

MARINE DECAPOD CRUSTACEA
OF THE
COOS BAY, OREGON DISTRICT

By
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A THESIS

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INTRODUCTION

In this paper are presented, described and classified the decapod Crustaceans in so far as they have been found to occur within Coos Bay, Oregon, in the waters of the Pacific Ocean beyond the Coos Bay bar to a distance of two miles, and along the shores of Coos County, Oregon to a distance of five miles north and five miles south of the Coos Bay bar.

Forty-nine species of decapod Crustaceans have been collected. The larger part of the collecting has been carried out along shore. Some dredging has been done in the bay and over the bar. Species obtained from deep water offshore and outside the bar were either dredged up by fishermen and brought in along with data as to depth and location, or were caught in the course of trawling operations and kindly given to the writer by men following the work of deep sea fishing.

The period covered by the collection of the species herein pictured and described has been from July 1, 1928 to March 1, 1930.

The shore collection work has been thorough and covers most of the shore inhabiting species. The deep water collecting has been much less thorough and many species of decapod Crustacea probably occur in the deep water outside the bar, that have not been obtained for inclusion in this paper.

Only actually collected and positively identified species have been included in the paper.

This paper has been planned and written, and the collection work done under the direction of Doctor H. B. Yocom, Professor of Zoology in the Biology Department of the University of Oregon.

Captain R. D. Barissu of Empire, Oregon, has lent much assistance in the dredging work carried on in the bay.

Captain McDonald of the deep sea fishing boat "The Angus", has kindly given the writer several deep water species that were brought up along the outer edge of the Coos Bay bar in the course of his trawling operations. Captain McDonald brought in a fine pair of Chorilia longipes brought from fifty-four feet of water. They were nestling in a huge urn shaped sponge. He also obtained a pair of Lopholithodes foraminatus in a living condition from the stomach of a halibut that had just been caught and dressed out.

Facing this page is a chart map of Coos Bay carrying full data in regard to the depths, areas, shorelines, etc., as they were in 1923. The only change since then has been in water depths. The bay has been deepened throughout its channel since then. At this time, March, 1930, an additional three feet are being dredged from the entire ship lane of the bay.

The photography work for this paper was been done by Mr. Stadden of Marshfield, Oregon.

The systematic arrangement used by Schmitt as given in "The Marine Decapod Crustacea of California" has been followed in this paper.

Descriptions are based on those of Schmitt for the true crabs and Natantia. Descriptions of the hermit crabs follow those of Belle M. Stevens in her paper on the "Hermit Crabs of the Puget Sound Area, Friday Harbor, Washington."

The descriptions in this paper are not as complete as those of Schmitt; only those being included which are diagnostic in value.

A brief bibliography is given at the end of the paper. This is by no means exhaustive and covers only works that have been consulted in the course of the collecting and identification.

DESCRIPTION OF COOS BAY

Coos Bay is an indentation of the south central Oregon coast. It has the form of an inverted U. By water it is 310 miles from the Coos Bay bar to Portland, Oregon; and 365 miles from the bar to San Francisco, California.

At mean low tide the bay averages about 700 yards in width; at Pigeon Point the width is about 1200 yards while at the Marshfield Docks the width is only about 250 yards.

Depth in feet is shown on Plate I for all places. The deepest water of the bay is midway between the sunken jetty and the bar. The depth at this point is about sixty-three feet.

The distance by water from the Marshfield Docks to the bar is ten miles.

The bay shores are varied as to their geological structure and the materials composing them. There are many types of shore within the limits covered by the collection work for this paper. This accounts for the varied species collected by shore collecting methods.

The west and northwest shores of the bay are of fine yellow sand. From North Slough Inlet east the shores are of sand mud and wide mud flats border the eastern shore line along its entire extent.

The Sunken Jetty is an old wall made of sandstone blocks piled loosely. It is submerged at high tide and uncovered at low water intervals. Many species of decapods inhabit the crevices among the rocks of the jetty.

Fossil Point, Pigeon Point and Coos Head are composed of soft, weathered sandstone and harbor several species of decapods.

The bar has a sand bottom. This same material forms the floor of the Ocean west from the bar and north of it.

The shore of the Ocean north of the bar is of fine, yellow sand. This beach is uniform in texture and runs in an almost straight line to a distance of some thirty miles north of the entrance to Coos Bay. Huge numbers of the decapods, Emerita analoga and Cancer magister inhabit this sandy beachline.

South from the entrance to Coos Bay the shoreline of the Pacific Ocean is bold, rocky and very irregular. Rocky points run for many hundreds of yards into the Ocean. Reefs, islands and rock masses contribute to the formation of an exceedingly rough and broken coastline. Numerous fine sand beaches occur at intervals between the headlands. Rock loving decapods find choice homes along this rugged coast.

COOS BAY

OREGON

PORT OF COOS BAY
JANUARY 1923

Compiled under the direction of Major T. T. Higgins, Engineer

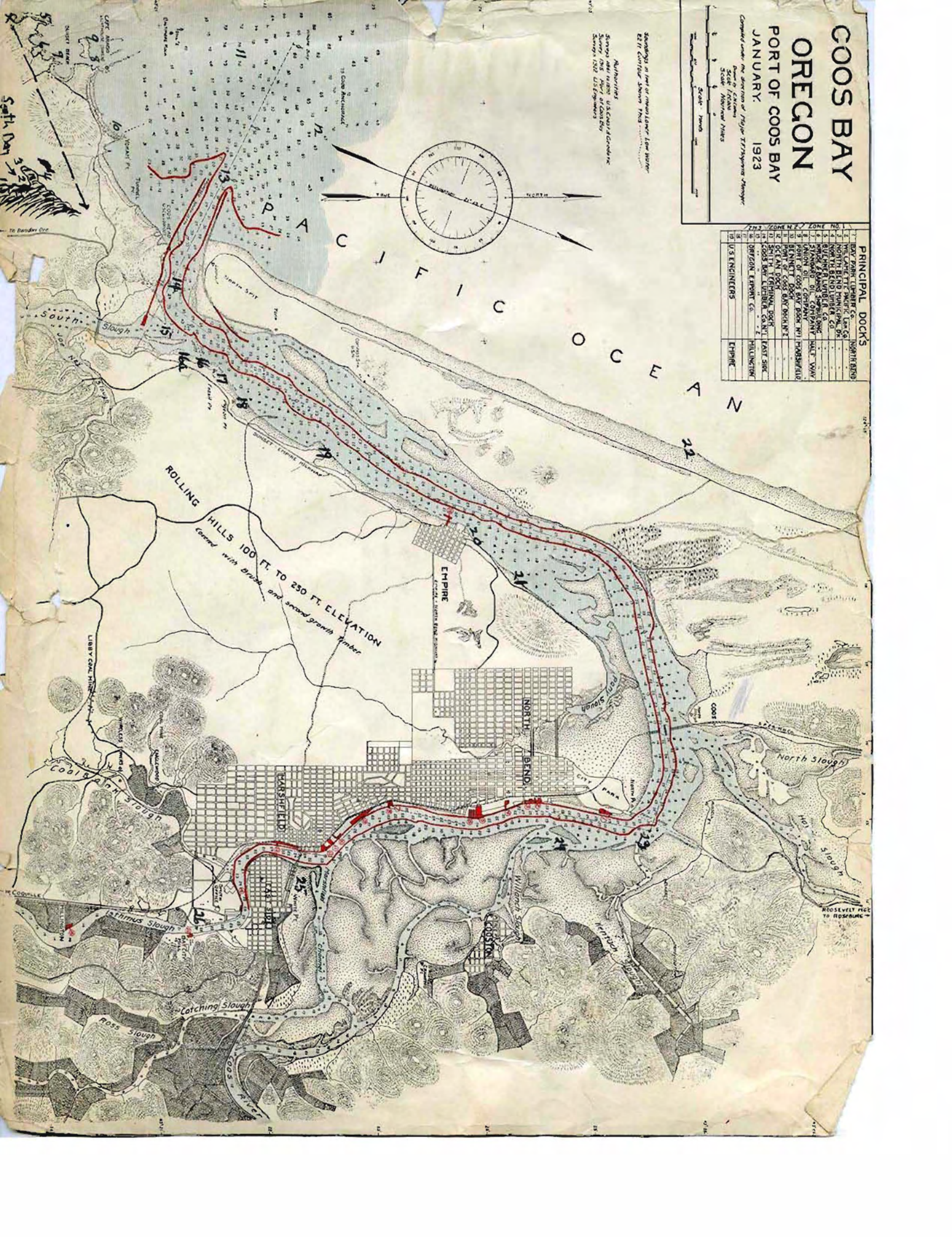
Scale: Nautical Miles

Soundings in feet or meters Lower Low Water
E.T. Contour Shows 1913

Northward
Soundings also refer to U.S. Coast and Geodetic Survey 1915 Survey of Coos Bay
Survey 1922 U.S. Engineers



PRINCIPAL DOCKS	
1	EMPIRE
2	EMPIRE
3	EMPIRE
4	EMPIRE
5	EMPIRE
6	EMPIRE
7	EMPIRE
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9	EMPIRE
10	EMPIRE
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98	EMPIRE
99	EMPIRE
100	EMPIRE



EXPLANATION OF PLATES

In the plates are figured a dorsal view of one type animal from each species collected. These are photographs of actual type animals.

At the bottom of each plate is given information as to view, magnification, sex, etc.

