds to a reflex in the Dana-Opo branch.

---

<sup>165</sup> Komo exhibits two distinct ATR harmony systems that are not stem-controlled but rather [+ATR] and [-ATR] dominant systems (Otero 2015, 2018b).

Central Koman phonology does not differ that much from PKMN, given that Dana and Chali Uduk retain most, if not all of the PKMN consonant and vowel system, though it could be argued that several morphological innovations gave rise to Central Koman. One strong feature of the verb system in Central Koman is nominal and verbal number marking in the verb, which is seen robustly in the Dana-Opo branch (Smolders *forthcoming*) and in Komo of the Komo-Uduk branch (Otero 2018b). The Uduk varieties retain some segmentally suppletive verbs (Stevenson 1942, Killian 2015).

#### 4.2.1 PCTRL consonants

PCTRL largely retained the consonant system inherited from PKMN with few exceptions. The PCTRL consonant inventory is provided in Table 87.

Table 87 Proto-Central Koman (PCTRL) consonant inventory

*p <sup>h</sup>	(*t <sup>h</sup> )	*t <sup>h</sup>		*k <sup>h</sup>
*p	*t	*t	*c	*k
*b	*d	*d	*ʃ	*g
*p'	*t'	*t'	*c'	*k'
*b		*d'		
		*s	*ʃ	*h
	(*ɽ)			
	(*ɽ)			
		*s'		
*m		*n		*ŋ
		*l	*ɲ	
		*r		
*w			*j	

The PCTRL consonant inventory strongly resembles that of PKMN, with retentions of all of the PKMN consonants. With regard to sound correspondences, PCTRL reflexes

exhibit the same sound correspondences as seen in PKMN (Chapter III). Given the strict criteria for reconstruction used here, I also recognize that some PCTRL cognates may well reconstruct to PKMN, having suffered a loss in Gwama.

Table 88 provides a schematized version of PCTRL retentions and innovations.

Table 88 Proto-Central Koman (PCTRL) phonological innovations

SET	PKMN		PCTRL	Observations
1	*p <sup>h</sup>	>	*p <sup>h</sup>	Retention
2	*p	>	*p	Retention
3	*b	>	*b	Retention
4	*ɓ	>	*ɓ	Retention
5	*p'	>	*p'	Retention
6	*t̥ <sup>h</sup>	>	*t̥ <sup>h</sup>	Retention
7	*t̥	>	*t̥	Retention
8	*d̥	>	*d̥	Retention
9	*t'	>	*t'	Retention
10	(*t <sup>h</sup> )	>	(*t <sup>h</sup> )	Retention (weak evidence overall)
11	*t	>	*t	Retention
12	*d	>	*d	Retention
13	*d'	>	*d'	Retention
14	*t'	>	*t'	Retention
15	*s'	>	*s'	Retention
16	*c	>	*c	Retention (weak PCTRL evidence)
17	*ʃ	>	*ʃ	Retention (weak PCTRL evidence)
18	*c'	>	*c'	Retention
19	*k <sup>h</sup>	>	*k <sup>h</sup>	Retention
20	*k	>	*k	Retention
21	*g	>	*g	Retention
22	*k'	>	*k'	Retention
23	*s	>	*s	Retention
24	*ʃ	>	*ʃ	Retention
25	*h	>	*h	Retention
26	*r	>	*r	Retention
27	*l	>	*l	Retention
28	*m	>	*m	Retention
29	*n	>	*n	Retention
30	(*ɲ)	>	(*ɲ)	Retention: only final
31	(*ŋ)	>	(*ŋ)	Retention: only medial/final
32	*w	>	*w	Retention
33	*j	>	*j	Retention
34	(*ṽ)	>	(*ṽ)	Retention
35	(*Ḍ)	>	(*Ḍ)	Retention

The bilabial series is robustly attested across stops, nasals, and glides. There is good evidence for the interdental stops \*t̪, \*d̪ and \*t̪ʰ. Evidence for a voiceless aspirated interdental stop \*t̪ʰ is still weak, given the fact that the best evidence for this proto-phoneme relies in cognates with a voiceless aspirated interdental reflex in Chali Uduk corresponding to a voiceless aspirated interdental reflex in Dana. The only reflexes of \*t̪ʰ are seen in (170). Note that the only solid correspondence is in (170a), and possibly (170b), though Chali Uduk exhibits an unaspirated interdental. Lastly, in (170c-d), Chali exhibits [tʰ] corresponding to Dana [t̪ʰ]. Evidence is weak overall for \*t̪ʰ.

(182)	PCTRL	Komo	Chali Uduk	Dana	Opo	Meaning
a.	*t̪ʰat̪ʰ	–	t̪ʰāt̪ʰ	t̪ʰāj̪d̪á	–	‘mediate’
b.	*t̪ʰip̪ʰ	–	t̪ʰip̪ʰ	t̪ʰi	–	‘raise (a child)’
c.	*t̪ʰùd̪	tùd	t̪ʰūr	t̪ʰùd̪	–	‘dry out’
d.	*t̪ʰ(w)ád̪	twáj	t̪ʰé	t̪ʰád̪	t̪ʰáj	‘hunger’

The palatal series of plain stops \*c and \*ɟ have few reflexes in PCTRL, though confidence in the existence of these stops is bolstered by identical correspondences in PKMN cognates (see \*ɟ correspondence sets 17).

Stops in word-final position are generally diachronically unstable. Some languages retain reflexes of word-final stops which correspond to glides or a total loss of the segment in other languages. For instance, in (170d), word-final /d̪/ is retained in Dana which corresponds to /j/ in Komo and Opo. Note that Chali Uduk has lost the final stop but its effect remains in the vowel as word-final /aj/ sequences can coalesce to /ɛ/.

#### 4.2.2 A note on \*Ṭ and \*Ḑ in PCTRL

In PCTRL, there is a bit more evidence for what in PKMN are marginal proto-phonemes: \*Ṭ and \*Ḑ. These proposed proto-phonemes gain credence when examining PCTRL reflexes, though deciding whether to reconstruct a proto-phoneme and if so, what to reconstruct is challenging. The PCTRL \*Ṭ and \*Ḑ correspondence sets are in Table 89.

Table 89 PCTRL \*Ṭ and \*Ḑ correspondence set

Set	PCTRL	Komo	Uduk		Dana	Opo			
			Yab	Cha		Bil	Mod	Pam	Kig
34	*Ṭ	s/z	s	ṭ	s	tʃ	tʃ	tʃ	tʃ
35	*Ḑ	z/j	j	j/w	ḑ	dʒ	dʒ	z	s/ʃ

In the \*Ṭ correspondence set, Chali Uduk exhibits /ṭ/ which corresponds to Dana /s/ and Opo /tʃ/. Komo alternates between /s/ and /z/, which cannot be explained except possibly by tone. The PCTRL \*Ṭ reflexes are seen in (183). Note that ‘resemble’ constitutes the only robust set. Dana /h/ could be explained as weakening from \*s. I cannot explain the Komo /z/ correspondence in ‘nosebleed’ other than the fact that it is not H tone. The ‘arrow’ correspondence is problematic given that the initial correspondences fit the pattern, but the vowels do not correspond in Dana-Opo. Further it is important to mention that the Komo cognate *sá* is also ‘tree’, though this cognate forms part of a \*c correspondence.<sup>166</sup> I include this Komo word in parentheses to indicate it may not be cognate with the other ‘arrow’ forms.

<sup>166</sup> \*c reflexes are /s/ in Komo, /tʃ/ in Opo, and /c/ in Uduk and Dana.



(183)	Komo	Uduk (Yabus)	Uduk (Chali)	Dana	Opo (Bil)	Meaning
a.	sál	sál	ṭál	hálà	tʃál	‘resemble’
b.	–	–	ṭiṭ’	–	tʃitʃá	‘urinate’
c.	zìnà	–	–	–	àtʃwìnà	‘nosebleed’
d.	(sá)	sá	à+ṭá	sēṭh	tʃē	‘arrow’

The \*Ḍ reflex is even more puzzling. The reflexes are seen in (184). In the DAOP branch, Dana /Ḍ/ corresponds to /dʒ, dʒ, z, s/f/ in the Opo varieties, with the exception of /d/ in Bilugu Opo in ‘penis’ and /dʒ/ in Pame Opo in ‘string (v.)’. This aside, there does seem to be a regular correspondence in DAOP. Turning to the KOUD branch, in Komo, the reflexes of \*Ḍ are /z/, /j/ or a loss altogether as in ‘string (v.)’, while the Uduk reflexes are /w/ and /j/. The /w/ could be the result of coalescence between an initial glide and a back vowel though this is speculation.

(184)	Komo	Uduk	Dana	Opo (Bil)	Opo (Mod)	Opo (Pam)	Opo (Kig)	Meaning
a.	zīt	–	–	dʒīt <sup>h</sup>	dʒīt <sup>h</sup>	zīt <sup>h</sup>	ʃīt <sup>h</sup>	‘shade’
b.	zāgà	–	–	dʒùgà	–	–	ʃùgà	‘name’
c.	jɪf	jīs	ḍīs	dōs	dʒōs	zōs	sōs	‘penis’
d.	jà	jà	ḍā	dʒà	dʒà	zà	ʃà	‘go.SG’
e.	òm	wòm	ḍòm	dʒòm	dʒòm	dʒòm	ʃòm	‘string (v.)’

An important note here must be made for the deictic ‘go’ and ‘come’ verbs, which appear to be a Central Koman innovation. The segmental histories of these verbs are very difficult to tease apart for a number of reasons. First, there are both singular and plural forms for each verb as seen in (185). Second, some of the ‘come’ verbs can be constructed from ‘go’ roots plus a deictic directional morpheme that indicates motion

towards the speaker. Many of these verb forms have fused a historical root and a directional morpheme.

(185)	Komo	Uduk (Chali)	Dana	Opo (Bil)	Opo (Mod)	Opo (Pam)	Opo (Kig)	Meaning
a.	jà	jà	ḍā	dʒà	dʒà	zà	ʃà	‘go.SG’
b.	ì	ī	ḍâ	ʔjá	ʔjá	ʔjá	ʔjá	‘go.PL’
c.	–	jà-í	jó	dʒō	dʒō	zō	ʃō	‘come.SG’
d.	ì-ó	ī-ú	já	dʒā	dʒā-í	zā-jó	ʃā-jó	‘come.PL.’

With specific regard to initial consonants, what stands out in the ‘go.SG’ reflexes is a \*Ḍ correspondence. Thus, ‘go.SG’ (or one form of a historical ‘go’ or ‘move’ verb) could conceivably reconstruct to \*Ḍa ‘go, move’. It appears that Proto-Opo (POP) constructs the ‘come’ forms from \*Ḍa plus a deictic directional \*<sub>ᵛ</sub> or \*<sub>ᵛI</sub>.<sup>167</sup> The /ḍ/ corresponds to /j/ in Komo-Uduk in the singular ‘come’ forms. Whether \*Ḍa is cognate with the plural ‘come’ verbs in Komo-Uduk is unclear, but likely. The plural ‘come’ forms may have arisen from a plural ‘go’ root \*ʔj(a) seen in Dana. Note that the initial segment in this form is one of the few true glottal stop onsets in Koman. Komo has a distinct (and cognate) form ʔjá ‘go.SG’ which only occurs in a particular deictic directional paradigm (Otero 2015b, 2018b). I cannot offer a definitive reconstruction of Koman ‘go/come’ verb roots at present. Nevertheless, these verbs appear to be very old given the idiosyncrasy in the reflexes that may well reconstruct to \*Ḍ.

Given the fact that these \*Ṭ and \*Ḍ irregular correspondences hold to varying degrees from PKMN down to lower nodes, one possible solution is to posit contrasting

---

<sup>167</sup> Whether to reconstruct \*<sub>ᵛ</sub>, \*<sub>I</sub> or a form such as \*<sub>ᵛI</sub> for deictic directional 1 (DD1) is unclear at present. See §2.2.3.2 for description of deictic directional morphology in Koman.

PKMN (or PCTRL) interdental fricatives \*θ and \*ð. The voicing is almost the same across the reflexes of the interdentals as is found in the corresponding reflexes of the proto fricatives and affricates. This is speculation at this point, yet by examining PCTRL and PKMN correspondences, the data suggest possibly reconstructing two additional proto-phonemes.

#### 4.2.3 PCTRL vowels and tone

The PCTRL vowel system reconstructs to a seven-vowel system /i, ɪ, ε, a, ɔ, ɔ̄, u/ with ATR contrast in the high vowels. There is evidence to suggest that PCTRL exhibited some kind of ATR vowel harmony system given that Komo and the Dana-Opo branch exhibit ATR harmony systems even though the systems are distinct. If PCTRL exhibited an ATR harmony system, it was most likely a stem-controlled system involving only the high vowels. This is due to the fact that there is phonemic ATR contrast only in the high vowels (i.e. there are no [+ATR] counterparts to /e, a, ɔ/), coupled with the observation that both Gwama and the Dana-Opo branch exhibit stem-controlled ATR harmony in the high vowels. Hypothesizing the retention of a stem-controlled ATR harmony system in Gwama and Dana-Opo requires fewer changes than positing that these two systems were independent yet identical innovations. This hypothesis also allows for the Komo innovation of a distinct harmony system from the inherited stem-controlled system in the other sub-branches. Therefore it is highly likely that PCTRL or even PKMN was characterized by a stem-controlled ATR harmony system involving only the high vowels /i, ɪ, ɔ̄, u/.

Tone figures prominently in the history of Koman phonology. It's historical relationship to word-initial (syllable onset) stops necessitates examining historical tone

and the onset consonants in tandem. Section 3.1 provided a historical scenario for the development of tone in PKMN beginning with a system which exhibited two contrasting level tones. From there, voiced stops acted as depressor consonants, lowering the pitch of the following vowel, which ultimately led to the phonologization of an additional third level tone. This accounted for much of the data with the exception how Dana and Komo acquired synchronic M tone. Recall that the correspondence for tone set B has M tone in all languages except for L tone in Komo and Dana (see Table 45 in §3.1.1). Further, there are no PKMN cognates with plain stop onsets in which all languages, including Komo and Dana, exhibit M tone.

Examining the tone distributions of PCTRL cognates provides a slightly different picture than that we can deduce from PKMN cognates, namely one additional robust tone correspondence set. The PCTRL tone correspondence sets mapped on to the distribution of stop onsets is seen in Table 90. Note that the historical tone classes based on the distribution in PKMN cognates are still robustly attested in PCTRL (i.e. tone sets A-C) and that set C is still in complementary distribution with set B with regard to voicing of stop onsets. Tone set D, in which all languages have corresponding M tone, is robust in PCTRL. This accounts for the M tones seen synchronically in Komo and Dana, but I cannot offer an explanation as to how this arose at present.

Table 90 Tone categories in PCTRL correspondence sets and the distribution with stop onsets

Set	Komo	Uduk	Dana	Opo	stop onsets
A	H	H	H	H	voiceless aspirated/unaspirated
B	L	M	L	M	voiceless aspirated/unaspirated
C	L	L	L	L	voiced
D	M	M	M	M	voiceless aspirated/unaspirated

### 4.3 Proto-Komo-Uduk (PKOUD)

PKOUD is one of two main branches which split from PCTRL Koman. There is virtually no change in the consonant, vowel and tone systems inherited from PCTRL. This is primarily due to the fact that Chali Uduk is extremely conservative, retaining virtually all of the PKMN consonants. One notable phonological innovation is the merger of  $*T̥ > *t̥$ . PUD also retains voiced stops before PKMN  $*L$  tone as opposed to PDAOP which devoices and merges voiced stops with voiceless unaspirated stops word-initially before  $*L$ . This is also seen partially in Gwama. In terms of morphological innovations, PKOUD loses the masculine singular nominal proclitic/prefix  $*\grave{v}$ , which is retained in Gwama and Dana-Opo (§5.2.1). Another morphological innovation that characterizes this branch is the development of PKOUD  $*-ki/ku$  DD2 deictic directional morpheme (§5.4).

#### 4.3.1 PKOUD consonants

The PKOUD consonant inventory is seen in Table 91. The PKOUD consonant system exhibits retentions across the board from PCTRL with the exception of two consonants:  $*T̥$  and  $*D̥$ .

Table 91 Proto-Komo-Uduk (PKOUD) consonant inventory

*p <sup>h</sup>	(*t <sup>h</sup> )	*t <sup>h</sup>	*k <sup>h</sup>	
*p	*t	*t	*c	*k
*b	*d	*d	*ʃ	*g
*p'	*t'	*t'	*c'	*k'
*ḅ		*d'		
	(*Ṭ)	*s	*ʃ	*h
	(*Ḍ)			
		*s'		
*m		*n	*ɲ	*ŋ
		*l		
		*r		
*w			*j	

While there were no significant innovations in the consonant system in PKOUD save innovation of the marginal proto-phonemes \*Ṭ and \*Ḍ. I provide a list of retentions in Table 92. Note that the fact that a particular proto-phoneme not having cognates that reconstruct to this node does not imply that the phoneme was not in the proto-system as there are lexemes in higher nodes that exhibit all of the reflexes in this table.

Table 92 Proto-Komo-Uduk (PKoUd) phonological innovations

SET	PKMN		PCTRL		PKOUD		Observations
1	*p <sup>h</sup>	>	*p <sup>h</sup>	>	*p <sup>h</sup>		Retention
2	*p	>	*p	>	*p		Retention
3	*b	>	*b	>	*b		Retention
4	*ḅ	>	*ḅ	>	*ḅ		Retention
5	*p'	>	*p'	>	*p'		Retention
6	*t <sup>h</sup>	>	*t <sup>h</sup>	>	*t <sup>h</sup>		Retention (no cognates in PKOUD)
7	*t	>	*t	>	*t		Retention (no cognates in PKOUD)
8	*d	>	*d	>	*d		Retention
9	*t'	>	*t'	>	*t'		Retention (no cognates in PKOUD)
10	(*t <sup>h</sup> )	>	(*t <sup>h</sup> )	>	(*t <sup>h</sup> )		Retention (no cognates in PKOUD)
11	*t	>	*t	>	*t		Retention
12	*d	>	*d	>	*d		Retention
13	*d'	>	*d'	>	*d'		Retention
14	*t'	>	*t'	>	*t'		Retention (no cognates in PKOUD)

Table 92 Proto-Komo-Uduk (PKoUd) phonological innovations

SET	PKMN		PCTRL		PKOUD	Observations
15	*s'	>	*s'	>	*s'	Retention
16	*c	>	*c	>	*c	Retention
17	*ʃ	>	*ʃ	>	*ʃ	Retention
18	*c'	>	*c'	>	*c'	Retention (no cognates in PKOUD)
19	*k <sup>h</sup>	>	*k <sup>h</sup>	>	*k <sup>h</sup>	Retention
20	*k	>	*k	>	*k	Retention
21	*g	>	*g	>	*g	Retention
22	*k'	>	*k'	>	*k'	Retention
23	*s	>	*s	>	*s	Retention
24	*f	>	*f	>	*f	Retention
25	*h	>	*h	>	*h	Retention (no cognates in PKOUD)
26	*r	>	*r	>	*r	Retention (no cognates in PKOUD)
27	*l	>	*l	>	*l	Retention (no cognates in PKOUD)
28	*m	>	*m	>	*m	Retention
29	*n	>	*n	>	*n	Retention (no cognates in PKOUD)
30	(*ɲ)	>	(*ɲ)	>	(*ɲ)	Retention: only final (no cognates in PKOUD)
31	(*ŋ)	>	(*ŋ)	>	(*ŋ)	Retention: only medial/final (no cognates in PKOUD)
32	*w	>	*w	>	*w	Retention
33	*j	>	*j	>	*j	Retention
34	(*ṽ)	>	(*ṽ)	>	(*ṽ)	Retention
35	(*Ḍ)	>	(*Ḍ)	>	(*Ḍ)	Retention (no cognates in PKOUD)

The \*ṽ and \*Ḍ proposed proto-phonemes were discussed in PCTRL cognates in §4.2.2. The only PKOUD cognate with reflexes of \*ṽ is in (186) and it follows the correspondences seen in higher nodes.

(186)	Komo	Uduk (Yabus)	Uduk (Chali)	Meaning
	s̄in	s̄in	ṽin	'tail'

PKOUD most likely retained \*Ḍ realized as some type of fricative or affricate given that it is realized as a fricative in Komo /s, z/ but (possibly) a glide /j, w/ in Uduk. Thus, positing PCTRL \*Ḍ > PKOUD \*j/\*w does not seem likely given that a change such as PKOUD \*j/\*w > Komo /s, z/ is unattested. Rather, retention of \*Ḍ in PKOUD and the

subsequent \*Ḍ > /s, z/ seems more likely. Given the paucity of reflexes, this is speculation at this point.

#### 4.3.2 PKoUD vowels and tone

PKoUD exhibited a seven-vowel system /i, ɪ, ε, a, ɔ, ʊ, u/ with ATR contrast in the high vowels. If stem-controlled ATR harmony was present in PCTRL (inherited from PKMN), then it was also present PKoUD. Given the fact that modern Uduk has collapsed the seven-vowel system into five vowels with no ATR contrast, but Komo retains the PKMN seven-vowel system with ATR contrast in the high vowel, I reconstruct the ATR value of the high vowels exhibited in Komo to PKoUD.

At the PKoUD stage in Koman's history, two level tones were in complementary distribution with voiced and voiceless stop onsets, which was inherited from PCTRL (c.f. Table 45). This complementary distribution between tone and onsets is retained in the modern Uduk varieties.<sup>168</sup> Further, this distribution holds across all Uduk reflexes in cognates reconstructed to PKoUD, PCTRL and PKMN.

#### 4.4 Komo

Komo underwent significant innovations from PKoUD specifically with regard to the consonant system such as the loss of interdental and palatal stops. Further, it developed a unique ATR harmony system unseen in any of the other Koman languages (§2.1.5.3). In the tone system, Komo extended the three level tone system to extend to the full range of stop onsets and onsets: synchronic Komo does not have any consonant-tone restrictions. In terms of morphological innovations, Komo innovated

---

<sup>168</sup> See §2.1.6.6 for discussion of synchronic Uduk consonant-tone restrictions and §3.1 for discussion of PKMN tone.



“exchoativity” in the deictic directional system in which a particular morpheme on stative verb roots expresses a state that no longer holds (§2.2.3.2). Komo also innovated an extensive system of participant indexing on the verb (§2.2.3.1.2). In the following subsections, I treat the major Komo phonological innovations.

#### 4.4.1 Komo consonants

Significant Komo innovations, largely by way of mergers, gave rise to the consonant inventory seen in Table 5 and reproduced here in (187). Note that the glottal stop and velar nasal are marginally contrastive.

(187)

p	t	k	(ʔ)
b	d	g	
pʰ	tʰ	kʰ	
ɸ	ɸ		
	s	ʃ	h
	z		
	sʰ		
m	n	(ŋ)	
	l		
	r		
w		j	

One overarching innovation in Komo was the complete merger of aspirated and unaspirated voiceless stops. This merger took place across three places of articulation: bilabial, interdental and alveolar. Further, the interdental and alveolar stops merged completely, drastically reducing the number of phonemic consonants. A schematized version of the Komo innovations is provided in Table 93.

Table 93 Komo phonological innovations

SET	PKMN	>	PCTRL	>	PKOUD	>	Komo	Observations
1	*p <sup>h</sup>	>	*p <sup>h</sup>	>	*p <sup>h</sup>	>	p	Merger
2	*p	>	*p	>	*p	>	p	Merger
3	*b	>	*b	>	*b	>	b	Retention

Table 93 Komo phonological innovations

SET	PKMN		PCTRL		PKOUD	Komo	Observations
4	*ḡ	>	*ḡ	>	*ḡ	ḡ	Retention: initial
4	*ḡ	>	*ḡ	>	*ḡ	p'	Merger: medial, final
5	*p'	>	*p'	>	*p'	p'	Retention
6	*t <sup>h</sup>	>	*t <sup>h</sup>	>	*t <sup>h</sup>	t	Merger
7	*t	>	*t	>	*t	t	Merger
8	*d	>	*d	>	*d	d	Merger
8	*d	>	*d	>	*d	z	Shift: spirantization before [i]
9	*t'	>	*t'	>	*t'	t'	Merger
10	(*t <sup>h</sup> )	>	(*t <sup>h</sup> )	>	(*t <sup>h</sup> )	t	Merger
11	*t	>	*t	>	*t	t	Merger
12	*d	>	*d	>	*d	d	Retention
13	*d'	>	*d'	>	*d'	d'	Retention
13	*d'	>	*d'	>	*d'	r	Merger: medial, final
14	*t'	>	*t'	>	*t'	t'	Retention
15	*s'	>	*s'	>	*s'	s'	Retention
16	*c	>	*c	>	*c	s	Shift
17	*j	>	*j	>	*j	z	Shift
18	*c'	>	*c'	>	*c'	s'	Merger
19	*k <sup>h</sup>	>	*k <sup>h</sup>	>	*k <sup>h</sup>	k	Merger
20	*k	>	*k	>	*k	k	Merger
21	*g	>	*g	>	*g	g	Retention
22	*k'	>	*k'	>	*k'	k'	Retention
23	*s	>	*s	>	*s	ʃ	Merger
24	*f	>	*f	>	*f	ʃ	Retention
25	*h	>	*h	>	*h	h	Retention
26	*r	>	*r	>	*r	r	Retention
27	*l	>	*l	>	*l	l	Retention
28	*m	>	*m	>	*m	m	Retention
29	*n	>	*n	>	*n	n	Retention
30	(*p)	>	(*p)	>	(*p)	n	Merger: only final
31	(*ŋ)	>	(*ŋ)	>	(*ŋ)	g	Merger: only medial
32	*w	>	*w	>	*w	w	Retention
33	*j	>	*j	>	*j	j	Retention
34	(*ṽ)	>	(*ṽ)	>	(*ṽ)	s	Merger
35	(*Ḍ)	>	(*Ḍ)	>	(*Ḍ)	z	Shift

There appears to be a chain shift in Komo beginning with the merger of the alveolar and alveopalatal fricatives \*s > ʃ, which allowed for the subsequent shift \*c > s. These shifts must have occurred in this order or else an initial merger of \*c > s would not justify only some /s/-initial words to have split to /ʃ/.

Another Komo innovation is the now-contrastive phoneme /z/. While this phoneme exists synchronically in three branches, I cannot reconstruct it to a proto-phoneme at any stage given the lack of solid correspondences. Komo /z/ could have arisen via the shift of \*ʃ > z as it parallels the \*c > ʃ shift in voicing. This is one possible source. Another possibility for the origin of /z/ in Komo is via the spirantization of \*ɖ > z before high front vowels and L tone (PKMN \*ɖim ‘strain’ > zim) and/or the weak \*ɖ correspondence of \*ɖ > z. Note also that Komo merges \*ʈ > s.

#### 4.4.2 Komo vowels and tone

The synchronic seven-vowel system /i, ɪ, ε, a, ɔ, ɔ̃, u/ in modern-day Komo was inherited all the way from PKMN. If an ATR harmony system existed in PKMN further down the nodes, it was most likely a stem-controlled system in which [+high] affix vowels harmonize to the ATR of a [+high] stem vowel. This is due to the fact that this ATR harmony system exists modernly in Gwama and in the Dana-Opo branch. Even if ATR harmony were not reconstructed to PKMN or any of the nodes below it, one very notable innovation in Komo is the unique bi-directional ATR harmony system seen modernly (§2.1.5.3 also Otero 2015, Olejarczuk et al. 2019).

Komo inherited a tone system with three level tones and crucially with distributional restrictions regarding the voicing of word-initial (syllable onset) stops. Throughout its history, Komo lost the consonant-tone restrictions. Synchronic Komo onsets are not sensitive to the voicing of the initial consonant, be it a stop or otherwise. As such, all consonants can occur with all three level tones in synchronic Komo. The trajectory of how Komo gained the tone system relative to onsets requires further investigation.

#### 4.5 Proto-Uduk (PUD) phonology

Uduk consists of the Northern varieties, Chali and Bonya and the Southern variety Yabus Uduk. The Chali and Bonya varieties are much closer in structure and the Yabus variety is the most divergent. This study focuses only on the Chali and Yabus varieties and a cognate must have reflexes in both Chali and Yabus to be reconstructed to PUD. A notable PUD innovation is the collapse of the PKMN seven-vowel inventory into a five-vowel system along with a loss of ATR contrast and ATR harmony which reconstructs to PKMN. I discuss the major PUD phonological innovations in the following subsections.

##### 4.5.1 PUD consonants

The Proto-Uduk PUD reconstructed consonant inventory is in Table 94.

Table 94 Proto-Uduk (PUD) consonant inventory

*p <sup>h</sup>	(*t <sup>h</sup> )	*t <sup>h</sup>		*k <sup>h</sup>
*p	*t	*t	*c	*k
*b	*d	*d	*ʃ	*g
*p'	*t'	*t'	*c'	*k'
*b		*d'		
		*s	*ʃ	*h
	(*T)			
	(*D)			
		*s'		
*m		*n		*ŋ
		*l	*ɲ	
		*r		
*w			*j	

PUD retained much of the PCTRL consonant inventory with a few notable exceptions. The PUD retentions and innovations are schematized in Table 95 and discussed below.

Table 95 Proto-Uduk (PUd) phonological innovations

SET	PKMN		PCTRL		PKOUD		PUD	Observations
1	*p <sup>h</sup>	>	*p <sup>h</sup>	>	*p <sup>h</sup>	>	*p <sup>h</sup>	Retention
2	*p	>	*p	>	*p	>	*p	Retention
3	*b	>	*b	>	*b	>	*b	Retention
4	*ḅ	>	*ḅ	>	*ḅ	>	*ḅ	Retention
5	*p'	>	*p'	>	*p'	>	*p'	Retention
6	*t <sup>h</sup>	>	*t <sup>h</sup>	>	*t <sup>h</sup>	>	*t <sup>h</sup>	Retention
7	*t	>	*t	>	*t	>	*t	Retention
8	*d	>	*d	>	*d	>	*d	Retention
9	*t'	>	*t'	>	*t'	>	*t'	Retention: only initial
9	*ṭ'	>	*ṭ'	>	*ṭ'	>	*ḍ'	Split: only final
10	(*t <sup>h</sup> )	>	(*t <sup>h</sup> )	>	(*t <sup>h</sup> )	>	(*t <sup>h</sup> )	Retention
11	*t	>	*t	>	*t	>	*t	Retention
12	*d	>	*d	>	*d	>	*d	Retention
13	*ḍ'	>	*ḍ'	>	*ḍ'	>	*ḍ'	Retention
14	*t'	>	*t'	>	*t'	>	*t'	Retention
15	*s'	>	*s'	>	*s'	>	*s'	Retention
16	*c	>	*c	>	*c	>	*c	Retention
17	*ɟ	>	*ɟ	>	*ɟ	>	*ɟ	Retention
18	*c'	>	*c'	>	*c'	>	*c'	Retention
19	*k <sup>h</sup>	>	*k <sup>h</sup>	>	*k <sup>h</sup>	>	*k <sup>h</sup>	Retention
20	*k	>	*k	>	*k	>	*k	Retention
21	*g	>	*g	>	*g	>	*g	Retention
22	*k'	>	*k'	>	*k'	>	*k'	Retention
23	*s	>	*s	>	*s	>	*s	Retention
24	*ʃ	>	*ʃ	>	*ʃ	>	*ʃ	Retention
25	*h	>	*h	>	*h	>	*h	Retention
26	*r	>	*r	>	*r	>	*r	Retention
27	*l	>	*l	>	*l	>	*l	Retention
28	*m	>	*m	>	*m	>	*m	Retention
29	*n	>	*n	>	*n	>	*n	Retention
30	(*ɲ)	>	(*ɲ)	>	*ɲ	>	*ɲ	Retention + Extension
31	(*ŋ)	>	(*ŋ)	>	(*ŋ)	>	*ŋ	Retention: only medial/final
32	*w	>	*w	>	*w	>	*w	Retention
33	*j	>	*j	>	*j	>	*j	Retention
34	(*ṽ)	>	(*ṽ)	>	(*ṽ)	>	(*ṽ)	Retention
35	(*Ḍ)	>	(*Ḍ)	>	(*Ḍ)	>	(*Ḍ)	Retention

One significant innovation in the modern Uduk varieties is the palatalization of all velar stops (including the ejective) before front vowels. This innovation, or series of innovations, split the velar series and merged those that were palatalized with the existing palatal stops. These changes have spread through the lexicon of Chali and

Yabus Uduk in that there are no lexemes containing a velar onset followed by a front vowel.<sup>169</sup> Thus it is tempting, and economical, to posit that these changes occurred once in PUD. This seems likely were it not for the fact that Yabus Uduk split PUD \*j > ʒ and PUD \*c' > ʃ. Crucially, these Yabus Uduk splits occurred in palatal reflexes that were not historically velars. Thus, two independent innovations of the split and merger of velars in onsets with front vowels had to occur independently in Chali and Yabus Uduk, despite this not being the most elegant solution.

PUD extends the palatal nasal to initial position. Recall that there is some evidence for \*ɲ in cognates higher up in the family, though the distribution is restricted to medial and final position. The velar nasal is completely phonologized in PUD though it only occurs in syllable coda position.

In the interdental series, PUD splits and merges \*t̪' > \*d̪' in coda position. This merger progresses subsequently in Yabus Uduk as \*d̪' > \*d.

#### 4.5.2 PUD vowels and tone

One important innovation that distinguishes the Uduk varieties from the rest of the living Koman languages is the merger of the seven-vowel system into a five-vowel system in PUD. This merger occurred in the high vowels where both \*i and \*ɪ merged into one vowel /i/, and the back vowels \*u and \*ʊ merged into /u/. Previous scholars have recognized the phonetic variation in Chali Uduk vowels (Stevenson 1942, Killian

---

<sup>169</sup> There are several exceptions in Chali Uduk, but they are all grammatical morphemes with the shape [ki] and distinct tones. These morphemes range in function from complementation, direction of motion to marking oblique phrases (see Killian 2015). I am grateful to Don Killian for pointing out these exceptions to me.

2015) though there is no evidence for anything other than a five-vowel contrastive system.

The PUD tone system retains the system inherited from PCTRL (§4.2.3). This tone system had distributional restrictions with regard to voicing in onsets and this remains completely phonologized in the Uduk varieties today.

#### 4.6 Chali Uduk

Chali Uduk has figured prominently in reconstructions of PKMN given its extensive consonant system (Bender 1983, Ehret 2001). Chali Uduk retains most of the PKMN consonant system with some important innovations: the palatalization of velar stops before front vowels, \*s' > ṭ' and \*ṭ' > t', among others. One important Chali Uduk innovation outside of phonology is the development of a nominal gender/class system. This gender/class system is outlined and discussed in Killian (2015) and summarized in §2.2.2.3.3 of this manuscript.

##### 4.6.1 Chali Uduk consonants

Chali Uduk is one of the most conservative Koman languages, retaining almost every consonant inherited from PKMN. The synchronic Chali Uduk consonant system is presented in Table 7 and reproduced in (188).

(188)	p <sup>h</sup>	ṭ <sup>h</sup>	t <sup>h</sup>	c <sup>h</sup>	k <sup>h</sup>	
	p	ṭ	t	c	k	(?)
	b	ḍ	d	ʃ	g	
	p'	ṭ'	t'	c'	k'	
	b̄		d̄			
			s	ʃ		h
	m		n	ɲ	ŋ	
			l			
			r			
	w			j		

The Chali Uduk retentions and innovations are schematized in Table 96.

Table 96 Chali Uduk phonological innovations

SET	PKMN		PCTRL		PKOUD		PUD		Chali Uduk	Observations
1	*p <sup>h</sup>	>	*p <sup>h</sup>	>	*p <sup>h</sup>	>	*p <sup>h</sup>	>	p <sup>h</sup>	Retention
2	*p	>	*p	>	*p	>	*p	>	p	Retention
3	*b	>	*b	>	*b	>	*b	>	b	Retention
4	*ḃ	>	*ḃ	>	*ḃ	>	*ḃ	>	ḃ	Retention
5	*p'	>	*p'	>	*p'	>	*p'	>	p'	Retention
6	*t <sup>h</sup>	>	*t <sup>h</sup>	>	*t <sup>h</sup>	>	*t <sup>h</sup>	>	t <sup>h</sup>	Retention
7	*t	>	*t	>	*t	>	*t	>	t	Retention
8	*d	>	*d	>	*d	>	*d	>	d	Retention
9	*t'	>	*t'	>	*t'	>	*t'	>	t'	Merger: only onsets
9	*t'	>	*t'	>	*t'	>	*d'	>	d'	Retention: only codas
10	(*t <sup>h</sup> )	>	(*t <sup>h</sup> )	>	(*t <sup>h</sup> )	>	(*t <sup>h</sup> )	>	t <sup>h</sup>	Retention
11	*t	>	*t	>	*t	>	*t	>	t	Retention
12	*d	>	*d	>	*d	>	*d	>	d	Retention
13	*d'	>	*d'	>	*d'	>	*d'	>	d'	Retention
14	*t'	>	*t'	>	*t'	>	*t'	>	t'	Retention
15	*s'	>	*s'	>	*s'	>	*s'	>	t'	Merger
16	*c	>	*c	>	*c	>	*c	>	c	Retention
17	*ʃ	>	*ʃ	>	*ʃ	>	*ʃ	>	ʃ	Retention
18	*c'	>	*c'	>	*c'	>	*c'	>	c'	Retention
19	*k <sup>h</sup>	>	*k <sup>h</sup>	>	*k <sup>h</sup>	>	*k <sup>h</sup>	>	k <sup>h</sup>	Retention
19	*k <sup>h</sup>	>	*k <sup>h</sup>	>	*c <sup>h</sup>	>	*k <sup>h</sup>	>	c <sup>h</sup>	Split: before front vowels
20	*k	>	*k	>	*k	>	*k	>	k	Retention
20	*k	>	*k	>	*k	>	*k	>	c	Split: before front vowels
21	*g	>	*g	>	*g	>	*g	>	g	Retention
21	*g	>	*g	>	*g	>	*g	>	ʃ	Split: before front vowels
22	*k'	>	*k'	>	*k'	>	*k'	>	k'	Retention
22	*k'	>	*k'	>	*k'	>	*k'	>	c'	Split: before front vowels
23	*s	>	*s	>	*s	>	*s	>	s	Retention
24	*ʃ	>	*ʃ	>	*ʃ	>	*ʃ	>	ʃ	Retention
25	*h	>	*h	>	*h	>	*h	>	h	Retention
26	*r	>	*r	>	*r	>	*r	>	r	Retention
27	*l	>	*l	>	*l	>	*l	>	l	Retention
28	*m	>	*m	>	*m	>	*m	>	m	Retention
29	*n	>	*n	>	*n	>	*n	>	n	Retention
30	(*ɲ)	>	(*ɲ)	>	*ɲ	>	*ɲ	>	ɲ	Retention
31	(*ŋ)	>	(*ŋ)	>	(*ŋ)	>	*ŋ	>	ŋ	Retention: medial/final



Table 96 Chali Uduk phonological innovations

SET	PKMN		PCTRL		PKOUD		PUD		Chali Uduk	Observations
32	*w	>	*w	>	*w	>	*w	>	w	Retention
33	*j	>	*j	>	*j	>	*j	>	j	Retention
34	(*ṽ)	>	(*ṽ)	>	(*ṽ)	>	(*ṽ)	>	ṽ	Merger
35	(*Ḍ)	>	(*Ḍ)	>	(*Ḍ)	>	(*Ḍ)	>	j/h	Merger

One significant innovation in Chali Uduk is what appears to be a chain shift in two PUD ejectives: \*ṽ' and \*s'. This presumably began with \*ṽ' > t' followed by \*s' > ṽ'. This is supported by the fact that in my database at least, there are no cognates in which both Chali Uduk and Dana both exhibit interdental ejective reflexes /ṽ'/.

Another innovation in Chali Uduk, which is paralleled in the Yabus variety, is the split of the velar stop series before front vowels. The split of \*k<sup>h</sup> > c<sup>h</sup> led to the creation of a new phoneme which provided symmetry across the stop series completing the four-way contrast seen modernly: voiceless aspirated, voiceless unaspirated, voiced and ejective.

#### 4.6.2 Chali Uduk vowels and tone

The Chali Uduk vowel system retains a five-vowel contrastive inventory /i, ε, a, ɔ, u/ with no ATR contrast inherited from the mergers in the high vowels in PUD. The Chali tone system remain identical to those inherited from PUD, with significant synchronic consonant-tone restrictions that are the result of the historical evolution of Koman.

#### 4.7 Yabus Uduk

While Chali Uduk exhibits strong retentions in the consonant system, Yabus Uduk is marked by several significant mergers and several innovations in the consonant system that are unique to Koman. Some significant Yabus Uduk innovations are the loss

of the interdental series, \*ɟ > ʒ, \*c' > ʃ and the spirantization of \*ɖ > z in some environments.

#### 4.7.1 Yabus Uduk consonants

The Yabus Uduk consonant inventory is presented in Table 11 and reproduced in (189). Note the loss of the interdental series from PUD.

(189)	p <sup>h</sup>	t <sup>h</sup>	c <sup>h</sup>	k <sup>h</sup>	
	p	t	c	k	(?)
	b	d	ɟ	g	
	p'	t'	c'	k'	
	ɓ	d			
		s	ʃ		h
		z	ʒ		
		s'	ʃ'		
	m	n	ɲ	ŋ	
		l			
		r			
	w		j		

Yabus Uduk underwent a series of mergers as well as innovated several phonemes. The Yabus Uduk innovations and retentions are presented in Table 97. The major innovations are discussed below.

Table 97 Yabus Uduk phonological innovations

SET	PKMN	PCTRL	PKOUD	PUD	Yabus Uduk	Observations
1	*p <sup>h</sup>	> *p <sup>h</sup>	> *p <sup>h</sup>	> *p <sup>h</sup>	> p <sup>h</sup>	Retention
2	*p	> *p	> *p	> *p	> p	Retention
3	*b	> *b	> *b	> *b	> b	Retention
4	*ɓ	> *ɓ	> *ɓ	> *ɓ	> ɓ	Retention
5	*p'	> *p'	> *p'	> *p'	> p'	Retention
6	*t <sup>h</sup>	> *t <sup>h</sup>	> *t <sup>h</sup>	> *t <sup>h</sup>	> t <sup>h</sup>	Merger
7	*t	> *t	> *t	> *t	> t	Merger
8	*ɖ	> *ɖ	> *ɖ	> *ɖ	> d	Merger

Table 97 Yabus Uduk phonological innovations

SET	PKMN	PCTRL	PKOUD	PUD	Yabus Uduk	Observations
8	*ḏ	> *ḏ	> *ḏ	> *ḏ	> z	Split: spirantization before front vowels
9	*t̥	> *t̥	> *t̥	> *t̥	> t'	Merger
9	*t̥	> *t̥	> *t̥	> *d̥	> d	Merger: only codas
10	(*t <sup>h</sup> )	> (*t <sup>h</sup> )	> (*t <sup>h</sup> )	> (*t <sup>h</sup> )	> t <sup>h</sup>	Retention
11	*t	> *t	> *t	> *t	> t	Retention
12	*d	> *d	> *d	> *d	> d	Retention
13	*d̥	> *d̥	> *d̥	> *d̥	> d̥	Retention: only onsets
13	*d̥	> *d̥	> *d̥	> *d̥	> d	Merger: only codas
14	*t'	> *t'	> *t'	> *t'	> t'	Retention
15	*s'	> *s'	> *s'	> *s'	> s'	Retention
16	*c	> *c	> *c	> *c	> c	Retention
17	*ɟ	> *ɟ	> *ɟ	> *ɟ	> ɟ	Retention
17	*ɟ	> *ɟ	> *ɟ	> *ɟ	> ʒ	Split: unconditioned
18	*c'	> *c'	> *c'	> *c'	> ʃ	Split
19	*k <sup>h</sup>	> *k <sup>h</sup>	> *k <sup>h</sup>	> *k <sup>h</sup>	> k <sup>h</sup>	Retention
19	*k <sup>h</sup>	> *k <sup>h</sup>	> *c <sup>h</sup>	> *k <sup>h</sup>	> c <sup>h</sup>	Split: before front vowels
20	*k	> *k	> *k	> *k	> k	Retention
20	*k	> *k	> *k	> *k	> c	Split: before front vowels
21	*g	> *g	> *g	> *g	> g	Retention
21	*g	> *g	> *g	> *ɟ	> ɟ	Split: before front vowels
22	*k'	> *k'	> *k'	> *k'	> k'	Retention
22	*k'	> *k'	> *k'	> *k'	> c'	Split: before front vowels
23	*s	> *s	> *s	> *s	> s	Retention
24	*ʃ	> *ʃ	> *ʃ	> *ʃ	> ʃ	Retention
25	*h	> *h	> *h	> *h	> h	Retention
26	*r	> *r	> *r	> *r	> r	Retention
27	*l	> *l	> *l	> *l	> l	Retention
28	*m	> *m	> *m	> *m	> m	Retention
29	*n	> *n	> *n	> *n	> n	Retention
30	(*ɲ)	> (*ɲ)	> *ɲ	> *ɲ	> ɲ	Retention
31	(*ŋ)	> (*ŋ)	> (*ŋ)	> *ŋ	> ŋ	Retention: medial/final
32	*w	> *w	> *w	> *w	> w	Retention
33	*j	> *j	> *j	> *j	> j	Retention
34	(*ṽ)	> (*ṽ)	> (*ṽ)	> (*ṽ)	> s	Retention
35	(*Ḍ)	> (*Ḍ)	> (*Ḍ)	> (*Ḍ)	> j/h	Merger

The most notable changes in Yabus Uduk involved the merger of the interdental series of plain stops with the alveolar series. In cognates reconstructed to nodes higher than PUD, Yabus Uduk generally exhibits /d/ reflexes of \*ḏ. There are some cases of /z/

reflexes in higher nodes but these can be explained by spirantization before front vowels (PKMN \*ḍim ‘strain’ > Yabus Uduk *zim*). It appears that an ongoing innovation in Yabus Uduk has begun the creation of phonemic \*ḍ > /z/ seen before non-front vowels (PUD \*ḍàn ‘elder, big’ > Yabus Uduk *zàn*). Though this does not explain anomalies such as PUD \*ḍis’ ‘sweep’ > Yabus Uduk *dis*’, in which we would expect Yabus Uduk *zis*’ ‘sweep’

Yabus Uduk innovated two other phonemes, a voiced palatal fricative /ʒ/ and a voiceless palatal fricative ejective /ʃ/. I cannot find any conditioning for the split PUD \*ʃ > Yabus Uduk /ʒ/. Nevertheless, /ʒ/ is rare in Yabus Uduk overall. Perhaps /ʒ/ is a recent innovation that is making its way through the Yabus Uduk lexicon. The palatal fricative ejective appears to form part of a chain shift wherein PUD \*c’ > Yabus Uduk /ʃ/ and PUD \*k’ > Yabus Uduk /c’/. There are no instances of Yabus Uduk /ʃ/ reflexes that correspond to PUD \*k’ or even PUD \*c’ which was the result of PCTRL \*k’ > PUD \*c’. This shift PUD \*c’ > Yabus Uduk /ʃ/ is a unique sound change that characterizes Yabus Uduk speech.

The questionable proto-phonemes \*Ṭ and \*Ḍ have distinct outcomes in Yabus Uduk. Yabus Uduk merges PUD \*Ṭ > s, though this is attested in a few reflexes only. The only possible cognates which contain a reflex of \*Ḍ in Yabus Uduk correspond to /j/ and /w/ and are weak overall.

#### 4.7.2 Yabus Uduk vowels and tone

The synchronic Yabus Uduk vowel system is a five-vowel contrastive inventory /i, ε, a, ɔ, u/ with no ATR contrast. This system was inherited from the merger of the PCTRL seven-vowel system in PUD. The Yabus tone system is retained from PUD, with

significant synchronic consonant-tone restrictions that are the result of the historical evolution of Koman.

#### 4.8 Proto-Dana-Opo (PDAOP) phonology

The Dana-Opo (DAOP) branch constitutes what was most likely a dialect chain historically. Dana is by far the most divergent dialect and is no longer mutually intelligible with the Opo varieties examined here. While the degree of mutual unintelligibility has yet to be determined definitively, Dana does exhibit a very distinct sound system from the Opo varieties, notably in the consonant and tone systems. Some of the innovations that distinguish this branch are the devoicing of word-initial voiced stops and subsequent merger with voiceless unaspirated stops before \*L tone (§3.1) and the innovation of the deictic directional morpheme \*-á DD2, which strongly profiles the addressee (§5.4).

##### 4.8.1 PDAOP consonants

The Proto-Dana-Opo (PDAOP) consonant system is largely retained from PCTRL Koman. That is, Dana exhibits the most conservative contrastive consonant inventory in Koman. The PDAOP reconstructed consonant inventory is in Table 98.

Table 98 Proto-Dana-Opo (PDAOP) consonant inventory

*p <sup>h</sup>	(*t <sup>h</sup> )	*t <sup>h</sup>		*k <sup>h</sup>
*p	*t	*t	*c	*k
*b	*d	*d	*ʃ	*g
*p'	*t'	*t'	*c'	*k'
*b		*d'		
		*s	*ʃ	*h
	(*T)			
	(*D)			
		*s'		
*m		*n	*ɲ	*ŋ
		*l		
		*r		
*w			*j	

Table 99 outlines the innovations in consonants in PDAOP. The major innovations, including the impact of tone on word-initial (syllable onset) consonants, is discussed below.

Table 99 Proto-Dana-Opo (PDaOp) phonological innovations

SET	PKMN	>	PCTRL	>	PDAOP	Observations
1	*p <sup>h</sup>	>	*p <sup>h</sup>	>	*p <sup>h</sup>	Retention
2	*p	>	*p	>	*p	Retention
3	*b	>	*b	>	*b	Retention
4	*b	>	*b	>	*b	Retention: only initial
5	*p'	>	*p'	>	*p'	Retention
6	*t <sup>h</sup>	>	*t <sup>h</sup>	>	*t <sup>h</sup>	Retention
7	*t	>	*t	>	*t	Retention
8	*d	>	*d	>	*d	Retention: elsewhere (see 8a)
8a	*d	>	*d	>	*t	Split: Initial, before Tone set C
9	*t'	>	*t'	>	*t'	Retention
10	(*t <sup>h</sup> )	>	(*t <sup>h</sup> )	>	*t <sup>h</sup>	Retention
11	*t	>	*t	>	*t	Retention
12	*d	>	*d	>	*d	Retention: elsewhere (see 12a)
12a	*d	>	*d	>	*t	Split: Initial, before Tone set C
13	*d'	>	*d'	>	*d'	Retention
14	*t'	>	*t'	>	*t'	Retention
15	*s'	>	*s'	>	*s'	Retention
16	*c	>	*c	>	*c	Retention
17	*ʃ	>	*ʃ	>	*ʃ	Retention: elsewhere (see 17a)
17a	*ʃ	>	*ʃ	>	*c	Split: Initial, before Tone set C
18	*c'	>	*c'	>	*c'	Retention

Table 99 Proto-Dana-Opo (PDAOp) phonological innovations

SET	PKMN	PCTRL	PDAOP	Observations
19	*k <sup>h</sup>	> *k <sup>h</sup>	> *k <sup>h</sup>	Retention
20	*k	> *k	> *k	Retention
21	*g	> *g	> *g	Retention: elsewhere (see 21a)
21a	*g	> *g	> *k	Split: Initial, before Tone set C
22	*k'	> *k'	> *k'	Retention
23	*s	> *s	> *s	Retention
24	*f	> *f	> *f	Retention
25	*h	> *h	> *h	Retention
26	*r	> *r	> *r	Retention
27	*l	> *l	> *l	Retention
28	*m	> *m	> *m	Retention
29	*n	> *n	> *n	Retention
30	(*ɲ)	> (*ɲ)	> *n	Merger
31	(*ŋ)	> (*ŋ)	> *ŋ	Retention and extension
32	*w	> *w	> *w	Retention
33	*j	> *j	> *j	Retention
34	(*ṽ)	> (*ṽ)	> (*ṽ)	Retention
35	(*Ḍ)	> (*Ḍ)	> (*Ḍ)	Retention

The most significant innovation in PDAOP involves word-initial (onset) stop consonants and historical tone. Recall that PKMN exhibited three major correspondence patterns with respect to tone, from which two tone categories can be reconstructed for an even earlier stage (see §3.1). These tone categories were most likely level tones of opposing F0, realized as L and H tones, which over the course of Koman's history, gave rise to three level tones.

The innovation of a third level tone was directly linked to voiced stop onset consonants (§3.1). Voiced stops functioned as depressor consonants and lowered the F0 realized on the vowel nucleus, which subsequently phonologized into three level tones (L, M, H synchronically). There is evidence that at the PDAOP stage, the level tones were in complementary distribution with respect to stop onsets: L tone with voiced stops, M and L with voiceless onsets. A PDAOP innovation was then to devoice almost all voiced stops before L tone, ultimately merging with voiceless unaspirated stops. This

conditioned split is seen throughout the Dana-Opo lexicon and is robustly attested in the bilabial, interdental, alveolar and velar stops but absent in the palatal stops. Nevertheless, there are exceptions to this sound change of devoicing, which are discussed in §3.1.2.

The implosives \*ɓ and \*ɗ are retained as implosives in word-initial (onset) position. In word-final, or syllable coda position, there is weakening of \*ɓ > p/p<sup>h</sup> though there does not appear to be enough evidence for a consistent pattern or for a strong diachronic signal. The alveolar implosive by contrast, is maintained in all positions in PDAOP. Lastly, the velar nasal is extended in use to all positions from an earlier medial/final restricted distribution in PCTRL.

#### 4.8.2 PDAOP vowels and tone

PDAOP retained the seven-vowel system /i, ɪ, ε, a, ɔ, ʊ, u/ with contrastive ATR in the high vowels, seen modernly in both Dana and the Opo varieties. Both Dana and Opo exhibit stem-controlled ATR harmony which occurs only with the high vowels (§2.1.8.3 and §2.1.7.3). In this system, high affix vowels harmonize to the ATR feature of the high vowel in the stem. This ATR system can be confidently reconstructed to PDAOP.

If PCTRL Koman exhibited an ATR harmony system it would have most likely been the stem-controlled harmony seen in the Dana-Opo branch and in modern day Gwama. This seems probable given that all of the Koman languages that have contrastive seven-vowel systems exhibit some type of ATR harmony. Another possibility would be that Gwama, Komo and Dana-Opo each innovated ATR harmony.



I discussed the role of tone and voiced stop onsets in PDAOP in §4.8.1. The general patterns correlate historical tone correspondence set C (in which all languages synchronically exhibit L tone) with word-initial voiced stops. There is strong evidence for subsequent devoicing of voiced stops and merging with voiceless unaspirated stops in PDAOP. Note, that crucially, there is absolutely no evidence for the devoicing and subsequent merger with voiceless aspirated stops in the DAOP branch, or elsewhere in Koman for that matter.

Nevertheless, there are correspondences of word-initial voiced stops that occur with L tone in DAOP, which either did not devoice for some reason that I cannot account for, or which may have entered the lexicon via lateral transmission. These are issues to be dealt with in further research. Notwithstanding, the diachronic signal of devoicing and merger outlined above is strong.

#### 4.9 Dana

Dana has not figured in any previous work on Koman reconstruction (e.g. Bender 1983, Ehret 2001). Without data from Dana, this reconstruction would have been significantly different. Dana forms a key piece to the reconstruction of PKMN given its conservative consonant system. From a historical perspective, it is the retention of interdental consonants in Dana which correspond to interdental consonants in Chali Uduk that provides evidence for a PKMN interdental series of consonants.

##### 4.9.1 Dana consonants

With regard to the contrastive consonant inventory, Dana is the most conservative of all Koman languages. The Dana consonant inventory is seen in Table 17 and reproduced in (190).

(190)	$p^h$	$t^h$	$t^h$	$c^h$	$k^h$	
	$p$	$t$	$t$	$c$	$k$	(?)
	$b$	$d$	$d$	$\text{ʃ}$	$g$	
	$p'$	$t'$	$t'$	$c'$	$k'$	
	$\text{ɸ}$		$d'$			
			$s$	$\text{ʃ}$		$h$
			$z$			
	$m$		$s'$	$\text{ɲ}$	$\text{ŋ}$	
			$n$			
			$l$			
	$w$		$r$	$j$		

Dana retains all of the consonants seen in PKMN. The Dana retentions and innovations are outlined in Table 100 and discussed below.

Table 100 Dana phonological innovations

SET	PKMN	>	PCTRL	>	PDAOP	>	Dana	Observations
1	$*p^h$	>	$*p^h$	>	$*p^h$	>	$p^h$	Retention
2	$*p$	>	$*p$	>	$*p$	>	$p$	Retention
3	$*b$	>	$*b$	>	$*b$	>	$b$	Retention
4	$*\text{ɸ}$	>	$*\text{ɸ}$	>	$*\text{ɸ}$	>	$\text{ɸ}$	Retention: only initial
5	$*p'$	>	$*p'$	>	$*p'$	>	$p'$	Retention
6	$*t^h$	>	$*t^h$	>	$*t^h$	>	$t^h$	Retention
7	$*t$	>	$*t$	>	$*t$	>	$t$	Retention
8	$*d$	>	$*d$	>	$*d$	>	$d$	Retention
8a	$*d$	>	$*d$	>	$*t$	>	$t$	Retention
9	$*t'$	>	$*t'$	>	$*t'$	>	$t'$	Retention
10	$(*t^h)$	>	$(*t^h)$	>	$*t^h$	>	$t^h$	Retention
11	$*t$	>	$*t$	>	$*t$	>	$t$	Retention
12	$*d$	>	$*d$	>	$*d$	>	$d$	Retention
12a	$*d$	>	$*d$	>	$*t$	>	$t$	Retention
13	$*d'$	>	$*d'$	>	$*d'$	>	$d'$	Retention
14	$*t'$	>	$*t'$	>	$*t'$	>	$t'$	Retention
15	$*s'$	>	$*s'$	>	$*s'$	>	$s'$	Retention
16	$*c$	>	$*c$	>	$*c$	>	$c$	Retention
17	$*\text{ʃ}$	>	$*\text{ʃ}$	>	$*\text{ʃ}$	>	$\text{ʃ}$	Retention
17a	$*\text{ʃ}$	>	$*\text{ʃ}$	>	$*c$	>	$c$	Retention

Table 100 Dana phonological innovations

SET	PKMN		PCTRL		PDAOP		Dana	Observations
18	*c'	>	*c'	>	*c'	>	c'	Retention
19	*k <sup>h</sup>	>	*k <sup>h</sup>	>	*k <sup>h</sup>	>	k <sup>h</sup>	Retention
20	*k	>	*k	>	*k	>	k	Retention
21	*g	>	*g	>	*g	>	g	Retention
21a	*g	>	*g	>	*k	>	k	Retention
22	*k'	>	*k'	>	*k'	>	k'	Retention
23	*s	>	*s	>	*s	>	s	Retention
24	*ʃ	>	*ʃ	>	*ʃ	>	ʃ	Retention
25	*h	>	*h	>	*h	>	h	Retention
26	*r	>	*r	>	*r	>	r	Retention
27	*l	>	*l	>	*l	>	l	Retention
28	*m	>	*m	>	*m	>	m	Retention
29	*n	>	*n	>	*n	>	n	Retention
30	(*ŋ)	>	(*ŋ)	>	*n	>	n	Merger
31	(*ŋ)	>	(*ŋ)	>	*ŋ	>	ŋ	Retention
32	*w	>	*w	>	*w	>	*w	Retention
33	*j	>	*j	>	*j	>	*j	Retention
34	(*Ṭ)	>	(*Ṭ)	>	(*Ṭ)	>	s	Merger
35	(*Ḍ)	>	(*Ḍ)	>	(*Ḍ)	>	ḍ	Merger

The bilabial implosive is retained only word-initially and the velar nasal is retained only medially/finally. The only significant difference between the PDAOP consonant inventory and the Dana inventory is the outcome of the \*Ṭ and \*Ḍ proto-phonemes. Recall that evidence for this set is weak overall. Dana merges PDAOP \*Ṭ > s and PDAOP \*Ḍ > ḍ.

#### 4.9.2 Dana vowels and tone

Aside from retaining the PKMN consonant inventory, Dana also retains the PKMN seven vowel inventory with ATR contrast in the high vowels /i, ɪ, ε, a, ɔ, ʊ, u/. Dana synchronically exhibits stem-controlled ATR harmony, in which only high vowels in affixes assimilate to the ATR value of the stem to which they attach (§2.1.8.3). This ATR harmony system was retained from PDAOP and most likely occurred in PKMN.

Dana synchronically exhibits three contrastive level tones as well as rising and falling contour tones (§2.1.8.4). This tone system was inherited from as far back as least as PCTRL or PKMN. One independent innovation in Dana was to extend the distribution of all three level tones to all consonant onsets. In Dana, there are no consonant-tone restrictions synchronically.

#### 4.10 Proto-Opo (POP)

The following sections outline the development of Proto-Opo (POP) from Proto-Dana-Opo. POP underwent significant innovations in the consonant system as well as in the tone system, with a most notable \*H > XH tone innovation. POP lost the interdental series which is retained in Dana. A morphological innovation in POP is the creation of new 3rd person independent pronouns from demonstrative bases plus gender prefixes (§2.2.2.5).

##### 4.10.1 POP consonants

The Proto-Opo consonant inventory is presented in Table 101.

Table 101 Proto-Opo (POP) consonant inventory

*p <sup>h</sup>	*t <sup>h</sup>		*k <sup>h</sup>
*p	*t	*tʃ	*k
*b	*d	*dʒ	*g
*pʼ	*tʼ	*tʃʼ	*kʼ
*ɸ	*dʼ		
	*s	*ʃ	*h
	(*D)		
	*sʼ		
*m	*n	*ɲ	*ŋ
	*l		
	*r		
*w		*j	

POP exhibits mostly retentions of the PDAOP consonant system with some exceptions. The POP innovations in the consonant system are schematized in Table 102.

The POP retentions and innovations are discussed below.

Table 102 Proto-Opo (POp) phonological innovations

SET	PKMN		PCTRL		PDAOP		POP	Observations
1	*p <sup>h</sup>	>	*p <sup>h</sup>	>	*p <sup>h</sup>	>	*p <sup>h</sup>	Retention
2	*p	>	*p	>	*p	>	*p	Retention
3	*b	>	*b	>	*b	>	*b	Retention
4	*ḃ	>	*ḃ	>	*ḃ	>	*ḃ	Retention: only initial
5	*p'	>	*p'	>	*p'	>	*p'	Retention
6	*t <sup>h</sup>	>	*t <sup>h</sup>	>	*t <sup>h</sup>	>	*t <sup>h</sup>	Retention
7	*t	>	*t	>	*t	>	*t	Retention
8	*d	>	*d	>	*d	>	*d	Merger
8a	*ḏ	>	*ḏ	>	*t	>	*t	Merger
9	*t'	>	*t'	>	*t'	>	*t'	Merger
10	(*t <sup>h</sup> )	>	(*t <sup>h</sup> )	>	*t <sup>h</sup>	>	*t <sup>h</sup>	Retention
11	*t	>	*t	>	*t	>	*t	Retention
12	*d	>	*d	>	*d	>	*d	Retention
12a	*d	>	*d	>	*t	>	*t	Retention
13	*d'	>	*d'	>	*d'	>	*d'	Retention
14	*t'	>	*t'	>	*t'	>	*t'	Retention
15	*s'	>	*s'	>	*s'	>	*tʃ	Merger
16	*c	>	*c	>	*c	>	*tʃ	Retention (shift in articulation)
17	*ʃ	>	*ʃ	>	*ʃ	>	*dʒ	Retention (shift in articulation)
17a	*ʃ	>	*ʃ	>	*c	>	*tʃ	Retention (shift in articulation)
18	*c'	>	*c'	>	*c'	>	*tʃ	Retention (shift in articulation)
19	*k <sup>h</sup>	>	*k <sup>h</sup>	>	*k <sup>h</sup>	>	*k <sup>h</sup>	Retention
20	*k	>	*k	>	*k	>	*k	Retention
21	*g	>	*g	>	*g	>	*g	Retention: elsewhere (see 21a)
21a	*g	>	*g	>	*k	>	*k	Split: Tone set C
22	*k'	>	*k'	>	*k'	>	*k'	Retention
23	*s	>	*s	>	*s	>	*s	Retention
24	*ʃ	>	*ʃ	>	*ʃ	>	*s	Merger
25	*h	>	*h	>	*h	>	*h	Retention
26	*r	>	*r	>	*r	>	*r	Retention
27	*l	>	*l	>	*l	>	*l	Retention
28	*m	>	*m	>	*m	>	*m	Retention
29	*n	>	*n	>	*n	>	*n	Retention
30	(*ɲ)	>	(*ɲ)	>	*n	>	*n	Retention
31	(*ŋ)	>	(*ŋ)	>	*ŋ	>	*ŋ	Retention
32	*w	>	*w	>	*w	>	*w	Retention
33	*j	>	*j	>	*j	>	*dʒ	Merger: initial

Table 102 Proto-Opo (POP) phonological innovations

SET	PKMN		PCTRL		PDAOP		POP	Observations
33	*j	>	*j	>	*j	>	*j	Retention: medial/final
34	(*ɾ̥)	>	(*ɾ̥)	>	(*ɾ̥)	>	*tʃ	Merger
35	(*Ḍ)	>	(*Ḍ)	>	(*Ḍ)	>	(*Ḍ)	Retention

The most significant innovations in POP consonants is the merger of all interdental stops with alveolar stops. This was a complete merger, one which distinguishes the modern day Opo varieties from Dana. The palatal series of stops, at least in some varieties or for some speakers, came to be articulated more in the alveopalatal place of articulation, which is seen in some modern day Opo varieties. Whether this shift in articulation occurred in POP or whether it was a more recent change has yet to be determined.

Another significant POP innovation was the merger of the alveolar ejective with the alveopalatal ejective PDAOP \*s' > POP \*tʃ'. The merger of the alveopalatal fricative with the alveolar fricative PDAOP \*ʃ > POP \*s, which definitively occurred in the Bilugu, Modin and Pame varieties, may not have occurred in the Kigile variety. Kigile Opo appears to exhibit a contrast between /s/ and /ʃ/ though it may be the case that [s] and [ʃ] are in free variation though I find the latter unlikely given the number of correspondences of Kigile /s/ with Dana /ʃ/.<sup>170</sup> Thus, there are two possible outcomes for POP \*ʃ: either PDAOP \*ʃ > POP \*s and Kigile later innovated /ʃ/ or \*ʃ is retained in PDAOP and the \*ʃ > s merger occurs deeper into Opo's history. This question can be answered with further research into the Opo varieties examined here as well as the

<sup>170</sup> My Opo consultants were not native Kigile speakers. The dialects of Opo that they spoke underwent a complete merger of \*ʃ > \*s. At times, the speakers hesitated between [s] and [ʃ] for particular lexemes. See consonant \*ʃ correspondence sets 24 in the appendices.

varieties for which data has not been collected. Notwithstanding, I tentatively analyze a retention of \*ʃ in POP. The palatal glide PDAOP \*j merges with POP \*dʒ in initial position and /j/ is retained in medial and final positions.

#### 4.10.2 POP vowels and tone

The seven-vowel system with ATR contrast in the high vowels is retained in POP. Given that Dana and the Opo varieties both exhibit stem-controlled ATR harmony involving the high vowels, this harmony system was also inherited from PDAOP, if not from an earlier stage in Koman's history (§4.2.3).

A significant innovation that distinguishes Opo from Dana and the rest of Koman lies in the contrastive tone system. All of the living Koman languages exhibit three contrastive level tones, with the exception of the Opo varieties, which exhibit four level tones (Smolders *forthcoming*). POP innovated a fourth level tone by splitting PDAOP \*H tone to H and an extra-high (XH) tone. This conditioned split of PDAOP \*H > POP \*XH that occurred robustly on [+high, +ATR] /i, u/ vowels. Crucially, this split occurred in cognates whose reflexes reconstruct to PKMN tone set A. This reconstructed tone category is defined by synchronic reflexes exhibiting H tone which was only preceded by voiceless onsets. To be explicit, there are no cognates for which tone set A can be reconstructed on a reconstructed [+high, +ATR] vowel (\*i, \*u) in which an Opo reflex does not exhibit XH tone. There are XH reflexes in Opo for which a tone cannot be reconstructed but they will always involve [i, u] and the Dana reflex will always be H tone. This suggests that in these correspondences, at least a PDAOP tone can be reconstructed to \*H.

Synchronic Opo varieties also exhibit XH tone on /a/. There is scant evidence for this XH tone being the reflex of a split that occurred at the POP stage given there are only two clear cognates, presented in (191). If this POP \*XH before /a/ were a true split from PDAOP \*H, there would be no conditioning for the split. As such, I argue that the POP split of a \*H that at least reconstructs to PDAOP if not earlier only occurred on \*i and \*u. Thus, it appears that this split in a PDAOP \*H tone in POP was conditioned by both the onset and also by the height and ATR quality of the vowel.

(191)	Komo	Chali Uduk	Dana	Opo	Meaning
a.	kárúm	–	k <sup>h</sup> ádúúm	k <sup>h</sup> ǎrúúm	‘roof’
b.	–	àhǎd̥kī	hád̥ik’	hǎr̥ik’	‘hiccough’

#### 4.11 Opo

This study employs data from four Opo varieties: Bilugu, Pame, Modin and more peripherally, Kigile Opo. The lexical and grammatical data were collected from native Pame Opo speakers who were bilingual in the Bilugu variety. Further, they had knowledge of the Modin variety, as it is very close to the Bilugu variety and some knowledge of the Kigile variety. Given the proximity in sound systems in the Opo varieties, I discuss the retentions as a whole and discuss the independent innovations individually.

##### 4.11.1 Opo consonants

The Opo consonant inventory is presented in Table 15 and reproduced in (192). Note that the voiceless alveopalatal fricative /ʃ/ only occurs in the Kigile variety and the



voiced alveolar fricative only occurs in the Pame variety. All other consonants occur in each variety.

(192)	p <sup>h</sup>	t <sup>h</sup>		k <sup>h</sup>
	p	t	tʃ	k
	b	d	dʒ	g
	pʼ	tʼ	tʃʼ	kʼ
	ḃ	ḋ		
		s	(ʃ)	h
		(z)		
	m	n	ɲ	ŋ
		l		
		r		
	w		j	

The Opo retentions and innovations are schematized in Table 103. The significant innovations are discussed below.

Table 103 Opo phonological innovations

SET	PKMN		PCTRL		PDAOP		POP		Opo	Observations
1	*p <sup>h</sup>	>	*p <sup>h</sup>	>	*p <sup>h</sup>	>	*p <sup>h</sup>	>	p <sup>h</sup>	Retention
2	*p	>	*p	>	*p	>	*p	>	p	Retention
3	*b	>	*b	>	*b	>	*b	>	b	Retention
4	*ḃ	>	*ḃ	>	*ḃ	>	*ḃ	>	ḃ	Retention: only initial
5	*pʼ	>	*pʼ	>	*pʼ	>	*pʼ	>	pʼ	Retention
6	*t <sup>h</sup>	>	*t <sup>h</sup>	>	*t <sup>h</sup>	>	*t <sup>h</sup>	>	t <sup>h</sup>	Retention
7	*t	>	*t	>	*t	>	*t	>	t	Retention
8	*ḋ	>	*ḋ	>	*ḋ	>	*ḋ	>	ḋ	Retention
8a	*ḋ	>	*ḋ	>	*t	>	*t	>	t	Retention
9	*tʼ	>	*tʼ	>	*tʼ	>	*tʼ	>	tʼ	Retention
10	(*t <sup>h</sup> )	>	(*t <sup>h</sup> )	>	*t <sup>h</sup>	>	*t <sup>h</sup>	>	t <sup>h</sup>	Retention
11	*t	>	*t	>	*t	>	*t	>	t	Retention
12	*d	>	*d	>	*d	>	*d	>	d	Retention
12a	*d	>	*d	>	*t	>	*t	>	t	Retention
13	*ḋ	>	*ḋ	>	*ḋ	>	*ḋ	>	ḋ	Retention
14	*tʼ	>	*tʼ	>	*tʼ	>	*tʼ	>	tʼ	Retention
15	*sʼ	>	*sʼ	>	*sʼ	>	*tʃʼ	>	tʃʼ	Retention
16	*c	>	*c	>	*c	>	*tʃ	>	tʃ	Retention

Table 103 Opo phonological innovations

SET	PKMN	PCTRL	PDAOP	POP	Opo	Observations
17	*j	> *j	> *j	> *dʒ	> dʒ	Retention
17a	*j	> *j	> *c	> *tʃ	> tʃ	Retention
18	*c'	> *c'	> *c'	> *tʃ'	> tʃ'	Retention
19	*k <sup>h</sup>	> *k <sup>h</sup>	> *k <sup>h</sup>	> *k <sup>h</sup>	> k <sup>h</sup>	Retention
20	*k	> *k	> *k	> *k	> k	Retention
21	*g	> *g	> *g	> *g	> g	Retention
21a	*g	> *g	> *k	> *k	> k	Retention
22	*k'	> *k'	> *k'	> *k'	> k'	Retention
23	*s	> *s	> *s	> *s	> s	Retention
24	*f	> *f	> *f	> *f	> ʃ	Retention: Kigile
24	*f	> *f	> *f	> *f	> s	Merger: Bilugu, Pame and Modin
25	*h	> *h	> *h	> *h	> h	Retention
26	*r	> *r	> *r	> *r	> r	Retention
27	*l	> *l	> *l	> *l	> l	Retention
28	*m	> *m	> *m	> *m	> m	Retention
29	*n	> *n	> *n	> *n	> n	Retention
30	(*ɲ)	> (*ɲ)	> *n	> *n	> n	Retention
31	(*ŋ)	> (*ŋ)	> *ŋ	> *ŋ	> ŋ	Retention
32	*w	> *w	> *w	> *w	> w	Retention
33	*j	> *j	> *j	> *dʒ	> dʒ	Retention: initial
33	*j	> *j	> *j	> *j	> j	Retention: medial/final
34	(*ɽ)	> (*ɽ)	> (*ɽ)	> *tʃ	> tʃ	Retention
35	(*ɖ)	> (*ɖ)	> (*ɖ)	> (*ɖ)	> dʒ	Merger: Bilugu and Modin
35	(*ɖ)	> (*ɖ)	> (*ɖ)	> (*ɖ)	> z	Shift: Pame
35	(*ɖ)	> (*ɖ)	> (*ɖ)	> (*ɖ)	> ʃ/s	Merger: Kigile

The modern Opo varieties exhibit mostly retentions from significant innovations in POP. Some notable differences in the varieties are the merger of \*f > s in the Bilugu, Pama and Modin Opo varieties. Further research will be needed to determine if these three varieties reconstruct to a node. Kigile Opo appears to have retained POP \*f: this is discussed in §4.10.1. Lastly, the marginal phoneme \*ɖ has interesting reflexes in the Opo varieties. Bilugu and Modin Opo merge \*ɖ > dʒ, Pame Opo shifts \*ɖ > z and Kigile Opo merges \*ɖ > ʃ/s.

Whether it is significant or not that \*ɽ and \*ɖ were fricatives or affricates of some kind (if they were indeed PKMN phonemes) and whether they correspond to the only

languages that display alveopalatal affricates as opposed to stops, remains to be determined, though it is interesting that \*Ṭ and \*Ḍ do not correspond to palatal stops in either Dana or Chali Uduk.

#### 4.11.2 Opo vowels and tone

The Opo varieties retained the seven-vowel system /i, ɪ, ε, a, ɔ, ʊ, u/ with contrastive ATR in the high vowels from POP. It appears that all of the Opo varieties studied here exhibit stem-controlled ATR harmony in the high vowels. In this system, high affix vowels harmonize to the ATR feature of the high vowel in the stem to which they are attached. The modern Opo varieties studied here retain the four level tones which resulted from a POP innovation (§4.10.2). I now turn to a reconstruction of some PKMN pronominal and deictic morphology.

CHAPTER V  
RECONSTRUCTION OF PROTO-KOMAN PRONOMINAL AND DEICTIC  
MORPHOLOGY

While the main aim of this dissertation is to reconstruct PKMN phonology, some attention to morphosyntax is presented to provide a more holistic picture of innovations at different stages of the Koman family. The only attempt at reconstructing any PKMN morphosyntax is Bender (1994), though his analysis included Gule, Gumuz and Shabo.<sup>171</sup> Further, it was framed within the assumption that Koman (plus the other languages mentioned) formed part of Nilo-Saharan. Thus, at times, Bender's analyses are obscured by efforts to link certain proto-forms outside of nuclear Koman to larger proposed genetic units.

Proto-Koman most likely displayed SV/AVP word-order, with a possible tendency towards verb-second (V2) word order. PKMN was most likely head-marking, which is seen in the nominal domain through reconstructed number/gender morphology, as well as in the verbal domain where deictic directional suffixes can be reconstructed. Many languages also index core S/A/P arguments on the verb. Much of this morphology likely came from the cliticization of independent pronouns which phonologically eroded as they developed into obligatory argument indexing verb morphology.

This chapter is not an exhaustive reconstruction of Koman morphology. I focus on reconstructing morphological forms (in some cases segments) to certain grammatical

---

<sup>171</sup> To be clear, Bender (1994) was not entirely convinced of Shabo's genetic affiliation.

categories. For instance, while many languages exhibit argument indexing verb morphology which may have originated in independent pronouns, I do not reconstruct the scenario for how this came to be. Rather, I discuss the cognacy of a particular bound morphological reflex to its source and leave the historical scenario of free pronouns developing into bound indexation for future work.

I begin with a reconstruction of PKMN pronominal elements (§5.1). Then I turn to nominal gender/number morphology (§5.2). I briefly discuss a reconstruction of deictic demonstrative elements in light of Bender's (1994) findings (§5.3). Lastly, I discuss a reconstruction of a PKMN deictic directional system on the verb (§5.4).

### 5.1 Reconstruction of Koman pronominal elements

A system of independent pronominals can be reconstructed to PKMN with few deviations from the system proposed by Bender (1994). He reconstructs a three-way gender distinction in 3SG as well as clusivity in 1PL. Bender (1994:37) proposes that both gender and clusivity are not original to Proto-Nilo-Saharan and both were Proto-Komuz (Koman + Gumuz) innovations. I reconstruct a similar system though I present an alternative analysis for the origin of clusivity seen in the modern Koman languages.

The Koman languages display some cognate independent pronouns that can be reconstructed to PKMN. The reconstructable independent pronouns appear to be monomorphemic, at least synchronically. Other pronominal forms can also be reconstructed to an earlier stage in Koman's history and in many cases, appear to have been polymorphemic. Further, many languages have subsequently cliticized or affixed erstwhile independent pronouns into argument indexing morphology on verbs and possessive pronominal clitics.

Table 19 contains the synchronic Koman independent pronouns that can probably be reconstructed to PKMN. The starred forms indicate a proto-form reconstructed from the dialectal variation within a language group (e.g. \*hád(i) in the “Uduk” column of Table 1 is reconstructed for Proto-Uduk/Pre-Uduk). The question mark in Gwama 2SG indicates the uncertainty of this form being cognate with the other 2SG forms. The plural first person forms have a more complex history which is discussed in detail below.

Table 104 PKMN reconstructable independent personal pronouns

	PKMN	Gwama	Komo	Uduk	Dana	Opo
1SG	*aGa	<i>gà</i>	<i>ākā</i>	<i>áhā</i>	<i>āgā</i>	<i>āgā</i>
2SG	*aj ~ ?*aɪk	<i>?(īk)</i>	<i>àj</i>	<i>é</i>	<i>āj</i>	<i>āj</i>
3SG.M	*had(i)	*hāl	<i>hàr</i>	*hádī	<i>hār</i>	–
3SG.F	*haḃ	<i>hāp’</i>	<i>hàp’</i>	–	<i>hāp’</i>	–
3NH	*hìn ~ hàn	–	<i>hìn ~ hàn</i>	–	<i>hān</i>	–
1PL.IN	(see §5.1.2)	<i>mīnì</i>	<i>ānà</i>	<i>ánā</i>	<i>mīnā</i>	<i>mìnà</i>
1PL.EX	(see §5.1.2)	<i>mà</i>	<i>āmò̀n</i>	<i>ámān</i>	<i>mānā</i>	<i>mànà</i>
2PL	*ɔ̀m(a)	<i>ṑm</i>	<i>ò̀m</i>	<i>úm</i>	<i>ṑmā</i>	<i>ṑmā</i>
3PL	*hṑn(i)	<i>hṑn</i>	<i>hò̀n</i>	*húnī	<i>hṑn</i>	–

– indicates the lack of a cognate form

Table 105 contains additional pronominal forms which are reconstructable. These forms may have been pronominal elements in a Pre-PKMN stage although \*ma ~ \*am can only be reconstructed to Proto-Central Koman given the lack of a cognate in Gwama.

Table 105 Additional reconstructable pronominal elements

1SG	<i>*na, *ma ~ *am</i>
2SG	<i>*(m)ini</i>

The following subsections discuss the reconstruction of the independent pronouns in Table 19 as well as the morphemes presented in Table 105.

### 5.1.1 PKMN 1SG reconstructed forms

I discuss three reconstructable 1SG morphemes in the following subsections.