EXPLANATION OF TERMS USED

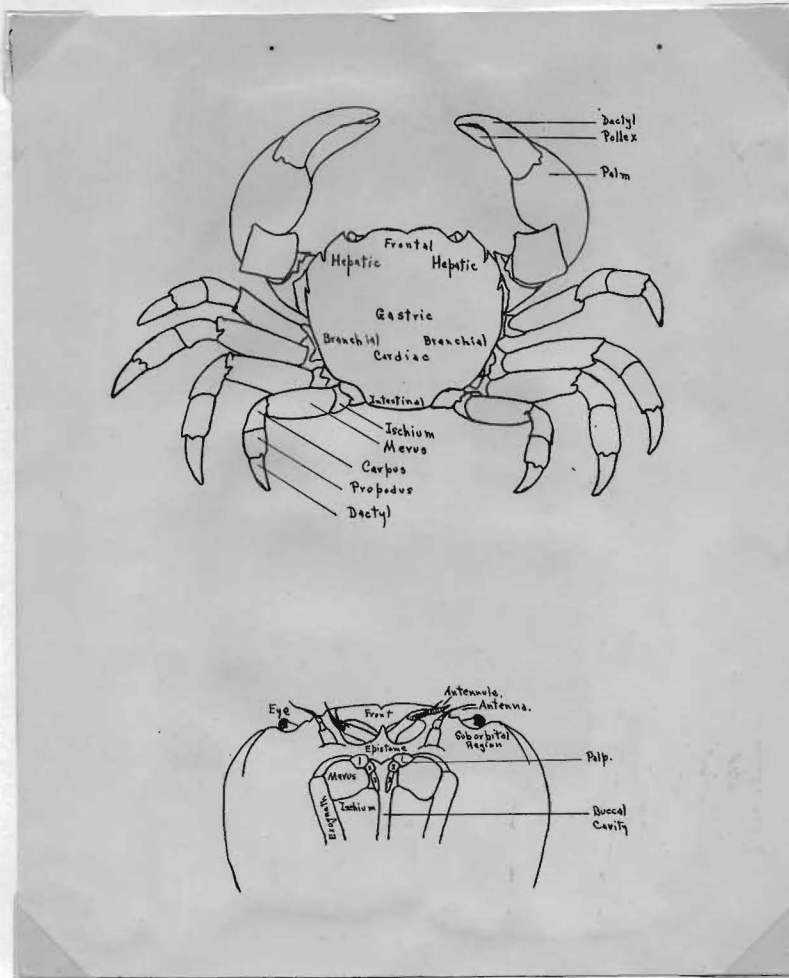
Decapoda is an order of Crustacea. The animals have the carapace fused dorsally with all the thoracic somites and the three anterior pairs of thoracic appendages are turned forward as foot-jaws.

The animals contained in this order are those commonly known as crabs, shrimps, lobsters, hermit crabs and crayfishes.

Decapoda characteristics are:

1. Body divided into head, thorax and abdomen, the first two of which are coalesced, and are dorsally covered by a cephalo-thoracic shield, the carapace.
2. The three front pairs of thoracic appendages modified into maxillipeds.
3. Branchiae usually in several series.
4. Investing skeleton of chitin, which is usually impregnated with lime salts.
5. Gills in a brancial chamber on each side of the thorax, and covered by the carapace wings.
6. There are usually five pairs of ambulatory legs.
7. Typically there are 19 pairs of appendages. A pair for each of the 19 true somites of the body. The appendages have the following distribution:
 - I. Head--carries first pairs of appendages.
 1. The first pair are the antennules.
 2. The second pair are the antennae.

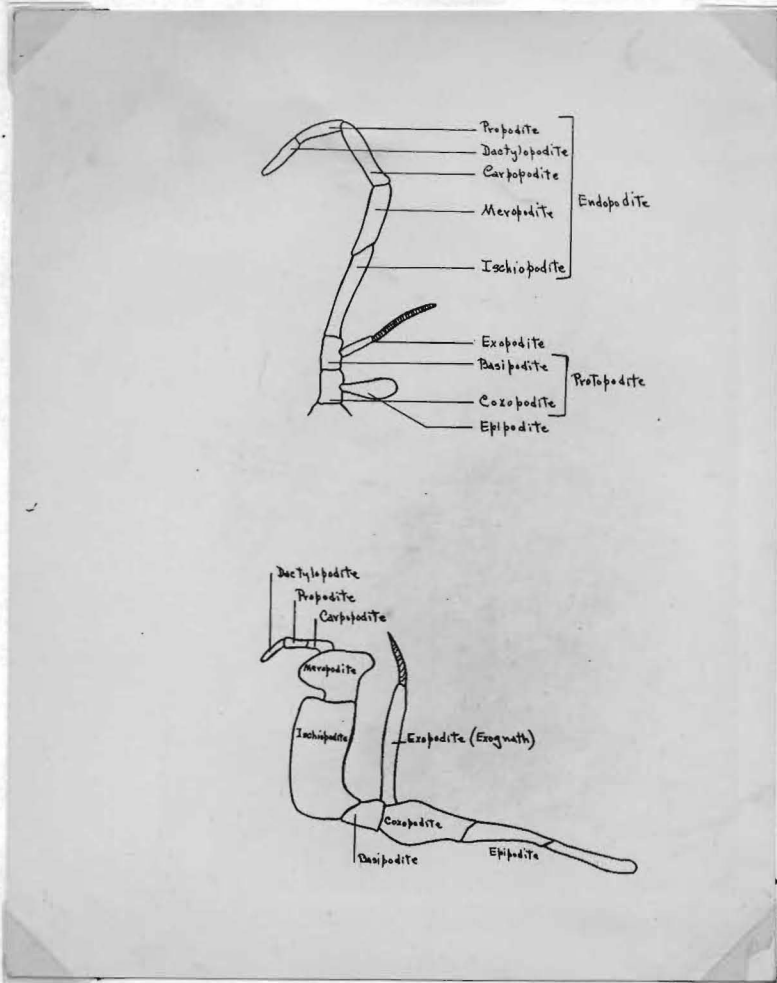
Plate II



Above.--Dorsal view of a typical brachyuran showing main body regions.

Below.--Ventral view of anterior region of a typical brachyuran showing main regions.

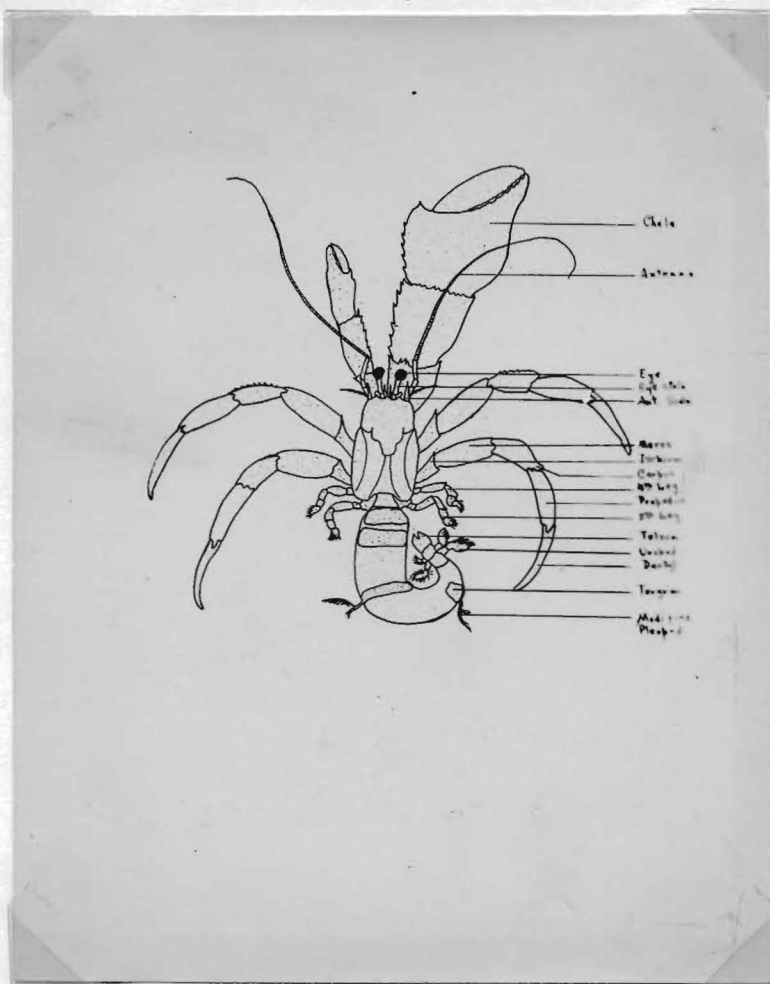
Plate III.



Above.--Typical third maxilliped of a macruran decapod (after Schmitt.)

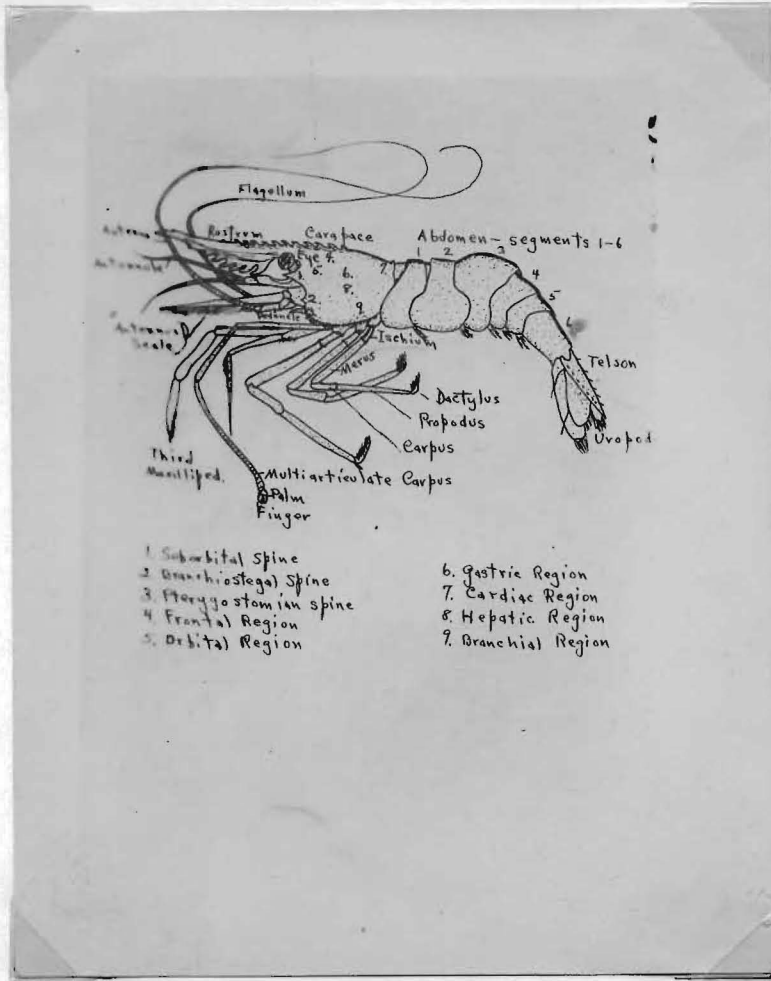
Below.--Typical third maxilliped of a brachyuran decapod (After Schmitt.)

Plate IV



Dorsal view of a typical hermit crab showing the main body regions.

Plate V.



Lateral view of a macruran (shrimplike) decapod showing the main body regions.

3. The third pair are mandibles.
4. The second maxillae.
5. The first maxillae.

II. Thorax, composed of eight somites which fuse with and are also covered by the carapace. The thorax carries the next eight pairs of appendages.

6. The third maxillipeds.
7. The second maxillipeds.
8. The first maxillipeds.
9. The fourth pair of thoracic appendages is the first pair of legs. Usually chelate.
10. Second pair of walking legs.
11. Third pair of walking legs.
12. Fourth pair of walking legs.
13. Fifth pair of walking legs.

III. Abdomen composed of six true somites plus a telson.

- 14, 15, 16, 17, 18. These first five pairs of appendages are the swimmerets. They may be variously modified or may be wanting.
19. The last pair of abdominal appendages are the uropods.

The following figures of a true crab, a typical shrimp and a typical hermit crab show the principal parts, body regions and appendages of the three main groups of Decapoda.

(See plates 2, 3, 4, 5 which face this page.)

Measurements and Colors:

Length is measured on the midline from anterior to posterior margin. The length of any segment is measured on its upper or anterior margin. Width of carapace and of a leg segment, is measured at its widest part. Rostrum width is measured at its posterior end.

Color descripts are from living animals.

EXPLANATION OF DESCRIPTIVE HEADINGS

A list of synonyms is given for each species. The authors name for the synonym is given after the synonym. The last section of this paper contains a list of the works in which these synonyms were published. A few of the synonym names have been taken from Schmitt's "Marine Decapod Crustacea of California" instead of from the original papers.

Local names are given for each species that is common enough to have had a colloquial name given to it by the people who have observed it and applied a name to it.

Under the heading, Characters are given points of diagnostic value of use in describing and identifying the species.

Dimensions.--(See explanation of measurements.)

Color notes are given. All color notes were made from dry, living specimens.

Occurrence is listed by stations. Systematic collection work was carried on at twenty-six stations. These stations are numbered on the map found on Plate I. Under the heading--Stations--for any given species are listed the stations where this species was found to occur. For instance.--

Pandalus danae

Stations 12, 13, 14, 16.

Depths in feet at which the various species were found are given. This depth means water depth in feet using mean low tide level as a beginning point for the measures. The term, low low tide line means the average height of the water at the lowest tide of the twenty-four hours for a lunar month. The term, high low tide line, means the average height of the water for the less low tide of the twenty-four hours during a lunar month. High high tide line and low high tide line have the same meaning for the two high tides of the day, as low low tide line and high low tide line have for the daily low waters.

Pacific Coast Distribution is given for every species as it is given by authorities such as Schmitt, Rathbun, Holmes, etc.

Systematic discussion of the representatives of the Order Decapoda found in Coos Bay and in the Pacific Ocean adjacent to the Coos Bay Bar. The Pacific Ocean was dredged out from the bar to stations 11, 12 and 13, along three lines from the bar to these stations to a depth of 66 fathoms and its shores were worked for a distance of five miles north of and five miles south of the Bar.

Key to the Suborders of Decapoda

I. Suborder Natantia

Body nearly always laterally compressed. Typical shrimplike form. Antennae with large scale at the base. Legs usually slender. Pleopods present in full number and used for swimming. — p. 7

II. Suborder Reptantia

Body usually depressed. Typical crablike form. First antennae without a scale. Second antennae without a scale or with only a small one. Legs strong. First pair of legs large and usually chelate. Pleopods reduced or absent. — p. 17

SUBORDER NATANTIA

Key to the Tribes of the Natantia

I. Carides. Pleura of second abdominal segment overlap those of the first; abdomen generally with sharp bend. Third legs not chelate.

II. Peneides. Pleura of first abdominal segment not overlapped by those of the second; abdomen without sharp bend. Third legs chelate.

No representatives were found in Coos Bay.

Tribe CARIDES

Key to the Coos Bay Families of the Carides

I. Exopodites on all legs.

No representatives found.

II. No exopodites on the legs.

A. One or both legs of the first pair simple; legs of the second pair unequal; second wrists multiarticulate.

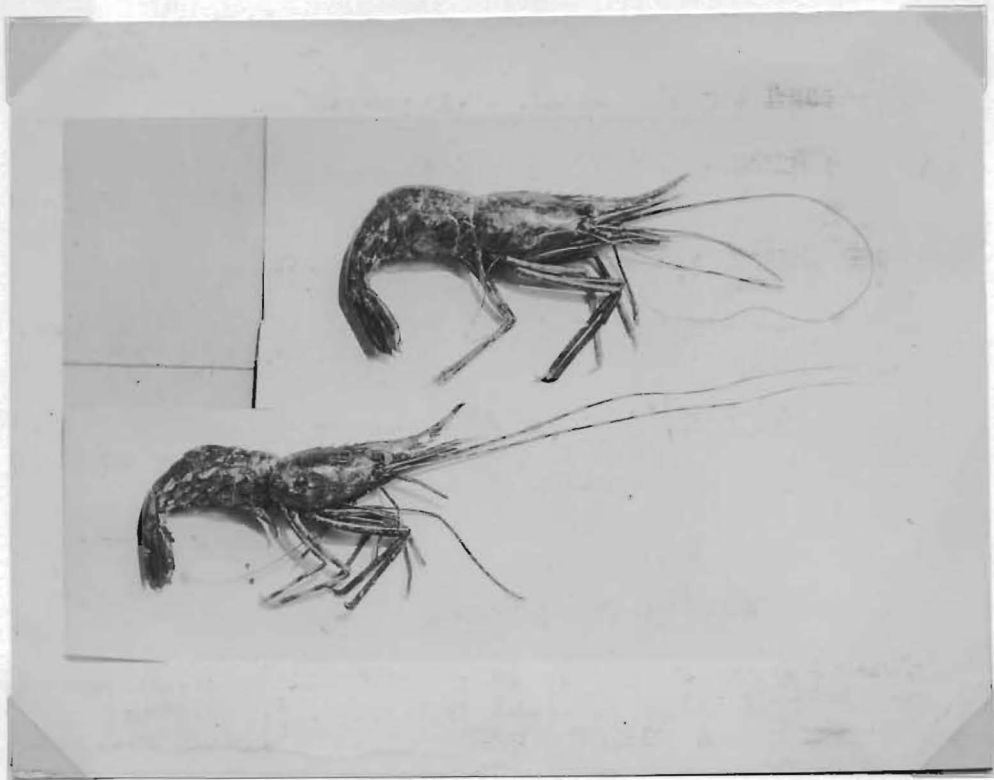
1. Only 1 leg of first pair simple.

No representatives found.

2. Both legs of the first pair simple.

Family Pandalidae.

Plate VI.



Pandalus danae, males, $\frac{1}{2} \times N$. Side views showing characteristic shape of rostrum.

B. Both legs of first pair chelate or subchelate.

1. First pair of legs subchelate; second wrists undivided.
Family Crangonidae.

2. First pair of legs chelate; second wrists subdivided
or undivided.

a. Second wrists undivided.
No representatives found.

b. Second wrists multiarticulate.

i. Eyes covered by carapace.
Family Crangonidae.

ii. Eyes not covered by carapace.

a. Wrists divided into 3, 7 or 32 segments.
Family Hippolytidae.

b. Wrists multiarticulate.
No representatives found.

~~Callinassidae~~

Family Pandalidae

Rostrum laterally compressed, long, and armed with teeth or spines. First pair of legs slender and usually simple; sometimes microscopically chelate. Second pair long, slender and chelate, with segmented carpus.

Genus Pandalus Leach

Rostrum long and prominent, armed above with spines, and below with fixed and rigid teeth. Antennules not longer than carapace. Second pair of legs unequal, with much segmented carpus.

Pandalus danae Stimpson

Plate VI

Pandalus danae Stimpson; Rathbun; Holmes; Schmitt.

Local name.--Coon striped shrimp.

Characters.--Surface finely pitted. Rostrum about one-sixth longer than carapace, distal two-thirds directed obliquely upward. Dorsal spines ten to twelve, movable, one-half of them on the carapace, the posterior spine a little behind the middle. Outer one-half of the rostrum unarmed above, apex trifid; lower margin six to eight spined, the spines diminishing anteriorly; lateral

carinae moderately prominent. Antennal scale from three-fourths to five-sixths as long as carapace. Carpus of right leg of second pair has eighteen to twenty-one joints. Left leg of second pair nearly one-half again as long as the right leg, its carpus has about sixty segments. Sixth segment of abdomen one and two-thirds as long as wide.

Dimensions.--A type specimen measures 82.3 m.m. in length exclusive of the rostrum. The specimens range from 40 m.m. to 102.4 m.m.

Color.--Pinkish yellow ground color. Legs and antennae bordered with red. Abdominal segments obliquely striped with dark red. Telson, uropods and rostrum tipped with red.

Stations.--12, 13, 14, 16. Moving over the bottom.

Depths in feet.--3 to 45.