#### 5.1.1.1 PKMN 1sg \*aGa

An independent 1SG pronoun \*aGa can be reconstructed to PKMN. Table 106 contains all of the reflexes of \*aGa found in Koman languages. “Morpheme type” in the last column indicates the type of morpheme the reflexes instantiate modernly.

Table 106 Reflexes of PKMN 1SG \*aGa

	PKMN	Gwama	Komo	Uduk	Dana	Opo	Morpheme type
1SG	*aGa	<i>gà</i>	<i>ākā</i>	<i>áhā</i>	<i>āgā</i>	<i>āgā</i>	1SG independent pronouns
		–	<i>-g</i> <i>-āk</i>	<i>-kā?</i>	<i>=āgā</i>	<i>=āgā</i>	1SG bound S/A/P VERB? affixes

The medial consonant appears to have been historically voiced given voiced reflexes in two distinct branches: Gwama and Dana-Opo. It is unclear whether \*aGa become /aka/ at the Proto-Komo-Uduk (PKOUD) stage given the voiced bound reflex in Komo /-g/. Alternatively, Komo /-g/ 1SG always occurs with a following suffix which is vowel-initial. Thus, the possibility that Komo /-g/ derived from an independent form /aka/ and then subsequently revoiced intervocally is also possible. If this were the case, a

subsequent PKOUD innovation would be the devoicing of \*aGa > [aka]. This may have also been likely. Note that Bender (1994:37) reconstructs PKMN \*aka 1SG.

#### 5.1.1.2 PKMN 1SG \*na

A second 1SG pronominal form \*na can tentatively be reconstructed to PKMN based on the reflexes in Table 107. Reflexes of \*na are found in bound subject indexing verb morphology as well as in possessive pronouns. Bender (1994) does not reconstruct this morpheme though he acknowledges its presence.

Table 107 Reflexes of PKMN 1SG \*na

	PKMN	Gwama	Komo	Uduk	Dana	Opo	Morpheme type
		<i>-nī</i>	<i>-(n)á</i>	<i>-(n)á</i>	–	–	1SG bound S/A affixes
		<i>=nā</i>	–	–	<i>=(i)nā</i>	–	1SG possessive pronouns
1SG	*na	–	–	–	<i>mīnā</i>	<i>mīnà</i>	1PL.EX independent pronoun
		–	<i>ānà</i>	<i>ánā</i>	<i>mānā</i>	<i>mànà</i>	1PL.IN independent pronoun

I cannot account for the vowel variation /i ~ a/ seen across 1SG bound S/A affixes including in the Gwama forms. This vowel variation occurs sporadically elsewhere in Koman, often within a language (e.g. the Komo independent 3N pronoun *hàn* ~ *hìn*). The Gwama bound S/A form *-nī* may or may not be cognate with the other forms in Table 107, but the possessive form is surely cognate. I discuss the cognacy and the structure of the 1PL forms in §5.1.2.



### 5.1.1.3 PCTRL 1SG \*ma ~ \*am

One other 1SG pronominal element \*ma ~ \*am can be reconstructed to Proto-Central Koman (PCTRL) via the reflexes in Table 108. Proto-Komo-Uduk (PKOUD) employs \*ma ~ \*am to innovate a 1PLEX pronoun. This innovation is discussed in §5.1.2.

Table 108 Reflexes of PCTRL 1SG \*má ~ \*ám

	PCTRL	Komo	Uduk	Dana	Opo	Morpheme type
1SG	*má ~ *ám	(b-)ám	(p-)ém	–	(í)má	1SG possessive pronouns
		ām(òñ)	ám(ān)	–	–	1PLEX independent pronoun

Whether \*ma ~ \*am reconstructs to PKMN and has subsequently been lost in Gwama has yet to be determined. Given the strict criteria employed here for reconstructing to nodes, I only reconstruct \*ma ~ \*am to PCTRL due to the lack of a reflex in Gwama. I assume metathesis of segments in either the Opo cluster or the Komo-Uduk branch but cannot account for the directionality at present. The vowel /ɛ/ in Uduk is problematic though Killian (2015) suggests it is phonetically [ɪ], which would give another example of an /a ~ ɪ/ vowel variation. Nonetheless, I assume the Uduk reflex is cognate.

### 5.1.2 1PL reconstructed forms

A clusivity contrast in first person plural is found in every Koman language. Hence, it is tempting to reconstruct an inclusive/exclusive distinction to PKMN though when examining the 1PL independent pronominals, but the picture is not as clear as one would expect. The synchronic Koman 1PL independent pronouns are in Table 109.

Table 109 Koman 1PL independent pronouns

	Gwama	Komo	Uduk	Dana	Opo
1PL.IN	<i>mīnì</i>	<i>ānà</i>	<i>ánā</i>	<i>mīnā</i>	<i>mìnà</i>
1PL.EX	<i>mà</i>	<i>āmò̀n</i>	<i>ámān</i>	<i>mānā</i>	<i>mànà</i>

The historical scenario tentatively proposed here presupposes a stage earlier than PKMN, one in which an inclusive/exclusive distinction had yet to evolve. Pre-Proto-Koman exhibited a general 1PL pronoun *\*\*mana*, which could have been bi-morphemic, composed of *\*\*ma* PL + *\*\*na* 1SG. A reflex of *\*\*ma* is retained in Gwama, seen synchronically as a plural marker on nouns /mā=/ PL (cf §5.2.2).

Once clusivity enters the Koman languages, possibly via contact with other groups and calquing, some branches employ a reflex of *\*mana* 1PL for the 1PL.EX form, and innovate a 1PL.IN form, and others employ a reflex of *\*mana* 1PL for the 1PL.IN form, and innovate a 1PL.EX form.

To illustrate, Proto-Komo-Uduk (PKOUD) employs *\*mana* > *ana* (with a loss of initial /m/) as the 1PL.IN independent pronoun. A later innovation is PKOUD *\*amò̀n* 1PL.EX composed from *\*am* 1SG + *\*ò̀n* 3PL, with a composite meaning of ‘me and them (i.e. not you)’. The reflexes of *\*mana* and *\*amò̀n* in the Komo-Uduk branch are in Table 110. The independent pronouns subsequently cliticized/affixed as argument indexing suffixes on verbs and over time become phonologically reduced. Another PKOUD innovation is possessive pronouns, which were most likely formed from a formative *\*ba* plus an independent pronoun (e.g PKOUD *\*ba* + *\*ana* > Komo *bānà* 1PL.IN). This formative *\*ba* could have been a demonstrative with a possible reflex /bā/ DEM.SG in Komo, which is found synchronically.

Table 110 Reflexes of 1PL in Komo-Uduk (KOUD)

	PKMN	PKOUD	Komo	Uduk	Morpheme type
1PL	*mana	*ana	<i>ānà</i>	<i>ánā</i>	1PL.IN independent pronoun
			<i>-(n)à</i>		
			<i>-(n)àn</i>	<i>-(n)à</i>	1PL.IN bound S/A/P verb affixes
			<i>-ānà</i>		
			<i>bānà</i>	<i>bǎnà</i>	1PL.IN possessive pronoun
1PL.EX		*amøŋ	<i>āmòŋ</i>	<i>ámān</i>	1PL.EX independent pronoun
			<i>-(n)á(m)</i>		
			<i>-(n)án</i>	<i>-(n)á</i>	1PL.EX bound S/A/P verb affixes
			<i>-ām ~ -ān</i>		
			<i>bābòŋ</i>	<i>bām</i>	1PL.EX possessive pronoun

While the PKOUD innovations seem plausible and provide a nice innovation to a single branch, the following scenario requires independent innovations in Proto-Gwama (PGW) and Proto-Dana-Opo (PDAOP). It is proposed that in these two branches, reflexes of \*mana 1PL are employed for 1PL.EX: PGW \*mana > /mà/ 1PL.EX and in PDAOP \*mana > /mana/ 1PL.EX. The subsequent independent innovations of \*minina 1PL.IN come about via \*mini 2SG + \*na 1SG with a meaning akin to ‘you and me’. In PDAOP, \*minina > \*mina via haplology and in PGW \*minina > \*mmɪ via apocope of the final syllable.

Reflexes of \*mana and \*minina in Gwama, Dana and Opo are seen in Table 111. Note that Dana and Opo do not display robust argument indexing on the verb. Rather, once-independent pronouns are beginning to encliticize. Such pronominal enclitics are also employed as possessive pronouns in the Dana-Opo branch. Presumably, this was a PDAOP innovation. Gwama, by contrast, exhibits robust S/A argument indexing on the verb, which has been significantly phonologically reduced.

Table 111 Reflexes of 1PL in Gwama, Dana and Opo

		Gwama	Dana	Opo	Morpheme type
1PL.IN	*minina	<i>mīni</i>	<i>mīnā</i>	<i>mìnà</i>	1PL.IN independent pronoun
		<i>-ni</i>	<i>=mīnā</i>	<i>=mìnà</i>	1PL.IN bound S/A/P verb affixes
		<i>=mīni</i>	<i>=mīnā</i>	<i>=míná</i>	1PL.IN possessive pronoun
1PL	*mana	<i>mà</i>	<i>mānā</i>	<i>mànà</i>	1PL.EX independent pronoun
		<i>-mī</i>	<i>=mānā</i>	<i>=mànà</i>	1PL.EX bound S/A/P verb affixes
		<i>-mà</i>			
		<i>=má</i>	<i>=mānā</i>	<i>=máná</i>	1PL.EX possessive pronoun

### 5.1.3 PKMN 2SG reconstructed forms

The two forms that reconstruct to 2SG pronominal elements are discussed below.

#### 5.1.3.1 PCTRL \*aj and questionable PKMN 2SG ?\*ai(k)

A 2SG independent pronoun \*aj can be confidently reconstructed to PCTRL via the independent and bound reflexes in Table 112. Further, the sound change \*aj > /ε, ɪ/ seen in the bound forms also seems likely as this is also seen in roots (e.g. PKOUD \*p<sup>h</sup>aj > Chali Uduk *p<sup>h</sup>é* ‘fly (v.)’).

Table 112 Reflexes of PCTRL 2SG \*aj

	PCTRL	Komo	Uduk	Dana	Opo	Morpheme type
		<i>àj</i>	<i>é</i>	<i>āj</i>	<i>āj</i>	2SG independent pronoun
2SG	*aj	<i>-í</i>			<i>ī=</i>	2SG bound S/A/P verb affixes
		<i>-é</i>	<i>-ě</i>	<i>=āj</i>	<i>=āj</i>	
		<i>-ē</i>				

An issue here is whether \*aj can be reconstructed to PKMN. The problem is due to the dubiously cognate reflexes in Gwama seen in Table 113. Note that almost all Gwama reflexes contain a velar stop, which is absent in Central Koman. If one were to reconstruct a PKMN pronoun that also reflected the Gwama data, it may have been of the shape ?\*ark. I employ a question mark here to indicate that this is a more questionable reconstruction.

Table 113 Reflexes of a questionable PKMN 2SG ?\*ark

PCTRL	Gwama	Komo	Uduk	Dana	Opo	Morpheme type
	<i>īk</i>	<i>àj</i>	<i>é</i>	<i>āj</i>	<i>āj</i>	2SG independent pronoun
2SG	?*ark	<i>-í</i>	<i>-é</i>	<i>-ĕ</i>	<i>=āj</i>	2SG bound S/A/P verb affixes
	<i>(-i)*</i>	<i>-í</i>			<i>ī=</i>	
		<i>-é</i>			<i>=āj</i>	
		<i>-ē</i>				
	<i>=ké</i>	–	–	–	–	2SG possessive pronoun

\* This form may be a reflex of \*mini (see §5.1.3.2)

The synchronic Gwama independent 2SG pronoun may have simplified the diphthong \*ark > /īk/. Metathesis and voicing could account for the Gwama bound verb affix \*ark > *īk* > *kɪ* > *gɪ*, though this is speculation. Further, Gwama is the only branch that employs a possible \*ark reflex in a possessive pronoun, whose form may have arisen via metathesis: \*ark > *kar* > *kaj* > *kɛ*.

In sum, while we can clearly reconstruct PCTRL \*aj 2SG, attempting to reconstruct a 2SG morpheme to PKMN by including the Gwama reflexes is problematic. This would entail a loss of the velar stop in PCTRL, which is plausible, though not robustly attested elsewhere. Nevertheless, Gwama seems markedly different here from Central Koman and PKMN ?\*ark does not inspire confidence as a reconstructed form. Further, there is

another 2SG pronominal element which can be reconstructed to PKMN, discussed in the following subsection. Note that Bender (1994) does not reconstruct a 2SG independent pronoun for the reasons presented here.

### 5.1.3.2 PKMN 2sg \*mini

A 2SG morpheme \*mini can be reconstructed to PKMN via the reflexes in Table 114. Reflexes of this morpheme occur primarily in possessive pronouns and in some composite 1PLEX independent pronouns as described in §5.1.2. It is likely that the Gwama bound verb affix /-ì/ is a reflex of \*mini given that the vowel and tone are identical to the final vowel of the independent pronoun /mīnì/.

Table 114 Reflexes of PKMN 2SG \*mini

PKMN	Gwama	Komo	Uduk	Dana	Opo	Morpheme type
	=mīnì	bīnì	pīnì	=mīn	=mīnì	2SG possessive pronoun
2SG *mini	-ì	-	-	-	-	2SG bound S/A/P verb affixes
	mīnì	-	-	mīnā	mīnà	1PLEX Independent pronoun

### 5.1.4 PKMN 2PL \*ʊm(a)

One 2PL pronoun \*ʊm(a) can be confidently reconstructed to PKMN via the reflexes in Table 115. It is unclear whether the final vowel reconstructs to PKMN or whether it was a later innovation in Proto-Dana-Opo (PDAOP).<sup>172</sup> Note that a PDAOP innovation is metathesis of PKMN\*ʊma > PDAOP \*mʊa, which is retained as /mwá/ in Opo and truncated to /mō/ in Dana.

<sup>172</sup> Bender (1994) reconstructs PKMN \*um.

Table 115 Reflexes of PKMN 2PL \**ɔm(a)*

PKMN	Gwama	Komo	Uduk	Dana	Opo	Morpheme type
	<i>ɔ̄m</i>	<i>ò̄m</i>	<i>úm</i>	<i>ɔ̄mā</i>	<i>ɔ̄mā</i>	2PL independent pronoun
2PL * <i>ɔm(a)</i>	<i>-mí</i> <i>-ò̄m</i>	<i>-m</i> <i>-ò̄m</i>	<i>-ǔm</i>	<i>=ɔ̄mā</i>	<i>=ɔ̄mā</i>	2PL bound S/A/P verb affixes
	<i>=kó̄m</i>	<i>bó̄m</i>	<i>bǔm</i>	<i>=mɔ̄</i>	<i>=mwá</i>	2PL possessive pronoun

I cannot account for the initial velar stop in Gwama */=kó̄m/* 2PL.POSS, though it appears to pattern with the velar stop seen in the Gwama 2SG forms discussed in §5.1.3. It seems likely that these velar stops are related though a definitive explanation requires further investigation.

#### 5.1.5 PKMN 3SG reconstructed forms

Synchronic Koman languages display either two or three genders in their synchronic third person pronominal system: masculine, feminine and possibly neuter/non-human (§2.2.2). Some of the languages retain this three-way distinction, such as Komo and Dana, while others have lost it altogether and only exhibit one 3SG pronoun, such as the Uduk varieties.

A note must be made on the 3rd person pronominal forms in general. All of the third person independent pronouns can be reconstructed with an initial voiceless glottal fricative \**h-* or a voiceless glottal fricative and a vowel \**hV-* (e.g. Komo *hàr* 3SG.M, *hàp'* 3SG.F, *hìn/hàn* 3N). While this suggests either \**h* or \**hV* as some sort of formative base to which gendered morphology may have attached, I cannot find a source for this proposed formative base. Thus, I reconstruct the 3rd person pronouns together with the voiceless glottal fricative for simplicity even though I recognize they may have had a

more complex history. The following sections examine the 3SG pronominal forms and discuss possible sources for their evolution.

#### 5.1.5.1 PKMN 3N \*han ~ \*hm

A 3SG pronoun \*han ~ \*hm can be reconstructed to PKMN via the reflexes in Table 116. I cannot account for the variation in vowel quality but again we see /a ~ ɪ/ alternations within and across languages in the 3N reflexes. Note that all languages retain reflexes of \*han ~ \*hm with the exception of the Uduk cluster, which has presumably lost any vestiges of this proto-pronoun. Gwama only retains a P argument indexing suffix /-à/ in limited constructions (cf. §2.2.3.1.1).

Table 116 Reflexes of PKMN 3N \*han ~ hm

	PKMN	Gwama	Komo	Uduk	Dana	Opo	Morpheme type
		–	<i>hìn/hàn</i>	–	<i>hān</i>	<i>hà<sup>†</sup></i> <i>nà<sup>†</sup></i>	3N independent pronoun
3N	* <i>ʊm(a)</i>	-à	- <i>n</i> - <i>ī</i> ~ <i>īn</i>	–	= <i>ān</i>	<i>ān</i> = = <i>ān</i>	3N bound S/A/P verb affixes
		–	<i>bín</i>	–	= <i>īn</i>	= <i>hín</i>	3N possessive pronoun

<sup>†</sup>This form cannot occur independently and requires demonstrative enclitics to derive the independent pronoun (cf. §2.2.2.5.1).

One notable Proto-Opo innovation is a distinct set of third person independent pronouns (see §2.2.2.5 for discussion). Opo employs bound formatives, or “bases” (such as 3N /hà/ and /nà/ in Table 116) in combination with demonstrative elements to form innovated 3N pronouns. Further, we see grammaticalized bound reflexes of \*han in the Opo verb affixes, which suggests that POP cliticized /han/ on the verb while innovating a new independent set of 3N pronouns with the 3N formatives /hà/ and /nà/.



Bender (1994:37) reconstructs \*hen 3N to PKMN and assumes it was only retained in Komo.<sup>173</sup> Note that the data from Dana, which Bender presumably did not have, reinforces the validity of an independent PKMN pronoun \*hm ~ \*han 3N, given that independent pronoun reflexes are seen in two branches: PKOUD and PDAOP.

#### 5.1.5.2 PKmn 3sg.f \*hab

A 3SG.F pronoun \*hab can be reconstructed to PKMN through the reflexes in Table 117. Note that reflexes are retained in all branches but Uduk, which lost the gender distinction in pronouns and only retains a reflex of the PKMN 3SG.M pronoun \*had(i), which is employed for all 3SG genders (cf. §2.2.2.3 for discussion).

Table 117 Reflexes of PKMN 3SG.F \*hab

	PKMN	Gwama	Komo	Uduk	Dana	Opo	Morpheme type
		<i>hāp'</i>	<i>hàp'</i>	–	<i>hāp'</i>	<i>ḥā†</i>	3SG.F independent pronoun
3SG.F	*hab	<i>-á /-bí*</i>	<i>-p'</i>	–	<i>=āp'</i>	<i>āb=</i>	3SG.F bound S/A/P verb affixes
		<i>-àp'</i>	<i>-āp'</i>			<i>=āb</i>	
		<i>=dāp'</i>	<i>bíp'</i>	–	<i>=īp'</i>	<i>=íb</i>	3SG.F possessive pronoun

†This form cannot occur independently (cf. §2.2.2.5.1).

Proto-Opo innovated a 3SG.F pronoun employing a formative base \*ba combined with demonstrative elements (see §2.2.2.5.1 for description). It seems very likely that this Opo formative base /ba/ is the same morpheme employed to derive feminine human nominals in modern-day Opo /ḥā=/ F.SG (cf. §5.2.1). This reinforces the validity

<sup>173</sup> Bender's (1994) "/e/" vowel most likely represents the same vowel that others have written as /ɪ/. Note that Bender only reconstructed five vowels /i, e, a, o, u/ to PKMN, though I reconstruct a seven-vowel /i, ɪ, ε, a, ɔ, u/ system.

of at least some of the gender morphology in the PKMN pronominal system having a common origin with the gender morphology in the nominal system. However, this does not hold for masculine gender, as discussed below in §5.1.5.3.

### 5.1.5.3 PKmn 3sg.m \*had(i)

A 3SG.M pronoun \*had(i) can be reconstructed to PKMN through the reflexes in Table 117. Note the regular sound correspondence of medial/final Chali Uduk /d/ to /d/ in Yabus Uduk and /r/ in the remaining languages (see §3.2.3.4 for reconstruction of PKMN \*d). Bender (1994:37) reconstructs \*har but does not give an explanation for reconstructing final \*r rather than \*d.

Table 118 Reflexes of PKMN 3SG.M \*had(i)

PKMN	Gwama	Komo	Uduk	Dana	Opo	Morpheme type
	<i>hār</i>	<i>hàr</i>	<i>ádī†</i> <i>hádī‡</i>	<i>hār</i>	<i>wàr§</i>	3SG.M independent pronoun
3SG.M *had(i)	<i>-ní</i>	<i>-r</i>	<i>-(V)d</i>	<i>=ār</i>	<i>ār=</i>	3SG.M bound S/A/P verb
	<i>-è</i>	<i>-ār</i>	<i>-ădī</i>		<i>=ār</i>	affixes
	<i>=dé</i>	<i>bír</i>	<i>pídī†</i> <i>pádī‡</i>	<i>=ír</i>	<i>=ír</i>	3SG.M possessive pronoun

† This form is from the Chali Uduk variety.

‡ This form is from the Yabus Uduk variety.

§ This form is from the Pame Opo variety and cannot occur independently.

Differently from PKMN \*haβ 3SG.F, which is most likely related to the PKMN nominal gender morpheme \*ba F, PKMN \*had(i) 3SG.M does not appear to have any related morphology in the PKMN nominal gender system. There are no vestiges of \*d or any other coronal consonants marking masculine gender outside of the pronominal system.

This suggests that a possible Pre-Proto-Koman gender system was binary: the feminine was coded by reflexes of \*b(a), which remain feminine modernly, and the masculine was coded by reflexes of the PKMN neuter morphology, \*han 3SG.N, which is most likely related to the PKMN neuter nominal gender morpheme \*à N. Evidence for this is the variation in loss of neuter marking throughout Koman: a vestige in the Gwama verb system and a peripheral neuter gender in Komo. Chali and Bonya Uduk retain presumably cognate à= CL2 morphemes. Only Dana and Opo retain a strong three-way gender system. PKMN could have innovated a masculine gender pronoun of the shape \*hàd(i) though the source for this is unknown.

#### 5.1.6 PKmn 3PL \*hɔn(i)

A 3PL independent pronoun \*hɔn(i) can be reconstructed to PKMN via the cognates in Table 119. Reflexes of PKMN \*hɔn(i) are attested in all branches as independent pronouns, bound verbal affixes and possessive pronouns. One exception is Proto-Opo (POP), which innovated a new series of third person independent pronouns, including 3PL. Nevertheless, Opo retains reflexes of \*hɔn(i) in the possessive pronouns and bound verbal indexing forms.<sup>174</sup> Bender (1994) reconstructs \*un, though he does not discuss its shape (i.e. the absence of initial /h/).

---

<sup>174</sup> The source for the POP innovated 3PL is discussed in §5.2.2.

Table 119 Reflexes of PKMN 3PL \*hɔn

PKMN	Gwama	Komo	Uduk	Dana	Opo	Morpheme type
	<i>hɔ̄n</i>	<i>hɔ̄n</i>	<i>húnī</i>	<i>hār</i>	–	3PL independent pronoun
3SG.M	*hɔn	-n -ɔ̄n	–	=ɔ̄n	ɔ̄n= =ɔ̄n	3PL bound S/A/P verb affixes
	=bɔ́n	bɔ́n	bǔnī	=mɔ̄n	=mɔ́n	3PL possessive pronoun

## 5.2 Reconstruction of Koman nominal gender/number morphology

Koman languages display varying degrees of nominal gender morphology, most of which can be reconstructed to PKMN.<sup>175</sup> We saw in §5.1.5 that the PKMN pronominal system exhibited a three-way gender distinction in the third person. Some of the morphology employed in the pronominal system is cognate with some of the morphology in the nominal gender system, particularly in the Opo varieties, which have the most elaborated nominal gender marking systems in Koman.

Koman languages that do not synchronically display productive nominal gender marking nevertheless retain vestiges of the historical gender morphology in kin terms. The following subsections reconstruct aspects of the PKMN nominal gender system.

### 5.2.1 PKMN singular nominal morphology

There is enough evidence to reconstruct a three-way gender system for singular referents to PKMN through the cognates in Table 120. The clearest morpheme to reconstruct is a feminine \*fa F, with reflexes retained in all languages. Note that Proto-Opo employed a reflex of this morpheme to innovate a 3SG.F pronoun (§5.1.5.2).

<sup>175</sup> See §2.2.2 for synchronic descriptions of Koman nominal gender systems.

Table 120 PKMN reconstructed singular nominal morphology

	PKMN	Gwama	Komo	Uduk	Dana	Opo
M	*ɔ̄	ɔ̄=	–	–	–	ɔ̄=
F	*ɓa	p'à <sup>†</sup>	ɓā(bī)= ɓā <sup>†</sup>	–	ɓā <sup>†</sup>	ɓā-  à <sup>†</sup>
N	*à	à=‡	à=	à-	à <sup>†</sup>	nà <sup>†</sup> hà <sup>†</sup>

<sup>†</sup> No longer productive, lexicalized

<sup>‡</sup> Restricted distribution (cf. §2.2.2.1.3)

<sup>†</sup> This form cannot occur independently.

A masculine gender marker \*ɔ̄ can be reconstructed to PKMN via the Gwama and Opo reflexes, but there are losses in the Komo-Uduk branch and in Dana. Interestingly, \*ɔ̄ does not appear to have any relation to masculine encoding in the pronominal system, which can be reconstructed to PKMN \*had(i).

A neuter morpheme \*à can be reconstructed to PKMN. All languages retain L tone in the reflexes of \*à. Further, \*à seems related to the Opo neuter morphemes /nà/ and /hà/, which also exhibit L tone. There are no /h : n/ sound correspondences to suggest a common origin for Opo /nà/ and /hà/ though these could be reflexes of PKMN \*han 3N. Whether or not the PKMN \*à neuter morpheme is related to PKMN \*han has yet to be determined.

There are two more reconstructable singular nominal gender morphemes, which do not bear any resemblance to the morphemes in Table 120. These morphemes, seen in Table 121, only have reflexes in Komo and Dana (see §2.2.2.2.3 for Komo and §2.2.2.4.3 for Dana). Thus, if these gender morphemes were to be reconstructed, it would have to

be to Proto-Central Koman given the lack of a reflex in Gwama. I tentatively reconstruct two morphemes to PCTRL: masculine \*jE and feminine \*jɔ.

Table 121 PCTRL singular nominal morphology?

	PCTRL	Komo	Uduk	Dana	Opo
M	*jE	jĩ=	–	jê=	–
F	*jɔ	–	–	jò=	–

### 5.2.2 PKMN plural nominal gender morphology

The synchronic Koman plural nominal proclitics are in Table 122. Only Gwama maintains a masculine/feminine gender distinction in the plural.

Table 122 Koman plural nominal (gender) morphology

	Gwama	Komo	Uduk	Dana	Opo
M	mà=				
F	ĩ=	gò=	ĩ=	kê=	bì=

Two challenges result from the array of morphemes in Table 122: (i) whether to reconstruct gender in the plural system, and (ii) which morpheme(s) actually reconstruct. It appears that at least \*i can be reconstructed as a plural morpheme to PKMN given the reflexes in Gwama and Uduk. Whether the PKMN \*i plural morpheme is related to the vestiges of an old plural suffix of the shape /-i/ seen in Komo and Dana in (193), is yet to be determined.

(193)	Gloss	Komo	Dana
	‘teeth’	ʃɛʔí	ʃɛʔé
	‘goats’	mɛʔí	mɛʔé

We saw in §5.1.2 that the synchronic Gwama /mà/ M.PL morpheme may be a reflex of a Pre-Proto-Koman plural morpheme \*ma employed to form a 1PL pronoun \*mana. Thus, it may be possible that PKMN exhibited nominal gender marking in the plural, and this system is retained in Gwama.

Turning to the remaining plural morphemes in Table 122, it is unclear whether Komo /gò=/ and Dana /kɛ=/ are related. I cannot account for the initial consonant correspondence and it does not follow the pattern seen in PKMN voiced onsets that became devoiced before \*L tone in Proto-Dana-Opo (§3.1.2). As such, Komo /gò=/ and Dana /kɛ=/ could be independent innovations.

Lastly, a PKMN plural morpheme \*bɪ should be reconstructed based on the following cognates: Opo /bì=/ plural and Gwama /-bí/ 3PL S/A argument indexing verb suffix.

To summarize, the three possible PKMN plural morphemes are presented in Table 123. I have glossed gender as a possibility for \*ma and \*ɪ. The fact that three nominal plural morphemes can be reconstructed (two with a possible gender distinction) parallels the three-way gender distinction in the singular; perhaps PKMN \*bɪ was a plural neuter morpheme.

Table 123 PKMN plural nominal  
(gender) morphology

PKMN	Meaning
*ma	PL.(M?)
*ɪ	PL.(F?)
*bɪ	PL

### 5.3 Reconstruction of PKMN demonstrative elements

No definitive demonstrative forms can be reconstructed for PKMN. Bender (1994:40) came to a similar conclusion but he reconstructs the demonstrative “archiforms” \*n ‘this’ and \*t ‘that’ for what I understand to mean proximal distance from an origo and medial/distal distance from an origo, respectively.

My data somewhat confirms Bender’s analysis. The Koman proximal demonstrative elements are in Table 21. Note that only Gwama and Komo distinguish M and F gender and only Gwama further distinguishes number (i.e. the Gwama M and F forms are singular). We do see a pattern of /n/ in all of the proximal forms if we include the Gwama plural form.

Table 124 Koman proximal demonstrative enclitics

	Gwama	Komo	Uduk	Dana	Opo
M	= $\acute{e}$	= $n\check{i}$		= $n\grave{i}$ , = $\bar{i}n\grave{a}$	= $\acute{i}n\bar{o}$
F	= $\grave{o}$	= $n\check{o}\check{i}$	- $n$ -, - $ns$ -		
PL	= $n\check{o}n$	-	-	-	-

Demonstratives elements encoding a medial distance from an origo are in Table 125.

In these forms, we see /t, d,  $\acute{d}$ ,  $\grave{d}$ / consonants across the modern forms.

Table 125 Koman medial demonstrative enclitics

	Gwama	Komo	Uduk	Dana	Opo
M	= $t\acute{e}$	= $d\check{i}$	- $d$ -		= $\acute{i}n\bar{i}$
F	= $t\grave{o}$	= $d\check{o}\check{i}$	- $t$ - - $nt$ -	= $\acute{d}\grave{a}$	= $\acute{i}n\bar{t}\bar{i}n$
PL	= $t\check{o}n$	-	-	-	-



In sum, while demonstrative morphemes cannot be easily reconstructed to PKMN, there appears to be remnants of consonants indicating distance from an origo: possibly \*n for a proximal distance and \*D (which includes alveolar and interdental obstruents) for a non-proximal distance.

#### 5.4 Reconstruction of Koman Deictic Directional (DD) verb morphology

Deictic directional (DD) suffixes form a core part of modern Koman verb morphological systems (see §2.2.3.2 for description). The Koman DD morphemes are strictly suffixing and occur immediately after verb root, before any additional morphology.<sup>176</sup> The fact that the Koman DDs occur deep within the verbal complex suggests they are old morphemes. Added to this is the fact that the forms are quite varied in shape and exhibit nuances of semantic function, which also suggest a greater time depth.

The Koman DD morphemes carry a heavy functional load across the languages, encoding direction of motion (including spatial orientation without motion), associated motion, and in some cases, aspect (Otero 2018a, *accepted*). It is safe to reconstruct some PKMN directional morphology which may have first coded a binary directed motion opposition with the speaker as the deictic center: motion *towards* a speaker (GOAL) and motion *away* from the speaker (SOURCE). I will refer to this opposition as ‘ventive’ and ‘itive’ when describing a possible historical evolution of these morphemes.

Table 44 presents synchronic forms expressing ventive motion towards the speaker; I refer to these in Table 44 as ‘deictic directional 1’ in part because of meaning

---

<sup>176</sup> The only exception is Gwama -gí DD2, which occurs after S/A suffixes on the verb. This morpheme may have been a later innovation.

extensions beyond clear ‘ventive motion’. Note that all of the languages display [+high, –ATR] vowels /ɪ, ʊ/ with H tone for the DD1 morphemes. Some languages have two forms, such as Chali Uduk, which employs /-í/ in finite verbs and /-ú/ in non-finite verbs (Killian 2015). Further, Modin Opo exhibits variation in deictic ‘come’ verbs that appear to contain both morphemes: *dʒɔ̄* ‘come.SG’ and *dʒāí* ‘come.PL’.

Table 126 Koman Deictic Directional 1 (DD1) morphemes

	Gwama	Komo	Uduk (Chali)	Dana	Opo (Bilugu, Pame)	Opo (Modin)
DD1		-ú	-ú		-ú	-ú
	-í		-í	-í		-í

From this evidence, we can either reconstruct two forms \*ú and \*í, or a composite of both forms \*úí ~ \*ú. At present I cannot find any diachronic sources for DD1. Further, many of the synchronic deictic motion verbs for ‘come’ appear to employ a historical root meaning either deictic ‘go’ or non-deictic ‘move’ which have lexicalized the synchronic DD1 morphemes. Thus, positing a ‘come’ verb (at least the synchronic ‘come’ verbs) as a possible source for PKMN ventive morphology is challenging at best.

Given that all Koman languages also employ DD1 to express subsequent associated motion to the speaker (i.e. VERB then ‘come’) on non-motion lexical roots, this associated motion semantic sense may have also existed at a PKMN stage.

Table 127 presents forms related to two additional deictic elements, that I call DD2 and DDØ. Synchronically, it is extremely important to note that the DD2 morphemes express motion towards the addressee. While this implies motion away from a source, the DD2 morphemes do not express this inherently. Only Komo exhibits additional non-

ventive directional suffixes, labeled DDØ. The DDØ morphemes are inert and do not exhibit any semantic material: /-í/ occurs on finite verbs and /-á/ on non-finite verbs. Nevertheless, I suspect that the Komo /-í, á/ DDØ morphemes are cognate with /-(j)á/ DD2 in Dana and Opo and these morphemes could be reflexes of a PKMN (or PCTRL) iterative morpheme. First, I turn to the synchronic DD2 morphemes.

Table 127 Koman Deictic Directional DDØ and DD2 morphemes

	Gwama	Komo	Uduk (Chali)	Dana	Opo (Bilugu)	Opo (Pame)
DD2	-gí	-úk, -kú, (kí) <sup>†</sup>	-kú -kí	-(j)á	-(j)á	-(j)á
DDØ	-	-í -á	-	-	-	-

- indicates a bare or unmarked form of the verb

<sup>†</sup>This form is lexicalized.

While the Gwama and the Uduk DD2 forms contain velar onsets, I do not suspect that the Komo-Uduk forms are cognate with Gwama, though this remains to be thoroughly investigated.<sup>177</sup> The Komo and Uduk DD2 forms are almost certainly cognate. In Chali Uduk, /-kí/ is employed on finite verbs and /-kú/ on non-finite verbs (Killian 2015). In Komo /-kú/ is employed on finite verbs and /-úk/ on non-finite verbs. Komo has a handful of verbs which appear to have lexicalized /-kí/, though this morpheme is no longer productive if it ever was at all.

<sup>177</sup> Gwama /-gí/ DD2 does not occur immediately on the verb root, but rather after S/A argument indexing suffixes, which suggests a possible Gwama innovation (see Hellenthal 2018 for discussion).

If the Gwama DD2 morpheme is not cognate with the Uduk and Komo forms, then one possible scenario is that an itive marker was a PCTRL innovation, sourced in the grammaticalization of a motion verb: \*Ḑa ‘go, move’ (see §3.2.10.1 for discussion). Reflexes of this possible PCTRL \*Ḑa itive are seen as DD2 in the Dana-Opo branch (with the semantic extension of motion towards the addressee).<sup>178</sup> The PCTRL itive may have been lost in the Komo-Uduk branch though vestiges may be retained in the Komo DDØ morphemes /-í, -á/, which are synchronically inert. After the loss, Proto-Komo-Uduk (PKOUD) possibly innovated a distinct itive form \*-kV containing a velar onset (the vowel cannot be definitively reconstructed). PKOUD\*-kV may have functioned as an itive and later became extended to express motion towards the addressee, or it may have been innovated initially as indicating motion towards the addressee. Whether this PKOUD innovation \*-kV is cognate with the Gwama independent pronoun *ĩk* 2SG remains a speculation, but these are the only forms with velar onsets and a meaning related to the second person.

In conclusion, it seems very likely that PKMN exhibited a morphological opposition for encoding itive and ventive deictic direction on verbs: this is core Koman verb morphology. A PKMN ventive function can be clearly reconstructed possibly to a unitary morpheme (\*ʔí ~ \*íʔ), or two distinct morphemes (\*ɪ, \*ʊ), though the former seems more likely to me.

An itive form cannot be definitively reconstructed to PKMN given the lack of a trustworthy cognate in Gwama. It could be argued that following a loss of the PKMN itive, PCTRL innovated a new itive from a motion verb \*Ḑa, which is retained in the

---

<sup>178</sup> See §3.2.10.1 for \*Ḑ correspondence set.

Dana-Opo branch and almost entirely lost in the Komo-Uduk branch (with a residual retention in Komo seen in the DDØ forms). Gwama then later innovated -gí DD2.

Another possibility is that a itive morpheme sourced in a motion verb \*Ḑa reconstructs to PKMN and was subsequently lost in Gwama.

The question of how the synchronic DD2 forms, which are not cognate across the family, all code motion towards the addressee remains a mystery. This semantic extension may have occurred independently in Gwama, the KOUD branch and in the DAOP branch, or it could have resulted through contact across these groups. Nevertheless, motion towards the addressee (and even associated motion towards the addressee in the DAOP branch) is a unique feature of the synchronic Koman DD systems.

## CHAPTER VI

### CONCLUSION

This dissertation is a first pass at a reconstruction of the Koman language family. Much of the data in this reconstruction was collected first-hand from native speakers in Ethiopia and with refugee speakers in the U.S. In this reconstruction, I focused specifically on the living Koman languages whose genetic affiliation to Koman is undisputed (Gwama, Komo, Uduk, Opo). I also included data from Dana, a previously unrecognized Koman language, which forms a key part of the reconstruction as it retains many aspects of the Proto-Koman phonological system. Further, this study also included data from several Koman dialects, such as Yabus Uduk, which had very little, if any, prior description.

In this study, I reconstructed parts of the phonology, lexicon and morphology of Proto-Koman. In the phonology, I reconstructed consonants, vowels and tone. I also discussed how historical tone in Pre-Koman impacted the development of syllable onset stop consonants. Another notable feature in the phonological reconstruction is the interaction between the Advanced Tongue Root [ATR] feature of high vowels and the realization of either alveolar or palatal fricatives in Gwama. I provide a wordlist of reconstructed etyma in Appendix D and indicate to which node each item reconstructs within Koman. Some morphological reconstructions include independent pronouns and deictic directional verb morphology. I have included all of the data employed in this study in the Appendices.

While Koman's affiliation to the purported Nilo-Saharan super family is still under debate, my main aim was to provide a conservative reconstruction of Proto-Koman which will hopefully serve future Komans scholars as well as those interested in higher-level genetic classifications of East African languages.

APPENDIX A  
ABBREVIATIONS

1	first person
2	second person
3	third person
A	agent-like argument of a canonical transitive verb
ACC	accusative
ADJZ	adjectivizer
ASS	associative
AUX	auxiliary
CL	class
COP	copula
DEF	definite
DEM	demonstrative
DEM.RT	demonstrative root
DD	deictic directional
DIST	distal
ERG	ergative
EX	exclusive
F	feminine
HUM	human
IN	inclusive
INT	intentative (future)
LOC	locative
M	masculine
MED	medial
N	neuter/non-human
NEG	negative



P	patient-like argument of a canonical transitive verb
PL	plural
PLU	pluractional
PROX	proximal
RED	reduplication
REM	remote
Q	polar question particle/marker
S	single argument of a canonical intransitive verb
SG	singular
sp.	species, type
SV	serial verb

## APPENDIX B

### ETYMOLOGICAL WORDLIST

This appendix contains all of the reconstructed lexica in this study. As different etyma can be reconstructed to different nodes, for each individual entry, I indicate the highest level (or node) to which it can be reconstructed.

Each entry contains a reconstructed form, followed by the word class. Below each reconstructed word are the cognates in the daughter languages. The abbreviations for the language varieties are as follows: GwLo= Lowland Gwama, GwHi= Highland Gwama, UdYa= Yabus Uduk, Komo=Ethiopian Komo, UdCh= Chali Uduk, Dana=Dana, OpBi= Bilugu Opo, OpMo= Modin Opo, OpPa= Pame Opo, OpKi= Kigile Opo.

I employ the grapheme <+> to indicate a historical or synchronic morpheme boundary.

\*p<sup>h</sup>(j)as' v. 'laugh': Reconstructs to: PKmn

GwHi īs'  
GwLo pās'  
Komo pès'  
UdYa p<sup>h</sup>ēs'  
UdCh p<sup>h</sup>ēṭ'  
Dana p<sup>h</sup>às'  
OpBi p<sup>h</sup>āṭʃ'  
OpMo p<sup>h</sup>āṭʃ'  
OpPa p<sup>h</sup>āṭʃ'  
OpKi p<sup>h</sup>āṭʃ'

\*p<sup>h</sup>ā v. 'bring\_2': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi p<sup>h</sup>ā+ó

OpMo p<sup>h</sup>ā+jó  
OpPa p<sup>h</sup>ā+jó  
OpKi p<sup>h</sup>ā+jó

\*p<sup>h</sup>àc' v. 'soak\_1': Reconstructs to: PKmn

GwHi pās'  
GwLo pās'  
Komo pàs'  
UdYa p<sup>h</sup>āf'  
UdCh p<sup>h</sup>āc'  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*p<sup>h</sup>àḍ v. 'fly (v.)': Reconstructs to: PKmn

GwHi pāl  
GwLo pāj  
Komo pàj  
UdYa p<sup>h</sup>āj  
UdCh p<sup>h</sup>ē  
Dana p<sup>h</sup>àḍ  
OpBi p<sup>h</sup>āj  
OpMo p<sup>h</sup>āj  
OpPa p<sup>h</sup>āj  
OpKi p<sup>h</sup>āj

Most likely borrowed from or related to PNilotic \*pär (Dimmendaal 1988:38)

\*p<sup>h</sup>ád(a) v. 'lay (v.)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo pár  
UdYa p<sup>h</sup>ád  
UdCh p<sup>h</sup>ád  
Dana p<sup>h</sup>óḍā  
OpBi p<sup>h</sup>ará  
OpMo p<sup>h</sup>ará  
OpPa p<sup>h</sup>ará  
OpKi p<sup>h</sup>ará

\*p<sup>h</sup>ák' v. 'plait or braid or weave\_1': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi p<sup>h</sup>ák'  
OpMo p<sup>h</sup>ák'  
OpPa p<sup>h</sup>ák'  
OpKi p<sup>h</sup>ák'

\*p<sup>h</sup>ák'á v. 'chop\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa p<sup>h</sup>á?  
UdCh -  
Dana p<sup>h</sup>ák'á  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*p<sup>h</sup>ák'á n. 'shoe': Reconstructs to: PKmn

GwHi pák  
GwLo pák  
Komo pá?  
UdYa p<sup>h</sup>ā?  
UdCh à+p<sup>h</sup>ā?  
Dana -  
OpBi p<sup>h</sup>ák'á  
OpMo p<sup>h</sup>ák'  
OpPa p<sup>h</sup>ák'  
OpKi -

\*p<sup>h</sup>al v. 'come free and fall off': Reconstructs to: PKmn

GwHi pǐ  
GwLo pǐ  
Komo -  
UdYa -

UdCh -  
Dana -  
OpBi p<sup>h</sup>ál  
OpMo p<sup>h</sup>ál  
OpPa p<sup>h</sup>ál  
OpKi p<sup>h</sup>ál

Loss of final lateral in Gwama: [al] → [ɪ]

\*p<sup>h</sup>āl n. ‘young people\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo pāl  
UdYa -  
UdCh -  
Dana p<sup>h</sup>āl  
OpBi p<sup>h</sup>āl  
OpMo p<sup>h</sup>āl  
OpPa p<sup>h</sup>āl  
OpKi p<sup>h</sup>āl

\*p<sup>h</sup>ará n. ‘platform’: Reconstructs to: PKmn

GwHi párá  
GwLo párá  
Komo párá  
UdYa -  
UdCh -  
Dana p<sup>h</sup>ará  
OpBi p<sup>h</sup>ará  
OpMo p<sup>h</sup>ará  
OpPa p<sup>h</sup>ará  
OpKi p<sup>h</sup>ará

Platform used to throw stones at birds when crops are ripe.

\*p<sup>h</sup>ɛd v. ‘peel, skin (with knife), peel, husk, peel’: Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo pèt  
UdYa p<sup>h</sup>ít<sup>h</sup>  
UdCh -  
Dana -  
OpBi -

OpMo -  
OpPa -  
OpKi -

\*p<sup>h</sup>ɛ̄d(ɛ) v. ‘untie, take out (quickly, e.g. out of fire)’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo pɛ̄l  
UdYa p<sup>h</sup>ɛ̄d  
UdCh p<sup>h</sup>ɛ̄d  
Dana p<sup>h</sup>ɛ̄rɛ  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*p<sup>h</sup>ɛ̄k'ɛ̄ʃ n. ‘Komo (ethnonym)\_2’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa p<sup>h</sup>ɛ̄k'ɛ̄ʃ  
UdCh p<sup>h</sup>ɛ̄k'ɛ̄ʃ  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*p<sup>h</sup>ɪ+t'wā v. ‘kiss\_3’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa p<sup>h</sup>ɪ+t'wā  
UdCh p<sup>h</sup>ɪt'wā  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*p<sup>h</sup>ĩ v. 'stab\_5': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi p<sup>h</sup>ĩ  
OpMo p<sup>h</sup>ĩ  
OpPa p<sup>h</sup>ĩ  
OpKi p<sup>h</sup>ĩ

\*(ĩ)p<sup>h</sup>ĩ v. 'drink\_SG': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo íp  
UdYa p<sup>h</sup>ĩ  
UdCh p<sup>h</sup>ĩ  
Dana íp<sup>h</sup>  
OpBi p<sup>h</sup>ĩ  
OpMo p<sup>h</sup>ĩ  
OpPa íp<sup>h</sup>  
OpKi íp<sup>h</sup>  
\*H tone in SG.

\*ìp<sup>h</sup>(ĩ) v. 'drink\_PL': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo ìp  
UdYa -  
UdCh -  
Dana ìp<sup>h</sup>ĩ  
OpBi ìp<sup>h</sup>ĩ  
OpMo ìp<sup>h</sup>ĩ  
OpPa ìp<sup>h</sup>  
OpKi ìp<sup>h</sup>  
\*L tone in PL.

\*p<sup>h</sup>óḡ n. 'back\_2': Reconstructs to: PKoUd

GwHi -  
GwLo -

Komo póg  
 UdYa p<sup>h</sup>óʔ  
 UdCh à+p<sup>h</sup>óʔ  
 Dana -  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*p<sup>h</sup>ɔp<sup>h</sup> v. ‘soak\_2’: Reconstructs to: PDaOp

GwHi -  
 GwLo -  
 Komo -  
 UdYa -  
 UdCh -  
 Dana p<sup>h</sup>ɔp<sup>h</sup>  
 OpBi p<sup>h</sup>óʔp<sup>h</sup>  
 OpMo p<sup>h</sup>óʔp<sup>h</sup>  
 OpPa p<sup>h</sup>óʔp<sup>h</sup>  
 OpKi p<sup>h</sup>óʔp<sup>h</sup>

\*p<sup>h</sup>ɔtʰ(ɔ) v. ‘light weight (be)\_1’: Reconstructs to: PCtrl

GwHi -  
 GwLo -  
 Komo pɔtʰ  
 UdYa p<sup>h</sup>ɔd  
 UdCh p<sup>h</sup>ɔd  
 Dana p<sup>h</sup>óʔtʰ  
 OpBi p<sup>h</sup>óʔtʰ  
 OpMo -  
 OpPa p<sup>h</sup>óʔtʰ  
 OpKi -

\*p<sup>h</sup>ú ~ p<sup>h</sup>ó v. ‘spoil, stink, smell bad\_1’: Reconstructs to: PCtrl

GwHi -  
 GwLo -  
 Komo pó  
 UdYa -  
 UdCh -  
 Dana -  
 OpBi p<sup>h</sup>úwú



OpMo p<sup>h</sup>újí  
OpPa p<sup>h</sup>úrú  
OpKi p<sup>h</sup>úrú

\*p<sup>h</sup>ui(ki) v. ‘blow (with mouth)’: Reconstructs to: PKmn

GwHi pīkī  
GwLo pī  
Komo pì  
UdYa p<sup>h</sup>új  
UdCh p<sup>h</sup>í  
Dana p<sup>h</sup>ùj  
OpBi p<sup>h</sup>ú  
OpMo p<sup>h</sup>ú  
OpPa p<sup>h</sup>ú  
OpKi p<sup>h</sup>ú

\*p<sup>h</sup>uku n. ‘fig\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa p<sup>h</sup>ū?  
UdCh à+p<sup>h</sup>ū?  
Dana p<sup>h</sup>új  
OpBi -  
OpMo p<sup>h</sup>úkū  
OpPa púj  
OpKi púj

\*p<sup>h</sup>Ul? v. ‘spicy (be)\_1’: Reconstructs to: PKmn

GwHi pəl  
GwLo pwì  
Komo -  
UdYa -  
UdCh -  
Dana p<sup>h</sup>íl  
OpBi p<sup>h</sup>ílī  
OpMo p<sup>h</sup>ílī  
OpPa p<sup>h</sup>ílī  
OpKi p<sup>h</sup>ílī

\*(fa)p<sup>h</sup>uZa n. ‘burnt ground, soot’: Reconstructs to: PKmn

GwHi fāpót  
GwLo fābót  
Komo kí+pú  
UdYa bwà+p<sup>h</sup>wí  
UdCh à+p<sup>h</sup>í?  
Dana pùzà?  
OpBi p<sup>h</sup>újhá  
OpMo p<sup>h</sup>újhá  
OpPa p<sup>h</sup>újhá  
OpKi p<sup>h</sup>újhá

\*p<sup>(h)</sup>ít(á) v. ‘rise (oneself)\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa pí  
UdCh pí  
Dana píṭá  
OpBi p<sup>h</sup>íjá  
OpMo p<sup>h</sup>íjá  
OpPa -  
OpKi p<sup>h</sup>íjá

\*p<sup>(h)</sup>òs v. ‘barren (be)’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana pòs  
OpBi p<sup>h</sup>òs  
OpMo p<sup>h</sup>òs  
OpPa p<sup>h</sup>òs  
OpKi p<sup>h</sup>òs

\*p<sup>(h)</sup>òṭ v. ‘slippery, smooth (be)\_1’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -

UdCh -  
Dana pòtʰ  
OpBi pʰɔt  
OpMo pʰɔt  
OpPa pʰɔt  
OpKi pʰɔt

\*p<sup>(h)</sup>ud(i) v. 'arrive\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh pʰūd  
Dana pújī  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*p<sup>(h)</sup>ōr v. 'burn (hairs off of pig skin), roast next to fire': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa pūr  
UdCh pūr  
Dana -  
OpBi pʰōr  
OpMo pʰōr  
OpPa pʰōr  
OpKi -

\*pa n. 'home, place\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa pā  
UdCh pā  
Dana -  
OpBi pà  
OpMo pà  
OpPa pà

OpKi -

\*páD v. 'hunt\_4': Reconstructs to: PUd

GwHi -

GwLo -

Komo -

UdYa pát<sup>h</sup>

UdCh pár

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*pàD v. 'touch\_1, crawl': Reconstructs to: PKmn

GwHi pāt

GwLo pāt

Komo pāt

UdYa pāt<sup>h</sup>

UdCh pār

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

Possible \*d > t<sup>(h)</sup> word-finally given voiced reflexes in Chali Uduk.

\*pāgā v. 'carry\_3': Reconstructs to: POp

GwHi -

GwLo -

Komo -

UdYa -

UdCh -

Dana -

OpBi pāgā

OpMo pāgā

OpPa pāgā

OpKi pāgā

\*páj n. ‘moon or month\_2’: Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo páj  
UdYa páj  
UdCh à+pé?  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -  
\*aj → /ε/ in Chali Uduk.

\*pǎjá n. ‘pottery, pot\_2’: Reconstructs to: PGw

GwHi pǎjá  
GwLo pǎjá  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*pājā n. ‘side of body, rib\_1’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana pājā  
OpBi -  
OpMo -  
OpPa zī+pāj  
OpKi -

\*pàl(í) v. ‘court (v.), flirt with\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo pàlí

UdYa -  
UdCh -  
Dana pàlí  
OpBi pàlí  
OpMo pàlí  
OpPa pàlí  
OpKi pàlí

Unclear as to why it's not voiced in Komo if initial was b and L tone.

\*pàndzá n. 'antelope\_4': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa pàndzá  
OpKi pàndzá

\*pàns' n. 'axe\_4': Reconstructs to: PGw

GwHi pàns'  
GwLo pàns'  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*pànt' v. 'plaster (v.), adhere\_4': Reconstructs to: PGw

GwHi pànt'  
GwLo pànt'  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -

OpMo -  
OpPa -  
OpKi -

\*pǎŋǵō v. 'lack (not have)\_2': Reconstructs to: PGw

GwHi pǎŋ  
GwLo pǎŋǵō  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*parǵa ~ parǵa n\*. 'horse\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo pǎrǵá  
UdYa -  
UdCh -  
Dana pǎrǵá  
OpBi pǎrsá  
OpMo pǎrsá  
OpPa pǎrsá  
OpKi pǎrsá

Unknown /ǵ ~ ǵ/ correspondence. Borrowing?

\*pǎǵá v. 'transplant (e.g. plant)\_4': Reconstructs to: PGw

GwHi pǎǵá  
GwLo pǎǵá  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*pātʃá v. ‘choose\_5, shut’: Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi pātʃá  
OpMo pātʃá  
OpPa pātʃá  
OpKi pātʃá

\*pàtʃí v. ‘pound (v.)\_6’: Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi pàtʃí  
OpMo pàtʃí  
OpPa -  
OpKi -

\*pētí n. ‘bad (be)\_2’: Reconstructs to: PGw

GwHi pētí  
GwLo pētí  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*pí v. ‘leave\_2’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa pí



UdCh pí  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*pid(V) v. 'shake (sth.)\_1': Reconstructs to: PKmn

GwHi -  
GwLo pídí  
Komo pídá  
UdYa pít<sup>h</sup>  
UdCh pír  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*pij(i) v. 'rub hands together (e.g. to make fire using stick)\_3': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo pìz  
UdYa -  
UdCh -  
Dana p<sup>h</sup>ic<sup>h</sup>  
OpBi pīdzí  
OpMo -  
OpPa pīdz  
OpKi -

\*pīs v. 'satiated (be)\_2': Reconstructs to: PGw

GwHi pīs  
GwLo pīs  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -

OpKi -

\*písāk(ʷ) n. ‘star\_3, firefly’: Reconstructs to: PCtrl

GwHi -

GwLo -

Komo písākʷ

UdYa -

UdCh -

Dana písākʷ

OpBi písákʷ

OpMo písákʷ

OpPa písákʷ

OpKi písákʷ

\*piǰ v. ‘disregard’: Reconstructs to: PKmn

GwHi pīs

GwLo pīs

Komo píǰ

UdYa -

UdCh píǰ

Dana píǰ

OpBi pīs

OpMo pīs

OpPa pīs

OpKi pīs

\*pít<sup>h</sup> ~ pí<sup>h</sup> n. ‘vagina\_1’: Reconstructs to: PKmn

GwHi pít

GwLo pít

Komo pít

UdYa -

UdCh -

Dana pí<sup>h</sup>

OpBi -

OpMo -

OpPa -

OpKi -

\*pítí n. ‘ash\_2’: Reconstructs to: POp

GwHi -

GwLo -

Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi pītí  
OpMo pītí  
OpPa -  
OpKi -

\*pit'ɔn ~ pit<sup>(h)</sup>ɔn n\*. 'flour\_4': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana pīt<sup>h</sup>ɔn  
OpBi pīt'ɔn  
OpMo pīt'ɔn  
OpPa pīt'ɔn  
OpKi pīt'ɔn

\*pī v. 'give birth\_2': Reconstructs to: PGw

GwHi pī  
GwLo pī  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*pīdìN n. 'stone or rock\_2': Reconstructs to: PGw

GwHi pīdìl  
GwLo pīdìn  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -

OpMo -  
OpPa -  
OpKi -

\*pīdzí v. 'soft (be)\_3': Reconstructs to: POP

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi pīdzí  
OpMo pīdzí  
OpPa pīdzí  
OpKi pīdzí

\*pínziákīfīn n. 'arrow\_2': Reconstructs to: PGw

GwHi pínziákīfīn  
GwLo pínziákīfīn  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*pīf n. 'broom\_3': Reconstructs to: PGw

GwHi pīf  
GwLo pīf  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*pĩ̀tì n. ‘hunger\_2’: Reconstructs to: PGw

GwHi pĩ̀tì  
GwLo pĩ̀dì  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*pógó n. ‘river\_3’: Reconstructs to: PGw

GwHi pógó  
GwLo pógó  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*pók’ v. ‘satiated (be)\_1’: Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo póg  
UdYa pók’  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*póf v. ‘dive\_2’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa póf

UdCh pɔ́f  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*pǔ́fɔ́ v. ‘arrive\_4’: Reconstructs to: PGw

GwHi pǔ́fɔ́  
GwLo pǔ́fɔ́  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*pùr n. ‘Dana (ethnonym)\_2’: Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa pùr  
UdCh pùr  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*put<sup>(h)</sup> v. ‘satiated (be)\_4’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana pút<sup>h</sup>  
OpBi pút  
OpMo pút  
OpPa pút

OpKi püt

\*póǵón v. 'dive\_1': Reconstructs to: PGw

GwHi pógón

GwLo pógón

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*pɔʃ ~ puʃ v. 'wrap': Reconstructs to: PKmn

GwHi pɔʃ

GwLo pɔʃ

Komo -

UdYa pūʃ

UdCh pūʃ

Dana púʃá

OpBi pūsá

OpMo pūsá

OpPa pūsá

OpKi pūsá

\*pwàʃ n. 'food\_2': Reconstructs to: PGw

GwHi pwàʃ

GwLo pwāʃ

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*bàb v. 'bury\_1': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo bàb  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa pàbà  
OpKi pàbà

\*bàbá n. 'father\_1': Reconstructs to: PKmn

GwHi -  
GwLo bàbá  
Komo bã  
UdYa à+bàbá  
UdCh à+bàbá  
Dana -  
OpBi àbá  
OpMo àbá  
OpPa àbá  
OpKi àbá

\*bada ~ pada n. 'waist, hip\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo bàr  
UdYa pād  
UdCh pād  
Dana pàdá?  
OpBi -  
OpMo -  
OpPa pìpārá  
OpKi pìpārá?

\*bàgál n. 'horse\_3': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa bàgál  
UdCh bàgál  
Dana -  
OpBi -



OpMo -  
OpPa -  
OpKi -

\*bàj n. 'elephant\_3': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi bàj  
OpMo bàj  
OpPa bàj  
OpKi bàj

\*bàj ~ bāj v. 'wide (be)': Reconstructs to: PKmn

GwHi pāj  
GwLo pāj  
Komo bājá  
UdYa bān  
UdCh bē  
Dana -  
OpBi pāj  
OpMo pāj  
OpPa pāj  
OpKi pāj

\*baja v. 'fast (from drinking or eating)': Reconstructs to: PGw

GwHi bājá  
GwLo bājā  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bàk n. 'hair\_2': Reconstructs to: PGw

GwHi bàk  
GwLo bàk  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bàmbá n. 'drum\_B': Reconstructs to: PKmn

GwHi pàmbà  
GwLo pàmbà  
Komo -  
UdYa bàmbá  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bămbàr n. 'chair\_4': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa bămbàr  
UdCh bămbàr  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bàngwà n. 'cannabis\_1': Reconstructs to: PKmn

GwHi bą̀gà  
GwLo bą̀gà  
Komo bą̀kò  
UdYa bą̀gò  
UdCh bą̀gò

Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bár n. 'bird\_heron': Reconstructs to: PKmn

GwHi -  
GwLo  $\bar{o}$ +bár  
Komo à+bár  
UdYa -  
UdCh -  
Dana à+bár  
OpBi à+bár  
OpMo à+bár  
OpPa à+bár  
OpKi à+bár

\*bàr v. 'sweep\_3': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi bàr  
OpMo bàr  
OpPa bàr  
OpKi bàr

\*bàs n. 'blood\_2': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo bàf  
UdYa bàs  
UdCh à+bàs  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bas' v. 'follow\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa bās'  
UdCh bāt'  
Dana pāt<sup>h</sup>i  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bàs' n. 'milk\_1': Reconstructs to: PGw

GwHi bàs'  
GwLo bàs'  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bās' v. 'precede\_4': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa bās'  
UdCh bāt<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bēs n. 'dream\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo bēs

UdYa -  
UdCh -  
Dana -  
OpBi bēs  
OpMo bēs  
OpPa bēs  
OpKi bēs

\*bēsēr v. ‘slip (v.)\_2’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo bēsēr  
UdYa -  
UdCh -  
Dana -  
OpBi bēsér  
OpMo bēsér  
OpPa bēsér  
OpKi bēsér

\*béfĕ v. ‘bypass\_2’: Reconstructs to: PGw

GwHi béfĕ  
GwLo béfĕ  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*à+bí n. ‘cloth, clothes\_3’: Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi à+bí  
OpMo à+bí

OpPa -  
OpKi -

\*bi+pāj+dzàw n. 'Komo (ethnonym)\_3': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi bi+pāj+dzàw  
OpMo bi+pāj+dzàw  
OpPa bi+pāj+zàw  
OpKi bi+pāj+fàwà

\*bib ~ bìb n\*. 'cow\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo bìb  
UdYa bì?  
UdCh bip<sup>h</sup>  
Dana pì?  
OpBi pìb  
OpMo pì  
OpPa pì  
OpKi pì

\*bīrīt' v. 'stretch': Reconstructs to: PGw

GwHi bīrīt'  
GwLo bīrīt'  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bīs`àn n. ‘firefly\_1’: Reconstructs to: PGw

GwHi bīs`àn  
GwLo bīs`àn  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bīs`àn n. ‘star\_2’: Reconstructs to: PGw

GwHi bīs`àn  
GwLo bīs`àn  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bíf v. ‘shiver\_3’: Reconstructs to: PGw

GwHi bíf  
GwLo bíf  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bīt n. ‘large bird’: Reconstructs to: PGw

GwHi bīt  
GwLo bīt  
Komo -  
UdYa -

UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bit<sup>(h)</sup> v. 'toss, throw away, fall over': Reconstructs to: PKmn

GwHi pìt  
GwLo pìt  
Komo bìt  
UdYa bīt<sup>h</sup>  
UdCh bīt<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*Binc' n. 'fishhook': Reconstructs to: PKmn

GwHi bīns'  
GwLo bīns'  
Komo bīns'  
UdYa bīf'  
UdCh à+bíc'  
Dana bíc'  
OpBi bītʃ'  
OpMo bītʃ'  
OpPa bītʃ'  
OpKi bītʃ'

Cannot account for initial /b/ in Opo.

\*bís'ínī n. 'four\_2': Reconstructs to: PGw

GwHi bís'ínī  
GwLo bís'ínī  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -



OpPa -  
OpKi -

\*bɔ̃b ~ bɔ̃b v. 'hide, skulk': Reconstructs to: PKmn

GwHi pɔ̃p'  
GwLo pɔ̃p'  
Komo bɔ̃b  
UdYa -  
UdCh -  
Dana -  
OpBi pɔ̃j  
OpMo pɔ̃j  
OpPa pɔ̃j  
OpKi -

\*bɔ̃g(ɔ̃) v. 'play\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo bɔ̃g  
UdYa -  
UdCh -  
Dana pɔ̃gɔ̃ʔ  
OpBi pɔ̃gɔ̃  
OpMo pɔ̃gɔ̃  
OpPa pɔ̃gɔ̃  
OpKi pɔ̃gɔ̃

\*bɔ̃r n. 'chest\_2': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa bɔ̃r  
UdCh à+bɔ̃r  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bū ~ pū n\*. 'sesame\_1': Reconstructs to: PKoUd

GwHi -

GwLo -  
Komo bŭ  
UdYa pŭ  
UdCh à+pŭ  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bùl n. 'drum\_A': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo bùl  
UdYa -  
UdCh -  
Dana bùl  
OpBi bùl  
OpMo bùl  
OpPa bùl  
OpKi bùl

\*bùl v. 'spoil, stink, smell bad\_2': Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa bùl  
UdCh bùl  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bUma v. 'pregnant (be)': Reconstructs to: PKmn

GwHi pòm  
GwLo pòm  
Komo bú  
UdYa pwá  
UdCh bwà  
Dana pùmá

OpBi pǔmá

OpMo pǔmá

OpPa pǔmá

OpKi pǔmá

Cannot account for /b/ in Komo and /p/ in Yabus Uduk.

\*bùmà n. ‘belly or stomach\_2’: Reconstructs to: PCtrl

GwHi -

GwLo -

Komo -

UdYa bwà?

UdCh -

Dana mwà

OpBi pùmà

OpMo pùmà

OpPa pùmà

OpKi pùmà

\*buɲɛ n. ‘forehead\_2’: Reconstructs to: PUd

GwHi -

GwLo -

Komo -

UdYa bwìɲ

UdCh bùjè

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*burbuɸ n. ‘dust, sand\_1’: Reconstructs to: PKmn

GwHi bùrbūt

GwLo bùrbūt

Komo -

UdYa bŭt<sup>h</sup>

UdCh bŭɸ

Dana bŭrk’ùs

OpBi bŭrk’ùs

OpMo bŭrk’ùs

OpPa bŭrk’ùs

OpKi bŭrk’ùs

Also bùrbūt' in Gwama. Addition of \*k'us appears to be a PDaOp innovation though source is unknown..

\*bus' v. 'choke, strangle\_1': Reconstructs to: PKmn

GwHi būs'  
GwLo būs'  
Komo -  
UdYa būs'  
UdCh bũṭ'  
Dana -  
OpBi p<sup>h</sup>ūṭf'  
OpMo -  
OpPa -  
OpKi -

\*bǔfú v. 'fart\_2': Reconstructs to: PGw

GwHi bǔfú  
GwLo bǔfú  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bǔfùl n. 'belly or stomach\_1': Reconstructs to: PKmn

GwHi bǔfùl  
GwLo bǔfi  
Komo bǔf  
UdYa -  
UdCh bǔf  
Dana -  
OpBi pùsà  
OpMo pùsà  
OpPa pùsà  
OpKi pùsà

\*bò n. 'hole\_2': Reconstructs to: PGw

GwHi bò

GwLo bə̀  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bək<sup>h</sup> v. 'extract tooth\_1, barking (of dog)': Reconstructs to: PKmn

GwHi pǔ  
GwLo pǔ  
Komo -  
UdYa -  
UdCh bǔk<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bǔrà n. 'cat\_1': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo bǔrà  
UdYa bǔrá  
UdCh à+bǔrá  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bǔrǎn n. 'cloth, clothes\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo bǔlèn  
UdYa bǔrǎn  
UdCh bǔrǎnè  
Dana à+bǔrǎn

OpBi -  
OpMo -  
OpPa bɔ̀lɛŋ  
OpKi bɔ̀lɛn

\*bɔ̀tò v. ‘clear land (for planting)\_2’: Reconstructs to: PGw

GwHi bɔ̀tò  
GwLo bɔ̀tò  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bVr(màn) n. ‘root\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo bìl  
UdYa bĩr  
UdCh birmàn  
Dana bìl+mà+cá  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bwàhādgī(da) n. ‘palate\_2’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa bwàgídà  
UdCh bwàhādgī  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bwàk' v. 'hide (oneself)': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo bò?  
UdYa bà?  
UdCh bàk'  
Dana bàk'  
OpBi -  
OpMo -  
OpPa -  
OpKi bòk'

\*bwaŋ(a) v. 'path, road\_1, towards': Reconstructs to: PKmn

GwHi pwǎŋà  
GwLo pwǎŋà  
Komo -  
UdYa -  
UdCh bwǎj  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bwǎfà n. 'snake\_3': Reconstructs to: PGw

GwHi bwǎfà  
GwLo bwǎfà  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bwí n. 'arm\_2': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa bwí

UdCh à+bĩ  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bɔŋk'ó n. 'frog\_1': Reconstructs to: PKmn

GwHi p'à+bɔŋg'ó  
GwLo p'à+bɔŋg'ó  
Komo bā+bɔŋk'ó  
UdYa -  
UdCh -  
Dana à+bɔŋk'ó?  
OpBi à+bɔŋk'ó  
OpMo à+bɔŋk'ó  
OpPa à+bɔŋk'ó  
OpKi à+bɔŋk'ó

\*b → b /V\_V in Proto-Gwama

\*b(w)áf v. 'polygamous (be)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo báf  
UdYa b(w)áf  
UdCh báf  
Dana báf  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bā+tínē v. 'lie down, sleep\_2': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi bā+tínē  
OpMo bā+tín



OpPa fá+tín  
OpKi fá+tín

\*fác' n. 'thigh\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo fás'  
UdYa -  
UdCh -  
Dana fác'  
OpBi fátʃ'  
OpMo fátʃ'  
OpPa fátʃ'  
OpKi fátʃ'

\*fak'um n. 'daughter': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo fá  
UdYa fawā?  
UdCh fáʔúm  
Dana -  
OpBi fāk'  
OpMo fāk'  
OpPa fāk'  
OpKi fāk'

Most likely related to, or source of 3sg.F morpheme \*fa.

\*falilaj n. 'palate\_1': Reconstructs to: PKmn

GwHi p'álíli  
GwLo p'álíli  
Komo fálíla  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bānáp<sup>h</sup>à n. ‘girl\_1’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana bānáp<sup>h</sup>à  
OpBi bānàpà  
OpMo bānàpà  
OpPa bānàpà  
OpKi bānàpà

\*bángō n. ‘hyrax\_1’: Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi bángō  
OpMo bángō  
OpPa bángō  
OpKi bángō

\*bāp<sup>h</sup>ā n. ‘woman’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana bāp<sup>h</sup>ā  
OpBi bāp<sup>h</sup>à  
OpMo bāp<sup>h</sup>ā  
OpPa bāp<sup>h</sup>ā  
OpKi bāp<sup>h</sup>ā

\*bár adv. ‘all\_5, finish’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa bár

UdCh ɓár  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ɓàs' v. 'hot (be)\_1, ill (be)': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo ɓàs'  
UdYa ɓàs'  
UdCh ɓāṽ'  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ɓaɓa n. 'tree\_sp.\_1': Reconstructs to: PKmn

GwHi p`àɓ  
GwLo -  
Komo ɓàɓ  
UdYa ɓàɓà  
UdCh -  
Dana ɓàɓà  
OpBi ɓāsā  
OpMo ɓāsā  
OpPa ɓāsā  
OpKi -

\*ɓàɓɓ n. 'buffalo\_2': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi ɓàɓɓ  
OpMo ɓàɓɓ  
OpPa ɓàɓɓ

OpKi bətʃ

\*bāʔō n. 'girl\_2': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo bāʔō  
UdYa -  
UdCh -  
Dana -  
OpBi bāó  
OpMo bāó  
OpPa bāó  
OpKi bāó

\*bēr v. 'arrive\_3': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi bēr  
OpMo bēr  
OpPa bēr  
OpKi bēr

\*bīda n. 'neck': Reconstructs to: PKmn

GwHi pʔl  
GwLo pʔ  
Komo bəʔ  
UdYa bāʔ  
UdCh bāʔ  
Dana bīdà  
OpBi bījā  
OpMo bījā  
OpPa bījā  
OpKi bījā

\*bībī n. 'wound\_2': Reconstructs to: PDaOp

GwHi -  
GwLo -

Komo -  
 UdYa -  
 UdCh -  
 Dana bíbī  
 OpBi bíbī  
 OpMo bíbī  
 OpPa bíbī  
 OpKi bíbī

Cognate with Komo /bí/ eye? Komo traditional scarring on cheeks can be circular.

\*ā+ḃīgín adv. ‘all\_1’: Reconstructs to: POp

GwHi -  
 GwLo -  
 Komo -  
 UdYa -  
 UdCh -  
 Dana -  
 OpBi ā+ḃīgín  
 OpMo ā+ḃīgín  
 OpPa ā+ḃīgín  
 OpKi ā+ḃōgà

\*ḃīsà n. ‘crocodile\_1’: Reconstructs to: PCtrl

GwHi -  
 GwLo -  
 Komo ḃīsà  
 UdYa -  
 UdCh -  
 Dana -  
 OpBi ḃīsā  
 OpMo ḃīsā  
 OpPa ḃīsā  
 OpKi -

\*ḃís’ ~ bíś’ v. ‘strong (be)\_1’: Reconstructs to: PKmn

GwHi p’í  
 GwLo p’í  
 Komo bíś’  
 UdYa bíś’  
 UdCh bíṭ’  
 Dana -

OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bOm(it<sup>th</sup>) n. 'woman': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo bāmít  
UdYa bûm  
UdCh à+bóm  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*bór v. 'good (be)\_1': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo ból  
UdYa bór  
UdCh bór  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*būntf'ú n. 'sap\_2': Reconstructs to: POP

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi būntf'ú  
OpMo būntf'ú  
OpPa būntf'ú  
OpKi būntf'ú

\*bóṭ v. 'soft (be)\_2': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana bóṭ  
OpBi bóṭ  
OpMo bóṭ  
OpPa bóṭ  
OpKi bóṭ

\*p'á v. 'dance\_2': Reconstructs to: PGw

GwHi p'á  
GwLo p'á  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*p'àc<sup>h</sup> v. 'sour (be)\_3': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa p'àc<sup>h</sup>  
UdCh p'àc<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*p'át'á v. 'white (be)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo p'át'á  
UdYa -

UdCh -  
Dana p'át'á  
OpBi p'át'á  
OpMo p'át'á  
OpPa p'át'á  
OpKi p'át'á

\*p'āt'à v. 'help\_2': Reconstructs to: PGw

GwHi p'āt'à  
GwLo p'āt'à  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*p'én n. 'buttocks\_2': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo p'én  
UdYa p'én  
UdCh p'én  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*p'ér v. 'red (be)\_1': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo p'él  
UdYa p'ér  
UdCh p'ér  
Dana -  
OpBi -  
OpMo -  
OpPa -



OpKi -

\*(t̥i)p'lk'ɪn(a) n. 'ash\_1': Reconstructs to: PKmn

GwHi p'ik'in

GwLo p'ik'in

Komo p'in

UdYa -

UdCh t'ip'ɪn

Dana p'inā

OpBi -

OpMo -

OpPa p'inā

OpKi p'inā

\*p'i(n)C? v. 'peel, husk\_1': Reconstructs to: PKmn

GwHi p'ins'

GwLo p'ins'

Komo -

UdYa -

UdCh p'id'

Dana p'it'

OpBi -

OpMo -

OpPa -

OpKi -

Unsure of glottalized coda consonant.

\*p'ɔ̣t'(a) v. 'pick\_1': Reconstructs to: PKmn

GwHi p'ɔt

GwLo p'ɔt

Komo p'ɔt'

UdYa -

UdCh -

Dana p'ɔ̣t'hà

OpBi p'ɔt'ā

OpMo p'ɔt'ā

OpPa p'ɔt'ā

OpKi p'ɔt'ā

Loss of glottalization in final \*t̥' Dana and Gwama?

\*p'õmòt' n. 'flour\_2': Reconstructs to: PGw

GwHi p'õmòt'  
GwLo p'õmòt'  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*t<sup>h</sup>(w)áḍ n. 'hunger\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo twáj  
UdYa t<sup>h</sup>ój  
UdCh t<sup>h</sup>é?  
Dana t<sup>h</sup>áḍ  
OpBi t<sup>h</sup>áj  
OpMo t<sup>h</sup>áj  
OpPa t<sup>h</sup>áj  
OpKi t<sup>h</sup>áj

\*t<sup>h</sup>áb v. 'kick': Reconstructs to: PKmn

GwHi táp'  
GwLo táp'  
Komo táb  
UdYa t<sup>h</sup>áb  
UdCh t<sup>h</sup>áb  
Dana t<sup>h</sup>áp  
OpBi t<sup>h</sup>áp  
OpMo t<sup>h</sup>áp  
OpPa t<sup>h</sup>áp  
OpKi t<sup>h</sup>áp

\*t<sup>h</sup>ás' v. 'pound (v.)\_2': Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa t<sup>h</sup>ás'

UdCh t̪ʰát̪ʰ  
 Dana -  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*t̪ʰat̪ʰ v. 'mediate\_1': Reconstructs to: PCtrl

GwHi -  
 GwLo -  
 Komo -  
 UdYa -  
 UdCh t̪ʰāt̪ʰ  
 Dana t̪ʰāj̪dá  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi t̪ʰáj̪á

In Chali Uduk the meaning is 'come towards as many people'.

\*t̪ʰipʰ v. 'raise (a child)\_2': Reconstructs to: PCtrl

GwHi -  
 GwLo -  
 Komo -  
 UdYa s̪ipʰ  
 UdCh t̪ipʰ  
 Dana t̪ʰi  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*t̪ʰu v. 'spit (v.)\_1': Reconstructs to: PKmn

GwHi t̪u  
 GwLo t̪u  
 Komo -  
 UdYa -  
 UdCh -  
 Dana t̪ʰúwà  
 OpBi t̪ʰúj̪há  
 OpMo t̪ʰúj̪há

OpPa t<sup>h</sup>újhá  
OpKi t<sup>h</sup>újhá

\*t<sup>h</sup>ùbá v. ‘show\_1’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana t<sup>h</sup>ùbá  
OpBi t<sup>h</sup>ùbá  
OpMo t<sup>h</sup>ùbá  
OpPa t<sup>h</sup>ùbá  
OpKi t<sup>h</sup>ùbá

\*t<sup>h</sup>ùd v. ‘dry out\_1, roast next to fire, aim at’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo t<sup>h</sup>ùd  
UdYa t<sup>h</sup>ùd  
UdCh t<sup>h</sup>ùr  
Dana t<sup>h</sup>ùd  
OpBi -  
OpMo -  
OpPa -  
OpKi -

Meaning: ‘aim at’ and ‘roast next to fire’ in Dana and Uduk.

\*t<sup>h</sup>áf ~ t<sup>h</sup>af v. ‘make go away’: Reconstructs to: PKmn

GwHi táf  
GwLo táf  
Komo táf  
UdYa t<sup>h</sup>áf  
UdCh t<sup>h</sup>áf  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*táj n. ‘sun\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo té  
UdYa tíndí  
UdCh à+ténté  
Dana táj  
OpBi táj  
OpMo táj  
OpPa táj  
OpKi táj

Also means ‘season’ and ‘year’ in Dana. Reduplication in Uduk?

\*tákaláj n. ‘half\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo tákálá  
UdYa -  
UdCh -  
Dana ták’áláj  
OpBi tálá  
OpMo tálá  
OpPa tálá  
OpKi tákàláj

\*tam v. ‘pray, beg\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo dàm  
UdYa -  
UdCh tàm  
Dana tàmá  
OpBi tāmá  
OpMo tāmá  
OpPa tāmá  
OpKi tāmá

\*tápàj n. ‘hyena\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo tápàjí

UdYa -  
UdCh -  
Dana à+ṭápàjī  
OpBi à+tápàjí  
OpMo à+tápàjí  
OpPa à+tápàjí  
OpKi à+tápàjí

\*ṭáp'í n. 'flea\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo tápí  
UdYa -  
UdCh -  
Dana ṭáp'í  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ṭàrá n. 'drum\_C': Reconstructs to: PKmn

GwHi -  
GwLo tàrá  
Komo tàrá  
UdYa -  
UdCh -  
Dana ṭàrá  
OpBi tàrá  
OpMo tàrá  
OpPa tàrá  
OpKi tàrá

Borrowing from Arabic darabukka?

\*ṭÉ v. 'know or be able\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh ṭé  
Dana ṭí  
OpBi -

OpMo -  
OpPa -  
OpKi -

\*t̥éd(á) v. 'swim\_1': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana t̥édá  
OpBi tí  
OpMo tí  
OpPa tí  
OpKi tí

\*t̥éd v. 'shallow (be)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa t̥éd  
UdCh t̥éd  
Dana t̥éd  
OpBi t̥éré  
OpMo t̥ér  
OpPa t̥ér  
OpKi t̥ér

\*t̥él v. 'pelt\_1, drive in, pound, hammer (something)': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo t̥él  
UdYa -  
UdCh t̥él  
Dana t̥él  
OpBi t̥él  
OpMo t̥él  
OpPa t̥él  
OpKi t̥él

\*t̥ɛ̀mè v. ‘try (test)\_1’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana t̥ɛ̀mè  
OpBi t̥ɛ̀mè  
OpMo -  
OpPa -  
OpKi t̥ɛ̀mɛ

\*t̥ɛ̀n(ɛ) n. ‘hail, ice\_2, melt’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh t̥ɛ̀n  
Dana t̥ɛ̀n  
OpBi t̥ɛ̀né  
OpMo -  
OpPa t̥ɛ̀n  
OpKi t̥ɛ̀n

In Chali Uduk the meaning is ‘melt’.