Pacific Coast Distribution.--Sitka, Alaska, to San Francisco, California. (Schmitt)

Family Hippolytidae

Rostrum nearly always prominent, armed with teeth, usually well developed, sometimes, however, even shorter than the eye stalks. First pair of legs chelate and moderately stout; stouter and shorter than the second pair. Second pair chelate, slender, equal and with segmented carpus.

Genus *Spirontocaris* is the only genus of this family found at Coos Bay during this collecting.

Genus *Spirontocaris* Bate

Carpus of the second pair of legs consists of seven segments, mandible with incisor process, and palp of two segments.

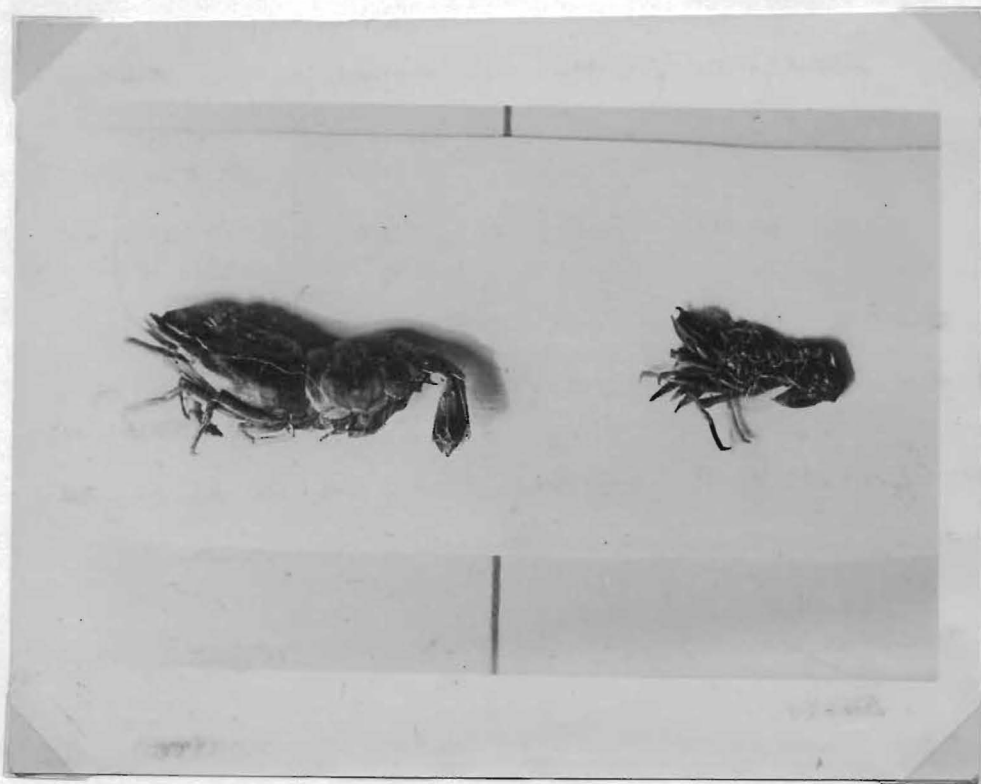
Key to the Coos Bay, Oregon, Species of *Spirontocaris*.

I. One or more supraorbital spines present.

A. Rostrum rather subcircular. Three supraorbital spines.
Spirontocaris prionota.

B. Rostrum not subcircular. One or two supraorbital spines.
No representatives found.

Plate VII



Spirontocaris prionota

Males. 1 x N.

Lateral views showing subcircular rostrum, supra-orbital spines, etc.

II. No supraorbital spines.

A. Rostrum as long as or longer than rest of carapace.

1. Terminal one-half of rostrum devoid of spines above.
No representatives found.
2. Terminal one-half of rostrum with spines.
 - a. Sixth abdominal segment longer than telson.
No representatives found.
 - b. Sixth abdominal segment shorter than telson.
 - i. Third maxillipeds exceeding antennal scale.
Spirontocaris paludicola.
 - ii. Third maxillipeds not exceeding the antennal scale.
 - a. Rostrum with more than eight spines above.
No representative found.
 - b. Rostrum with five or six spines above.
Spirontocaris kincaidii.

B. Rostrum shorter than the rest of the carapace.

1. Rostrum elongate, reaching beyond middle of antennal scale.
No representatives found.
2. Rostrum short, not reaching beyond middle of antennal scale.
 - a. Rostrum not reaching as far as the cornea.
No representatives found.
Spirontocaris Taylori
 - b. Rostrum reaching to or beyond the cornea.
 - i. Antennal scale longer than telson.
No representatives found.
 - ii. Antennal scale equal in length to, or shorter than the telson.
Spirontocaris brevirostris.

Spirontocaris prionota (Stimpson)

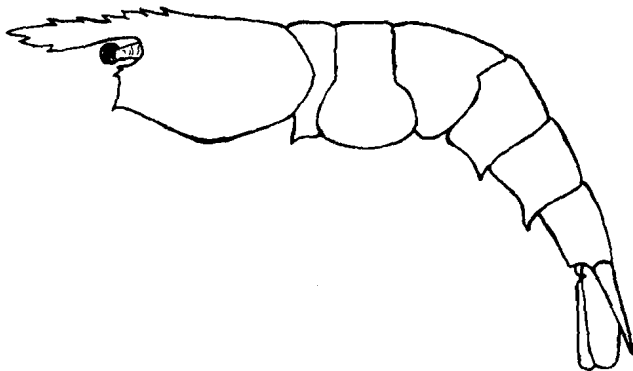
Plate VII

Hippelyte prionota Stimpson; Kingsley.

Spirontocaris prionota Walker; Holmes; Rathbun; Schmitt.

Local name.--Saw crested shrimp.

Plate VIII



Spirontocaris paludicola

At top.--Side view. 8 x N. The rostrum tip is broken on this specimen.

At bottom.--Diagram of the specimen showing rostrum tip as it was before being broken away.

Characters.--Carapace has two or three supraorbital spines in a nearly longitudinal series. Carapace with high crest nearly to posterior margin and armed with three teeth. Rostrum shorter than carapace. Rostrum almost as deep as long. Rostrum outline above is a flattened circular; anterior and dorsal margin minutely serrated, with spinuliform teeth, lower margin with four or five small simple teeth. Dactyls of the walking legs are one-half as long as their propodi.

Dimensions.--The larger type animal on Plate VII measures 28.5 mm.

Color.--Body reddish brown. Rostrum usually pale yellow or cream color.

Stations.--12, 13, 16. On sandy bottom.

Depths in feet.--45, 25, 60.

Pacific Coast Distribution.--From Bering Sea to Monterey, California (Rathbun).

Spirontocaris paludicola (Holmes)

Plate VIII

Heptacarpus paludicola Holmes.

Spirontocaris paludicola Rathbun; Schmitt.

Characters.--Rostrum slender, about as long as carapace, reaching about to the end of the antennal scale, armed above with 6 to 8 evenly spaced teeth; has below 2 to 4 teeth on the distal two-fifths of the rostrum. Third abdominal segment smoothly rounded above, not carinate nor has it the posterior margin produced. Sixth abdominal segment shorter than the telson. The telson is shorter than the antennal scale.

Dimensions.--From tip of rostrum to end of telson an average specimen measures 31 mm.

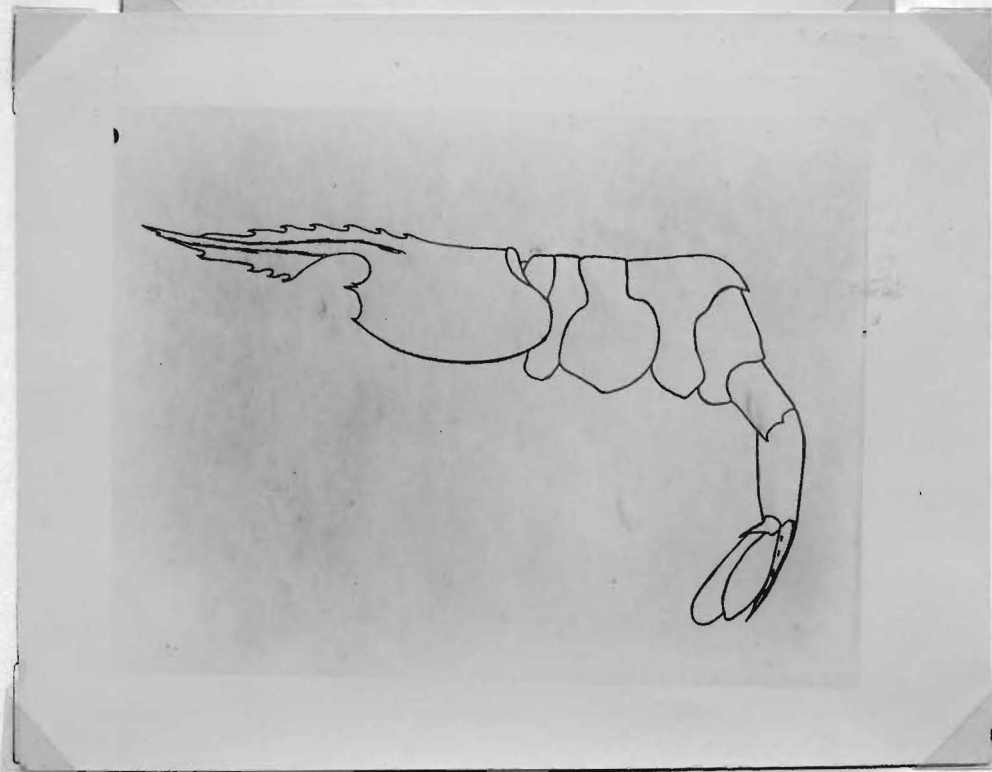
Color.--Clear green.

Stations.--4. Free among rocks in shallow water.

Depth in feet.--Among the rocks at extreme low tide.

Pacific Coast Distribution.--British Columbia, to San Francisco, California (Schmitt).