\*t̥ɛ̀r v. ‘urinate\_2’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh t̥ɛ̀r  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*t̥imìs n. ‘beer filter\_3’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -



UdYa -  
 UdCh -  
 Dana ɬimìs  
 OpBi timìs  
 OpMo timīs  
 OpPa timīs  
 OpKi timíʃ

\*ɬip<sup>(h)</sup>a n. ‘sesame\_4’: Reconstructs to: PDaOp

GwHi -  
 GwLo -  
 Komo -  
 UdYa -  
 UdCh -  
 Dana ɬip<sup>h</sup>à  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi tīpá

\*ɬit v. ‘roughen (stone for grinding)’: Reconstructs to: PKmn

GwHi sít  
 GwLo sít  
 Komo tít  
 UdYa tít<sup>h</sup>  
 UdCh tír  
 Dana ɬit<sup>h</sup>  
 OpBi títí  
 OpMo tít<sup>h</sup>  
 OpPa tít<sup>h</sup>  
 OpKi tít<sup>h</sup>

\*(ɔ)ɬ<sup>(h)</sup>ɔɖ v. ‘grind (second grind)’: Reconstructs to: PKmn

GwHi -  
 GwLo twéj  
 Komo tó  
 UdYa -  
 UdCh ɬɔɖ  
 Dana ɔɬ<sup>h</sup>ó  
 OpBi ótó  
 OpMo ót<sup>h</sup>

OpPa ót<sup>h</sup>

OpKi ót<sup>h</sup>

Meaning in Chali Uduk is ‘scrape grindings into container’.

\*t̥Ub(a) v. ‘pierce\_1’: Reconstructs to: PKmn

GwHi só

GwLo só

Komo -

UdYa t̥up<sup>h</sup>

UdCh t̥up<sup>h</sup>

Dana t̥úbá

OpBi -

OpMo -

OpPa t<sup>h</sup>úbá

OpKi t<sup>h</sup>úbá

\*(pɾ)t̥ɔj n. ‘farm (n.)\_3’: Reconstructs to: PDaOp

GwHi -

GwLo -

Komo -

UdYa -

UdCh -

Dana t̥ɔj

OpBi p̥it̥i

OpMo p̥it̥òj

OpPa p̥it̥òj

OpKi p̥at̥òj

\*t̥úk<sup>(h)</sup>(u) n. ‘acacia’: Reconstructs to: PKmn

GwHi t̥ókò

GwLo -

Komo t̥úk

UdYa t̥úk<sup>h</sup>

UdCh à+t̥úk<sup>h</sup>

Dana t̥úk<sup>h</sup>

OpBi t̥úk<sup>h</sup>

OpMo t̥úk<sup>h</sup>

OpPa t̥úk<sup>h</sup>

OpKi t̥úk<sup>h</sup>

\*t̥Us n. ‘cotton, thread, spider web\_1’: Reconstructs to: PKmn

GwHi dōf

GwLo dōf

Komo tūf

UdYa tūs

UdCh t̥ūs

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

Cannot account for initial /d/ in Gwama.

\*t̥ús v. ‘extinguish\_1’: Reconstructs to: PCtrl

GwHi -

GwLo -

Komo túf

UdYa ūs

UdCh ūs

Dana t̥ús

OpBi t̥ús

OpMo t̥ús

OpPa t̥ús

OpKi t̥ús

\*t̥āgāj ~ t̥āgāj n. ‘giraffe\_1’: Reconstructs to: PCtrl

GwHi -

GwLo -

Komo t̥āgī

UdYa -

UdCh -

Dana -

OpBi t̥āgāj

OpMo t̥āgāj

OpPa t̥āgāj

OpKi -

\*t̥ít(á) ~ t̥ít(á) v. ‘precede\_1’: Reconstructs to: PCtrl

GwHi -

GwLo -

Komo t̥ít

UdYa -  
UdCh -  
Dana -  
OpBi títá  
OpMo títá  
OpPa títá  
OpKi títá

\*t̥itil ~ titil v. 'cut (meat into one long piece)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo títíl  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa títíl  
OpKi títíl

\*t̥ùn ~ tùn v. 'raise (a child)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo tùn  
UdYa -  
UdCh -  
Dana -  
OpBi tūn  
OpMo tūn  
OpPa tūn  
OpKi tún

\*d̥(w)àràc' n. 'urine\_2': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo dàràs'  
UdYa dwàràf  
UdCh d̥àràc'  
Dana -  
OpBi -  
OpMo -

OpPa -  
OpKi -

\*dàm n. 'bee, honey': Reconstructs to: Pkmm

GwHi tàmm  
GwLo tàmm  
Komo dàm  
UdYa dàm  
UdCh à+dàm  
Dana tàm  
OpBi tàmm  
OpMo tàmm  
OpPa tàmm  
OpKi tàmm

\*dàm(V) v. 'old (be)\_1': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa zàmì  
UdCh dàmò  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dàn v. 'big (be), male, elder\_2': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa zàn  
UdCh dòn  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dàn+còm n. 'grandfather\_2': Reconstructs to: PUd

GwHi -

GwLo -  
Komo -  
UdYa zàn+côm  
UdCh à+ḍàn+côm  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ḍana n. ‘Dana (ethnonym)\_3’: Reconstructs to: PKmn

GwHi dànā  
GwLo dànā  
Komo dānā  
UdYa -  
UdCh -  
Dana ḍànā  
OpBi dànā  
OpMo dànā  
OpPa dànā  
OpKi dànā

\*ḍEkwāḍà n. ‘kidney\_1’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana ḍèk<sup>h</sup>wāḍà  
OpBi òikwāḍà  
OpMo òikwāḍà  
OpPa òikwāḍà  
OpKi òikwāḍà

\*ḍel v. ‘sweet (be)\_1’: Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa zēl  
UdCh ḍělēl  
Dana -

OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ḍèrín v. 'tear (shred)\_1': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo sèrín  
UdYa zěr  
UdCh ḍěr  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ḍèrk'és' v. 'slip (v.)\_1': Reconstructs to: PKmn

GwHi dērgés'  
GwLo dērgés'  
Komo -  
UdYa dèrès  
UdCh ḍèrès  
Dana ḍèrk'és'  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ḍìbà n. 'rain (precipitation)\_1': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana ḍìbà  
OpBi -  
OpMo -  
OpPa -  
OpKi òbà

\*ḍim v. ‘strain (solids from liquid)\_1’: Reconstructs to: PKmn

GwHi -  
GwLo zìṅā  
Komo zìm  
UdYa zìm  
UdCh ḍim  
Dana ṭim  
OpBi òim  
OpMo òim  
OpPa òim  
OpKi òim

\*aḍime n. ‘child\_3’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo āt  
UdYa -  
UdCh -  
Dana àḍín  
OpBi àḍímé  
OpMo àḍím  
OpPa àḍím  
OpKi àḍím

\*ḍinḍal n. ‘beer filter\_2’: Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo zinzàl  
UdYa zinzàl  
UdCh à+ḍinḍal  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

Spirantization in Yabus Uduk and Komo.

\*ḍis ~ ḍis v. ‘new\_1’: Reconstructs to: PKmn

GwHi dīf  
GwLo dīf  
Komo zīf



UdYa tīs  
UdCh t̄īs  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*d̄is' v. 'sweep\_1': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa d̄is'  
UdCh d̄it̄'  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*d̄òbò n. 'lion\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo d̄òb  
UdYa zòp<sup>h</sup>  
UdCh à+d̄òp<sup>h</sup>  
Dana -  
OpBi t̄òbò  
OpMo t̄òbò  
OpPa t̄òb  
OpKi t̄òb

\*d̄òs' v. 'suck\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo d̄òs'  
UdYa d̄òs'  
UdCh d̄òt̄'  
Dana t̄òs'  
OpBi t̄òt̄f'ò  
OpMo t̄òt̄f'

OpPa tətʃ  
OpKi tətʃ

\*d̥tʰ(á) v. ‘tie up (tether)\_1’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana d̥tʰá  
OpBi d̥tʰ  
OpMo d̥tʰ  
OpPa d̥tʰ  
OpKi d̥tʰ

\*d̥U(ru)s(E) v. ‘fart\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo tùʃ  
UdYa -  
UdCh wū+d̥ùrùs  
Dana t̥ôs  
OpBi t̥isí  
OpMo t̥isí  
OpPa t̥ōsé  
OpKi t̥ōʃí

\*d̥ğà n. ‘bean\_4’: Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa zúgà?  
UdCh à+d̥ğà  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*t̥ākʰ v. ‘spit (v.)\_2’: Reconstructs to: PUD

GwHi -

GwLo -  
 Komo -  
 UdYa t'ak<sup>h</sup>  
 UdCh t̥ak<sup>h</sup>  
 Dana -  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*t̥ak'an v. 'abstain from\_1': Reconstructs to: PDaOp

GwHi -  
 GwLo -  
 Komo -  
 UdYa -  
 UdCh -  
 Dana t̥ak'an  
 OpBi t'ak'a  
 OpMo t'ak'a  
 OpPa t'ak'a  
 OpKi -

\*t̥ak'omó n. 'calf of leg': Reconstructs to: PDaOp

GwHi -  
 GwLo -  
 Komo -  
 UdYa -  
 UdCh -  
 Dana t̥ak'omó  
 OpBi t'ak'omó  
 OpMo t'ak'omó  
 OpPa t'ak'omó  
 OpKi t'ak'omó

\*t̥àm v. 'rinse face\_1': Reconstructs to: PCtrl

GwHi -  
 GwLo -  
 Komo t'à+fi  
 UdYa -  
 UdCh -  
 Dana t̥àm

OpBi t'ām  
OpMo t'ām  
OpPa t'ām  
OpKi t'ām

\*t'at̚ v. 'empty (be)\_1, dull': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo t'ĩ  
UdYa -  
UdCh t'í?  
Dana t'at̚  
OpBi t'áj  
OpMo t'áj  
OpPa t'áj  
OpKi t'áj

\*t'ed̚ v. 'lick\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo t'ēr  
UdYa t'ēd  
UdCh t'ēd̚  
Dana t'éd̚  
OpBi t'éré  
OpMo t'ér  
OpPa t'ér  
OpKi t'ér

\*t'en adv. 'alone, abstain from, not want to do': Reconstructs to: PKmn

GwHi -  
GwLo s'ĩn  
Komo s'én  
UdYa t'én  
UdCh t'é  
Dana gà+t'én  
OpBi ā+t'én  
OpMo ā+t'én  
OpPa ā+t'én  
OpKi ā+t'én

\*t̥in v. 'stretch': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo t̥in  
UdYa t̥in̄in+is  
UdCh t̥in̄in+is  
Dana t̥in  
OpBi t̥in  
OpMo t̥in  
OpPa t̥in  
OpKi t̥in

\*t̥i(t̥V) v. 'thin (be)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo t̥it̥'a  
UdYa t̥i  
UdCh t̥i  
Dana -  
OpBi t̥it̥'i  
OpMo t̥it̥'i  
OpPa t̥it̥'i  
OpKi t̥it̥'i

\*t̥O v. 'grab with fingers, pinch\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh t̥u  
Dana t̥'owá  
OpBi t̥'ó  
OpMo t̥'ó  
OpPa t̥'ó  
OpKi t̥'ó

\*t̥Os' v. 'choke, strangle\_2': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo t̥'ús'  
UdYa -

UdCh t'óe<sup>h</sup>  
 Dana t'ós'  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*t'òd v. 'slaughter, cross boundary, chop': Reconstructs to: PCtrl

GwHi -  
 GwLo -  
 Komo t'òr  
 UdYa -  
 UdCh -  
 Dana t'òd  
 OpBi -  
 OpMo -  
 OpPa t'òr  
 OpKi t'òr

\*t'wa n. 'mouth': Reconstructs to: PKmn

GwHi t'wā  
 GwLo t'wā  
 Komo t'ā  
 UdYa t'wā  
 UdCh t'wā  
 Dana t'āʔá  
 OpBi t'ā  
 OpMo t'ā  
 OpPa t'ā  
 OpKi t'ā

\*t'wI v. 'enter\_2, sprout': Reconstructs to: PKmn

GwHi t'wí  
 GwLo t'wí  
 Komo -  
 UdYa -  
 UdCh -  
 Dana t'wī  
 OpBi -  
 OpMo -  
 OpPa -

OpKi -  
Meaning in 'sprout' in Gwama.

\*t<sup>h</sup>ágá v. 'mediate\_2': Reconstructs to: POP

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi t<sup>h</sup>ágá  
OpMo t<sup>h</sup>ágá  
OpPa t<sup>h</sup>ágá  
OpKi -

\*t<sup>h</sup>ánā ~ t<sup>h</sup>ánī n. 'turtle\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo bā+tánī  
UdYa -  
UdCh -  
Dana t<sup>h</sup>ánā  
OpBi t<sup>h</sup>ánā  
OpMo t<sup>h</sup>ánā  
OpPa t<sup>h</sup>ánā  
OpKi t<sup>h</sup>ánā

\*t<sup>h</sup>áp v. 'plaster (v.), adhere\_3': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana t<sup>h</sup>áp<sup>h</sup>  
OpBi t<sup>h</sup>áp  
OpMo t<sup>h</sup>áp  
OpPa t<sup>h</sup>áp  
OpKi t<sup>h</sup>áp

\*t<sup>h</sup>át ~ t<sup>h</sup>át v. 'transplant (e.g. plant)\_1': Reconstructs to: PCtrl

GwHi -

GwLo -  
Komo tát  
UdYa -  
UdCh -  
Dana -  
OpBi t<sup>h</sup>át  
OpMo t<sup>h</sup>át  
OpPa t<sup>h</sup>át  
OpKi t<sup>h</sup>át

\*t<sup>hi</sup>(aj) n. ‘pottery, pot\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo sī  
UdYa -  
UdCh -  
Dana tījā  
OpBi t<sup>h</sup>ĩ  
OpMo t<sup>h</sup>ĩ  
OpPa t<sup>h</sup>ĩ  
OpKi t<sup>h</sup>ĩ

\*t<sup>h</sup>ín+kùm n. ‘grandmother\_2’: Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa t<sup>h</sup>ín+kùm  
UdCh à+t<sup>h</sup>ín+kùm  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*t<sup>h</sup>ír v. ‘pour\_2’: Reconstructs to: POP

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -



OpBi t<sup>h</sup>ír  
OpMo t<sup>h</sup>ír  
OpPa t<sup>h</sup>ír  
OpKi t<sup>h</sup>ír

\*t<sup>h</sup>óǵ v. ‘plait or braid or weave\_5’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa t<sup>h</sup>óǵ  
UdCh t<sup>h</sup>óǵ  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*t<sup>h</sup>ór v. ‘show\_2’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa t<sup>h</sup>ór  
UdCh t<sup>h</sup>ór  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*t<sup>h</sup>ú(i) v. ‘give birth\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo tú  
UdYa -  
UdCh t<sup>h</sup>ú  
Dana t<sup>h</sup>wí  
OpBi t<sup>h</sup>ú  
OpMo t<sup>h</sup>ú  
OpPa t<sup>h</sup>ú  
OpKi t<sup>h</sup>ú

Chali Uduk meaning is ‘last child born’.

\*t<sup>h</sup>ul n. ‘gourd\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo túl  
UdYa -  
UdCh t<sup>h</sup>úl  
Dana -  
OpBi t<sup>h</sup>òj  
OpMo t<sup>h</sup>òj  
OpPa t<sup>h</sup>òj  
OpKi -

\*t<sup>h</sup>úlá n. ‘brain\_2’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa t<sup>h</sup>úlá  
UdCh à+t<sup>h</sup>úlá?  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*t<sup>h</sup>af ~ t<sup>h</sup>af v. ‘make go away’: Reconstructs to: PKmn

GwHi tāf  
GwLo tāf  
Komo tàf  
UdYa t<sup>h</sup>áf  
UdCh t<sup>h</sup>áf  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*t<sup>(h)</sup>(w)àg n. ‘forehead\_1’: Reconstructs to: PKmn

GwHi twã  
GwLo twã̃  
Komo tàg

UdYa -  
UdCh -  
Dana tàg  
OpBi bī+t<sup>h</sup>āg  
OpMo -  
OpPa pī+t<sup>h</sup>āg  
OpKi -

\*tà v. 'be, do': Reconstructs to: PKmn

GwHi -  
GwLo ta  
Komo tà  
UdYa tā  
UdCh tā  
Dana -  
OpBi tā  
OpMo -  
OpPa tā  
OpKi -  
Gwama 'be far' Opo 'do/work'

\*tā v. 'abstain from\_2': Reconstructs to: PGW

GwHi tā  
GwLo tā  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*tā+dzàj v. 'fight\_2': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi tā+dzàj

OpMo tā+dzàj  
OpPa tā+zàj  
OpKi tā+fàj

\*tābūk v. ‘mediate\_4’: Reconstructs to: PGw

GwHi tābūk  
GwLo tābūk  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*tādā n. ‘mother\_1’: Reconstructs to: PKoUD

GwHi -  
GwLo -  
Komo dā  
UdYa à+tādā  
UdCh tādā  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*takal n. ‘saliva\_3’: Reconstructs to: PGw

GwHi tākāl  
GwLo tāgí  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*tǎŋá n. ‘bamboo\_1’: Reconstructs to: PGw

GwHi tǎŋá  
GwLo tǎŋá  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*tǎp<sup>h</sup>à n. ‘chief\_2’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa tǎp<sup>h</sup>à  
UdCh tǎp<sup>h</sup>à  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*tǎp’ v. ‘follow\_4’: Reconstructs to: PGw

GwHi tǎp’  
GwLo tǎp’  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*tǎf n. ‘mosquito\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa tǎf

UdCh à+tǎf  
Dana tǎf  
OpBi tās  
OpMo tās  
OpPa tās  
OpKi tǎf

\*tǎf v. ‘strain (solids from liquid)\_2’: Reconstructs to: PGw

GwHi tǎf  
GwLo tǎf  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*tát n. ‘belly or stomach\_3’: Reconstructs to: PGw

GwHi tát  
GwLo tát  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*tàwàn v. ‘hot (be)\_3’: Reconstructs to: PGw

GwHi tàwàn  
GwLo tàwàn  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -

OpKi -

\*tazà n. 'beer filter\_1': Reconstructs to: PGw

GwHi tazà

GwLo tazà

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*tEŋ(g)(E) v. 'shake (sth.)\_2': Reconstructs to: PKmn

GwHi tīgī

GwLo tīgī

Komo -

UdYa -

UdCh -

Dana tēŋ

OpBi -

OpMo tīŋhá

OpPa tīŋhá

OpKi tīŋhá

\*tēr v. 'carry\_2': Reconstructs to: PKoUd

GwHi -

GwLo -

Komo tēr

UdYa tēr

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*tíbí v. 'listen\_3': Reconstructs to: PGw

GwHi tíbí

GwLo tíbí

Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*tiŋ(a) ~ tin(a) n. 'cheek\_4': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana tīŋ  
OpBi tīná  
OpMo tīná  
OpPa tīná  
OpKi tīná

Related to or borrowed from 'breast' in W. Nilotic (e.g. /ṭin/ in Mayak)?

\*tiritiri n. 'bird\_dove (African mourning)': Reconstructs to: PKmn

GwHi -  
GwLo títitī  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi à+tìrítírì  
OpMo à+tìrítírì  
OpPa à+tìrítírì  
OpKi à+tìrítírì

\*tìfàr n. 'lion\_2': Reconstructs to: PGw

GwHi tìfàl  
GwLo tìfàr  
Komo -  
UdYa -  
UdCh -  
Dana -



OpBi -  
OpMo -  
OpPa -  
OpKi -

\*tí v. 'give': Reconstructs to: PGw

GwHi tí  
GwLo tí  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*tīm v. 'protect\_3': Reconstructs to: PGw

GwHi tīm  
GwLo tīm  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*tíf n. 'milk\_2': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana tíf  
OpBi tís  
OpMo tís  
OpPa tís  
OpKi -

\*tǎ́ǎ́ n. ‘thigh\_2’: Reconstructs to: PGw

GwHi tǎ́ǎ́  
GwLo tǎ́ǎ́  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*tòdó v. ‘slurp\_2’: Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi tòdó  
OpMo tòdó  
OpPa tòdó  
OpKi -

\*tón v. ‘big (be), male, elder\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo tón  
UdYa -  
UdCh -  
Dana tón  
OpBi tón  
OpMo tón  
OpPa tón  
OpKi tón

\*tòṅàs ~ twàṅgàs n. ‘chest\_3’: Reconstructs to: PGw

GwHi tòṅàs  
GwLo twàṅgàs  
Komo -  
UdYa -

UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*tùl v. 'dwell (live, reside)\_1': Reconstructs to: PGw

GwHi tùl  
GwLo tùl  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*tùl v. 'short (be)\_2': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi tūl  
OpMo tūl  
OpPa tūl  
OpKi tūl

\*tŪr v. 'long or tall (be)\_1': Reconstructs to: PKmn

GwHi tŭ  
GwLo tŭ  
Komo tól  
UdYa túr  
UdCh túr  
Dana -  
OpBi -  
OpMo -  
OpPa -

OpKi -

\*tònsòs v. 'blame (somebody)\_2': Reconstructs to: PGw

GwHi tònzò

GwLo tònsòs

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*tōròm v. 'scootch (move over)\_5': Reconstructs to: PGw

GwHi tōròm

GwLo tōlòm

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*twī v. 'call\_4': Reconstructs to: PGw

GwHi twī

GwLo twī

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*dà n. 'fat (from animals)\_3': Reconstructs to: PGw

GwHi dà

GwLo dà

Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dà n. 'oil (organic substance)\_2': Reconstructs to: PGw

GwHi dà  
GwLo dà  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dǎʋ n. 'Dazu (S. Sudan)': Reconstructs to: PKmn

GwHi dǎzò  
GwLo dǎzò  
Komo dǎzò  
UdYa dǎʋò  
UdCh dǎʋò  
Dana dǎʋò  
OpBi dǎdzò  
OpMo dǎdzò  
OpPa dǎdzò  
OpKi dǎdzò

\*dak v. 'finish\_1': Reconstructs to: PKmn

GwHi -  
GwLo dak  
Komo dàg  
UdYa dāk<sup>h</sup>  
UdCh dāk<sup>h</sup>  
Dana dāk  
OpBi dāk

OpMo -  
OpPa -  
OpKi -

Initial /d/ did not devoice in DaOp due to tone not being L? Dana exhibits F tone which could mean dâk in Proto-Dana-Opo.

\*dāŋā v. ‘not know (how)\_2’: Reconstructs to: PGw

GwHi dāŋā  
GwLo dāŋā  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*daŋV ~ ta(n)ŋV n. ‘snake\_2’: Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo dāfó  
UdYa tānzí  
UdCh tāfá  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

It is unclear whether Komo t > d or PUd d > t.

\*dàwà? n. ‘baboon\_3’: Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo dâw  
UdYa -  
UdCh à+dàwà  
Dana -  
OpBi -  
OpMo -  
OpPa -

OpKi -

\*dĕk<sup>h</sup> v. 'tie (bundle)\_3': Reconstructs to: PUD

GwHi -

GwLo -

Komo -

UdYa dĕk<sup>h</sup>

UdCh dĕk<sup>h</sup>

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*dēmés' v. 'belch\_2': Reconstructs to: PGW

GwHi dēmés'

GwLo dēmés'

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*dĕŋ v. 'choke, strangle\_3': Reconstructs to: PDaOp

GwHi -

GwLo -

Komo -

UdYa -

UdCh -

Dana dĕŋ

OpBi -

OpMo dĕŋ

OpPa dĕŋ

OpKi dĕŋ

\*dĕŋ v. 'count\_1': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo dèn  
 UdYa dèn̄+ē  
 UdCh dèn̄+ē  
 Dana -  
 OpBi -  
 OpMo -  
 OpPa dèn  
 OpKi dèn  
 Cannot account for lack of devoicing /d/ → /t/ in Opo.

\*did v. 'dwell (live, reside)\_2': Reconstructs to: PUD

GwHi -  
 GwLo -  
 Komo -  
 UdYa did  
 UdCh di  
 Dana -  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*did v. 'heavy (be)\_1': Reconstructs to: PKoUd

GwHi -  
 GwLo -  
 Komo did  
 UdYa dit<sup>h</sup>  
 UdCh dit<sup>h</sup>  
 Dana -  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*àdǐjē n. 'mother\_2': Reconstructs to: POp

GwHi -  
 GwLo -  
 Komo -  
 UdYa -  
 UdCh -  
 Dana -



OpBi àdǐjē  
OpMo àdǐjē  
OpPa àdǐjē  
OpKi àdǐjē

\*dinc'à n. 'skin': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo dɪns'ā  
UdYa -  
UdCh -  
Dana dinc'à  
OpBi dɪntʃ'à  
OpMo dɪntʃ'à  
OpPa dɪntʃ'à  
OpKi dɪntʃ'à

Cannot account for lack of expected devoicing d/ → t in Dana-Opo before L tone.

\*dǐp<sup>h</sup>áj n. 'flour\_3': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa dǐp<sup>h</sup>éj  
UdCh à+dǐp<sup>h</sup>áj  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dǐf(a) n. 'mushroom\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo dǐf  
UdYa dǐfɪ?  
UdCh à+dǐf  
Dana tǐfà  
OpBi tísà  
OpMo tísà  
OpPa tísà  
OpKi tǐfà

\*dɪŋɪ n. ‘baboon\_1, dog\_2’: Reconstructs to: PKmn

GwHi tɪ̀nì

GwLo tɪ̀nì

Komo -

UdYa -

UdCh -

Dana tɛ̀ŋ

OpBi tɪ̀nì

OpMo tɪ̀nì

OpPa tɪ̀n

OpKi tɪ̀n

Borrowing from Burun or W. Nilotic? cf. ɖɛ̀ɛŋ ‘cow’ in Kurmuk (Andersen 2007:81)

\*dɪŋkā n. ‘fish\_sp (electric)\_1’: Reconstructs to: PKmn

GwHi -

GwLo ɔ̄+wàs'+dɪŋkā

Komo dɪŋkā

UdYa -

UdCh -

Dana -

OpBi dɪŋā

OpMo dɪŋā

OpPa dɪŋā

OpKi dɪŋā

\*djalɪs v. ‘stomp, step on\_1’: Reconstructs to: PKmn

GwHi dɛ̀lɪs'

GwLo dālɪs'

Komo dɪl

UdYa dɪl

UdCh dɪl

Dana -

OpBi tɪlɪ

OpMo tɪlɪ

OpPa tɪlɪ

OpKi tɪlɪ

\*àdòj n. ‘moon or month\_1’: Reconstructs to: PDaOp

GwHi -

GwLo -

Komo -  
 UdYa -  
 UdCh -  
 Dana à+dòj  
 OpBi à+dòj  
 OpMo à+dòj  
 OpPa à+dòj  
 OpKi à+dòj

\*dɔl(ɔ) v. ‘shout\_1’: Reconstructs to: PKmn

GwHi dól  
 GwLo dól  
 Komo dól  
 UdYa -  
 UdCh -  
 Dana òló  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*dɔlb n. ‘fish\_sp (very small, scaled fish with a small rounded mouth)’: Reconstructs to: PKmn

GwHi -  
 GwLo dǒló  
 Komo dǒló  
 UdYa -  
 UdCh -  
 Dana dólí?  
 OpBi dǒló  
 OpMo dǒló  
 OpPa dǒló  
 OpKi dólí

\*dǒlɔ́ n. ‘gourd\_4’: Reconstructs to: PGw

GwHi dǒló  
 GwLo dǒló  
 Komo -  
 UdYa -  
 UdCh -  
 Dana -

OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dòṅ v. 'bite (by animal)\_4': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana dṅ  
OpBi dṅ  
OpMo dṅ  
OpPa dṅ  
OpKi dṅ

\*dṅgəl n. 'chicken\_2': Reconstructs to: PGw

GwHi dṅgəl  
GwLo dṅí  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dṅgòn n. 'four\_1': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo dṅgòn  
UdYa dṅòn  
UdCh dṅòn  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dər v. 'hit\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa dər  
UdCh dər  
Dana tòdór  
OpBi tər  
OpMo tər  
OpPa tər  
OpKi tər

\*dǝf v. 'stand\_1': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo dǝf  
UdYa dǝf  
UdCh dǝf  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dǝf v. 'court (v.), flirt with\_3': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa dǝf  
UdCh dǝf  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dòzò v. 'teach\_2': Reconstructs to: PGw

GwHi dòzò  
GwLo dòzò  
Komo -  
UdYa -

UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dùc'á v. 'urine\_1, urinate\_1': Reconstructs to: PKmn

GwHi dùs'  
GwLo tùs'  
Komo dùs'  
UdYa -  
UdCh -  
Dana tùc'á?  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dùm v. 'pound (v.)\_5': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo dùm  
UdYa -  
UdCh -  
Dana dùm  
OpBi dùm  
OpMo dùm  
OpPa dùm  
OpKi dùm

Cannot account for expected lack of devoicing d → /t/ in Dana-Opo with L tone.

\*dùmàj n. 'tree (sp.)(sausage tree\_Kigelia africana)': Reconstructs to: PKmn

GwHi -  
GwLo ū+dùmì  
Komo dùmè  
UdYa -  
UdCh -  
Dana dùmáj  
OpBi dùmàj  
OpMo dùmàj

OpPa dùmàj  
OpKi dùmàj

\*dǔrVc' n. 'young people\_3': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa dǔrīc'  
UdCh dǔrūc'  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dǔjǒ n. 'fist\_3': Reconstructs to: PGw

GwHi dǔjǒ  
GwLo dǔjǒ  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dǔjè n. 'pipe (for smoking)\_1': Reconstructs to: PKmn

GwHi dǔzè  
GwLo dǔzè  
Komo dǔzè  
UdYa -  
UdCh -  
Dana dǔjè  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dV v. 'shiver\_4': Reconstructs to: PUd

GwHi -

GwLo -  
Komo -  
UdYa d̄ō  
UdCh d̄ě  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dwā n. 'girl\_3': Reconstructs to: PGw

GwHi dwà  
GwLo dwā  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dwak<sup>h</sup> n. 'bird\_weaver': Reconstructs to: PKmn

GwHi ̄ō+dwâk  
GwLo ̄ō+dók  
Komo à+dók  
UdYa -  
UdCh -  
Dana à+dwák<sup>h</sup>  
OpBi à+dwák<sup>h</sup>  
OpMo à+dwák<sup>h</sup>  
OpPa à+dwák<sup>h</sup>  
OpKi à+dwák<sup>h</sup>

\*dwákì n. 'hyrax\_2': Reconstructs to: PGw

GwHi dwákì  
GwLo dwákì  
Komo -  
UdYa -  
UdCh -  
Dana -



OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dwì v. 'buy\_1': Reconstructs to: PGw

GwHi dwì  
GwLo dwì  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dwì v. 'sell\_1': Reconstructs to: PGw

GwHi dwì  
GwLo dwì  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*Dàs' v. 'grind wet (first grind)': Reconstructs to: PKmn

GwHi dàs'  
GwLo dàs'  
Komo nàs'  
UdYa nàs'  
UdCh nàṭ'  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

Unsure of /n : d/ correspondence but it seems cognate.

\*dOt v. 'ask (inquire)\_1': Reconstructs to: PKmn

GwHi tǔt  
GwLo tǔt  
Komo dǔt  
UdYa dǔt<sup>h</sup>  
UdCh dǔt<sup>h</sup>  
Dana -  
OpBi tǔtǔ  
OpMo tǔtǔ  
OpPa -  
OpKi -

\*dwád v. 'hunt (in group)': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa wát<sup>h</sup>  
UdCh wád  
Dana -  
OpBi dwàr  
OpMo dwàr  
OpPa dwàr  
OpKi -

\*Dangal v. 'roll\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa dǎngàl  
UdCh dǎngál  
Dana nǎngàl  
OpBi lǎngàl  
OpMo lǎngàl  
OpPa lǎngàl  
OpKi lǎngàl

\*d(w)ank'I n. 'scorpion': Reconstructs to: PKmn

GwHi t'wǎnk'ít'wǎnk'  
GwLo t'wǎnk'ít'wǎnk'  
Komo bǎdǎgí?

UdYa d̄wāk<sup>h</sup>  
UdCh à+dāk<sup>h</sup>  
Dana d̄āgí  
OpBi d̄āgǐ  
OpMo d̄āgǐ  
OpPa d̄āgǐ  
OpKi d̄āgǐ

\*d̄ab(a) v. 'adhere': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo d̄àb  
UdYa d̄āp<sup>h</sup>  
UdCh d̄āp<sup>h</sup>  
Dana d̄ábá  
OpBi d̄ábá  
OpMo d̄ábá  
OpPa d̄ábá  
OpKi d̄ábá

\*d̄agi n. 'bean\_1': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo d̄ègí  
UdYa d̄àgì  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*d̄Am n. 'ladle\_2': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo d̄óm  
UdYa d̄ám  
UdCh d̄ám  
Dana -  
OpBi -  
OpMo -

OpPa -  
OpKi -

\*ɗar(a) v. 'send someone\_1': Reconstructs to: PKmn

GwHi t'álà  
GwLo t'ájà  
Komo ɗàr  
UdYa ɗēt<sup>h</sup>  
UdCh -  
Dana ɗêd  
OpBi -  
OpMo ɗēr  
OpPa -  
OpKi ɗēr

\*ɗAs v. 'dry out\_3': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo ɗàf  
UdYa ɗās  
UdCh ɗās  
Dana ɗès  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ɗε n. 'one (1)\_1, alone\_2': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo ɗé  
UdYa ɗé  
UdCh ɗé  
Dana ɗêdé  
OpBi ɗjān  
OpMo ɗjān  
OpPa ɗêdē  
OpKi ɗêdē

OpO most likely bimorphemic ɗε+ān (3N suffix).

\*dɛm v. 'to stew (food)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo dɛ̃m  
UdYa -  
UdCh -  
Dana dɛ̃m  
OpBi dɛ̃m  
OpMo dɛ̃m  
OpPa dɛ̃m  
OpKi dɛ̃m

\*dɪfa v. 'near\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo dɪf  
UdYa dɪf  
UdCh dɪf  
Dana dɪfà  
OpBi ɪsā  
OpMo ɪsí  
OpPa dɪsā  
OpKi dɪfā

\*dɪtʰ ? n. 'bird': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo dɪw  
UdYa dɪwì  
UdCh dɪ  
Dana dɪtʰ  
OpBi dɪwò  
OpMo dɪwò  
OpPa dɪwò  
OpKi dɪwò

\*dɪlá v. 'rise (oneself)\_3': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -

UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa dǎlá  
OpKi dǎlá

\*(tɔ)ɔ̄ v. ‘carry many things\_1’: Reconstructs to: PKmn

GwHi tɔ̄ɔ̄  
GwLo -  
Komo ɔ̄ɔ̄  
UdYa ɔ̄ɔ̄  
UdCh ɔ̄ɔ̄  
Dana -  
OpBi ɔ̄ɔ̄  
OpMo ɔ̄ɔ̄  
OpPa ɔ̄ɔ̄  
OpKi ɔ̄ɔ̄

\*dɔ̄ŋgɔ̄rɔ̄ n. ‘salt\_3’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa dɔ̄ŋgɔ̄rɔ̄  
UdCh à+dɔ̄ŋgɔ̄rɔ̄  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*dúbá v. ‘tasty (be)\_1’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana dúbá  
OpBi dúbá  
OpMo dúbá  
OpPa dúbá

OpKi dǔbá

\*dǔwá n. 'frog\_2': Reconstructs to: PUd

GwHi -

GwLo -

Komo -

UdYa dǔwá

UdCh à+dǔwá

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*t'ák'al n. 'tongue\_2': Reconstructs to: PGw

GwHi t'ák'al

GwLo t'ákí

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*t'ápán v. 'lick\_2': Reconstructs to: PGw

GwHi t'ápán

GwLo t'ápán

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*t'áf n. 'salt\_(made from ash of a particular plant/tree)\_2': Reconstructs to: PKmn

GwHi t'áf

GwLo t'áf

Komo t'àf  
UdYa t'āf  
UdCh t'āf  
Dana t'àf  
OpBi t'ās  
OpMo -  
OpPa -  
OpKi -

meaning is 'stew/soup' in Uduk.

\*t'áfá n. 'mushroom\_2': Reconstructs to: PGw

GwHi t'áfá  
GwLo t'áfá  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*t'ík'á v. 'heavy (be)\_3': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana t'ík'á  
OpBi t'ík'á  
OpMo t'ík'á  
OpPa t'ík'á  
OpKi t'ík'á

\*t'irá n. 'rope\_2': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -



OpBi t'írá  
OpMo t'írá  
OpPa t'írá  
OpKi t'írá

\*t'íf ~ t'íf v. 'grind (fine)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo t'íf  
UdYa t'íf  
UdCh t'íf  
Dana t'ífí?  
OpBi t'ís  
OpMo t'ís  
OpPa t'ís  
OpKi -

\*t'ᵑp' v. 'drink': Reconstructs to: PGw

GwHi t'ᵑp'  
GwLo t'ᵑp'  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*t'ᵑf v. 'pain, be hurt\_3': Reconstructs to: PGw

GwHi t'ᵑf  
GwLo t'ᵑf  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*t'ót'ó v. 'black (be)\_2': Reconstructs to: PGw

GwHi t'ót'ó  
GwLo t'ót'ó  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*t'ózí v. 'precede\_3': Reconstructs to: PGw

GwHi t'ózí  
GwLo t'ózí  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*t'um(á) n. 'fist\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo t'ùmá  
UdYa t'úm+mèd  
UdCh t'úm+mèd  
Dana t'ùmá  
OpBi t'ùmá  
OpMo t'ùmá  
OpPa t'ùmá  
OpKi t'ùmá

\*t'òmò n. 'home, place\_3': Reconstructs to: PGw

GwHi t'òmò  
GwLo t'ómō  
Komo -  
UdYa -

UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*tʷf ~ tʷf v. 'forbid\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo tʷf  
UdYa tʷf  
UdCh tʷf  
Dana -  
OpBi tʷsī  
OpMo tʷsī  
OpPa -  
OpKi -

\*tʷālā v. 'strong (be)\_4': Reconstructs to: PGw

GwHi tʷālā  
GwLo tʷājā  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*tʷaŋ(k)a ~ tʷaŋ(k)a v. 'cut (split in half lengthwise)\_1': Reconstructs to: PKmn

GwHi tʷāŋà  
GwLo tʷāŋà  
Komo -  
UdYa tʷák<sup>h</sup>  
UdCh tʷák<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -

OpKi -

\*s'(j)am v. 'sweet (be)\_2': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo s'ām

UdYa -

UdCh -

Dana s'ém

OpBi tʃém

OpMo tʃém

OpPa tʃém

OpKi tʃém

\*s'a v. 'light (ignite)': Reconstructs to: PKmn

GwHi s'ā

GwLo s'ā

Komo s'à

UdYa s'ā

UdCh ṭ'ā

Dana s'ówà

OpBi tʃǎ

OpMo tʃǎ

OpPa tʃǎ

OpKi tʃǎ

\*s'á v. 'annoint (with oil)\_1': Reconstructs to: PGw

GwHi s'á

GwLo s'á

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*s'ám v. 'cold(be)\_2, wet, sweet (be)': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo s'ám  
 UdYa s'ám  
 UdCh ṭám  
 Dana s'é̄m  
 OpBi tʃém+sē  
 OpMo tʃém+sē  
 OpPa tʃém+sē  
 OpKi tʃém+sē  
 Meaning is 'wind (n.)' in Uduk

\*s'ámá n. 'blood\_1': Reconstructs to: PKmn

GwHi s'ám  
 GwLo s'ám  
 Komo -  
 UdYa -  
 UdCh -  
 Dana s'ámá?  
 OpBi tʃámá  
 OpMo tʃámá  
 OpPa tʃámá  
 OpKi tʃámá

\*s'āns' n. 'root\_3': Reconstructs to: PGw

GwHi s'āns'  
 GwLo s'āns'  
 Komo -  
 UdYa -  
 UdCh -  
 Dana -  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*s'EU n. 'bamboo\_2': Reconstructs to: PCtrl

GwHi -  
 GwLo -  
 Komo s'îw  
 UdYa s'î  
 UdCh à+ṭē  
 Dana s'îw

OpBi -  
OpMo -  
OpPa -  
OpKi -

\*s'ɛ́ v. 'curse\_2': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo s'ɛ́  
UdYa -  
UdCh t'ɛ́  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*s'ɛ̀ḍ ~ s'ɪḍ v. 'shave': Reconstructs to: PKmn

GwHi s'ɪ̃  
GwLo s'ɪ̃  
Komo s'ɛ̀  
UdYa s'ɪ̃  
UdCh c'ɛ̀  
Dana s'ɛ̀ḍ  
OpBi tʃ'ɛ̀  
OpMo tʃ'ɛ̀  
OpPa tʃ'ɛ̀  
OpKi tʃ'ɛ̀

\*s'ɛ́k<sup>h</sup> v. 'rub hands together (e.g. to make fire using stick)\_2': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa s'ɛ́k<sup>h</sup>  
UdCh t̩'ɛ́k<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*s'ès'(è) n. 'termite\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo s'ès'  
UdYa -  
UdCh -  
Dana s'ès'  
OpBi tʃ̣ētʃ̣ē  
OpMo tʃ̣ētʃ̣ē  
OpPa tʃ̣ētʃ̣'  
OpKi tʃ̣ētʃ̣'

\*s'ēwàn ~ s'jāwàn n. 'moon or month\_3': Reconstructs to: PGw

GwHi s'ēwàn  
GwLo s'jāwàn  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*s'í v. 'die\_2': Reconstructs to: PGw

GwHi s'í  
GwLo s'í  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*s'íḍ v. 'black (be)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo s'í  
UdYa s'íʔ

UdCh t̥íʔ  
Dana s'íd̥  
OpBi tʃí  
OpMo tʃí  
OpPa tʃí  
OpKi tʃí

Also means 'diarreeh' in KoUd

\*s'ík n. 'rat\_1': Reconstructs to: PKmn

GwHi s'í  
GwLo s'í  
Komo s'ík  
UdYa s'íʔ  
UdCh à+t̥ík<sup>h</sup>  
Dana -  
OpBi tʃ'ígí  
OpMo tʃ'ígí  
OpPa tʃ'ígí  
OpKi tʃ'ígí

\*s'il(it<sup>h</sup>) n. 'thatch': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo s'ilít  
UdYa s'il  
UdCh t̥íl  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*s'Op<sup>h</sup> v. 'light (the way with torch/flashlight)\_2': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo s'òp  
UdYa -  
UdCh -  
Dana s'òp<sup>h</sup>  
OpBi tʃ'ò  
OpMo tʃ'ò



OpPa tʃ̄õ  
OpKi tʃ̄õ

\*s'õ v. 'pray, beg\_3': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa s'õ  
UdCh ṭ'õ  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*s'ú v. 'plait or braid or weave\_3': Reconstructs to: PGw

GwHi s'ú  
GwLo s'ú  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*s'ú v. 'rub hands together (e.g. to make fire using stick)\_1': Reconstructs to: PGw

GwHi s'ú  
GwLo s'ú  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*s'UB(V)(n) v. 'dip food in sauce with fingers\_1': Reconstructs to: PKmn

GwHi -  
GwLo s'úpón  
Komo s'üb  
UdYa s'úp<sup>h</sup>  
UdCh t̥'úp<sup>h</sup>  
Dana s'úbá  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*s'UDI v. 'defecate\_1, diarrhea': Reconstructs to: PKmn

GwHi ús'  
GwLo ús'  
Komo s'í  
UdYa -  
UdCh t̥'í  
Dana s'òdó  
OpBi tʃ'òjí  
OpMo tʃ'òjí  
OpPa tʃ'òjí  
OpKi tʃ'òjí

\*s'udf v. 'kiss\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo s'ùr  
UdYa -  
UdCh -  
Dana s'údf  
OpBi tʃ'úr  
OpMo tʃ'úr  
OpPa tʃ'úr  
OpKi tʃ'úr

\*s'uns' v. 'bite\_2': Reconstructs to: PGw

GwHi sūns'  
GwLo s'úns'  
Komo -  
UdYa -

UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*S'Un(t)a n. 'nosebleed\_2': Reconstructs to: PKmn

GwHi -  
GwLo t'ònt'  
Komo -  
UdYa -  
UdCh -  
Dana s'ùná?  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*s'úp' v. 'suck\_2': Reconstructs to: PGw

GwHi s'úp'  
GwLo s'úp'  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*s'óp v. 'cold (be)\_1': Reconstructs to: PKmn

GwHi s'óp  
GwLo s'óp  
Komo -  
UdYa s'úp<sup>h</sup>  
UdCh t'úp<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -

OpKi -

\*s'ópón v. 'kiss\_2': Reconstructs to: PGw

GwHi s'ópón

GwLo s'ópón

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*s'öp' n. 'breast, milk\_2': Reconstructs to: PGw

GwHi s'öp'

GwLo s'öp'

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*s'ús' v. 'scratch\_2': Reconstructs to: PKoUd

GwHi -

GwLo -

Komo s'ús'

UdYa s'ús'

UdCh ʃúʃ<sup>h</sup>

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*s'ús'ómò n. 'calf of leg': Reconstructs to: PGw

GwHi s'ús'ómò

GwLo s'ús'ómò

Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*c(w)ā v. 'big (be)\_1': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo swà  
UdYa cā  
UdCh cā  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*caja adv. 'very, many\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo sà  
UdYa -  
UdCh cājá  
Dana -  
OpBi sáj  
OpMo sáj  
OpPa sáj  
OpKi sáj

Cannot account for /s/ in Opo, would expect /tʃ/.

\*càk<sup>h</sup>O n. 'grandfather\_1': Reconstructs to: PKmn

GwHi -  
GwLo sàkó  
Komo sàkó  
UdYa -  
UdCh -  
Dana -

OpBi tʃàk<sup>h</sup>ʒ  
OpMo tʃàk<sup>h</sup>ʒ  
OpPa tʃàk<sup>h</sup>ʒ  
OpKi tʃàk<sup>h</sup>ʒ

\*cān v. 'poor (be)\_1': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana cān  
OpBi tʃān  
OpMo tʃān  
OpPa tʃān  
OpKi tʃān

\*cēŋ v. 'curse\_1': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana cēŋ  
OpBi tʃēŋ  
OpMo tʃēŋ  
OpPa tʃēŋ  
OpKi tʃēŋ

\*cēf v. 'protect\_4': Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa cēf  
UdCh cēf  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*cik'a ~ cik'a v. 'listen\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo sig  
UdYa ʃik'  
UdCh cik<sup>h</sup>  
Dana s'ik'à  
OpBi -  
OpMo -  
OpPa -  
OpKi -

In Komo, final \*k' → [g] /V\_V then loss of final vowel. Dana later glottalizes initial /s/ → /s'/ to harmonize with glottal /k'/?

\*Cis' v. 'warm up (sth.)': Reconstructs to: PKmn

GwHi ʃij  
GwLo ʃij  
Komo jiz  
UdYa jis'  
UdCh jí<sup>h</sup>  
Dana hízá  
OpBi ísá  
OpMo ísá  
OpPa ísá  
OpKi -

Gwama may not be cognate.

\*cək<sup>h</sup> v. 'sit\_3': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo sək  
UdYa -  
UdCh cək<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*cəm n. 'father\_2': Reconstructs to: PCtrl

GwHi -

GwLo -  
 Komo sòm  
 UdYa à+còm  
 UdCh còm  
 Dana sòm  
 OpBi tʃòmò  
 OpMo tʃòmò  
 OpPa tʃòm  
 OpKi tʃòm  
 Initial /s/ in Dana due to contact with Komo?

\*cúl n. ‘firefly\_2’: Reconstructs to: PUd

GwHi -  
 GwLo -  
 Komo -  
 UdYa -  
 UdCh à+cúl  
 Dana -  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*cut v. ‘whistle’: Reconstructs to: PKmn

GwHi -  
 GwLo ʃút  
 Komo ʃít  
 UdYa -  
 UdCh cúwā  
 Dana côi  
 OpBi tʃúwì  
 OpMo tʃúwì  
 OpPa tʃúwì  
 OpKi tʃúwì

\*cōk<sup>(h)</sup>(ɪ) n. ‘hoof’: Reconstructs to: PKoUd

GwHi -  
 GwLo -  
 Komo sōkí  
 UdYa -  
 UdCh à+cūk<sup>h</sup>



Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*CVk'Um v. 'rinse mouth\_1': Reconstructs to: PKmn

GwHi ʃòkóm  
GwLo ʃòkóm  
Komo zùk'úm  
UdYa -  
UdCh -  
Dana ʒák'óm  
OpBi tʃák'ómá  
OpMo tʃák'ómá  
OpPa sāk'ómá  
OpKi tʃák'ómá

Cannot account for voiced initial consonant in Komo and Dana.

\*cwálá n. 'tree': Reconstructs to: PKmn

GwHi swálá  
GwLo swájá  
Komo sá  
UdYa ʃwá  
UdCh cwá  
Dana cá  
OpBi tʃá  
OpMo tʃá  
OpPa tʃá  
OpKi tʃá

\*tʃápūm n. 'waist, hip\_2': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi tʃápūm  
OpMo tʃápūm  
OpPa -

OpKi -

\*tʃim v. 'bury\_4': Reconstructs to: POp

GwHi -

GwLo -

Komo -

UdYa -

UdCh -

Dana -

OpBi tʃim

OpMo tʃim

OpPa -

OpKi -

\*tʃɔt v. 'pierce\_2': Reconstructs to: POp

GwHi -

GwLo -

Komo -

UdYa -

UdCh -

Dana -

OpBi tʃɔt

OpMo tʃɔt

OpPa -

OpKi -

\*dzibàj n. 'cloud, fog\_2': Reconstructs to: POp

GwHi -

GwLo -

Komo -

UdYa -

UdCh -

Dana -

OpBi dzibàj

OpMo dzibàj

OpPa dzibàj

OpKi dzibàj

\*ʒà v. 'dig\_1': Reconstructs to: PKmn

GwHi ʒà

GwLo ʒà

Komo -  
UdYa -  
UdCh -  
Dana cà  
OpBi tfà  
OpMo tfà  
OpPa tfà  
OpKi tfà

\*ɟàn n. 'dream\_4': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa zàn  
UdCh ɟàn  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ɟana n. 'sorghum, millet': Reconstructs to: PKmn

GwHi sjànà  
GwLo sjànà  
Komo zènā  
UdYa -  
UdCh -  
Dana -  
OpBi dzèná  
OpMo -  
OpPa dzèná  
OpKi -

\*ɟaŋ(ɔ)aj n. 'Nuer (ethnonym)\_1': Reconstructs to: PKmn

GwHi zǎgó  
GwLo zǎgó  
Komo zǎgó  
UdYa ɟwǎŋgì  
UdCh -  
Dana ɟàŋwèj  
OpBi dzǎŋó

OpMo -  
OpPa zãŋwé  
OpKi ʃãŋwè

\*ʃarɛ n. ‘baboon\_2’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana ʃārē  
OpBi tʃārè  
OpMo tʃārè  
OpPa tʃārè  
OpKi tʃàrì

\*ʃàrú n. ‘bird\_stork (maribou)’: Reconstructs to: PKmn

GwHi zèrú  
GwLo zèrú  
Komo zèrú  
UdYa zàrú  
UdCh -  
Dana ʃèrú  
OpBi dzèrú  
OpMo dzèrú  
OpPa dzèrú  
OpKi dzèrú

\*ʃè n. ‘elephant\_2’: Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh ʃè  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*jìbí v. 'slurp\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo zibí  
UdYa -  
UdCh -  
Dana jìbí  
OpBi -  
OpMo -  
OpPa -  
OpKi tʃibi

\*jìkʰì v. 'forbid\_4': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana jìkʰì  
OpBi -  
OpMo -  
OpPa zìkʰí  
OpKi ʃìkʰí

\*jVtʰid n. 'sweat (substance)\_1': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo zàtít  
UdYa jìtʰíd  
UdCh jìtʰí  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*c'(w)ēs' v. 'tear (shred)\_3': Reconstructs to: PKmn

GwHi s'wě  
GwLo s'wě  
Komo -  
UdYa -

UdCh c'ēŋ'  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*c'ac' n. 'chest\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo s'ās'  
UdYa -  
UdCh -  
Dana c'ac'  
OpBi tʃ'ātʃ'  
OpMo tʃ'ātʃ'  
OpPa tʃ'ātʃ'  
OpKi s'ās'

\*c'ák'úmú n. 'ladle\_1': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana c'ák'úmú  
OpBi tʃ'ák'úmú  
OpMo tʃ'ák'úmú  
OpPa tʃ'ák'úmú  
OpKi tʃ'ák'úmú

\*c'ε n. 'ear': Reconstructs to: PKmn

GwHi s'ē  
GwLo s'ē  
Komo s'ē  
UdYa ʃ'é  
UdCh c'é  
Dana k'ē  
OpBi tʃ'è  
OpMo tʃ'è  
OpPa tʃ'è

OpKi tʃè

Cannot account for the initial /k'/ in Dana.

\*c'èk' n. 'termite\_2': Reconstructs to: PUd

GwHi -

GwLo -

Komo -

UdYa c'èk'

UdCh à+c'èk'

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*c'èʃ n. 'earth, soil, ground, floor\_3': Reconstructs to: PUd

GwHi -

GwLo -

Komo -

UdYa c'èʃ

UdCh à+c'èʃ

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*à+c'í n. 'child\_2': Reconstructs to: PUd

GwHi -

GwLo -

Komo -

UdYa àʃí

UdCh à+c'í

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*c'isân v. 'sneeze\_4': Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa ʃisân  
UdCh c'isân  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*c'ik' v. 'sour (be)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo s'ik'  
UdYa -  
UdCh -  
Dana c'ik'  
OpBi tʃ'ik'+dzè  
OpMo tʃ'ik'+dzè  
OpPa tʃ'ik'+zè  
OpKi tʃ'ik'+sè

\*c'ik'ír n. 'fingernail, toenail, claw, hoof\_3': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo s'ik'il  
UdYa -  
UdCh -  
Dana k'ik'ír  
OpBi tʃ'ik'ír  
OpMo tʃ'ik'ír  
OpPa tʃ'ik'ír  
OpKi tʃ'ik'ír

Dana initial /k'/ instead of expected /c'/ cannot be accounted for (cf. 'ear' in Dana).

\*c'ɔ(t'ɔ)l v. 'drip (fall in globules)\_1': Reconstructs to: PKmn

GwHi s'ót'ó  
GwLo s'ót'ó  
Komo s'òlil



UdYa -  
UdCh c'ʔc'ʔlʔc'  
Dana c'ʔʔ  
OpBi tʃʔ  
OpMo tʃʔ  
OpPa tʃʔ  
OpKi tʃʔ

\*c'úg v. 'untie, undress\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo s'úk  
UdYa -  
UdCh c'úk<sup>h</sup>  
Dana -  
OpBi tʃ'úg  
OpMo tʃ'úg  
OpPa tʃ'úg  
OpKi tʃ'úg

\*c'úm~c'úm v. 'suck\_3': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa ʃ'úzùm  
UdCh c'úɲc'úm  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*c'Vmaj n. 'dregs': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo s'ímá  
UdYa ʃ'ómá  
UdCh à+c'úmá  
Dana c'ímáj  
OpBi tʃ'ímáj  
OpMo tʃ'ímáj

OpPa tʃʷímáj  
OpKi tʃʷímáj

\*k<sup>h</sup>ā n. ‘chicken\_3’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana k<sup>h</sup>ā  
OpBi k<sup>h</sup>ā  
OpMo k<sup>h</sup>ā  
OpPa k<sup>h</sup>ā  
OpKi k<sup>h</sup>ā

\*k<sup>h</sup>ab n. ‘wind (n.)\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh hāpāp<sup>h</sup>  
Dana k<sup>h</sup>àb  
OpBi k<sup>h</sup>āb  
OpMo k<sup>h</sup>āb  
OpPa k<sup>h</sup>āb  
OpKi k<sup>h</sup>āb

\*k<sup>h</sup>aʃ v. ‘repair\_1’: Reconstructs to: PKmn

GwHi áp  
GwLo -  
Komo áb  
UdYa -  
UdCh -  
Dana ʃbā  
OpBi k<sup>h</sup>áp’  
OpMo k<sup>h</sup>áp’  
OpPa k<sup>h</sup>áp’  
OpKi k<sup>h</sup>áp’

\*k<sup>h</sup>ac’ v. ‘shut\_2’: Reconstructs to: PKmn

GwHi kǎʃ

GwLo kǎf  
 Komo -  
 UdYa k<sup>h</sup>ǎf  
 UdCh k<sup>h</sup>ác'  
 Dana -  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*k<sup>h</sup>ád(a) v. 'open': Reconstructs to: PKmn

GwHi kálá  
 GwLo kájá  
 Komo kár  
 UdYa k<sup>h</sup>ǎd  
 UdCh k<sup>h</sup>ǎd'  
 Dana k<sup>h</sup>átá  
 OpBi k<sup>h</sup>átá  
 OpMo k<sup>h</sup>átá  
 OpPa k<sup>h</sup>átá  
 OpKi k<sup>h</sup>átá

\*k<sup>h</sup>ádúm n. 'roof\_1': Reconstructs to: PCtrl

GwHi -  
 GwLo -  
 Komo kárúm  
 UdYa -  
 UdCh -  
 Dana k<sup>h</sup>ádúm  
 OpBi k<sup>h</sup>ǎrúm  
 OpMo k<sup>h</sup>ǎrúm  
 OpPa k<sup>h</sup>ǎrúm  
 OpKi k<sup>h</sup>ǎrúm

\*k<sup>h</sup>āg v. 'leave\_3': Reconstructs to: PDaOp

GwHi -  
 GwLo -  
 Komo -  
 UdYa -  
 UdCh -  
 Dana k<sup>h</sup>āgí+ǰè

OpBi -  
OpMo k<sup>h</sup>āgí+dzì  
OpPa k<sup>h</sup>āgí+zì  
OpKi k<sup>h</sup>āgí+fì

\*k<sup>h</sup>āgá v. ‘hot (be)\_4’: Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi k<sup>h</sup>āgá  
OpMo k<sup>h</sup>āgá  
OpPa k<sup>h</sup>āgá  
OpKi -

\*k<sup>h</sup>aj v. ‘herd (v.)’: Reconstructs to: PKmn

GwHi kē?  
GwLo kē?  
Komo kà?  
UdYa -  
UdCh -  
Dana k<sup>h</sup>àjí?  
OpBi k<sup>h</sup>ājí  
OpMo k<sup>h</sup>ājí  
OpPa k<sup>h</sup>ājí  
OpKi k<sup>h</sup>ājí

Lowland Gwama meaning is ‘herd (of animals)’ .

\*k<sup>h</sup>ak’a v. ‘bitter, sour (be)’: Reconstructs to: PKmn

GwHi kāgā  
GwLo kāgā  
Komo kà?  
UdYa k<sup>h</sup>ā?  
UdCh k<sup>h</sup>ā?  
Dana k<sup>h</sup>àk`à  
OpBi k<sup>h</sup>āk`ā  
OpMo k<sup>h</sup>āk`ā  
OpPa k<sup>h</sup>āk`ā  
OpKi k<sup>h</sup>āk`ā

\*k<sup>h</sup>al v. ‘bring\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo kà-ō  
UdYa k<sup>h</sup>ál+i  
UdCh k<sup>h</sup>ál+ú  
Dana kùjí  
OpBi -  
OpMo -  
OpPa -  
OpKi -

Possibly borrowed from W.Nilotic (cf. Kurmuk /kal/ ‘steal’)

\*k<sup>h</sup>al v. ‘carry\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo kàj  
UdYa k<sup>h</sup>ál  
UdCh k<sup>h</sup>ál  
Dana k<sup>h</sup>ál  
OpBi k<sup>h</sup>ál  
OpMo k<sup>h</sup>ál  
OpPa k<sup>h</sup>ál  
OpKi k<sup>h</sup>ál

\*k<sup>h</sup>ál v. ‘carry on head\_2’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa k<sup>h</sup>ál  
UdCh k<sup>h</sup>ál  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k<sup>h</sup>álí n. ‘sheep\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -

Komo kālí  
UdYa -  
UdCh -  
Dana k<sup>h</sup>ālí  
OpBi k<sup>h</sup>ālí  
OpMo k<sup>h</sup>ālí  
OpPa k<sup>h</sup>ālí  
OpKi k<sup>h</sup>ālí

\*k<sup>h</sup>āŋ v. ‘light (the way with torch/flashlight)\_1’: Reconstructs to: PKmn

GwHi kīn  
GwLo kīn  
Komo -  
UdYa k<sup>h</sup>āŋ  
UdCh k<sup>h</sup>āŋ  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k<sup>h</sup>áŋgá n. ‘cannabis\_2’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana k<sup>h</sup>áŋgá  
OpBi k<sup>h</sup>áŋgá  
OpMo k<sup>h</sup>áŋgá  
OpPa k<sup>h</sup>áŋgá  
OpKi k<sup>h</sup>áŋgá

\*k<sup>h</sup>āp<sup>h</sup>ā v. ‘red (be)\_2’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana k<sup>h</sup>āp<sup>h</sup>ā  
OpBi k<sup>h</sup>āpā

OpMo k<sup>h</sup>āpā  
OpPa k<sup>h</sup>āpā  
OpKi k<sup>h</sup>āpā

\*k<sup>h</sup>ar v. ‘pour\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo kál  
UdYa -  
UdCh -  
Dana k<sup>h</sup>ár  
OpBi k<sup>h</sup>ārí  
OpMo k<sup>h</sup>ārí  
OpPa k<sup>h</sup>ārí  
OpKi k<sup>h</sup>ārí

\*k<sup>h</sup>é v. ‘arrive\_2’: Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo ké  
UdYa c<sup>h</sup>é  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k<sup>h</sup>ēbē n. ‘vagina\_3’: Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi k<sup>h</sup>ēbē  
OpMo k<sup>h</sup>ēbē  
OpPa k<sup>h</sup>ēbē  
OpKi k<sup>h</sup>ēbē

\*k<sup>h</sup>em v. ‘pierce, cut (grass with sickle)’: Reconstructs to: PCtrl

GwHi -  
 GwLo -  
 Komo kém  
 UdYa -  
 UdCh -  
 Dana -  
 OpBi k<sup>h</sup>èm  
 OpMo k<sup>h</sup>èm  
 OpPa k<sup>h</sup>èm  
 OpKi k<sup>h</sup>èm

\*k<sup>h</sup>ĩdí n. ‘rat\_2’: Reconstructs to: PDaOp

GwHi -  
 GwLo -  
 Komo -  
 UdYa -  
 UdCh -  
 Dana k<sup>h</sup>ĩdí  
 OpBi k<sup>h</sup>ĩ?  
 OpMo k<sup>h</sup>ĩ?  
 OpPa k<sup>h</sup>ĩ?  
 OpKi k<sup>h</sup>ĩ?

\*k<sup>h</sup>ĩ v. ‘give’: Reconstructs to: PCtrl

GwHi -  
 GwLo -  
 Komo kĩ+k  
 UdYa c<sup>h</sup>ĩ?  
 UdCh c<sup>h</sup>ĩ  
 Dana k<sup>h</sup>ĩ+wā  
 OpBi k<sup>h</sup>ĩ?  
 OpMo k<sup>h</sup>ĩ?  
 OpPa k<sup>h</sup>ĩ?  
 OpKi k<sup>h</sup>ĩ?

\*k<sup>h</sup>ĩl n. ‘root\_2’: Reconstructs to: POp

GwHi -  
 GwLo -  
 Komo -  
 UdYa -  
 UdCh -



Dana -  
OpBi k<sup>h</sup>ɪl  
OpMo k<sup>h</sup>ɪl  
OpPa k<sup>h</sup>ɪl  
OpKi k<sup>h</sup>ɪl

\*k<sup>h</sup>ɪs' v. 'burn\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo kɪs'  
UdYa c<sup>h</sup>ɪs'  
UdCh c<sup>h</sup>ɪt̥'  
Dana k<sup>h</sup>ɪs'ā  
OpBi k<sup>h</sup>ɪt̥fā  
OpMo k<sup>h</sup>ɪt̥fā  
OpPa k<sup>h</sup>ɪt̥fā  
OpKi k<sup>h</sup>ɪt̥fā

\*k<sup>h</sup>O(r)nOn v. 'snore': Reconstructs to: PKmn

GwHi kònòn  
GwLo kònòn  
Komo kònòn  
UdYa k<sup>h</sup>ünün  
UdCh àk<sup>h</sup>ɔrnē?  
Dana k<sup>h</sup>ònòn  
OpBi k<sup>h</sup>ònòn  
OpMo k<sup>h</sup>ònòn  
OpPa k<sup>h</sup>ònòn  
OpKi k<sup>h</sup>ònòn

\*k<sup>h</sup>Oba n. 'chair\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo kɔbá  
UdYa -  
UdCh -  
Dana -  
OpBi k<sup>h</sup>ɔbá  
OpMo k<sup>h</sup>ɔbá  
OpPa k<sup>h</sup>ɔbá  
OpKi k<sup>h</sup>ɔbá

\*k<sup>h</sup>OG n. ‘giraffe\_2’: Reconstructs to: PKmn

GwHi kók

GwLo kók

Komo -

UdYa k<sup>h</sup>ú?

UdCh k<sup>h</sup>ú?

Dana k<sup>h</sup>ég

OpBi -

OpMo -

OpPa -

OpKi kêk

Related to Proto-Nilotic \*ko-RI ‘giraffe’ (Dimmendaal 1988:40)?

\*k<sup>h</sup>ó n. ‘bad (be)\_3’: Reconstructs to: POp

GwHi -

GwLo -

Komo -

UdYa -

UdCh -

Dana -

OpBi k<sup>h</sup>ó

OpMo k<sup>h</sup>ó

OpPa k<sup>h</sup>ó

OpKi k<sup>h</sup>ó

\*k<sup>h</sup>óba n. ‘maize\_1’: Reconstructs to: PCtrl

GwHi -

GwLo -

Komo -

UdYa k<sup>h</sup>óbà

UdCh à+k<sup>h</sup>óbà

Dana k<sup>h</sup>óbā

OpBi k<sup>h</sup>óbà

OpMo k<sup>h</sup>óbà

OpPa k<sup>h</sup>óbà

OpKi k<sup>h</sup>óbà

\*k<sup>h</sup>óɓ v. ‘bale out (water)’: Reconstructs to: PCtrl

GwHi -

GwLo -

Komo kóp  
 UdYa k<sup>h</sup>ɔb  
 UdCh k<sup>h</sup>ɔɓ  
 Dana k<sup>h</sup>óp<sup>h</sup>  
 OpBi k<sup>h</sup>óp<sup>h</sup>á  
 OpMo k<sup>h</sup>óp<sup>h</sup>á  
 OpPa k<sup>h</sup>óp<sup>h</sup>á  
 OpKi k<sup>h</sup>óp<sup>h</sup>á

\*k<sup>h</sup>ɔm v. ‘pound (v.)\_1’: Reconstructs to: PDaOp

GwHi -  
 GwLo -  
 Komo -  
 UdYa -  
 UdCh -  
 Dana k<sup>h</sup>ɔm  
 OpBi -  
 OpMo -  
 OpPa k<sup>h</sup>ɔm  
 OpKi k<sup>h</sup>ɔm

\*k<sup>h</sup>ɔm v. ‘follow\_3’: Reconstructs to: POp

GwHi -  
 GwLo -  
 Komo -  
 UdYa -  
 UdCh -  
 Dana -  
 OpBi k<sup>h</sup>ɔm  
 OpMo k<sup>h</sup>ɔm  
 OpPa k<sup>h</sup>ɔm  
 OpKi k<sup>h</sup>ɔm

\*k<sup>h</sup>ɔr v. ‘stumble\_1’: Reconstructs to: PCtrl

GwHi -  
 GwLo -  
 Komo kɔr+ɔf  
 UdYa -  
 UdCh -  
 Dana k<sup>h</sup>ɔk<sup>h</sup>ɔr  
 OpBi k<sup>h</sup>ɔk<sup>h</sup>ɔr

OpMo k<sup>h</sup>ɔ̄k<sup>h</sup>ɔ̄r  
OpPa k<sup>h</sup>ɔ̄k<sup>h</sup>ɔ̄r  
OpKi k<sup>h</sup>ɔ̄k<sup>h</sup>ɔ̄r

\*k<sup>h</sup>ɔ̄T v. ‘to prepare earth for farming\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo kót  
UdYa k<sup>h</sup>ɔ̄d  
UdCh k<sup>h</sup>ɔ̄r  
Dana k<sup>h</sup>ɔ̄t<sup>h</sup>  
OpBi k<sup>h</sup>ɔ̄tɔ̄  
OpMo k<sup>h</sup>ɔ̄tɔ̄  
OpPa k<sup>h</sup>ɔ̄t  
OpKi k<sup>h</sup>ɔ̄t

\*k<sup>h</sup>úŋ v. ‘dig\_2’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa k<sup>h</sup>úŋ  
UdCh k<sup>h</sup>úŋ  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k<sup>h</sup>ūr n. ‘skin, hide (of animal), bark of tree\_5’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh k<sup>h</sup>ūr  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k<sup>h</sup>uʃ v. ‘smoke out (e.g an animal out of a hole)\_1’: Reconstructs to: PKmn

GwHi kǔʃ  
GwLo kǔʃ  
Komo ūs  
UdYa -  
UdCh -  
Dana húʃ  
OpBi ús  
OpMo ús  
OpPa ús  
OpKi úʃ

Also means ‘evaporate’ in Dana.

\*k<sup>h</sup>ús’ v. ‘dry (be)’: Reconstructs to: PKmn

GwHi kús’  
GwLo kús’  
Komo kós’  
UdYa k<sup>h</sup>ús’  
UdCh k<sup>h</sup>úʃ’  
Dana k<sup>h</sup>ús’  
OpBi k<sup>h</sup>ótʃ’  
OpMo k<sup>h</sup>ótʃ’  
OpPa k<sup>h</sup>ótʃ’  
OpKi -

\*k<sup>h</sup>waG’ v. ‘fear (be afraid)’: Reconstructs to: PKmn

GwHi kwāgà  
GwLo kwāgà  
Komo kōg  
UdYa k<sup>h</sup>ʔ  
UdCh k<sup>h</sup>ʔk’  
Dana k<sup>h</sup>ók ~ k<sup>h</sup>ògó  
OpBi k<sup>h</sup>ōgó  
OpMo k<sup>h</sup>ōgó  
OpPa k<sup>h</sup>ōgó  
OpKi k<sup>h</sup>ōgó

\*k<sup>h</sup>wal v. ‘steal\_2’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo kwál

UdYa k<sup>h</sup>wāl  
UdCh k<sup>h</sup>wāl  
Dana k<sup>h</sup>wàlà  
OpBi -  
OpMo -  
OpPa -  
OpKi k<sup>h</sup>wālā

\*k<sup>h</sup>wālàŋ n. 'fat (from animals)\_2': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa k<sup>h</sup>wālàŋ  
UdCh k<sup>h</sup>wālàŋ  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k<sup>h</sup>wāŋk<sup>h</sup>ām n. 'turtle\_2': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa k<sup>h</sup>wāŋk<sup>h</sup>ām  
UdCh à+k<sup>h</sup>wāŋk<sup>h</sup>ām  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k<sup>(h)</sup>a v. 'refuse\_1': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana kâ  
OpBi k<sup>h</sup>à  
OpMo k<sup>h</sup>à

OpPa k<sup>h</sup>à  
OpKi k<sup>h</sup>à

\*k<sup>(h)</sup>a(ŋ)k<sup>(c)</sup>a v. ‘thorn, sharp (be)’: Reconstructs to: PKmn

GwHi kãŋà  
GwLo kãŋà  
Komo kákā  
UdYa kã?  
UdCh kăkã  
Dana k<sup>h</sup>ák<sup>h</sup>ã?  
OpBi k<sup>h</sup>ák’ã  
OpMo k<sup>h</sup>ák’ã  
OpPa k<sup>h</sup>ák’ã  
OpKi k<sup>h</sup>ák’ã

\*k<sup>(h)</sup>ak’as ~ k<sup>(h)</sup>asak’ n. ‘porcupine\_1’: Reconstructs to: PKmn

GwHi kák’ăf  
GwLo kák’ăf  
Komo káfāk’  
UdYa -  
UdCh -  
Dana kásāk’  
OpBi k<sup>h</sup>ásāk’  
OpMo k<sup>h</sup>ásāk’  
OpPa k<sup>h</sup>ásāk’  
OpKi k<sup>h</sup>áfāk’

\*k<sup>(h)</sup>īḍ n. ‘horn (anatomy)\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo kī  
UdYa cú  
UdCh cé  
Dana kīḍ  
OpBi k<sup>h</sup>īw  
OpMo k<sup>h</sup>īw  
OpPa k<sup>h</sup>īw  
OpKi k<sup>h</sup>īw

\*k<sup>(h)</sup>ínáj n. ‘Opo (ethnonym)\_1’: Reconstructs to: PKmn

GwHi kíná  
GwLo kíná  
Komo kíná  
UdYa c<sup>h</sup>ínáj  
UdCh -  
Dana kínáj  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k<sup>(h)</sup>ír(a) v. ‘tear (shred)\_2’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana kír  
OpBi k<sup>h</sup>írá  
OpMo k<sup>h</sup>írá  
OpPa k<sup>h</sup>írá  
OpKi k<sup>h</sup>írá

\*k<sup>(h)</sup>ìs adv. ‘new\_2’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana kìs  
OpBi k<sup>h</sup>ìs  
OpMo k<sup>h</sup>ìs  
OpPa k<sup>h</sup>ìs  
OpKi k<sup>h</sup>ìs

\*k<sup>(h)</sup>ìs n. ‘tree\_sp. (mahogany, Trichilia emetica)’: Reconstructs to: PKmn

GwHi kìsì  
GwLo ̄o+kīs  
Komo kīs  
UdYa cēs



UdCh c<sup>h</sup>ís  
 Dana kís  
 OpBi k<sup>h</sup>ís  
 OpMo k<sup>h</sup>ís  
 OpPa k<sup>h</sup>ís  
 OpKi k<sup>h</sup>ís

\*k<sup>(h)</sup>ís' ~ k'ís' v\*. 'cut\_1': Reconstructs to: PCtrl

GwHi -  
 GwLo -  
 Komo -  
 UdYa c'ís'  
 UdCh c'ít<sup>h</sup>  
 Dana k<sup>h</sup>ís'  
 OpBi k<sup>h</sup>ítʃ'  
 OpMo k<sup>h</sup>ítʃ'  
 OpPa k<sup>h</sup>ítʃ'  
 OpKi k<sup>h</sup>ítʃ'

Meaning is 'sting' in Dana-Opo. Possibly not cognate with Uduk.

\*k<sup>(h)</sup>ít<sup>(h)</sup>(à) adv. 'right (direction)\_1': Reconstructs to: PDaOp

GwHi -  
 GwLo -  
 Komo -  
 UdYa -  
 UdCh -  
 Dana kít<sup>h</sup>à  
 OpBi k<sup>h</sup>īt  
 OpMo k<sup>h</sup>īt  
 OpPa k<sup>h</sup>īt  
 OpKi kītā

\*k<sup>(h)</sup>O v. 'say\_1': Reconstructs to: PKmn

GwHi kō  
 GwLo kō  
 Komo ó  
 UdYa ó  
 UdCh ó  
 Dana -  
 OpBi -  
 OpMo -

OpPa -  
OpKi -

\*k<sup>(h)</sup>Orɛc' n. 'hoe (n.)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa kūrɛ́  
UdCh k<sup>h</sup>ɔ̀rɛ́c'  
Dana kɔ̀rɛ́  
OpBi kɔ̀rɛ́  
OpMo kɔ̀rɛ́  
OpPa kɔ̀rɛ́  
OpKi kɔ̀rɛ́

\*k<sup>(h)</sup>wal ~ k'wal v\*. 'want\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo k'wàl  
UdYa -  
UdCh -  
Dana k<sup>h</sup>wāj  
OpBi kwāj  
OpMo k<sup>h</sup>wáj  
OpPa k<sup>h</sup>wáj  
OpKi k<sup>h</sup>wáj

\*kájá n. 'sun\_2': Reconstructs to: PGw

GwHi kájá  
GwLo kájá  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kājā n. 'day (24 hours)\_2': Reconstructs to: PGw

GwHi kājā  
GwLo kājā  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kāl v. 'bypass\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo kāl  
UdYa kāl  
UdCh kāl  
Dana kāl  
OpBi kāl  
OpMo kāl  
OpPa kāl  
OpKi kāl

\*kàn v. 'bury\_2': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo kàn  
UdYa kãn  
UdCh kãn  
Dana kànà  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kānā n. 'dog\_1': Reconstructs to: PGw

GwHi kānā  
GwLo kānā  
Komo -  
UdYa -

UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kāná+wòné v. 'cross legs\_2': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi kāná+wòné  
OpMo kāná+wòn  
OpPa kāná+wòn  
OpKi kāná+wòn

\*kāns' v. 'pelt\_2': Reconstructs to: PGw

GwHi kāns'  
GwLo kāns'  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kāp v. 'bring\_3': Reconstructs to: PGw

GwHi kāp  
GwLo kāp  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -

OpKi -

\*kàrà v. 'listen\_2': Reconstructs to: POp

GwHi -

GwLo -

Komo -

UdYa -

UdCh -

Dana -

OpBi kàrà

OpMo -

OpPa kàrà

OpKi kàrà

\*kàrò n. 'salt\_(from ash of a particular plant/tree)\_1': Reconstructs to: POp

GwHi -

GwLo -

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo kàrò

OpPa kàrò

OpKi kàrò

\*(dzì+)kārō n. 'soup\_3': Reconstructs to: POp

GwHi -

GwLo -

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo dzì+kārō

OpPa zì+kārō

OpKi řì+kārō

\*kàs v. 'forbid\_2': Reconstructs to: PGw

GwHi kàs

GwLo kìs

Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kàs'mǎná n. 'hyena\_1': Reconstructs to: PGw

GwHi kàs'mǎná  
GwLo kàs'mǎná  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kát<sup>(h)</sup> v. 'protect\_1': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana kát<sup>h</sup>  
OpBi -  
OpMo -  
OpPa kát  
OpKi kát

\*kāw v. 'strong (be)\_3': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi kāw

OpMo kāw  
OpPa kāw  
OpKi kāw

\*kEɲ n. ‘bird\_(cattle egret)’: Reconstructs to: PKmn

GwHi kīl  
GwLo kīl  
Komo à+kíl  
UdYa cécéñā  
UdCh à+céɲ  
Dana à+kíl  
OpBi à+kíl  
OpMo à+kíl  
OpPa à+kíl  
OpKi à+kíl

\*kě v. ‘sweep\_4’: Reconstructs to: PGw

GwHi kě  
GwLo kě  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kéntéʃ v. ‘stumble\_2’: Reconstructs to: PGw

GwHi kétéʃ  
GwLo kéntéʃ  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kénzé v. ‘offend\_2’: Reconstructs to: PGw

GwHi kénzé  
GwLo kénzé  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kés(é) v. 'roast or fry\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo kéf  
UdYa cés  
UdCh cés  
Dana kés  
OpBi késé  
OpMo késé  
OpPa kés  
OpKi késé

\*kēf v. 'curse\_3': Reconstructs to: PGw

GwHi kēf  
GwLo kēf  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k<sup>h</sup>àk<sup>h</sup>á n. 'grandmother\_1': Reconstructs to: PKmn

GwHi -  
GwLo kàká?  
Komo kàká  
UdYa -  
UdCh -



Dana k<sup>h</sup>àk<sup>h</sup>á

OpBi kàká

OpMo kàká

OpPa kàká

OpKi kàká

Unclear as to why it's not voiced in Komo if initial was b and L tone.

\*kija n. 'bed\_3': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo -

UdYa cī

UdCh à+cī

Dana kījā

OpBi -

OpMo -

OpPa -

OpKi -

\*kíl v. 'sharpen\_1': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo kíl

UdYa cíl

UdCh cíl

Dana -

OpBi kíl

OpMo kíl

OpPa kíl

OpKi kíl

\*kif ~ kif n\*. 'antelope\_gazelle': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo kīf

UdYa cíf

UdCh à+cíf

Dana àkīf

OpBi k<sup>h</sup>īs

OpMo k<sup>h</sup>īs

OpPa k<sup>h</sup>īs

OpKi kĭf

Aspiration likely a POp innovation.