Plate IX



At top.--Lateral views of two specimens. 2 x N.
At bottom.--Diagram of body outline of a type specimen.
4 x N.

Spirontocaris kincaidii

Plate X



Spirontocaris brevirostris (Dana)

Male 1 1/5 x N.

Lateral view showing characteristic rostral spines.

Spirontocaris kincaidi Rathbun

Plate IX

Spirontocaris kincaidi Rathbun; Schmitt.

Common name.--None.

Characters.--Rostrum one-third longer than carapace, not reaching the tip of the antennal scale, horizontal. Rostrum has five to six teeth above. Lower side of rostrum has five teeth. Posterior margin of the third segment of the abdomen is drawn out backward into a pronounced lobe. Sixth abdominal segment twice as long as wide and a little shorter than the telson.

Dimensions.--Length of an average specimen is 35.2 mm. The larger specimen on Plate IX has this length measure.

Color.--Light reddish to dull scarlet. Flecked sparingly with yellowish pink.

Stations.--9, 13. Free among the rocks in shallow water.

Depths in feet.--3 and 25.

Pacific Coast Distribution.--Puget Sound to San Pedro, California (Schmitt).

Spirontocaris brevirostris (Dana)

Plate X

Hippolyte brevirostris Dana.

Heptacarpus brevirostris Holmes.

Spirontocaris brevirostris Rathbun; Schmitt.

Local name.--Tide pool darter.

Characters.--Antennal scale is the same length or slightly shorter than the telson. Rostrum reaches the cornea or slightly beyond, but never exceeds the first segment of the antennal peduncle. Rostrum has five or six teeth above, the last three or four are on the carapace. Rostrum has no teeth below. Rostrum tip usually simple.

Dimensions.--Types: length 20 to 40 mm.

Color.--Crimson with slight greenish cast. Others light red. Those in association with Strongylocentrotus purpuratus were purplish red to brown.

Stations.--1, 2, 3, 4, 5, 7, 9, 10, 15, 16, 17, 18, 19, 23. Among rocks at low tide, on sea urchins and among the brown seaweeds.

Depths in feet.--From low tide to 4 feet.

Pacific Coast Distribution.--/ttu, Aleutian Islands, to San Francisco Bay, California (Rathbun).

Family Crangonidae (Alpheidae)

Rostrum small or wanting. Eyes covered by carapace. First pair of legs chelate, with one or both claws strongly developed. Second pair of legs with very small chelae, long, slender and equal, with segmented carpus. Telson broad and rounded.

Key to the Coos Bay, Oregon Genera of the Crangonidae

- I. Rostrum present, short and pointed. Hands normal.
No representatives found.
- II. Rostrum wanting. Hands inverted so the dactyls are on the lower side.
Genus *Betaeus*.

Genus *Betaeus* Dana

Hands inverted so that the dactyls are on the lower side. Rostrum wanting; front not spined, either emarginate or rounded between the eyes.

Betaeus harfordi (Kingsley) is the only species of the genus *Betaeus* found in the Coos Bay region.

Plate XI



Betaeus harfordi. All females. 2 x N.

Side views showing lack of rostrum and dactyl on lower side of hand.

Betaeus harfordi (Kingsley)

Plate XI

Alpheus harfordi Kingsley.*Betaeus aequalis* Lockington.*Alpheus aequalis* Holmes.*Betaeus harfordi* Rathbun; Hilton; Schmitt.

Local name.--None.

Characters.--Front of carapace indented between the eyes. Hands oval, smooth, compressed. Dactyls slender, inner margin a little concave near its base. Fixed finger much wider than the dactyl. Tips of fingers cross when closed. Hands naked except inner margins of fingers.

Dimensions.--Type: length 27.1 mm.

Color.--Yellowish green. Eggs of female a clear, light green. Another was light yellow with dark cream colored hands.

Stations.--3, 4, 9. Among rocks at low tide line.

Depths in feet.--Extreme low tide line.

Pacific Coast Distribution.--Point Arena to Laguna Beach, California (Schmitt). Occurs as far north as Coos Bay, Oregon.

Note: The finding of this shrimp in goodly numbers at low tide line at South Bay, Squaw Island Reef, etc., in the Coos Bay area sets a new northern limit for its Pacific Coast range. Schmitt, in the *Marine Decapod Crustacea of California*, University of California Publications in Zoology, Vol. 23, gives it the range from Point Arena to Laguna Beach, both of which are California stations.

Family Cragonidae

Rostrum small, usually dorsally flattened, and not toothed, or wanting. Eyes free, except in *Nectocrangon*. First pair of legs, subchelate and stouter than the second. Second legs slender and equal, with unsegmented carpus.

Key to the Coos Bay, Oregon Genera of the Cragonidae

I. Rostrum present. Eyes free.

A. Rostrum short. Five pairs of legs present.

Genus *Crago*.

B. Rostrum elongate. Second legs wanting.

No representatives found.

II. Rostrum wanting. Eyes hidden by carapace.

No representatives found.

Genus *Crago* Lamarck

Rostrum very short and somewhat flattened. Eyes free. Dactyls of the fourth and fifth pairs of legs rather flattened.

Key to the Coos Bay, Oregon Species of *Crago*

I. Gastric region not depressed below the general level of the carapace.

A. Carapace with no middle gastric spine.

No representatives found.

B. Carapace has one or more median spines.

1. Carapace with one median spine.

a. Sixth abdominal segment sulcate beneath.

i. Hand of first pair of feet very slender.

Crago franciscorum.

ii. Hand of first pair of feet not slender.

a. Fifth segment of abdomen not carinate.

No representatives found.

b. Fifth segment of the abdomen has a dorsal median carina.

Crago nigricauda.

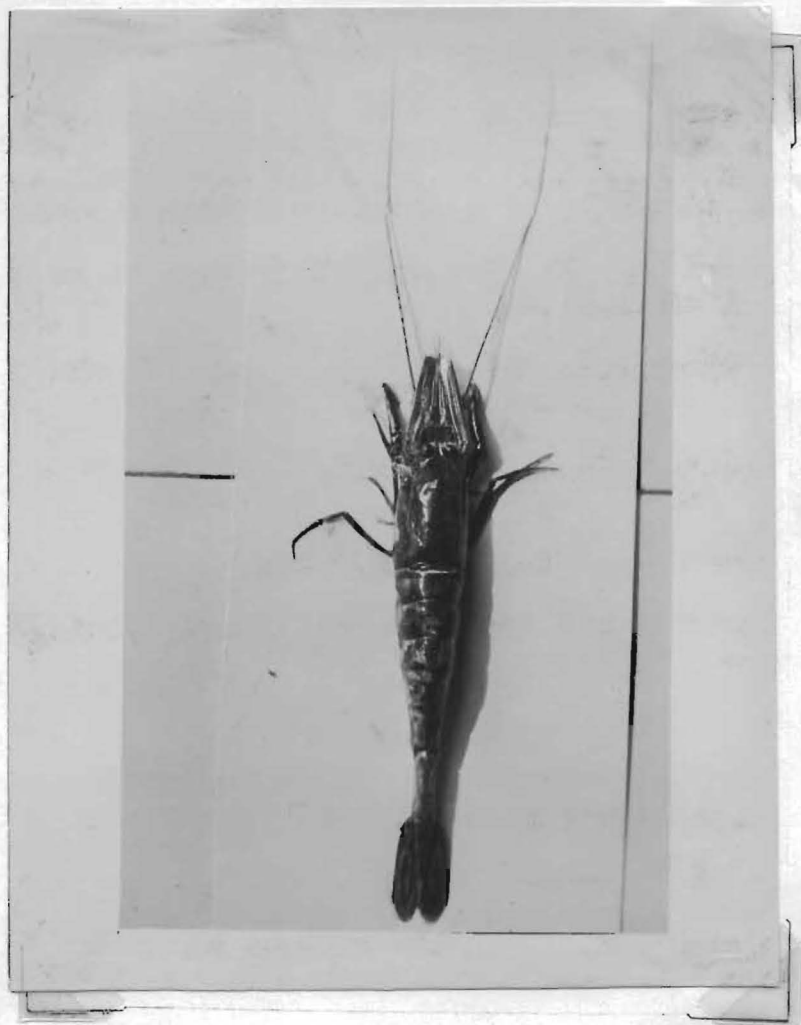
b. Sixth Abdominal segment convex beneath.

No representatives found.

II. Gastric region depressed below the general level of the carapace.

No representatives found.

Plate XIII



Crango franciscorum. Male. 1 x N.
Dorsal view showing long, slender hands of this species.

Crango nigricauda (Stimpson)

Plate XII

Crangon nigricauda Stimpson; Holmes; Rathbun.*Crango nigricauda* Schmitt.

Local name.--Black tailed shrimp.

Characters.--Antennal scale is two-thirds the carapace length; front internal angle rounded and its mid-curve extends as far forward as the spine. Hand is slightly over twice as long as wide. Fifth segment of the abdomen has a distinct median carina.

Dimensions.--Type: length 50.2 mm. Measurements of thirty-two specimens ran from 28 to 51.5 mm.

Color.--Gray to blackish. Tail region almost black. Hand a pale bluish color.

Stations.--20, 19, 14, 8, 4. Taken by dredge from sandy, and rocky bottoms.

Depths in feet.--22, 20, 33, low tide, 3.

Pacific Coast Distribution.--Comox, British Columbia, to Lower California (Rathbun).

Crango franciscorum (Stimpson)

Plate XIII

Crangon franciscorum Stimpson; Holmes; Rathbun.*Crango franciscorum* Schmitt.

Local Name.--Long handed shrimp.

Characters.--Hands long and narrow. Hand four times as long as wide. Outer margin of hand concave. Inner hand margin convex. Dactyl almost longitudinal when flexed. Antennal spine exceeds the antennal blade tip in length. Fifth abdominal segment not carinate.

Dimensions.--Type: 80.3 mm.