\*kĭw v. 'shout\_2': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo -

UdYa cú

UdCh cú

Dana -

OpBi kĭw

OpMo kĭw

OpPa kĭw

OpKi kĭw

\*kĭl n. 'star\_1': Reconstructs to: PKoUd

GwHi -

GwLo -

Komo kĭl

UdYa cúl

UdCh à+cúl

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*kĭm(V) n. 'day (24 hours)\_1': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo kĭmí

UdYa cím

UdCh à+cím

Dana kĭmà

OpBi -

OpMo -

OpPa -

OpKi -

\*kĭnt' n. 'dew\_3': Reconstructs to: PGw

GwHi kĭnt'

GwLo k̄nt'  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k̄is̄ v. 'near\_2': Reconstructs to: PGw

GwHi k̄is̄  
GwLo k̄is̄  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k̄is' v. 'set (heavenly bodies)\_2': Reconstructs to: PGw

GwHi k̄is'  
GwLo k̄is'  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k̄if v. 'spoil (become spoiled)\_3': Reconstructs to: PGw

GwHi k̄if  
GwLo k̄if  
Komo -  
UdYa -  
UdCh -  
Dana -

OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kjana adv. ‘tomorrow\_1’: Reconstructs to: PKmn

GwHi -  
GwLo gì+kjānā  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi dzì+kén  
OpMo dzì+kén  
OpPa zì+kén  
OpKi ʃì+kén

\*kjank’a v. ‘cluck (of hen)’: Reconstructs to: PKmn

GwHi kākā  
GwLo kjāŋk’ā  
Komo kágá  
UdYa -  
UdCh -  
Dana kágà  
OpBi kēn  
OpMo kēn  
OpPa kēn  
OpKi kēn

\*kO(j) v. ‘cry’: Reconstructs to: PKmn

GwHi kū  
GwLo kū  
Komo kò  
UdYa kō  
UdCh kō  
Dana kòj  
OpBi kwē  
OpMo kwē  
OpPa kwē  
OpKi kwē

\*kOp<sup>h</sup> v. ‘carry on head\_1’: Reconstructs to: PKmn

GwHi kũ  
GwLo kũ  
Komo -  
UdYa -  
UdCh -  
Dana kōp<sup>h</sup>  
OpBi kōp  
OpMo kōp  
OpPa kōp  
OpKi kōp

\*kOr n. ‘chief\_1’: Reconstructs to: PKmn

GwHi ̄ō+kōl  
GwLo ̄ō+kwì  
Komo jī+kwì  
UdYa -  
UdCh -  
Dana jè+kōrō  
OpBi -  
OpMo -  
OpPa -  
OpKi -  
\*kOr > kOl > kOj > kwɪ

\*dzīnī+kōré n. ‘sesame\_2’: Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi dzīnī+kōré  
OpMo dzīnī+kōré  
OpPa zīnī+kōré  
OpKi -

\*kOṭan n. ‘head pad (for head carrying)\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -

UdYa -  
UdCh -  
Dana kòt̪háj  
OpBi kōtìn  
OpMo kōtìn  
OpPa kōtìn  
OpKi -

Dana aspirates intervocalically.

\*kó v. 'roast or fry\_2': Reconstructs to: PGw

GwHi kó  
GwLo kó  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kóḍ n. 'breast, milk\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo kó  
UdYa kó  
UdCh à+kó  
Dana kóḍ  
OpBi kój  
OpMo kój  
OpPa kój  
OpKi kój

\*kóndíl v. 'count\_3': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi kóndíl

OpMo kóndíl  
OpPa -  
OpKi -

\*kóηð n. 'chair\_2': Reconstructs to: PGw

GwHi kóηð  
GwLo kóηð  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kóp<sup>h</sup> v. 'pound (v.)\_4': Reconstructs to: PKmn

GwHi kóp  
GwLo kóp  
Komo -  
UdYa kúp<sup>h</sup>  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kōp<sup>h</sup> n. 'antelope\_waterbuck': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo kōp  
UdYa kōp<sup>h</sup>  
UdCh kōp<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kós v. 'sew\_1': Reconstructs to: PKmn

GwHi ós  
GwLo ós  
Komo -  
UdYa -  
UdCh -  
Dana kós  
OpBi kós  
OpMo kós  
OpPa kós  
OpKi kós

\*kòfi n. 'skin, hide (of animal), bark of tree\_4': Reconstructs to: PGw

GwHi kòfi  
GwLo kòfi  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kòt<sup>h</sup> v. 'have': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana kòt<sup>h</sup>  
OpBi kòt<sup>h</sup>  
OpMo -  
OpPa kòt<sup>h</sup>  
OpKi kòt<sup>h</sup>

\*kūc' v. 'defecate\_3': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa kūf



UdCh kūc'  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kúf n. 'smoke (exhaust)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo kūr  
UdYa kúd  
UdCh à+kúf  
Dana kūfā?  
OpBi kūrā  
OpMo kūrā  
OpPa kūrā  
OpKi kūrā

\*kúk<sup>h</sup> n. 'vagina\_2': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa kú?  
UdCh à+kúk<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kum(bi) v. 'cover (v.)': Reconstructs to: PKmn

GwHi kùmbì  
GwLo kùmbì  
Komo kúm  
UdYa kūm  
UdCh kūm  
Dana kúmā  
OpBi kúmá  
OpMo kúmá  
OpPa kúmá

OpKi kúmá

\*kúmú n. ‘egg\_3’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana kúmú  
OpBi kúmú  
OpMo kúmú  
OpPa kúmú  
OpKi kúmú

\*kúnā v. ‘help\_3’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana kúnā  
OpBi kúná  
OpMo kúná  
OpPa kúná  
OpKi kúná

\*kūp n. ‘bamboo\_3’: Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi kūp  
OpMo kūp  
OpPa kūp  
OpKi kūp

\*kúf v. ‘white (be)\_3’: Reconstructs to: PUD

GwHi -  
GwLo -

Komo -  
UdYa kúf  
UdCh kúf  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kò v. 'brood (v.)\_2': Reconstructs to: PGw

GwHi kò  
GwLo kò  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*kòdós n. 'pipe (for smoking)\_2': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi kòdós  
OpMo kòdós  
OpPa kòdós  
OpKi kòdóf

\*kòĩ v. 'rise (oneself)\_2': Reconstructs to: PGw

GwHi kòĩ  
GwLo kòĩ  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -

OpMo -  
OpPa -  
OpKi -

\*kǒká n. 'joint\_3': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi kǒká  
OpMo kǒká  
OpPa kǒká  
OpKi kǒká

\*kómá v. 'carry on back\_2': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi kómá  
OpMo kómá  
OpPa kómá  
OpKi kómá

\*kōman n. 'mother, female': Reconstructs to: PKmn

GwHi -  
GwLo kūm  
Komo kōmán  
UdYa kūmán  
UdCh kūm ~ kūmán  
Dana kòm ~ kwàn  
OpBi kōmán  
OpMo kōmán  
OpPa kōmán  
OpKi kōmán

\*Kǒfòn n. 'shadow\_4': Reconstructs to: PGw

GwHi gōfòn  
 GwLo kōfòn  
 Komo -  
 UdYa -  
 UdCh -  
 Dana -  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*KU<sup>h</sup> v. ‘short (be)\_1’: Reconstructs to: PKmn

GwHi gōt  
 GwLo gōt  
 Komo kùt  
 UdYa kūt<sup>h</sup>  
 UdCh kūt<sup>h</sup>  
 Dana -  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

Cannot explain initial /g/ in Gwama

\*kwabOf v. ‘steal\_1’: Reconstructs to: PKmn

GwHi kōbóf  
 GwLo kōbóf  
 Komo -  
 UdYa -  
 UdCh -  
 Dana -  
 OpBi kǎbús  
 OpMo kǎbús  
 OpPa kǎbús  
 OpKi -

\*kwak v. ‘cut (split in half lengthwise)\_2’: Reconstructs to: PCtrl

GwHi -  
 GwLo -  
 Komo kwàk  
 UdYa -

UdCh -  
Dana kwí  
OpBi kwāk  
OpMo kwāk  
OpPa kwāk  
OpKi kwāk

\*kwáj v. ‘pick up (small things), peck at\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo kwán  
UdYa kwáj  
UdCh kwáj  
Dana kwán  
OpBi kwán  
OpMo kwán  
OpPa kwán  
OpKi -

\*kwàp n. ‘horn (anatomy)\_2’: Reconstructs to: PGw

GwHi kwàp  
GwLo kwàp  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*(gɔ)kwar(a) v. ‘swagger, arrogant (be)’: Reconstructs to: PKmn

GwHi -  
GwLo kwára  
Komo gòkòl  
UdYa kār+īs  
UdCh kār+īs  
Dana k<sup>h</sup>ɔr  
OpBi k<sup>h</sup>ɔr  
OpMo k<sup>h</sup>ɔr  
OpPa k<sup>h</sup>ɔr

OpKi k<sup>h</sup>ɔr

\*ɔ=kam kamɔ n. ‘brother’: Reconstructs to: PKmn

GwHi kwám

GwLo kwám

Komo kàm

UdYa kām

UdCh à+kām

Dana āmó

OpBi hām

OpMo hām

OpPa hām

OpKi hām

Possibly ɔ+kam → kwam → kam or \*kamɔ → kwam → kam

\*(n(j)a)gaD v. ‘replace’: Reconstructs to: PKmn

GwHi nāgát

GwLo njāgát

Komo gádá

UdYa gàs

UdCh gār

Dana gátá

OpBi kàrá

OpMo kàrá

OpPa kàrá

OpKi kàrá

\*gàd(am) v. ‘belch\_1’: Reconstructs to: PCtrl

GwHi -

GwLo -

Komo gəl

UdYa gərə

UdCh gǎd

Dana gərəm

OpBi k’ērēm

OpMo gərəm

OpPa gərəm

OpKi gərəm

Cannot account for lack of expected word-initial devoicing before \*L in Dana-Opo.  
Cannot account for initial /k/ in Bilugu Opo.

\*gāgá? n. 'beeswax\_1': Reconstructs to: PKmn

GwHi gāgá  
GwLo gāgá  
Komo -  
UdYa -  
UdCh -  
Dana gāgá  
OpBi gāgá  
OpMo gāgá  
OpPa gāgá  
OpKi gāgá

\*gàj n. 'termite mound\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo gà?  
UdYa k'óp<sup>h</sup>āgàj  
UdCh k'úp<sup>h</sup>ājè  
Dana k'ók'àj  
OpBi kàj  
OpMo kàj  
OpPa kàj  
OpKi kàj

\*gàjí v. 'sow seeds (by throwing)\_2': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana gājí  
OpBi gàdzí  
OpMo gàdzí  
OpPa gàdzí  
OpKi gàdzí

\*gak' v. 'fast (from drinking or eating)': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo gá?  
UdYa gǎ



UdCh gǎk'  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*gàŋ(a) v. 'smell (v.)': Reconstructs to: PKmn

GwHi kē  
GwLo kē  
Komo gǎg  
UdYa -  
UdCh -  
Dana kàŋà  
OpBi kàŋà  
OpMo kàŋà  
OpPa kàŋà  
OpKi kàŋà

\*gàŋgārà n. 'side of body, rib\_3': Reconstructs to: POP

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi gǎŋgārà  
OpMo gǎŋgārà  
OpPa -  
OpKi -

\*gǎŋú n. 'horse\_2': Reconstructs to: PGw

GwHi gǎŋú  
GwLo gǎŋú  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -

OpKi -

\*gàs v. 'celebrate': Reconstructs to: PKoUd

GwHi -

GwLo -

Komo gàs

UdYa -

UdCh gàs

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*g(w)às' n. 'person\_1, man': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo jī+gwàz

UdYa wàzí

UdCh wàṭí

Dana jē+kàz

OpBi ò+kàdz

OpMo ò+kàdz

OpPa ò+kàdz

OpKi ò+kàdz

s' > z intervocalically then loss of final V s' > c' in Opo then voicing to [dz]  
intervocalically with loss of final V.

\*g(w)às' n. 'person\_2, man': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo gwàz

UdYa gwàs'

UdCh gwàṭ<sup>h</sup>

Dana kwàz

OpBi -

OpMo -

OpPa -

OpKi -

\*gàs' n. 'husband\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo gàz  
UdYa à+kàs'  
UdCh kàṭ<sup>h</sup>  
Dana kàzūp'  
OpBi kàdzóm  
OpMo kàdzóm  
OpPa kàdzóm  
OpKi kàdzóm  
\*s' > z /V\_V in Dana.

\*gafa n. 'belt, sash': Reconstructs to: PKmn

GwHi gáfà  
GwLo gáfà  
Komo -  
UdYa gǎf  
UdCh gāfá  
Dana gâf  
OpBi gātǎf  
OpMo gātǎf  
OpPa gātǎf  
OpKi gâf

\*gɛdɪf n. 'broom\_2': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa ʃɛdɪf  
UdCh ʃɛdɛ̃f  
Dana kɛdɛ̃f  
OpBi k<sup>h</sup>ɛ̀rɪs  
OpMo k<sup>h</sup>ɛ̀rɪs  
OpPa k<sup>h</sup>ɛ̀rɪs  
OpKi k<sup>h</sup>ɛ̀rɪf

\*gɛnd(V)(l) n. 'beehive basket': Reconstructs to: PKmn

GwHi gɛndél  
GwLo gɛndí  
Komo kɛndē

UdYa -  
UdCh -  
Dana gèndá  
OpBi gèndá  
OpMo gèndá  
OpPa gìndá  
OpKi gèndá

\*gì(n)s' v. 'tie (bundle)\_1': Reconstructs to: PKmn

GwHi kìns'  
GwLo kìns'  
Komo gìs'  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*gìc' v. 'enter\_1': Reconstructs to: PKmn

GwHi kìs'  
GwLo kìs'  
Komo gìz  
UdYa -  
UdCh cìc'  
Dana -  
OpBi kitú  
OpMo kitú  
OpPa kitú  
OpKi kitú

Alveolar /t/ in Opo cannot be accounted for.

\*gìrì v. 'poor (be)\_4': Reconstructs to: PGw

GwHi gìrì  
GwLo gìrì  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -

OpMo -  
OpPa -  
OpKi -

\*gìm v. 'pack in, stuff into container\_1': Reconstructs to: PKmn

GwHi gìm  
GwLo gìm  
Komo -  
UdYa -  
UdCh jìm  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*gìm v. 'stuff into\_2': Reconstructs to: PGw

GwHi gìm  
GwLo gìm  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*gìapaj n. 'dew\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa jápē?  
UdCh jápē?  
Dana k<sup>h</sup>ìp<sup>b</sup>ôj  
OpBi gīpàj  
OpMo gīpàj  
OpPa gīpàj  
OpKi gīpàj

\*gOmp<sup>h</sup>Vja n. 'bird\_stork (abdim)': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo à+gòmpíjá  
UdYa -  
UdCh -  
Dana -  
OpBi à+kòmp<sup>h</sup>ūjá  
OpMo -  
OpPa à+kòmp<sup>h</sup>ūjá  
OpKi -

\*gók'òm v. 'rough (be)\_3': Reconstructs to: PGw

GwHi gók'òm  
GwLo gók'òm  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*gòl v. 'stumble\_3': Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa gòl  
UdCh gòl  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*gòn v. 'scratch\_1': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -

UdCh -  
Dana gòn  
OpBi gòn  
OpMo gòn  
OpPa gòn  
OpKi gòn

\*gònk'(ɔ) n. 'skin, hide (of animal), bark of tree\_1': Reconstructs to: PKmn

GwHi gòk'óf  
GwLo gòk'óf  
Komo gònk'í  
UdYa gòk<sup>h</sup>  
UdCh -  
Dana kògò  
OpBi kògò  
OpMo kògò  
OpPa kògò  
OpKi gwàngí

\*gòr v. 'climb\_2': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo gòl  
UdYa -  
UdCh -  
Dana -  
OpBi kòr  
OpMo kòr  
OpPa kòr  
OpKi kòr

\*gùb(V) n. 'house\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo gùbí  
UdYa gùb  
UdCh gùb  
Dana kù?ú  
OpBi kù  
OpMo kù  
OpPa kù

OpKi kù

\*gUḍUm n. 'pig\_1': Reconstructs to: PKmn

GwHi kòróṃ

GwLo kòróṃ

Komo gùdúm

UdYa -

UdCh -

Dana gùḍùm

OpBi kùdùmà

OpMo kùdùmà

OpPa kùdùmà

OpKi kùdùmà

Would expect initial /k/ in Dana before \*L (cf. Gwama).

\*gùr n. 'fish\_sp (big and fat sized fish)': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo gùr

UdYa -

UdCh -

Dana gùr

OpBi gùr

OpMo gùr

OpPa gùr

OpKi gùr

\*gÛs v. 'run (SG)\_1, flow, bleed': Reconstructs to: PKmn

GwHi gòs

GwLo gòs

Komo gùf

UdYa gùs

UdCh gùs

Dana -

OpBi -

OpMo -

OpPa -

OpKi -



\*gUs' v. 'swallow\_1': Reconstructs to: PKmn

GwHi gùs'  
GwLo kùs'  
Komo gòs'  
UdYa -  
UdCh -  
Dana kòs'á  
OpBi kòt'fá  
OpMo kòt'fá  
OpPa kòt'fá  
OpKi kòt'fá

\*gólila n. 'bird (yellow-billed kite or black kite)': Reconstructs to: PKmn

GwHi -  
GwLo gól:ā  
Komo bāgólilā  
UdYa -  
UdCh -  
Dana bāgól:ā  
OpBi -  
OpMo bāgólól  
OpPa bāgólól  
OpKi bāgólà

\*gǒpò v. 'pound (v.)\_7': Reconstructs to: PGw

GwHi gǒpò  
GwLo gǒpò  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*gVs n. 'hole\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo gìf  
UdYa jìs

UdCh jìs  
Dana kùs  
OpBi kùs  
OpMo kùs  
OpPa kùs  
OpKi kùs

Vowel must have been /i/ in PKoUd to account for PUD \*g > ʃ.

\*gwàj n. 'elephant\_1': Reconstructs to: PKmn

GwHi kwì  
GwLo kwì  
Komo gwà  
UdYa gwàj  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*gwàj n. 'name\_3': Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa gwàj  
UdCh gwàj  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*gwàlí n. 'bean\_3': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana gwàlí  
OpBi gwàlí  
OpMo gwàlí

OpPa gwàlí  
OpKi gwàlí

\*gwama n. ‘Gwama (ethnonym)’: Reconstructs to: PKmn

GwHi gwà má  
GwLo kwā m à  
Komo gwà má  
UdYa -  
UdCh -  
Dana gò má  
OpBi gò má  
OpMo gò má  
OpPa gò má  
OpKi gò má

\*gwăp<sup>h</sup>i n. ‘fingernail, toenail, claw, hoof\_1’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa gwăp<sup>h</sup>i  
UdCh à+gwăp<sup>h</sup>i  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*gwăř n. ‘side of body, rib\_4’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa gwăř  
UdCh gwăř  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*gwàrás' n. 'broom\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo gwàrás'  
UdYa -  
UdCh -  
Dana gwàrás'  
OpBi gwàrátʃ  
OpMo gwàrátʃ  
OpPa gwàrátʃ  
OpKi gwàrátʃ

\*gwàt<sup>h</sup>á n. 'gourd\_2': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana gwàt<sup>h</sup>á  
OpBi -  
OpMo -  
OpPa -  
OpKi gwàt<sup>h</sup>á

\*gwat<sup>h</sup>V n. 'head pad (for head carrying)\_2': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo gwàtó  
UdYa gwăt<sup>h</sup>ē  
UdCh gwăt<sup>h</sup>ē  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*gàm v. 'find, meet': Reconstructs to: PKmn

GwHi kàm  
GwLo kàm  
Komo gàm  
UdYa gàm

UdCh gàm  
Dana kàm  
OpBi kàm  
OpMo kàm  
OpPa kàm  
OpKi kàm

\*gɔ̀jama? n. 'wound\_1': Reconstructs to: PKmn

GwHi kāmā  
GwLo kāmā  
Komo zāmā  
UdYa ɟámá  
UdCh ɟámá  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*gòdɔ̀k' v. 'deep (be)\_1': Reconstructs to: PKmn

GwHi kwì  
GwLo kwǐ  
Komo gòr  
UdYa -  
UdCh -  
Dana kòdɔ̀k'  
OpBi kōró  
OpMo kōró  
OpPa kōró  
OpKi kōró

\*k(j)as'VN n. 'earth, soil, ground, floor\_1': Reconstructs to: PKmn

GwHi k'jáɲás'  
GwLo k'ēs'én  
Komo k'às'ì  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -

OpKi -

\*k'(w)ás n. 'back\_1': Reconstructs to: PKmn

GwHi k'wás

GwLo k'wás

Komo k'ăw

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*k'á(n)c'ír v. 'chop\_3': Reconstructs to: PDaOp

GwHi -

GwLo -

Komo -

UdYa -

UdCh -

Dana k'ác'ír

OpBi k'ántf'ír

OpMo k'ántf'ír

OpPa k'ántf'ír

OpKi k'ántf'ír

\*k'ád v. 'soft (be)\_1': Reconstructs to: PKmn

GwHi k'át'

GwLo k'át'

Komo k'át'

UdYa k'ád

UdCh k'ád

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*k'ád v. 'sprout (verb)': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo k'áʔ  
UdYa k'áj  
UdCh k'ád  
Dana k'ájī  
OpBi k'áʔ  
OpMo k'áʔ  
OpPa k'áʔ  
OpKi k'áʔ

\*k'áj v. 'good (be)\_2': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi k'áj  
OpMo k'áj  
OpPa k'áj  
OpKi k'áj

\*k'ājà v. 'grab with fingers, pinch\_2': Reconstructs to: PGw

GwHi k'ājà  
GwLo k'ājà  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k'alala n. 'tonsils\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo k'alálá  
UdYa -  
UdCh -  
Dana k'alálá  
OpBi k'ált'ā

OpMo kält'ā  
OpPa kält'ā  
OpKi kält'ā

\*k'ama v. 'eat (hard food)': Reconstructs to: PKmn

GwHi k'ā  
GwLo k'ā  
Komo k'á  
UdYa k'á?  
UdCh k'á  
Dana k'ámá  
OpBi k'ámá  
OpMo k'ámá  
OpPa k'ámá  
OpKi k'ámá

\*k'ándí n. 'head pad (for head carrying)\_3': Reconstructs to: PGw

GwHi k'ándí  
GwLo k'ándí  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k'áf v. 'lack (not have)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo k'áfà  
UdYa k'áf  
UdCh k'áf  
Dana k'àf  
OpBi k'ās  
OpMo k'ās  
OpPa k'ās  
OpKi k'āf



\*k'āf v. 'red (be)\_3': Reconstructs to: PGw

GwHi k'āf  
GwLo k'āf  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k'āw ~ k'wá n\*. 'dog\_2': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo k'āw  
UdYa k'wá?  
UdCh à+k'á  
Dana -  
OpBi ?wáj  
OpMo -  
OpPa -  
OpKi -

\*k'éd v. 'break (destroy or get destroyed)': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo k'èr  
UdYa c'éd  
UdCh c'éd  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k'ēm v. 'sing\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa c'ēm

UdCh -  
Dana k'è̄m  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k'èr(é) v. 'clear land (for planting)\_3': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana k'è̄é  
OpBi k'è̄r  
OpMo k'è̄r  
OpPa k'è̄r  
OpKi k'è̄r

\*k'I(m)Is' n. 'charcoal or coal': Reconstructs to: PKmn

GwHi s'ís'ín  
GwLo s'ís'ín  
Komo k'ís'ís'ì?  
UdYa c'è̄lēs'  
UdCh c'ìlāṭ'  
Dana k'ís'  
OpBi k'ìmitʃ  
OpMo k'ìmitʃ  
OpPa k'ìtʃ  
OpKi k'ìtʃ

\*k'ì(mi)s' v. 'chop\_2': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo k'ís'  
UdYa c'ìmis'  
UdCh c'ìmīṭ'  
Dana -  
OpBi -  
OpMo -  
OpPa -

OpKi -

\*k'Of v. 'kill, fight': Reconstructs to: PKmn

GwHi k'óf  
GwLo k'óf  
Komo k'óf  
UdYa k'óf  
UdCh k'óf  
Dana k'óf  
OpBi k'ósó  
OpMo k'ósó  
OpPa k'ós  
OpKi k'óf

\*k'ó v. 'sit\_1, dwell (live, reside)\_PL': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa k'ó  
UdCh k'ó  
Dana k'ó?  
OpBi k'ó  
OpMo k'ó  
OpPa k'ó  
OpKi k'ó

\*k'òd+fè? n. 'gums\_2': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa k'òd+fè?  
UdCh k'òd+fè?  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k'ój v. 'peel\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -

Komo k'ĩ  
UdYa c'é  
UdCh c'é  
Dana k'òj  
OpBi k'é  
OpMo -  
OpPa -  
OpKi -

\*k'ók'ól n. 'cheek\_2': Reconstructs to: PGw

GwHi k'ók'ól  
GwLo k'ókí  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k'ólò n. 'hand\_2': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo k'ólò  
UdYa -  
UdCh -  
Dana -  
OpBi k'òj  
OpMo k'òj  
OpPa k'wī  
OpKi -

\*k'ót'f'ó n. 'earth, soil, ground, floor\_2': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi k'ót'f'ó

OpMo k'ótʃó  
OpPa k'ótʃó  
OpKi k'ótʃó

\*k'úβ v. 'finish\_2': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo kúp'  
UdYa -  
UdCh k'úβ  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k'ūc<sup>h</sup>ūr ~ k'ūcūr v. 'rinse mouth\_2': Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa k'úzūr  
UdCh k'ūc<sup>h</sup>ūr  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k'úl v. 'deep (be)\_2': Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa k'úl  
UdCh k'úl  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k'úmú n. 'navel, umbilical cord': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo k'úmú  
UdYa -  
UdCh -  
Dana k'úmú  
OpBi k'úmú  
OpMo k'úmú  
OpPa k'úmú  
OpKi k'úmú

\*k'úns' v. 'bite (by animal)\_2': Reconstructs to: PGw

GwHi k'úns'  
GwLo k'úns'  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k'ūɲ v. 'tasty (be)\_4': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa k'ūɲ  
UdCh k'ūɲ  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k'úp<sup>h</sup> v. 'to stew (food)\_4': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa k'úp<sup>h</sup>

UdCh k'úp<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k'uṭ v. 'clear land (for planting)\_1': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo k'úf  
UdYa k'ús  
UdCh k'út<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k'ók'ól v. 'crow (verb)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo k'ók'ól  
UdYa -  
UdCh -  
Dana k'ók'ól  
OpBi k'ók'óló  
OpMo k'ók'óló  
OpPa k'ók'óló  
OpKi k'ók'óló

\*k'ómkē n. 'termite\_3': Reconstructs to: PGW

GwHi k'ómkē  
GwLo k'ómkē  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -

OpKi -

\*k'õmp' n. 'fingernail, toenail, claw, hoof\_2': Reconstructs to: PGw

GwHi k'õmp'

GwLo k'õmp'

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*k'óp n. 'head': Reconstructs to: PKmn

GwHi k'óp

GwLo ?óp

Komo k'óp

UdYa k'úp<sup>h</sup>

UdCh k'úp<sup>h</sup>

Dana k'óp<sup>h</sup>

OpBi k'óp

OpMo k'óp

OpPa k'óp

OpKi k'óp

\*k'ós n. 'throat': Reconstructs to: PKmn

GwHi k'úf

GwLo k'úf

Komo k'óf

UdYa k'ús

UdCh k'ús

Dana k'ós

OpBi k'ósó

OpMo k'ús

OpPa k'ús

OpKi k'ús

\*k'ós(V) n. 'river\_1': Reconstructs to: PDaOp

GwHi -

GwLo -



Komo -  
 UdYa -  
 UdCh -  
 Dana k'ósī  
 OpBi k'ósó+dzi  
 OpMo k'ósó+dzi  
 OpPa k'ósí+zì  
 OpKi k'ósí+sì

\*k'õs' v. 'scratch\_3': Reconstructs to: PGw

GwHi k'õs'  
 GwLo k'õs'  
 Komo -  
 UdYa -  
 UdCh -  
 Dana -  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*k'ót v. 'cut\_2': Reconstructs to: PGw

GwHi k'ót  
 GwLo k'ót  
 Komo -  
 UdYa -  
 UdCh -  
 Dana -  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*k'õt̩ k'ut̩ v\*. 'cough': Reconstructs to: PKmn

GwHi k'ók'ót  
 GwLo k'ók'ót  
 Komo k'ùt  
 UdYa k'út<sup>h</sup>  
 UdCh k'út<sup>h</sup>  
 Dana k'út<sup>h</sup>  
 OpBi k'út'ù

OpMo k'út'ù  
OpPa k'út'ù  
OpKi k'út'ù

\*k'Vk'Vr v. 'rough (be)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa ʃégēr  
UdCh -  
Dana k'àk'àr  
OpBi k'ēk'ēr  
OpMo k'ēk'ēr  
OpPa k'ēk'ēr  
OpKi k'ák'ár

If a, vowel must have shifted to /ɛ/ in Proto- Uduk to account for k' > c' > ʃ shift in Yabus Uduk.

\*k'wà n. 'gourd\_3': Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa k'wà  
UdCh k'wà  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*k'wàḍ(í) v. 'dig (for water)\_1': Reconstructs to: PKmn

GwHi k'wī  
GwLo k'wī  
Komo k'ò  
UdYa k'wā  
UdCh -  
Dana k'wàḍí  
OpBi k'ōj  
OpMo wārí  
OpPa wādí  
OpKi k'wārí

Loss of initial /k'/ in Modin and Pame Opo.

\*k'wànt̄ n. 'tick': Reconstructs to: PKmn

GwHi k'wānt̄'fkwānt̄'

GwLo k'wānt̄'fkwānt̄'

Komo k'wàt'

UdYa k'wāt<sup>h</sup>

UdCh à+k'wāf

Dana k'wāt̄'

OpBi k'wāt'

OpMo k'wāt'

OpPa k'wāt'

OpKi k'wāt'

\*k'wǎfà n. 'bean\_2': Reconstructs to: PGw

GwHi k'wǎfà

GwLo k'wǎfà

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*s(w)à v. 'dance\_1': Reconstructs to: PKoUd

GwHi -

GwLo -

Komo f wà

UdYa sã

UdCh sã

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*s(w)am v. 'warm oneself': Reconstructs to: PKmn

GwHi sóm

GwLo sóm

Komo ʃóm  
UdYa sām  
UdCh sām  
Dana sòm  
OpBi sōm  
OpMo sōm  
OpPa sōm  
OpKi ʃōm

\*sā v. ‘court (v.), flirt with\_2’: Reconstructs to: PGw

GwHi sā  
GwLo sā  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*sád(á) n. ‘calf of leg’: Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo ʃára  
UdYa sád  
UdCh à+sád  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*sāmp’ n. ‘side of body, rib\_5’: Reconstructs to: PGw

GwHi sāmp’  
GwLo sāmp’  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -

OpMo -  
OpPa -  
OpKi -

\*sàmún n. 'maize\_3': Reconstructs to: PGw

GwHi sàmún  
GwLo sàmún  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*sáŋk' v. 'swim\_3': Reconstructs to: PGw

GwHi sáŋk'  
GwLo sáŋk'  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*sàzà v. 'dry out\_2': Reconstructs to: PGw

GwHi sàzà  
GwLo sàzà  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*sE v. 'sow seeds (by planting)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo ʃɛʔ  
UdYa sī  
UdCh sī  
Dana sè  
OpBi sē  
OpMo sē  
OpPa sē  
OpKi -

\*sel v. 'climb\_1': Reconstructs to: PKmn

GwHi sál  
GwLo sēl  
Komo -  
UdYa sē  
UdCh sē  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*sénē? n. 'one (1)\_2': Reconstructs to: PGw

GwHi sénē?  
GwLo sénē?  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*sí v. 'lay (v.)\_2': Reconstructs to: PGw

GwHi sí  
GwLo sí  
Komo -  
UdYa -

UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*sīb n. 'sand\_1': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa sīb  
UdCh à+sīb  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*sìl v. 'heavy (be)\_2': Reconstructs to: PGw

GwHi sìl  
GwLo sì?  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*símp' n. 'egg\_2': Reconstructs to: PGw

GwHi símp'  
GwLo símp'  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -

OpKi -

\*sĩnk' n. 'smoke (exhaust)\_2': Reconstructs to: PGw

GwHi sĩnk'

GwLo sĩnk'

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*sír v. 'dive\_3': Reconstructs to: PDaOp

GwHi -

GwLo -

Komo -

UdYa -

UdCh -

Dana sír

OpBi sír

OpMo sír

OpPa sír

OpKi sír

\*sĩrE n. 'tooth (canine)\_1': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo ʃil

UdYa -

UdCh -

Dana síré

OpBi sírá

OpMo sírá

OpPa sírá

OpKi sírá

\*sìzì n. 'crocodile\_2': Reconstructs to: PGw

GwHi sìzì

GwLo sìzì



Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*síd(a) v. 'hang up\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo fír  
UdYa fír  
UdCh fír  
Dana sídā  
OpBi sír  
OpMo sír  
OpPa sír  
OpKi sír

\*síl(ɪ) v. 'cut (meat into one long piece)\_2': Reconstructs to: PKmn

GwHi fíli  
GwLo fí  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi sí  
OpMo -  
OpPa -  
OpKi -

\*sìṽ v. 'far (be)\_1': Reconstructs to: PKmn

GwHi -  
GwLo fít'  
Komo fít'  
UdYa sīd  
UdCh sīd  
Dana sṽ'  
OpBi sīt'

OpMo sīt'  
OpPa sīt'  
OpKi sīt'

\*sīt'in n. 'back\_4': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi sīt'in  
OpMo sīt'in  
OpPa sīt'in  
OpKi sīt'in

\*sjã n. 'penis\_2': Reconstructs to: PGw

GwHi sjã  
GwLo sjã  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*sjãk'úf n. 'tonsils\_2': Reconstructs to: PGw

GwHi sjãk'úf  
GwLo sjãk'úf  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*sō v. 'run\_PL\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa sō  
UdCh -  
Dana -  
OpBi só  
OpMo só  
OpPa só  
OpKi só

\*sód v. 'offend\_3': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo fót  
UdYa sód  
UdCh sór  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*sóp v. 'stab\_1': Reconstructs to: PKmn

GwHi só  
GwLo só  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi sóp  
OpMo -  
OpPa sóp  
OpKi -

\*sōsór v. 'poor (be)\_3': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -

UdCh -  
Dana -  
OpBi s̄s̄s̄r  
OpMo s̄s̄s̄r  
OpPa s̄s̄s̄r  
OpKi s̄s̄s̄r

\*sud(i) n. 'beer': Reconstructs to: PKmn

GwHi fól  
GwLo fwí  
Komo fùʒí  
UdYa sū  
UdCh à+sū  
Dana sùḍ  
OpBi sī  
OpMo swī  
OpPa swī  
OpKi swī  
Gwama presumably u > ʊ and then s > f

\*sūk' v. 'stab\_3': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa sūk'  
UdCh sūk'  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*sūsá ~ s̄s̄s̄á v\*. 'push\_1': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana sūsá  
OpBi s̄s̄s̄á  
OpMo s̄s̄s̄á

OpPa sōsá  
OpKi sōsá

\*sūt'ā v. 'dip food in sauce with fingers\_2': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi sūt'ā  
OpMo sūt'ā  
OpPa sūt'ā  
OpKi sūt'ā

\*sōk'ā adv. 'two': Reconstructs to: PKmn

GwHi swījā  
GwLo swījā  
Komo sō  
UdYa sú  
UdCh sú  
Dana sōk'ā  
OpBi sōk'á  
OpMo sōk'á  
OpPa sōk'á  
OpKi sōk'á

\*sōm n. 'python\_1': Reconstructs to: PKmn

GwHi fōfóm  
GwLo fōfóm  
Komo fóm  
UdYa -  
UdCh súm  
Dana sōmó  
OpBi sōmó  
OpMo sōmó  
OpPa sōmó  
OpKi sōmó

\*sʊs v. 'lead (guide)\_1': Reconstructs to: PKmn

GwHi fʊf  
GwLo fʊf  
Komo fʊf  
UdYa sús  
UdCh sús  
Dana sʊʔ  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*swāl n. 'house\_2': Reconstructs to: PGw

GwHi swāl  
GwLo swī  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*swí v. 'pour\_3': Reconstructs to: PGw

GwHi swí  
GwLo swí  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*fa v. 'eat (soft food)\_SG': Reconstructs to: PKmn

GwHi fā  
GwLo fā  
Komo fā  
UdYa fʷá

UdCh ɟwá  
 Dana úfā  
 OpBi sá  
 OpMo sá  
 OpPa sá  
 OpKi fá

PCtrl innovates \*ufa for plural, Uduk metathesizes plural for both singular and plural, Dana changes tone for sg/pl opposition.

\*ɟ(w)at̚En n. ‘children\_1’: Reconstructs to: PCtrl

GwHi -  
 GwLo -  
 Komo ɟwàt̚ín  
 UdYa -  
 UdCh -  
 Dana ɔ̀+ɟàt̚én  
 OpBi bì+t̚í  
 OpMo -  
 OpPa -  
 OpKi -

\*ɟàdí v. ‘hot (be)\_2’: Reconstructs to: PDaOp

GwHi -  
 GwLo -  
 Komo -  
 UdYa -  
 UdCh -  
 Dana ɟàdí  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi ɟàrí

\*ɟákáná v. ‘empty (be)\_3’: Reconstructs to: PGw

GwHi ɟákáná  
 GwLo ɟákáná  
 Komo -  
 UdYa -  
 UdCh -  
 Dana -  
 OpBi -

OpMo -  
OpPa -  
OpKi -

\*fàk'à v. 'carry\_4': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana fàk'à  
OpBi sāk'ā  
OpMo sāk'ā  
OpPa sāk'ā  
OpKi sāk'ā

\*fali n. 'cloud, fog\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo fèlí  
UdYa fílá  
UdCh fílá?  
Dana àpàjǎlí?  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*fali v. 'offend\_1': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana fàlí  
OpBi sālī  
OpMo sālī  
OpPa sālī  
OpKi fál



\*fám v. 'love\_4': Reconstructs to: PGw

GwHi fám  
GwLo fám  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*fám v. 'want\_2': Reconstructs to: PGw

GwHi fám  
GwLo fám  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*fápó n. 'salt\_1': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana à+fàbó  
OpBi à+sàpó  
OpMo à+sàpó  
OpPa à+sàpó  
OpKi à+fàbó?

\*fāp' v. 'rain (v.)\_2': Reconstructs to: PGw

GwHi fāp'  
GwLo fāp'  
Komo -  
UdYa -

UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*fāf(ā) n. ‘birth pangs (pain)’: Reconstructs to: PKmn

GwHi fέ  
GwLo fέ  
Komo fāf  
UdYa -  
UdCh -  
Dana fāfā  
OpBi sāsā  
OpMo sāsā  
OpPa sāsā  
OpKi fāfā

\*fáw v. ‘pain, be hurt\_2’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo fáw  
UdYa -  
UdCh -  
Dana fáw  
OpBi sáw  
OpMo sáw  
OpPa sáw  
OpKi fáw

\*fāwā v. ‘slippery, smooth (be)\_1’: Reconstructs to: PGw

GwHi fāwā  
GwLo fāwā  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -

OpKi -

\*ʃE n. 'tooth': Reconstructs to: PKmn

GwHi ʃī  
GwLo ʃī  
Komo ʃè  
UdYa ʃē  
UdCh ʃē  
Dana ʃē  
OpBi sē  
OpMo sē  
OpPa sē  
OpKi ʃē

\*ʃèd v. 'sweep\_2': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo ʃêr  
UdYa -  
UdCh -  
Dana ʃèd  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ʃéŋgél v. 'light weight (be)\_2': Reconstructs to: PGw

GwHi ʃéŋgél  
GwLo ʃéŋí?  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ʃēt<sup>(h)</sup> n. 'antelope\_1': Reconstructs to: PKmn

GwHi ʃēt  
GwLo ʃēt

Komo ʃɛt  
UdYa ʃɛtʰ  
UdCh à+ʃɛtʰ  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ʃíd v. ‘tie up (tether)\_2’: Reconstructs to: P Ud

GwHi -  
GwLo -  
Komo -  
UdYa ʃíd  
UdCh ʃíd  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ʃij(a) v. ‘shiver\_1’: Reconstructs to: P Da Op

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana ès+ʃijà  
OpBi īs+sǐjá  
OpMo īs+sǐjá  
OpPa īs+sǐjá  
OpKi īs+sǐjá

\*ʃijà v. ‘dance\_3’: Reconstructs to: P Da Op

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana ʃijà  
OpBi sǐjā

OpMo sījā

OpPa sījā

OpKi fījā

Most likely not cognate with ‘dance\_1’ as /ʃ/ in Dana would indicate \*ʃ and /ʃ/ in Uduk is lacking.

\*fīkānā n. ‘tooth (canine)\_2’: Reconstructs to: PGw

GwHi fī+kānā

GwLo fīkānā

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*fīk’ v. ‘long or tall (be)\_2’: Reconstructs to: POp

GwHi -

GwLo -

Komo -

UdYa -

UdCh -

Dana -

OpBi sīk’

OpMo sīk’

OpPa sīk’

OpKi fīk’

\*fīn v. ‘pelt\_3, throw’: Reconstructs to: PCtrl

GwHi -

GwLo -

Komo fīn

UdYa fīn

UdCh fīn

Dana fīnà

OpBi sīnā

OpMo sīnā

OpPa -

OpKi -

\*ʃip<sup>h</sup>á n. 'knife': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo ʃipá  
UdYa -  
UdCh -  
Dana ʃip<sup>h</sup>á  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ʃí v. 'rain (v.)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo ʃí  
UdYa -  
UdCh -  
Dana ʃí  
OpBi sí  
OpMo sí  
OpPa sí  
OpKi sí

\*ʃíg n. 'bad (be)\_1': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo ʃíg  
UdYa ʃí?  
UdCh ʃí?  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ʃint' ~ ʃint' v. 'blow nose': Reconstructs to: PKmn

GwHi ʃint'  
GwLo ʃint'  
Komo ʃin+ʃònf

UdYa ʃĩn  
 UdCh ʃĩn  
 Dana ʃĩnà+ʃòʃ  
 OpBi sǐná  
 OpMo sǐná  
 OpPa sǐná  
 OpKi sǐná

\*ʃíʃ v. ‘extinguish\_2’: Reconstructs to: PGw

GwHi ʃíʃ  
 GwLo ʃíʃ  
 Komo -  
 UdYa -  
 UdCh -  
 Dana -  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*ʃO n. ‘grass’: Reconstructs to: PKmn

GwHi ʃóʃṵ  
 GwLo ʃóʃṵʃṵ  
 Komo ʃṵʔí  
 UdYa ʃṵ  
 UdCh à+ʃṵ  
 Dana ʃṵʔó  
 OpBi sṵ  
 OpMo sṵ  
 OpPa sṵ  
 OpKi sṵ

Possibly reduplicated in Gwama.

\*ʃOk'(VN) n. ‘louse\_1’: Reconstructs to: PKmn

GwHi -  
 GwLo ʃṵgṵn  
 Komo ʃṵwṵn  
 UdYa ʃṵk'ṵm  
 UdCh à+ʃṵk'ṵm  
 Dana ʃṵk'náj  
 OpBi sṵk'én

OpMo sūk'én  
OpPa sūk'én  
OpKi fūk'én

\*fOl(V) v. 'stuff into\_3': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana fóló  
OpBi sǒlí  
OpMo sǒlí  
OpPa sǒlí  
OpKi fǒlí

\*fǒ v. 'sew\_2': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo fǒ  
UdYa fǒ  
UdCh fǒ  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*fǒd v. 'scootch (move over)\_2': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo fǒd  
UdYa fǒr  
UdCh fǒr  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -



\*ʃɔk' n. 'rain (precipitation)\_2': Reconstructs to: PKmn

GwHi -  
GwLo ʃó  
Komo ó  
UdYa ʃɔk'  
UdCh à+ʃɔk'  
Dana -  
OpBi hó  
OpMo hǒ  
OpPa hǒ  
OpKi -  
\*ʃ > s > h in Opo?

\*ʃɔnk' n. 'foot or leg\_1': Reconstructs to: PKmn

GwHi sɔŋk'  
GwLo sɔnt'  
Komo ʃòg  
UdYa ʃɔk'  
UdCh ʃɔ?  
Dana ʃòg  
OpBi -  
OpMo -  
OpPa -  
OpKi -  
Cannot account for final /t' in Lowland Gwama.

\*ʃɔŋ(V) v. 'pack in, stuff into container\_2': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana ʃòŋó  
OpBi sɔŋí  
OpMo sɔŋí  
OpPa sɔŋí  
OpKi ʃɔŋó

\*ʃudaj n. 'hair\_3': Reconstructs to: PDaOp

GwHi -  
GwLo -

Komo -  
UdYa -  
UdCh -  
Dana fùdáj  
OpBi sūjé  
OpMo sūjé  
OpPa sūjé  
OpKi sūjé

\*fUImak' n. 'bone': Reconstructs to: PKmn

GwHi sí  
GwLo sí  
Komo fúmák'  
UdYa sīmā?  
UdCh à+sīmā?  
Dana fój  
OpBi sój  
OpMo sój  
OpPa sój  
OpKi sój

\*fuk'(i) v. 'wake (trs.)\_1': Reconstructs to: PKmn

GwHi sūgì  
GwLo sūgì  
Komo fùg  
UdYa fūk'  
UdCh -  
Dana fùg  
OpBi sūg  
OpMo sūg  
OpPa sūg  
OpKi fūg

\*fuk'in v. 'breathe': Reconstructs to: PKmn

GwHi fɪnfí  
GwLo fɪnfì  
Komo fùʔɛn  
UdYa fɪʔɪn  
UdCh fɪʔɪn  
Dana fɪk'  
OpBi sɪk'

OpMo sīk'  
OpPa sīk'  
OpKi sīk'

\*fúm(a) n. 'meat, animal': Reconstructs to: PKmn

GwHi sūm  
GwLo sūm  
Komo fùm  
UdYa fūm  
UdCh fūm  
Dana fùmà  
OpBi sūmā  
OpMo sūmā  
OpPa sūmā  
OpKi fūmā

\*fúm+īs v. 'stuff into\_1': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa fúm+īs  
UdCh fúm+īs  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*fúmā v. 'brood (v.)\_4': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana fúmā  
OpBi sūmā  
OpMo sūmā  
OpPa sūmā  
OpKi sūmā

\*fut' ? n. 'rope\_1': Reconstructs to: PKmn

GwHi fōdōl  
GwLo fwīt'in  
Komo fòʔí  
UdYa fí  
UdCh à+fí  
Dana fól  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*fō v. 'buy\_3, sell': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo fò  
UdYa -  
UdCh -  
Dana fò  
OpBi sō  
OpMo sō  
OpPa sō  
OpKi sō

\*fō(n)k' n. 'tendon, vein': Reconstructs to: PKmn

GwHi fōnk'  
GwLo fōnk'  
Komo fō  
UdYa fú?  
UdCh à+fú?  
Dana fùk'  
OpBi sōk'  
OpMo sōk'  
OpPa sōk'  
OpKi fūk'

\*fób v. 'copulate (animal)\_3': Reconstructs to: PKmn

GwHi fóp'  
GwLo fóp'  
Komo -  
UdYa fúb

UdCh fúḅ  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*fɔ̃nɲ n. 'nose': Reconstructs to: PKmn

GwHi fɔ̃ɲ  
GwLo fɔ̃ɲ  
Komo fɔ̃nɲ  
UdYa fũɲ  
UdCh fũɲ  
Dana fɔ̃ɲ  
OpBi sòsò  
OpMo sòs  
OpPa sòs  
OpKi fɔ̃ɲ

\*fɔ̃nɔ̃ n. 'brain\_3': Reconstructs to: PGw

GwHi fɔ̃nɔ̃  
GwLo fɔ̃nɔ̃  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*fɔ̃fɔ̃ v. 'polygamous (be)\_2': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi sósó  
OpMo sósó  
OpPa sós

OpKi [ɔ́]

\*ha v. ‘come, come\_SG’: Reconstructs to: PKmn

GwHi hǒ  
GwLo hǒ  
Komo hà + ɔ́  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*had v. ‘pull, pull off, drag’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo hàd  
UdYa -  
UdCh hǎd  
Dana hàdí  
OpBi hādí  
OpMo hādí  
OpPa hādí  
OpKi hādí

\*hádik v. ‘hiccough\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh àhǎdkí?  
Dana hádik’  
OpBi hárik’  
OpMo hárik’  
OpPa hárik’  
OpKi -

\*hag(a) v. ‘have sex\_1’: Reconstructs to: PKmn

GwHi há?  
GwLo há?

Komo hág  
UdYa -  
UdCh há?  
Dana -  
OpBi hágá  
OpMo hágá  
OpPa hágá  
OpKi hágá

\*ham v. 'yawn\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo hám  
UdYa hám  
UdCh à+hāmē  
Dana hām  
OpBi hām  
OpMo hām  
OpPa hām  
OpKi -

\*hànt'à v. 'big (be)\_2': Reconstructs to: PGw

GwHi hànt'à  
GwLo hànt'à  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*has' v. 'trample, ruminatè': Reconstructs to: PKmn

GwHi -  
GwLo hās'ì  
Komo hás'  
UdYa hás'  
UdCh háṭ'  
Dana hás'  
OpBi háṭf

OpMo hátʃ  
OpPa hátʃ  
OpKi hátʃ

\*hās'+k'òd v. 'poor (be)\_5': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa hās'+k'òd  
UdCh hāt'+k'òd  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*hāt'is v. 'sneeze\_1': Reconstructs to: PKmn

GwHi hāt'ij  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana hāt'is  
OpBi hāt'is  
OpMo hāt'is  
OpPa hāt'is  
OpKi hāt'is

\*hāwā v. 'yawn\_2': Reconstructs to: PGw

GwHi hāwā  
GwLo hāwā  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -



\*hégè v. ‘frighten\_1’: Reconstructs to: PGw

GwHi hégè  
GwLo hégè  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*hīgì v. ‘hiccough\_3’: Reconstructs to: PGw

GwHi hīgì  
GwLo hīgì  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*hìmì v. ‘fight\_3’: Reconstructs to: PGw

GwHi hìmì  
GwLo hìmì  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*hís’ ~ jís’ v\*. ‘dress up\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo jíz  
UdYa jís’

UdCh híṭ'  
Dana hízá  
OpBi hídzá  
OpMo hídzá  
OpPa hídzá  
OpKi hídzá

\*hìnt' v. 'lost (be)\_2': Reconstructs to: PGw

GwHi hìnt'  
GwLo hìnt'  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*hṣ v. 'go': Reconstructs to: PGw

GwHi hṣ  
GwLo hṣ  
Komo hà  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*hṣc' v. 'bite\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo wṣs'  
UdYa wṣʃ  
UdCh wṣc'  
Dana hṣc'  
OpBi hṣtʃṣ  
OpMo hṣtʃṣ  
OpPa hṣtʃ

OpKi hōtʃ

\*hōj v. 'hunt\_1': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo hōj

UdYa -

UdCh -

Dana -

OpBi hōj

OpMo hōj

OpPa hōj

OpKi hōj

\*hòsà ~ wòsà v. 'frighten\_4': Reconstructs to: PDaOp

GwHi -

GwLo -

Komo -

UdYa -

UdCh -

Dana wòsà

OpBi hōsā

OpMo hōsā

OpPa hōsā

OpKi hōsā

\*hōʃóʃ n. 'sap\_3': Reconstructs to: PGw

GwHi hōʃóʃ

GwLo hōʃóʃ

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*hwaj v. 'love\_1': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo hwāj  
 UdYa -  
 UdCh -  
 Dana ój  
 OpBi ójá  
 OpMo ójá  
 OpPa ójá  
 OpKi ójá

\*ràk<sup>h</sup> n. 'cloud, fog\_3': Reconstructs to: P Ud

GwHi -  
 GwLo -  
 Komo -  
 UdYa ràk<sup>h</sup>  
 UdCh ràk<sup>h</sup>  
 Dana -  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*rOk<sup>(h)</sup>Op<sub>n</sub> n. 'corner': Reconstructs to: PKmn

GwHi rókòn  
 GwLo rókòn  
 Komo rókòn  
 UdYa rùgùṅ  
 UdCh à+rúkūṅ  
 Dana rók<sup>h</sup>òn  
 OpBi rókōn  
 OpMo rókōn  
 OpPa rókōn  
 OpKi rókōn

\*RUKa n. 'basket': Reconstructs to: PKmn

GwHi lúkà  
 GwLo lúkà  
 Komo lùg  
 UdYa rùgà  
 UdCh -  
 Dana ròk<sup>h</sup>à  
 OpBi rùwà

OpMo ròkà  
OpPa ròkà  
OpKi ròkà

\*ruk'(i) v. 'tie (knot)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa rūk'  
UdCh rūh  
Dana rwí  
OpBi rwì  
OpMo rwì  
OpPa rwì  
OpKi rwì

\*rúm v. 'frighten\_3': Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa rúm  
UdCh rúm  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*lala v. 'crawl\_2': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana lálá  
OpBi lálá  
OpMo lálá  
OpPa lálá  
OpKi lálá

\*lâlí v. ‘annoint (with oil)\_5’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana làlí  
OpBi làlí  
OpMo làlí  
OpPa làlí  
OpKi làlí

\*lám+ē v. ‘rinse face\_2’: Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa lám+ē  
UdCh lám+?ē  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*langàrèt n. ‘bed\_1’: Reconstructs to: PKmn

GwHi ángàr  
GwLo -  
Komo ángàr  
UdYa ángàr  
UdCh -  
Dana -  
OpBi làngàrét  
OpMo àngàríp<sup>h</sup>  
OpPa àngàríp<sup>h</sup>  
OpKi àngàríp<sup>h</sup>

\*laṭɔn n. ‘cotton, thread, spider web\_2’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -

UdCh -  
Dana láṭʰɔ̃n  
OpBi lătɔ̃n  
OpMo lătɔ̃n  
OpPa lătɔ̃n  
OpKi lătɔ̃n

Dana aspirates voiceless interdental intervocalically.

\*lawã v. ‘cut (meat into one long piece)\_3’: Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi làwà  
OpMo làwà  
OpPa -  
OpKi -

\*lɛṭʰa n. ‘tongue\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo lɛṭʰ  
UdYa lèd  
UdCh à+lɛṭʰ  
Dana liṭʰá  
OpBi liṭʰá  
OpMo liṭʰá  
OpPa liṭʰá  
OpKi liṭʰá

\*lɛpʰɛ n. ‘claves (instrument)\_1’: Reconstructs to: PKmn

GwHi lɛpɛ  
GwLo àlàpɛ  
Komo lɛpɛ  
UdYa lɛpʰɛ  
UdCh -  
Dana lɛpʰɛ  
OpBi àlɛpʰɛ  
OpMo àlɛpʰɛ

OpPa àlèp<sup>h</sup>é  
OpKi àlèp<sup>h</sup>é

\*lilí v. ‘sink (descend)’: Reconstructs to: PKmn

GwHi lilí  
GwLo lilí  
Komo lilí  
UdYa -  
UdCh -  
Dana lil  
OpBi lilí  
OpMo lilí  
OpPa lilí  
OpKi lilí

\*lit<sup>h</sup> n. ‘large bird’: Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi lit<sup>h</sup>  
OpMo lit<sup>h</sup>  
OpPa lit<sup>h</sup>  
OpKi lit<sup>h</sup>

\*lī v. ‘extract tooth\_3’: Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi lī  
OpMo lī  
OpPa lī  
OpKi lī

\*lɔb v. ‘play\_3’: Reconstructs to: PUd

GwHi -



GwLo -  
Komo -  
UdYa lɔb  
UdCh lɔf  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*lɔgɔ v. 'tell\_2': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana lɔgɔ  
OpBi -  
OpMo -  
OpPa -  
OpKi lɔgɔ

\*lɔj n. 'antelope\_2': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi lɔj  
OpMo lɔj  
OpPa -  
OpKi -

\*lɔlɔk' n. 'brain\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo lɔlɔk'  
UdYa -  
UdCh -  
Dana lɔlɔ?

OpBi lólk'  
OpMo lólk'  
OpPa lólk'  
OpKi lólk'

\*lòṅò n. 'testicles\_2': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana lòṅò  
OpBi lòṅò  
OpMo lòṅò  
OpPa lòṅò  
OpKi lòṅò

\*lós v. 'swallow\_2': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa lós  
UdCh lós  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*lud(a) v. 'copulate (animal)\_2': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo lùd  
UdYa -  
UdCh -  
Dana lùḍá  
OpBi lūdá  
OpMo lūdá  
OpPa lūdá  
OpKi lūdá

\*lus ~ rus v\*. 'hide (sth.)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo lùs  
UdYa -  
UdCh -  
Dana rùs  
OpBi lùs  
OpMo lùs  
OpPa rùs  
OpKi -

\*luṭ<sup>(h)</sup>u n. 'trunk (of elephant)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo lūd  
UdYa -  
UdCh -  
Dana lùṭ<sup>h</sup>ú  
OpBi -  
OpMo -  
OpPa -  
OpKi -

Komo voices intervocalically: \*ṭ > d /V\_V. Subsequent loss of final vowel in Komo and retention of word-final /d/.

\*lùṭ' ~ lèt' n. 'testicles\_1': Reconstructs to: PKmn

GwHi dūt'  
GwLo dūt'  
Komo lèt'  
UdYa lùd  
UdCh à+lùd  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

Reduplication \*lùṭ' > lùṭ'ūṭ' > lùṭūṭ' > lùdūt' > dut' in Gwama?

\*lǝm n. 'bird\_vulture (white-backed)\_1': Reconstructs to: PKmn

GwHi ǝ+lǝm  
GwLo -  
Komo lǝm  
UdYa lù?  
UdCh -  
Dana lǝm  
OpBi lǝm  
OpMo lǝm  
OpPa lǝm  
OpKi lǝm

\*mà(?V) n. 'food\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo mǝʔí  
UdYa mà  
UdCh mà  
Dana màʔá  
OpBi mǎ  
OpMo mǎ  
OpPa mǎ  
OpKi mǎ

\*mā+kíkjàtə n. 'women\_2': Reconstructs to: PGw

GwHi mā+kíkjàtə  
GwLo mā+kíkjàtə  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*mǎjā v. 'criticize\_2': Reconstructs to: PGw

GwHi mǎjā  
GwLo mǎjā  
Komo -  
UdYa -

UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*mák<sup>h</sup> n. 'fox\_3': Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa mák<sup>h</sup>  
UdCh à+mák<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*mal(at) ~ mɔl v\*. 'not know (how)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo màlàt  
UdYa mɔl  
UdCh mɔl  
Dana -  
OpBi tā+mál  
OpMo tā+mál  
OpPa tā+mál  
OpKi tā+mál

\*mal(i) v. 'fish (v.)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo māl  
UdYa mālí  
UdCh -  
Dana màl  
OpBi màl  
OpMo màl  
OpPa màl

OpKi màl

\*màm(a) v. ‘carry on back\_1’: Reconstructs to: PKmn

GwHi màm  
GwLo màm  
Komo màmá  
UdYa màm  
UdCh màm  
Dana màmá  
OpBi màmā  
OpMo màmā  
OpPa màmā  
OpKi màmā

\*măn n. ‘children\_3’: Reconstructs to: PGw

GwHi măn  
GwLo măn  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*măn n. ‘young people\_2’: Reconstructs to: PGw

GwHi măn  
GwLo măn  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*mapa n. ‘saliva\_1’: Reconstructs to: PKoUd

GwHi -  
GwLo -

Komo mālà  
UdYa màjà  
UdCh màjà  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*màf n. 'wife\_1, marry, wedding': Reconstructs to: PKmn

GwHi -  
GwLo p'ā+màf  
Komo màf  
UdYa màf  
UdCh màf  
Dana màf  
OpBi màs  
OpMo màs  
OpPa màs  
OpKi màs

Range of meanings: 'wife' in Gwama, 'wedding' in Komo, wife and 'marry' in Dana, wife in Opo

\*mε n. 'goat\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo mé  
UdYa mè  
UdCh mì  
Dana mē  
OpBi mē  
OpMo mē  
OpPa mē  
OpKi mē

\*mếfế v. 'sharpen\_2': Reconstructs to: PGw

GwHi mếfế  
GwLo mếfế  
Komo -  
UdYa -  
UdCh -

Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*mɛ̃t(i) v. 'chase': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo mɛ̃tí  
UdYa -  
UdCh -  
Dana mɛ̃t<sup>h</sup>  
OpBi mɛ̃tí  
OpMo mɛ̃tí  
OpPa mɛ̃tí  
OpKi mɛ̃tí

\*mɛ̃t' n. 'hand\_1': Reconstructs to: PKmn

GwHi bit'  
GwLo mit'  
Komo -  
UdYa mɛ̃d  
UdCh mɛ̃d  
Dana mɛ̃t'  
OpBi mit'í  
OpMo mit'í  
OpPa -  
OpKi mɛ̃t'

\*mililu ~ milili n\*. 'bird\_cormant (whistling duck)': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo à+mílílū  
UdYa -  
UdCh -  
Dana mílílū  
OpBi mílílì  
OpMo mílílì  
OpPa mílílì  
OpKi mílílì



\*mít'ī v. 'grind (fine)\_2': Reconstructs to: PGw

GwHi mít'ī

GwLo mít'ī

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*mimī n. 'mosquito\_2, firefly': Reconstructs to: PKmn

GwHi mīmí

GwLo mīmí

Komo mīmí

UdYa mīmī

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

Meaning is 'firefly' in Yabus Uduk.

\*mīn v. 'tie (bundle)\_2': Reconstructs to: POP

GwHi -

GwLo -

Komo -

UdYa -

UdCh -

Dana -

OpBi mīn

OpMo mīn

OpPa mīn

OpKi mīn

\*mís n. ‘sky\_2’: Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo míʃ  
UdYa mís  
UdCh mís  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*Kì-mís v. ‘rise (oneself)\_4’: Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo gímíʃ  
UdYa cì+mís  
UdCh cì+mís  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

Unsure whether initial consonant was voiced or voiceless.

\*míʃ v. ‘know or be able\_2’: Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo míʃ  
UdYa míʃ  
UdCh míʃ  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*mòndèd n. ‘farm (n.)\_2’: Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -

UdYa m̀̀nz̀̀d  
UdCh m̀̀nd̀̀d̀̀  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*m̀̀ra n. ‘fat (from animals)\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo m̀̀r̀̀  
UdYa -  
UdCh -  
Dana m̀̀r̀̀  
OpBi m̀̀r̀̀  
OpMo m̀̀r̀̀  
OpPa m̀̀r̀̀  
OpKi m̀̀r̀̀

\*m̀̀s v. ‘clan\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo m̀̀s  
UdYa -  
UdCh -  
Dana m̀̀s  
OpBi m̀̀s  
OpMo m̀̀s  
OpPa m̀̀s  
OpKi m̀̀s

\*m̀̀r n. ‘hair\_1’: Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo m̀̀l  
UdYa m̀̀r  
UdCh à+m̀̀r  
Dana -  
OpBi -  
OpMo -

OpPa -  
OpKi -

\*mùs' v. 'rinse face\_3': Reconstructs to: PGw

GwHi mùs'  
GwLo mùs'  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*mùs' n. 'soup\_2': Reconstructs to: PGw

GwHi mùs'  
GwLo mùs'  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*mùt<sup>h</sup>á v. 'finish\_3': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi mùt<sup>h</sup>á  
OpMo mùt<sup>h</sup>á  
OpPa mùt<sup>h</sup>á  
OpKi mùt<sup>h</sup>á

\*mòs' v. 'wring\_3': Reconstructs to: PGw

GwHi mòs'  
GwLo mòs'  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*mVs'(a) v. 'shut\_1, close eyes': Reconstructs to: PKmn

GwHi mìs'  
GwLo mìs'  
Komo mòs'  
UdYa mús'+ē  
UdCh mút'+ē  
Dana mìs'à  
OpBi mòtʃ'à  
OpMo mòtʃ'à  
OpPa mòtʃ'à  
OpKi mòtʃ'à

Cannot account for the variation in vowels.

\*nǎ v. 'pick up (small things), peck at\_2': Reconstructs to: PGw

GwHi nǎ  
GwLo nǎ  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*nàbòng(w)à n. 'bird\_pelican (brown)': Reconstructs to: PKmn

GwHi -  
GwLo ǝ+nàbòṅà  
Komo nàbòṅà

UdYa -  
UdCh -  
Dana nàbòṅḡḡ  
OpBi nàbòṅḡḡ  
OpMo nàbòṅḡḡ  
OpPa nàbòṅḡḡ  
OpKi nàbòṅḡḡ

\*nàm v. ‘ask (inquire)\_2’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana nàm  
OpBi -  
OpMo -  
OpPa nàm  
OpKi nàm

\*nāmā v. ‘trade or barter\_2’: Reconstructs to: PGw

GwHi nāmā  
GwLo nāmā  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*nap(a) v. ‘disabled (be), angry (be)’: Reconstructs to: PKmn

GwHi nǎpá  
GwLo nǎpá  
Komo nǎpá  
UdYa -  
UdCh náp<sup>h</sup>ē  
Dana náp<sup>h</sup>  
OpBi nāp  
OpMo nāp

OpPa nāp  
OpKi nāp

\*nék<sup>h</sup> n. 'bird\_hammerkopf\_1': Reconstructs to: PKmn

GwHi -  
GwLo ̄+nék  
Komo à+nék  
UdYa nék<sup>h</sup>  
UdCh à+nék<sup>h</sup>  
Dana à+ník<sup>h</sup>  
OpBi -  
OpMo -  
OpPa à+ník<sup>h</sup>  
OpKi à+ník<sup>h</sup>

\*nì n. 'antelope (dikdik, small deer)\_2': Reconstructs to: PGw

GwHi ̄+nì  
GwLo nì  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*nīnī v. 'hide (sth.)\_2': Reconstructs to: PGw

GwHi nī  
GwLo nīnī  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*njans'és' n. 'honey badger': Reconstructs to: PKmn

GwHi jāns'és'  
GwLo jēnzés'  
Komo nèz  
UdYa nès'  
UdCh à+nèṭ'  
Dana nès  
OpBi nèdzè  
OpMo -  
OpPa nèdzè  
OpKi -

\*nok'a v. 'spoil (become spoiled)\_1': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana nók'à  
OpBi nǒk'á  
OpMo nǒk'á  
OpPa nǒk'á  
OpKi nǒk'á

\*nɔg v. 'blame (somebody)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo nɔg  
UdYa -  
UdCh -  
Dana nɔg  
OpBi nɔgá  
OpMo nɔgá  
OpPa nɔgá  
OpKi nɔgá

\*nókó v. 'good (be)\_3': Reconstructs to: PGw

GwHi nókó  
GwLo nókó  
Komo -  
UdYa -



UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*nós n. 'pottery, pot\_3': Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa nós  
UdCh à+nós  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*nɔp' ~ nɔmp' v\*. 'bury (sideways)': Reconstructs to: PKmn

GwHi ɔmp'  
GwLo ɔmp'  
Komo -  
UdYa -  
UdCh -  
Dana nɔp'á  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ànùrè n. 'bird\_hammerkopf\_2': Reconstructs to: POP

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi ànùrè  
OpMo ànùrè  
OpPa -

OpKi -

\*nà(n) n. 'goat\_2': Reconstructs to: PKmn

GwHi njǎ̃

GwLo njǎ̃

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*nàrá n. 'girl\_4': Reconstructs to: PUd

GwHi -

GwLo -

Komo -

UdYa nàrá

UdCh nàrá

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*náv n. 'cat\_2': Reconstructs to: PUd

GwHi -

GwLo -

Komo -

UdYa náv

UdCh à+náv

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*nǎk<sup>h</sup> v. 'try (test)\_3': Reconstructs to: PUd

GwHi -

GwLo -

Komo -  
UdYa ɲɔk<sup>h</sup>  
UdCh ɲɔk<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ɲɔr v. 'pain, be hurt\_4': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa ɲɔr  
UdCh ɲɔr  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ɲú v. 'wring\_4': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa ɲú  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ɲùrún n. 'hyena\_2': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa ɲùrínʂ'í?  
UdCh à+ɲùrún  
Dana -  
OpBi -

OpMo -  
OpPa -  
OpKi -

\*ηáp<sup>h</sup> v. 'want\_3': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa ηáp<sup>h</sup>  
UdCh ηáp<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*ηEɟ v. 'teach\_1': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana ηìɟ  
OpBi ηètɟ  
OpMo -  
OpPa -  
OpKi ηitɟ

\*àηèràη n. 'arrow\_1': Reconstructs to: POP

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi àηèràη  
OpMo -  
OpPa àηèràη  
OpKi -

\*ɲwan n. ‘four\_3’: Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana ɲwān  
OpBi hwàn  
OpMo hwàn  
OpPa hwàn  
OpKi hwàn

Borrowed from or related to \*ɲwan Proto-Nilotic (Dimmendaal 1988:39).

\*(w)àf n. ‘wife\_2’: Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo wàf  
UdYa āf  
UdCh āf  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*wa v. ‘break (v.)\_1’: Reconstructs to: PKmn

GwHi wǎ  
GwLo wǎ  
Komo wà  
UdYa wá  
UdCh wá  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*wà v. ‘dwell (live, reside)\_5’: Reconstructs to: POP

GwHi -  
GwLo -  
Komo -

UdYa -  
 UdCh -  
 Dana -  
 OpBi wà  
 OpMo wà  
 OpPa wà  
 OpKi wà

\*wa(n)t̥(I) n. ‘fire or firewood’: Reconstructs to: PKmn

GwHi ānt̥  
 GwLo ānt̥  
 Komo wàt̥íj  
 UdYa ɔ̄d  
 UdCh ɔ̄d̥  
 Dana ɔ̄t̥  
 OpBi wɔ̄t̥í  
 OpMo wɔ̄t̥í  
 OpPa wɔ̄t̥í  
 OpKi ɔ̄t̥í

\*wàɓ n. ‘boar (wild)\_1’: Reconstructs to: PKmn

GwHi wàp̥  
 GwLo wàp̥  
 Komo wàp̥  
 UdYa wàp̥<sup>h</sup>  
 UdCh à+wàɓ  
 Dana -  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*waC(a) adv. ‘fast (velocity)\_1’: Reconstructs to: PCtrl

GwHi -  
 GwLo -  
 Komo í+wàfà  
 UdYa ŋwác<sup>h</sup>à  
 UdCh wác<sup>h</sup>à  
 Dana wā<sup>h</sup>t̥  
 OpBi wāt̥  
 OpMo wāt̥

OpPa wāt  
OpKi wāt

\*wàc' à n. 'fish (n.) general term': Reconstructs to: PKmn

GwHi wàs'  
GwLo wàs'  
Komo wàs'  
UdYa wàf'  
UdCh wàc'  
Dana wàc' à  
OpBi wàtf' à  
OpMo wàtf' à  
OpPa wàtf' à  
OpKi wàtf' à

\*wàḡ n. 'home, place\_2': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana wáḡ  
OpBi -  
OpMo -  
OpPa -  
OpKi wăṯ<sup>h</sup>

\*wàḡ v. 'criticize\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo wàḡ  
UdYa wàk<sup>h</sup>  
UdCh wàk<sup>h</sup>  
Dana wàḡ  
OpBi wàḡ  
OpMo wàḡ  
OpPa wàḡ  
OpKi wàḡ

\*wàk<sup>h</sup> n. 'clan\_4': Reconstructs to: PUd

GwHi -

GwLo -  
Komo -  
UdYa wàk<sup>h</sup>  
UdCh wàk<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*wəŋa n. 'chicken\_1': Reconstructs to: PKmn

GwHi wāŋā  
GwLo wāŋā  
Komo wàgá  
UdYa ŋwá  
UdCh à+ŋwá  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*wǎŋó n. 'fox\_2': Reconstructs to: PGw

GwHi wǎŋó  
GwLo wǎŋó  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*wār n. 'child\_1': Reconstructs to: PGw

GwHi wār  
GwLo wāl  
Komo -  
UdYa -  
UdCh -  
Dana -



OpBi -  
OpMo -  
OpPa -  
OpKi -

\*wárkìn v. 'shallow (be)\_3': Reconstructs to: PGw

GwHi wárkìn  
GwLo wálkìn  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*was(ik') v. 'boil (of liquid)\_1': Reconstructs to: PKmn

GwHi wǎf  
GwLo wǎfí  
Komo wǎfík'  
UdYa -  
UdCh -  
Dana wás  
OpBi wās  
OpMo wās  
OpPa wās  
OpKi wās

\*wasak' n. 'hail, ice\_1': Reconstructs to: PKmn

GwHi wàsà  
GwLo wàsà  
Komo wǎfāk'  
UdYa wàsá?  
UdCh à+wàsá?  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*wəṭala n. 'fox\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo wātálà  
UdYa -  
UdCh -  
Dana à+wāṭ<sup>h</sup>álā  
OpBi à+wātálà  
OpMo à+wātálà  
OpPa à+wātálà  
OpKi à+wātálà

\*wé v. 'dress up\_2': Reconstructs to: PGw

GwHi wé  
GwLo wé  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*wò v. 'tell\_3': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo wò  
UdYa ó  
UdCh ó  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*wòḍ v. 'help\_1': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo wòḍ  
UdYa wòs

UdCh wòt<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*wòj n. 'axe\_5': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi wòj  
OpMo wòj  
OpPa wòj  
OpKi wòj

\*wònè n. 'foot or leg\_2': Reconstructs to: POp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi wònè  
OpMo wònè  
OpPa wòn  
OpKi wòn

\*wòr n. 'river\_4': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa wòr  
UdCh wòr  
Dana -  
OpBi -  
OpMo -  
OpPa -

OpKi -

\*wɔ̃f n. 'stone or rock\_1': Reconstructs to: PKoUd

GwHi -

GwLo -

Komo ɔ̃f

UdYa wɔ̃f

UdCh wɔ̃f

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*wɔ̃tʰ v. 'mediate\_5, help': Reconstructs to: PUD

GwHi -

GwLo -

Komo -

UdYa wòs

UdCh wɔ̃tʰ

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*wúpʰ v. 'brood (v.)\_3': Reconstructs to: PUD

GwHi -

GwLo -

Komo -

UdYa wúpʰ

UdCh wùpʰ

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*wUs n. 'sky\_1': Reconstructs to: PKmn

GwHi wús

GwLo wús

Komo -  
 UdYa -  
 UdCh -  
 Dana -  
 OpBi wòs  
 OpMo wòs  
 OpPa wòs  
 OpKi wòs

\*wús' n. 'enset\_1': Reconstructs to: PKoUd

GwHi -  
 GwLo -  
 Komo wús'  
 UdYa wús'  
 UdCh à+wút'  
 Dana -  
 OpBi -  
 OpMo -  
 OpPa -  
 OpKi -

\*wut<sup>h</sup> n. 'bird\_ostrich\_1': Reconstructs to: PKmn

GwHi -  
 GwLo wūt  
 Komo wūt  
 UdYa út<sup>h</sup>  
 UdCh à+út<sup>h</sup>  
 Dana -  
 OpBi hūt<sup>h</sup>  
 OpMo hūt<sup>h</sup>  
 OpPa hūt<sup>h</sup>  
 OpKi hūt<sup>h</sup>

Possibly borrowed from W.Nilotic (cf. Kurmuk /ʔúudù/ (Andersen 2007:75))

\*wVd v. 'become, become angry': Reconstructs to: PKmn

GwHi wět  
 GwLo wět  
 Komo wàl  
 UdYa wár  
 UdCh wád  
 Dana wâl

OpBi -  
OpMo -  
OpPa -  
OpKi -

\*(pa)jas' v. 'vomit\_1': Reconstructs to: PKmn

GwHi pājàs'  
GwLo pājàs'  
Komo jà?  
UdYa ǰǎ?  
UdCh jǎ?  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*jàgàl n. 'sweat (substance)\_2': Reconstructs to: PKmn

GwHi jàgàl  
GwLo jàgì  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi dzík'āj  
OpMo dzík'āj  
OpPa zík'āj  
OpKi ǰík'āj

Possibly not cognate between Opo and Gwama. Opo most likely compound water + good meaning 'good water'.

\*jàhúṭ n. 'fish\_(small, small scales)': Reconstructs to: PKmn

GwHi jàhú  
GwLo jàhú  
Komo jàhú  
UdYa -  
UdCh -  
Dana àhúṭ<sup>h</sup>  
OpBi àhú  
OpMo àhú  
OpPa àhúwí

OpKi àhúj

\*jàk' n. 'son': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo jà

UdYa jà?

UdCh jà?

Dana jàk'

OpBi dzàk'

OpMo dzàk'

OpPa zàk'

OpKi sàk'

\*jàn v. 'pray, beg\_2': Reconstructs to: PGw

GwHi jàn

GwLo jàn

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*jàs' v. 'wet\_2': Reconstructs to: PKoUd

GwHi -

GwLo -

Komo jès'

UdYa jàs'

UdCh jàṭ'

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*jawa ? n. ‘stone or rock\_3, grindstone (bottom)’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo wàʔí  
UdYa jòʔ  
UdCh à+jò  
Dana jàwà  
OpBi dzàw  
OpMo dzàw  
OpPa zàw  
OpKi fàwà

Narrowing of meaning to ‘grindstone’ in PKoUd.

\*jEk<sup>h</sup> v. ‘sow seeds (by throwing)\_1’: Reconstructs to: PKmn

GwHi jì  
GwLo jì  
Komo jèk  
UdYa jèk<sup>h</sup>  
UdCh jèk<sup>h</sup>  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*jEn(ɪ) n. ‘oil (organic substance)\_1’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo jèn  
UdYa jìn  
UdCh à+jìn  
Dana jín  
OpBi dzīní  
OpMo dzīní  
OpPa zīn  
OpKi fīn

\*jEsI v. ‘wet\_1, slippery’: Reconstructs to: PKmn

GwHi ífɪ  
GwLo ífɪ  
Komo jèf



UdYa jès  
UdCh jès  
Dana sì?  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*jèk<sup>h</sup> v. 'extract tooth\_2': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo jè?  
UdYa ék<sup>h</sup>  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*jès' n. 'tree\_sp.': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo jès'  
UdYa jès'  
UdCh à+jèt'  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*jìc' n. 'skin, hide (of animal), bark of tree\_3': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo jìs'  
UdYa jìnzà  
UdCh jìc'  
Dana -  
OpBi -  
OpMo -

OpPa -  
OpKi -  
\*c' > ʒ /V\_V in Yabus Uduk.

\*jid n. 'skin, hide (of animal), bark of tree\_2': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa jīd  
UdCh à+jīd  
Dana jīd+mà+fúmà  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*jidE n. 'water': Reconstructs to: PKmn

GwHi ijá?  
GwLo ijá?  
Komo jī  
UdYa wùdí?  
UdCh jīd'é?  
Dana jī'í  
OpBi dzì  
OpMo dzì  
OpPa zì  
OpKi fì?  
Cannot explain initial /wu/ in Yabus Uduk.

\*jigi v. 'protect\_2': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo jìgí?  
UdYa -  
UdCh -  
Dana -  
OpBi dzìgí  
OpMo dzìgí  
OpPa -  
OpKi -

\*jikin v. 'shake (sth.)\_4': Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa jígin  
UdCh jík<sup>h</sup>in  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*jíl v. 'play\_2': Reconstructs to: PGw

GwHi jíl  
GwLo jí  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*jílón n. 'shadow\_1': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana jílón  
OpBi -  
OpMo -  
OpPa -  
OpKi jílón

\*jìman n. 'sap\_1': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo ìmàn+sá  
UdYa -

UdCh jìmán  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*jìf n. 'maggot\_3': Reconstructs to: PUD

GwHi -  
GwLo -  
Komo -  
UdYa jìf  
UdCh à+jìf  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*jī v. 'play (instrument)\_2': Reconstructs to: PKmn

GwHi jī  
GwLo jī  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi dǎjī  
OpMo dǎjī  
OpPa zī  
OpKi fī

\*jǐ v. 'leave\_1': Reconstructs to: PGw

GwHi jǐ  
GwLo jǐ  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -

OpKi -

\*jīḍ n. 'axe\_2': Reconstructs to: PCtrl

GwHi -

GwLo -

Komo jīʔ

UdYa -

UdCh -

Dana jīḍ

OpBi -

OpMo -

OpPa -

OpKi -

\*jīp' v. 'stab\_2': Reconstructs to: PKoUd

GwHi -

GwLo -

Komo jīp'

UdYa jíḗ<sup>h</sup>

UdCh jíḗ<sup>h</sup>

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

Deglottalization word-finally \*p' > p<sup>h</sup> in Proto-Uduk?

\*jól v. 'buy\_2': Reconstructs to: PUD

GwHi -

GwLo -

Komo -

UdYa jól

UdCh jól

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*jól v. 'sell\_2': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa jól  
UdCh jól  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*jòr v. 'grind (dry)\_4': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa jòr  
UdCh jòr  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*jú v. 'pour\_5': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa jú  
UdCh jú  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*juga v. 'call\_2': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa júk<sup>h</sup>

UdCh júk<sup>h</sup>  
Dana -  
OpBi dzùgà  
OpMo dzùgà  
OpPa zùgà  
OpKi fùgà

Also means 'sing' in Chali Uduk

\*jVl v. 'set (heavenly bodies)\_3': Reconstructs to: PUd

GwHi -  
GwLo -  
Komo -  
UdYa jíl  
UdCh júl  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*T̄A(t̄<sup>h</sup>) n. 'arrow\_3': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo sá  
UdYa sá  
UdCh à+t̄á  
Dana sē̄t̄<sup>h</sup>  
OpBi -  
OpMo t̄fē  
OpPa -  
OpKi t̄fē

Cognacy of KoUd with DaOp is questionable.