Color.--Mottled yellow gray,

Stations.--19, 14, 8. Taken in the dredge on sandy bottom.

Depths in feet.--24, 53, low tide line.

Pacific Coast Distribution.--Southeastern Alaska to San Diego, California. (Schmitt).

Suborder Reptantia

Key to Coos Bay, Oregon Tribes of Reptantia

- I. Abdomen large, Typically anomurous. Antennae placed external to the eye. Last thoracic sternum free. Tribe Anomura. p. 17
- II. Abdomen small, Typically brachyurous. Antennae placed internal to the eye. Last thoracic sternum fused to the rest. Tribe Brachyura. p. 33

Tribe ANOMURA

Key to Coos Bay, Oregon Families of Anomura

- I. Second to fourth legs with last joint curved and flattened. First pair styliform or subchelate. Abdomen bent under thorax.
- A. First pair of legs simple. Carapace anterolateral angles unarmed. Family Hippidae.
- B. First pair of legs subchelate. Carapace anterolateral angles spined. No representatives found.
- II. Second to fourth legs with last joint not curved and flattened. First pair of legs chelate.
- A. Uropods present and adapted to swimming. Abdomen symmetrical.
1. Body depressed. Abdomen bent under.
- a. Body shrimplike. No representatives found.
- b. Body crablike. Family Porcellanidae.
2. Body compressed. Abdomen extended.
- a. Abdominal pleura large. No representatives found.
- b. Abdominal pleura small or absent. Family Callinassidae.

Plate XIV



Upogebia pugettensis. Females. $2/3 \times N$.

Dorsal views showing roughened rostrum and anterior carapace.

B. Uropods not adapted for swimming. Abdomen asymmetrical.

1. Carapace firm in front and soft behind. Uropods adapted to holding body in hollow objects. Abdomen soft and usually asymmetrical.

Family Paguridae.

2. Carapace surface all firm. Body crablike. Uropods absent. Abdomen rather firm and bent under the thorax.

Family Lithodidae.

Family Callinassidae

Body shrimplike. Abdomen extended. Tail fan well developed. First pair of legs equal or subequal, perfectly or imperfectly chelate. Antennal scale very small.

Key to Coos Bay, Oregon Genera of Callinassidae

- I. Rostrum good sized, rough and hairy. First pair of legs subequal, with small pollex.

Genus Upogebia.

- II. Rostrum small or absent. First pair of legs very unequal. Well developed chelae.

Genus Callinassa.

Genus Upogebia Leach

First pair of legs subequal and subchelate. Eye-stalks cylindrical. Cornes terminal. Rostrum short, rough, and hairy.

Upogebia pugettensis (Dana)

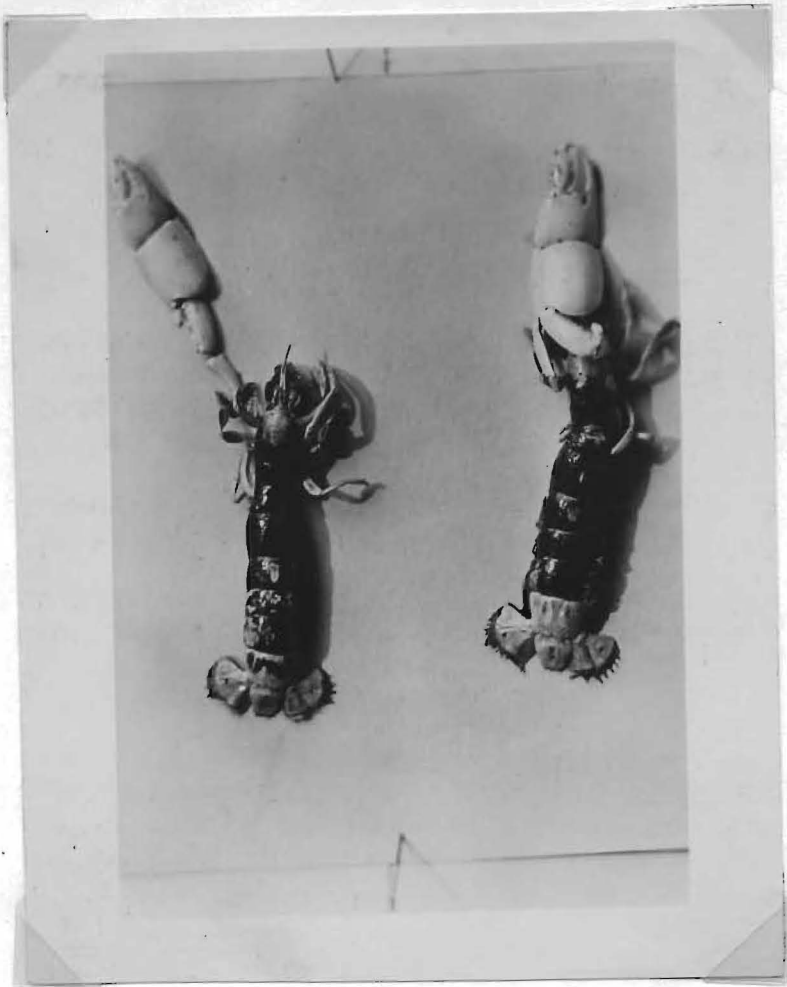
Plate XIV

Gebia pugettensis Dana; Stimpson; Lookington.

Upogebia pugettensis Holmes; Rathbun; Schmitt.

Local name.--Salt water crayfish.

Characters.--Rostrum narrow and roughened anteriorly. First legs chelate. Chelipeds of equal size. Hand has two parallel hairy lines on its upper edge. Thumb bent downward, has tooth near middle and is shorter than the sharp curved dactyl. Carapace in front of the cervical groove is flattened, scabrous and hairy. This region has three longitudinal grooves.



Callianassa californiensis

Males. $2/3 \times N$.

Dorsal views showing the one extremely large
cheliped.

Dimension.--Type: length 110.2 mm. Specimens range from 38 mm. to well over 100 mm.

Color.--Grayish tan to drab brown. Almost the exact color of very muddy sand.

Stations.--1, 4, 10, 18, 19, 20, 21, 23, 24, 28.

Depths in feet.--Low tide line at all stations listed. In addition was found at Stations 18, 19 and 21 down to 10 feet below low water mark. Occurs in sandy and mud sand beaches.

Pacific Coast Distribution.--Southeastern Alaska to San Quentin Bay, Lower California (Rathbun).

Genus *Callinassa* Leach

First pair of legs unequal. Well developed chelae on first legs. Eye-stalks triangular or oblong; cornea dorsal, median, small, or absent. Rostrum short, triangular, rudimentary, or absent.

Key to Coos Bay, Oregon Species of *Callinassa*

- I. Eye-stalks with acute and divergent ends. Median prominence of the front rounded; cornea at middle of eye-stalk; large cheliped of the male very broad.
Callinassa californiensis.
- II. Eye-stalks with acute and divergent ends. Median prominence of the front is subacute. Cornea just behind the middle of the eye-stalk. Large cheliped of the male is elongate.
Callinassa longimana.

Callinassa californiensis Dana

Plate XV

Callinassa californiensis Dana; Stimpson; Holmes; Rathbun; Schmitt.

Local name.--Large clawed crayfish.

Characters.--Large hand and carpus very broad. Carpus with curled over upper margin on its inner side. Carpus very little longer than broad. Cornea in middle of eye-stalk. Middle tooth of front short and rounded. Carpus longer than the palm.

Dimensions.--Length of a male was 63 mm. Its large cheliped was 52 mm. in length.

Color.--Body a pale pinkish yellow. Feet and lower edges of the carapace and pleura a dark pink color.

Plate XVI



Callianassa longimana

Female. 1 x N.

Dorsal view showing long, narrow cheliped. The length and narrowness of this cheliped distinguishes this species from *Callianassa californiensis*.

Stations.--21, 23.

Depths.--Found between low high and low low tide lines in burrows.

Pacific Coast Distribution.--Mutiny Bay, Alaska (Lockington), to the mouth of Tia Juana River, San Diego County, California (Rathbun).

Callianassa longimana Stimpson

Plate XVI

Callianassa longimana Stimpson; Holmes; Rathbun; Hilton; Schmitt.

Local name.--Long handed crayfish.

Characters.--Large cheliped long and narrow. Carpus of large cheliped about twice as long as broad. Cornea just behind the middle of the eye-stalk. Middle tooth offront small and acute. Eye-stalks have acute and divergent extremities.

Dimensions.--Female type was 100 mm. long.

Color.--Pale yellowish pink.

Stations.--21.

Depth.--Low tide line area. In burrows.

Pacific Coast Distribution.--Vancouver Island, British Columbia to San Quentin Bay, Lower California (Schmitt).

Family Paguridae

Abdomen soft, usually twisted or spirally coiled. Abdominal appendages reduced in size or lost. Uropods adapted to clinging to shell columellas or in worn tubes. Carapace firm in front and soft in hinder part.

Fourth pair of legs unlike the third pair.

Key to Coos Bay, Oregon Genera of Paguridae

- I. Right cheliped larger than left. External maxillipeds widely separated at base.
 - A. Fingers of chelipeds opening and closing horizontally. No paired appendages on the first or second abdominal segments.

Genus Pagurus.

B. Fingers of chelipeds opening and closing obliquely. A pair of appendages on the first abdominal segment of the female only.

No representatives found.

II. Chelipeds equal or subequal or the left larger than the right. External maxillipeds approximated at the base.

Genus Paguristes.

Genus Pagurus Fabricius

Uropods are the only paired appendages on the abdomen of either sex. External maxillipeds widely separated at the base. Chelipeds usually unequal. The right cheliped is the larger. Fourth pair of legs subchelate.

Key to Coos Bay, Oregon Species of Pagurus

I. Hands granulate or mostly granulate above.

A. Hands granulate only; large hand elongate and little if any broader than carpus.

1. Hands hairy.

Pagurus hirsutiusculus.

2. Hands not hairy.

Pagurus granosimanus.