\*T̄ál v. 'resemble (reflect)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo sál  
UdYa sál  
UdCh t̄ál  
Dana hálà  
OpBi t̄fál

OpMo tfál  
OpPa tfál  
OpKi tfál

\*T̄in n. 'tail (of animal)\_2': Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo sìn  
UdYa sìn  
UdCh t̄ìn  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*(a)T̄ina ? n. 'nosebleed\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo zinà  
UdYa -  
UdCh -  
Dana -  
OpBi àtfwinà  
OpMo àtfwinà  
OpPa àtfwinà  
OpKi àtfwinà

Cannot account for voicing in intial /z/ in Komo.

\*T̄is v. 'lost (be)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa tís  
UdCh t̄ís  
Dana síš  
OpBi síšī  
OpMo síšī  
OpPa síšī  
OpKi síšī



\*Tis'(a) v. 'urinate\_3': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh t̩t̩'  
Dana -  
OpBi t̩t̩f'á  
OpMo t̩t̩f'á  
OpPa t̩t̩f'á  
OpKi t̩t̩f'á

\*T̩Ol(a) v. 'descend (land)': Reconstructs to: PKmn

GwHi -  
GwLo f̩ò  
Komo -  
UdYa s̩l  
UdCh t̩l  
Dana -  
OpBi t̩f̩j'á  
OpMo t̩f̩j'á  
OpPa t̩f̩j'á  
OpKi t̩f̩j'á

\*T̩ú<sup>(h)</sup>(a) v. 'set (heavenly bodies)\_4': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana s̩ú<sup>h</sup>ā  
OpBi -  
OpMo -  
OpPa -  
OpKi t̩f̩ú<sup>h</sup>á

\*T̩ú(n)G n. 'guinea fowl\_1': Reconstructs to: PKmn

GwHi f̩ǒnk'  
GwLo f̩ǒnk'  
Komo zòg  
UdYa -

UdCh t̥ūk<sup>h</sup>  
Dana s̥ōk<sup>h</sup>  
OpBi t̥f̥ōg<sup>ó</sup>  
OpMo t̥f̥ōg<sup>ó</sup>  
OpPa t̥f̥ōg  
OpKi t̥f̥ōg

\*D̥a v. 'go\_SG': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo jà  
UdYa jà  
UdCh jà  
Dana ḍā  
OpBi dzà  
OpMo dzà  
OpPa zà  
OpKi ʃà

\*D̥ak'a v. 'vomit\_2': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana ḍák'à  
OpBi dzāk'á  
OpMo dzāk'á  
OpPa zāk'á  
OpKi ʃāk'á

\*D̥E n. 'eye\_1': Reconstructs to: PKmn

GwHi zì  
GwLo zì  
Komo -  
UdYa ī  
UdCh ē  
Dana ḍè  
OpBi dzè  
OpMo dzè  
OpPa zè

OpKi ʃè

\*D̥E(se) n. ‘seed\_1’: Reconstructs to: PKmn

GwHi zì

GwLo zì

Komo -

UdYa -

UdCh -

Dana d̥èsê

OpBi dz̥èsē

OpMo dz̥èsē

OpPa z̥èsē

OpKi s̥èsē

Cf. ‘eye’

\*D̥i v. ‘doze off\_1’: Reconstructs to: PKmn

GwHi síṣī

GwLo síṣī

Komo zìzì

UdYa -

UdCh -

Dana -

OpBi dìsì

OpMo dìsì

OpPa zìz

OpKi sìs

\*D̥ibàl n. ‘bird\_Quelea (Red-billed)’: Reconstructs to: PCtrl

GwHi -

GwLo -

Komo dibàl

UdYa -

UdCh -

Dana -

OpBi à+dzìbà

OpMo à+dzìbà

OpPa à+dzìbà

OpKi à+dzìbà

Cannot account for lack of expected initial /z/ in Komo.

\*D̥ir ? v. 'green\_1': Reconstructs to: PKmn

GwHi z̥i  
GwLo z̥î  
Komo z̥i  
UdYa z̥i  
UdCh d̥i  
Dana s̥is̥i  
OpBi t̥ʃir  
OpMo t̥ʃir  
OpPa t̥ʃir  
OpKi t̥ʃir

\*D̥iṭa n. 'person\_2': Reconstructs to: PKmn

GwHi s̥it  
GwLo s̥it  
Komo -  
UdYa -  
UdCh -  
Dana d̥iṭà  
OpBi -  
OpMo -  
OpPa v̥+zit̥à  
OpKi v̥+ʃit̥à

\*D̥iṭ<sup>h</sup> n. 'shadow\_5': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo z̥iṭ  
UdYa -  
UdCh -  
Dana -  
OpBi d̥z̥iṭ<sup>h</sup>  
OpMo d̥z̥iṭ<sup>h</sup>  
OpPa z̥iṭ<sup>h</sup>  
OpKi ʃiṭ<sup>h</sup>

\*D̥om v. 'string (v.) (e.g. beads)\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo òm  
UdYa w̥òm

UdCh hóm  
Dana ðòm  
OpBi dzòm  
OpMo dzòm  
OpPa dzòm  
OpKi fòm

\*ḍṍṥṥṥ n. 'snake\_1': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana ḍṍṥṥṥṥ  
OpBi dzṍ  
OpMo dzṍ  
OpPa zṍ  
OpKi fṍ

\*ḍṍḍṍ n. 'name\_1': Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo zāgà  
UdYa -  
UdCh -  
Dana -  
OpBi dzùgà  
OpMo -  
OpPa -  
OpKi fùgà

\*ḍṍḍṍ'à v. 'grind (dry)\_1': Reconstructs to: PDaOp

GwHi -  
GwLo -  
Komo -  
UdYa -  
UdCh -  
Dana ḍṍḍṍ'à  
OpBi dzùk'à  
OpMo dzùk'à  
OpPa zùk'à

OpKi fùk'à

Would expect initial /ḡ/ in Dana.

\*DVf n. 'maggot\_1': Reconstructs to: PDaOp

GwHi -

GwLo -

Komo -

UdYa -

UdCh -

Dana dɨf

OpBi dùsù

OpMo dzùs

OpPa zùs

OpKi fùf

Would expect initial /ḡ/ in Dana.

\*zàl v. 'sit\_2': Reconstructs to: PGw

GwHi zàl

GwLo zè

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*zínzì v. 'thin (be)\_2': Reconstructs to: PGw

GwHi zínzì

GwLo zínzì

Komo -

UdYa -

UdCh -

Dana -

OpBi -

OpMo -

OpPa -

OpKi -

\*zjada(j) n. ‘chili pepper\_1’: Reconstructs to: PKmn

GwHi zét  
GwLo zét  
Komo zjànt’á  
UdYa -  
UdCh -  
Dana à+zāt<sup>h</sup>ē?  
OpBi dzèrà  
OpMo -  
OpPa -  
OpKi -

\*zūgū v. ‘stand\_2’: Reconstructs to: PGw

GwHi zūgū  
GwLo zūgū  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

\*zɔj n. ‘antelope (dikdik, small deer)\_2’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo zwì  
UdYa wí  
UdCh à+ʔúj  
Dana zòj  
OpBi à+ʔójó  
OpMo à+ʔóí  
OpPa à+ʔóí  
OpKi -

\*ʔja v. ‘go\_PL’: Reconstructs to: PCtrl

GwHi -  
GwLo -  
Komo ì  
UdYa ī

UdCh ī  
Dana -  
OpBi ʔjá  
OpMo ʔjá  
OpPa ʔjá  
OpKi ʔjá

\*ʔjamVn n. ‘seed\_2’: Reconstructs to: PKoUd

GwHi -  
GwLo -  
Komo ʔjámón  
UdYa ēmén  
UdCh ēmén  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -

Also means ‘kidney’ in Uduk.

\*ʔù v. ‘grind (dry)\_3’: Reconstructs to: PGw

GwHi ʔù  
GwLo ʔù  
Komo -  
UdYa -  
UdCh -  
Dana -  
OpBi -  
OpMo -  
OpPa -  
OpKi -



APPENDIX C

tone correspondence sets

C.1 PKMN Tone Correspondence Set A

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
cannabis_1	*bángwà	báŋgà	báŋgà	bánkò	bǎŋgò	bǎŋgò	-	-	-	-	-
bird_heron	*bár	-	ō+bár	à+bár	-	-	à+bár	à+bár	à+bár	à+bár	à+bár
strong (be)_1	*bís' ~ bís'	p'í	p'í	bís'	bís'	bít'	-	-	-	-	-
whistle	*cut	-	fút	fít	-	cúwā	cói	tjúwì	tjúwì	tjúwì	tjúwì
tree	*cwálá	swálá	swájá	sá	f wá	cwá	cá	tjá	tjá	tjá	tjá
Dazu (S. Sudan)	*dájV	dázò	dázò	dázò	dǎjò	dǎjò	dájò	dádžò	dádžò	dádžò	dádžò
shout_1	*dól(ɔ)	dól	dól	dól	-	-	ól	-	-	-	-
pipe (for smoking)_1	*dójè	dózè	dózè	dózè	-	-	dójè	-	-	-	-
have sex_1	*hag(a)	háʔ	háʔ	hág	-	háʔ	-	hágá	hágá	hágá	hágá
trample, ruminant	*has'	-	hās'ì	hás'	hás'	hát'	hás'	hátʃ'	hátʃ'	hátʃ'	hátʃ'
Opo (ethnonym)_1	*k <sup>(h)</sup> ínáj	kíná	kíná	kíná	c <sup>h</sup> ínáj	-	kínáj	-	-	-	-
sew_1	*kós	ós	ós	-	-	-	kós	kós	kós	kós	kós
pound (v.)_4	*kóp <sup>h</sup>	kóp	kóp	-	kúp <sup>h</sup>	-	-	-	-	-	-
repair_1	*k <sup>h</sup> aɓ	áp	-	áb	-	-	óbā	k <sup>h</sup> áp'	k <sup>h</sup> áp'	k <sup>h</sup> áp'	k <sup>h</sup> áp'
shut_2	*k <sup>h</sup> ac'	kǎʃ	kǎʃ	-	k <sup>h</sup> áʃ	k <sup>h</sup> ác'	-	-	-	-	-
open	*k <sup>h</sup> ád(a)	kálá	kájá	kár	k <sup>h</sup> äd	k <sup>h</sup> äd'	k <sup>h</sup> átá	k <sup>h</sup> átá	k <sup>h</sup> átá	k <sup>h</sup> átá	k <sup>h</sup> átá
giraffe_2	*k <sup>h</sup> OG	kók	kók	-	k <sup>h</sup> úʔ	k <sup>h</sup> úʔ	k <sup>h</sup> ég	-	-	-	kék
dry (be)	*k <sup>h</sup> ós'	kús'	kús'	kós'	k <sup>h</sup> ús'	k <sup>h</sup> út'	k <sup>h</sup> ós'	k <sup>h</sup> ótʃ'ó	k <sup>h</sup> ótʃ'ó	k <sup>h</sup> ótʃ'ó	-
porcupine_1	*k <sup>(h)</sup> ak'as ~ k <sup>(h)</sup> asak'	kák'àʃ	kák'àʃ	káfák'	-	-	kásāk'	k <sup>h</sup> ásāk'	k <sup>h</sup> ásāk'	k <sup>h</sup> ásāk'	k <sup>h</sup> áfāk'
soft (be)_1	*k'át'	k'át'	k'át'	k'át'	k'ád	k'ád'	-	-	-	-	-

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
kill, fight	*k'Of	k'óf	k'óf	k'óf	k'óf	k'óf	k'óf	k'ósó	k'ósó	k'ós	k'óf
head	*k'óp	k'óp	?óp	k'óp	k'úp <sup>h</sup>	k'úp <sup>h</sup>	k'óp <sup>h</sup>	k'óp	k'óp	k'óp	k'óp
throat	*k'ús	k'úf	k'úf	k'óf	k'ús	k'ús	k'ús	k'ósó	k'ús	k'ús	k'ús
bird_hammerkopf_1	*nék <sup>h</sup>	-	ō+nék	à+nék	nék <sup>h</sup>	à+nék <sup>h</sup>	à+ník <sup>h</sup>	-	-	à+ník <sup>h</sup>	à+ník <sup>h</sup>
shake (sth.)_1	*pid(V)	-	pídí	pídá	pít <sup>h</sup>	pír	-	-	-	-	-
vagina_1	*pít <sup>h</sup> ~ pít <sup>h</sup>	pít	pít	pít	-	-	pít <sup>h</sup>	-	-	-	-
platform	*p <sup>h</sup> ará	pára	pára	pára	-	-	p <sup>h</sup> ará	p <sup>h</sup> ará	p <sup>h</sup> ará	p <sup>h</sup> ará	p <sup>h</sup> ará
peel, husk_1	*p'i(n)C'?	p'íns'	p'íns'	-	-	p'íd'	p'ít'	-	-	-	-
corner	*rOk <sup>(h)</sup> Op	rókòn	rókòn	rókòn	rúgùn	à+rúkūp	rók <sup>h</sup> òn	rókòn	rókòn	rókòn	rókòn
cut (meat into one long piece)_2	*síl(i)	ʃíli	ʃí	-	-	-	-	sí	-	-	-
stab_1	*sóp	só	só	-	-	-	-	sóp	-	sóp	-
lead (guide)_1	*sɔs	ʃóf	ʃóf	ʃóf	sús	sús	sóʔ	-	-	-	-
blood_1	*s'ámá	s'ám	s'ám	-	-	-	s'ámá	tʃámá	tʃámá	tʃámá	tʃámá
cold (be)_1	*s'óp	s'óp	s'óp	-	s'úp <sup>h</sup>	t'úp <sup>h</sup>	-	-	-	-	-
copulate (animal)_3	*ʃóʃ	ʃóp'	ʃóp'	-	ʃúb	ʃúb	-	-	-	-	-
grind (second grind)	*(ɔ)t'ɔd'	-	twéj	tó	-	t'ód'	òt'ó	ótó	ót <sup>h</sup>	ót <sup>h</sup>	ót <sup>h</sup>
roughen (stone for grinding)	*tít	sít	sít	tít	tít <sup>h</sup>	tír	tít <sup>h</sup>	títí	tít <sup>h</sup>	tít <sup>h</sup>	tít <sup>h</sup>
kick	*t <sup>h</sup> áb	táp'	táp'	táb	t <sup>h</sup> áb	t <sup>h</sup> áb	t <sup>h</sup> áp	t <sup>h</sup> áp	t <sup>h</sup> áp	t <sup>h</sup> áp	t <sup>h</sup> áp

## C.2 PKMN Tone Correspondence Set B

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
neck	*bida ~ bɪda	p̄il	p̄i	bàʔ	bāʔ	bāʔ	bɪdà	bɪjā	bɪjā	bɪjā	bɪjā
new_1	*dis ~ dɪs	dɪf	dɪf	zɪf	tɪs	tɪs	-	-	-	-	-
send	*dar(a)	t'álà	t'ájà	dàr	dɛt <sup>h</sup>	-	dɛd	-	dɛr	-	dɛr
someone_1	*gòd'ók'	kwi	kwi	gòr	-	-	kòd'ók'	kōró	kōró	kōró	kōró

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
short (be)_1	*KŪt'	gōt	gōt	kùt	kūth	kūth	-	-	-	-	-
cry	*kO(j)	kū	kū	kò	kō	kō	kòj	kwē	kwē	kwē	kwē
herd (v.)	*k <sup>h</sup> aj	kēʔ	kēʔ	kàʔi	-	-	k <sup>h</sup> ajíʔ	k <sup>h</sup> ají	k <sup>h</sup> ají	k <sup>h</sup> ají	k <sup>h</sup> ají
bitter, sour (be)	*k <sup>h</sup> ak'a	kāgā	kāgā	kàʔ	k <sup>h</sup> āʔ	k <sup>h</sup> āʔ	k <sup>h</sup> ak'à	k <sup>h</sup> ak'ā	k <sup>h</sup> ak'ā	k <sup>h</sup> ak'ā	k <sup>h</sup> ak'ā
dig (for water)_1	*k'wàḍ(i)	k'wī	k'wī	k'ò	k'wā	-	k'wàḍí	k'òj	wārí	wādí	k'wārí
tick	*k'wànt'	k'wànt'í'kwànt'	k'wànt'í'kwànt'	k'wàt'	k'wāt <sup>h</sup>	à+k'wāḍ'	k'wàḍ'	k'wāt'	k'wāt'	k'wāt'	k'wāt'
sink (descend)	*lilí	lilí	lilí	lilí	-	-	lil	lilí	lilí	lilí	lilí
bury (sideways)	*nɔp' ~ *nɔmp'	ōmp'	ōmp'	-	-	-	nòp'á	-	-	-	-
touch_1, crawl	*pàD	pāt	pāt	pàt	pāt <sup>h</sup>	pār	-	-	-	-	-
wrap	*pɔʃ ~ puʃ	pōʃ	pōʃ	-	pūʃ	pūʃ	púʃá	pūsá	pūsá	pūsá	pūsá
laugh	*p <sup>h</sup> (j)as'	īs'	pās'	pès'	p <sup>h</sup> ēs'	p <sup>h</sup> ēʃ'	p <sup>h</sup> às'	p <sup>h</sup> atʃ'	p <sup>h</sup> atʃ'	p <sup>h</sup> atʃ'	p <sup>h</sup> atʃ'
soak_1	*p <sup>h</sup> àc'	pās'	pās'	pàs'	p <sup>h</sup> āʃ'	p <sup>h</sup> āc'	-	-	-	-	-
fly (v.)	*p <sup>h</sup> àḍ	pāl	pāj	pàj	p <sup>h</sup> āj	p <sup>h</sup> ē	p <sup>h</sup> àḍ	p <sup>h</sup> āj	p <sup>h</sup> āj	p <sup>h</sup> āj	p <sup>h</sup> āj
far (be)_1	*sìʃ'	-	ʃit'	ʃit'	sīd	sīd'	sìʃ'	sīt'	sīt'	sīt'	sīt'
shave	*s'èḍ ~ s'ìḍ	sīl	sī	s'è	sī	c'ē	s'èḍ	tʃ'ē	tʃ'ē	tʃ'ē	tʃ'ē
louse_1	*ʃOk'(VN)	-	ʃōgòn	ʃùwèn	ʃōk'òm	à+ʃōk'òm	ʃùk'náj	sūk'één	sūk'één	sūk'één	ʃùk'één
foot or leg_1	*ʃɔnk'	sōŋk'	sōnt'	ʃòg	ʃòk'	ʃòʔ	ʃòg	-	-	-	-
wake (trs.)_1	*ʃuk'(V)	sūgì	sūgì	ʃùg	ʃùk'	-	ʃùg	sūg	sūg	sūg	ʃùg
meat, animal	*ʃum(a)	sūm	sūm	ʃùm	ʃùm	ʃùm	ʃùmà	sūmā	sūmā	sūmā	ʃùmā
forehead_1	*t <sup>(h)</sup> (w)àg	twā	twā	tàg	-	-	tàg	bī+t <sup>h</sup> āg	-	pī+t <sup>h</sup> āg	-
be, do	*tà	-	ta	tà	tā	tā	-	tā	-	tā	-
salt_(made from ash of a particular plant/tree)_2	*t'aj	t'āʃ	t'āʃ	t'àʃ	t'āʃ	t'āʃ	t'àʃ	t'ās	-	-	-
fire or firewood	*wa(n)t'(Iʃ)	ānt'	ānt'	wàt'íʃ	ōd	ōd'	òʃ'	wōt'í	wōt'í	wōt'í	ōt'í

C.3 PKMN Tone Correspondence Set C

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
father_1	*bàbá	-	bàbá	bǎ	à+bàbá	à+bàbá	-	àbá	àbá	àbá	àbá
wide (be)	*bàj ~ bǎj	pàj	pàj	ǎjà	ǎn	bè	-	pàj	pàj	pàj	pàj
drum_B	*bàmbá	pàmbà	pàmbà	-	bàmbá	-	-	-	-	-	-
toss, throw away, fall over	*bit <sup>(h)</sup>	pìt	pìt	bit	bít <sup>h</sup>	bít <sup>h</sup>	-	-	-	-	-
hide, skulk	*bòb ~ bǒb	pòp'	pòp'	bòb	-	-	-	pòj	pòj	pòj	-
pregnant (be)	*bUma	pòm	pòm	bú	pwá	bwà	pùmá	pǔmá	pǔmá	pǔmá	pǔmá
belly or stomach_1	*bùfùl	bùfùl	bùfi	bùf	-	bùf	-	pùsà	pùsà	pùsà	pùsà
path, road_1, towards	*bwan(a)	pwǎnà	pwǎnà	-	-	bwàj	-	-	-	-	-
palate_1	*ǎlilaj	p'ǎlìlì	p'ǎlìlì	ǎlìlǎ	-	-	-	-	-	-	-
grandfather_1	*càk <sup>h</sup> O	-	sàkó	sàkó	-	-	-	tǎk <sup>h</sup> ó	tǎk <sup>h</sup> ó	tǎk <sup>h</sup> ó	tǎk <sup>h</sup> ó
dig_1	*jà	jà	jà	-	-	-	cà	tjà	tjà	tjà	tjà
baboon_1, dog_2	*dɪŋɪ	tìni	tìni	-	-	-	tèŋ	tìni	tìni	tìn	tìn
stomp, step on_1	*djalIs'	dèlìs'	dàlìs'	dìl	dìl	dìl	-	tìlì	tìlì	tìlì	tìlì
urine_1, urinate_1	*dùc'á	dùs'	tùs'	dòs'	-	-	tùc'á?	-	-	-	-
tree (sp.)(sausage tree_Kigelia africana)	*dùmàj	-	ū+dùmì	dùmè	-	-	dùmáj	dùmàj	dùmàj	dùmàj	dùmàj
grind wet (first grind)	*Dàs'	dàs'	dàs'	nàs'	nàs'	nàṭ'	-	-	-	-	-
Dana (ethnonym)_3	*ḍana	dànā	dànā	dānā	-	-	ḍanā	dànā	dànā	dànā	dànā
strain (solids from liquid)_1	*ḍim	-	zìŋā	zìm	zìm	ḍim	ṭim	tìm	tìm	tìm	tìm
bee, honey	*ḍàm	tàm	tàm	dàm	dàm	à+ḍàm	ṭàm	tàm	tàm	tàm	tàm
seed_1	*ḌE(se)	zì	zì	-	-	-	ḍèsè	džèsè	džèsè	zèsè	sèsè

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
replace	*(n(j)a)gaD	nāgát	njāgát	gàdá	gàs	gàr	gàtá	kàrá	kàrá	kàrá	kàrá
smell (v.)	*gàŋ(a)	kē	kē	gàg	-	-	kàŋà	kàŋà	kàŋà	kàŋà	kàŋà
tie (bundle)_1	*gì(n)s'	kìns'	kìns'	gìs'	-	-	-	-	-	-	-
pack in, stuff into container_1	*gìm	gìm	gìm	-	-	jìm	-	-	-	-	-
skin, hide (of animal), bark of tree_1	*gònk'(ɔf)	gòk'óf	gòk'óf	gònk'í	gòk <sup>h</sup>	-	kògò	kògò	kògò	kògò	gwàŋgí
pig_1	*gUđUm	kòróm	kòróm	gùdúm	-	-	gùđùm	kùdùmà	kùdùmà	kùdùmà	kùdùmà
run (SG)_1, flow, bleed	*gùs ~ gòs	gòs	gòs	gùf	gùs	gùs	-	-	-	-	-
swallow_1	*gUs'	gùs'	kùs'	gòs'	-	-	kòs'á	kòt'á	kòt'á	kòt'á	kòt'á
elephant_1	*gwàj	kwì	kwì	gwà	gwàj	-	-	-	-	-	-
Gwama (ethnonym)	*gwama	gwàmá	kwāmà	gwàmá	-	-	gòmá	gòmá	gòmá	gòmá	gòmá
find, meet	*gàm	kàm	kàm	gàm	gàm	gàm	kàm	kàm	kàm	kàm	kàm
sow seeds (by throwing)_1	*jEk <sup>h</sup>	jì	jì	jèk	jèk <sup>h</sup>	jèk <sup>h</sup>	-	-	-	-	-
wet_1, slippery water	*jEsI *ji(dE)	ífi ìjá?	ífi ìjá?	jèf jǐ	jès wùdí?	jès jìd'é?	sì? jìrì	- dzì	- dzì	- zì	- fì?
sorghum, millet	*jana	sjànà	sjànà	zènā	-	-	-	dzèná	-	dzèná	-
bird_stork (maribou)	*jàrú	zèrú	zèrú	zèrú	zàrú	-	ʃèrú	dzèrú	dzèrú	dzèrú	dzèrú
grandmother_1	*k <sup>h</sup> àk <sup>h</sup> á	-	kàká	kàká	-	-	k <sup>h</sup> àk <sup>h</sup> á	kàká	kàká	kàká	kàká
claves (instrument)_1	*lèp <sup>h</sup> é	lèpé	àlápé	lèpé	lèp <sup>h</sup> é	-	lèp <sup>h</sup> é	àlèp <sup>h</sup> é	àlèp <sup>h</sup> é	àlèp <sup>h</sup> é	àlèp <sup>h</sup> é
carry on back_1	*màm(a)	màm	màm	màmá	màm	màm	màmá	màmā	màmā	màmā	màmā
wife_1, marry, wedding	*màf	-	p'ā+màf	màf	màf	màf	màf	màs	màs	màs	màs
hand_1	*mèt'	bìt'	mìt'	-	mèd	mèd'	mèt'	mìt'í	mìt'í	-	mèt'

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
bird_pelican (brown)	*nàbòng(w)à	-	ō+nàbòṅà	nàbòṅà	-	-	nàbòṅgò	nàbòṅgò	nàbòṅgò	nàbòṅgò	nàbòṅgò
nosebleed_2	*S'Un(t')a	-	t'ònt'	-	-	-	s'ùnà?	-	-	-	-
drum_C	*tàrá	-	tàrá	tàrá	-	-	tàrá	tàrá	tàrá	tàrá	tàrá
boar (wild)_1	*wàḅ	wàp'	wàp'	wàp'	wàp <sup>h</sup>	à+wàḅ	-	-	-	-	-
fish (n.) general term	*wàc'à	wàs'	wàs'	wàs'	wàḟ'	wàc'	wàc'à	wàḟ'à	wàḟ'à	wàḟ'à	wàḟ'à
hail, ice_1	*wasak'	wàsà	wàsà	wàḟāk'	wàsá?	à+wàsá?	-	-	-	-	-

#### C.4 POP XH Correspondence Set

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
warm up (sth.)	*Cis'	ḟif	ḟif	jíz	jís'	jít <sup>h</sup>	hízà	ísá	ísá	ísá	-
fish_sp (electric)_1	*díṅkā	-	ō+wàs'+díṅkā	díṅkā	-	-	-	díṅā	díṅā	díṅā	díṅā
bird_weaver	*dwak <sup>h</sup>	ō+dwâk	ō+dók	à+dók	-	-	à+dwák <sup>h</sup>	à+dwák <sup>h</sup>	à+dwák <sup>h</sup>	à+dwák <sup>h</sup>	à+dwák <sup>h</sup>
sneeze_1	*haḟ'is	hăt'if	-	-	-	-	hăt'is	hăt'is	hăt'is	hăt'is	hăt'is
fish_(small, small scales)	*jàhút	jàhú	jàhú	jàhú	-	-	àhút <sup>h</sup>	àhú	àhú	àhúwí	àhúj
smoke out (e.g an animal out of a hole)_1	*k <sup>h</sup> uf	kǒḟ	kǒḟ	ūs	-	-	húḟ	ús	ús	ús	úḟ
cover (v.)	*kum(bi)	kùmbì	kùmbì	kúm	kūm	kūm	kúmā	kúmá	kúmá	kúmá	kúmá
blow (with mouth)	*p <sup>h</sup> ui(ki)	pīkī	pī	pì	p <sup>h</sup> új	p <sup>h</sup> í	p <sup>h</sup> új	p <sup>h</sup> ú	p <sup>h</sup> ú	p <sup>h</sup> ú	p <sup>h</sup> ú
spicy (be)_1	*p <sup>h</sup> Ul?	pòl	pwi	-	-	-	p <sup>h</sup> íl	p <sup>h</sup> íli	p <sup>h</sup> íli	p <sup>h</sup> íli	p <sup>h</sup> íli
burnt gound, soot	*p <sup>h</sup> uZa	ḟāpót	ḟābót	kí+pú	bwà+p <sup>h</sup> wí	à+p <sup>h</sup> í?	pùzà?	p <sup>h</sup> újhá	p <sup>h</sup> újhá	p <sup>h</sup> újhá	p <sup>h</sup> újhá

disregard	*pif	pīs	pīs	píf	-	píf	píf	pís	pís	pís	pís
rat_1	*s'ík	s'í	s'í	s'ík	s'í?	à+ɬ'ík <sup>h</sup>	-	tʃ'ígí	tʃ'ígí	tʃ'ígí	tʃ'ígí
blow nose	*fɪnt' ~ *fɪnt'	fɪnt'	fɪnt'	fɪn+fònɲ	fɪn	fɪn	fɪnà+fòɲ	síná	síná	síná	síná
spit (v.)_1	*ɬ <sup>h</sup> ú	tū	tū	-	-	-	ɬ <sup>h</sup> úwà	t <sup>h</sup> újhá	t <sup>h</sup> újhá	t <sup>h</sup> újhá	t <sup>h</sup> újhá
bird_dove (African mourning)	*tiritiri	-	títìtì	-	-	-	-	à+tìrítírì	à+tìrítírì	à+tìrítírì	à+tìrítírì
acacia	*túk <sup>(h)</sup> (u)	tőkò	-	túk	túk <sup>h</sup>	à+ɬúk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>
bird_ostrich_1	*wut <sup>h</sup>	-	wūt	wūt	út <sup>h</sup>	à+út <sup>h</sup>	-	hút <sup>h</sup>	hút <sup>h</sup>	hút <sup>h</sup>	hút <sup>h</sup>

APPENDIX D

PROTO-KOMAN CONSONANT CORRESPONDENCE SETS

The abbreviations for the language varieties are as follows: GwLo= Lowland Gwama, GwHi= Highland Gwama, UdYa= Yabus Uduk, Komo=Ethiopian Komo, UdCh= Chali Uduk, Dana=Dana, OpBi= Bilugu Opo, OpMo= Modin Opo, OpPa= Pame Opo, OpKi= Kigile Opo. I employ the grapheme <+> to indicate a historical or synchronic morpheme boundary.

D.1 PKMN Correspondence Set 1: \*p<sup>h</sup>

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
laugh	*p <sup>h</sup> (j)as'	īs'	pās'	pès'	p <sup>h</sup> ēs'	p <sup>h</sup> ēt'	p <sup>h</sup> às'	p <sup>h</sup> ātʃ'	p <sup>h</sup> ātʃ'	p <sup>h</sup> ātʃ'	p <sup>h</sup> ātʃ'
soak_1	*p <sup>h</sup> àc'	pās'	pās'	pàs'	p <sup>h</sup> ājʃ'	p <sup>h</sup> āc'	-	-	-	-	-
fly (v.)	*p <sup>h</sup> àḍ	pāl	pāj	pàj	p <sup>h</sup> āj	p <sup>h</sup> ē	p <sup>h</sup> àḍ	p <sup>h</sup> āj	p <sup>h</sup> āj	p <sup>h</sup> āj	p <sup>h</sup> āj
shoe	*p <sup>h</sup> ák'á	pák	pák	páʔ	p <sup>h</sup> āʔ	à+p <sup>h</sup> āʔ	-	p <sup>h</sup> ák'á	p <sup>h</sup> ák'	p <sup>h</sup> ák'	-
come free and fall off	*p <sup>h</sup> al	pĩ	pĩ	-	-	-	-	p <sup>h</sup> ál	p <sup>h</sup> ál	p <sup>h</sup> ál	p <sup>h</sup> ál
platform	*p <sup>h</sup> ará	pára	pára	pára	-	-	p <sup>h</sup> ará	p <sup>h</sup> ará	p <sup>h</sup> ará	p <sup>h</sup> ará	p <sup>h</sup> ará
blow (with mouth)	*p <sup>h</sup> ui(ki)	pīkī	pī	pì	p <sup>h</sup> ùj	p <sup>h</sup> í	p <sup>h</sup> ùj	p <sup>h</sup> ú	p <sup>h</sup> ú	p <sup>h</sup> ú	p <sup>h</sup> ú
spicy (be)_1	*p <sup>h</sup> Ul?	pòl	pwi	-	-	-	p <sup>h</sup> íl	p <sup>h</sup> ílī	p <sup>h</sup> ílī	p <sup>h</sup> ílī	p <sup>h</sup> ílī
burnt ground, soot	*p <sup>h</sup> uZa	ḟāpót	ḟābót	kí+pú	bwà+p <sup>h</sup> wí	à+p <sup>h</sup> íʔ	pùzàʔ	p <sup>h</sup> újhá	p <sup>h</sup> újhá	p <sup>h</sup> újhá	p <sup>h</sup> újhá
pound (v.)_4	*kóp <sup>h</sup>	kóp	kóp	-	kúp <sup>h</sup>	-	-	-	-	-	-
claves (instrument)_1	*lèp <sup>h</sup> é	lèpé	àlèpé	lèpé	lèp <sup>h</sup> é	-	lèp <sup>h</sup> é	àlèp <sup>h</sup> é	àlèp <sup>h</sup> é	àlèp <sup>h</sup> é	àlèp <sup>h</sup> é
cold (be)_1	*s'óp	s'óp	s'óp	-	s'úp <sup>h</sup>	ʃ'úp <sup>h</sup>	-	-	-	-	-
bathe	*úp <sup>h</sup>	óp	óp	úp	úp <sup>h</sup>	úp <sup>h</sup>	úp <sup>h</sup>	úp <sup>h</sup>	úp <sup>h</sup>	úp <sup>h</sup>	úp <sup>h</sup>



D.2 PKMN Correspondence Set 2: \*p

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
touch_1, crawl	*pàD	pāt	pāt	pāt	pāt <sup>h</sup>	pār	-	-	-	-	-
shake (sth.)_1	*pid(V)	-	pídí	pídá	pít <sup>h</sup>	pír	-	-	-	-	-
disregard	*píʃ	pīs	pīs	píʃ	-	píʃ	píʃ	pís	pís	pís	pís
vagina_1	*pít <sup>h</sup> ~ pít <sup>h</sup>	pít	pít	pít	-	-	pít <sup>h</sup>	-	-	-	-
wrap	*pʊʃ ~ puʃ	pōʃ	pōʃ	-	pūʃ	pūʃ	púʃá	pūsá	pūsá	pūsá	pūsá
carry on head_1	*kOp <sup>h</sup>	kǔ	kǔ	-	-	-	kōp <sup>h</sup>	kōp	kōp	kōp	kōp
head	*k'óp	k'óp	?óp	k'óp	k'úp <sup>h</sup>	k'úp <sup>h</sup>	k'óp <sup>h</sup>	k'óp	k'óp	k'óp	k'óp
disabled, angry (be)	*nap(a)	nápá	nápá	nápá	-	náp <sup>h</sup> ē	náp <sup>h</sup>	nāp	nāp	nāp	nāp
stab_1	*sóp	só	só	-	-	-	-	sóp	-	sóp	-

D.3 PKMN Correspondence Set 3: \*b

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
father_1	*bábá	-	bàbá	bǎ	à+bàbá	à+bàbá	-	àbá	àbá	àbá	àbá
cannabis_1	*bángwà	bángà	bángà	bánkò	bǎngò	bǎngò	-	-	-	-	-
bird_heron	*bár	-	ō+bár	à+bár	-	-	à+bár	à+bár	à+bár	à+bár	à+bár
fishhook	*Bmc'	bīms'	bīms'	bīms'	bīʃ'	à+bīc'	bíc'	bītʃ'	bītʃ'	bītʃ'	bītʃ'
dust, sand_1	*burbuʃ	bùrbūt	bùrbūt	-	būt <sup>h</sup>	búd'	būr'k'ùs	būr'k'ùs	būr'k'ùs	būr'k'ùs	būr'k'ùs
steal_1	*kwabOʃ	kōbóʃ	kōbóʃ	-	-	-	-	kābús	kābús	kābús	-
bird_pelican (brown)	*nàbòng(w)à	-	nàbòṅà	nàbòṅà	-	-	nàbòṅò	nàbòṅò	nàbòṅò	nàbòṅò	nàbòṅò
dip food in sauce with fingers_1	*s'UB(V)(n)	-	s'ópón	s'üb	s'úp <sup>h</sup>	t'úp <sup>h</sup>	s'úbá	-	-	-	-
pierce_1	*tʊb(a) ~ tuba(a)	só	só	-	tüp <sup>h</sup>	tüp <sup>h</sup>	túbá	-	-	t <sup>h</sup> úbá	t <sup>h</sup> úbá

D.3a PKMN Correspondence Set 3a: \*b

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
wide (be)	*bàj ~ báj	pàj	páj	bàjá	bàn	bè	-	pàj	páj	páj	páj
drum_B	*bàmbá	pàmbà	pàmbà	-	bàmbá	-	-	-	-	-	-
toss, throw away, fall over	*bit <sup>(h)</sup>	pìt	pìt	bit	bít <sup>h</sup>	bít <sup>h</sup>	-	-	-	-	-
hide, skulk	*bòb ~ bób	pòp'	póp'	bòb	-	-	-	pòj	pój	pój	-
pregnant (be)	*bUma	pòm	pòm	bú	pwá	bwà	pùmá	pùmá	pùmá	pùmá	pùmá
belly or stomach_1	*bùfùl	bùfùl	bùfì	bùf	-	bùf	-	pùsà	pùsà	pùsà	pùsà
extract tooth_1, barking (of dog)	*bøk <sup>h</sup>	pö	pö	-	-	bük <sup>h</sup>	-	-	-	-	-
path, road_1, towards	*bwan(a)	pwǎŋà	pwǎŋà	-	-	bwàj	-	-	-	-	-
choke, strangle_1	*bus'	büs'	büs'	-	büs'	büt'	-	p <sup>h</sup> ütʃ	-	-	-

D.4 PKMN Correspondence Set 4: \*b

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
frog_1	*bɔŋk'ó	p'à+bɔŋg'ó	p'à+bɔŋg'ó	bā+bɔŋk'ó	-	-	à+bɔŋk'ó	à+bɔŋk'ó	à+bɔŋk'ó	à+bɔŋk'ó	à+bɔŋk'ó
palate_1	*balilaj	p'àlìlì	p'àlìlì	bàlìlá	-	-	-	-	-	-	-
tree_sp._1	*bafa	p'àf	-	bàf	bàfà	-	bàfà	bāsā	bāsā	bāsā	-
neck	*biɖa ~ biɖa	p'īl	p'ī	bàʔ	bāʔ	bāʔ	biɖà	biǰā	biǰā	biǰā	biǰā
strong (be)_1	*bís' ~ bís'	p'í	p'í	bís'	bís'	bít'	-	-	-	-	-
copulate (animal)_3	*fóɓ	fóp'	fóp'	-	fúb	fúb	-	-	-	-	-
kick	*t <sup>h</sup> áb	táp'	táp'	táb	t <sup>h</sup> áb	t <sup>h</sup> áb	t <sup>h</sup> áp	t <sup>h</sup> áp	t <sup>h</sup> áp	t <sup>h</sup> áp	t <sup>h</sup> áp
boar (wild)_1	*wàb	wàp'	wàp'	wàp'	wàp <sup>h</sup>	à+wàb	-	-	-	-	-

D.5 PKMN Correspondence Set 5: \*p'

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
ash_1	*(t'i)p'IkIɲ(a)	p'ík'ín	p'ík'ín	p'ín	-	t'ip'ɪɲ	p'ínā	-	-	p'ínā	p'ínā
peel, husk_1	*p'i(n)C'?	p'íns'	p'íns'	-	-	p'íd'	p'ít'	-	-	-	-
pick_1	*p'ɔ́ɫ'(a)	p'ót	p'ót	p'òt'	-	-	p'òt' <sup>h</sup> à	p'òt'ā	p'òt'ā	p'òt'ā	p'òt'ā
bury (sideways)	*nɔp' ~ nɔmp'	ɔmp'	ɔmp'	-	-	-	nɔp'á	-	-	-	-
sip (liquid)	*wɔp' ~ hɔp'	hɔ̀bòs'hòp'	hɔ̀bòs'	wóp'	k <sup>h</sup> ɔ̀bòs	-	hòp'	hòp'ɔ̀	hòp'	hòp'	hòp'

D.6 PKMN Correspondence Set 6: \*t<sup>h</sup>

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
kick	*t <sup>h</sup> áb	táp'	táp'	táb	t <sup>h</sup> áb	t <sup>h</sup> áb	t <sup>h</sup> áp	t <sup>h</sup> áp	t <sup>h</sup> áp	t <sup>h</sup> áp	t <sup>h</sup> áp
make go away	*t <sup>h</sup> af ~ t <sup>h</sup> af	tāf	tāf	tàf	t <sup>h</sup> áf	t <sup>h</sup> áf	-	-	-	-	-
spit (v.)_1	*t <sup>h</sup> ú	tū	tū	-	-	-	t <sup>h</sup> úwà	t <sup>h</sup> újhá	t <sup>h</sup> újhá	t <sup>h</sup> újhá	t <sup>h</sup> újhá
vagina_1	*pít <sup>h</sup> ~ pít <sup>h</sup>	pít	pít	pít	-	-	pít <sup>h</sup>	-	-	-	-

D.7 PKMN Correspondence Set 7: \*t

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
cotton, thread, spider web_1	*t <sup>h</sup> ɔs ~ t <sup>h</sup> us	dɔ́f	dɔ́f	tūf	tūs	tūs	-	-	-	-	-
drum_C	*t <sup>h</sup> àrá	-	tàrá	tàrá	-	-	t <sup>h</sup> àrá	tàrá	tàrá	tàrá	tàrá
acacia	*t <sup>h</sup> úk <sup>(h)</sup> (u)	tɔ̀kò	-	túk	túk <sup>h</sup>	à+t <sup>h</sup> úk <sup>h</sup>	t <sup>h</sup> úk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>
roughen (stone for grinding)	*t <sup>h</sup> ít	sít	sít	tít	tít <sup>h</sup>	tír	t <sup>h</sup> ít <sup>h</sup>	títí	tít <sup>h</sup>	tít <sup>h</sup>	tít <sup>h</sup>
pierce_1	*t <sup>h</sup> ɔ̀b(a) ~ t <sup>h</sup> uba(a)	só	só	-	tūp <sup>h</sup>	tūp <sup>h</sup>	t <sup>h</sup> úbá	-	-	t <sup>h</sup> úbá	t <sup>h</sup> úbá
grind (second grind)	*ɔ̀t <sup>h</sup> ɔ̀d	-	twéj	tó	-	t <sup>h</sup> óɔ́	òt <sup>h</sup> ɔ̀	ótó	ót <sup>h</sup>	ót <sup>h</sup>	ót <sup>h</sup>

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
person_2	*Dṛṛa	sīt	sīt	-	-	-	ḍṛṛà	-	-	ò+zità	ò+fità

D.8 PKMN Correspondence Set 8: \*ḍ

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
Dana (ethnonym)_3	*ḍana	dānā	dānā	dānā	-	-	ḍānā	dānā	dānā	dānā	dānā
slip (v.)_1	*ḍerk'es'	dērgés'	dērgés'	-	dērès	ḍērès	ḍérk'és	-	-	-	-
neck	*ḍiḍa ~ ḍiḍa	pīl	pī	bàʔ	bāʔ	bāʔ	ḍiḍà	ḍijā	ḍijā	ḍijā	ḍijā
beehive basket	*gēnd(V)(l)	géndél	géndí	këndē	-	-	gēndá	géndá	géndá	gindá	géndá
pig_1	*gUḍUm	kòróṃ	kòróṃ	gùdúm	-	-	gùḍúm	kùdùmà	kùdùmà	kùdùmà	kùdùmà
dig (for water)_1	*k'wàḍ(i)	k'wī	k'wī	k'ò	k'wā	-	k'wàḍí	k'òj	wārí	wādí	k'wārí
fly (v.)	*p <sup>h</sup> àḍ	pāl	pāj	pàj	p <sup>h</sup> āj	p <sup>h</sup> ē	p <sup>h</sup> àḍ	p <sup>h</sup> āj	p <sup>h</sup> āj	p <sup>h</sup> āj	p <sup>h</sup> āj
beer	*suḍ(i)	fól	fwí	fùʔí	sū	à+sū	sùḍ	sī	swī	swī	swī
shave	*s'èḍ ~ s'ìḍ	sīl	sī	s'è	sī	c'ē	s'èḍ	tj'ē	tj'ē	tj'ē	tj'ē

D.8 PKMN Correspondence Set 8a: \*ḍ

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
strain (solids from liquid)_1	*ḍim	-	zìṅā	zìṃ	zìṃ	ḍìṃ	ṭìṃ	tìṃ	tìṃ	tìṃ	tìṃ
new_1	*ḍis ~ ḍis	dīf	dīj	zìf	tīs	ṭīs	-	-	-	-	-
bee, honey	*ḍàm	tàm	tàm	dàm	dàm	à+ḍàm	ṭàm	tàm	tàm	tàm	tàm

D.9 PKMN Correspondence Set 9: \*t̥'

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
sneeze_1	*haʔ̥'is	hát'íʃ	-	-	-	-	háʔ̥'is	hát'is	hát'is	hát'is	hát'is
alone, abstain from, not want to do	*t̥'ɛn	-	s̄'ín	s'én	t'én	t'é	gà+t̥'én	ā+t'én	ā+t'én	ā+t'én	ā+t'én
mouth	*t̥'wa	t'wā	t'wā	t'ā	t'wā	t'wā	t̥'āʔ̥á	t'ā	t'ā	t'ā	t'ā
enter_2, sprout	*t̥'wɪ	t'wí	t'wí	-	-	-	t̥'wí	-	-	-	-

D.9 PKMN Correspondence Set 9a: \*t̥'

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
soft (be)_1	*k'át̥'	k'át'	k'át'	k'át'	k'ád	k'ád'	-	-	-	-	-
cough	*k'Uʔ̥'	k'ók'ót	k'ók'ót	k'út	k'út <sup>h</sup>	k'út <sup>h</sup>	k'úʔ̥ <sup>h</sup>	k'út'ù	k'út'ù	k'út'ù	k'út'ù
tick	*k'wànt̥'	k'wánt'í kwánt'	k'wánt'í kwánt'	k'wát'	k'wāt <sup>h</sup>	à+k'wād	k'wàʔ̥'	k'wāt'	k'wāt'	k'wāt'	k'wāt'
testicles_1	*lùʔ̥' ~ lòʔ̥'	dūt'	dūt'	lòt'	lùd	à+lùd'	-	-	-	-	-
hand_1	*mèʔ̥'	bìt'	mìt'	-	mèd	mèd'	mèʔ̥'	mìt'í	mìt'í	-	mèt'
pick_1	*p'ɔʔ̥'(a)	pót	pót	p'òt'	-	-	p'òʔ̥ <sup>h</sup> à	p'òt'ā	p'òt'ā	p'òt'ā	p'òt'ā
far (be)_1	*sìʔ̥'	-	ʃìt'	ʃìt'	sīd	sīd'	sìʔ̥'	sīt'	sīt'	sīt'	sīt'
fire or firewood	*wa(n)ʔ̥'(ɪʃ)	ānt'	ānt'	wàt'íʃ	ōd	ōd'	òʔ̥'	wōt'í	wōt'í	wōt'í	ōt'í
chili pepper_1	*zjaʔ̥'a(j)	zét	zét	zjànt'á	-	-	à+zāʔ̥ <sup>h</sup> ēʔ̥?	dzèrà	-	-	-

D.10 PKMN Correspondence Set 10: \*t<sup>h</sup>

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
toss, throw away, fall over	*bit <sup>(h)</sup>	pìt	pìt	bìt	bít <sup>h</sup>	bít <sup>h</sup>	-	-	-	-	-
short (be)_1	*KŪt <sup>h</sup>	gōt	gōt	kùt	kūt <sup>h</sup>	kūt <sup>h</sup>	-	-	-	-	-
antelope_1	*fēt <sup>(h)</sup>	ōfēt	fēt	fēt	fēt <sup>h</sup>	à+fēt <sup>h</sup>	-	-	-	-	-
bird_ostrich_1	*wut <sup>h</sup>	-	wūt	wūt	út <sup>h</sup>	à+út <sup>h</sup>	-	hút <sup>h</sup>	hút <sup>h</sup>	hút <sup>h</sup>	hút <sup>h</sup>

## D.11 PKMN Correspondence Set 11: \*t

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
forehead_1	*t <sup>(h)</sup> (w)àg	twã	twã	tàg	-	-	tàg	bī+t <sup>h</sup> àg	-	pī+t <sup>h</sup> àg	-
be, do	*tà	-	ta	tà	tā	tā	-	tā	-	tā	-
shake (sth.)_2	*tEŋ(g)(E)	tīgī	tīgī	-	-	-	téŋ	-	tíŋhá	tíŋhá	tíŋhá
bird_dove (African mourning)	*tiritiri	-	títìtì	-	-	-	-	à+tìrítírì	à+tìrítírì	à+tìrítírì	à+tìrítírì
long or tall (be)_1	*tur ~ tər	tũ	tũ	tól	túr	túr	-	-	-	-	-
tell_1	*(w)ot(V)	ǒdó	ǒd	-	-	-	-	ótá	ótá	ótá	-

## D.12 PKMN Correspondence Set 12: \*d

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
Dazu (S. Sudan)	*dájV	dázò	dázò	dázzò	dājò	dājò	dájò	dádžò	dádžò	dádžò	dádžò
shout_1	*dəl(ɔ)	dól	dól	dól	-	-	ǒl	-	-	-	-
finish_1	*dak	-	dak	dàg	dàk <sup>h</sup>	dàk <sup>h</sup>	dàk	dàk	-	-	-

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
tree (sp.)(sausage tree_Kigelia africana)	*dùmàj	-	ũ+dùmì	dùmè	-	-	dùmáj	dùmàj	dùmàj	dùmàj	dùmàj
grind wet (first grind)	*Dàs'	dàs'	dàs'	nàs'	nàs'	nàṭ'	-	-	-	-	-
fish_sp (electric)_1	*díŋkā	-	ō+wàs' +díŋkā	díŋkā	-	-	-	díŋā	díŋā	díŋā	díŋā
pipe (for smoking)_1	*dójè	dózè	dózè	dózè	-	-	dójè	-	-	-	-
fish_sp (very small, scaled fish with a small rounded mouth)	*dòlò	-	dòlò	dòlò	-	-	dólí?	dòlò	dòlò	dòlò	dólí
bird_weaver	*dwak <sup>h</sup>	ō+dwák	ō+dók	à+dók	-	-	à+dwák <sup>h</sup>	à+dwák <sup>h</sup>	à+dwák <sup>h</sup>	à+dwák <sup>h</sup>	à+dwák <sup>h</sup>

#### D.12 PKMN Correspondence Set 12a: \*d

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
baboon_1, dog_2	*díŋɾ	tìní	tìní	-	-	-	tèŋ	tìní	tìní	tìn	tìn
stomp, step on_1	*djalls'	dèlís'	dàlís'	díl	díl	díl	-	tílí	tílí	tílí	tílí
urine_1, urinate_1	*dùc'á	dùs'	tùs'	dòs'	-	-	tùc'á?	-	-	-	-
ask (inquire)_1	*dOt	tõt	tõt	dòt	dõt <sup>h</sup>	dõt <sup>h</sup>	-	tõtó	tõtó	-	-

#### D.13 PKMN Correspondence Set 13: \*d

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
carry many things_1	*(t)ḍò	tòḍò	-	ḍò	ḍò	ḍò	-	ḍò	ḍò	ḍò	ḍò

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
scorpion	*d(w)ank'i ~ d(w)ank'i	*t'wānk'í	*t'wānk'	bādāgí	dfwāk <sup>h</sup>	à+dāk <sup>h</sup>	dāgí	dāgí	dāgí	dāgí	dāgí
send someone_1	*dar(a)	t'álà	t'ájà	dār	dēt <sup>h</sup>	-	dèd	-	dēr	-	dēr
dust, sand_1	*burbuɸ	bùrbüt	bùrbüt	-	büt <sup>h</sup>	büɸ	bürk'ùs	bürk'ùs	bürk'ùs	bürk'ùs	bürk'ùs
water	*ji(dE)	ijá?	ijá?	jī	wùdí?	jìd'é?	jìrì	dzì	dzì	zì	fi?
dust, sand_1	*burbuɸ	bùrbüt	bùrbüt	-	büt <sup>h</sup>	büɸ	bürk'ùs	bürk'ùs	bürk'ùs	bürk'ùs	bürk'ùs
3SG.M	*had(i)	ō+hāl	ō+hāj	hàr	hádi	ádi	hār	-	-	-	-

D.14 PKMN Correspondence Set 14: \*t'

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
salt_(made from ash of a particular plant/tree)_2	*t'af	t'āf	t'āf	t'āf	t'āf	t'āf	t'āf	t'ās	-	-	-
cut (split in half lengthwise)_1	*t'wan(k)a ~ t'wan(k)a	t'āṅà	t'āṅà	-	t'wák <sup>h</sup>	t'wák <sup>h</sup>	-	-	-	-	-
drip (fall in globules)_1	*c'ɔ(t'ɔ)l	s'ót'ó	s'ót'ó	s'òlil	-	c'ɔc'ɔlɔc'	c'ò?	tʃ'ɔ	tʃ'ɔ	tʃ'ɔ	tʃ'ɔ
nosebleed_2	*S'Un(t')a	-	t'ònt'	-	-	-	s'ùná?	-	-	-	-
rope_1	*fut' ?	fōdòl	fwit'in	fò?í	fí	à+fí	fól	-	-	-	-

D.15 PKMN Correspondence Set 15: \*s'

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
blood_1	*s'ámá	s'ám	s'ám	-	-	-	s'ámá?	tʃ'ámá	tʃ'ámá	tʃ'ámá	tʃ'ámá
light (ignite)	*s'a	s'ā	s'ā	s'à	s'ā	t'ā	s'ówà	tʃ'ǎ	tʃ'ǎ	tʃ'ǎ	tʃ'ǎ
cold (be)_1	*s'óp	s'óp	s'óp	-	s'úp <sup>h</sup>	t'úp <sup>h</sup>	-	-	-	-	-
shave	*s'èd ~ s'ìd	s'īl	s'ī	s'è	s'ī	c'ē	s'èd	tʃ'ē	tʃ'ē	tʃ'ē	tʃ'ē



Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
rat_1	*s'ík	s'í	s'í	s'ík	s'íʔ	à+t'ík <sup>h</sup>	-	tʃ'ígí	tʃ'ígí	tʃ'ígí	tʃ'ígí
dip food in sauce with fingers_1	*s'UB(V)(n)	-	s'ópón	s'ūb	s'úp <sup>h</sup>	t'úp <sup>h</sup>	s'úbá	-	-	-	-
defecate_1, diarrhea	*s'UDI	ús'	ús'	s'í	-	t'í	s'òdó	tʃ'ōjí	tʃ'ōjí	tʃ'ōjí	tʃ'ōjí
nosebleed_2	*S'Un(t')a	-	t'ònt'	-	-	-	s'ùnáʔ	-	-	-	-
choke, strangle_1	*bus'	būs'	būs'	-	bùs'	bùt'	-	p <sup>h</sup> útʃ'	-	-	-
strong (be)_1	*bís' ~ bís'	p'í	p'í	bís'	bís'	bít'	-	-	-	-	-
tear (shred)_3	*c'(w)ēs'	s'wě	s'wě	-	-	c'ēt'	-	-	-	-	-
grind wet (first grind)	*Dàs'	dàs'	dàs'	nàs'	nàs'	nàt'	-	-	-	-	-
slip (v.)_1	*d̥erk'es'	d̥érgés'	d̥érgés'	-	d̥èrès	d̥èrès	d̥érk'és	-	-	-	-
tie (bundle)_1	*gì(n)s'	kìns'	kìns'	gìs'	-	-	-	-	-	-	-
swallow_1	*gUs'	gùs'	kùs'	gòs'	-	-	kòs'á	kòtʃ'á	kòtʃ'á	kòtʃ'á	kòtʃ'á
trample, ruminate	*has'	-	hàs'ì	hàs'	hàs'	hát'	hàs'	hátʃ'	hátʃ'	hátʃ'	hátʃ'
vomit_1	*(pa)jas'	pājàs'	pājàs'	jàʔ	ǰǎʔ	ǰǎʔ	-	-	-	-	-
dry (be)	*k <sup>h</sup> ós'	kús'	kús'	kós'	k <sup>h</sup> ús'	k <sup>h</sup> út'	k <sup>h</sup> ós'	k <sup>h</sup> ótʃ'ó	k <sup>h</sup> ótʃ'ó	k <sup>h</sup> ótʃ'ó	-
earth, soil, ground, floor_1	*k(j)as'VN	k'jánás'	k'ēs'én	k'ās'ì	-	-	-	-	-	-	-
charcoal or coal	*k'I(m)Is'	s'ís'ín	s'ís'ín	kìs'ís'ìʔ	c'ēlēs'	c'īlāṭ'	k'is'	k'imitʃ'	k'imitʃ'	k'ītʃ'	k'ītʃ'
shut_1, close eyes	*mVs'	mìs'	mìs'	mòs'	mús'+ē	mút'+ē	mìs'à	mòtʃ'à	mòtʃ'à	mòtʃ'à	mòtʃ'à
honey badger	*njans'es'	jāns'és'	ǰēnzés'	nèz	nès'	à+nēt'	nès	nèdzè	-	nèdzè	-
laugh	*p <sup>h</sup> (j)as'	īs'	pās'	pès'	p <sup>h</sup> ēs'	p <sup>h</sup> ēt'	p <sup>h</sup> às'	p <sup>h</sup> ātʃ'	p <sup>h</sup> ātʃ'	p <sup>h</sup> ātʃ'	p <sup>h</sup> ātʃ'
peel, husk_1	*p'i(n)C'?	p'íns'	p'íns'	-	-	p'íd	p'ít'	-	-	-	-
warm up (sth.)	*Cis'	ʃíʃ	ʃíʃ	jíz	jís'	jít <sup>h</sup>	hízá	ísá	ísá	ísá	-

D.16 PKMN Correspondence Set 16: \*c

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
grandfather_1	*càk <sup>h</sup> O	-	sàkó	sàkó	-	-	-	tʃàk <sup>h</sup> ó	tʃàk <sup>h</sup> ó	tʃàk <sup>h</sup> ó	tʃàk <sup>h</sup> ó

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
whistle	*cut	-	fút	fít	-	cúwā	cói	tʃúwì	tʃúwì	tʃúwì	tʃúwì
tree	*cwálá	swálá	swájá	sá	fʷá	cwá	cá	tʃá	tʃá	tʃá	tʃá
rinse mouth_1	*CVk'Um	fòkóm	fòkóm	zúk'úm	-	-	ʃák'ómá	tʃák'ómá	tʃák'ómá	sák'ómá	tʃák'ómá
belt, sash	*gafá	gáfà	gáfà	-	gǎf	gāfá	gáf	gātʃ	gātʃ	gātʃ	gáf

D.17 PKMN Correspondence Set 17: \*ʃ

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
dig_1	*ʃà	ʃà	ʃà	-	-	-	cà	tʃà	tʃà	tʃà	tʃà
Nuer (ethnonym)_1	*ʃanj(ɔ)aj	zǎgó	zǎgó	zǎgó	ʒwǎŋgì	-	ʃàŋwèj	dzǎŋó	-	zǎŋwé	ʃàŋwè
sorghum, millet	*ʃana	sjànà	sjànà	zènā	-	-	-	dzèná	-	dzèná	-
bird_stork (maribou)	*ʃàrú	zèrú	zèrú	zèrú	zàrú	-	ʃèrú	dzèrú	dzèrú	dzèrú	dzèrú
Dazu (S. Sudan)	*dáʃV	dázò	dázò	dázò	dǎʃò	dǎʃò	dáʃò	dádʒò	dádʒò	dádʒò	dádʒò
pipe (for smoking)_1	*dóʃè	dóʒè	dóʒè	dóʒè	-	-	dóʃè	-	-	-	-

D.18 PKMN Correspondence Set 18: \*c'

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
tear (shred)_3	*c'(w)ēs'	s'wě	s'wě	-	-	c'ēṽ'	-	-	-	-	-
ear	*c'ε	s'ē	s'ē	s'ē	ʃé	c'é	k'ē	tʃè	tʃè	tʃè	tʃè
drip (fall in globules)_1	*c'(t'ɔ)l	s'ót'ó	s'ót'ó	s'òlil	-	c'ɔc'òlɔc'	c'òʔ	tʃò	tʃò	tʃò	tʃò
fishhook	*Bmc'	bīns'	bīns'	bīns'	bǐʃ	à+bīc'	bíc'	bitʃ	bitʃ	bitʃ	bitʃ
urine_1, urinate_1	*dùc'á	dùs'	tùs'	dòs'	-	-	tùc'áʔ	-	-	-	-
enter_1	*gìc'	kīs'	kīs'	gìz	-	cīc'	-	kìtú	kìtú	kìtú	kìtú
shut_2	*k <sup>h</sup> ac'	kǎʃ	kǎʃ	-	k <sup>h</sup> áʃ	k <sup>h</sup> ác'	-	-	-	-	-
soak_1	*p <sup>h</sup> ac'	pās'	pās'	pàs'	p <sup>h</sup> áʃ	p <sup>h</sup> ác'	-	-	-	-	-
fish (n.) general term	*wàc'à	wàs'	wàs'	wàs'	wǎʃ	wàc'	wàc'à	wàtʃà	wàtʃà	wàtʃà	wàtʃà

D.19 PKMN Correspondence Set 19: \*k<sup>h</sup>

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
dry (be)	*k <sup>h</sup> ós'	kús'	kús'	kós'	k <sup>h</sup> ús'	k <sup>h</sup> út̚'	k <sup>h</sup> ós'	k <sup>h</sup> ót̚ʃ'ó	k <sup>h</sup> ót̚ʃ'ó	k <sup>h</sup> ót̚ʃ'ó	-
repair_1	*k <sup>h</sup> ab	áp	-	áb	-	-	óbā	k <sup>h</sup> áp'	k <sup>h</sup> áp'	k <sup>h</sup> áp'	k <sup>h</sup> áp'
shut_2	*k <sup>h</sup> ac'	kǎʃ	kǎʃ	-	k <sup>h</sup> ǎʃ	k <sup>h</sup> ác'	-	-	-	-	-
open	*k <sup>h</sup> ád(a)	kálá	kájá	kár	k <sup>h</sup> ád	k <sup>h</sup> áɗ	k <sup>h</sup> átá	k <sup>h</sup> átá	k <sup>h</sup> átá	k <sup>h</sup> átá	k <sup>h</sup> átá
light (the way with torch/flashlight)_1	*k <sup>h</sup> ǎɲ	kīn	kīn	-	k <sup>h</sup> ǎɲ	k <sup>h</sup> ǎɲ	-	-	-	-	-
snore	*k <sup>h</sup> O(r)nOn	kòɲòɲ	kòɲòɲ	kòɲòɲ	k <sup>h</sup> ūnūn	àk <sup>h</sup> ɔ̄rnēʔ	k <sup>h</sup> òɲòɲ	k <sup>h</sup> òɲòɲ	k <sup>h</sup> òɲòɲ	k <sup>h</sup> òɲòɲ	k <sup>h</sup> òɲòɲ
fear (be afraid)	*k <sup>h</sup> waG'	kwāgà	kwāgà	kōg	k <sup>h</sup> ɔʔ	k <sup>h</sup> ɔk'	k <sup>h</sup> ɔk ~ k <sup>h</sup> ɔgɔ	k <sup>h</sup> ɔgɔ	k <sup>h</sup> ɔgɔ	k <sup>h</sup> ɔgɔ	k <sup>h</sup> ɔgɔ
herd (v.)	*k <sup>h</sup> aj	kēʔ	kēʔ	kàʔi	-	-	k <sup>h</sup> ájíʔ	k <sup>h</sup> ájí	k <sup>h</sup> ájí	k <sup>h</sup> ájí	k <sup>h</sup> ájí
bitter, sour (be)	*k <sup>h</sup> ak'a	kāgā	kāgā	kàʔ	k <sup>h</sup> āʔ	k <sup>h</sup> āʔ	k <sup>h</sup> àk'à	k <sup>h</sup> āk'ā	k <sup>h</sup> āk'ā	k <sup>h</sup> āk'ā	k <sup>h</sup> āk'ā
tree_sp. (mahogany, Trichilia emetica)	*k <sup>(h)</sup> is	kísì	ō+kīs	kīs	cés	c <sup>h</sup> ís	kís	k <sup>h</sup> ís	k <sup>h</sup> ís	k <sup>h</sup> ís	k <sup>h</sup> ís
extract tooth_1, barking (of dog)	*bɔk <sup>h</sup>	pǔ	pǔ	-	-	búk <sup>h</sup>	-	-	-	-	-
grandfather_1	*càk <sup>h</sup> O	-	sàkó	sàkó	-	-	-	tʃàk <sup>h</sup> ɔ	tʃàk <sup>h</sup> ɔ	tʃàk <sup>h</sup> ɔ	tʃàk <sup>h</sup> ɔ
sow seeds (by throwing)_1	*jEk <sup>h</sup>	jì	jì	jèk	jèk <sup>h</sup>	jèk <sup>h</sup>	-	-	-	-	-
bird_hammerkopf_1	*nék <sup>h</sup>	-	ō+nék	à+nék	nék <sup>h</sup>	à+nék <sup>h</sup>	à+ník <sup>h</sup>	-	-	à+ník <sup>h</sup>	à+ník <sup>h</sup>
acacia	*túk <sup>(h)</sup> (u)	tǔkò	-	túk	túk <sup>h</sup>	à+túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>
bird_weaver	*dwak <sup>h</sup>	ō+dwák	ō+dók	à+dók	-	-	à+dwák <sup>h</sup>	à+dwák <sup>h</sup>	à+dwák <sup>h</sup>	à+dwák <sup>h</sup>	à+dwák <sup>h</sup>

D.20 PKMN Correspondence Set 20: \*k

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
sew_1	*kós	ós	ós	-	-	-	kós	kós	kós	kós	kós
pound (v.)_4	*kóp <sup>h</sup>	kóp	kóp	-	kúp <sup>h</sup>	-	-	-	-	-	-
tomorrow_1	*kjana	-	gì+kjānā	-	-	-	-	dʒì+kén	dʒì+kén	zì+kén	ʃì+kén
cluck (of hen)	*kjank'a	kākā	kjāɲk'ā	kágá	-	-	kágà	kēn	kēn	kēn	kēn
cry	*kO(j)	kū	kū	kò	kō	kō	kòj	kwē	kwē	kwē	kwē

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
carry on head_1	*kOp <sup>h</sup>	kũ	kũ	-	-	-	kōp <sup>h</sup>	kōp	kōp	kōp	kōp
chief_1	*kOr	õ+kõl	õ+kwì	ji+kwì	-	-	jè+kõrõ	-	-	-	-
cover (v.)	*kum(bi)	kùmbì	kùmbì	kúm	kūm	kūm	kúmā	kúmá	kúmá	kúmá	kúmá
steal_1	*kwabOf	kōbóf	kōbóf	-	-	-	-	kābús	kābús	kābús	-
grandmother_1	*k <sup>h</sup> àk <sup>h</sup> á	-	kàkà	kàkà	-	-	k <sup>h</sup> àk <sup>h</sup> á	kàkà	kàkà	kàkà	kàkà
brother	*õ=kam ~ *kamõ	kwám	kwám	kàm	kām	à+kām	āmó	hàm	hàm	hàm	hàm

D.20 PKMN Correspondence Set 20a: \*k

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
Opo (ethnonym)_1	*k <sup>(h)</sup> ínáj	kíná	kíná	kíná	c <sup>h</sup> ínáj	-	kínáj	-	-	-	-
bird_(cattle egret)	*kEɲ	kíl	kíl	à+kíl	cécénā	à+céɲ	à+kíl	à+kíl	à+kíl	à+kíl	à+kíl

D.21 PKMN Correspondence Set 21: \*g

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
beeswax_1	*gāgá?	gāgá	gāgá	-	-	-	gāgá	gāgá	gāgá	gāgá	gāgá
belt, sash	*gáfá	gáfà	gáfà	-	gǎf	gāfá	gáf	gātɟ	gātɟ	gātɟ	gáf
bird (yellow-billed kite or black kite)	*gólɪlā	-	gól:ā	bāgólɪlā	-	-	bāgól:ā	-	bāgólól	bāgólól	bāgólà
run (SG)_1, flow, bleed	*gùs ~ gòs	gòs	gòs	gùf	gùs	gùs	-	-	-	-	-
Gwama (ethnonym)	*gwama	gwàmá	kwàmà	gwàmá	-	-	gòmá	gòmá	gòmá	gòmá	gòmá
finish_1	*dak	-	dak	dàg	dàk <sup>h</sup>	dàk <sup>h</sup>	dák	dàk	-	-	-
cannabis_1	*bāngwà	bāngà	bāngà	bánkò	bāngò	bāngò	-	-	-	-	-
have sex_1	*hag(a)	há?	há?	hág	-	há?	-	hágá	hágá	hágá	hágá
giraffe_2	*k <sup>h</sup> OG	kók	kók	-	k <sup>h</sup> ú?	k <sup>h</sup> ú?	k <sup>h</sup> ég	-	-	-	kék

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
bed_1	*langaret	ángàr	-	ángàr	ángàr	-	-	làngàréṭ	àngàríp <sup>h</sup>	àngàríp <sup>h</sup>	àngàríp <sup>h</sup>
forehead_1	*t <sup>(h)</sup> (w)àg	twā	twā	tàg	-	-	tàg	bī+t <sup>h</sup> āg	-	pī+t <sup>h</sup> āg	-

D.21 PKMN Correspondence Set 21a: \*g

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
tie (bundle)_1	*gì(n)s'	kìns'	kìns'	gìs'	-	-	-	-	-	-	-
swallow_1	*gUs'	gùs'	kùs'	gòs'	-	-	kòs'á	kòtʃ'á	kòtʃ'á	kòtʃ'á	kòtʃ'á
replace	*(n(j)a)gaD	nāgát	njāgát	gàdá	gàs	gàr	gàtá	kàrá	kàrá	kàrá	kàrá
enter_1	*gìc'	kìs'	kìs'	gìz	-	cìc'	-	kitú	kitú	kitú	kitú
smell (v.)	*gàŋ(a)	kē	kē	gàg	-	-	kàŋà	kàŋà	kàŋà	kàŋà	kàŋà
skin, hide (of animal), bark of tree_1	*gɔnk'(ɔf)	gòk'óʃ	gòk'óʃ	gònk'í	gòk <sup>h</sup>	-	kògò	kògò	kògò	kògò	gwàŋgí
pig_1	*gUḍUm	kòróm	kòróm	gùdúm	-	-	gùḍùm	kùdùmà	kùdùmà	kùdùmà	kùdùmà
elephant_1	*gwàj	kwì	kwì	gwà	gwàj	-	-	-	-	-	-

D.22 PKMN Correspondence Set 21: \*k'

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
back_1	*k'(w)ás	k'wás	k'wás	k'áw	-	-	-	-	-	-	-
soft (be)_1	*k'át'	k'át'	k'át'	k'át'	k'ád	k'ád	-	-	-	-	-
eat (hard food)	*k'ama	k'ā	k'ā	k'á	k'áʔ	k'á	k'ámá	k'ámá	k'ámá	k'ámá	k'ámá
kill, fight	*k'Of	k'óʃ	k'óʃ	k'óʃ	k'óʃ	k'óʃ	k'óʃ	k'ósó	k'ósó	k'ós	k'óʃ
head	*k'óp	k'óp	ʔóp	k'óp	k'úp <sup>h</sup>	k'úp <sup>h</sup>	k'óp <sup>h</sup>	k'óp	k'óp	k'óp	k'óp
throat	*k'ús	k'úʃ	k'úʃ	k'óʃ	k'ús	k'ús	k'ús	k'úsó	k'ús	k'ús	k'ús
dig (for water)_1	*k'wàḍ(i)	k'wī	k'wī	k'ò	k'wā	-	k'wàḍí	k'ōj	wārí	wàḍí	k'wārí

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
tick	*k'wàntʰ	k'wàntʰí kwànt'	k'wàntʰí kwànt'	k'wàt'	k'wàtʰ	à+k'wād	k'wàtʰ	k'wàt'	k'wàt'	k'wàt'	k'wàt'
earth, soil, ground, floor_1	*k(j)as'VN	k'járjás'	k'ēs'én	k'ās'ì	-	-	-	-	-	-	-
cough	*k'Uʰ	k'ók'ót	k'ók'ót	k'út	k'útʰ	k'útʰ	k'útʰ	k'út'ù	k'út'ù	k'út'ù	k'út'ù
bitter, sour (be)	*kʰak'a	kāgā	kāgā	kàʔ	kʰāʔ	kʰāʔ	kʰāk'à	kʰāk'ā	kʰāk'ā	kʰāk'ā	kʰāk'ā
cluck (of hen)	*kjank'a	kākā	kjárk'ā	kágá	-	-	kágà	kēn	kēn	kēn	kēn
porcupine_1	*kʰak'as ~ kʰasak'	kák'àf	kák'àf	káfāk'	-	-	kásāk'	kʰásāk'	kʰásāk'	kʰásāk'	kʰáfāk'
foot or leg_1	*fɔnk'	sōŋk'	sōnt'	fòg	fōk'	fōʔ	fòg	-	-	-	-
wake (trs.)_1	*fuk'(V)	sūgì	sūgì	fùg	fūk'	-	fùg	sūg	sūg	sūg	fūg
frog_1	*bɔŋk'ó	p'à+bōŋg ó	p'à+bōŋg ó	bā+bōŋk' ó	-	-	à+bōŋk'ó	à+bōŋk'ó	à+bōŋk'ó	à+bōŋk' ó	à+bōŋk'ó
rinse mouth_1	*CVk'Um	fòkóm	fòkóm	zúk'úm	-	-	ják'óm	tʃāk'óm á	tʃāk'óm á	sāk'óm á	tʃāk'óm á
scorpion	*d(w)ank'i ~ d(w)ank'ɪ	*t'wānk'	*t'wānk'	bādāgíʔ	d'wākʰ	à+dākʰ	dāgí	dāgí	dāgí	dāgí	dāgí
sweat (substance)_2	*jàgàl	jàgàl	jàgì	-	-	-	-	dʒík'āj	dʒík'āj	zík'āj	ʃík'āj
fear (be afraid)	*kʰwaG	kwāgà	kwāgà	kōg	kʰōʔ	kʰōk'	kʰōk' ~ kʰōg'ó	kʰōg'ó	kʰōg'ó	kʰōg'ó	kʰōg'ó
shoe	*pʰák'á	pák	pák	páʔ	pʰāʔ	à+pʰāʔ	-	pʰák'á	pʰák'	pʰák'	-
two	*sók'a	swijā	swijā	sō	sú	sú	sók'à	sōk'á	sōk'á	sōk'á	sōk'á
louse_1	*fOk'(VN)	-	fōgòn	fùwèn	fōk'ō m	à+fōk'ō m	fúk'náj	sūk'én	sūk'én	sūk'én	fúk'én
rain (precipitation)_ 2	*fɔk'	-	fó	ó	fōk'	à+fōk'	-	hó	hǒ	hǒ	-
breathe	*fuk'in	fɪŋfɪ	fɪŋfɪ	fùʔēn	fɪʔin	fɪʔin	ʃik'	sik'	sik'	sik'	sik'
tendon, vein	*fɔ(n)k'	fōnk'	fōnk'	fō	fúʔ	à+fúʔ	fúk'	sōk'	sōk'	sōk'	fúk'

D.23 PKMN Correspondence Set 23: \*s

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
lead (guide)_1	*sɔs	fɔf	fɔf	fɔf	sús	sús	sóʔ	-	-	-	-
cut (meat into one long piece)_2	*síl(ɪ)	fíli	fí	-	-	-	-	sí	-	-	-
far (be)_1	*sìt̚	-	fít̚	fít̚	sīd	síd	sìt̚	sīt̚	sīt̚	sīt̚	sīt̚
beer	*sud̚(i)	fól	fíwí	fùʔí	sū	à+sū	sùd̚	sī	swī	swī	swī
python_1	*sɔm	fɔfɔm	fɔfɔm	fɔm	-	súm	sɔmɔ	sɔmɔ	sɔmɔ	sɔmɔ	sɔmɔ
new_1	*d̚is ~ d̚is	d̚if	d̚if	z̚if	t̚is	t̚is	-	-	-	-	-
sneeze_1	*haʔis	hát̚if	-	-	-	-	hát̚is	hát̚is	hát̚is	hát̚is	hát̚is
wet_1, slippery	*jEsI	ífi	ífi	jèf	jès	jès	sìʔ	-	-	-	-
throat	*k'ós	k'úf	k'úf	k'óʔ	k'ús	k'ús	k'ós	k'ósó	k'ós	k'ós	k'ós
lead (guide)_1	*sɔs	fɔf	fɔf	fɔf	sús	sús	sóʔ	-	-	-	-
cotton, thread, spider web_1	*t̚Us	dɔf	dɔf	t̚uf	t̚us	t̚us	-	-	-	-	-
roast (something)	*t̚ós	t̚ɔf	t̚ɔf	t̚óʔ	t̚ós	t̚ós	-	-	-	-	-
boil (of liquid)_1	*was(ik')	wǎf	wǎfi	wǎfik'	-	-	wás	wās	wās	wās	wās

D.23 PKMN Correspondence Set 23a: \*s

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
warm oneself	*s(w)a m	sóm	sóm	fóm	sām	sām	sòm	sōm	sōm	sōm	fōm
climb_1	*seI	sál	sēI	-	sē	sē	-	-	-	-	-
stab_1	*sóp	só	só	-	-	-	-	sóp	-	sóp	-
body_1	*(j)Es	-	jīs	īf	īs	īs	ès	ēs	ēs	ēs	ēs
run (SG)_1, flow, bleed	*gùs ~ gòs	gòs	gòs	gùf	gùs	gùs	-	-	-	-	-
ripen	*ís ~ ís	ís	ís	íf	ís	ís	ísá	ísá	ísá	ísá	ítjá

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
sew_1	*kós	ós	ós	-	-	-	kós	kós	kós	kós	kós
hail, ice_1	*wasak'	wàsà	wàsà	wàfàk'	wàsá?	à+wàsá?	-	-	-	-	-
back_1	*k'(w)ás	k'wás	k'wás	k'áw	-	-	-	-	-	-	-
tree_sp. (mahogany, Trichilia emetica)	*k <sup>(h)</sup> ís	kísì	ō+kīs	kīs	cés	c <sup>h</sup> ís	kís	k <sup>h</sup> ís	k <sup>h</sup> ís	k <sup>h</sup> ís	k <sup>h</sup> ís
sky_1	*wUs	wús	wús	-	-	-	-	wòs	wòs	wòs	wòs

D.24 PKMN Correspondence Set 24: \*f

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
birth pangs (pain)	*fāf(ā)	fé	fé	fāf	-	-	fāfā	sāsā	sāsā	sāsā	fāfā
warm up (sth.)	*Cis'	fīf	fīf	jíz	jís'	jít <sup>h</sup>	hízá	ísá	íśá	íśá	-
copulate (animal)_3	*fób	fóp'	fóp'	-	fúb	fúb	-	-	-	-	-
eat (soft food)_SG	*fa	fā	fā	fá	f wá	f wá	úfā	sá	sá	sá	fá
tooth	*fE	fī	fī	fè	fē	fē	fē	sē	sē	sē	fē
antelope_1	*fēt <sup>(h)</sup>	ōfēt	fēt	fēt	fēt <sup>h</sup>	à+fēt <sup>h</sup>	-	-	-	-	-
blow nose	*fInt'	fīnt'	fīnt'	fīn+fònf	fīn	fīn	fīnà+fòf	síná	síná	síná	síná
grass	*fO	fófō	fófōfō	fòfí	fō	à+fō	fōfó	sò	sò	sò	sò
louse_1	*fOk'(VN)	-	fōgòn	fùwèn	fōk'òm	à+fōk'òm	fùk'náj	sùk'én	sùk'én	sùk'én	fùk'én
rain (precipitation)_2	*fok'	-	fó	ó	fōk'	à+fōk'	-	hó	hǒ	hǒ	-
breathe	*fuk'in	fīnfí	fīnfí	fùfēn	fīfīn	fīfīn	fík'	sīk'	sīk'	sīk'	sīk'
tendon, vein	*fō(n)k'	fōnk'	fōnk'	fō	fú?	à+fú?	fùk'	sōk'	sōk'	sōk'	fùk'
rope_1	*fut' ?	fōdòl	f wīt'in	fòfí	fí	à+fí	fól	-	-	-	-
nose	*fōnf	fōf	fōf	fònf	fūf	fūf	fòf	sòsò	sòs	sòs	fòf
belly or stomach_1	*bùfùl	bùfùl	bùfí	bùf	-	bùf	-	pùsà	pùsà	pùsà	pùsà
tree_sp._1	*bafa	p'àf	-	bàf	bàfà	-	bàfà	bāsā	bāsā	bāsā	-
lie down, sleep_1	*if	if	if	if	if	if	ifá	-	-	-	-



Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
smoke out (e.g an animal out of a hole)_1	*k <sup>h</sup> uf	kǒf	kǒf	ūs	-	-	húf	ús	ús	ús	úf
kill, fight	*k'Oj	k'óf	k'óf	k'óf	k'óf	k'óf	k'óf	k'ósó	k'ósó	k'ós	k'óf
wife_1, marry, wedding	*màf	-	p'ā+màf	màf	màf	màf	màf	màs	màs	màs	màs
wrap	*pɔf ~ puɔf	pōf	pōf	-	pūf	pūf	púfá	pūsá	pūsá	pūsá	pūsá
nose	*fɔnf	fōf	fōf	fònf	fūf	fūf	fòf	sòsò	sòs	sòs	fòf
make go away	*t <sup>h</sup> af ~ t <sup>h</sup> af	tāf	tāf	tàf	t <sup>h</sup> áf	t <sup>h</sup> áf	-	-	-	-	-
salt_(made from ash of a particular plant/tree)_2	*t'af	t'āf	t'āf	t'àf	t'āf	t'āf	t'àf	t'ās	-	-	-
buttocks_1	*ɔf	īf	ōf	-	-	-	ōf	ōs	ōs	ōs	ōf
birth pangs (pain)	*fāf(ā)	fé	fé	fāf	-	-	fāfā	sāsā	sāsā	sāsā	fāfā

D.24 PKMN Correspondence Set 24a: \*f

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
foot or leg_1	*fɔnk'	sōŋk'	sōnt'	fɔg	fɔk'	fɔʔ	fɔg	-	-	-	-
wake (trs.)_1	*fuk'(V)	sūgì	sūgì	fùg	fūk'	-	fùg	sūg	sūg	sūg	fūg
bone	*fUImak'	sí	sí	fúmák'	sīmāʔ	à+sīmāʔ	fój	sój	sój	sój	sój
meat, animal	*fum(a)	sūm	sūm	fùm	fūm	fūm	fùmà	sūmā	sūmā	sūmā	fūmā
disregard	*piɔf	pīs	pīs	píɔf	-	píɔf	píɔf	pís	pís	pís	pís

D.25 PKMN Correspondence Set 25: \*h

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
have sex_1	*hag(a)	háʔ	háʔ	hág	-	háʔ	-	hágá	hágá	hágá	hágá
trample, ruminant	*has'	-	hās'ì	hás'	hás'	hát'	hás'	hátf'	hátf'	hátf'	hátf'
fish_(small, small scales)	*jàhút	jàhú	jàhú	jàhú	-	-	àhút <sup>h</sup>	àhú	àhú	àhúwí	àhúj

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
come, come_SG	*ha	hǒ	hǒ	hà + ʉ	-	-	-	-	-	-	-
sip (liquid)	*wɔp'(ɔs') ~ hɔp'(ɔs')	hǒbɔs'	hǒbɔs'	wɔp'	k <sup>h</sup> ɔbɔs	-	hɔp'	hɔp'ɔ	hɔp'	hɔp'	hɔp'

D.26 PKMN Correspondence Set 26: \*r

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
corner	*rOk <sup>(h)</sup> Op	rókɔn	rókɔn	rókɔn	rúgùɲ	à+rúkūɲ	rók <sup>h</sup> ɔn	rókɔn	rókɔn	rókɔn	rókɔn
swagger, arrogant (be)	*(gɔ)kwar(a)	-	kwára	gɔkɔl	kār+is	kār+is	k <sup>h</sup> ɔr	k <sup>h</sup> ɔr	k <sup>h</sup> ɔr	k <sup>h</sup> ɔr	k <sup>h</sup> ɔr
bird_heron	*bár	-	ɔ+bár	à+bár	-	-	à+bár	à+bár	à+bár	à+bár	à+bár
green_1	*D̥ir	zî	zî	zì	zì	ɖì	sīsī	tʃir	tʃir	tʃir	tʃir
bird_stork (maribou)	*jàrú	zèrú	zèrú	zèrú	zàrú	-	ʒèrú	dʒèrú	dʒèrú	dʒèrú	dʒèrú
chief_1	*kOr	ɔ+kɔl	ɔ+kwì	jī+kwì	-	-	jè+kɔrɔ	-	-	-	-
platform	*p <sup>h</sup> ará	pára	pára	pára	-	-	p <sup>h</sup> ará	p <sup>h</sup> ará	p <sup>h</sup> ará	p <sup>h</sup> ará	p <sup>h</sup> ará
drum_C	*t̥ará	-	tàrá	tàrá	-	-	t̥ará	tàrá	tàrá	tàrá	tàrá

D.27 PKMN Correspondence Set 27: \*l

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
bed_1	*langaret	ángàr	-	ángàr	àngàr	-	-	làngàrét	àngàríp <sup>h</sup>	àngàríp <sup>h</sup>	àngàríp <sup>h</sup>
sink (descend)	*lilí	lilí	lilí	lilí	-	-	lil	lilí	lilí	lilí	lilí
testicles_1	*lùt̥' ~ lɔt̥'	dūt'	dūt'	lɔt'	lùd	à+lùd	-	-	-	-	-
bird_vulture (white-backed)_1	*lɔm	ɔlɔm	-	lɔm	lù?	-	lɔm	lɔm	lɔm	lɔm	lɔm
claves (instrument)_1	*lèp <sup>h</sup> é	lèpé	àlàpé	lèpé	lèp <sup>h</sup> é	-	lèp <sup>h</sup> é	àlèp <sup>h</sup> é	àlèp <sup>h</sup> é	àlèp <sup>h</sup> é	àlèp <sup>h</sup> é
palate_1	*ɓalilaj	p'àlilí	p'àlilí	ɓàlilá	-	-	-	-	-	-	-

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
stomp, step on_1	*djalls'	dèlís'	dàlís'	dil	dil	dil	-	tílí	tílí	tílí	tílí
shout_1	*dól(ɔ)	dól	dól	dól	-	-	óló	-	-	-	-
fish_sp (very small, scaled fish with a small rounded mouth)	*dolo	-	dóló	dóló	-	-	dólí?	dóló	dóló	dóló	dólí
bird (yellow-billed kite or black kite)	*gólila	-	gól:ā	bāgólila	-	-	bāgól:ā	-	bāgólól	bāgólól	bāgólà
ululate_1	*ílil ~ ilil	ílil	ílil	ílil	-	-	ílil	ílil	ílil	ílil	ílil
come free and fall off	*p <sup>h</sup> al	pǐ	pǐ	-	-	-	-	p <sup>h</sup> ál	p <sup>h</sup> ál	p <sup>h</sup> ál	p <sup>h</sup> ál
spicy (be)_1	*p <sup>h</sup> Ul	pòl	pwì	-	-	-	p <sup>h</sup> íl	p <sup>h</sup> íli	p <sup>h</sup> íli	p <sup>h</sup> íli	p <sup>h</sup> íli
climb_1	*səl	sál	sēl	-	sē	sē	-	-	-	-	-

D.28 PKMN Correspondence Set 28: \*m

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
shut_1, close eyes	*mVs'	mìs'	mìs'	mòs'	mús'+ē	mút'+ē	mis'à	mòtʃ'à	mòtʃ'à	mòtʃ'à	mòtʃ'à
carry on back_1	*màm(a)	màm	màm	màmá	màm	màm	màmá	màmā	màmā	màmā	màmā
mosquito_2, firefly	*mumɪ	mímí	mímí	mímí	mímí	-	-	-	-	-	-
wife_1, marry, wedding	*màʃ	-	p'ā+màʃ	màʃ	màʃ	màʃ	màʃ	màs	màs	màs	màs
hand_1	*mètʃ'	bit'	mìt'	-	mèd	mèd	mètʃ'	mìt'í	mìt'í	-	mèt'
drum_B	*bàmbá	pàmbà	pàmbà	-	bàmbá	-	-	-	-	-	-
pregnant (be)	*bUma	pòm	pòm	bú	pwá	bwà	pùmá	pùmá	pùmá	pùmá	pùmá
tree (sp.)(sausage tree_Kigelia africana)	*dùmàj	-	ū+dùmì	dùmè	-	-	dùmáj	dùmàj	dùmàj	dùmàj	dùmàj
strain (solids from liquid)_1	*dìm	-	zìṅā	zìm	zìm	dìm	tìm	tìm	tìm	tìm	tìm
bee, honey	*dàm	tàm	tàm	dàm	dàm	à+dàm	tàm	tàm	tàm	tàm	tàm

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
Gwama (ethnonym)	*gwama	gwámá	kwāmà	gwámá	-	-	gòmá	gòmá	gòmá	gòmá	gòmá
find, meet	*gàm	kàm	kàm	gàm	gàm	gàm	kàm	kàm	kàm	kàm	kàm
pack in, stuff into container_1	*gìm	gìm	gìm	-	-	jìm	-	-	-	-	-
wound_1	*gjama?	kāmā	kāmā	zāmā	jámá	jámá	-	-	-	-	-
cover (v.)	*kum(bi)	kùmbì	kùmbì	kúm	kūm	kūm	kúmā	kúmá	kúmá	kúmá	kúmá
brother	* <sub>ɔ</sub> =kam *kam <sub>ɔ</sub>	kwám	kwám	kàm	kām	à+kām	āmó	hàm	hàm	hàm	hàm
eat (hard food)	*k'ama	k'ā	k'ā	k'á	k'á?	k'á	k'ámá	k'ámá	k'ámá	k'ámá	k'ámá
bird_vulture (white- backed)_1	*lòm	ōlòm	-	lòm	lù?	-	lòm	lòm	lòm	lòm	lòm
warm oneself	*s(w)am	sóm	sóm	ǰóm	sām	sām	sòm	sóm	sóm	sóm	ǰóm
python_1	*sòm	ǰōǰóm	ǰōǰóm	ǰòm	-	súm	sómó	sómó	sómó	sómó	sómó
blood_1	*s'ámá	s'ám	s'ám	-	-	-	s'ámá?	tǰ'ámá	tǰ'ámá	tǰ'ámá	tǰ'ámá
bone	*ǰUImak'	sí	sí	ǰúmák'	sīmā?	à+sīmā?	ǰój	sój	sój	sój	sój
meat, animal	*ǰum(a)	sūm	sūm	ǰùm	ǰūm	ǰūm	ǰùmà	sūmā	sūmā	sūmā	ǰūmā

D.29 PKMN Correspondence Set 29: \*n

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
honey badger	*njans'es'	jāns'és'	ǰēnzés'	nēz	nēs'	à+nèt'	nēs	nèdzè	-	nèdzè	-
disabled (be), angry (be)	*nap(a)	nǎpá	nǎpá	nǎpá	-	náp <sup>h</sup> ē	náp <sup>h</sup>	nāp	nāp	nāp	nāp
bird_hammerkopf_1	*nék <sup>h</sup>	-	ō+nék	à+nék	nék <sup>h</sup>	à+nék <sup>h</sup>	à+ník <sup>h</sup>	-	-	à+ník <sup>h</sup>	à+ník <sup>h</sup>
bury (sideways)	*nɔp' ~ *nɔmp'	ōmp'	ōmp'	-	-	-	nòp'á	-	-	-	-
bird_pelican (brown)	*nàbòng(w)à	-	ō+nàbòṅà	nàbòṅà	-	-	nàbòṅò	nàbòṅò	nàbòṅò	nàbòṅò	nàbòṅò
Dana (ethnonym)_3	*ḍana	dānā	dānā	dānā	-	-	ḍānā	dānā	dānā	dānā	dānā

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
Opo (ethnonym)_1	*k <sup>(h)</sup> ínáj	kíná	kíná	kíná	c <sup>h</sup> ínáj	-	kínáj	-	-	-	-
sorghum, millet	*jana	sjànà	sjànà	zènā	-	-	-	dzèná	-	dzèná	-
snore	*k <sup>h</sup> O(r)nOn	kònòn	kònòn	kònòn	k <sup>h</sup> ünün	àk <sup>h</sup> õrnē	k <sup>h</sup> ònòn	k <sup>h</sup> ònòn	k <sup>h</sup> ònòn	k <sup>h</sup> ònòn	k <sup>h</sup> ònòn
tomorrow_1	*kjana	-	gì+kjānā	-	-	-	-	dzi+kén	dzi+kén	zi+kén	ji+kén
blow nose	*fint' ~ *fint'	fīnt'	fīnt'	fīn+fònʃ	fīn	fīn	fīnà+fòʃ	síná	síná	síná	síná
alone, abstain from, not want to do	*t'én	-	sīn	s'én	t'én	t'é	gà+t'én	ā+t'én	ā+t'én	ā+t'én	ā+t'én
seed_2	*ʔjamVn	-	-	ʔjāmón	ēmén	ēmén	-	-	-	-	-

D.30 PKMN Correspondence Set 30: \*ɲ

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
ash_1	*(t'i)p'Ik'Iɲ(a)	p'ik'ín	p'ik'ín	p'ín	-	t'ip'ɲ	p'inā	-	-	p'inā	p'inā
bird_(cattle egret)	*kEɲ	kīl	kīl	à+kíl	cécénā	à+céɲ	à+kíl	à+kíl	à+kíl	à+kíl	à+kíl
light (the way with torch/flashlight)_1	*k <sup>h</sup> àɲ	kīn	kīn	-	k <sup>h</sup> āɲ	k <sup>h</sup> āɲ	-	-	-	-	-
corner	*rOk <sup>(h)</sup> Oɲ	rókòn	rókòn	rókòn	rúgùɲ	à+rúkūɲ	rók <sup>h</sup> òn	rókōn	rókōn	rókōn	rókōn

D.31 PKMN Correspondence Set 31: \*ɲ

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
path, road_1, towards	*bwaɲ(a)	pwǎɲà	pwǎɲà	-	-	bwàɲ	-	-	-	-	-
baboon_1, dog_2	*dɲɪ	tìni	tìni	-	-	-	tèɲ	tìni	tìni	tìn	tìn

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
fish_sp (electric)_1	*dɪŋkā	-	ō+wàs' +dɪŋkā	dɪŋkā	-	-	-	dɪŋā	dɪŋā	dɪŋā	dɪŋā
smell (v.)	*gàŋ(a)	kē	kē	gàg	-	-	kàŋà	kàŋà	kàŋà	kàŋà	kàŋà
Nuer (ethnonym)_1	*jaŋg(ɔ)aj	zǎgó	zǎgó	zǎgó	ʒwǎŋgì	-	jàŋwèj	dʒāŋó	-	zāŋwé	jàŋwè
shake (sth.)_2	*tEŋ(g)(E)	tīgī	tīgī	-	-	-	téŋ	-	tíŋhá	tíŋhá	tíŋhá
cut (split in half lengthwise)_1	*t'waŋ(k)a ~ t'waŋ(k)a	t'āŋà	t'āŋà	-	t'wák <sup>h</sup>	t'wák <sup>h</sup>	-	-	-	-	-
chicken_1	*waŋa	wāŋā	wāŋā	wàgá	ŋwá	à+ŋwá	-	-	-	-	-

D.32 PKMN Correspondence Set 32: \*w

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
boil (of liquid)_1	*was(ik')	wǎf	wǎfí	wǎfík'	-	-	wás	wās	wās	wās	wās
hail, ice_1	*wasak'	wàsà	wàsà	wǎfāk'	wàsá?	à+wàsá?	-	-	-	-	-
break (v.)_1	*wa	wǎ	wǎ	wà	wá	wá	-	-	-	-	-
fire or firewood	*wa(n)t'(Ij)	ānt'	ānt'	wàt'íj	ōd	ōd	òt'	wōt'í	wōt'í	wōt'í	ōt'í
boar (wild)_1	*wàb	wàp'	wàp'	wàp'	wàp <sup>h</sup>	à+wàb	-	-	-	-	-
fish (n.) general term	*wàc'à	wàs'	wàs'	wàs'	wǎf	wàc'	wàc'à	wàt'f'à	wàt'f'à	wàt'f'à	wàt'f'à
chicken_1	*waŋa	wāŋā	wāŋā	wàgá	ŋwá	à+ŋwá	-	-	-	-	-
sky_1	*wUs	wús	wús	-	-	-	-	wòs	wòs	wòs	wòs
bird_ostrich_1	*wut <sup>h</sup>	-	wūt	wūt	út <sup>h</sup>	à+út <sup>h</sup>	-	hút <sup>h</sup>	hút <sup>h</sup>	hút <sup>h</sup>	hút <sup>h</sup>
become, become angry	*wVd	wět	wět	wàl	wár	wád	wâl	-	-	-	-

D.33 PKMN Correspondence Set 33: \*j

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
wet_1, slippery	*jEsI	ífi	ífi	jèf	jès	jès	si?	-	-	-	-

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
vomit_1	*(pa)jas'	pājàs'	pājàs'	jàʔ	ǰǎʔ	ǰǎʔ	-	-	-	-	-
play (instrument)_2	*ji	jì	jì	-	-	-	-	dʒī	dʒī	zī	ʃī
sow seeds (by throwing)_1	*jEk <sup>h</sup>	jì	jì	jèk	jèk <sup>h</sup>	jèk <sup>h</sup>	-	-	-	-	-
water	*ji(dE)	ìjáʔ	ìjáʔ	jǐ	wùdíʔ	jìdǎʔ	jìʔí	dʒì	dʒì	zì	ʃìʔ
sweat (substance)_2	*jàgàl	jàgàl	jàgì	-	-	-	-	dʒìk'áj	dʒìk'áj	zìk'áj	ʃìk'áj
elephant_1	*gwàj	kwì	kwì	gwà	gwàj	-	-	-	-	-	-
herd (v.)	*k <sup>h</sup> aj	kēʔ	kēʔ	kàʔí	-	-	k <sup>h</sup> ájíʔ	k <sup>h</sup> ájí	k <sup>h</sup> ájí	k <sup>h</sup> ájí	k <sup>h</sup> ájí
cry	*kO(j)	kū	kū	kò	kō	kō	kòj	kwē	kwē	kwē	kwē
blow (with mouth)	*p <sup>h</sup> ui(ki)	pīkī	pī	pì	p <sup>h</sup> ùj	p <sup>h</sup> í	p <sup>h</sup> ùj	p <sup>h</sup> ú	p <sup>h</sup> ú	p <sup>h</sup> ú	p <sup>h</sup> ú

D.34 PKMN Correspondence Set 34: \*Ṭ

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
descend (land)	*ṬOI(a)	-	ʃò	-	sūl	ṭūl	-	tʃójá	tʃójá	tʃójá	tʃójá
guinea fowl_1	*Ṭo(n)G	ʃǒnk'	ʃǒnk'	zòg	-	ṭūk <sup>h</sup>	sòk <sup>h</sup>	tʃògó	tʃògó	tʃòg	tʃòg

D.35 PKMN Correspondence Set 34: \*Ḍ

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
eye_1	*ḌE	zì	zì	-	ī	ē	ḍè	dʒè	dʒè	zè	ʃè
doze off_1	*Ḍi	sísī	sísī	zìzì	-	-	-	dìsì	dìsì	zìz	sìs
green_1	*Ḍir	zî	zî	zì	zì	ḍì	sīsī	tʃír	tʃír	tʃír	tʃír
person_2	*Ḍiṭa	sīt	sīt	-	-	-	ḍiṭà	-	-	ò+zìtà	ò+ʃìtà
seed_1	*ḌE(se)	zì	zì	-	-	-	ḍèsè	dʒèsè	dʒèsè	zèsè	sèsè

APPENDIX E

PROTO-KOMAN VOWEL CORRESPONDENCE SETS

E.1 Correspondence Set V1: PKMN \*i<sub>1</sub>

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
green_1	*Ḑir	zî	zî	zì	zì	ḑì	sīsī	tʃir	tʃir	tʃir	tʃir
person_2	*Ḑiṭa	sit	sit	-	-	-	ḑiṭà	-	-	ò+zità	ò+ʃità
lie down, sleep_1	*if	ìf	ìf	ìf	īf	īf	īfá	-	-	-	-
water	*ji(dE)	ìjá?	ìjá?	jì	wùdí?	jìdɛ́?	jìʔí	dzi	dzi	zì	ʃi?
sink (descend)	*lili	lilí	lilí	lilí	-	-	lil	lilí	lilí	lilí	lilí
shake (sth.)_1	*pid(V)	-	pídí	pídá	pít <sup>h</sup>	pír	-	-	-	-	-
strain (solids from liquid)_1	*ḑim	-	ziṅā	zìm	zìm	ḑim	tìm	tìm	tìm	tìm	tìm
bird_dove (African mourning)	*tiritiri	-	títití	-	-	-	-	à+tìrítírì	à+tìrítírì	à+tìrítírì	à+tìrítírì
disregard	*pif	pīs	pīs	píf	-	píf	píf	pís	pís	pís	pís

E.2 Correspondence Set V2: PKMN \*i<sub>1</sub>

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
ash_1	*(t'i)p'lk'Iṅ(a)	p'ík'ín	p'ík'ín	p'ín	-	t'ip'ṅ	p'ínā	-	-	p'ínā	p'ínā
fishhook	*Bmc'	bīns'	bīns'	bīns'	bīf	à+bíc'	bíc'	ḑitʃ	ḑitʃ	ḑitʃ	ḑitʃ
Opo (ethnonym)_1	*k <sup>(h)</sup> ínáj	kíná	kíná	kíná	c <sup>h</sup> ínáj	-	kínáj	-	-	-	-
pack in, stuff into container_1	*gim	gim	gim	-	-	jim	-	-	-	-	-
play (instrument)_2	*ji	jì	jì	-	-	-	-	dzī	dzī	zī	ʃī
bird_(cattle egret)	*kEṅ	kīl	kīl	à+kíl	cécénā	à+céṅ	à+kíl	à+kíl	à+kíl	à+kíl	à+kíl



Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
charcoal or coal	*kʼI(m)Isʼ	sʼísʼín	sʼísʼín	kísʼísʼíʔ	cʼēlḗsʼ	cʼilāṭʼ	kʼísʼ	kʼimítʃʼ	kʼimítʃʼ	kʼītʃʼ	kʼītʃʼ
mosquito_2, firefly	*mimɪ	mímí	mímí	mímí	mímí	-	-	-	-	-	-
peel, husk_1	*pʼi(n)Cʼʔ	pʼínsʼ	pʼínsʼ	-	-	pʼídʼ	pʼítʼ	-	-	-	-
cut (meat into one long piece)_2	*síl(r)	ʃilì	ʃí	-	-	-	-	sí	-	-	-
far (be)_1	*sìṭʼ	-	ʃítʼ	ʃítʼ	sīd	sīd	sìṭʼ	sītʼ	sītʼ	sītʼ	sītʼ
roughen (stone for grinding)	*títʰ	sít	sít	tít	títʰ	tír	títʰ	títí	títʰ	títʰ	títʰ
tree_sp. (mahogany, Trichilia emetica)	*kʰɪs	kísì	ō+kīs	kīs	cés	cʰís	kís	kʰís	kʰís	kʰís	kʰís

## E.2 Correspondence Set V2a: PKMN \*I₂

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
strong (be)_1	*bísʼ ~ bísʼ	pʼí	pʼí	bísʼ	bísʼ	bíṭʼ	-	-	-	-	-
toss, throw away, fall over	*bitʰ	pít	pít	bít	bítʰ	bítʰ	-	-	-	-	-
doze off_1	*ḍi	sísī	sísī	zízí	-	-	-	ḍisì	ḍisì	zìz	sìs
fish_sp (electric)_1	*dɪŋkā	-	ō+wàsʼ +dɪŋkā	dɪŋkā	-	-	-	dɪŋā	dɪŋā	dɪŋā	dɪŋā
tie (bundle)_1	*gì(n)sʼ	kínsʼ	kínsʼ	gìsʼ	-	-	-	-	-	-	-
enter_1	*gìcʼ	kísʼ	kísʼ	gìz	-	cīcʼ	-	kìtú	kìtú	kìtú	kìtú
LOC, BE LOC	*í ~ *í	-	í	í	-	í	-	í	-	-	-
ululate_1	*ɪlɪ ~ ilil	ílil	ílil	ílil	-	-	ílil	ílil	ílil	ílil	ílil
ripen	*ís ~ ís	ís	ís	íʃ	ís	ís	ísá	ísá	ísá	ísá	ítʃá
vagina_1	*pítʰ ~ pítʰ	pít	pít	pít	-	-	pítʰ	-	-	-	-
warm up (sth.)	*Cisʼ	ʃíʃ	ʃíʃ	jíz	jísʼ	jítʰ	hízá	ísá	ísá	ísá	-
blow nose	*ʃimtʼ ~ *ʃimtʼ	ʃimtʼ	ʃimtʼ	ʃin+fɔŋʃ	ʃin	ʃin	ʃinà+fɔŋʃ	síná	síná	síná	síná
rat_1	*sʼík	sʼí	sʼí	sʼík	sʼíʔ	à+tʼíkʰ	-	tʃígí	tʃígí	tʃígí	tʃígí

E.3 Correspondence Set V3: PKMN \*u<sub>1</sub>

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
choke, strangle_1	*bus'	būs'	būs'	-	būs'	bùt'	-	p <sup>h</sup> útʃ'	-	-	-
dust, sand_1	*burbuɸ	bùrbūt	bùrbūt	-	bùt <sup>h</sup>	bùɸ'	bùrk'ùs	bùrk'ùs	bùrk'ùs	bùrk'ùs	bùrk'ùs
belly or stomach_1	*bùfùl	bùfùl	bùfi	bùf	-	bùf	-	pùsà	pùsà	pùsà	pùsà
extract tooth_1, barking (of dog)	*bøk <sup>h</sup>	pǒ	pǒ	-	-	bùk <sup>h</sup>	-	-	-	-	-
urine_1, urinate_1	*dùc'á	dùs'	tùs'	dòs'	-	-	tùc'á?	-	-	-	-
tree (sp.)(sausage tree_Kigelia africana)	*dùmàj	-	ū+dùmì	dùmè	-	-	dùmáj	dùmàj	dùmàj	dùmàj	dùmàj
fish_(small, small scales)	*jàhút	jàhú	jàhú	jàhú	-	-	àhút <sup>h</sup>	àhú	àhú	àhúwí	àhúj
wake (trs.)_1	*fuk'(V)	sūgì	sūgì	fùg	fūk'	-	fùg	sūg	sūg	sūg	fūg
cover (v.)	*kum(bi)	kùmbì	kùmbì	kúm	kūm	kūm	kúmā	kúmá	kúmá	kúmá	kúmá
smoke out (e.g an animal out of a hole)_1	*k <sup>h</sup> uɸ	kǒɸ	kǒɸ	ūs	-	-	húɸ	ús	ús	ús	úɸ
follow_2	*uD	ū	ū	út	úr	úr	-	-	-	-	-
spit (v.)_1	*t <sup>h</sup> ú	tū	tū	-	-	-	t <sup>h</sup> úwà	t <sup>h</sup> újhá	t <sup>h</sup> újhá	t <sup>h</sup> újhá	t <sup>h</sup> újhá
meat, animal	*fum(a)	sūm	sūm	fùm	fūm	fūm	fùmà	sūmā	sūmā	sūmā	fūmā
bird_ostrich_1	*wut <sup>h</sup>	-	wút	wút	út <sup>h</sup>	à+út <sup>h</sup>	-	hút <sup>h</sup>	hút <sup>h</sup>	hút <sup>h</sup>	hút <sup>h</sup>

E.3a Correspondence Set V3a: PKMN \*u<sub>2</sub>

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
pregnant (be)	*bUma	pòm	pòm	bú	pwá	bwà	pùmá	pùmá	pùmá	pùmá	pùmá
pig_1	*gUɸUm	kòróm	kòróm	gùdúm	-	-	gùɸùm	kùdùmà	kùdùmà	kùdùmà	kùdùmà
short (be)_1	*KŪt <sup>h</sup>	gǒt	gǒt	kùt	kūt <sup>h</sup>	kūt <sup>h</sup>	-	-	-	-	-
run (SG)_1, flow, bleed	*gùs ~ gòs	gòs	gòs	gùɸ	gùs	gùs	-	-	-	-	-
cough	*k'Uɸ'	k'ók'ót	k'ók'ót	k'út	k'út <sup>h</sup>	k'út <sup>h</sup>	k'út <sup>h</sup>	k'út'ù	k'út'ù	k'út'ù	k'út'ù

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
wrap	*pʊʃ ~ puʃ	pɔʃ	pɔʃ	-	pūʃ	pūʃ	púʃá	pūsá	pūsá	pūsá	pūsá
burnt gound, soot	*p <sup>h</sup> uZa	ʃāpót	ʃābót	kí+pú	bwà+p <sup>h</sup> wí	à+p <sup>h</sup> í?	pùzà?	p <sup>h</sup> újhá	p <sup>h</sup> újhá	p <sup>h</sup> újhá	p <sup>h</sup> újhá
dip food in sauce with fingers_1	*s'UB(V)(n)	-	s'ópón	s'üb	s'úp <sup>h</sup>	t'úp <sup>h</sup>	s'úbá	-	-	-	-
nosebleed_2	*S'Un(t)a	-	t'ònt'	-	-	-	s'úná?	-	-	-	-
bathe	*úp <sup>h</sup>	óp	óp	úp	úp <sup>h</sup>	úp <sup>h</sup>	úp <sup>h</sup>	úp <sup>h</sup>	úp <sup>h</sup>	úp <sup>h</sup>	úp <sup>h</sup>
cotton, thread, spider web_1	*tʊs ~ tus	dɔʃ	dɔʃ	tūʃ	tūs	tūs	-	-	-	-	-
acacia	*túk <sup>(h)</sup> (u)	tɔkò	-	túk	túk <sup>h</sup>	à+túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>
pierce_1	*tʊb(a) ~ tuba(a)	sú	sú	-	tūp <sup>h</sup>	tūp <sup>h</sup>	túbá	-	-	t <sup>h</sup> úbá	t <sup>h</sup> úbá

#### E.4 Correspondence Set V4: PKMN \*ʊ<sub>1</sub>

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
pipe (for smoking)_1	*dóʒè	dózè	dózè	dózè	-	-	dóʒè	-	-	-	-
bird (yellow-billed kite or black kite)	*gʊlɪlɑ	-	gól:ā	bāgʊlɪlā	-	-	ḡāgʊl:ā	-	ḡāgʊlól	ḡāgʊlól	ḡāgʊlɑ
head	*k'óp	k'óp	?óp	k'óp	k'úp <sup>h</sup>	k'úp <sup>h</sup>	k'óp <sup>h</sup>	k'óp	k'óp	k'óp	k'óp
bird_vulture (white- backed)_1	*lɔm	ɔlɔm	-	lɔm	lù?	-	lɔm	lɔm	lɔm	lɔm	lɔm
bury (sideways)	*nɔp' ~ *nɔmp'	ɔmp'	ɔmp'	-	-	-	nɔp'á	-	-	-	-
guinea fowl_1	*ʔʊ(n)G	ʃɔnk'	ʃɔnk'	zòg	-	túk <sup>h</sup>	sɔk <sup>h</sup>	tʃɔgɔ	tʃɔgɔ	tʃɔg	tʃɔg
nose	*ʃɔnʃ	ʃɔʃ	ʃɔʃ	ʃɔnʃ	ʃūʃ	ʃūʃ	ʃòʃ	sùsù	sùs	sùs	ʃòʃ
lead (guide)_1	*sʊs	ʃóʃ	ʃóʃ	ʃóʃ	sús	sús	sú?	-	-	-	-
python_1	*sɔm	ʃɔʃóm	ʃɔʃóm	ʃɔm	-	súm	sɔmó	sɔmó	sɔmó	sɔmó	sɔmó
cold (be)_1	*s'óp	s'óp	s'óp	-	s'úp <sup>h</sup>	t'úp <sup>h</sup>	-	-	-	-	-
copulate (animal)_3	*ʃóʃ	ʃóp'	ʃóp'	-	ʃúb	ʃúb	-	-	-	-	-

E.4a Correspondence Set V4a: PKMN \*ʊ₂

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
throat	*k'ús	k'úf	k'úf	k'úf	k'ús	k'ús	k'ús	k'úsú	k'ús	k'ús	k'ús
swallow_1	*gUs'	gùs'	kùs'	gòs'	-	-	kòs'á	kòtʃ'á	kòtʃ'á	kòtʃ'á	kòtʃ'á
dry (be)	*kʰús'	kús'	kús'	kós'	kʰús'	kʰúʔ'	kʰús'	kʰótʃ'ó	kʰótʃ'ó	kʰótʃ'ó	-
testicles_1	*lùʔ' ~ lòʔ'	dūt'	dūt'	lòt'	lùd	à+lùd'	-	-	-	-	-
long or tall (be)_1	*tur ~ tɔr	tù	tù	tól	túr	túr	-	-	-	-	-
defecate_1, diarrhea	*s'UDI	ús'	ús'	s'í	-	ʔ'í	s'òdó	tʃ'òjí	tʃ'òjí	tʃ'òjí	tʃ'òjí
sky_1	*wUs	wús	wús	-	-	-	-	wòs	wòs	wòs	wòs

E.5 Correspondence Set V5: PKMN \*ɛ

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
ear	*c'ɛ	s'ē	s'ē	s'ē	ʃ'é	c'é	k'ē	tʃ'è	tʃ'è	tʃ'è	tʃ'è
seed_1	*D̥E(se)	zì	zì	-	-	-	ḍēsê	dzè̄sē	dzè̄sē	zèsē	sèsē
slip (v.)_1	*ḍerk'és'	dērgés'	dērgés'	-	dèrès	ḍèrès	ḍérk'és	-	-	-	-
bird_stork (maribou)	*jàrú	zèrú	zèrú	zèrú	zàrú	-	jèrú	dzèrú	dzèrú	dzèrú	dzèrú
beehive basket	*gɛnd(V)(l)	géndél	gèndí	kèndē	-	-	gèndá	gèndá	gèndá	gìndá	gèndá
climb_1	*sɛl	sál	sēl	-	sē	sē	-	-	-	-	-
antelope_1	*ʃɛtʰ)	ɔʃɛt	ʃɛt	ʃɛt	ʃɛtʰ	à+ʃɛtʰ	-	-	-	-	-
alone, abstain from, not want to do	*ʔ'ɛn	-	s'ín	s'én	t'én	t'é	gà+t'én	ā+t'én	ā+t'én	ā+t'én	ā+t'én

E.6 Correspondence Set V6: PKMN \*ɔ

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
carry many things_1	*(tɔ)dɔ	tòdò	-	dò	dɔ	dɔ	-	dɔ	dò	dò	dò
tell_1	*(w)ɔt(V)	ǎdó	ǎd	-	-	-	-	ótá	ótá	ótá	-

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
hide, skulk	*bòb ~ bòb	pòp'	pòp'	bòb	-	-	-	pòj	pòj	pòj	-
drip (fall in globules)_1	*c'ò(t'ò)l	s'ót'ó	s'ót'ó	s'òlìl	-	c'òc'òlòc'	c'ò?	t'f'ó	t'f'ó	t'f'ó	t'f'ó
shout_1	*dòl(ò)	dól	dól	dól	-	-	òl	-	-	-	-
fish_sp (very small, scaled fish with a small rounded mouth)	*dòlò	-	dòl	dòl	-	-	dòlì?	dòl	dòl	dòl	dòlì
skin, hide (of animal), bark of tree_1	*gònk'(òf)	gòk'ó	gòk'ó	gònk'í	gòk <sup>h</sup>	-	kògò	kògò	kògò	kògò	gwàngí
foot or leg_1	*fònk'	sònk'	sònt'	fòg	fòk'	fò?	fòg	-	-	-	-
roast (something)	*t'ós	t'òf	t'òf	t'òf	t'ós	t'ós	-	-	-	-	-
pound (v.)_4	*kóp <sup>h</sup>	kóp	kóp	-	kúp <sup>h</sup>	-	-	-	-	-	-
frog_1	*bònk'ó	p'à+ bòngó	p'à+ bòngó	bā+ bònk'ó	-	-	à+ bònk'ó?	à+ bònk'ó	à+ bònk'ó	à+ bònk'ó	à+ bònk'ó
deep (be)_1	*gòdòk'	kwi	kwi	gòr	-	-	kòdòk'	kòr	kòr	kòr	kòr
stab_1	*sóp	só	só	-	-	-	-	sóp	-	sóp	-
sew_1	*kós	ós	ós	-	-	-	kós	kós	kós	kós	kós
grind (second grind)	*(ò)t <sup>(h)</sup> òd	-	twéj	tó	-	t'ód	òt <sup>h</sup>	ót	ót <sup>h</sup>	ót <sup>h</sup>	ót <sup>h</sup>
sip (liquid)	*wòp' ~ hòp'	hòbòs'hòp'	hòbòs'	wòp'	k <sup>h</sup> òbòs	-	hòp'	hòp'ò	hòp'	hòp'	hòp'

#### E.7 Correspondence Set V7: PKMN \*a

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
father_1	*bàbá	-	bàbá	bā	à+bàbá	à+bàbá	-	àbá	àbá	àbá	àbá
finish_1	*dak	-	dak	dàg	dàk <sup>h</sup>	dàk <sup>h</sup>	dák	dàk	-	-	-
wide (be)	*bàj ~ bāj	pàj	pàj	bājá	bàn	bè	-	pàj	pàj	pàj	pàj
bird_heron	*bár	-	ò+bár	à+bár	-	-	à+bár	à+bár	à+bár	à+bár	à+bár
drum_B	*bàmbá	pàmbà	pàmbà	-	bàmbá	-	-	-	-	-	-

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
bitter, sour (be)	*k <sup>h</sup> ak'a	kāgā	kāgā	kàʔ	k <sup>h</sup> aʔ	k <sup>h</sup> āʔ	k <sup>h</sup> ak'à	k <sup>h</sup> ak'ā	k <sup>h</sup> ak'ā	k <sup>h</sup> ak'ā	k <sup>h</sup> ak'ā
palate_1	*balilaj	p'àlīli	p'àlīli	bàlilá	-	-	-	-	-	-	-
grandfather_1	*càk <sup>h</sup> O	-	sàkó	sàkó	-	-	-	tʃàk <sup>h</sup> ó	tʃàk <sup>h</sup> ó	tʃàk <sup>h</sup> ó	tʃàk <sup>h</sup> ó
tree_sp._1	*bafa	p'àf	-	bàf	bàfà	-	bàfà	bāsā	bāsā	bāsā	-
dig_1	*jà	fà	fà	-	-	-	cà	tʃà	tʃà	tʃà	tʃà
grind wet (first grind)	*Dàs'	dàs'	dàs'	nàs'	nàs'	nàʔ'	-	-	-	-	-
cannabis_1	*bāngwà	bāŋgà	bāŋgà	bánkò	bāŋgò	bāŋgò	-	-	-	-	-
Dazu (S. Sudan)	*dájV	dázò	dázò	dázò	dǎʔò	dǎʔò	dǎʔò	dádʒò	dádʒò	dádʒò	dádʒò
sneeze_1	*haʔ'is	hǎʔ'if	-	-	-	-	hǎʔ'is	hǎʔ'is	hǎʔ'is	hǎʔ'is	hǎʔ'is
have sex_1	*hag(a)	háʔ	háʔ	hág	-	háʔ	-	hágá	hágá	hágá	hágá
belt, sash	*gafa	gáfà	gáfà	-	gǎf	gǎfá	gǎf	gǎʔf	gǎʔf	gǎʔf	gǎf
Dana (ethnonym)_3	*ɖana	dānā	dānā	dāná	-	-	ɖāná	dānā	dānā	dānā	dānā
porcupine_1	*k <sup>(h)</sup> ak'as ~ k <sup>(h)</sup> asak'	kák'àf	kák'àf	káfák'	-	-	kásāk'	k <sup>h</sup> ásāk'	k <sup>h</sup> ásāk'	k <sup>h</sup> ásāk'	k <sup>h</sup> áfák'
trample, ruminate	*has'	-	hās'ì	hás'	hás'	hǎʔ'	hás'	hǎʔf	hǎʔf	hǎʔf	hǎʔf
replace	*(n(j)a)gaD	nāgát	njāgát	gàdá	gàs	gàr	gàtá	kàrá	kàrá	kàrá	kàrá
vomit_1	*(pa)jas'	pājàs'	pājàs'	jàʔ	ǰǎʔ	ǰǎʔ	-	-	-	-	-
find, meet	*gàm	kàm	kàm	gàm	gàm	gàm	kàm	kàm	kàm	kàm	kàm
come, come_SG	*ha	hǒ	hǒ	hà + ó	-	-	-	-	-	-	-
Nuer (ethnonym)_1	*ʃaŋg(ɔ)aj	zǎgó	zǎgó	zǎgó	ʒwǎŋgì	-	ʃaŋwèj	dzǎŋó	-	zǎŋwé	ʃaŋwè
boil (of liquid)_1	*was(ik')	wǎf	wàfí	wǎfík'	-	-	wás	wās	wās	wās	wās
repair_1	*k <sup>h</sup> aɓ	áp	-	áb	-	-	óba	k <sup>h</sup> áp'	k <sup>h</sup> áp'	k <sup>h</sup> áp'	k <sup>h</sup> áp'
shut_2	*k <sup>h</sup> ac'	kǎf	kǎf	-	k <sup>h</sup> ǎf	k <sup>h</sup> ác'	-	-	-	-	-
open	*k <sup>h</sup> ád(a)	kálá	kájá	kár	k <sup>h</sup> ád	k <sup>h</sup> ǎf	k <sup>h</sup> átá	k <sup>h</sup> átá	k <sup>h</sup> átá	k <sup>h</sup> átá	k <sup>h</sup> átá
herd (v.)	*k <sup>h</sup> aj	kēʔ	kēʔ	kàʔí	-	-	k <sup>h</sup> ájíʔ	k <sup>h</sup> ájí	k <sup>h</sup> ájí	k <sup>h</sup> ájí	k <sup>h</sup> ájí
soft (be)_1	*k'át'	k'át'	k'át'	k'át'	k'ád	k'ád	-	-	-	-	-

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
scorpion	*d(w)ank'i ~ d(w)ank'i	*t'wānk'	*t'wānk'	bādāgí?	dwāk <sup>h</sup>	à+dāk <sup>h</sup>	dāgí	dāgí	dāgí	dāgí	dāgí
platform	*p <sup>h</sup> ará	pára	pára	pára	-	-	p <sup>h</sup> ará	p <sup>h</sup> ará	p <sup>h</sup> ará	p <sup>h</sup> ará	p <sup>h</sup> ará
bed_1	*langaret	àngàr	-	àngàr	àngàr	-	-	làngàré t	àngàríp h	àngàríp h	àngàríp h
eat (hard food)	*k'ama	k'ā	k'ā	k'á	k'á?	k'á	k'ámá	k'ámá	k'ámá	k'ámá	k'ámá
forehead_1	*t <sup>(h)</sup> (w)àg	twā	twā	tàg	-	-	tàg	bī+t <sup>h</sup> āg	-	pī+t <sup>h</sup> āg	-
grandmother_1	*k <sup>h</sup> àk <sup>h</sup> á	-	kàkà	kàkà	-	-	k <sup>h</sup> àk <sup>h</sup> á	kàkà	kàkà	kàkà	kàkà
carry on back_1	*màm(a)	màm	màm	màmá	màm	màm	màmá	màmā	màmā	màmā	màmā
wife_1, marry, wedding	*màf	-	p'ā+màf	màf	màf	màf	màf	màs	màs	màs	màs
disabled (be), angry (be)	*nap(a)	nápá	nápá	nápá	-	náp <sup>h</sup> ē	náp <sup>h</sup>	nāp	nāp	nāp	nāp
soak_1	*p <sup>h</sup> àc'	pās'	pās'	pàs'	p <sup>h</sup> àf	p <sup>h</sup> àc'	-	-	-	-	-
come free and fall off	*p <sup>h</sup> al	pī	pī	-	-	-	-	p <sup>h</sup> ál	p <sup>h</sup> ál	p <sup>h</sup> ál	p <sup>h</sup> ál
fly (v.)	*p <sup>h</sup> àḍ	pāl	pāj	pàj	p <sup>h</sup> āj	p <sup>h</sup> ē	p <sup>h</sup> àḍ	p <sup>h</sup> āj	p <sup>h</sup> āj	p <sup>h</sup> āj	p <sup>h</sup> āj
blood_1	*s'ámá	s'ám	s'ám	-	-	-	s'ámá?	tʃ'ámá	tʃ'ámá	tʃ'ámá	tʃ'ámá
light (ignite)	*s'a	s'ā	s'ā	s'à	s'ā	tʃ'ā	s'ówà	tʃ'ā	tʃ'ā	tʃ'ā	tʃ'ā
beeswax_1	*gāgá?	gāgá	gāgá	-	-	-	gāgá	gāgá	gāgá	gāgá	gāgá
bird_pelican (brown)	*nàbòng(w) à	-	ō+nàbòṅà	nàbòṅà	-	-	nàbòṅò	nàbòṅg ò	nàbòṅg ò	nàbòṅg ò	nàbòṅg ò
make go away	*t <sup>h</sup> af ~ t <sup>h</sup> af	tāf	tāf	tàf	t <sup>h</sup> áf	t <sup>h</sup> áf	-	-	-	-	-
thorn, sharp (be)	*k <sup>(h)</sup> a(ṅ)k <sup>(o)</sup> a	kāṅà	kāṅà	kákā	kā?	kākā	k <sup>h</sup> ák <sup>h</sup> ā?	k <sup>h</sup> ák'ā	k <sup>h</sup> ák'ā	k <sup>h</sup> ák'ā	k <sup>h</sup> ák'ā
salt_(made from ash of a particular plant/tree)_2	*t'af	t'āf	t'āf	t'àf	t'āf	t'āf	t'àf	t'ās	-	-	-
be, do	*tà	-	ta	tà	tā	tā	-	tā	-	tā	-
drum_C	*t'ará	-	tàrá	tàrá	-	-	t'ará	tàrá	tàrá	tàrá	tàrá

Meaning	PKmn	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
hail, ice_1	*wasak'	wàsà	wàsà	wàfàk'	wàsá?	à+wàsá ?	-	-	-	-	-
touch_1, crawl	*pàD	pāt	pāt	pàt	pāth	pār	-	-	-	-	-
kick	*tʰáb	táp'	táp'	táb	tʰáb	tʰáb	tʰáp	tʰáp	tʰáp	tʰáp	tʰáp
birth pangs (pain)	*fāf(ā)	fé	fé	fāf	-	-	fāfā	sāsā	sāsā	sāsā	fāfā
back_1	*k'(w)ás	k'wás	k'wás	k'ǎw	-	-	-	-	-	-	-
break (v.)_1	*wa	wǎ	wǎ	wà	wá	wá	-	-	-	-	-
boar (wild)_1	*wàb	wàp'	wàp'	wàp'	wàpʰ	à+wàb	-	-	-	-	-
fish (n.) general term	*wàc'à	wàs'	wàs'	wàs'	wàf	wàc'	wàc'à	wàtf'à	wàtf'à	wàtf'à	wàtf'à
chicken_1	*waŋa	wāŋā	wāŋā	wàgá	ŋwá	à+ŋwá	-	-	-	-	-
bee, honey	*dàm	tàm	tàm	dàm	dàm	à+dàm	tàm	tàm	tàm	tàm	tàm



APPENDIX F  
COMPLETE DATASET

This appendix contains the complete dataset used in this reconstruction. It is organized alphabetically by meaning. The first column (**NODE**) indicates the highest node to which a particular etymon can be reconstructed. The **\*proto** column contains all reconstructed forms. If it is the case that a meaning has only one entry, then I do not reconstruct a word for this meaning and the proto column is left empty.

The abbreviations for the language varieties are as follows: GwLo= Lowland Gwama, GwHi= Highland Gwama, UdYa= Yabus Uduk, Komo=Ethiopian Komo, UdCh= Chali Uduk, Dana=Dana, OpBi= Bilugu Opo, OpMo= Modin Opo, OpPa= Pame Opo, OpKi= Kigile Opo.

I employ the grapheme <+> to indicate a historical or synchronic morpheme boundary.

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PDaOp	abstain from_1	*t̥ák'án	-	-	-	-	-	t̥ák'án	t̥ák'á	t̥ák'á	t̥ák'á	-
PGw	abstain from_2	*tā	tā	tā	-	-	-	-	-	-	-	-
PKmn	acacia	*túk <sup>(h)</sup> (u)	t̥ók̚	-	túk	túk <sup>h</sup>	à+túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>	túk <sup>h</sup>
PCtrl	adhere	*dáb(a)	-	-	dáb	dāp <sup>h</sup>	dāp <sup>h</sup>	dábá	dábá	dábá	dábá	dábá

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
POp	all_1	*ā+ḃigín	-	-	-	-	-	-	ā+ḃigín	ā+ḃigín	ā+ḃigín	ā+ḃōgà
Komo	all_2		-	-	í+fím	-	-	-	-	-	-	-
PGw	all_3		-	møkín	-	-	-	-	-	-	-	-
Dana	all_4		-	-	-	-	-	gà+p <sup>h</sup> ān	-	-	-	-
PUd	all_5, finish	*ḃár	-	-	-	ḃár	ḃár	-	-	-	-	-
	alone,											
PKmn	abstain from, not want to do	*ṭ'én	-	s'ín	s'én	t'én	t'é	gà+ṭ'én	ā+t'én	ā+t'én	ā+t'én	ā+t'én
PGw	annoint (with oil)_1	*s'á	s'á	s'á	-	-	-	-	-	-	-	-
Komo	annoint (with oil)_2		-	-	mò	-	-	-	-	-	-	-
PUd	annoint (with oil)_3		-	-	-	k'ój+jì	n	-	-	-	-	-
PUd	annoint (with oil)_4		-	-	-	-	cūr	-	-	-	-	-
PDaOp	annoint (with oil)_5	*lálí	-	-	-	-	-	lálí	lálí	lálí	lálí	lálí

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	antelope (dikdik, small deer)_2	*nì	ō+nì	nì	-	-	-	-	-	-	-	-
	antelope (dikdik, small deer)_2	*zɔj	-	-	zwì	wí	à+ʔúj	zɔj	à+ʔójó	à+ʔóí	à+ʔóí	-
PKmn	antelope_1	*fēt <sup>(h)</sup>	ōfēt	fēt	fēt	fēt <sup>h</sup>	à+fēt <sup>h</sup>	-	-	-	-	-
POp	antelope_2	*lɔj	-	-	-	-	-	-	lɔj	lɔj	-	-
Dana	antelope_3		-	-	-	-	-	bùjè	-	-	-	-
POp	antelope_4	*pàndzà	-	-	-	-	-	-	-	-	pàndzà	pàndzà
PCtrl	antelope_g azelle	*kɪf ~ *kɪf	-	-	kɪf	cɪf	à+cɪf	àkɪf	k <sup>h</sup> ɪs	k <sup>h</sup> ɪs	k <sup>h</sup> ɪs	kɪf
PKoUd	antelope_w aterbuck	*kōp <sup>h</sup>	-	-	kōp	kōp <sup>h</sup>	kōp <sup>h</sup>	-	-	-	-	-
PGwKo	arm_1	*kwapa	kwápá	kwápá	kōp	-	-	-	-	-	-	-
PUd	arm_2	*bwí	-	-	-	bwí	à+bí	-	-	-	-	-
Dana	arm_3, shoulder		-	-	-	-	-	kàlòŋ	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PCtrl	arrive_1	*p <sup>(h)</sup> ud(i)	-	-	-	-	p <sup>h</sup> üď	pújĩ	-	-	-	-
PKoUd	arrive_2	*k <sup>h</sup> é	-	-	ké	c <sup>h</sup> é	-	-	-	-	-	-
POp	arrive_3	*bēr	-	-	-	-	-	-	bēr	bēr	bēr	bēr
PGw	arrive_4	*pǒfǒ	pǒfǒ	pǒfǒ	-	-	-	-	-	-	-	-
POp	arrow_1	*àŋèràŋ	-	-	-	-	-	-	àŋèràŋ	-	àŋèràŋ	-
PGw	arrow_2	*pínziák'ĩfi n	pínziák'ĩfi n	pínziák'ĩfi n	-	-	-	-	-	-	-	-
PCtrl	arrow_3	*T <sub>A</sub> (t <sup>h</sup> )	-	-	sá	sá	à+ṭá	sēṭ <sup>h</sup>	-	tǣ	-	tǣ
PKmn	ash_1	*(ti)p'lk'ɪŋ( a)	p'ík'ín	p'ík'ín	p'ín	-	t'ip'ɪŋ	p'ínā	-	-	p'ínā	p'ínā
POp	ash_2	*pítí	-	-	-	-	-	-	pítí	pítí	-	-
PUd	ash_3		-	-	-	bút <sup>h</sup>	-	-	-	-	-	-
PKmn	ask (inquire)_1	*dOt	tǒt	tǒt	dǒt	dǒt <sup>h</sup>	dǒt <sup>h</sup>	-	tǒt	tǒt	-	-
PDaOp	ask (inquire)_2	*nàm	-	-	-	-	-	nàm	-	-	nàm	nàm
PCtrl	avenge	*óg	-	-	óg	-	-	óg	óg	óg	óg	óg
PUd	axe_1		-	-	-	c <sup>h</sup> ĩs'	-	-	-	-	-	-
PCtrl	axe_2	*jĩḍ	-	-	jĩḥ	-	-	jĩḍ	-	-	-	-
PUd	axe_3		-	-	-	-	c <sup>h</sup> úṭ <sup>h</sup>	-	-	-	-	-

<b>NODE</b>	<b>Meaning</b>	<b>*proto</b>	<b>GwHi</b>	<b>GwLo</b>	<b>Komo</b>	<b>UdYa</b>	<b>UdCh</b>	<b>Dana</b>	<b>OpBi</b>	<b>OpMo</b>	<b>OpPa</b>	<b>OpKi</b>
PGw	axe_4	*pàns'	pàns'	pàns'	-	-	-	-	-	-	-	-
POp	axe_5	*wòj	-	-	-	-	-	-	wòj	wòj	wòj	wòj
PKmn	baboon_1, dog_2	*dɪŋɪ	tɪnì	tɪnì	-	-	-	tɛŋ	tɪnì	tɪnì	tɪn	tɪn
PDaOp	baboon_2	*jare	-	-	-	-	-	jārē	tʃārè	tʃārè	tʃārè	tʃārì
PKoUd	baboon_3	*dàwàʔ	-	-	dàw	-	à+dàwà	-	-	-	-	-
PUd	baboon_4		-	-	-	gàwàʃ	-	-	-	-	-	-
PGw	baboon_5	*ɛ́lé	ɛ́lé	ɛ́lé	-	-	-	-	-	-	-	-
PKmn	back_1	*k'(w)ás	k'wás	k'wás	k'ăw	-	-	-	-	-	-	-
PKoUd	back_2	*pʰóǵ	-	-	póǵ	pʰóʔ	à+pʰóʔ	-	-	-	-	-
Dana	back_3		-	-	-	-	-	dàrsóǵ	-	-	-	-
POp	back_4	*sít̄ɪn	-	-	-	-	-	-	sít̄ɪn	sít̄ɪn	sít̄ɪn	sít̄ɪn
PKoUd	bad (be)_1	*ʃíg	-	-	ʃíg	ʃíʔ	ʃíʔ	-	-	-	-	-
PGw	bad (be)_2	*pḗtí	pḗtí	pḗtí	-	-	-	-	-	-	-	-
POp	bad (be)_3	*kʰó	-	-	-	-	-	-	kʰó	kʰó	kʰó	kʰó
Dana	bad (be)_4		-	-	-	-	-	sít̄hā	-	-	-	-
PCtrl	bale out (water)	*kʰóɓ	-	-	kóp	kʰóɓ	kʰóɓ	kʰóɓʰ	kʰóɓʰá	kʰóɓʰá	kʰóɓʰá	kʰóɓʰá
PGw	bamboo_1	*tǎŋá	tǎŋá	tǎŋá	-	-	-	-	-	-	-	-
PCtrl	bamboo_2	*sEU	-	-	s'iw	s'ì	à+ɬ'ē	s'iw	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
POp	bamboo_3	*kūp	-	-	-	-	-	-	kūp	kūp	kūp	kūp
PDaOp	barren (be)	*p <sup>h</sup> ḡs	-	-	-	-	-	pḡs	p <sup>h</sup> ḡs	p <sup>h</sup> ḡs	p <sup>h</sup> ḡs	p <sup>h</sup> ḡs
PKmn	basket	*RUKa	lúkà	lúkà	lùg	rùgà	-	ròk <sup>h</sup> à	rùwà	ròkà	ròkà	ròkà
PKmn	bathe	*úp <sup>h</sup>	óp	óp	úp	úp <sup>h</sup>	úp <sup>h</sup>	úp <sup>h</sup>	úp <sup>h</sup>	úp <sup>h</sup>	úp <sup>h</sup>	úp <sup>h</sup>
PKmn	be, do	*tà	-	ta	tà	tā	tā	-	tā	-	tā	-
PKoUd	bean_1	*ḡagi	-	-	ḡḡí	ḡḡì	-	-	-	-	-	-
PGw	bean_2	*k'wāfà	k'wāfà	k'wāfà	-	-	-	-	-	-	-	-
PDaOp	bean_3	*gwàlí	-	-	-	-	-	gwàlí	gwàlí	gwàlí	gwàlí	gwàlí
PUd	bean_4	*ḡḡà	-	-	-	zúgà?	à+ḡḡà	-	-	-	-	-
	become,											
PKmn	become angry	*wVd	wět	wět	wàl	wár	wád	wàl	-	-	-	-
PKmn	bed_1	*langarēt	àngàr	-	àngàr	àngàr	-	-	làngàrēt	àngàríp <sup>h</sup>	àngàríp <sup>h</sup>	àngàríp <sup>h</sup>
PGw	bed_2		-	bámbar	-	-	-	-	-	-	-	-
PCtrl	bed_3	*kija	-	-	-	cī	à+cī	kijà	-	-	-	-
PKmn	bee, honey	*ḡàm	tàm	tàm	dàm	dàm	à+ḡàm	tàm	tàm	tàm	tàm	tàm
PKmn	beehive basket	*gènd(V)(l)	géndél	gèndí	kèndē	-	-	gèndá	gèndá	gèndá	gìndá	gèndá
PKmn	beer	*suḡ(i)	fól	fwí	fùlí	sū	à+sū	sùḡ	sī	swī	swī	swī

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	beer filter_1	*tazà	tazà	tazà	-	-	-	-	-	-	-	-
PKoUd	beer filter_2	*d̥ɪnd̥àl	-	-	zɪnzàl	zɪnzàl	à+d̥ɪnd̥àl	-	-	-	-	-
PDaOp	beer filter_3	*t̥im̥is	-	-	-	-	-	t̥im̥is	t̥im̥is	t̥im̥is	t̥im̥is	t̥im̥iʃ
PKmn	beeswax_1	*gāgáʔ	gāgá	gāgá	-	-	-	gāgá	gāgá	gāgá	gāgá	gāgá
Komo	beeswax_2		-	-	f̥ùt'	-	-	-	-	-	-	-
PUd	beeswax_3		-	-	-	j̥ígán	-	-	-	-	-	-
PUd	beeswax_4		-	-	-	-	d̥ɪŋgílá	-	-	-	-	-
PCtrl	belch_1	*gàd(am)	-	-	gàl	gàrà	gǎd'	gàrà̀m	k'ērēm	gàrà̀m	gàrà̀m	gàrà̀m
PGw	belch_2	*dēmés'	dēmés'	dēmés'	-	-	-	-	-	-	-	-
PKmn	belly or stomach_1	*bùf̥ul	bùf̥ul	bùf̥i	bùf̥	-	bùf̥	-	pùsà	pùsà	pùsà	pùsà
PCtrl	belly or stomach_2	*bùmà	-	-	-	bwàʔ	-	mwà	pùmà	pùmà	pùmà	pùmà
PGw	belly or stomach_3	*tát	tát	tát	-	-	-	-	-	-	-	-
PKmn	belt, sash	*gáʃa	gáʃà	gáʃà	-	gǎʃ	gǎʃá	gǎʃ	gǎtʃ	gǎtʃ	gǎtʃ	gǎʃ
PKoUd	big (be)_1	*c(w)ā	-	-	swà	cā	cā	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	big (be)_2	*hànt'à	hànt'à	hànt'à	-	-	-	-	-	-	-	-
	big (be),											
PCtrl	male, elder_1	*tòn	-	-	tòn	-	-	tòn	tòn	tòn	tòn	tòn
	big (be),											
PUD	male, elder_2	*ḍàn	-	-	-	zàn	ḍàn	-	-	-	-	-
PCtrl	bird	*ḍit <sup>h</sup> ?	-	-	ḍīw	ḍūwì	ḍī	ḍit <sup>h</sup>	ḍīrò	ḍīrò	ḍīrò	ḍīrò
	bird (yellow-											
PKmn	billed kite or black kite)	*gòlila	-	gòl:ā	bāgòlilā	-	-	bāgòl:ā	-	bāgòlól	bāgòlól	bāgòlà
PKmn	bird_(cattle egret)	*kEɲ	kīl	kīl	à+kīl	cécénā	à+céɲ	à+kīl	à+kīl	à+kīl	à+kīl	à+kīl
	bird_corma											
PCtrl	nt (whistling duck)	*mililu ~ *milili	-	-	à+mīlīlū	-	-	mīlīlū	mīlīli	mīlīli	mīlīli	mīlīli



NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PKmn	bird_dove (African mourning)	*tiritiri	-	títiti	-	-	-	-	à+tírítírì	à+tírítírì	à+tírítír ì	à+tírítír ì
PKmn	bird_hamm erkopf_1	*nék <sup>h</sup>	-	ō+nék	à+nék	nék <sup>h</sup>	à+nék <sup>h</sup>	à+ník <sup>h</sup>	-	-	à+ník <sup>h</sup>	à+ník <sup>h</sup>
POp	bird_hamm erkopf_2	*ànùrè	-	-	-	-	-	-	ànùrè	ànùrè	-	-
PKmn	bird_heron	*bár	-	ō+bár	à+bár	-	-	à+bár	à+bár	à+bár	à+bár	à+bár
PKmn	bird_ostric h_1	*wut <sup>h</sup>	-	wūt	wūt	út <sup>h</sup>	à+út <sup>h</sup>	-	hút <sup>h</sup>	hút <sup>h</sup>	hút <sup>h</sup>	hút <sup>h</sup>
Dana	bird_ostric h_2		-	-	-	-	-	ròt <sup>h</sup> áj	-	-	-	-
PKmn	bird_pelican (brown)	*nàbòng(w) à	-	ō+nàbòṅà	nàbòṅà	-	-	nàbòṅgò	nàbòṅgò	nàbòṅgò	nàbòṅg ò	nàbòṅgò
PCtrl	bird_Quelea (Red-billed)	*Dìbàl	-	-	dìbàl	-	-	-	à+dzìbà	à+dzìbà	à+dzìbà	à+dzìbà
PCtrl	bird_stork (abdim)	*gOmp <sup>h</sup> Vja	-	-	à+gòmpí já	-	-	-	à+kòmp <sup>h</sup> újá	-	à+kòm p <sup>h</sup> újá	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PKmn	bird_stork (maribou)	*jàrú	zèrú	zèrú	zèrú	zàrú	-	jèrú	dzèrú	dzèrú	dzèrú	dzèrú
PKmn	bird_vultur e (white- backed)_1	*lòm	ǒlòm	-	lòm	lù?	-	lòm	lòm	lòm	lòm	lòm
PGw	bird_vultur e (white- backed)_2		-	k'öpó	-	-	-	-	-	-	-	-
PUd	bird_vultur e (white- backed)_2		-	-	-	-	k'óró	-	-	-	-	-
PKmn	bird_weave r	*dwak <sup>h</sup>	ǒ+dwák	ǒ+dók	à+dók	-	-	à+dwák <sup>h</sup>	à+dwák <sup>h</sup>	à+dwák <sup>h</sup>	à+dwák <sup>h</sup>	à+dwák <sup>h</sup>
PKmn	birth pangs (pain)	*fāf(ā)	fé	fé	fāf	-	-	fāfā	sāsā	sāsā	sāsā	fāfā
Komo	bite (by animal)_1		-	-	d'ór	-	-	-	-	-	-	-
PGw	bite (by animal)_2	*k'úns'	k'úns'	k'úns'	-	-	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PUd	bite (by animal)_3		-	-	-	-	ʃɛp <sup>h</sup>	-	-	-	-	-
PDaOp	bite (by animal)_4	*dòŋ	-	-	-	-	-	dòŋ	dòŋ	dòŋ	dòŋ	dòŋ
PCtrl	bite_1	*hóc'	-	-	wós'	wǒʃ	wǒc'	hóc'	hɔ́tʃɔ́	hɔ́tʃɔ́	hɔ́tʃ	hɔ́tʃ
PGw	bite_2	*s'uns'	sūns'	s'úns'	-	-	-	-	-	-	-	-
PKmn	bitter, sour (be)	*k <sup>h</sup> ak'a	kāgā	kāgā	kàʔ	k <sup>h</sup> āʔ	k <sup>h</sup> āʔ	k <sup>h</sup> ak'à	k <sup>h</sup> ak'ā	k <sup>h</sup> ak'ā	k <sup>h</sup> ak'ā	k <sup>h</sup> ak'ā
PCtrl	black (be)_1	*s'íɖ	-	-	s'í	s'íʔ	t'íʔ	s'íɖ	tʃ'í	tʃ'í	tʃ'í	tʃ'í
PGw	black (be)_2	*t'ót'ót	t'ót'ót	t'ót'ót	-	-	-	-	-	-	-	-
PCtrl	blame (somebody) _1	*nɔ́g	-	-	nɔ́g	-	-	nɔ́g	nɔ́gá	nɔ́gá	nɔ́gá	nɔ́gá
PGw	blame (somebody) _2	*tònsòs	tònzò	tònsòs	-	-	-	-	-	-	-	-
PKmn	blood_1	*s'ámá	s'ám	s'ám	-	-	-	s'ámáʔ	tʃ'ámá	tʃ'ámá	tʃ'ámá	tʃ'ámá
PKoUd	blood_2	*bàs	-	-	bàʃ	bàs	à+bàs	-	-	-	-	-
PKmn	blow (with mouth)	*p <sup>h</sup> ui(ki)	pīkī	pī	pì	p <sup>h</sup> ùj	p <sup>h</sup> í	p <sup>h</sup> ùj	p <sup>h</sup> ú	p <sup>h</sup> ú	p <sup>h</sup> ú	p <sup>h</sup> ú

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PKmn	blow nose	*fɪnt' ~ fɪnt'	fɪnt'	fɪnt'	fɪn+fɔ̃nɲ	fɪn	fɪn	fɪnà+fɔ̃ɲ	síná	síná	síná	síná
PKmn	boar (wild)_1	*wàb	wàp'	wàp'	wàp'	wàp <sup>h</sup>	à+wàb	-	-	-	-	-
POp	boar (wild)_2		-	-	-	-	-	-	t <sup>h</sup> àrk'á	-	-	-
PKmn	body_1	*(j)Es	-	jīs	īf	īs	īs	ēs	ēs	ēs	ēs	ēs
PGw	body_2		wúsɪn	-	-	-	-	-	-	-	-	-
PKmn	boil (of liquid)_1	*was(ik')	wǎf	wǎfí	wǎfík'	-	-	wás	wās	wās	wās	wās
PUd	boil (of liquid)_2		-	-	-	gàbùfà	-	-	-	-	-	-
PKmn	bone	*fUImak'	sí	sí	fúmák'	símā?	à+símā?	fój	sój	sój	sój	sój
PCtrl	brain_1	*lɔ̀lɔ̀k'	-	-	lɔ̀lɔ̀k'	-	-	lɔ̀lɔ̀?	lɔ̀lɔ̀k'	lɔ̀lɔ̀k'	lɔ̀lɔ̀k'	lɔ̀lɔ̀k'
PUd	brain_2	*t <sup>h</sup> úlá	-	-	-	t <sup>h</sup> úlá	à+t <sup>h</sup> úlá?	-	-	-	-	-
PGw	brain_3	*fɔ̃nɔ̃	fɔ̃nɔ̃	fɔ̃nɔ̃	-	-	-	-	-	-	-	-
PKoUd	break (destroy or get destroyed)	*k'ɛd	-	-	k'èr	c'éd	c'éd	-	-	-	-	-
PKmn	break (v.)_1	*wa	wǎ	wǎ	wà	wá	wá	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
POp	break (v.)_2		-	-	-	-	-	-	pɛ́má	-	-	-
Dana	break (v.)_3		-	-	-	-	-	táj	-	-	-	-
P Ctrl	breast, milk_1	*kóḡ	-	-	kó	kó	à+kó	kóḡ	kój	kój	kój	kój
PGw	breast, milk_2	*s'õp'	s'õp'	s'õp'	-	-	-	-	-	-	-	-
PKmn	breathe	*fuk'in	fĩmjí	fĩmfi	fùʔɛ̀n	fĩʔin	fĩʔin	fik'	sik'	sik'	sik'	sik'
P Ctrl	bring_1	*k <sup>h</sup> al	-	-	kà-õ	k <sup>h</sup> ál+í	k <sup>h</sup> ál+ú	kùjí	-	-	-	-
POp	bring_2	*p <sup>h</sup> ā	-	-	-	-	-	-	p <sup>h</sup> ā+ó	p <sup>h</sup> ā+jó	p <sup>h</sup> ā+jó	p <sup>h</sup> ā+jó
PGw	bring_3	*kāp	kāp	kāp	-	-	-	-	-	-	-	-
Dana	bring_4		-	-	-	-	-	đójɛ̀	-	-	-	-
Komo	brood (v.)_1		-	-	fùḡ	-	-	-	-	-	-	-
PGw	brood (v.)_2	*kò	kò	kò	-	-	-	-	-	-	-	-
PUd	brood (v.)_3	*wúp <sup>h</sup>	-	-	-	wúp <sup>h</sup>	wúp <sup>h</sup>	-	-	-	-	-
P DaOp	brood (v.)_4	*fúmā	-	-	-	-	-	fúmā	súmá	súmá	súmá	súmá
P Ctrl	broom_1	*gwàrás'	-	-	gwàrás'	-	-	gwàrás'	gwàrátʃ'	gwàrátʃ'	gwàrátʃ'	gwàrátʃ'
P Ctrl	broom_2	*gɛ̀díʃ	-	-	-	ʒèdíʃ	ʒèdɛ̀ʃ	kèdɛ̀ʃ	k <sup>h</sup> èris	k <sup>h</sup> èris	k <sup>h</sup> èris	k <sup>h</sup> èriʃ
PGw	broom_3	*pĩʃ	pĩʃ	pĩʃ	-	-	-	-	-	-	-	-
PKmn	brother	*ɔ=kam *kamɔ	kwám	kwám	kám	kām	à+kām	āmó	hàm	hàm	hàm	hàm

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
GwKo	buffalo_1	*gwàs'	kwàs'	kwàs'	gwàs'	-	-	-	-	-	-	-
POp	buffalo_2	*bàtʃ	-	-	-	-	-	-	bàtʃ	bàtʃ	bàtʃ	bàtʃ
PCtrl	buffalo_3	*ʃùmà+s'íɖ	-	-	-	ʃùmā+	-	ʃùmà+s'í	-	-	-	-
						s'íʔ		ɖ				
PCtrl	burn (hairs off of pig skin), roast next to fire	*p <sup>(h)</sup> ōr	-	-	-	pūr	pūr	-	p <sup>h</sup> ōr	p <sup>h</sup> ōr	p <sup>h</sup> ōr	-
PCtrl	burn_1	*k <sup>h</sup> ís'	-	-	kís'	c <sup>h</sup> ís'	c <sup>h</sup> ítʃ'	k <sup>h</sup> ís'ā	k <sup>h</sup> ítʃ'ā	k <sup>h</sup> ítʃ'ā	k <sup>h</sup> ítʃ'ā	k <sup>h</sup> ítʃ'ā
PGw	burn_2		-	t'ánt'	-	-	-	-	-	-	-	-
PKmn	burnt gound, soot	*(ja)p <sup>h</sup> uZa	ʃāpót	ʃābót	kí+pú	bwà+p h <sup>w</sup> í	à+p <sup>h</sup> íʔ	pùzàʔ	p <sup>h</sup> újhá	p <sup>h</sup> újhá	p <sup>h</sup> újhá	p <sup>h</sup> újhá
PKmn	bury (sideways)	*nɔp' ~ *nɔmp'	ōmp'	ōmp'	-	-	-	nòp'á	-	-	-	-
PCtrl	bury_1	*bàb	-	-	bàb	-	-	-	-	-	pàbà	pàbà
PCtrl	bury_2	*kàn	-	-	kàn	kān	kān	kànà	-	-	-	-
POp	bury_4	*tʃim	-	-	-	-	-	-	tʃim	tʃim	-	-
PKmn	buttocks_1	*ɔʃ	īʃ	ōʃ	-	-	-	ōʃ	ōs	ōs	ōs	ōʃ
PKoUd	buttocks_2	*p'én	-	-	p'én	p'én	p'én	-	-	-	-	-
PGw	buy_1	*dwì	dwì	dwì	-	-	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PUd	buy_2	*jól	-	-	-	jól	jól	-	-	-	-	-
PCtrl	buy_3, sell	*f̥o	-	-	f̥o	-	-	f̥o	s̄o	s̄o	s̄o	s̄o
PCtrl	bypass_1	*kál	-	-	kāl	kál	kál	kál	kál	kál	kál	kál
PGw	bypass_2	*béf̥è	béf̥è	béf̥è	-	-	-	-	-	-	-	-
PKoUd	calf of leg	*sád(á)	-	-	f̥ará	sád	à+sád	-	-	-	-	-
PGw	calf of leg	*s'ús's'óm̩	s'ús's'óm̩	s'ús's'óm̩	-	-	-	-	-	-	-	-
PDaOp	calf of leg	*t̥'ák'óm̩	-	-	-	-	-	t̥'ák'óm̩	t̥'ák'óm̩	t̥'ák'óm̩	t̥'ák'óm̩	t̥'ák'óm̩
											ó	ó
Dana	call_1		-	-	-	-	-	àr	-	-	-	-
PCtrl	call_2	*juga	-	-	-	júk <sup>h</sup>	júk <sup>h</sup>	-	dʒùgà	dʒùgà	zùgà	fùgà
Komo	call_3		-	-	ól	-	-	-	-	-	-	-
PGw	call_4	*twī	twī	twī	-	-	-	-	-	-	-	-
PKmn	cannabis_1	*bángwà	bángà	bángà	bánkò	bǎngò	bǎngò	-	-	-	-	-
PDaOp	cannabis_2	*k <sup>h</sup> ángá	-	-	-	-	-	k <sup>h</sup> ángá	k <sup>h</sup> ángá	k <sup>h</sup> ángá	k <sup>h</sup> ángá	k <sup>h</sup> ángá
PKmn	carry many things_1	*(tɔ)dɔ	tòdò	-	d̥ɔ	d̥ɔ	d̥ɔ	-	d̥ɔ	d̥ɔ	d̥ɔ	d̥ɔ
PGw	carry many things_2		-	pòl	-	-	-	-	-	-	-	-
PKmn	carry on back_1	*màm(a)	màm	màm	màmá	màm	màm	màmá	màmā	màmā	màmā	màmā

<b>NODE</b>	<b>Meaning</b>	<b>*proto</b>	<b>GwHi</b>	<b>GwLo</b>	<b>Komo</b>	<b>UdYa</b>	<b>UdCh</b>	<b>Dana</b>	<b>OpBi</b>	<b>OpMo</b>	<b>OpPa</b>	<b>OpKi</b>
POp	carry on back_2	*kómá	-	-	-	-	-	-	kómá	kómá	kómá	kómá
PKmn	carry on head_1	*kOp <sup>h</sup>	kù	kù	-	-	-	kõp <sup>h</sup>	kõp	kõp	kõp	kõp
PUd	carry on head_2	*k <sup>h</sup> ál	-	-	-	k <sup>h</sup> ál	k <sup>h</sup> ál	-	-	-	-	-
Komo	carry on head_3		-	-	kákà	-	-	-	-	-	-	-
PCtrl	carry_1	*k <sup>h</sup> al	-	-	kàj	k <sup>h</sup> ál	k <sup>h</sup> ál	k <sup>h</sup> ál	k <sup>h</sup> ál	k <sup>h</sup> ál	k <sup>h</sup> ál	k <sup>h</sup> ál
PKoUd	carry_2	*tér	-	-	tér	tēr	-	-	-	-	-	-
POp	carry_3	*pāgā	-	-	-	-	-	-	pāgā	pāgā	pāgā	pāgā
PDaOp	carry_4	*fāk'à	-	-	-	-	-	fāk'à	sāk'ā	sāk'ā	sāk'ā	sāk'ā
PGw	carry_5		-	sündí	-	-	-	-	-	-	-	-
Dana	carry_6		-	-	-	-	-	kwà	-	-	-	-
PUd	carry_7		-	-	-	-	hāf	-	-	-	-	-
PKoUd	cat_1	*bõrà	-	-	bõrà	bürá	à+bürá	-	-	-	-	-
PUd	cat_2	*náv	-	-	-	náv	à+náv	-	-	-	-	-
PKoUd	celebrate	*gàs	-	-	gàs	-	gàs	-	-	-	-	-
PCtrl	chair_1	*k <sup>h</sup> Oba	-	-	kóbá	-	-	-	k <sup>h</sup> óbá	k <sup>h</sup> óbá	k <sup>h</sup> óbá	k <sup>h</sup> óbá
PGw	chair_2	*kóŋɔ̃	kóŋɔ̃	kóŋɔ̃	-	-	-	-	-	-	-	-



NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
Dana	chair_3		-	-	-	-	-	kánáj	-	-	-	-
PUD	chair_4	*bǎmbàr	-	-	-	bǎmbà r	bǎmbàr	-	-	-	-	-
PKmn	charcoal or coal	*kʷI(m)Isʷ	sʷisʷm	sʷisʷm	kisʷisʷiʷ	cʷēlēsʷ	cʷilātʷ	kʷisʷ	kʷimītʃʷ	kʷimītʃʷ	kʷītʃʷ	kʷītʃʷ
PCtrl	chase	*mēt(i)	-	-	mētí	-	-	mētʰ	mētí	mētí	mētí	mētí
Komo	cheek_1		-	-	kʷjʃ	-	-	-	-	-	-	-
PGw	cheek_2	*kʷókʷól	kʷókʷól	kʷókí	-	-	-	-	-	-	-	-
PUD	cheek_3		-	-	-	tʷjʃ	-	-	-	-	-	-
PDAOp	cheek_4	*tɪŋ(a) ~ tɪn(a)	-	-	-	-	-	tɪŋ	tɪná	tɪná	tɪná	tɪná
PCtrl	chest_1	*cʷacʷ	-	-	sʷàsʷ	-	-	cʷacʷ	tʃʷātʃʷ	tʃʷātʃʷ	tʃʷātʃʷ	sʷàsʷ
PUD	chest_2	*bòr	-	-	-	bòr	à+bòr	-	-	-	-	-
PGw	chest_3	*tòŋàs ~ twàngàs	tòŋàs	twàngàs	-	-	-	-	-	-	-	-
PKmn	chicken_1	*wǎŋa	wǎŋā	wǎŋā	wǎgá	ŋwá	à+ŋwá	-	-	-	-	-
PGw	chicken_2	*dòŋgòl	dòŋgòl	dòŋjí	-	-	-	-	-	-	-	-
PDAOp	chicken_3	*kʰā	-	-	-	-	-	kʰā	kʰā	kʰā	kʰā	kʰā
PKmn	chief_1	*kOr	ō+kōl	ō+kwì	jī+kwì	-	-	jè+kōrō	-	-	-	-
PUD	chief_2	*tǎpʰà	-	-	-	tǎpʰà	tǎpʰà	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	child_1	*wār	wār	wāl	-	-	-	-	-	-	-	-
PUd	child_2	*à+c'í	-	-	-	àjí	à+c'í	-	-	-	-	-
PCtrl	child_3	*aḍime	-	-	āt	-	-	àḍín	àḍímé	àḍím	àḍím	àḍím
PCtrl	children_1	*f(w)at'En	-	-	fɔwàt'ín	-	-	ò+fàt'én	bi+t'í	-	-	-
PUd	children_2	*ū+c'hí	-	-	-	ū+fíʔ	ū+c'hí	-	-	-	-	-
PGw	children_3	*mǎn	mǎn	mǎn	-	-	-	-	-	-	-	-
PKmn	chili pepper_1	*zjadɑ(j)	zét	zét	zjànt'á	-	-	à+zāḥ'ēʔ	dʒèrà	-	-	-
PUd	chili pepper_2	*à+c'héḍà	-	-	-	c'hézá	à+c'héḍà	-	-	-	-	-
PKmn	choke, strangle_1	*bus'	būs'	būs'	-	bùs'	bùt'	-	p <sup>h</sup> útʃ'	-	-	-
PCtrl	choke, strangle_2	*t'Os'	-	-	t'ús'	-	t'óc <sup>h</sup>	t'ós'	-	-	-	-
PDaOp	choke, strangle_3	*deŋ	-	-	-	-	-	déŋ	-	dēŋ	dēŋ	dēŋ
GwKo	choose_1	*lòs	lòs	lòs	lòs	-	-	-	-	-	-	-
PUd	choose_2	-	-	-	-	gú	-	-	-	-	-	-
Dana	choose_3	-	-	-	-	-	-	mêk <sup>h</sup>	-	-	-	-
PUd	choose_4	-	-	-	-	-	ɲit <sup>h</sup> +is	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
POp	choose_5, shut	*pātǃá	-	-	-	-	-	-	pātǃá	pātǃá	pātǃá	pātǃá
PCtrl	chop_1	*p <sup>h</sup> ák'á	-	-	-	p <sup>h</sup> áʔ	-	p <sup>h</sup> ák'á	-	-	-	-
PKoUd	chop_2	*kɪ(mɪ)s'	-	-	k'ís'	c'ímis'	c'ímĩɬ'	-	-	-	-	-
PDaOp	chop_3	*k'á(n)c'ír	-	-	-	-	-	k'ác'ír	k'ántǃír	k'ántǃír	k'ántǃír	k'ántǃír
PCtrl	clan_1	*mòs	-	-	mòs	-	-	mòs	mòs	mòs	mòs	mòs
PGw	clan_2		t'òt'òmò	-	-	-	-	-	-	-	-	-
PGw	clan_3		-	zērí	-	-	-	-	-	-	-	-
PUd	clan_4	*wàk <sup>h</sup>	-	-	-	wàk <sup>h</sup>	wàk <sup>h</sup>	-	-	-	-	-
	claves											
PKmn	(instrument )_1	*lèp <sup>h</sup> é	lèpé	àlàpé	lèpé	lèp <sup>h</sup> é	-	lèp <sup>h</sup> é	àlèp <sup>h</sup> é	àlèp <sup>h</sup> é	àlèp <sup>h</sup> é	àlèp <sup>h</sup> é
	claves											
PUd	(instrument )_2		-	-	-	-	gǒl	-	-	-	-	-
	clear land											
PKoUd	(for planting)_1	*k'ùɬ	-	-	k'úɬ	k'ús	k'úɬ <sup>h</sup>	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
	clear land											
PGw	(for planting)_2	*bòtò	bòtò	bòtò	-	-	-	-	-	-	-	-
	clear land											
PDaOp	(for planting)_3	*k'èr(é)	-	-	-	-	-	k'èré	k'ēr	k'ēr	k'ēr	k'ēr
PKmn	climb_1	*səl	sál	səl	-	sē	sē	-	-	-	-	-
PCtrl	climb_2	*gòr	-	-	gòl	-	-	-	kòr	kòr	kòr	kòr
Dana	climb_3		-	-	-	-	-	k <sup>b</sup> àc	-	-	-	-
PCtrl	cloth, clothes_1	*bɔrɔp	-	-	bōlɛn	būrɛɲ	bùrɪɲè	à+bóráɲ	-	-	bòlɛɲ	bòlɛn
PGw	cloth, clothes_2	*ɔ̀lò	ɔ̀lò	ɔ̀jò	-	-	-	-	-	-	-	-
POp	cloth, clothes_3	*à+bí	-	-	-	-	-	-	à+bí	à+bí	-	-
PCtrl	cloud, fog_1	*fali	-	-	fèlí	fílá	fílá?	àpàjfalí?	-	-	-	-
POp	cloud, fog_2	*dzibàj	-	-	-	-	-	-	dzibàj	dzibàj	dzibàj	dzibàj

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PUd	cloud, fog_3	*ràk <sup>h</sup>	-	-	-	ràk <sup>h</sup>	ràk <sup>h</sup>	-	-	-	-	-
PGw	cloud, fog_4	*ɔkɔ	ɔkɔ	ɔkɔ	-	-	-	-	-	-	-	-
PKmn	cluck (of hen)	*kjank'a	kākā	kjāŋk'ā	kágá	-	-	kágà	kēn	kēn	kēn	kēn
PKmn	cold (be)_1	*s'óp	s'óp	s'óp	-	s'úp <sup>h</sup>	ʃ'úp <sup>h</sup>	-	-	-	-	-
PCtrl	cold(be)_2, wet, sweet (be)	*s'ám	-	-	s'ám	s'ám	ʃ'ám	s'éɛm	tʃ'éɛm+sē	tʃ'éɛm+sē	tʃ'éɛm+sē	tʃ'éɛm+sē
PKmn	come free and fall off	*p <sup>h</sup> al	pĩ	pĩ	-	-	-	-	p <sup>h</sup> ál	p <sup>h</sup> ál	p <sup>h</sup> ál	p <sup>h</sup> ál
PKmn	come, come_SG	*ha	hǒ	hǒ	hà + ɔ	-	-	-	-	-	-	-
PCtrl	copulate (animal)_2	*lud(a)	-	-	lùd	-	-	lùdá	lūdá	lūdá	lūdá	lūdá
PKmn	copulate (animal)_3	*ʃóɓ	ʃóp'	ʃóp'	-	ʃúb	ʃúb	-	-	-	-	-
PKmn	corner	*rOk <sup>(b)</sup> Oɲ	rókòn	rókòn	rókòn	rúgùɲ	à+rúkūɲ	rók <sup>h</sup> òn	rókōn	rókōn	rókōn	rókōn

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PKmn	cotton, thread, spider web_1	*tUs	dɔf	dɔf	tuf	tūs	tūs	-	-	-	-	-
PDaOp	cotton, thread, spider web_2	*laɬɔn	-	-	-	-	-	lɑtʰɔn	lɑtɔn	lɑtɔn	lɑtɔn	lɑtɔn
PKmn	cough	*k'ɔt̚ *k'uɬ	k'ók'ót	k'ók'ót	k'út	k'útʰ	k'útʰ	k'útʰ	k'út'ù	k'út'ù	k'út'ù	k'út'ù
PCtrl	count_1	*dɛŋ	-	-	dɛn	dɛŋ+ɛ̃	dɛŋ+ɛ̃	-	-	-	dɛn	dɛn
PGw	count_2		-	ət	-	-	-	-	-	-	-	-
POp	count_3	*kóndíl	-	-	-	-	-	-	kóndíl	kóndíl	-	-
Dana	count_4		-	-	-	-	-	kʰɛ̀nɛ́	-	-	-	-
PCtrl	court (v.), flirt with_1	*pál(í)	-	-	pálí	-	-	pálí	pálí	pálí	pálí	pálí
PGw	court (v.), flirt with_2	*sā	sā	sā	-	-	-	-	-	-	-	-
PUD	court (v.), flirt with_3	*dɔf	-	-	-	dɔf	dɔf	-	-	-	-	-
PKmn	cover (v.)	*kum(bi)	kùmbì	kùmbì	kúm	kūm	kūm	kúmā	kúmá	kúmá	kúmá	kúmá

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PCtrl	cow_1	*bib ~ *bib	-	-	bìb	bìʔ	bìp <sup>h</sup>	piʔ	pìb	pì	pì	pì
PGw	cow_2	*ímí	ímí	ímí	-	-	-	-	-	-	-	-
PDaOp	crawl_2	*lala	-	-	-	-	-	lálá	lālá	lālá	lālá	lālá
PCtrl	criticize_1	*wàg	-	-	wàg	wàk <sup>h</sup>	wàk <sup>h</sup>	wàg	wàg	wàg	wàg	wàg
PGw	criticize_2	*mǎjá	mǎjá	mǎjá	-	-	-	-	-	-	-	-
PCtrl	crocodile_1	*bīsà	-	-	bīsà	-	-	-	bīsā	bīsā	bīsā	-
PGw	crocodile_2	*sìzì	sìzì	sìzì	-	-	-	-	-	-	-	-
GwKo	cross legs_1	*gǎ(j)má	gǎjá	gǎmá	gém	-	-	-	-	-	-	-
POp	cross legs_2	*káná+wòn	-	-	-	-	-	-	káná+w	káná+w	káná+w	káná+w
		è	-	-	-	-	-	-	ònè	òn	òn	òn
PCtrl	crow (verb)_1	*k'ók'ól	-	-	k'ók'ól	-	-	k'ók'ól	k'ók'óló	k'ók'óló	k'ók'óló	k'ók'óló
GwKo	crow (verb)_2	*k'ínk'ílí	k'ínk'ílí	k'ínk'ílí	k'íngíl	-	-	-	-	-	-	-
PKmn	cry	*kO(j)	kū	kū	kō	kō	kō	kōj	kwē	kwē	kwē	kwē
PDaOp	curse_1	*cɛŋ	-	-	-	-	-	céŋ	tʃɛŋ	tʃɛŋ	tʃɛŋ	tʃɛŋ
PKoUd	curse_2	*s'é	-	-	s'é	-	t'é	-	-	-	-	-
PGw	curse_3	*kēf	kēf	kēf	-	-	-	-	-	-	-	-
PUd	curse_4		-	-	-	zílí	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PCtrl	cut (meat											
	into one											
	long piece)_1	*t̥itil ~ titil	-	-	t̥itil	-	-	-	-	-	t̥itil	t̥itil
PKmn	cut (meat											
	into one											
	long piece)_2	*sɪl(i)	fɪli	fɪ	-	-	-	-	sí	-	-	-
POp	cut (meat											
	into one											
	long piece)_3	*làwà	-	-	-	-	-	-	làwà	làwà	-	-
PKmn	cut (split in											
	half	*t̥waŋ(k)a										
	lengthwise) _1	~ t̥waŋ(k)a	t̥aŋà	t̥aŋà	-	t̥wák <sup>h</sup>	t̥wák <sup>h</sup>	-	-	-	-	-
PCtrl	cut (split in											
	half											
	lengthwise) _2	*kwak	-	-	kwàk	-	-	kwí	kwāk	kwāk	kwāk	kwāk



NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	cut (split in half lengthwise) _3		-	pé	-	-	-	-	-	-	-	-
PCtrl	cut_1	*k'ís' ~ *k <sup>h</sup> ís'	-	-	-	c'ís'	c'ít <sup>h</sup>	k <sup>h</sup> ís'	k <sup>h</sup> ítʃ	k <sup>h</sup> ítʃ	k <sup>h</sup> ítʃ	k <sup>h</sup> ítʃ
PGw	cut_2	*k'ót	k'ót	k'ót	-	-	-	-	-	-	-	-
Dana	Dana (ethnonym) _1		-	-	-	-	-	ḍé+kēṭ <sup>h</sup> ā +wáḍ	-	-	-	-
PUD	Dana (ethnonym) _2	*pùr	-	-	-	pùr	pùr	-	-	-	-	-
PKmn	Dana (ethnonym) _3	*ḍana	dānā	dānā	dānā	-	-	ḍaná	dānā	dānā	dānā	dānā
PKoUd	dance_1	*s(w)à	-	-	ʃwà	sā	sā	-	-	-	-	-
PGw	dance_2	*p'á	p'á	p'á	-	-	-	-	-	-	-	-
PDaOp	dance_3	*ʃijà	-	-	-	-	-	ʃijà	sijā	sijā	sijā	ʃijā
PCtrl	daughter	*bāk'um	-	-	bā	bwā?	bā?úm	-	bāk'	bāk'	bāk'	bāk'

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
P Ctrl	day (24 hours)_1	*km(V)	-	-	kímí	cím	à+cím	kimà	-	-	-	-
PGw	day (24 hours)_2	*kājā	kājā	kājā	-	-	-	-	-	-	-	-
PKmn	Dazu (S. Sudan)	*dájV	dázò	dázò	dázò	dājò	dājò	dájò	dádzò	dádzò	dádzò	dádzò
PKmn	deep (be)_1	*gòdòk'	kwì	kwì	gòr	-	-	kòdòk'	kòró	kòró	kòró	kòró
PUd	deep (be)_2	*k'úl	-	-	-	k'úl	k'úl	-	-	-	-	-
PKmn	defecate_1, diarrhea	*s'UDI	ús'	ús'	s'í	-	t'í	s'òdò	t'òjí	t'òjí	t'òjí	t'òjí
Komo	defecate_2		-	-	páp	-	-	-	-	-	-	-
PUd	defecate_3	*kūc'	-	-	-	kūf'	kūc'	-	-	-	-	-
PGw	defecate_4	*túf	túf	túf	-	-	-	-	-	-	-	-
PKmn	descend (land)	*TOL(a)	-	fò	-	sūl	tūl	-	t'ójá	t'ójá	t'ójá	t'ójá
P Ctrl	dew_1	*gǰapaj	-	-	-	ǰápē?	ǰápē?	k <sup>h</sup> ip <sup>h</sup> ǰ	gǰpàj	gǰpàj	gǰpàj	gǰpàj
Komo	dew_2		-	-	zàpó	-	-	-	-	-	-	-
PGw	dew_3	*kǰnt'	kǰnt'	kǰnt'	-	-	-	-	-	-	-	-
P Ctrl	die_1	*hwOj	-	-	wó	wú	wú	-	hwǰī	hwǰī	hǰj	hwǰī
PGw	die_2	*s'í	s'í	s'í	-	-	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
Dana	die_3		-	-	-	-	-	jíḍ	-	-	-	-
PKmn	dig (for water)_1	*k'wàḍ(i)	k'wī	k'wī	k'ò	k'wā	-	k'wàḍí	k'ɔ́j	wārí	wādí	k'wārí
PUd	dig (for water)_2		-	-	-	-	gɔ́p <sup>h</sup>	-	-	-	-	-
PKmn	dig_1	*jà	fà	fà	-	-	-	cà	tjà	tjà	tjà	tjà
PUd	dig_2	*k <sup>h</sup> úṅ	-	-	-	k <sup>h</sup> úṅ	k <sup>h</sup> úṅ	-	-	-	-	-
Komo	dig_3		-	-	mòt'	-	-	-	-	-	-	-
	dip food in sauce with fingers_1	*s'UB(V)(n)	-	s'ópón	s'úb	s'úp <sup>h</sup>	t'úp <sup>h</sup>	s'úbá	-	-	-	-
POp	dip food in sauce with fingers_2	*sūt'ā	-	-	-	-	-	-	sūt'ā	sūt'ā	sūt'ā	sūt'ā
PKmn	disabled (be), angry (be)	*nap(a)	nāpá	nāpá	nāpá	-	náp <sup>h</sup> ē	náp <sup>h</sup>	nāp	nāp	nāp	nāp
PKmn	disregard	*píḥ	pīs	pīs	píḥ	-	píḥ	píḥ	pīs	pīs	pīs	pīs
PGw	dive_1	*pógón	pógón	pógón	-	-	-	-	-	-	-	-
PUd	dive_2	*póf	-	-	-	póf	póf	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PDaOp	dive_3	*sír	-	-	-	-	-	sír	sír	sír	sír	sír
Komo	dive_4		-	-	k'òlòm	-	-	-	-	-	-	-
PGw	dog_1	*kānā	kānā	kānā	-	-	-	-	-	-	-	-
PCtrl	dog_2	*k'áw ~ *k'wá	-	-	k'áw	k'wá?	à+k'á	-	?wáj	-	-	-
PKmn	doze off_1	*D̥i	sísī	sísī	zízí	-	-	-	disì	disì	ziz	sis
Dana	doze off_2		-	-	-	-	-	hólólá	-	-	-	-
PUd	doze off_3		-	-	-	-	ij+ki+mís	-	-	-	-	-
PUd	doze off_4		-	-	-	k <sup>h</sup> alā+ē	-	-	-	-	-	-
PCtrl	dream_1	*bēs	-	-	bēs	-	-	-	bēs	bēs	bēs	bēs
Dana	dream_2		-	-	-	-	-	k <sup>h</sup> ét <sup>h</sup> èn	-	-	-	-
PGw	dream_3	*āmón	āmón	āmón	-	-	-	-	-	-	-	-
PUd	dream_4	*jàn	-	-	-	zàn	jàn	-	-	-	-	-
PCtrl	dregs	*c'Vmaj	-	-	s'ímá	ʃ'ómá	à+c'úmá	c'ímáj	tʃ'ímáj	tʃ'ímáj	tʃ'ímáj	tʃ'ímáj
PUd	residue of fat		-	-	-	-	t'ímáɬ'	-	-	-	-	-
PCtrl	dress up_1	*hís' ~ *jís'	-	-	jíz	jís'	hít'	hízá	hídzá	hídzá	hídzá	hídzá
PGw	dress up_2	*wé	wé	wé	-	-	-	-	-	-	-	-
PGw	drink	*t'òp'	t'òp'	t'òp'	-	-	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PCtrl	drink_PL	*ip <sup>h</sup> (t)	-	-	ìp	-	-	ìp <sup>h</sup> í	ìp <sup>h</sup> ĩ	ìp <sup>h</sup> ĩ	ìp <sup>h</sup>	ìp <sup>h</sup>
PCtrl	drink_SG	*(t)p <sup>h</sup> í	-	-	íp	p <sup>h</sup> í	p <sup>h</sup> í	íp <sup>h</sup>	p <sup>h</sup> í	p <sup>h</sup> í	íp <sup>h</sup>	íp <sup>h</sup>
PKmn	drip (fall in globules)_1	*cɔ(tɔ)l	s'ót'ó	s'ót'ó	s'ólil	-	c'ɔc'ɔlɔc'	c'ɔʔ	tʃɔ	tʃɔ	tʃɔ	tʃɔ
PUd	drip (fall in globules)_2		-	-	-	fúk'	-	-	-	-	-	-
PCtrl	drum_A	*bùl	-	-	bùl	-	-	bùl	bùl	bùl	bùl	bùl
PKmn	drum_B	*bàmbá	pàmbà	pàmbà	-	bàmbá	-	-	-	-	-	-
PKmn	drum_C	*tàrá	-	tàrá	tàrá	-	-	tàrá	tàrá	tàrá	tàrá	tàrá
PKmn	dry (be)	*k <sup>h</sup> ós'	kús'	kús'	kós'	k <sup>h</sup> ús'	k <sup>h</sup> úʔ'	k <sup>h</sup> ós'	k <sup>h</sup> ótʃ'ó	k <sup>h</sup> ótʃ'ó	k <sup>h</sup> ótʃ'ó	-
	dry out_1,											
PCtrl	roast next to fire, aim at	*t <sup>h</sup> ùd	-	-	tùd	t <sup>h</sup> ùd	t <sup>h</sup> ūr	t <sup>h</sup> ùd	-	-	-	-
PGw	dry out_2	*sàzà	sàzà	sàzà	-	-	-	-	-	-	-	-
PCtrl	dry out_3	*dAs	-	-	dāʃ	dās	dās	dēs	-	-	-	-
PKmn	dust, sand_1	*burbuɗ	bùrbüt	bùrbüt	-	büt <sup>h</sup>	büɗ	bürk'ùs	bürk'ùs	bürk'ùs	bürk'ùs	bürk'ùs
Komo	dust, sand_2		-	-	pùlání	-	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	dwel (live, reside)_1	*tùl	tùl	tùl	-	-	-	-	-	-	-	-
PUd	dwel (live, reside)_2	*did	-	-	-	did	di	-	-	-	-	-
Komo	dwel (live, reside)_3		-	-	dò	-	-	-	-	-	-	-
Dana	dwel (live, reside)_4	*p <sup>h</sup> i	-	-	-	-	-	p <sup>h</sup> i	-	-	-	-
POp	dwel (live, reside)_5	*wà	-	-	-	-	-	-	wà	wà	wà	wà
PKmn	ear	*c'ɛ	s'ɛ̃	s'ɛ̃	s'ɛ̃	ʃɛ́	c'ɛ́	k'ɛ̃	tʃɛ̀	tʃɛ̀	tʃɛ̀	tʃɛ̀
	earth, soil,											
PKmn	ground, floor_1	*k(j)as'VN	k'jànjás'	k'ɛ̃s'én	k'ás'ì	-	-	-	-	-	-	-
	earth, soil,											
POp	ground, floor_2	*k'ótʃ'ó	-	-	-	-	-	-	k'ótʃ'ó	k'ótʃ'ó	k'ótʃ'ó	k'ótʃ'ó
	earth, soil,											
PUd	ground, floor_3	*c'ɛ́ʃ	-	-	-	c'ɛ́ʃ	à+c'ɛ́ʃ	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
	earth, soil,											
Dana	ground, floor_4		-	-	-	-	-	ṭm	-	-	-	-
PKmn	eat (hard food)	*k'ama	k'ā	k'ā	k'á	k'áʔ	k'á	k'ámá	k'ámá	k'ámá	k'ámá	k'ámá
P Ctrl	eat (soft food)_PL	*uʃa	-	-	ùʃ	-	-	ùʃá	ùsà	ùsà	ùsà	ùʃà
PKmn	eat (soft food)_SG	*ʃa	ʃā	ʃā	ʃá	ʃwá	ʃwá	úʃā	sá	sá	sá	ʃá
PKoUd	egg_1	*òṃ	-	-	òṃ	òṃ	à+ʔòṃ	-	-	-	-	-
PGw	egg_2	*símp'	símp'	símp'	-	-	-	-	-	-	-	-
P DaOp	egg_3	*kúmú	-	-	-	-	-	kúmú	kúmú	kúmú	kúmú	kúmú
PKmn	elephant_1	*gwàj	kwì	kwì	gwà	gwàj	-	-	-	-	-	-
PUd	elephant_2	*jè	-	-	-	-	jè	-	-	-	-	-
POp	elephant_3	*bàj	-	-	-	-	-	-	bàj	bàj	bàj	bàj
Dana	elephant_4		-	-	-	-	-	dúk'àn	-	-	-	-
P Ctrl	empty (be)_1, dull	*t'at'	-	-	t'ĩ	-	t'ĩʔ	t'át'	t'áj	t'áj	t'áj	t'áj
PUd	empty (be)_2		-	-	-	dí+bw à	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	empty (be)_3	*fákáná	fákáná	fákáná	-	-	-	-	-	-	-	-
PKoUd	enset_1	*wús'	-	-	wús'	wús'	à+wúŋ'	-	-	-	-	-
PGw	enset_2	*éǰé	éǰé	éǰé	-	-	-	-	-	-	-	-
Dana	enset_3		-	-	-	-	-	bāḍā	-	-	-	-
PKmn	enter_1	*gic'	kĩs'	kĩs'	giz	-	cīc'	-	kitú	kitú	kitú	kitú
PKmn	enter_2, sprout	*t'wI	t'wí	t'wí	-	-	-	t'wí	-	-	-	-
PUd	enter_3		-	-	-	síʔ	-	-	-	-	-	-
PCtrl	extinguish_ 1	*tús	-	-	túǰ	ūs	ūs	tús	tús	tús	tús	tús
PGw	extinguish_ 2	*ǰif	ǰif	ǰif	-	-	-	-	-	-	-	-
PKmn	extract tooth_1, barking (of dog)	*bɔk <sup>h</sup>	pǒ	pǒ	-	-	bük <sup>h</sup>	-	-	-	-	-
PKoUd	extract tooth_2	*jek <sup>h</sup>	-	-	jèʔ	ék <sup>h</sup>	-	-	-	-	-	-



NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
POp	extract tooth_3	*lĩ	-	-	-	-	-	-	lĩ	lĩ	lĩ	lĩ
PKmn	eye_1	*ḍE	zì	zì	-	ī	ē	ḍè	dʒè	dʒè	zè	ʃè
Komo	eye_2		-	-	ḥĩ	-	-	-	-	-	-	-
PKmn	far (be)_1	*sĩʔ	-	ʃĩʔ	ʃĩʔ	sĩd	sĩd	sĩʔ	sĩʔ	sĩʔ	sĩʔ	sĩʔ
PGw	far (be)_2		ʃúl	-	-	-	-	-	-	-	-	-
PGw	far (be)_3		-	tãʔ	-	-	-	-	-	-	-	-
GwKo	farm (n.)_1	*kwar	kwàlà	kwĩ	kwàr	-	-	-	-	-	-	-
PUd	farm (n.)_2	*mòndèd	-	-	-	mònzè d	mòndèd	-	-	-	-	-
PDaOp	farm (n.)_3	*(pɪ)ʔoj	-	-	-	-	-	ʔòj	pìtì	pìtòj	pìtòj	pàtòj
PCtrl	fart_1	*ḍU(ru)s(E)	-	-	tùʃ	-	wū+ḍùrù s	ʔòs	tìsì	tìsì	tòsè	tòʃí
PGw	fart_2	*bũfú	bũfú	bũfú	-	-	-	-	-	-	-	-
	fast (from											
PGw	drinking or eating)	*baja	bájá	bājā	-	-	-	-	-	-	-	-
	fast (from											
PKoUd	drinking or eating)	*gak'	-	-	gáʔ	gã	gãk'	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PCtrl	fast (velocity)_1	*waC(a)	-	-	í+wàfà	ɲwác <sup>h</sup> à	wác <sup>h</sup> à	wāṭ <sup>h</sup>	wāt	wāt	wāt	wāt
PGw	fast (velocity)_2		-	kāmākó	-	-	-	-	-	-	-	-
PCtrl	fat (from animals)_1	*mōra	-	-	mǒrá	-	-	mórá	mōrá	mōrá	mōrá	mōrá
PUd	fat (from animals)_2	*k <sup>h</sup> wālàɲ	-	-	-	k <sup>h</sup> wālà ɲ	k <sup>h</sup> wālàɲ	-	-	-	-	-
PGw	fat (from animals)_3	*dà	dà	dà	-	-	-	-	-	-	-	-
PKmn	father_1	*bàbá	-	bàbá	bǎ	à+bàbá	à+bàbá	-	àbá	àbá	àbá	àbá
PCtrl	father_2	*còm	-	-	sòm	à+còm	còm	sòm	tʃòmò	tʃòmò	tʃòm	tʃòm
PKmn	fear (be afraid)	*k <sup>h</sup> waG'	kwāgà	kwāgà	kōg	k <sup>h</sup> ʔ	k <sup>h</sup> ʔk'	k <sup>h</sup> ʔk ~ k <sup>h</sup> ʔgó	k <sup>h</sup> ʔgó	k <sup>h</sup> ʔgó	k <sup>h</sup> ʔgó	k <sup>h</sup> ʔgó
PCtrl	fig_1	*p <sup>h</sup> uku	-	-	-	p <sup>h</sup> ūʔ	à+p <sup>h</sup> ūʔ	p <sup>h</sup> új	-	p <sup>h</sup> úkū	púj	púj
Komo	fig_2		-	-	s'úɲá	-	-	-	-	-	-	-
PGw	fig_3	*ísì	ísì	ísì	-	-	-	-	-	-	-	-
POp	fig_4		-	-	-	-	-	-	dùrú	-	-	-
POp	fight_2	*tā+dzàj	-	-	-	-	-	-	tā+dzàj	tā+dzàj	tā+zàj	tā+fàj
PGw	fight_3	*hími	hími	hími	-	-	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PKmn	find, meet	*gàm	kàm	kàm	gàm	gàm	gàm	kàm	kàm	kàm	kàm	kàm
	fingernail,											
PUD	toenail, claw, hoof_1	*gwǎp <sup>h</sup> ĩ	-	-	-	gwǎp <sup>h</sup> ĩ	à+gwǎp <sup>h</sup> ĩ	-	-	-	-	-
	fingernail,											
PGw	toenail, claw, hoof_2	*k'õmp'	k'õmp'	k'õmp'	-	-	-	-	-	-	-	-
	fingernail,											
PCtrl	toenail, claw, hoof_3	*c'ík'ír	-	-	s'ík'íl	-	-	k'ík'ír	tʃ'ík'ír	tʃ'ík'ír	tʃ'ík'ír	tʃ'ík'ír
PKmn	finish_1	*dak	-	dak	dàg	dàk <sup>h</sup>	dàk <sup>h</sup>	dák	dàk	-	-	-
PKoUd	finish_2	*k'úb	-	-	kúp'	-	k'úb	-	-	-	-	-
POp	finish_3	*mùt <sup>h</sup> ǎ	-	-	-	-	-	-	mùt <sup>h</sup> ǎ	mùt <sup>h</sup> ǎ	mùt <sup>h</sup> á	mùt <sup>h</sup> á
PCtrl	finish_4		-	-	-	-	-	dòk <sup>h</sup> á	-	-	-	-
PKmn	fire or firewood	*wa(n)ɿ'(I)ɿ	ānt'	ānt'	wàt'íɿ	ɔd	ɔd	òɿ'	wōt'í	wōt'í	wōt'í	ōt'í
PGw	firefly_1	*bīs'àn	bīs'àn	bīs'àn	-	-	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PUd	firefly_2	*cúl	-	-	-	-	à+cúl	-	-	-	-	-
	fish (n.)											
PKmn	general term	*wàc'à	wàs'	wàs'	wàs'	wàf'	wàc'	wàc'à	wàtf'à	wàtf'à	wàtf'à	wàtf'à
PCtrl	fish (v.)_1	*mal(i)	-	-	māl	mālí	-	màl	màl	màl	màl	màl
PGw	fish (v.)_2		-	hípí	-	-	-	-	-	-	-	-
PUd	fish (v.)_3		-	-	-	-	ròk <sup>h</sup>	-	-	-	-	-
	fish_(small, scales)											
PKmn	small	*jàhút	jàhú	jàhú	jàhú	-	-	àhút <sup>h</sup>	àhú	àhú	àhúwí	àhúj
	fish_sp (big and fat sized fish)											
PCtrl	and fat sized fish)	*gùr	-	-	gùr	-	-	gùr	gùr	gùr	gùr	gùr
PKmn	fish_sp (electric)_1	*díŋkā	-	ō+wàs'+d íŋkā	díŋkā	-	-	-	díŋā	díŋā	díŋā	díŋā
Dana	fish_sp (electric)_2		-	-	-	-	-	à+dìjès	-	-	-	-
PUd	fish_sp (electric)_3		-	-	-	-	à+t'ēw	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
	fish_sp (very small, scaled fish											
PKmn	with a small rounded mouth)	*dɔlɔ	-	dɔlɔ	dɔlɔ	-	-	dɔlɪʔ	dɔlɔ	dɔlɔ	dɔlɔ	dɔlɪ
PKmn	fishhook	*Bmc'	bĩns'	bĩns'	bĩns'	bij'	à+bíc'	bíc'	bitʃ'	bitʃ'	bitʃ'	bitʃ'
PCtrl	fist_1	*t'um(á)	-	-	t'umá	t'úm+ mèd'	t'úm+mè	t'umá	t'umá	t'umá	t'umá	t'umá
PUd	fist_2		-	-	-	-	-	-	-	-	-	-
PGw	fist_3	*dɔjɔ	dɔjɔ	dɔjɔ	-	-	-	-	-	-	-	-
PCtrl	flea_1	*táp'í	-	-	tápí	-	-	tápí	-	-	-	-
Komo	flour_1		-	-	bùdí	-	-	-	-	-	-	-
PGw	flour_2	*p'òmòt'	p'òmòt'	p'òmòt'	-	-	-	-	-	-	-	-
PUd	flour_3	*díp <sup>h</sup> ájɪ	-	-	-	díp <sup>h</sup> éɪ	à+díp <sup>h</sup> ájɪ	-	-	-	-	-
PDaOp	flour_4	*pit'ɔn ~ *pit <sup>(b)</sup> ɔn	-	-	-	-	-	pit <sup>h</sup> ɔn	pit'ɔn	pit'ɔn	pit'ɔn	pit'ɔn
PKmn	fly (v.)	*p <sup>h</sup> àd	pāl	pāj	pàj	p <sup>h</sup> āj	p <sup>h</sup> ē	p <sup>h</sup> àd	p <sup>h</sup> āj	p <sup>h</sup> āj	p <sup>h</sup> āj	p <sup>h</sup> āj
PCtrl	follow_1	*bas'	-	-	-	bās'	bāɫ'	pāt <sup>h</sup> í	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PKmn	follow_2	*uD	ū	ū	út	úr	úr	-	-	-	-	-
POp	follow_3	*k <sup>h</sup> òm	-	-	-	-	-	-	k <sup>h</sup> òm	k <sup>h</sup> òm	k <sup>h</sup> òm	k <sup>h</sup> òm
PGw	follow_4	*táp'	táp'	táp'	-	-	-	-	-	-	-	-
PUd	follow_5		-	-	-	súk <sup>h</sup>	-	-	-	-	-	-
PCtrl	food_1	*mà(ʔV)	-	-	mèʔí	mà	mà	màʔá	mă	mă	mă	mă
PGw	food_2	*pwàf	pwàf	pwāf	-	-	-	-	-	-	-	-
PKmn	foot or leg_1	*ʃonk'	sɔŋk'	sɔnt'	ʃɔg	ʃɔk'	ʃɔʔ	ʃɔg	-	-	-	-
POp	foot or leg_2	*wɔnɛ̀	-	-	-	-	-	-	wɔnɛ̀	wɔnɛ̀	wɔn	wɔn
PCtrl	forbid_1	*tʷf ~ tʷf	-	-	t'áf	t'áf	t'áf	-	t'ísī	t'ísī	-	-
PGw	forbid_2	*kàs	kàs	kìs	-	-	-	-	-	-	-	-
PUd	forbid_3		-	-	-	-	-	-	-	-	-	-
PDaOp	forbid_4	*jɪk <sup>h</sup> ɪ	-	-	-	-	-	jɪk <sup>h</sup> ɪ	-	-	zɪk <sup>h</sup> ɪ	ʃɪk <sup>h</sup> ɪ
PKmn	forehead_1	*t <sup>(h)</sup> (w)àg	twā	twā̃	tàg	-	-	tàg	bī+t <sup>h</sup> āg	-	pī+t <sup>h</sup> āg	-
PUd	forehead_2	*buɲɛ	-	-	-	bwìɲ	bùjè	-	-	-	-	-
PUd	forehead_3		-	-	-	-	-	-	-	-	-	-
PKoUd	four_1	*dòŋgòn	-	-	dògòn	dòŋòn	dòŋòn	-	-	-	-	-
PGw	four_2	*bís'ínī	bís'ínī	bís'ínī	-	-	-	-	-	-	-	-
PDaOp	four_3	*ɲwan	-	-	-	-	-	ɲwān	hwàn	hwàn	hwàn	hwàn

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
P Ctrl	fox_1	*wata <sub>l</sub> a	-	-	watála	-	-	à+wāt <sup>h</sup> ál	à+watál	à+watál	à+watál	à+watál
								ā	à	à	à	à
PGw	fox_2	*wāŋó	wāŋó	wāŋó	-	-	-	-	-	-	-	-
PUd	fox_3	*mák <sup>h</sup>	-	-	-	mák <sup>h</sup>	à+mák <sup>h</sup>	-	-	-	-	-
PGw	frighten_1	*héǵè	héǵè	héǵè	-	-	-	-	-	-	-	-
Komo	frighten_2		-	-	málá	-	-	-	-	-	-	-
PUd	frighten_3	*rúm	-	-	-	rúm	rúm	-	-	-	-	-
P DaOp	frighten_4	*hòsà ~ wòsà	-	-	-	-	-	wòsà	hòsā	hòsā	hòsā	hòsā
PKmn	frog_1	*bɔŋk'ó	p'à+bɔŋó	p'à+bɔŋó	bā+bɔŋk' ó	-	-	à+bɔŋk'ó	à+bɔŋk'	à+bɔŋk'	à+bɔŋk'	à+bɔŋk'
								?	ó	ó	ó	ó
PUd	frog_2	*d'wá	-	-	-	d'wá	à+d'wá	-	-	-	-	-
GwKo	frog_sp (long)	*bapenk'ɛ	p'ā+p'èŋǵè	p'ā+p'èŋǵè	bā+p'ɛnk' ,	-	-	-	-	-	-	-
P Ctrl	giraffe_1	*tāǵāj ~ tāǵāj	-	-	tāǵī	-	-	-	tāǵāj	tāǵāj	tāǵāj	-
PKmn	giraffe_2	*k <sup>h</sup> OG	kók	kók	-	k <sup>h</sup> ú?	k <sup>h</sup> ú?	k <sup>h</sup> éǵ	-	-	-	kék
P DaOp	girl_1	*bānáp <sup>h</sup> à	-	-	-	-	-	bānáp <sup>h</sup> à	bānàpà	bānàpà	bānàpà	bānàpà
P Ctrl	girl_2	*bāʔɔ	-	-	bāʔɔ	-	-	-	bāó	bāó	bāó	bāó
PGw	girl_3	*dwā	dwà	dwā	-	-	-	-	-	-	-	-

<b>NODE</b>	<b>Meaning</b>	<b>*proto</b>	<b>GwHi</b>	<b>GwLo</b>	<b>Komo</b>	<b>UdYa</b>	<b>UdCh</b>	<b>Dana</b>	<b>OpBi</b>	<b>OpMo</b>	<b>OpPa</b>	<b>OpKi</b>
PUD	girl_4	*nàrá	-	-	-	nàrá	nàrá	-	-	-	-	-
PCtrl	give	*kʰí	-	-	kĩ+k	cʰíʔ	cʰí	kʰí+wā	kʰíʔ	kʰíʔ	kʰíʔ	kʰíʔ
PGw	give	*tí	tí	tí	-	-	-	-	-	-	-	-
PCtrl	give birth_1	*tʰú(i)	-	-	tú	-	tʰú	tʰwí	tʰú	tʰú	tʰú	tʰú
PGw	give birth_2	*pī	pī	pī	-	-	-	-	-	-	-	-
PGw	go	*hō	hō	hō	hà	-	-	-	-	-	-	-
PCtrl	go_PL	*ʔja	-	-	ì	ī	ī	-	ʔjá	ʔjá	ʔjá	ʔjá
PCtrl	go_SG	*Ḍa	-	-	jà	jà	jà	ḍā	dzà	dzà	zà	fà
PCtrl	goat_1	*mε	-	-	mé	mè	mì	mē	mè	mè	mè	mè
PKmn	goat_2	*na(n)	njā̃	njā̃	-	-	-	-	-	-	-	-
PKoUd	good (be)_1	*bór	-	-	ból	bór	bór	-	-	-	-	-
POp	good (be)_2	*k'áj	-	-	-	-	-	-	k'áj	k'áj	k'áj	k'áj
PGw	good (be)_3	*nókó	nókó	nókó	-	-	-	-	-	-	-	-
Dana	good (be)_4		-	-	-	-	-	píḍá	-	-	-	-
PCtrl	gourd_1	*tʰul	-	-	túl	-	tʰúl	-	tʰòj	tʰòj	tʰòj	-
PDAOp	gourd_2	*gwàtʰá	-	-	-	-	-	gwàtʰá	-	-	-	gwàtʰá
PUD	gourd_3	*k'wà	-	-	-	k'wà	k'wà	-	-	-	-	-
PGw	gourd_4	*dóló	dóló	dóló	-	-	-	-	-	-	-	-



NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
	grab with fingers, pinch_1	*tʰO	-	-	-	-	tʰú	tʰówá	tʰó	tʰó	tʰó	tʰó
	grab with fingers, pinch_2	*k'ājà	k'ājà	k'ājà	-	-	-	-	-	-	-	-
	grab with fingers, pinch_3		-	-	p'è	-	-	-	-	-	-	-
PKmn	grandfather _1	*càk <sup>h</sup> O	-	sàkó	sàkó	-	-	-	tʃàk <sup>h</sup> ó	tʃàk <sup>h</sup> ó	tʃàk <sup>h</sup> ó	tʃàk <sup>h</sup> ó
PUd	grandfather _2	*ḍàn+còm	-	-	-	zàn+cô m	à+ḍàn+cô m	-	-	-	-	-
PKmn	grandmoth er_1	*k <sup>h</sup> àk <sup>h</sup> á	-	kàká?	kàká	-	-	k <sup>h</sup> àk <sup>h</sup> á	kàká	kàká	kàká	kàká
PUd	grandmoth er_2	*t <sup>h</sup> íŋ+kùm	-	-	-	t <sup>h</sup> íŋ+k ùm	à+t <sup>h</sup> íŋ+kū m	-	-	-	-	-
PKmn	grass	*ʃO	ʃóʃō	ʃóʃōʃō	ʃòʔí	ʃō	à+ʃō	ʃòʔó	sò	sò	sò	sò
PKmn	green_1	*Ḍir ?	zī	zī	zì	zì	ḍì	sīsī	tʃír	tʃír	tʃír	tʃír
PUd	green_2		-	-	-	-	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PDaOp	grind (dry)_1	*Dùk'à	-	-	-	-	-	dùk'à	dzùk'à	dzùk'à	zùk'à	fùk'à
Komo	grind (dry)_2		-	-	ďm	-	-	-	-	-	-	-
PGw	grind (dry)_3	*ʔù	ʔù	ʔù	-	-	-	-	-	-	-	-
PUd	grind (dry)_4	*jòr	-	-	-	jòr	jòr	-	-	-	-	-
PCtrl	grind (fine)_1	*t'íj ~ t'íj	-	-	t'íj	t'íj	t'íj	t'íjʔ	t'ís	t'ís	t'ís	-
PGw	grind (fine)_2	*mít'ì	mít'ì	mít'ì	-	-	-	-	-	-	-	-
PKmn	grind (second grind)	*(ɔ)ɬ <sup>h</sup> ɔɖ	-	twéj	tó	-	tɔ́ɖ	ɔ́ɬ <sup>h</sup> ɔ	ótó	ót <sup>h</sup>	ót <sup>h</sup>	ót <sup>h</sup>
PKmn	grind wet (first grind)	*Dàs'	dàs'	dàs'	nàs'	nàs'	nàɬ'	-	-	-	-	-
PKmn	guinea fowl_1	*Tɔ̃(n)G	fɔ̃nk'	fɔ̃nk'	zòg	-	tɔ̃k <sup>h</sup>	sòk <sup>h</sup>	tʃògó	tʃògó	tʃòg	tʃòg

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PUd	guinea fowl_2		-	-	-	dwàjá	-	-	-	-	-	-
GwKo	gums_1	*gùrèt'	gùlèt'	gùrèt'	gùlèt'	-	-	-	-	-	-	-
PUd	gums_2	*k'òd+fɛʔ	-	-	-	k'òd+fɛ ʔ	k'òd+fɛʔ	-	-	-	-	-
Dana	gums_3		-	-	-	-	-	ónáfé	-	-	-	-
PKmn	Gwama (ethnonym)	*gwama	gwàmá	kwāmà	gwàmá	-	-	gòmá	gòmá	gòmá	gòmá	gòmá
PKmn	hail, ice_1	*wasak'	wàsà	wàsà	wàfàk'	wàsáʔ	à+wàsáʔ	-	-	-	-	-
PCtrl	hail, ice_2, melt	*tɛn(ɛ)	-	-	-	-	tɛn	tɛn	téné	-	tén	tén
PKoUd	hair_1	*mùr	-	-	mùl	mùr	à+mùr	-	-	-	-	-
PGw	hair_2	*bàk	bàk	bàk	-	-	-	-	-	-	-	-
PDaOp	hair_3	*fudaj	-	-	-	-	-	fùdáj	sùjé	sùjé	sùjé	sùjé
PCtrl	half_1	*táak'áláj	-	-	tákálá	-	-	ták'áláj	tálá	tálá	tálá	tákàlāj
PGw	half_2		-	dàgà	-	-	-	-	-	-	-	-
PUd	half_3		-	-	-	-	k'úp <sup>h</sup> +kút h	-	-	-	-	-
PKmn	hand_1	*mèt'	bìt'	mìt'	-	mèd	mèd'	mèt'	mìt'í	mìt'í	-	mèt'

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PCtrl	hand_2	*k'ɔlɔ	-	-	k'ɔlɔ	-	-	-	k'ɔj	k'ɔj	k'wī	-
PCtrl	hang up_1	*síd(a)	-	-	fír	fír	fír	sídā	sír	sír	sír	sír
PGw	hang up_2	*sūt'	sūt'	sūt'	-	-	-	-	-	-	-	-
PDaOp	have	*kòt <sup>h</sup>	-	-	-	-	-	kòt <sup>h</sup>	kòt <sup>h</sup>	-	kòt <sup>h</sup>	kòt <sup>h</sup>
PKmn	have sex_1	*hag(a)	háʔ	háʔ	hág	-	háʔ	-	hágá	hágá	hágá	hágá
PUd	have sex_2		-	-	-	màf	-	-	-	-	-	-
Dana	have sex_3		-	-	-	-	-	bòdó	-	-	-	-
PKmn	head	*k'óp	k'óp	ʔóp	k'óp	k'úp <sup>h</sup>	k'úp <sup>h</sup>	k'óp <sup>h</sup>	k'óp	k'óp	k'óp	k'óp
	head pad											
PCtrl	(for head carrying)_1	*kOʔan	-	-	-	-	-	kòt <sup>h</sup> áj	kòtin	kòtin	kòtin	-
	head pad											
PKoUd	(for head carrying)_2	*gwat <sup>h</sup> V	-	-	gwàtó	gwǎt <sup>h</sup> ē	gwǎt <sup>h</sup> ē	-	-	-	-	-
	head pad											
PGw	(for head carrying)_3	*k'ándí	k'ándí	k'ándí	-	-	-	-	-	-	-	-
	heavy (be)_1	*did	-	-	dìd	dìt <sup>h</sup>	dìt <sup>h</sup>	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	heavy (be)_2	*sil	sil	siʔ	-	-	-	-	-	-	-	-
PDaOp	heavy (be)_3	*tʰíkʰá	-	-	-	-	-	tʰíkʰá	tʰíkʰá	tʰíkʰá	tʰíkʰá	tʰíkʰá
PKoUd	help_1	*wòḏ	-	-	wòl	wòs	wòḏ <sup>h</sup>	-	-	-	-	-
PGw	help_2	*pʰātʰà	pʰātʰà	pʰātʰà	-	-	-	-	-	-	-	-
PDaOp	help_3	*kúnā	-	-	-	-	-	kúnā	kúná	kúná	kúná	kúná
PKmn	herd (v.)	*kʰaj	kēʔ	kēʔ	kàʔi	-	-	kʰájíʔ	kʰájí	kʰájí	kʰájí	kʰájí
PCtrl	hiccough_1	*háɸíkʰ	-	-	-	-	àhǎɸkīʔ	háɸíkʰ	hárikʰ	hárikʰ	hárikʰ	-
Komo	hiccough_2	-	-	-	zòr	-	-	-	-	-	-	-
PGw	hiccough_3	*hīgim	hīgim	hīgim	-	-	-	-	-	-	-	-
PUd	hiccough_4	-	-	-	-	híʔtāʔ	-	-	-	-	-	-
PCtrl	hide (oneself)	*bwàkʰ	-	-	bòʔ	bàʔ	bàkʰ	bàkʰ	-	-	-	bòkʰ
PCtrl	hide (sth.)_1	*lus ~ *rus	-	-	lùs	-	-	rùs	lùs	lùs	rùs	-
PGw	hide (sth.)_2	*nīmī	nīmī	nīmī	-	-	-	-	-	-	-	-
PKmn	hide, skulk	*bòb ~ bòḑ	pòpʰ	pòpʰ	bòb	-	-	-	pòj	pòj	pòj	-
PCtrl	hit_1	*dər	-	-	-	dǎr	dǎr	tòdǎr	tǎr	tǎr	tǎr	tǎr

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
GwKo	hit_2	*f̄ap'	f̄ap'	f̄ab	f̄ap'	-	-	-	-	-	-	-
PCtrl	hoe (n.)_1	*k <sup>(h)</sup> Orec'	-	-	-	kūrɛ́	k <sup>h</sup> ōrɛ́c'	kōrɛ́	kōrɛ́	kōrɛ́	kōrɛ́	kōrɛ́
GwKo	hoe (n.)_2	*gafa	gàfà	gàfà	gáf	-	-	-	-	-	-	-
PCtrl	hole_1	*gVs	-	-	gìf	jìs	jìs	kùs	kùs	kùs	kùs	kùs
PGw	hole_2	*bò	bò	bò	-	-	-	-	-	-	-	-
PCtrl	home, place_1	*pa	-	-	-	pā	pā	-	pà	pà	pà	-
PDaOp	home, place_2	*wad̥	-	-	-	-	-	wád̥	-	-	-	wát <sup>h</sup>
PGw	home, place_3	*t'òmò	t'òmò	t'ómō	-	-	-	-	-	-	-	-
Komo	home, place_4		-	-	làū	-	-	-	-	-	-	-
PKmn	honey badger	*njans'es'	jāns'és'	ɲēnzés'	nèz	nès'	à+nèŋ'	nès	nèdzè	-	nèdzè	-
PKoUd	hoof	*cōk <sup>(h)</sup> (i)	-	-	sōkí	-	à+cūk <sup>h</sup>	-	-	-	-	-
	horn											
PCtrl	(anatomy)_	*k <sup>(h)</sup> ɪd̥	-	-	kī	cú	cé	kīd̥	k <sup>h</sup> ɪw	k <sup>h</sup> ɪw	k <sup>h</sup> ɪw	k <sup>h</sup> ɪw

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
	horn											
PGw	(anatomy)_ 2	*kwàp	kwàp	kwàp	-	-	-	-	-	-	-	-
PCtrl	horse_1	*parfa ~ *parḏa	-	-	pǎrfá	-	-	pàrḏá	pàrsá	pàrsá	pàrsá	pàrsá
PGw	horse_2	*gǎŋú	gǎŋú	gǎŋú	-	-	-	-	-	-	-	-
PUd	horse_3	*bàgál	-	-	-	bàgál	bàgál	-	-	-	-	-
PKoUd	hot (be)_1, ill (be)	*bàs'	-	-	bàs'	bàs'	bāṭ'	-	-	-	-	-
PDaOp	hot (be)_2	*fadí	-	-	-	-	-	fadí	-	-	-	fàrí
PGw	hot (be)_3	*tawàn	tawàn	tawàn	-	-	-	-	-	-	-	-
POp	hot (be)_4	*k <sup>h</sup> āgá	-	-	-	-	-	-	k <sup>h</sup> āgá	k <sup>h</sup> āgá	k <sup>h</sup> āgá	-
PCtrl	house_1	*gùb(V)	-	-	gùbí	gùb	gùb	kùʔú	kù	kù	kù	kù
PGw	house_2	*swāl	swāl	swī	-	-	-	-	-	-	-	-
PCtrl	hunger_1	*t <sup>h</sup> (w)áḏ	-	-	twáj	t <sup>h</sup> ój	t <sup>h</sup> éʔ	t <sup>h</sup> áḏ	t <sup>h</sup> áj	t <sup>h</sup> áj	t <sup>h</sup> áj	t <sup>h</sup> áj
PGw	hunger_2	*piti	piti	pidi	-	-	-	-	-	-	-	-
PCtrl	hunt (in group)	*dwáf	-	-	-	wát <sup>h</sup>	wáf	-	dwàr	dwàr	dwàr	-
PCtrl	hunt_1	*hōj	-	-	hōj	-	-	-	hōj	hōj	hōj	hōj
Dana	hunt_2		-	-	-	-	-	màṭ <sup>h</sup> á	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	hunt_3	*irɪŋ	irɪŋ	irɪŋ	-	-	-	-	-	-	-	-
PUd	hunt_4	*páD	-	-	-	pát <sup>h</sup>	pár	-	-	-	-	-
PCtrl	husband_1	*gàs'	-	-	gàz	à+kàs'	kàt <sup>h</sup>	kàzūp'	kàdzóm	kàdzóm	kàdzóm	kàdzóm
PGw	husband_2		-	jiti	-	-	-	-	-	-	-	-
PGw	hyena_1	*kàs'mǎná	kàs'mǎná	kàs'mǎná	-	-	-	-	-	-	-	-
PCtrl	hyena_1	*tápàj	-	-	tápàjí	-	-	à+tápàjí	à+tápàjí	à+tápàjí	à+tápàjí	à+tápàjí
PUd	hyena_2	*nùrúp	-	-	-	ɲūrɪŋs' í?	à+nùrúp	-	-	-	-	-
PUd	hyena_3		-	-	-	-	-	-	-	-	-	-
POp	hyrax_1	*bǎŋɔ̄	-	-	-	-	-	-	bǎŋɔ̄	bǎŋɔ̄	bǎŋɔ̄	bǎŋɔ̄
PGw	hyrax_2	*dwáki	dwáki	dwáki	-	-	-	-	-	-	-	-
Komo	hyrax_3		-	-	k'wà	-	-	-	-	-	-	-
GwKo	joint_1	*dùdù	-	dùdù+k'á +mit'	dùdù+k'	-	-	-	-	-	-	-
PUd	joint_2		-	-	-	fú?	-	-	-	-	-	-
POp	joint_3	*kǒká	-	-	-	-	-	-	kǒká	kǒká	kǒká	kǒká
Dana	joint_4		-	-	-	-	-	t'á+súk'	-	-	-	-
PKmn	kick	*t <sup>h</sup> áb	táp'	táp'	táb	t <sup>h</sup> áb	t <sup>h</sup> áb	t <sup>h</sup> áp	t <sup>h</sup> áp	t <sup>h</sup> áp	t <sup>h</sup> áp	t <sup>h</sup> áp
PDaOp	kidney_1	*dEkwāḍà	-	-	-	-	-	dèk <sup>h</sup> wāḍ	dikwāḍà	dikwāḍà	dikwāḍ	dikwāḍ
								à			à	à



NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
Komo	kidney_2		-	-	ɗwàkàɗ wàkà	-	-	-	-	-	-	-
PKmn	kill, fight	*k'ɔf	k'ɔf	k'ɔf	k'ɔf	k'ɔf	k'ɔf	k'ɔf	k'ɔsɔ	k'ɔsɔ	k'ɔs	k'ɔf
PCtrl	kiss_1	*s'ud	-	-	s'ur	-	-	s'ud	tʃ'ur	tʃ'ur	tʃ'ur	tʃ'ur
PGw	kiss_2	*s'ópón	s'ópón	s'ópón	-	-	-	-	-	-	-	-
PUD	kiss_3	*p <sup>h</sup> i+t'wā	-	-	-	p <sup>h</sup> i+t'w ā	p <sup>h</sup> it'wā	-	-	-	-	-
PCtrl	knife	*ʃip <sup>h</sup> á	-	-	ʃipá	-	-	ʃip <sup>h</sup> á	-	-	-	-
PCtrl	know or be able_1	*tÉ	-	-	-	-	té	tí	-	-	-	-
PKoUd	know or be able_2	*mɪf	-	-	mɪf	míj	míj	-	-	-	-	-
GwKo	know or be able_3	*ar(V)	älā	ájá	àrí	-	-	-	-	-	-	-
GwKo	(ethnonym) _1	*kwàmà	kwàmà	kwàmà	kòm	-	-	-	-	-	-	-
PUD	(ethnonym) _2	*p <sup>h</sup> ɛk'ɛf	-	-	-	p <sup>h</sup> ɛk'ɛf	p <sup>h</sup> ɛk'ɛf	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
POp	Komo (ethnonym)	*bi+pāj+dʒ	-	-	-	-	-	-	bì+pāj+	bì+pāj+	bì+pāj+	bì+pāj+f
	_3	àw							dʒàw	dʒàw	zàw	àwà
Dana	Komo (ethnonym)		-	-	-	-	-	màḍin	-	-	-	-
	_4											
PCtrl	lack (not have)_1	*kʼaf	-	-	kʼáfà	kʼáf	kʼáf	kʼàf	kʼàs	kʼàs	kʼàs	kʼáf
PGw	lack (not have)_2	*pǎŋgɔ̄	pǎŋ	pǎŋgɔ̄	-	-	-	-	-	-	-	-
PDaOp	ladle_1	*cʼákʼúmú	-	-	-	-	-	cʼákʼúmú	tʃʼákʼúm	tʃʼákʼúm	tʃʼákʼúm	tʃʼákʼúm
									ú	ú	ú	ú
PKoUd	ladle_2	*dʼAm	-	-	dʼóm	dʼám	dʼám	-	-	-	-	-
PGw	large bird	*bīt	bīt	bīt	-	-	-	-	-	-	-	-
POp	large bird	*līt <sup>h</sup>	-	-	-	-	-	-	līt <sup>h</sup>	līt <sup>h</sup>	līt <sup>h</sup>	līt <sup>h</sup>
Komo	large bird		-	-	sʼóp	-	-	-	-	-	-	-
PKmn	laugh	*pʰ(j)asʼ	īsʼ	pāsʼ	pèsʼ	pʰēsʼ	pʰēṭʼ	pʰàsʼ	pʰātʃʼ	pʰātʃʼ	pʰātʃʼ	pʰātʃʼ
PCtrl	lay (v.)_1	*pʰád(a)	-	-	pár	pʰád	pʰád	pʰódā	pʰará	pʰará	pʰará	pʰará
PGw	lay (v.)_2	*sí	sí	sí	-	-	-	-	-	-	-	-
PUd	lay (v.)_3		-	-	-	-	tʃí	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PKmn	lead (guide)_1	*sʊs	fóʃ	fóʃ	fóʃ	sús	sús	sóʔ	-	-	-	-
POp	lead (guide)_2		-	-	-	-	-	-	títā	-	-	-
PGw	leave_1	*jĩ	jĩ	jĩ	-	-	-	-	-	-	-	-
PUD	leave_2	*pí	-	-	-	pí	pí	-	-	-	-	-
PDaOp	leave_3	*k <sup>h</sup> äg	-	-	-	-	-	k <sup>h</sup> ägí+ɖè	-	k <sup>h</sup> ägí+dʒ ì	k <sup>h</sup> ägí+zì	k <sup>h</sup> ägí+jì
PCtrl	lick_1	*t̥éd	-	-	t̥ēr	t̥ēd	t̥ēd	t̥éd	t̥éré	t̥ér	t̥ér	t̥ér
PGw	lick_2	*t̥ápán	t̥ápán	t̥ápán	-	-	-	-	-	-	-	-
PKmn	lie down, sleep_1	*ij	ij	ij	ij	ij	ij	ijá	-	-	-	-
POp	lie down, sleep_2	*bā+tínē	-	-	-	-	-	-	bā+tínē	bā+tín	bā+tín	bā+tín
PKmn	light (ignite)	*s'a	s'ā	s'ā	s'à	s'ā	t̥'ā	s'ówà	t̥'ǎ	t̥'ǎ	t̥'ǎ	t̥'ǎ
PKmn	light (the way with torch/flashl ight)_1	*k <sup>h</sup> ān	kīn	kīn	-	k <sup>h</sup> ān	k <sup>h</sup> ān	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PCtrl	light (the way with torch/flashl ight)_2	*s'Op <sup>h</sup>	-	-	s'òp	-	-	s'òp <sup>h</sup>	tʃ'ò	tʃ'ò	tʃ'ò	tʃ'ò
PCtrl	light weight (be)_1	*p <sup>h</sup> ɔ̄t'(ɔ)	-	-	pòt'	p <sup>h</sup> ɔ̄d	p <sup>h</sup> ɔ̄d'	p <sup>h</sup> ɔ̄t'	p <sup>h</sup> ɔ̄t'ɔ	-	p <sup>h</sup> ɔ̄t'	-
PGw	light weight (be)_2	*fɛ̄ŋgél	fɛ̄ŋgél	fɛ̄ŋjíʔ	-	-	-	-	-	-	-	-
PCtrl	lion_1	*d̄òbɔ	-	-	dòb	zòp <sup>h</sup>	à+d̄òp <sup>h</sup>	-	tòbò	tòbò	tòb	tòb
PGw	lion_2	*tɪfà̄r	tɪfà̄l	tɪfà̄r	-	-	-	-	-	-	-	-
Dana	lion_3		-	-	-	-	-	jél	-	-	-	-
PCtrl	listen_1	*cik'a ~ cik'a	-	-	sìg	fík'	cík <sup>h</sup>	s'ik'à	-	-	-	-
POp	listen_2	*kàrà	-	-	-	-	-	-	kàrà	-	kàrà	kàrà
PGw	listen_3	*tíbí	tíbí	tíbí	-	-	-	-	-	-	-	-
PKmn	LOC, BE LOC	*í ~ *í	-	í	í	-	í	-	í	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PKmn	long or tall (be)_1	*tUr	tũ	tũ	tól	túr	túr	-	-	-	-	-
POp	long or tall (be)_2	*fík'	-	-	-	-	-	-	sík'	sík'	sík'	fík'
Dana	long or tall (be)_3		-	-	-	-	-	búd	-	-	-	-
PCtrl	lost (be)_1	*T̄is	-	-	-	tís	ṭís	sís	sísí	sísí	sísí	sísí
PGw	lost (be)_2	*hìnt'	hìnt'	hìnt'	-	-	-	-	-	-	-	-
Komo	lost (be)_3		-	-	wòk	-	-	-	-	-	-	-
PKmn	louse_1	*fOk'(VN)	-	fõgòn	fùwèn	fõk'õm	à+fõk'õm	fùk'náj	sùk'én	sùk'én	sùk'én	fùk'én
PGw	louse_2		s'õnzò	-	-	-	-	-	-	-	-	-
PCtrl	love_1	*hwaj	-	-	hwāj	-	-	ój	ójá	ójá	ójá	ójá
GwKo	love_2	*fun(V)	fūnù	fūn	fùnà	-	-	-	-	-	-	-
PUd	love_3	*én	-	-	-	én	én	-	-	-	-	-
PGw	love_4	*fám	fám	fám	-	-	-	-	-	-	-	-
PDaOp	maggot_1	*DVf	-	-	-	-	-	dif	dùsù	dzùs	zùs	fùf
GwKo	maggot_2	*s'ont'a	s'ont'	s'ont'	s'wàndá	-	-	-	-	-	-	-
PUd	maggot_3	*jif	-	-	-	jif	à+jif	-	-	-	-	-
PCtrl	maize_1	*k <sup>h</sup> õba	-	-	-	k <sup>h</sup> õbà	à+k <sup>h</sup> õbà	k <sup>h</sup> õbā	k <sup>h</sup> õbà	k <sup>h</sup> õbà	k <sup>h</sup> õbà	k <sup>h</sup> õbà
Komo	maize_2		-	-	kāmā	-	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	maize_3	*sàmún	sàmún	sàmún	-	-	-	-	-	-	-	-
PKmn	make go away	*t <sup>h</sup> af ~ ṭ <sup>h</sup> af	tāf	tāf	tàf	t <sup>h</sup> áf	t <sup>h</sup> áf	-	-	-	-	-
PKmn	meat, animal	*fum(a)	sūm	sūm	fùm	fūm	fūm	fùmà	sūmā	sūmā	sūmā	fūmā
PCtrl	mediate_1	*ṭ <sup>h</sup> aṭ'	-	-	-	-	ṭ <sup>h</sup> āṭ'	ṭ <sup>h</sup> ājǰá	-	-	-	t <sup>h</sup> ájá
POp	mediate_2	*t <sup>h</sup> ágá	-	-	-	-	-	-	t <sup>h</sup> ágá	t <sup>h</sup> ágá	t <sup>h</sup> ágá	-
Komo	mediate_3		-	-	tìf	-	-	-	-	-	-	-
PGw	mediate_4	*tābūk	tābūk	tābūk	-	-	-	-	-	-	-	-
PUd	mediate_5, help	*wòṭ <sup>h</sup>	-	-	-	wòs	wòṭ <sup>h</sup>	-	-	-	-	-
PGw	milk_1	*bàs'	bàs'	bàs'	-	-	-	-	-	-	-	-
PDaOp	milk_2	*tíf	-	-	-	-	-	tíf	tís	tís	tís	-
PDaOp	moon or month_1	*àdòj	-	-	-	-	-	à+dòj	à+dòj	à+dòj	à+dòj	à+dòj
PKoUd	moon or month_2	*páj	-	-	páj	páj	à+pé?	-	-	-	-	-
PGw	moon or month_3	*s'ēwàn ~ s'jāwàn	s'ēwàn	s'jāwàn	-	-	-	-	-	-	-	-
PCtrl	mosquito_1	*taf	-	-	-	tāf	à+tāf	tāf	tās	tās	tās	tǎf

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PKmn	mosquito_2 , firefly	*mimi	mímí	mímí	mímí	mímí	-	-	-	-	-	-
PKoUd	mother_1	*tádā	-	-	dā	à+tádā	tádā	-	-	-	-	-
POp	mother_2	*àdǎjē	-	-	-	-	-	-	àdǎjē	àdǎjē	àdǎjē	àdǎjē
PKmn	mother, female	*kōman	-	kūm	kōmán	kūmán	kūm ~ kūmán	kòm ~ kwàn	kōmán	kōmán	kōmán	kōmán
PKmn	mouth	*t'wa	t'wā	t'wā	t'ā	t'wā	t'wā	t'āʔá	t'ā	t'ā	t'ā	t'ā
PCtrl	mushroom_ 1	*dǐf(a)	-	-	dǐf	dǐfɪʔ	à+dǐf	tǐfā	tìsà	tìsà	tìsà	tǐfā
PGw	mushroom_ 2	*t'áfá	t'áfá	t'áfá	-	-	-	-	-	-	-	-
PCtrl	name_1	*Duga	-	-	zāgà	-	-	-	dzùgà	-	-	fùgà
PDaOp	name_2	*jǐntʰí	-	-	-	-	-	jǐntʰí	-	dzǐntʰí	zǐntʰí	fǐntʰí
PUd	name_3	*gwàj	-	-	-	gwàj	gwàj	-	-	-	-	-
PGw	name_4		-	twī	-	-	-	-	-	-	-	-
PCtrl	navel, umbilical cord	*k'úmú	-	-	k'úmú	-	-	k'úmú	k'úmú	k'úmú	k'úmú	k'úmú
PCtrl	near_1	*dǐfa	-	-	dǐf	dǐf	dǐf	dǐfā	isā	isí	dīsā	dǐfā
PGw	near_2	*kīsī	kīsī	kīsī	-	-	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PKmn	neck	*bɪ̀ɖa	p̄ɪl	p̄ɪ	bàʔ	bāʔ	bāʔ	biɖà	bija	bija	bija	bija
PKmn	new_1	*ɖis ~ ɖis	ɖiʃ	ɖiʃ	zìʃ	tis	t̄is	-	-	-	-	-
PDaOp	new_2	*k <sup>(h)</sup> is	-	-	-	-	-	kis	k <sup>h</sup> is	k <sup>h</sup> is	k <sup>h</sup> is	k <sup>h</sup> is
PKmn	nose	*ʃɔ̄nʃ	ʃɔ̄ʃ	ʃɔ̄ʃ	ʃònʃ	ʃūʃ	ʃūʃ	ʃòʃ	sòsò	sòs	sòs	ʃòʃ
PCtrl	nosebleed_1	*(a)Tina ?	-	-	zìnà	-	-	-	àtfwinà	àtfwinà	àtfwinà	àtfwinà
PKmn	nosebleed_2	*S'Un(t)a	-	t'ònt'	-	-	-	s'unáʔ	-	-	-	-
PCtrl	not know (how)_1	*mal(at) ~ *mɔl	-	-	màlàt	mɔl	mɔl	-	tā+mál	tā+mál	tā+mál	tā+mál
PGw	not know (how)_2	*dāŋā	dāŋā	dāŋā	-	-	-	-	-	-	-	-
Nuer												
PKmn	(ethnonym) _1	*jaŋg(ɔ)aj	zǎgó	zǎgó	zǎgó	ʒwǎŋgì	-	jàŋwèj	dʒāŋó	-	zāŋwé	jàŋwè
Nuer												
POp	(ethnonym) _2		-	-	-	-	-	-	-	nòr	-	-
PDaOp	offend_1	*falɪ	-	-	-	-	-	fálí	sálí	sálí	sálí	fál
PGw	offend_2	*kénzé	kénzé	kénzé	-	-	-	-	-	-	-	-



NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PKoUd	offend_3	*sóD	-	-	ʃót	sód	sór	-	-	-	-	-
	oil (organic											
PCtrl	substance)_ 1	*jEn(t)	-	-	jèn	jìn	à+jìn	jím	džǐní	džǐní	zǐn	ʃǐn
	oil (organic											
PGw	substance)_ 2	*dà	dà	dà	-	-	-	-	-	-	-	-
PUd	old (be)_1	*dàm(V)	-	-	-	zàmì	dàmò	-	-	-	-	-
PCtrl	one (1)_1, alone_2	*dɛ	-	-	dě	dé	dé	dédé	dǰān	dǰān	dɛdɛ	dɛdɛ
PGw	one (1)_2	*sénɛʔ	sénɛʔ	sénɛʔ	-	-	-	-	-	-	-	-
PKmn	open	*k <sup>h</sup> ád(a)	kálá	kájá	kár	k <sup>h</sup> ăd	k <sup>h</sup> ăd	k <sup>h</sup> átá	k <sup>h</sup> átá	k <sup>h</sup> átá	k <sup>h</sup> átá	k <sup>h</sup> átá
	Opo											
PKmn	(ethnonym) _1	*k <sup>(h)</sup> ínáj	kíná	kíná	kíná	c <sup>h</sup> ínáj	-	kínáj	-	-	-	-
	Opo											
POp	(ethnonym) _2		-	-	-	-	-	-	òpò	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
	pack in,											
PKmn	stuff into container_1	*gìm	gìm	gìm	-	-	jìm	-	-	-	-	-
	pack in,											
PDAOp	stuff into container_2	*fɔŋ(V)	-	-	-	-	-	fɔŋó	sɔŋí	sɔŋí	sɔŋí	fɔŋó
	pack in,											
Komo	stuff into container_3		-	-	wüb	-	-	-	-	-	-	-
	pack in,											
PUd	stuff into container_4		-	-	-	dil	-	-	-	-	-	-
	pack in,											
PUd	stuff into container_5		-	-	-	-	-	-	-	-	-	-
	pain, be hurt_1	*mìt'(V)n	-	mìt'ĩ	mìt'án	-	-	-	-	-	-	-
	pain, be hurt_2	*fáw	-	-	fáw	-	-	fáw	sáw	sáw	sáw	fáw

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	pain, be hurt_3	*tʰɔf	tʰɔf	tʰɔf	-	-	-	-	-	-	-	-
PUd	pain, be hurt_4	*ɲɔr	-	-	-	ɲɔr	ɲɔr	-	-	-	-	-
PKmn	palate_1	*ɓalilaj	p'əlɪli	p'əlɪli	ɓəlɪlá	-	-	-	-	-	-	-
PUd	palate_2	*bwáhādgí( da)	-	-	-	bwágíd à	bwáhādgí	-	-	-	-	-
Dana	palate_3		-	-	-	-	-	kàlt'á	-	-	-	-
PKmn	path, road_1, towards	*bwaɲ(a)	pwǎɲà	pwǎɲà	-	-	bwàɲ	-	-	-	-	-
Dana	path, road_2		-	-	-	-	-	jàrábūd	-	-	-	-
PUd	path, road_3		-	-	-	ɲɔɲ	-	-	-	-	-	-
POp	path, road_4	*pór	-	-	-	-	-	-	dzèpór	dzèpór	t'ā+ò+p ór	t'ā+ò+p ór
Komo	path, road_5		-	-	kòmà	-	-	-	-	-	-	-
PCtrl	peel_1	*k'ɔj	-	-	k'í	c'é	c'é	k'òj	k'é	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PDaOp	peel_2	*jek' ~ hək'	-	-	-	-	-	hék'	-	jék'	jĕk'	jĕk'
PKmn	peel, husk_1	*p'i(n)C'?	p'ins'	p'ins'	-	-	p'íd	p'ít'	-	-	-	-
PKoUd	peel, skin (with knife), peel, husk, peel	*p <sup>h</sup> ɛd	-	-	pèt	p <sup>h</sup> ít <sup>h</sup>	-	-	-	-	-	-
PCtrl	pelt_1, drive in, pound, hammer (something)	*t̥él	-	-	tél	-	t̥él	t̥él	tél	tél	tél	tél
PGw	pelt_2	*kāns'	kāns'	kāns'	-	-	-	-	-	-	-	-
PCtrl	pelt_3, throw	*ʃin	-	-	ʃin	ʃin	ʃin	ʃinà	sīnā	sīnā	-	-
PCtrl	penis_1	*D̥Is	-	-	j̥ɪ	j̥is	j̥is	ɖ̥is	d̥os	d̥z̥os	z̥os	s̥os
PGw	penis_2	*sjā	sjā	sjā	-	-	-	-	-	-	-	-
PCtrl	person_1, man	*g(w)às'	-	-	jī+gwàz	wàzì	wàɖí	jĕ+kàz	ò+kàd̥z	ò+kàd̥z	ò+kàd̥z	ò+kàd̥z
PKmn	person_2	*D̥iṭa	sīt	sīt	-	-	-	ɖ̥iṭà	-	-	ò+zità	ò+ʃità

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
P Ctrl	person_2, man	*g(w)às'	-	-	gwàz	gwàs'	gwàtʰ	kwàz	-	-	-	-
P Ctrl	pick up (small things), peck at_1	*kwáɲ	-	-	kwán	kwáɲ	kwáɲ	kwán	kwán	kwán	kwán	-
PGw	pick up (small things), peck at_2	*ná	ná	ná	-	-	-	-	-	-	-	-
PKmn	pick_1	*p'òt̪'(a)	pót	pót	p'òt'	-	-	p'òt̪ʰà	p'òt'ā	p'òt'ā	p'òt'ā	p'òt'ā
PUd	pick_2		-	-	-	wóʔ	hó	-	-	-	-	-
PKmn	pierce_1	*t̪Uɓ(a)	só	só	-	t̪upʰ	t̪upʰ	t̪úbá	-	-	t̪úbá	t̪úbá
POp	pierce_2	*t̪ʃt	-	-	-	-	-	-	t̪ʃt	t̪ʃt	-	-
P Ctrl	pierce, cut (grass with sickle)	*kʰɛm	-	-	kém	-	-	-	kʰɛm	kʰɛm	kʰɛm	kʰɛm
PKmn	pig_1	*gUɖUm	kòróm	kòróm	gùdúm	-	-	gùɖùm	kùdùmà	kùdùmà	kùdùmà	kùdùmà
PKmn	pipe (for smoking)_1	*dójè	dózè	dózè	dózè	-	-	dójè	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
POp	pipe (for smoking)_2	*kòdós	-	-	-	-	-	-	kòdós	kòdós	kòdós	kòdóf
POp	plait or braid or weave_1	*p <sup>h</sup> ák'	-	-	-	-	-	-	p <sup>h</sup> ák'	p <sup>h</sup> ák'	p <sup>h</sup> ák'	p <sup>h</sup> ák'
Komo	plait or braid or weave_2		-	-	ʃít	-	-	-	-	-	-	-
PGw	plait or braid or weave_3	*s'ú	s'ú	s'ú	-	-	-	-	-	-	-	-
Dana	plait or braid or weave_4		-	-	-	-	-	ták <sup>h</sup>	-	-	-	-
PUd	plait or braid or weave_5	*t <sup>h</sup> óǀ	-	-	-	t <sup>h</sup> óǀ	t <sup>h</sup> óǀ	-	-	-	-	-
Komo	plaster (v.), adhere_1		-	-	lòk	-	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PDaOp	plaster (v.), adhere_3	*t <sup>h</sup> áp	-	-	-	-	-	t <sup>h</sup> áp <sup>h</sup>	t <sup>h</sup> áp	t <sup>h</sup> áp	t <sup>h</sup> áp	t <sup>h</sup> áp
PGw	plaster (v.), adhere_4	*pànt'	pànt'	pànt'	-	-	-	-	-	-	-	-
PKmn	platform	*p <sup>h</sup> ará	pára	pára	pára	-	-	p <sup>h</sup> ará	p <sup>h</sup> ará	p <sup>h</sup> ará	p <sup>h</sup> ará	p <sup>h</sup> ará
	play											
Dana	(instrument )_1		-	-	-	-	-	fáj	-	-	-	-
	play											
PKmn	(instrument )_2	*jɪ	jì	jì	-	-	-	-	dʒī	dʒī	zī	fī
	play											
Komo	(instrument )_3		-	-	tíʃ	-	-	-	-	-	-	-
	play											
PUd	(instrument )_4		-	-	-	p <sup>h</sup> ú	-	-	-	-	-	-
PCtrl	play_1	*bòg(ò)	-	-	bòg	-	-	pògòʔ	pògò	pògò	pògò	pògò
PGw	play_2	*jíl	jíl	jí	-	-	-	-	-	-	-	-
PUd	play_3	*lòb	-	-	-	lòb	lòb	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PCtrl	polygamou s (be)_1	*b(w)áf	-	-	báf	bwáf	báf	báf	-	-	-	-
POp	polygamou s (be)_2	*fófó	-	-	-	-	-	-	sósú	sósú	sós	fóf
PGw	polygamou s (be)_3		-	p'õsóp'	-	-	-	-	-	-	-	-
PDaOp	poor (be)_1	*cân	-	-	-	-	-	cân	tjân	tjân	tjân	tjân
Komo	poor (be)_2		-	-	dègá	-	-	-	-	-	-	-
POp	poor (be)_3	*sõsór	-	-	-	-	-	-	sõsór	sõsór	sõsór	sõsór
PGw	poor (be)_4	*gìrì	gìrì	gìrì	-	-	-	-	-	-	-	-
PUd	poor (be)_5	*hās'+k'òd	-	-	-	hās'+k' òd	hāt'+k'òd	-	-	-	-	-
PKmn	porcupine_ 1	*k <sup>(h)</sup> ak'as ~ k <sup>(h)</sup> asak'	kák'àf	kák'àf	káfak'	-	-	kásāk'	k <sup>h</sup> ásāk'	k <sup>h</sup> ásāk'	k <sup>h</sup> ásāk'	k <sup>h</sup> áfak'
PUd	porcupine_ 2		-	-	-	tõnsúlé ɲ	-	-	-	-	-	-
PUd	porcupine_ 3		-	-	-	-	jáp <sup>h</sup>	-	-	-	-	-
PCtrl	pottery, pot_1	*t <sup>h</sup> i(aj)	-	-	sī	-	-	tījā	t <sup>h</sup> ī	t <sup>h</sup> ī	t <sup>h</sup> ī	t <sup>h</sup> ī



NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	pottery, pot_2	*pǎjá	pǎjá	pǎjá	-	-	-	-	-	-	-	-
PUd	pottery, pot_3	*nós	-	-	-	nós	à+nós	-	-	-	-	-
PDaOp	pound (v.)_1	*k <sup>h</sup> òm	-	-	-	-	-	k <sup>h</sup> òm	-	-	k <sup>h</sup> óm	k <sup>h</sup> óm
PUd	pound (v.)_2	*t <sup>h</sup> ás'	-	-	-	t <sup>h</sup> ás'	t <sup>h</sup> át'	-	-	-	-	-
PCtrl	pound (v.)_3	*Vl	-	-	-	ál	ál	ɔl	ɔl	ɔl	ɔl	ɔl
PKmn	pound (v.)_4	*kóp <sup>h</sup>	kóp	kóp	-	kúp <sup>h</sup>	-	-	-	-	-	-
PCtrl	pound (v.)_5	*dùm	-	-	dùm	-	-	dùm	dùm	dùm	dùm	dùm
POp	pound (v.)_6	*pàtfí	-	-	-	-	-	-	pàtfí	pàtfí	-	-
PGw	pound (v.)_7	*gǔpò	gǔpò	gǔpò	-	-	-	-	-	-	-	-
PCtrl	pour_1	*k <sup>h</sup> ar	-	-	kál	-	-	k <sup>h</sup> ár	k <sup>h</sup> ārí	k <sup>h</sup> ārí	k <sup>h</sup> ārí	k <sup>h</sup> ārí
POp	pour_2	*t <sup>h</sup> ír	-	-	-	-	-	-	t <sup>h</sup> ír	t <sup>h</sup> ír	t <sup>h</sup> ír	t <sup>h</sup> ír

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	pour_3	*swí	swí	swí	-	-	-	-	-	-	-	-
Dana	pour_4		-	-	-	-	-	tísà	-	-	-	-
PUd	pour_5	*jú	-	-	-	jú	jú	-	-	-	-	-
PCtrl	pray, beg_1	*ɬam	-	-	dám	-	ɬám	ɬámá	támá	támá	támá	támá
PGw	pray, beg_2	*jàn	jàn	jàn	-	-	-	-	-	-	-	-
PUd	pray, beg_3	*s'ɔ̃	-	-	-	s'ɔ̃	ɬ'ɔ̃	-	-	-	-	-
PCtrl	precede_1	*tít(á) ~ tít(á)	-	-	tít	-	-	-	títá	títá	títá	títá
Dana	precede_2		-	-	-	-	-	kòḍá	-	-	-	-
PGw	precede_3	*t'ózi	t'ózi	t'ózi	-	-	-	-	-	-	-	-
PUd	precede_4	*bās'	-	-	-	bās'	bāɬʰ	-	-	-	-	-
PKmn	pregnant (be)	*bUma	pòm	pòm	bú	pwá	bwà	pùmá	pùmá	pùmá	pùmá	pùmá
PDaOp	protect_1	*káɬʰ <sup>(h)</sup>	-	-	-	-	-	káɬʰ	-	-	kát	kát
PCtrl	protect_2	*jigi	-	-	jígíʔ	-	-	-	dʒígí	dʒígí	-	-
PGw	protect_3	*tīm	tīm	tīm	-	-	-	-	-	-	-	-
PUd	protect_4	*cēʃ	-	-	-	cēʃ	cēʃ	-	-	-	-	-
PCtrl	pull, pull off, drag	*hād	-	-	hàd	-	hǎd	hàdí	hǎdí	hǎdí	hǎdí	hǎdí