B. Hands granulate and tuberculate or granulate and spiny.

No representatives found.

II. Hands spiny or tuberculate above or mostly so.

A. Hands with spines only. Spines slender.

Pagurus ochotensis.

B. Hands with spines only. Spines stout.

1. Hair of hands scarcely as long as spines.

No representatives found.

2. Hair of hands much longer than spines.

Pagurus setosus.

Plate XVII



Pagurus hirsutiusculus

Males. 1/2 x N.

Dorsal views showing characteristics of the larger cheliped, the leg joint banding and the type of shells inhabited.

Plate XVIII



Pagurus hemphillii

Male. 1 x N.

Dorsal view showing deep carapace of cheliped,
long carapace and slender eye-stalks.

Pagurus hirsutiusculus (Dana)

Plate XVII

Bernhardus hirsutiusculus Dana.*Pagurus hirsutiusculus* Holmes; Rathbun; Hilton; Schmitt;
Stevens.

Common name.--Hairy hermit crab.

Characters.--Ambulatory legs and body pubescent. Hand of large cheliped often almost naked. Front portion of carapace wider than long; median tooth acute and distinct; lateral teeth lacking. Short eye-stalks exceeded slightly in length by the antennal acicles. Chelipeds unequal. Hand nearly twice as long as wide. Sides of small cheliped rounded. Ambulatory legs granulo-scabrous. Dactyls about the same length as the propodi.

Dimensions.--Type male: length 35.5 mm. Specimens up to 39 mm. common.

Color.--Light blue to olive gray. Dactyls light blue and longitudinally striped with reddish brown. Antennae brown with gold yellow spots about every three segments.

Stations.--2, 3, 4, 5, 7, 8, 9, 10, 16, 17, 18. Among rocks in tide pools left by receding tide.

Depths.--Between low high and low low tide lines.

Pacific Coast Distribution.--Aleutian Islands to San Diego, California (Rathbun).

Pagurus hemphillii

Plate XVIII

Eupagurus hemphillii Benedict.*Pagurus hemphillii* Holmes; Rathbun; Schmitt.

Local name.--Blue hermit crab.

Characters.--Carpus of large cheliped with deep, flat, perpendicular inner face, forming a distinct angle with the lower face, depth of the carpus greater than its width. Base of immovable finger of large hand somewhat excavated above, causing it to appear bent upward. Small hand compressed laterally, not swollen, sides subparallel. Anterior portion of the carapace very long, about one-third longer than wide, not hairy, smooth and shining; median projection of front triangular, acute. Eye-stalks long and slender. Ambulatory legs scarcely if at all hairy.

Plate XIX



Pagurus ochotensis

Both males. 1 1/2 x N.

Dorsal views showing twisted dactyls and characteristic spining of the chelipeds.

Dimensions.--Type: length of carapace 11 mm.

Color.--Bluish red. Tips of the dactyls lighter colored. Blue spots on ambulatory legs.

Stations.--3, 4, 9, 16. In tide pools left by the receding tide.

Depths.--Between high and low tide marks.

Pacific Coast Distribution.--British Columbia, to Monterey, California (Schmitt).

Pagurus ochotensis (Brandt)

Plate XIX

Pagurus (*Eupagurus*) *bernhardus* Brandt.

Bernhardus armatus Dana.

Eupagurus armatus Stimpson; Bate; Whiteaves.

Pagurus ochotensis Holmes; Benedict; Rathbun; Schmitt; Stevens.

Local name.--None.

Characters.--Frontal teeth about equal in prominence. Antennal scicle has inner edge uneven, not spiny, exceeding eye-stalk by one-half its length. Hand carpus thickly set with slender spines. Hands hairy, but the hairs are not as long as the spines on the hand. Dactyls as long as the two preceding leg joints. Dactyls twisted.

Dimensions.--Type: length of carapace 7 mm. Hand length 13.6 mm.

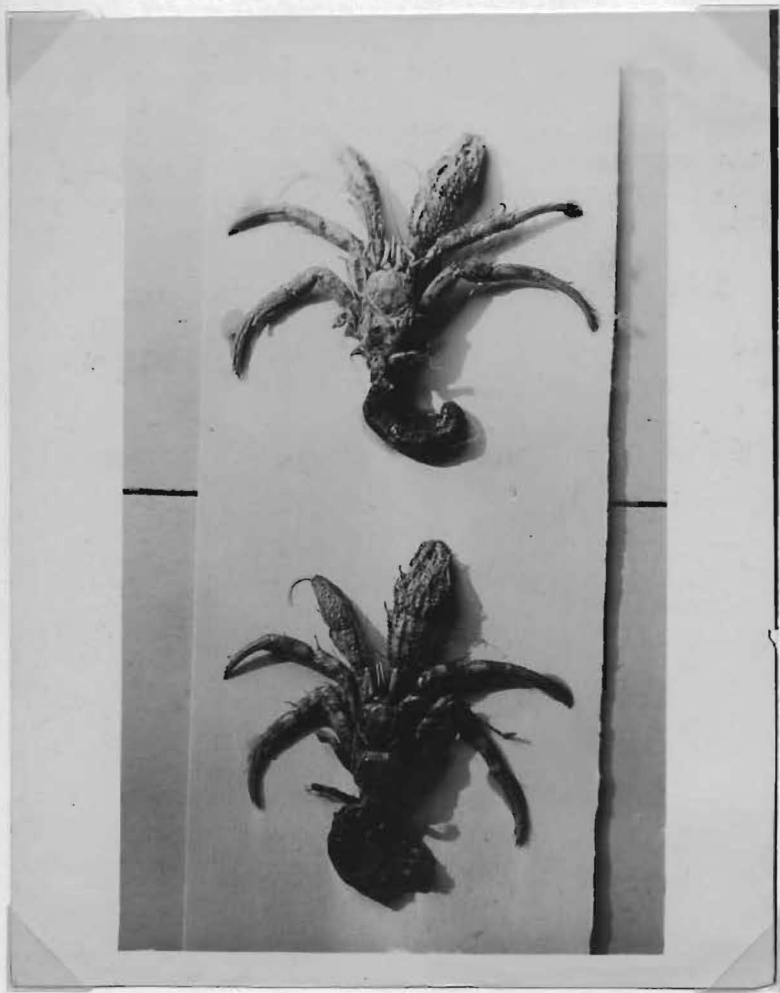
Color.--Pale olive to dark orange. Brown and violet markings.

Stations.--11. Taken in the dredge on coarse gravelly bottom.

Depth in feet.--75 to 80.

Pacific Coast Distribution.--Unalaska to San Diego, California (Rathbun).

Plate XX



Pagurus setosus

Males. 1 x N

Dorsal views showing bristles on the hands and the seven rows of spines on the carpus.

Pagurus setosus (Benedict)

Plate XX

Eupagurus setosus Benedict.*Pagurus setosus* Rathun; Schmitt; Stevens.

Local name.--None.

Characters.--Carapace a little longer than broad, median projection of the front rounded. Eye-stalks about one-half as long as the front portion of the carapace. Both hands set with stiff bristles. Large hand has seven longitudinal rows of spines on its top and two upper margins. Upper margins of the legs have spines only on the carpus segments of the first pair.

Dimensions.--Type: length of male carapace 12.3 mm.

Color.--Light pinkish brown with bands of brown yellow on the legs and body. Spine tips are orange.

Stations.--11. Taken in the dredge on gravelly bottom.

Depths in feet.--75 to 80.

Pacific Coast Distribution.--Kadiak, Alaska to off Santa Cruz Island, California (Schmitt).

Genus *Paguristes* Dana

Chelipeds similar, equal, subequal or the left may be larger than the right. Fourth pair of legs simple. External maxillipeds together at their bases. Abdomen of male has paired appendages on first two segments of male and first segment of female. Uropods present in both male and female.

Plate XXI



Paguristes turgidus

Male. 1 x N.

Dorsal view showing equal chelipeds.

Paguristes turgidus (Stimpson)

Plate XXI

Eupagurus turgidus Stimpson

Clibanarius turgidus Stimpson; Bate; Whiteaves

Paguristes turgidus Stimpson; Smith; Walker; Holmes;
Rathbun; Schmitt; Stevens.

Characters--Very hirsute. Front portion of carapace longer than wide; teeth of front subequal and prominent. Eye-stalks slender and one-half as long as front portion of carapace. Chelipeds similar, upper surface has dark tipped spines. Ambulatory legs rather stout. Dactyls a little longer than the propodi.

Dimensions.--Type: length of carapace 12 mm. Several larger ones also obtained.

Color.--Yellowish brown. The hairy covering masks the color a good deal. Spines dark tipped.

Stations.--11, 12, 14. Taken in the dredge on sand rock bottom.

Depths in feet.--75, 45, 39.

Pacific Coast Distribution.--From British Columbia to San Diego, California (Schmitt).

Family Lithodidae

Body crablike. Abdomen rather firm, often segmented, bent under the thorax. Uropods absent. Carapace firm. First pair of legs chelate. Fourth pair of legs like the third. Fifth pair of legs small and folded under the carapace.

Key to the Coos Bay, Oregon Genera of Lithodidae

I. Abdomen soft, unsegmented; at most only the basal and terminal part stiffened by thin calcareous plates. Carapace moderately convex, granular on the upper surface. Ambulatory legs subcylindrical and sparsely haired.

Genus Oedignathus.

II. Abdomen segmented, and subdivided into more or less well calcified plates.

A. Abdominal plates with raised and rounded papillated edges enclosing a central membrane area.

No representatives found.

Plate XXII



Oedignathus inermis

Male. 1 x N.

Dorsal view showing granulated tubercles
on the large cheliped.

B. Abdominal plates without a central membrane area.

1. Ambulatory legs shorter than the greatest width of the carapace, usually much shorter.

a. Carapace broadly oval, convex, smooth, and produced into lateral expansions, which completely shield the ambulatory legs.