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PDaOp	push_1	*sūsá ~ *sōsá	-	-	-	-	-	sūsá	sōsá	sōsá	sōsá	sōsá
PKmn	python_1	*sòm	fōfóm	fōfóm	fóm	-	súm	sómó	sómó	sómó	sómó	sómó
PUd	python_2		-	-	-	kàldōŋ ā	-	-	-	-	-	-
	rain											
PDaOp	(precipitati on)_1	*ḍibà	-	-	-	-	-	ḍibà	-	-	-	ḍibà
	rain											
PKmn	(precipitati on)_2	*fɔk'	-	fó	ó	fɔk'	à+fɔk'	-	hó	hǒ	hǒ	-
	rain											
PGw	(precipitati on)_3		hins'	-	-	-	-	-	-	-	-	-
PCtrl	rain (v.)_1	*fí	-	-	fí	-	-	fí	sí	sí	sí	sí
PGw	rain (v.)_2	*fāp'	fāp'	fāp'	-	-	-	-	-	-	-	-
PUd	rain (v.)_3		-	-	-	jós'	-	-	-	-	-	-
PUd	rain (v.)_4		-	-	-	-	hét'	-	-	-	-	-
	raise (a child)_1	*tùn ~ tùn	-	-	tùn	-	-	-	tùn	tùn	tùn	tùn

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PCtrl	raise (a child)_2	*tʰipʰ	-	-	-	sipʰ	tʰipʰ	tʰi	-	-	-	-
PKmn	rat_1	*sʰík	sʰi	sʰi	sʰík	sʰiʔ	à+tʰíkʰ	-	tʃʰígí	tʃʰígí	tʃʰígí	tʃʰígí
PDaOp	rat_2	*kʰidí	-	-	-	-	-	kʰidí	kʰiʔ	kʰiʔ	kʰiʔ	kʰiʔ
PKoUd	red (be)_1	*pʰér	-	-	pʰél	pʰér	pʰér	-	-	-	-	-
PDaOp	red (be)_2	*kʰāpʰā	-	-	-	-	-	kʰāpʰā	kʰāpā	kʰāpā	kʰāpā	kʰāpā
PGw	red (be)_3	*kʰāf	kʰāf	kʰāf	-	-	-	-	-	-	-	-
PDaOp	refuse_1	*kʰa	-	-	-	-	-	kā	kʰà	kʰà	kʰà	kʰà
PKoUd	refuse_2	*ʊf	-	-	ōf	úf	úf	-	-	-	-	-
PKmn	repair_1	*kʰaḃ	áp	-	áb	-	-	óbā	kʰápʰ	kʰápʰ	kʰápʰ	kʰápʰ
PGw	repair_2		-	át	-	-	-	-	-	-	-	-
PUd	repair_3		-	-	-	-	t̥s̥s̥n	-	-	-	-	-
PUd	repair_4		-	-	-	nòŋ	-	-	-	-	-	-
PKmn	replace	*(n(j)a)gaD	nāgát	njāgát	gàdá	gàs	gàr	gàtá	kàrà	kàrà	kàrà	kàrà
PCtrl	resemble (reflect)_1	*Tál	-	-	sál	sál	tál	hálà	tʃál	tʃál	tʃál	tʃál
PGw	resemble (reflect)_2		zí	zí	-	-	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
	right											
PDaOp	(direction)_ 1	*k <sup>(h)</sup> ɪ̥ <sup>(h)</sup> (à)	-	-	-	-	-	ki̥ <sup>h</sup> à	k <sup>h</sup> ɪ̥t	k <sup>h</sup> ɪ̥t	k <sup>h</sup> ɪ̥t	kɪ̥tā
	right											
GwKo	(direction)_ 2	*k'ana	-	k'ána	k'ána	-	-	-	-	-	-	-
	right											
PUd	(direction)_ 3		-	-	-	mēd+p à	-	-	-	-	-	-
	right											
PUd	(direction)_ 4		-	-	-	-	à+bĩmpór ōs	-	-	-	-	-
PCtrl	rinse face_1	*t̥'àm	-	-	t'â+bí	-	-	t̥'àm	t'ām	t'ām	t'ām	t'ām
PUd	rinse face_2	*lám+ē	-	-	-	lám+ē	lám+ʔē	-	-	-	-	-
PGw	rinse face_3	*mùs'	mùs'	mùs'	-	-	-	-	-	-	-	-
PKmn	rinse mouth_1	*CVk'Um	fòkóm	fòkóm	zùk'úm	-	-	jàk'óm	tʃàk'ómá	tʃàk'ómá	sàk'ómá	tʃàk'óm á
PUd	rinse mouth_2	*k'üc <sup>h</sup> ür ~ k'üc'ür	-	-	-	k'úzür	k'üc <sup>h</sup> ür	-	-	-	-	-
PKmn	ripen	*ís ~ ís	ís	ís	íʃ	ís	ís	ísá	ísá	ísá	ísá	ítʃá

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PCtrl	rise (oneself)_1	*p <sup>(h)</sup> ɪ̄(á)	-	-	-	pí	pí	pí̄á	p <sup>h</sup> íjá	p <sup>h</sup> íjá	-	p <sup>h</sup> íjá
PGw	rise (oneself)_2	*kòĩ	kòĩ	kòĩ	-	-	-	-	-	-	-	-
POp	rise (oneself)_3	*dílá	-	-	-	-	-	-	-	-	dílá	dílá
PKoUd	rise (oneself)_4	*Kì-mís	-	-	gìmíf	cì+mís	cì+mís	-	-	-	-	-
PDaOp	river_1	*k'ós(V)	-	-	-	-	-	k'ósì	k'ósó+d zì	k'ósó+d zì	k'ósí+zì	k'ósí+sì
Komo	river_2		-	-	s'óʔ	-	-	-	-	-	-	-
PGw	river_3	*pógó	pógó	pógó	-	-	-	-	-	-	-	-
PUd	river_4	*wòr	-	-	-	wòr	wòr	-	-	-	-	-
PDaOp	roast (burn hairs off of pig skin)_1	*Hil	-	-	-	-	-	híl	jìl	jìl	-	sìl
PKmn	roast (something)	*t'ós	t'óʃ	t'óʃ	t'óʃ	t'ós	t'ós	-	-	-	-	-
PCtrl	roast or fry_1	*kés(é)	-	-	kéʃ	cés	cés	kés	késé	késé	kés	késé

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	roast or fry_2	*kó	kó	kó	-	-	-	-	-	-	-	-
PCtrl	roll_1	*Dangal	-	-	-	dángàl	dángál	nàngàl	làngàl	làngál	làngàl	làngál
GwKo	roll_2	*tVndVI	tìndìl	tìndì	tùndàl	-	-	-	-	-	-	-
PCtrl	roof_1	*k <sup>h</sup> ádúm	-	-	kárúm	-	-	k <sup>h</sup> ádúm	k <sup>h</sup> árúm	k <sup>h</sup> árúm	k <sup>h</sup> árúm	k <sup>h</sup> árúm
PUD	roof_2		-	-	-	k'óngù b	-	-	-	-	-	-
PUD	roof_3		-	-	-	-	bàmbòr+ gùb	-	-	-	-	-
PCtrl	root_1	*bVr(màn)	-	-	bìl	bír	bírmàn	bìl+mà+c á	-	-	-	-
POp	root_2	*k <sup>h</sup> ìl	-	-	-	-	-	-	k <sup>h</sup> ìl	k <sup>h</sup> ìl	k <sup>h</sup> ìl	k <sup>h</sup> ìl
PGw	root_3	*s'ans'	s'ans'	s'ans'	-	-	-	-	-	-	-	-
PKmn	rope_1	*fut' ?	födòl	fwit'in	fòʔí	fí	à+fí	fól	-	-	-	-
POp	rope_2	*t'írá	-	-	-	-	-	-	t'írá	t'írá	t'írá	t'írá
PCtrl	rough (be)_1	*kV <sup>k</sup> Vr	-	-	-	fégēr	-	k'àk'àr	k'èk'èr	k'èk'èr	k'èk'èr	k'àk'àr
Komo	rough (be)_2		-	-	kákán	-	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	rough (be)_3	*gók'òm	gók'òm	gók'òm	-	-	-	-	-	-	-	-
PUD	rough (be)_4		-	-	-	-	k <sup>h</sup> õkõr	-	-	-	-	-
PKmn	roughen (stone for grinding)	*tít	sít	sít	tít	tít <sup>h</sup>	tír	tít <sup>h</sup>	títí	tít <sup>h</sup>	tít <sup>h</sup>	tít <sup>h</sup>
PGw	rub hands together (e.g. to make fire using stick)_1	*s'ú	s'ú	s'ú	-	-	-	-	-	-	-	-
PUD	rub hands together (e.g. to make fire using stick)_2	*s'ék <sup>h</sup>	-	-	-	s'ék <sup>h</sup>	t'ék <sup>h</sup>	-	-	-	-	-



NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
	rub hands together (e.g. to make fire using stick)_3											
PCtrl		*piʃ(i)	-	-	piz	-	-	p <sup>h</sup> ic <sup>h</sup>	pīdzí	-	pīdz	-
PKmn	run (SG)_1, flow, bleed	*gŭs	gòs	gòs	gùʃ	gùs	gùs	-	-	-	-	-
PCtrl	run_PL_1	*so	-	-	-	sō	-	-	só	só	só	só
PKoUd	saliva_1	*majə	-	-	mālà	màjà	màjà	-	-	-	-	-
Dana	saliva_2		-	-	-	-	-	mòlʔà	-	-	-	-
PGw	saliva_3	*takal	tākāl	tāgí	-	-	-	-	-	-	-	-
POp	saliva_4	*dʒi+t'à	-	-	-	-	-	-	dʒi+t'à	dʒit'à	zi+t'à	ʃit'à
	salt_(from ash of a particular plant/tree)_ 1											
POp		*kàrò	-	-	-	-	-	-	-	kàrò	kàrò	kàrò

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
	salt_(made from ash of a particular plant/tree)_ 2	*t'af	t'áf	t'áf	t'áf	t'áf	t'áf	t'áf	t'ás	-	-	-
PDaOp	salt_1	*fâpó	-	-	-	-	-	à+fâbó	à+sàpó	à+sàpó	à+sàpó	à+fâbó?
PGw	salt_2		-	nǎdó	-	-	-	-	-	-	-	-
PUd	salt_3	*dǝŋgǝrǝ	-	-	-	dǝŋgǝr ǝ	à+dǝŋgǝr ǝ	-	-	-	-	-
PUd	sand_1	*sib	-	-	-	sib	à+sib	-	-	-	-	-
GwKo	sand_2	*pUfU	pufu	pufu	póf	-	-	-	-	-	-	-
PKoUd	sap_1	*jìman	-	-	ìmàn+sá	-	jìmán	-	-	-	-	-
POp	sap_2	*büntf'ú	-	-	-	-	-	-	büntf'ú	büntf'ú	büntf'ú	büntf'ú
PGw	sap_3	*hǝfǝf	hǝfǝf	hǝfǝf	-	-	-	-	-	-	-	-
PKoUd	satiated (be)_1	*pók'	-	-	póg	pók'	-	-	-	-	-	-
PGw	satiated (be)_2	*pīs	pīs	pīs	-	-	-	-	-	-	-	-
PUd	satiated (be)_3		-	-	-	-	kāp <sup>h</sup>	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PDaOp	satiated (be)_4	*put <sup>(h)</sup>	-	-	-	-	-	pút <sup>h</sup>	püt	püt	püt	püt
PKmn	say_1	*k <sup>(h)</sup> O	kɔ̃	kɔ̃	ó	ó	ó	-	-	-	-	-
PDaOp	scootch (move over)_1	*hòk <sup>h</sup> á ~wòk <sup>h</sup> á	-	-	-	-	-	hòk <sup>h</sup> á	-	-	wòk <sup>h</sup> á	wòk <sup>h</sup> á
PKoUd	scootch (move over)_2	*fɔ̃d	-	-	fɔ̃d	fɔ̃r	fɔ̃r	-	-	-	-	-
POp	scootch (move over)_3		-	-	-	-	-	-	-	jèk <sup>h</sup> á	-	-
POp	scootch (move over)_4		-	-	-	-	-	-	tjērá	-	-	-
PGw	scootch (move over)_5	*tōròm	tōròm	tōlòm	-	-	-	-	-	-	-	-
PKmn	scorpion	*d(w)ank'I	t'wānk'ít' wānk'	t'wānk'ít' wānk'	bādāgí?	dwāk <sup>h</sup>	à+dāk <sup>h</sup>	dāgí	dāgí	dāgí	dāgí	dāgí

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PDaOp	scratch_1	*gòn	-	-	-	-	-	gòn	gòn	gòn	gòn	gòn
PKoUd	scratch_2	*s'ús'	-	-	s'ús'	s'ús'	ʃ'út <sup>h</sup>	-	-	-	-	-
PGw	scratch_3	*k'òs'	k'òs'	k'òs'	-	-	-	-	-	-	-	-
PKmn	seed_1	*ḐE(se)	zì	zì	-	-	-	ḑèsê	dzèsē	dzèsē	zèsē	sèsē
PKoUd	seed_2	*ʔjamVn	-	-	ʔjámón	ēmén	ēmén	-	-	-	-	-
PGw	sell_1	*dwì	dwì	dwì	-	-	-	-	-	-	-	-
PUd	sell_2	*jól	-	-	-	jól	jól	-	-	-	-	-
PKmn	send someone_1	*ḑar(a)	t'álà	t'ájà	ḑar	ḑēt <sup>h</sup>	-	ḑèd	-	ḑēr	-	ḑēr
POp	send someone_2	-	-	-	-	-	-	-	tʃànjí	-	-	-
PUd	send someone_3	-	-	-	-	-	hāf	-	-	-	-	-
POp	send someone_4	-	-	-	-	-	-	-	-	-	k <sup>h</sup> átá	-
PKoUd	sesame_1	*bū ~ *pū	-	-	bū	pū	à+pū	-	-	-	-	-
POp	sesame_2	*dʒmí+kōré	-	-	-	-	-	-	dʒmí+kō	dʒmí+kō	zímí+kō	-
									ré	ré	ré	-
PGw	sesame_3	*ís	ís	ís	-	-	-	-	-	-	-	-
PDaOp	sesame_4	*ʃp <sup>(h)</sup> a	-	-	-	-	-	ʃp <sup>h</sup> à	-	-	-	tīpá

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
	set											
Komo	(heavenly bodies)_1		-	-	wùdīd	-	-	-	-	-	-	-
	set											
PGw	(heavenly bodies)_2	*kīs'	kīs'	kīs'	-	-	-	-	-	-	-	-
	set											
PUD	(heavenly bodies)_3	*jVl	-	-	-	jíl	júl	-	-	-	-	-
	set											
PDaOp	(heavenly bodies)_4	*Túṭ <sup>(h)</sup> (a)	-	-	-	-	-	súṭ <sup>h</sup> ā	-	-	-	tʃúṭ <sup>h</sup> á
PKmn	sew_1	*kós	ós	ós	-	-	-	kós	kós	kós	kós	kós
PKoUd	sew_2	*fó	-	-	fó	fó	fó	-	-	-	-	-
PDaOp	shadow_1	*jílónḡ	-	-	-	-	-	jílónḡ	-	-	-	jílónḡ
PUD	shadow_2		-	-	-	c <sup>h</sup> izàrà	-	-	-	-	-	-
PUD	shadow_3		-	-	-	-	à+k <sup>h</sup> āfirā	-	-	-	-	-
PGw	shadow_4	*Kōfòn	gōfòn	kōfòn	-	-	-	-	-	-	-	-
PCtrl	shadow_5	*Dīt <sup>h</sup>	-	-	zīt	-	-	-	dzīt <sup>h</sup>	dzīt <sup>h</sup>	zīt <sup>h</sup>	fīt <sup>h</sup>

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PKmn	shake (sth.)_1	*pid(V)	-	pídí	pídá	pít <sup>h</sup>	pír	-	-	-	-	-
PKmn	shake (sth.)_2	*tEŋ(g)(E)	tīgī	tīgī	-	-	-	téŋ	-	tíŋhá	tíŋhá	tíŋhá
POp	shake (sth.)_3		-	-	-	-	-	-	k <sup>h</sup> íhá	-	-	-
PUd	shake (sth.)_4	*jikin	-	-	-	jígìn	jík <sup>h</sup> in	-	-	-	-	-
PCtrl	shallow (be)_1	*téd	-	-	-	téd	téd	téd	téré	tér	tér	tér
Komo	shallow (be)_2		-	-	bàd	-	-	-	-	-	-	-
PGw	shallow (be)_3	*wàrkìn	wàrkìn	wàlkìn	-	-	-	-	-	-	-	-
PCtrl	sharpen_1	*kíl	-	-	kíl	cíl	cíl	-	kíl	kíl	kíl	kíl
PGw	sharpen_2	*mэфé	mэфé	mэфé	-	-	-	-	-	-	-	-
Dana	sharpen_3		-	-	-	-	-	sík'	-	-	-	-
PKmn	shave	*s'èd ~ s'ìd	s'íl	s'ī	s'è	s'ī	c'ē	s'èd	tʃ'ē	tʃ'ē	tʃ'ē	tʃ'ē
PCtrl	sheep_1	*k <sup>h</sup> alí	-	-	kálí	-	-	k <sup>h</sup> alí	k <sup>h</sup> alí	k <sup>h</sup> alí	k <sup>h</sup> alí	k <sup>h</sup> alí
PDaOp	shiver_1	*fij(a)	-	-	-	-	-	ès+fijà	īs+síjǎ	īs+síjǎ	īs+síjǎ	īs+síjǎ

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
Komo	shiver_2		-	-	zùg	-	-	-	-	-	-	-
PGw	shiver_3	*bíf	bíf	bíf	-	-	-	-	-	-	-	-
PUd	shiver_4	*dV	-	-	-	dṣ	dě	-	-	-	-	-
PKmn	shoe	*p <sup>h</sup> ák'á	pák	pák	páʔ	p <sup>h</sup> āʔ	à+p <sup>h</sup> āʔ	-	p <sup>h</sup> ák'á	p <sup>h</sup> ák'	p <sup>h</sup> ák'	-
PKmn	short (be)_1	*KU <sup>h</sup>	gōt	gōt	kùt	kū <sup>h</sup>	kū <sup>h</sup>	-	-	-	-	-
POp	short (be)_2	*tūl	-	-	-	-	-	-	tūl	tūl	tūl	tūl
Dana	short (be)_3		-	-	-	-	-	tùm	-	-	-	-
PKmn	shout_1	*dɔl(ɔ)	dól	dól	dól	-	-	òlɔ	-	-	-	-
PCtrl	shout_2	*kíw	-	-	-	cú	cú	-	kíw	kíw	kíw	kíw
PDaOp	show_1	*t <sup>h</sup> ùbá	-	-	-	-	-	t <sup>h</sup> ùbá	t <sup>h</sup> ùbá	t <sup>h</sup> ùbá	t <sup>h</sup> ùbá	t <sup>h</sup> ùbá
PUd	show_2	*t <sup>h</sup> ór	-	-	-	t <sup>h</sup> ór	t <sup>h</sup> ór	-	-	-	-	-
PGw	show_3		-	dēpē	-	-	-	-	-	-	-	-
Komo	show_4		-	-	sùn	-	-	-	-	-	-	-
PKmn	shut_1, close eyes	*mVs'(a)	mis'	mis'	mòs'	mús'+ē	mú <sub>ɣ</sub> '+ē	mis'à	mòtʃ'à	mòtʃ'à	mòtʃ'à	mòtʃ'à
PKmn	shut_2	*k <sup>h</sup> ac'	kǎf	kǎf	-	k <sup>h</sup> ǎf	k <sup>h</sup> ác'	-	-	-	-	-
PCtrl	shut_3	*hús'(a) ~ wús'(a)	-	-	wús'	wús'	-	hús'a	hítʃ'a	hóʃʃ'a	hóʃʃ'a	hóʃʃ'a
PDaOp	side of body, rib_1	*pājā	-	-	-	-	-	pājā	-	-	zī+pāj	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
Komo	side of body, rib_2		-	-	gēm	-	-	-	-	-	-	-
POp	side of body, rib_3	*gàngārà	-	-	-	-	-	-	gàngārà	gàngārà	-	-
PUD	side of body, rib_4	*gwär	-	-	-	gwär	gwär	-	-	-	-	-
PGw	side of body, rib_5	*sāmp'	sāmp'	sāmp'	-	-	-	-	-	-	-	-
PCtrl	sing_1	*k'ēm	-	-	-	c'ēm	-	k'ēm	-	-	-	-
Komo	sing_2		-	-	ḏōd	-	-	-	-	-	-	-
POp	sing_3	*ōlá	-	-	-	-	-	-	ōlá	ōlá	ōlá	ōlá
PKmn	sink (descend)	*lilí	lilí	lilí	lilí	-	-	lil	lilí	lilí	lilí	lilí
PKmn	sip (liquid)	*wóp' ~ hóp'	hōbōs'hóp'	hōbōs'	wóp'	k <sup>h</sup> ōbōs	-	hóp'	hōp'ō	hōp'	hōp'	hōp'
PCtrl	sit_1, dwell (live, reside)_PL	*k'ó	-	-	-	k'ó	k'ó	k'ó?	k'ó	k'ó	k'ó	k'ó
PGw	sit_2	*zàl	zàl	zè	-	-	-	-	-	-	-	-
PKoUd	sit_3	*còk <sup>h</sup>	-	-	sòk	-	còk <sup>h</sup>	-	-	-	-	-



NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PCtrl	skin	*dinc'à	-	-	dìns'á	-	-	dìnc'à	dìntf'à	dìntf'à	dìntf'à	dìntf'à
	skin, hide											
PKmn	(of animal), bark of tree_1	*gɔnk'(ɔf)	gɔk'ɔf	gɔk'ɔf	gɔnk'í	gɔk <sup>h</sup>	-	kɔgɔ	kɔgɔ	kɔgɔ	kɔgɔ	gwàngí
	skin, hide											
PCtrl	(of animal), bark of tree_2	*jid	-	-	-	jid	à+jid	jid+mà+f úmà	-	-	-	-
	skin, hide											
PKoUd	(of animal), bark of tree_3	*jic'	-	-	jis'	jinzà	jic'	-	-	-	-	-
	skin, hide											
PGw	(of animal), bark of tree_4	*kɔfi	kɔfi	kɔfi	-	-	-	-	-	-	-	-
	skin, hide											
PUd	(of animal),	*k <sup>h</sup> ūr	-	-	-	-	k <sup>h</sup> ūr	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
	bark of tree_5											
PKmn	sky_1	*wUs	wús	wús	-	-	-	-	wòs	wòs	wòs	wòs
PKoUd	sky_2	*mís	-	-	míf	mís	mís	-	-	-	-	-
	slaughter, cross boundary, chop											
PCtrl		*t'òd'	-	-	t'òr	-	-	t'òd'	-	-	t'òr	t'òr
PKmn	slip (v.)_1	*ḍerk'es'	dērgés'	dērgés'	-	dêrès	ḍêrès	ḍérk'és	-	-	-	-
PCtrl	slip (v.)_2	*beser	-	-	bèsèr	-	-	-	běsér	běsér	běsér	běsér
	slippery, smooth (be)_1											
PDaOp		*p <sup>(h)</sup> ḍt	-	-	-	-	-	pḍt <sup>h</sup>	p <sup>h</sup> ḍt	p <sup>h</sup> ḍt	p <sup>h</sup> ḍt	p <sup>h</sup> ḍt
	slippery, smooth (be)_1											
PGw		*fāwā	fāwā	fāwā	-	-	-	-	-	-	-	-
PCtrl	slurp_1	*jībí	-	-	zibí	-	-	jībí	-	-	-	tjibi
POp	slurp_2	*tòdó	-	-	-	-	-	-	tòdó	tòdó	tòdó	-
PKmn	smell (v.)	*gàŋ(a)	kē	kē	gàg	-	-	kàŋà	kàŋà	kàŋà	kàŋà	kàŋà

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PCtrl	smoke (exhaust)_1	*kudʰ	-	-	kūr	kúd	à+kúdf	kūdāʔ	kúrá	kúrá	kúrá	kúrá
PGw	smoke (exhaust)_2	*sɪnkʰ	sɪnkʰ	sɪnkʰ	-	-	-	-	-	-	-	-
PKmn	smoke out (e.g an animal out of a hole)_1	*kʰuf	kɔʃ	kɔʃ	ūs	-	-	húʃ	ús	ús	ús	úʃ
PDaOp	snake_1	*dɔʔʰɛn	-	-	-	-	-	dɔʔʰɛn	dʒɔ	dʒɔ	zɔ	ʃɔ
PKoUd	snake_2	*daʃV ~ ta(n)ʃV	-	-	dàfɔ	tānzí	tāfá	-	-	-	-	-
PGw	snake_3	*bwǎfǎ	bwǎfǎ	bwǎfǎ	-	-	-	-	-	-	-	-
PKmn	sneeze_1	*haʔʰis	hǎʔʰiʃ	-	-	-	-	hǎʔʰis	hǎʔʰis	hǎʔʰis	hǎʔʰis	hǎʔʰis
Komo	sneeze_2		-	-	gèt	-	-	-	-	-	-	-
PGw	sneeze_3		-	tɪnsʰi	-	-	-	-	-	-	-	-
PUd	sneeze_4	*cʰisân	-	-	-	jɪsân	cʰisân	-	-	-	-	-
PKmn	snore	*kʰO(r)nOn	kɔ̀nɔ̀n	kɔ̀nɔ̀n	kɔ̀nɔ̀n	kʰũnũn	àkʰɔ̀rnɛʔ	kʰɔ̀nɔ̀n	kʰɔ̀nɔ̀n	kʰɔ̀nɔ̀n	kʰɔ̀nɔ̀n	kʰɔ̀nɔ̀n
PKmn	soak_1	*pʰǎcʰ	pāsʰ	pāsʰ	pàsʰ	pʰǎʃ	pʰǎcʰ	-	-	-	-	-
PDaOp	soak_2	*pʰɔpʰ	-	-	-	-	-	pʰɔpʰ	pʰɔpʰ	pʰɔpʰ	pʰɔpʰ	pʰɔpʰ
PKmn	soft (be)_1	*kʰád	kʰátʰ	kʰátʰ	kʰátʰ	kʰád	kʰád	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PDaOp	soft (be)_2	*bót'	-	-	-	-	-	bót'	bót'	bót'	bót'	bót'
POp	soft (be)_3	*pīdzí	-	-	-	-	-	-	pīdzí	pīdzí	pīdzí	pīdzí
PCtrl	son	*jàk'	-	-	jà	jàʔ	jàʔ	jàk'	dzàk'	dzàk'	zàk'	sàk'
PKmn	sorghum, millet	*jana	sjàná	sjàná	zènā	-	-	-	dzèná	-	dzèná	-
PCtrl	soup_1	*hwaja	-	-	wì	wì	à+wìj	hòjàʔ	dzì+hwā jā	-	-	-
PGw	soup_2	*mùs'	mùs'	mùs'	-	-	-	-	-	-	-	-
POp	soup_3	*(dzì+)kārō	-	-	-	-	-	-	-	dzì+kārō	zì+kārō	ʃì+kārō
PCtrl	sour (be)_1	*c'ik'	-	-	s'ik'	-	-	c'ik'	tʃ'ik'+dz è	tʃ'ik'+dz è	tʃ'ik'+zè	tʃ'ik'+sè
PUd	sour (be)_3	*p'àc <sup>h</sup>	-	-	-	p'àc <sup>h</sup>	p'àc <sup>h</sup>	-	-	-	-	-
	sow seeds											
PCtrl	(by planting)_1	*sE	-	-	ʃèʔ	sī	sī	sè	sē	sē	sē	-
	sow seeds											
PGw	(by planting)_2	*àf	àf	àf	-	-	-	-	-	-	-	-
	sow seeds											
PKmn	(by	*jEk <sup>h</sup>	jì	jì	jèk	jèk <sup>h</sup>	jèk <sup>h</sup>	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
	throwing)_											
	1											
	sow seeds											
PDaOp	(by throwing)_	*gàjí	-	-	-	-	-	gàjí	gàdží	gàdží	gàdží	gàdží
	2											
PKmn	spicy (be)_1	*p <sup>h</sup> Ul?	pòl	pwì	-	-	-	p <sup>h</sup> íl	p <sup>h</sup> íli	p <sup>h</sup> íli	p <sup>h</sup> íli	p <sup>h</sup> íli
Komo	spicy (be)_2		-	-	p <sup>h</sup> íp'	-	-	-	-	-	-	-
PKmn	spit (v.)_1	*t <sup>h</sup> u	tū	tū	-	-	-	t <sup>h</sup> úwà	t <sup>h</sup> újhá	t <sup>h</sup> újhá	t <sup>h</sup> újhá	t <sup>h</sup> újhá
PUd	spit (v.)_2	*t <sup>h</sup> ák <sup>h</sup>	-	-	-	t <sup>h</sup> ák <sup>h</sup>	t <sup>h</sup> ák <sup>h</sup>	-	-	-	-	-
Komo	spit (v.)_3		-	-	t <sup>h</sup> àp	-	-	-	-	-	-	-
	spoil											
PDaOp	(become spoiled)_1	*nok'a	-	-	-	-	-	nók'à	nók'á	nók'á	nók'á	nók'á
	spoil											
Komo	(become spoiled)_2		-	-	k'úf	-	-	-	-	-	-	-
	spoil											
PGw	(become spoiled)_3	*kīf	kīf	kīf	-	-	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PCtrl	spoil, stink, smell bad_1	*p <sup>h</sup> ú ~ *p <sup>h</sup> ó	-	-	pó	-	-	-	p <sup>h</sup> úwú	p <sup>h</sup> újí	p <sup>h</sup> úrú	p <sup>h</sup> úrú
PUD	spoil, stink, smell bad_2	*bùl	-	-	-	bùl	bùl	-	-	-	-	-
PCtrl	sprout (verb)	*k'ád	-	-	k'áʔ	k'áj	k'ád	k'ájí	k'áʔ	k'áʔ	k'áʔ	k'áʔ
PKmn	stab_1	*sóp	só	só	-	-	-	-	sóp	-	sóp	-
PKoUd	stab_2	*jīp'	-	-	jīp'	jíp <sup>h</sup>	jíp <sup>h</sup>	-	-	-	-	-
PUD	stab_3	*sūk'	-	-	-	sūk'	sūk'	-	-	-	-	-
Dana	stab_4		-	-	-	-	-	mòc'	-	-	-	-
POp	stab_5	*p <sup>h</sup> ī	-	-	-	-	-	-	p <sup>h</sup> ī	p <sup>h</sup> ī	p <sup>h</sup> ī	p <sup>h</sup> ī
PKoUd	stand_1	*dǝʃ	-	-	dǝʃ	dǝʃ	dǝʃ	-	-	-	-	-
PGw	stand_2	*zūgū	zūgū	zūgū	-	-	-	-	-	-	-	-
PKoUd	star_1	*kīl	-	-	kīl	cúl	à+cúl	-	-	-	-	-
PGw	star_2	*bīs'àn	bīs'àn	bīs'àn	-	-	-	-	-	-	-	-
PCtrl	star_3, firefly	*písák'ó	-	-	písákó	-	-	písák'ó	písák'ó	písák'ó	písák'ó	písák'ó
PKmn	steal_1	*kwabOʃ	kǝbǝʃ	kǝbǝʃ	-	-	-	-	kábús	kábús	kábús	-
PCtrl	steal_2	*k <sup>h</sup> wal	-	-	kwál	k <sup>h</sup> wāl	k <sup>h</sup> wāl	k <sup>h</sup> walà	-	-	-	k <sup>h</sup> walā

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PKmn	stomp, step on_1	*djalls'	dɛ́lís'	dàlís'	díl	díl	díl	-	tílí	tílí	tílí	tílí
PUd	stomp, step on_2		-	-	-	-	-	-	-	-	-	-
PKoUd	stone or rock_1	*wɔ́ʃ	-	-	ɔ́ʃ	wɔ́ʃ	wɔ́ʃ	-	-	-	-	-
PGw	stone or rock_2	*pīdìN	pīdíl	pīdìm	-	-	-	-	-	-	-	-
PCtrl	stone or rock_3, grindstone (bottom)	*jawa ?	-	-	wàʔí	jɔ́ʔ	à+jò	jàwà	dʒàw	dʒàw	zàw	fàwà
PKmn	strain (solids from liquid)_1	*ɖìm	-	zìŋā	zìm	zìm	ɖìm	ʔìm	tìm	tìm	tìm	tìm
PGw	strain (solids from liquid)_2	*táf	táf	táf	-	-	-	-	-	-	-	-
PGw	stretch	*bīrīt'	bīrīt'	bīrīt'	-	-	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PCtrl	stretch	*t̥in	-	-	t̥in	t̥in̄in+īs	t̥in̄in+īs	t̥in	t̥in	t̥in	t̥in	t̥in
	string (v.)					s						
PCtrl	(e.g. beads)_1	*D̥om	-	-	òm	wòm	hóm	ḡòm	dzòm	dzòm	dzòm	ḡòm
	string (v.)											
PGw	(e.g. beads)+2	*ún	ún	ún	-	-	-	-	-	-	-	-
PKmn	strong (be)_1	*b̥is' ~ b̥is'	p̥í	p̥í	b̥is'	b̥is'	b̥íṭ'	-	-	-	-	-
Dana	strong (be)_2		-	-	-	-	-	t̥h̥ɛʔ	-	-	-	-
POp	strong (be)_3	*kāw	-	-	-	-	-	-	kāw	kāw	kāw	kāw
PGw	strong (be)_4	*t̥wālā	t̥wālā	t̥wājā	-	-	-	-	-	-	-	-
PUd	stuff into_1	*f̥úm+īs	-	-	-	f̥úm+īs	f̥úm+īs	-	-	-	-	-
PGw	stuff into_2	*g̥im	g̥im	g̥im	-	-	-	-	-	-	-	-
PDaOp	stuff into_3	*f̥ol(V)	-	-	-	-	-	f̥óló	s̥ólí	s̥ólí	s̥ólí	f̥ólí
Komo	stuff into_4		-	-	f̥út'	-	-	-	-	-	-	-



NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PCtrl	stumble_1	*k <sup>h</sup> ɔr	-	-	kɔr+ɔf	-	-	k <sup>h</sup> ɔk <sup>h</sup> ɔr	k <sup>h</sup> ɔk <sup>h</sup> ɔr	k <sup>h</sup> ɔk <sup>h</sup> ɔr	k <sup>h</sup> ɔk <sup>h</sup> ɔr	k <sup>h</sup> ɔk <sup>h</sup> ɔr
PGw	stumble_2	*kɛntɛf	kɛtɛf	kɛntɛf	-	-	-	-	-	-	-	-
PUd	stumble_3	*gɔl	-	-	-	gɔl	gɔl	-	-	-	-	-
PCtrl	suck_1	*ɖɔs'	-	-	dɔs'	dɔs'	ɖɔɣ'	tɔs'	tɔtɣ'ɔ	tɔtɣ'	tɔtɣ'	tɔtɣ'
PGw	suck_2	*s'úp'	s'úp'	s'úp'	-	-	-	-	-	-	-	-
PUd	suck_3	*c'úm~c'úm	-	-	-	fúzùm	c'úpnc'úm	-	-	-	-	-
PCtrl	sun_1	*táj	-	-	té	tíndí	à+ténté	táj	táj	táj	táj	táj
PGw	sun_2	*kájá	kájá	kájá	-	-	-	-	-	-	-	-
PKmn	swagger, arrogant (be)	*(gɔ)kwar( a)	-	kwára	gɔkɔl	kār+is	kār+is	k <sup>h</sup> ɔr	k <sup>h</sup> ɔr	k <sup>h</sup> ɔr	k <sup>h</sup> ɔr	k <sup>h</sup> ɔr
PKmn	swallow_1	*gUs'	gùs'	kùs'	gòs'	-	-	kòs'á	kòtɣ'á	kòtɣ'á	kòtɣ'á	kòtɣ'á
PUd	swallow_2	*lɔs	-	-	-	lɔs	lɔs	-	-	-	-	-
PKoUd	sweat (substance) _1	*ɣVt <sup>h</sup> id	-	-	zátít	ɣit <sup>h</sup> id	ɣit <sup>h</sup> i	-	-	-	-	-
PKmn	sweat (substance) _2	*jàgàl	jàgàl	jàgì	-	-	-	-	dɣìk'áj	dɣìk'áj	zìk'áj	fìk'áj

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
	sweat											
Dana	(substance) _3		-	-	-	-	-	hĩp <sup>h</sup>	-	-	-	-
PUd	sweep_1	*ḍis'	-	-	-	ḍis'	ḍiṭ'	-	-	-	-	-
PCtrl	sweep_2	*fɛɗ	-	-	fɛr	-	-	fɛɗ	-	-	-	-
POp	sweep_3	*bār	-	-	-	-	-	-	bār	bār	bār	bār
PGw	sweep_4	*kě	kě	kě	-	-	-	-	-	-	-	-
	sweet											
PUd	(be)_1	*ḍel	-	-	-	zēl	ḍēlēl	-	-	-	-	-
	sweet											
PCtrl	(be)_2	*s'(j)am	-	-	s'am	-	-	s'ém	tj'ém	tj'ém	tj'ém	tj'ém
	sweet											
PGw	(be)_3		-	mĩzĩ	-	-	-	-	-	-	-	-
	sweet											
PGw	(be)_4		tām	-	-	-	-	-	-	-	-	-
	swim											
PDaOp	swim_1	*t̥éd(á)	-	-	-	-	-	t̥édá	tí	tí	tí	tí
	swim											
Komo	swim_2		-	-	pàg	-	-	-	-	-	-	-
	swim											
PGw	swim_3	*sáŋk'	sáŋk'	sáŋk'	-	-	-	-	-	-	-	-
	swim											
PUd	swim_4		-	-	-	líd	-	-	-	-	-	-
	swim											
PUd	swim_5		-	-	-	-	káŋ	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PUD	swim_6		-	-	-	mól	-	-	-	-	-	-
PDaOp	tail (of animal)_1	*hùl ~ wùl	-	-	-	-	-	hùl	wùl	wùl	wùl	wùl
PKoUd	tail (of animal)_2	*t̥in	-	-	sìn	sìn	t̥in	-	-	-	-	-
PGw	tail (of animal)_3	*õŋõ	õŋõ	õŋõ	-	-	-	-	-	-	-	-
PDaOp	tasty (be)_1	*dúbá	-	-	-	-	-	dúbá	dúbá	dúbá	dúbá	dúbá
Komo	tasty (be)_2		-	-	s'ílá	-	-	-	-	-	-	-
PGw	tasty (be)_3	*íŋgíʃ	íŋgíʃ	íŋgíʃ	-	-	-	-	-	-	-	-
PUD	tasty (be)_4	*k'ũŋ	-	-	-	k'ũŋ	k'ũŋ	-	-	-	-	-
PDaOp	teach_1	*ŋEʃ	-	-	-	-	-	ŋɪʃ	ŋètʃ	-	-	ŋitʃ
PGw	teach_2	*dòzò	dòzò	dòzò	-	-	-	-	-	-	-	-
PKoUd	tear (shred)_1	*dèrín	-	-	sèrín	zër	d̥ër	-	-	-	-	-
PDaOp	tear (shred)_2	*k <sup>(h)</sup> ír(a)	-	-	-	-	-	kír	k <sup>h</sup> írá	k <sup>h</sup> írá	k <sup>h</sup> írá	k <sup>h</sup> írá
PKmn	tear (shred)_3	*c'(w)ēs'	s'wě	s'wě	-	-	c'ēt̥'	-	-	-	-	-
PKmn	tell_1	*(w)ɔt(V)	ǒdó	ǒd	-	-	-	-	ótá	ótá	ótá	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PDaOp	tell_2	*lògó	-	-	-	-	-	lògó	-	-	-	lògó
PKoUd	tell_3	*wɔ	-	-	wò	ó	ó	-	-	-	-	-
PKmn	tendon, vein	*fɔ(n)k'	fɔnk'	fɔnk'	fɔ	fúʔ	à+fúʔ	fùk'	sɔk'	sɔk'	sɔk'	fùk'
PCtrl	termite mound_1	*gàj	-	-	gàʔ	k'óp <sup>h</sup> āg āj	k'úp <sup>h</sup> ājè	k'ók'àj	kàj	kàj	kàj	kàj
PGw	termite mound_2	*úndijá	úndijá	úndijá	-	-	-	-	-	-	-	-
PCtrl	termite_1	*s'ès'(è)	-	-	s'ès'	-	-	s'ès'	tʃ'ètʃ'è	tʃ'ètʃ'è	tʃ'ètʃ'	tʃ'ètʃ'
PUd	termite_2	*c'èk'	-	-	-	c'èk'	à+c'èk'	-	-	-	-	-
PGw	termite_3	*k'ómkē	k'ómkē	k'ómkē	-	-	-	-	-	-	-	-
PKmn	testicles_1	*lùt' ~ lòt'	dūt'	dūt'	lòt'	lùd	à+lùd'	-	-	-	-	-
PDaOp	testicles_2	*lòŋò	-	-	-	-	-	lòŋò	lòŋò	lòŋò	lòŋò	lòŋò
PKoUd	thatch	*s'íl(it <sup>th</sup> )	-	-	s'ílít	s'íl	t'íl	-	-	-	-	-
PCtrl	thigh_1	*bác'	-	-	bás'	-	-	bác'	bátʃ'	bátʃ'	bátʃ'	bátʃ'
PGw	thigh_2	*tjǎfá	tjǎfá	tjǎfá	-	-	-	-	-	-	-	-
PUd	thigh_3		-	-	-	dūhúm	-	-	-	-	-	-
PUd	thigh_4		-	-	-	-	-	-	-	-	-	-
PUd	thigh_5		-	-	-	-	à+wúm	-	-	-	-	-
PCtrl	thin (be)_1	*t'í(t'V)	-	-	t'ít'á	t'í	t'í	-	t'ít'í	t'ít'í	t'ít'í	t'ít'í

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	thin (be)_2	*zínzì	zínzì	zínzì	-	-	-	-	-	-	-	-
PKmn	thorn, sharp (be)	*k <sup>(h)</sup> a(ŋ)k <sup>(c)</sup> a	kāŋà	kāŋà	kákā	kā?	kākā	k <sup>h</sup> ák <sup>h</sup> ā?	k <sup>h</sup> ák'ā	k <sup>h</sup> ák'ā	k <sup>h</sup> ák'ā	k <sup>h</sup> ák'ā
PKmn	throat	*k'ós	k'úf	k'úf	k'óf	k'ús	k'ús	k'ós	k'ósó	k'ós	k'ós	k'ós
PKmn	tick	*k'wàntʃ'	k'wántʃ'k wánt'	k'wántʃ'k wánt'	k'wàt'	k'wāt <sup>h</sup>	à+k'wād'	k'wàtʃ'	k'wāt'	k'wāt'	k'wāt'	k'wāt'
PKmn	tie (bundle)_1	*gi(n)s'	kins'	kins'	gis'	-	-	-	-	-	-	-
POp	tie (bundle)_2	*mīn	-	-	-	-	-	-	mīn	mīn	mīn	mīn
PUD	tie (bundle)_3	*dĕk <sup>h</sup>	-	-	-	dĕk <sup>h</sup>	dĕk <sup>h</sup>	-	-	-	-	-
Dana	tie (bundle)_4		-	-	-	-	-	tíjá	-	-	-	-
PCtrl	tie (knot)_1	*ruk'(i)	-	-	-	rūk'	rūh	rwí	rwì	rwì	rwì	rwì
PGw	tie (knot)_2		-	k'óp	-	-	-	-	-	-	-	-
Komo	tie (knot)_3		-	-	lùdùm	-	-	-	-	-	-	-
PDaOp	tie up (tether)_1	*dòt <sup>h</sup> (á)	-	-	-	-	-	dòt <sup>h</sup> á	dòt <sup>h</sup>	dòt <sup>h</sup>	dòt <sup>h</sup>	dòt <sup>h</sup>

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PUd	tie up (tether)_2	*ʃid	-	-	-	ʃid	ʃid	-	-	-	-	-
PCtrl	to prepare earth for farming_1	*kʰʊT	-	-	kót	kʰʊd	kʰór	kʰʊtʰ	kʰʊtʊ	kʰʊtʊ	kʰót	kʰót
PCtrl	to stew (food)_1	*dɛm	-	-	dɛm	-	-	dɛm	dɛm	dɛm	dɛm	dɛm
PGw	to stew (food)_2		-	ʃók'òn	-	-	-	-	-	-	-	-
PGw	to stew (food)_3		wūʃ	-	-	-	-	-	-	-	-	-
PUd	to stew (food)_4	*k'úpʰ	-	-	-	k'úpʰ	k'úpʰ	-	-	-	-	-
PKmn	tomorrow_ 1	*kjana	-	gi+kjānā	-	-	-	-	dʒi+kén	dʒi+kén	zi+kén	ʃi+kén
Komo	tomorrow_ 2		-	-	s'əŋgà	-	-	-	-	-	-	-
Dana	tomorrow_ 3		-	-	-	-	-	lɛs'ɛnɛ	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PUd	tomorrow_ 4		-	-	-	s'ámé	-	-	-	-	-	-
PUd	tomorrow_ 5		-	-	-	-	kā+ɬámō	-	-	-	-	-
PCtrl	tongue_1	*lEɬ'a	-	-	lèt'	lèd	à+lèd	lìɬ'a	lìt'a	lìt'a	lìt'a	lìt'a
PGw	tongue_2	*t'ák'ál	t'ák'ál	t'ákí	-	-	-	-	-	-	-	-
PCtrl	tonsils_1	*k'alala	-	-	k'álalá	-	-	k'àlálá	kált'a	kált'a	kált'a	kált'a
PGw	tonsils_2	*sjāk'úf	sjāk'úf	sjāk'úf	-	-	-	-	-	-	-	-
PUd	tonsils_3		-	-	-	ārgám +lèd	-	-	-	-	-	-
PUd	tonsils_4		-	-	-	-	lèdā+gwá d+gà	-	-	-	-	-
PKmn	tooth	*ɬE	ɬi	ɬi	ɬè	ɬē	ɬē	ɬē	sē	sē	sē	ɬē
PCtrl	tooth (canine)_1	*sɪrE	-	-	ɬil	-	-	síré	sírá	sírá	sírá	sírá
PGw	tooth (canine)_2	*ɬikānā	ɬi+kānā	ɬikānā	-	-	-	-	-	-	-	-
PUd	tooth (canine)_3		-	-	-	-	ɬēŋk'á	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
	toss, throw											
PKmn	away, fall over	*bit <sup>(h)</sup>	pìt	pìt	bìt	bít <sup>h</sup>	bít <sup>h</sup>	-	-	-	-	-
PKmn	touch_1, crawl	*pàD	pāt	pāt	pàt	pāt <sup>h</sup>	pār	-	-	-	-	-
PDaOp	touch_2	*ɔl	-	-	-	-	-	ɔlá	ól	ól	ól	ól
PCtrl	trade or barter_1	*hwaŋḁa	-	-	wāḁá	wǎn+ē	wǎn	wàŋḁá	hwān	hwān	hwān	hwān
PGw	trade or barter_2	*nāmā	nāmā	nāmā	-	-	-	-	-	-	-	-
PKmn	trample, ruminant	*has'	-	hās'ì	hás'	hás'	hátʃ'	hás'	hátʃ'	hátʃ'	hátʃ'	hátʃ'
PCtrl	transplant (e.g. plant)_1	*t <sup>h</sup> át ~ ṭ <sup>h</sup> át	-	-	tát	-	-	-	t <sup>h</sup> át	t <sup>h</sup> át	t <sup>h</sup> át	t <sup>h</sup> át
PUD	transplant (e.g. plant)_2	*c <sup>h</sup> ús'	-	-	-	c <sup>h</sup> ús'	c <sup>h</sup> úʃ'	-	-	-	-	-



NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
	transplant											
Dana	(e.g. plant)_3		-	-	-	-	-	tʰàgíʔ	-	-	-	-
	transplant											
PGw	(e.g. plant)_4	*pǎfá	pǎfá	pǎfá	-	-	-	-	-	-	-	-
PKmn	tree	*cwálá	swálá	swájá	sá	ʃwá	cwá	cá	tʃá	tʃá	tʃá	tʃá
	tree (sp.)(sausag											
PKmn	e tree_Kigelia africana)	*dùmàj	-	ū+dùmi	dùmè	-	-	dùmáj	dùmàj	dùmàj	dùmàj	dùmàj
PKoUd	tree_sp.	*jès'	-	-	jès'	jès'	à+jèʔ'	-	-	-	-	-
	tree_sp. (mahogany, Trichilia emetica)											
PKmn		*kʰis	kisi	ō+kis	kis	cés	cʰis	kis	kʰis	kʰis	kʰis	kʰis
PKmn	tree_sp._1	*bǎfǎ	p'ǎf	-	bǎf	bǎfǎ	-	bǎfǎ	bāsā	bāsā	bāsā	-
PCtrl	trunk (of elephant)_1	*lūtʰu	-	-	lūd	-	-	lūtʰú	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	trunk (of elephant)_2		wūmbū	-	-	-	-	-	-	-	-	-
PDaOp	try (test)_1	*t̥ɛmɛ̃	-	-	-	-	-	t̥ɛmɛ̃	t̥ɛmɛ̃	-	-	tɛmɛ
GwKo	try (test)_2	*tóg	tók	tók	tóg	-	-	-	-	-	-	-
PUd	try (test)_3	*ɲòkʰ	-	-	-	ɲòkʰ	ɲòkʰ	-	-	-	-	-
PCtrl	turtle_1	*tʰánā ~ tʰánī	-	-	bā+tánī	-	-	tʰánā	tʰánā	tʰánā	tʰánā	tʰánā
PUd	turtle_2	*kʰwāŋkʰā m	-	-	-	kʰwāŋk hām	à+kʰwāŋk hām	-	-	-	-	-
PKmn	two	*sók'a	swījā	swijā	sō	sú	sú	sók'à	sók'á	sók'á	sók'á	sók'á
PKmn	ululate_1	*ilil ~ ilil	ílil	ílil	ílil	-	-	ílil	ílil	ílil	ílil	ílil
PUd	ululate_2		-	-	-	jísāɲ	-	-	-	-	-	-
PUd	ululate_3		-	-	-	-	káji	-	-	-	-	-
PCtrl	untie, take out (quickly, e.g. out of fire)	*pʰɛd(ɛ)	-	-	pɛl	pʰɛd	pʰɛd	pʰɛrɛ	-	-	-	-
PCtrl	untie, undress_1	*c'úg	-	-	s'úk	-	c'úkʰ	-	tʃ'úg	tʃ'úg	tʃ'úg	tʃ'úg

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PGw	untie, undress_2	*s̄ɪl	s̄ɪl	s̄ɪʔ	-	-	-	-	-	-	-	-
Dana	untie, undress_3		-	-	-	-	-	gùḍúʔ	-	-	-	-
PUd	urinate_2	*t̄ɛr	-	-	-	-	t̄ɛr	-	-	-	-	-
PCtrl	urinate_3	*T̄is'(a)	-	-	-	-	t̄iɪ'	-	tʃitʃ'á	tʃitʃ'á	tʃitʃ'á	tʃitʃ'á
PKmn	urine_1, urinate_1	*dùc'á	dùs'	tùs'	dòs'	-	-	tùc'áʔ	-	-	-	-
PKoUd	urine_2	*ḡ(w)àràc'	-	-	dàràs'	dwàràf	ḡàràc'	-	-	-	-	-
PKmn	vagina_1	*pít <sup>h</sup> ~ pít <sup>h</sup>	pít	pít	pít	-	-	pít <sup>h</sup>	-	-	-	-
PUd	vagina_2	*kúk <sup>h</sup>	-	-	-	kúʔ	à+kúk <sup>h</sup>	-	-	-	-	-
POp	vagina_3	*k <sup>h</sup> ɛbɛ	-	-	-	-	-	-	k <sup>h</sup> ɛbɛ	k <sup>h</sup> ɛbɛ	k <sup>h</sup> ɛbɛ	k <sup>h</sup> ɛbɛ
PCtrl	very, many_1	*caja	-	-	sà	-	cājá	-	sáj	sáj	sáj	sáj
Dana	very, many_2		-	-	-	-	-	bwɪ	-	-	-	-
PKmn	vomit_1	*(pa)jas'	pājàs'	pājàs'	jàʔ	ɟǎʔ	ǎʔ	-	-	-	-	-
PDaOp	vomit_2	*D̄ak'a	-	-	-	-	-	ḡák'á	dʒāk'á	dʒāk'á	zāk'á	fāk'á

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PCtrl	waist, hip_1	*baða ~ paða	-	-	bàr	pād	pāḏ	pàḏá?	-	-	piḗará	piḗará?
POp	waist, hip_2	*tʃápūm	-	-	-	-	-	-	tʃápūm	tʃápūm	-	-
PKmn	wake (trs.)_1	*ʃuk'(i)	sūgì	sūgì	ʃùg	ʃūk'	-	ʃùg	sūg	sūg	sūg	ʃūg
PUd	wake (trs.)_2		-	-	-	-	mèr+ē	-	-	-	-	-
PCtrl	want_1	*k <sup>(h)</sup> wal ~ *k'wal	-	-	k'wàl	-	-	k <sup>h</sup> wāj	kwāj	k <sup>h</sup> wáj	k <sup>h</sup> wáj	k <sup>h</sup> wáj
PGw	want_2	*ʃám	ʃám	ʃám	-	-	-	-	-	-	-	-
PUd	want_3	*ŋáp <sup>h</sup>	-	-	-	ŋáp <sup>h</sup>	ŋáp <sup>h</sup>	-	-	-	-	-
PKmn	warm oneself	*s(w)am	sóm	sóm	ʃóm	sām	sām	sòm	sōm	sōm	sōm	ʃōm
PKmn	warm up (sth.)	*Cis'	ʃiʃ	ʃiʃ	ʃíz	ʃís'	ʃiʃ <sup>h</sup>	hízá	ísá	ísá	ísá	-
PKmn	water	*jiðE	ijá?	ijá?	ji	wùdí?	jìḏé?	jìʔí	dʒì	dʒì	zì	fiʔ
PKmn	wet_1, slippery	*jEsI	ífi	ífi	jèʃ	jès	jès	sìʔ	-	-	-	-
PKoUd	wet_2	*jàs'	-	-	jès'	jàs'	jàḏ'	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PKmn	whistle	*cut	-	fút	fít	-	cúwā	cōi	tʃúwì	tʃúwì	tʃúwì	tʃúwì
PCtrl	white (be)_1	*p'át'á	-	-	p'át'á	-	-	p'át'á	p'át'á	p'át'á	p'át'á	p'át'á
PGw	white (be)_2		-	sélé	-	-	-	-	-	-	-	-
PUD	white (be)_3	*kúf	-	-	-	kúf	kúf	-	-	-	-	-
PKmn	wide (be)	*bàj ~ bāj	pàj	pàj	bàjá	bàn	bè	-	pàj	pàj	pàj	pàj
PKmn	wife_1, marry, wedding	*màf	-	p'ā+màf	màf	màf	màf	màf	màs	màs	màs	màs
PKoUd	wife_2	*(w)àf	-	-	wàf	āf	āf	-	-	-	-	-
PCtrl	wind (n.)_1	*k <sup>h</sup> ab	-	-	-	-	hāpāp <sup>h</sup>	k <sup>h</sup> àb	k <sup>h</sup> āb	k <sup>h</sup> āb	k <sup>h</sup> āb	k <sup>h</sup> āb
Komo	wind (n.)_2		-	-	pùt	-	-	-	-	-	-	-
PGw	wind (n.)_3		-	kās	-	-	-	-	-	-	-	-
PDaOp	woman	*bāp <sup>h</sup> ā	-	-	-	-	-	bāp <sup>h</sup> ā	bāp <sup>h</sup> ā	bāp <sup>h</sup> ā	bāp <sup>h</sup> ā	bāp <sup>h</sup> ā
PKoUd	woman	*bOm(it <sup>h</sup> )	-	-	bāmít	bûm	à+bóm	-	-	-	-	-
PCtrl	women_1	*Up <sup>h</sup> (U)	-	-	ōp	ūp <sup>h</sup>	ūp <sup>h</sup>	ōp <sup>h</sup>	ōp <sup>h</sup> 5	ōp <sup>h</sup> 5	ōp <sup>h</sup>	ōp <sup>h</sup>
PGw	women_2	*mā+kíkjät à	mā+kíkjät à	mā+kíkjät à	-	-	-	-	-	-	-	-

NODE	Meaning	*proto	GwHi	GwLo	Komo	UdYa	UdCh	Dana	OpBi	OpMo	OpPa	OpKi
PKmn	wound_1	*gjama?	kāmā	kāmā	zāmā	jàmá	jàmá	-	-	-	-	-
PDaOp	wound_2	*bíbī	-	-	-	-	-	bíbī	bíbī	bíbī	bíbī	bíbī
PKmn	wrap	*pɔʃ ~ puʃ	pɔʃ	pɔʃ	-	pūʃ	pūʃ	púʃá	pūsá	pūsá	pūsá	pūsá
PCtrl	wring_1	*ùm	-	-	ùm	ūm	ūm	-	ùmà	ùmà	-	-
Dana	wring_2		-	-	-	-	-	nàjí	-	-	-	-
PGw	wring_3	*mòs'	mòs'	mòs'	-	-	-	-	-	-	-	-
PUd	wring_4	*nú	-	-	-	nú	-	-	-	-	-	-
POp	wring_5		-	-	-	-	-	-	-	-	t'ótʃ	-
PCtrl	yawn_1	*ham	-	-	hám	hám	à+hāmē	hâm	hâm	hâm	hâm	-
PGw	yawn_2	*hāwā	hāwā	hāwā	-	-	-	-	-	-	-	-
PCtrl	young people_1	*p <sup>h</sup> al	-	-	pāl	-	-	p <sup>h</sup> al	p <sup>h</sup> al	p <sup>h</sup> al	p <sup>h</sup> al	p <sup>h</sup> al
PGw	young people_2	*mǎn	mǎn	mǎn	-	-	-	-	-	-	-	-
PUd	young people_3	*dūrVc'	-	-	-	dūríc'	dūrūc'	-	-	-	-	-

## REFERENCES CITED

- Ahland, Colleen. 2010. The classification of Gumuz and Koman languages. Paper presented at the International Workshop on Language Isolates in Africa, Laboratoire Dynamique du Langage (DDL), 3–4 December, Lyon.
- Ahland, Colleen. 2012. *A grammar of Northern and Southern Gumuz*. Eugene, OR: University of Oregon Ph.D. dissertation.
- Ahland, Colleen. 2013. The status of Gumuz as a language isolate. Paper presented at the 87th annual meeting of the Linguistic Society of America, 3–6 January, Boston.
- Ahland, Michael. 2012. *A grammar of Northern Mao (Màwés Aas'è)*. Eugene, OR: University of Oregon Ph.D. dissertation.
- Alamin, Suzan, Gertrud Schneider-Blum, & Gerrit Dimmendaal. 2012. Finding your way in Tima. In Angelika Mietzner, & Ulrike Claudi (eds.), *Directionality in grammar and discourse: Case studies from Africa*, 9-33. Köln: Rüdiger Köppe Verlag.
- Amare Tsehay. 2013. *Documentation and description of tense, aspect and mood in Gwama*. Addis Ababa: Addis Ababa University MA thesis.
- Andersen, Torben. 1987a. The phonemic system of Agar Dinka. *Journal of African Languages and Linguistics* 9(1). 1-28.
- Andersen, Torben. 1987b. An outline of Lulubo phonology. *Studies in African Linguistics* 18(1).
- Andersen, Torben. 1988. Consonant alternation in the verbal morphology of Pări. *Afrika und Übersee* 71. 63-113.
- Andersen, Torben. 1999a. Vowel quality alternation in Mabaan and its Western Nilotic history. *Journal of African Languages and Linguistics* 20(2). 97-120.
- Andersen, Torben. 1999b. Vowel harmony and vowel alternation in Mayak (Western Nilotic). *Studies in African Linguistics* 28(1). 1-30.
- Andersen, Torben. 2004. Jumjum Phonology. *Studies in African Linguistics* 33(2).
- Andersen, Torben. 2007. Kurmuk phonology. *Studies in African Linguistics* 36. 29-90.

- Andersen, Torben. 2012a. Verbal directionality and argument alternation in Dinka. In Angelika Mietzner, & Ulrike Claudi (eds.), *Directionality in grammar and discourse: Case studies from Africa*, 35-53. Köln: Rüdiger Köppe Verlag.
- Andersen, Torben. 2012b. Spatial roles and verbal directionality in Dinka. *Journal of African Languages and Linguistics* 33(2). 143-179.
- Aralova, Natalia. 2015. *Vowel harmony in two Even dialects: Production and perception*. Amsterdam: LOT.
- Baković, Eric. 2000. *Harmony, dominance and control*. New Brunswick, NJ: Rutgers University Ph.D. dissertation.
- Beam, Mary S., & A. Elizabeth Cridland. 1956. *Uduk-English dictionary*. Khartoum, Sudan: University of Khartoum.
- Belkadi, Aicha. 2015. Associated motion with deictic directionals: A comparative overview. *SOAS Working Papers in Linguistics* 17. 49-76.
- Belkadi, Aicha. 2016. Associated motion constructions in African languages. *Africana Linguistica* 22. 43-70.
- Bender, M. Lionel. 1971. The languages of Ethiopia: A new lexicostatistic classification and some problems of diffusion. *Anthropological Linguistics* 13(5). 165-288.
- Bender, M. Lionel. 1975. *The Ethiopian Nilo-Saharan*. Addis Ababa: Artistic Printers.
- Bender, M. Lionel. 1983. Proto-Koman phonology and lexicon. *Afrika und Übersee* 66(2). 259-297.
- Bender, M. Lionel. 1985. Gumuz, Koman, Mao and Omotic. *Studies in African Linguistics (supplement)* 9. 19-21.
- Bender, M. Lionel. 1989. Nilo-Saharan pronouns/demonstratives. In M. Lionel Bender (ed.), *Topics in Nilo-Saharan Linguistics*, 1-34. Hamburg: Helmut Buske Verlag.
- Bender, M. Lionel. 1991. Sub-classification of Nilo-Saharan. In M. Lionel Bender (ed.), *Proceedings of the Fourth Nilo-Saharan Linguistics Colloquium*, 1-36. Hamburg: Helmut Buske Verlag.
- Bender, M. Lionel. 1994. Comparative Komuz grammar. *Afrika und Übersee* 77(1). 31-54.
- Bender, M. Lionel. 1996. *The Nilo-Saharan languages: A comparative essay*. München: Lincom Europa.
- Bender, M. Lionel. 2008. Koman. In Siegbert Uhlig (ed.), *Encyclopaedia Aethiopica*, Vol. 4, 416-418. Wiesbaden: Otto Harrassowitz.



- Bloomfield, Leonard. 1973 [1933]. *Language*. London: George Allen & Unwin Ltd.
- Bourdin, Philippe. 2006. The marking of directional deixis in Somali: How typologically idiosyncratic is it? In Erhard Voeltz (ed.), *Studies in African linguistic typology*, 13–41. Amsterdam: John Benjamins.
- Burns, Samuel J. 1947. Notes toward a grammar of the Koma language. London: Sudan Interior Mission, MS.
- Bryan, Margaret. 1945. A linguistic no-man's land. *Africa: Journal of the International African Institute* 15(4). 188-205.
- Campbell, Lyle. 1998. *Historical linguistics: An introduction*. Cambridge, MA: The MIT press.
- Casali, Roderic F. 2003. [ATR] value asymmetries and underlying vowel inventory structure in Niger-Congo and Nilo-Saharan. *Linguistic Typology* 7(3). 307-382.
- Casali, Roderic F. 2008. ATR harmony in African languages. *Language and Linguistics Compass* 2(3). 496-549.
- Cipriani, Lidio. 1942. Sui Berta, Coma e Mao dell'ovest etiopico. *Rassegna di Studi Etiopici* 2(3). 273-276.
- Clements, George. 2000. Phonology. In Bernd Heine, & Derek Nurse (eds.), *African languages: An introduction*, 123-160. Cambridge: Cambridge University Press.
- Comrie, Bernard. 1989. *Language universals and linguistic typology: Syntax and morphology*. Chicago: University of Chicago press.
- Corbett, Greville. 1991. *Gender*. Cambridge: Cambridge University Press.
- Corbett, Greville. 2000. *Number*. Cambridge: Cambridge University Press.
- Corfield, Frank D. 1938. The Koma. *Sudan Notes and Records* 21(1). 123-165.
- Davies, H. R. J. 1960. Some tribes of the Ethiopian borderland between the Blue Nile and Sobat rivers. *Sudan Notes and Records* 41. 21-34.
- Dimmendaal, Gerrit J. 1988. The lexical reconstruction of Proto-Nilotic: A first reconnaissance. *Afrikanistische Arbeitspapiere* 16. 5-67
- Dimmendaal, Gerrit J. 2003. Locatives as core constituents. In Erin Shay, & Uwe Seibert (eds.), *Motion, direction and location in languages*, vol. 56, 91-109. Amsterdam: John Benjamins.

- Dimmendaal, Gerrit J. 2011. *Historical linguistics and the comparative study of African languages*. Amsterdam: John Benjamins.
- Dimmendaal, Gerrit J. 2018. On stable and unstable features in Nilo-Saharan. In Helga Schröder, & Prisca Jerono (eds.), *Nilo-Saharan issues and perspectives*, 9-24. Köln: Rüdiger Köppe Verlag.
- Dimmendaal, Gerrit. *forthcoming*. On word-final voicing contrasts in Nilotic and beyond. In Klaus Beyer et al. (eds.), *Linguistics across Africa: Festschrift for Rainer Vossen*, Köln: Rüdiger Köppe Verlag.
- Dimmendaal, Gerrit. *to appear*. Nilo-Saharan and its limits. In Rainer Vossen, & Gerrit Dimmendaal (eds.), *Oxford handbook of African languages*, Oxford: Oxford University Press.
- Ehret, Christopher. 2001. *A historical-comparative reconstruction of Nilo-Saharan*. Köln: Rüdiger Köppe Verlag.
- Evans-Pritchard, Edward E. 1932. Ethnological observations in Dar Fung. *Sudan Notes and Records* 15. 1-61.
- Federal Democratic Commission Republic of Ethiopia Population Census (FDCREPC). 2008. *Summary and statistical report of the 2007 population and housing census*. Addis Ababa, Ethiopia.
- Fernández, Víctor M. 2004. Prospección arqueológica y etnoarqueológica en el Nilo Azul (Sudán y Etiopía). *Bienes Culturales: Revista del Instituto del Patrimonio Histórico Español* 2. 121-129.
- Fernández, Víctor M. et al. 2007. A Late Stone Age sequence from west Ethiopia: The sites of K'aaba and Bel K'urk'umu (Assosa, Benishangul-Gumuz regional state). *Journal of African Archaeology* 5(1). 91-126.
- Goldberg, Joelle. 2018. Person marking in Gwama. In Helga Schröder, & Prisca Jerono (eds.), *Nilo-Saharan issues and perspectives*, 57-72. Köln: Rüdiger Köppe Verlag.
- Goldberg, Justin. 2018. Obstruent neutralization in Gwama. In Helga Schröder, & Prisca Jerono (eds.), *Nilo-Saharan issues and perspectives*, 57-72. Köln: Rüdiger Köppe Verlag.
- Goldberg, Justin, Joelle Goldberg, & Anne-Christie Hellenthal. 2017. Gwama write-up. Addis Ababa: SIL Ethiopia, MS.
- González-Ruibal, Alfredo. 2014. *An archaeology of resistance: Materiality and time in an African borderland*. Rowman & Littlefield.

- Good, Jeff, & Michael Cysouw. 2013. Languoid, doculect, and glossonym: Formalizing the notion 'language'. *Journal of Language Documentation and Conservation* 7. 331-359.
- Greenberg, Joseph H. 1963. *The languages of Africa*. Bloomington: Indiana University.
- Greenberg, Joseph H. 1981. Nilo-Saharan moveable-k as a stage III article:(with a Penutian typological parallel). *Journal of African Languages and Linguistics* 3(2). 105-112.
- Guillaume, Antoine. 2016. Associated motion in South America: Typological and areal perspectives. *Linguistic Typology* 20(1). 81-177.
- Guillaume, Antoine. 2017. Associated motion: Australia, South America and beyond. Paper presented at the 12th Meeting of the Association for Linguistic Typology, Workshop on Associated Motion, Canberra, Australia.
- Güldemann, Tom. 2018. Historical linguistics and genealogical language classification in Africa. In Tom Güldemann (ed.), *The languages and linguistics of Africa*, 58-444. Berlin: De Gruyter Mouton.
- Heath, Jeffrey. 2005. *A grammar of Tamashek (Tuareg of Mali)*. Berlin: Mouton de Gruyter.
- Hellenthal, Anne-Christie. 2005. Notes on Mao. Addis Ababa: SIL Ethiopia, MS.
- Hellenthal, Anne-Christie. 2018. Semantics of directional verb morphology in Gwama. In Helga Schröder, & Prisca Jerono (eds.), *Nilo-Saharan issues and perspectives*, 178-192. Köln: Rüdiger Köppe Verlag.
- Hellenthal, Anne-Christie, & Constance Kutsch-Lojenga. 2011. Phonology/Orthography statement for the Gwama language. Addis Ababa: SIL Ethiopia, MS.
- Hockett, Charles F. 1958. *A course in modern linguistics*. New York: Macmillan.
- Hombert, Jean-Marie. 1978. Consonant types, vowel quality and tone. In Victoria A. Fromkin (ed.), *Tone: a linguistic survey*, 77-111. New York: Academic Press.
- Huffman, Ray. 1929. *Nuer-English dictionary*. Berlin: Dietrich Reimer.
- Hyman, Larry M. 2001. Tone systems. In Martin Haspelmath et al. (eds.), *Language typology and language universals, vol. II*, 1367-1380. Berlin: Walter de Gruyter.
- James, Wendy R. 1968. A crisis in Uduk history. *Sudan Notes and Records* 49. 17-44.
- James, Wendy. 1975. Sister-exchange marriage. *Scientific American* 233(6). 84-94.

- James, Wendy. 1978. Ephemeral names: The Uduk case. *Aspects of Language in the Sudan* 5. 114-144.
- James, Wendy. 1979. *'Kwanim Pa: The making of the Uduk people: An ethnographic study of survival in the Sudan-Ethiopian borderlands*. Oxford: Clarendon Press.
- James, Wendy, Gerd Baumann, & Douglas Hamilton Johnson (eds.). 1996. *Juan Maria Schuver's travels in North-East Africa: 1880-1883*. London: The Hakluyt Society.
- Jedrej, M. Charles. 2004. The Southern Funj of the Sudan as a frontier society, 1820-1980. *Comparative Studies in Society and History* 46(4). 709-729.
- Johnson, Douglas H. 2016. *South Sudan: a new history for a new nation*. Athens: Ohio University Press.
- Kiessling, Roland. 2007. Space and reference in Datooga verbal morphosyntax. In Doris Payne, & Mechthild Reh (eds.), *Advances in Nilo-Saharan Linguistics: Proceedings of the 8th Nilo-Saharan Linguistics Colloquium, Hamburg, August 22-25, 2001*, 123-142. Köln: Rüdiger Köppe.
- Kievit, Dirk, & Erika Robertson. 2012. Notes on Gwama grammar. *Studies in African Linguistics* 41(1). 39-97.
- Killian, Don. 2014. Uduk-English dictionary. Helsinki: MS.
- Killian, Don. 2015. *Topics in Uduk phonology and morphosyntax*. Helsinki: University of Helsinki Ph.D. dissertation.
- Killian, Don. *to appear*. Gender in Uduk. In Francesca Di Garbo, & Wälchili (eds.), *Grammatical gender and linguistic complexity*, 137-160. Berlin: Language Science Press.
- Kirchner, Robert. 1993. Turkish vowel harmony and disharmony: An Optimality Theoretic account. Paper presented at the Rutgers Optimality Workshop I (ROW-I), October 22, 1993, Rutgers University, New Jersey.
- Koch, Harold. 1984. The category of 'associated motion' in Kaytej. *Language in central Australia* 1. 23-34.
- Kutsch Lojenga, Constance, & Manuel A. Otero. 2011a. First Komo lexicon. Addis Ababa: SIL Ethiopia, MS.
- Kutsch Lojenga, Constance, & Manuel A. Otero. 2011b. Phonology/orthography statement for the Komo language. Addis Ababa: SIL Ethiopia, MS.
- Lemi Kebebw. 2010. *A grammatical description of Opo*. Addis Ababa: Addis Ababa University MA thesis.

- Krell, Amy. 2011. A sociolinguistic survey of the Ganza, Komo, and "Baruun be Magtole" language groups. *SIL Electronic Survey Report 2011-039*.
- Lejean, Guillaume. 1865. Note sur les Fougn et leur idiome. *Bulletin de la Société de Géographie de Paris, 5e Série, IX*. 238-252.
- Lewis, Paul M., Gary F. Simons, & Charles Fennig (eds.). 2015. *Ethnologue: Languages of the world, 18th edition*. Dallas, TX: SIL international.
- List, Johann-Mattis, Simon Greenhill, Tiago Tresoldi & Robert Forkel. 2018. LingPy: A Python library for historical linguistics. Version 2.6.4. Online: <http://lingpy.org>.
- Marno, Ernst. 1874. *Reisen im Gebiete des blauen und weissen Nil, im ägyptischen Sudan und den angrenzenden Negerländern, in den Jahren 1869 bis 1873*. Vienna: C. Gerold.
- Meckelburg, Alexander. 2016. *From "subject to citizen"? History, identity and minority citizenship: The case of the Mao and Komo of Western Ethiopia*. Hamburg: Universität Hamburg Ph.D. dissertation.
- Mellese Gelaneh Alemu. 2017. *Documentation and grammatical description of Tapo*. Addis Ababa: Addis Ababa University Ph.D. dissertation.
- Mietzner, Angelika. 2012. Spatial orientation in Nilotic languages and the forces of innovation. In Angelika Mietzner, & Ulrike Claudi (eds.), *Directionality in grammar and discourse: Case studies from Africa*, 165-175. Köln: Rüdiger Köppe Verlag.
- Negaso Gidada. 2001. *History of the Sayyoo Oromoo of Southwestern Wallaga, Ethiopia: from about 1730 to 1886*. Addis Ababa: Mega Printing Enterprise.
- Olejarczuk, Paul, Manuel A. Otero, & Melissa Baese-Berk. 2019. Acoustic correlates of anticipatory and progressive [ATR] harmony processes in Ethiopian Komo. *Journal of Phonetics* 74. 18-41.
- Otero, Manuel A. 2014. *Notes from the Komo language discover your grammar workshop*. Addis Ababa: SIL Ethiopia.
- Otero, Manuel A. 2015a. [+ATR] dominant vowel harmony except when it's not? Evidence from Ethiopian Komo. In Ruth Kramer, Elizabeth C. Zsiga, & One Tlale Boyer (eds.), *Selected Proceedings of the 44th Annual Conference on African Linguistics*, 212-220. Somerville, MA: Cascadilla Proceedings Project.
- Otero, Manuel A. 2015b. Dual number in Ethiopian Komo. In Angelika Mietzner, & Anne Storch (eds.), *Nilo-Saharan: Models and descriptions*, 123-134. Köln: Rüdiger Köppe Verlag.

- Otero, Manuel A. 2015c. Nominal morphology and ‘topic’ in Ethiopian Komo. In Osamu Hieda (ed.), *Information Structure and Nilotic Languages*, 19-35. Tokyo: Research Institute for Languages and Cultures of Asia and Africa.
- Otero, Manuel A. 2016. Reconstructing pronominal morphology in Koman languages. Paper presented at the 47th Annual Conference on African Linguistics, Berkeley, CA.
- Otero, Manuel A. 2017. (Deictic)direction/associated motion in Ethiopian Komo: A typological perspective. Paper presented at the 12th Conference of the Association for Linguistics Typology, Workshop on Associated Motion, Canberra, Australia.
- Otero, Manuel A. 2018a. Directional verb morphology in Ethiopian Komo. In Helga Schröder, & Prisca Jerono (eds.), *Nilo-Saharan issues and perspectives*, 165-177. Köln: Rüdiger Köppe Verlag.
- Otero, Manuel A. 2018b. Aspects of Ethiopian Komo (morpho-)phonology. *Linguistic Discovery* 16(2). 136-178.
- Otero, Manuel A. *accepted*. Associated motion, direction and (exchoative) aspect in Ethiopian Komo. *Studies in Language*.
- Otero, Manuel A., Sumale Pogi, & Giregna Tesfaye. 2015. Tta Komo, Tta Gozome, Tta Inglizi diksheneri [*Komo, Amharic, English dictionary*]. Addis Ababa: SIL Ethiopia.
- Payne, Doris L. 2013. The challenge of Maa ‘Away’. In Tim Thornes, Gwendolyn Hyslop, & Joana Jansen (eds.), *Functional-historical approaches to explanation: In honor of Scott DeLancey*, 259-282. Amsterdam: John Benjamins.
- Reh, Mechthild. 1996. *Anywa language: Description and internal reconstructions*. Köln: Rüdiger Köppe Verlag.
- Ribeiro, Eduardo Rivail. 2000. [ATR] vowel harmony and palatalization in Karajá. *Santa Barbara Papers in Linguistics* 10. 80-92.
- Ribeiro, Eduardo Rivail. 2002. Directionality in vowel harmony: The case of Karajá (Macro-Jê). *Annual Meeting of the Berkeley Linguistics Society* 28(1). 475-485.
- Seligmann, Brenda Z. 1912. Note on two languages spoken in the Sennar Province of the Anglo-Egyptian Sudan. *Zeitschrift für Kolonialsprachen* 2. 297-308.
- Serzisko, Fritz. 1988. On bounding in Ik. In B. Rudzka-Ostyn (ed.), *Topics in cognitive linguistics*, 429-445. John Benjamins: Amsterdam.
- Simons, Gary F., & Charles D. Fennig (eds.). 2018. *Ethnologue: Languages of the world, 21st edition*. Dallas, TX: SIL International.

- Smolders, Joshua. 2017. A wordlist of T'apo (Opuuo): Version 0.1-28/02/2017. Addis Ababa: SIL International, MS.
- Smolders, Joshua. *forthcoming*. Nominal and verbal number in Bilugu Opo. *Studies in African Linguistics*. MS.
- Starostin, George (ed.). 2011-2016. The Global Lexicostatistical Database. Moscow: Russian State University for the Humanities, & Santa Fe: Santa Fe Institute. Available online at <http://lexstat.tk/databases/>, accessed on [April 14, 2018].
- Stevenson, Roland C. 1942. Notes toward a grammar of the Uduk language. MS.
- Storch, Anne. 2014. *A Grammar of Luwo: An anthropological approach*. Philadelphia: John Benjamins.
- Tesfaye Negash Bayou. 2015. *Documentation and grammatical description of Kwom*. Addis Ababa: Addis Ababa University Ph.D. dissertation.
- Teshome Yehualashet. 2008. A brief phonological description and nomenclature of Kwama/ Komo (a Nilo-Saharan language). Addis Ababa: University of Addis Ababa, MS.
- Thelwall, Robin. 1983. Twampa phonology. In M Lionel Bender (ed.), *Nilo-Saharan language studies*, 323-335. East Lansing, MI: African Studies Center, Michigan State University.
- Trask, Robert Lawrence. 1996. *Historical linguistics*. Oxford: Oxford University Press.
- Triulzi, Alessandro. 1981. *Salt, gold, and legitimacy: Prelude to the history of a no-man's land, Belä Shangul, Wallaggä, Ethiopia (ca. 1800-1898)*. Napoli: Istituto Universitario Orientale.
- Tucker, Archibald N., & Margaret A. Bryan. 1966. *Linguistic analysis: The non-Bantu languages of North-Eastern Africa*. London: Oxford University Press.
- van Silfhout, Marijke. 2013. *Opuo: Towards a phonology*. Leiden: Leiden University MA Thesis.
- Voisin, Sylvie. 2010. Les morphèmes -i et -si en wolof. *Sciences et Techniques du Langage* 7. 25-34.
- Voisin, Sylvie. 2013. Expressions de trajectoire dans quelques langues atlantiques (groupe Nord). *Faits de langues* 42(2). 131-152.

- Wedekind, Charlotte, & Charlotte Wedekind. 2002. Sociolinguistic survey report of the Asosa-Begi-Komosha area: part II. *SIL Electronic Survey Reports* 55.
- Wilkins, David P. 1989. *Mparntwe Arrernte (Aranda): Studies in the structure and semantics of grammar*. Canberra: The Australian National University Ph.D. dissertation.
- Wilkins, David P. 1991. The semantics, pragmatics and diachronic development of 'associated motion' in Mparntwe Arrernte. *Buffalo Papers in Linguistics* 1. 207–257.
- Wolff, H. Ekkehard. 1987. Consonant-tone interference in Chadic and its implications for a theory of tonogenesis in Afroasiatic. In Daniel Barreteau (ed.), *Langues et cultures dans le bassin du lac Tchad*, 193-216. Paris: ORSTOM.
- Zealelem Leyew. 2005. Gwama, a little-known endangered language of Ethiopia: A sketch of its grammar and lexicon. Addis Ababa: Addis Ababa University, MS.