Genus *Cryptolithodes*.

b. Carapace not so produced, more crablike in appearance, rather tuberculated.

i. Outline of carapace forms an equilateral triangle.
No representatives found.

ii. Outline of carapace roughly pentagonal or hexagonal, very convex, has conical tubercles.

Genus *Lopholithodes*.

2. Ambulatory legs considerably longer than the greatest width of the carapace.

No representatives found.

Genus *Oedignathus* Benedict

Carapace moderately convex, granular on the upper surface, slightly setose but not hairy. Ambulatory legs subcylindrical, sparsely haired. Abdomen flexed loosely, unsegmented.

Oedignathus inermis (Stimpson)

Plate XXII

Hapalogaster inermis Stimpson.

Hapalogaster brandti Schalfeew.

Oedignathus inermis Holmes.

Oedignathus inermis Rathbun; Schmitt.

Dermaturus inermis Balss.

Local name.--Warty crab.

Characters.--Carapace almost completely covered by scale like plates, which are setose along the front margin. Chelipeds unequal and covered by low, granulated tubercles. Hand of the larger cheliped large and swollen. Calcareous plates on the two terminal abdominal segments are inconspicuous.

Plate XXIII



Cryptolithodes sitchensis

Above--Male. 1 x N.

Below--Female. 1 x N.

Dorsal views showing characteristic wing
expansions of the carapace.

Dimensions.--Type: length 23 mm.

Color.--Chocolate brown to medium light brown.

Stations.--3, 4, 9, 16. Among the rocks and in masses of blue mussels, Mytilus californianus.

Depths.--Close around low low tide line.

Pacific Coast Distribution.--Unalaska to Pacific Grove, California (Rathbun).

Genus Cryptolithodes Brandt

Carapace broadly oval, rather smooth, high in the middle, laterally produced into wide expansions, which conceal the ambulatory legs. Abdomen flattened, triangular. Minute triangular telson concealed.

The only species of this genus found was Cryptolithodes sitchensis.

Cryptolithodes sitchensis Brandt

Plate XXIII

Cryptolithodes sitchensis Brandt; Holmes; Schmitt.

Local name.--Turtle crab.

Characters.--Carapace one and two-thirds times as wide as long, produced into lateral expansions. Rostrum widened towards distal end. Hands smooth, with a single, faint longitudinal, rounded ridge a little below the middle of the outer surface. Abdomen smooth, lateral plates flat.

Dimensions.--Type male: length 34 mm.

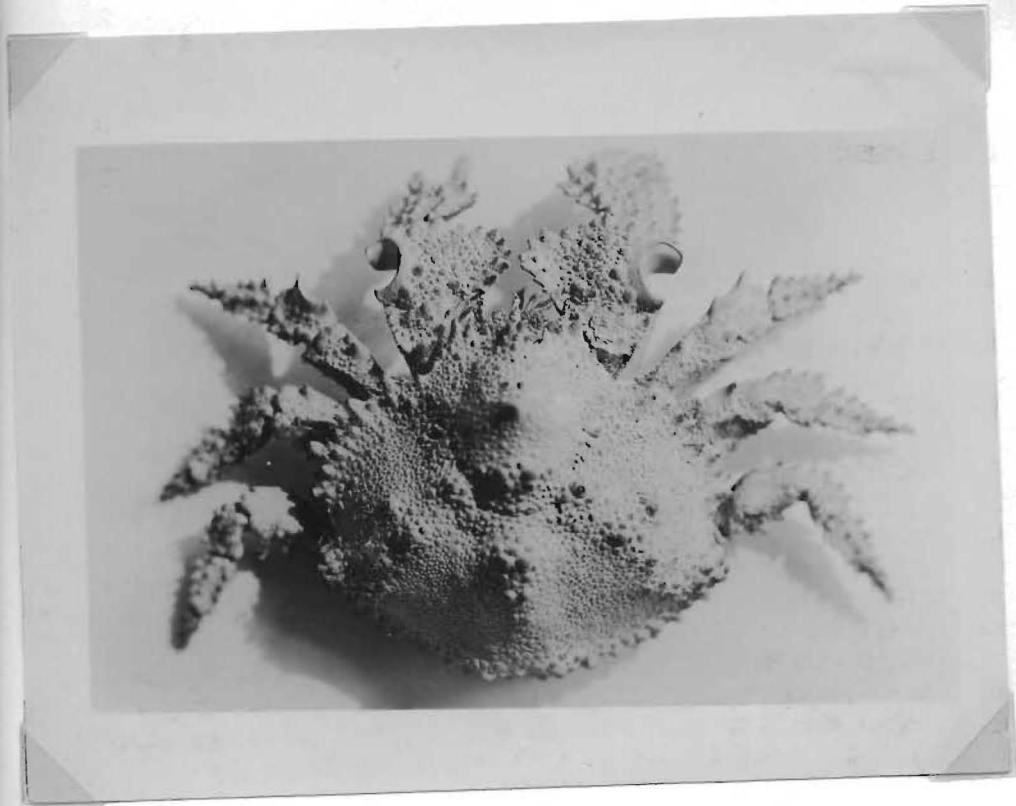
Color.--Red to purple. Crusted with coralline algae.

Stations.--1. Among rounded pebbles of the shape and coloring of the specimen. A case of wonderful protective adaptation.

Depth. At extreme low tide line.

Pacific Coast Distribution.--Sitka, Alaska, to Pacific Grove, California (Schmitt).

Plate XXIV



Lopholithodes foraminatus

Male. 1 x N.

Dorsal view showing circular holes in
carpus of chelipeds.

Genus *Lopholithodes* Brandt

Carapace broad, pentagonal, or hexagonal above, with margins and upper surface armed with setose tubercles and a few conical tubercles. Ambulatory legs short, tuberculated, and capable of being folded under carapace. Telson very small.

The only species of this genus found was *Lopholithodes foraminatus*.

Lopholithodes foraminatus (Stimpson)

Plate XXIV

Echinocerus foraminatus Stimpson; Newcombe.

Lopholithodes foraminatus Holmes; Schmitt.

Local name.--None.

Characters.--Carapace depressed; gastric region elevated, furnished with a short, conical tubercle near the middle and a group of smaller tubercles near the posterior end; external to the orbits there are three spines in a nearly transverse line. Rostrum rather short with a median spine, and a cluster of spiny tubercles above the base. Tubercles of chelipeds and legs spiniform; carpus of chelipeds with outer edge excavated, forming a smooth, deep, rounded sinus, which when approximated to the shallower corresponding sinus on the anterior edge of the carpus of the first pair of ambulatory legs forms a striking, smooth, nearly circular foramen.

Dimensions.--Type: length of carapace 61 mm.

Color.--Bright scarlet and red. Violet purple and orange markings.

Stations.--One mile west of station eleven (11). In stomach of a halibut.

Depths in feet.--Approximately 138.

Pacific Coast Distribution.--Victoria, British Columbia to off San Diego, California (Schmitt).

Family Hippidae

First pair of legs simple; second to fourth legs with the last joint curved and flattened. Carapace subcylindrical, with wings which cover the legs. Third maxillipeds broad, without exopodites. Abdomen bent under the thorax; tail fan not adapted for swimming.

Plate XXV



Emerita analoga

Females. 1 x N.

Dorsal views showing how the abdomen
is folded beneath the body.

Genus *Emerita* Gronovius, Benedict

Antennal with flagellus very long, robust, multiarticulate, and strongly ciliated, normally hidden, coiled beneath the external mouth parts. Dactyls of first pair of legs oval and lamellate.

Emerita analoga (Stimpson)

Plate XXV

Hippa analoga Stimpson; Miers; Ortmann; Holmes.

Emerita analoga Rathbun; Weymouth and Richardson; Schmitt.

Local name.--Sand crab,

Characters.--Carapace oblong oval, very convex. Middle projection of the front of the carapace subtriangular but rounded at the tip. Lateral lobes of the carapace, triangular and acute, reaching farther forward than the middle lobe. Eye-stalks very long and slender. Telson narrowly triangular, acute; outer surface convex, smooth, glossy.

Dimensions.--Length of carapace 26.5 mm.

Color.--Steel gray above; under surface and legs of a whitish pink color.

Stations.--4, 10, 22.

Depths.--Found in the wash of the waves, especially where small creeks flow across the beach and into the wave washed area.

Pacific Coast Distribution.--From Oregon to Panama (Holmes).

Family Porcellanidae

Body crablike. Abdomen bent under and folded against the thorax. Tail fan well developed. First pair of legs chelate, long and stout. Fifth pair of legs small and elevated so that they rest on the carapace edge.

Key to the Coos Bay, Oregon Genera of Porcellanidae

I. Chelipeds equal or subequal, broad and flattened; carpus more or less elongated.

Genus *Petrolisthes* p. 31

Plate XXVI



Pachycheles rudis

Both females. 5/8 x N.

Dorsal views showing method of folding
of the hindmost pair of legs.

- II. Chelipeds unequal, thick and more or less roughened; carpus short.
Genus *Pachycheles*.

Genus *Pachycheles* Stimpson

Carapace rounded, ovate, at least as broad as long. Epimera of carapace posteriorly broken up. Chelipeds unequal, thick, more or less roughened. Carpus short.

Key to the Coos Bay, Oregon Species of *Pachycheles*

- I. Chelipeds rugose, granulated and tuberculated above and furnished with a prominent, naked, granulated tubercle on the median distal portion of the palm near the gape of the fingers. Lateral plates of the telson in one piece.
- A. Chelipeds covered with thick, even, velvety, dense, pubescence, which also fills the gape between the fingers.
No representatives found.
- B. Chelipeds with only a few scattered, coarse hairs on upper surface, and with only a few if any in the gape of the fingers.
Pachycheles rudis.
- II. Chelipeds evenly rounded. Granulated chelipeds with granules hidden by a short thick pubescence, which is interspersed with tufts of erect, long hairs. Lateral plates of the telson composed of two pieces.
Pachycheles pubescens.

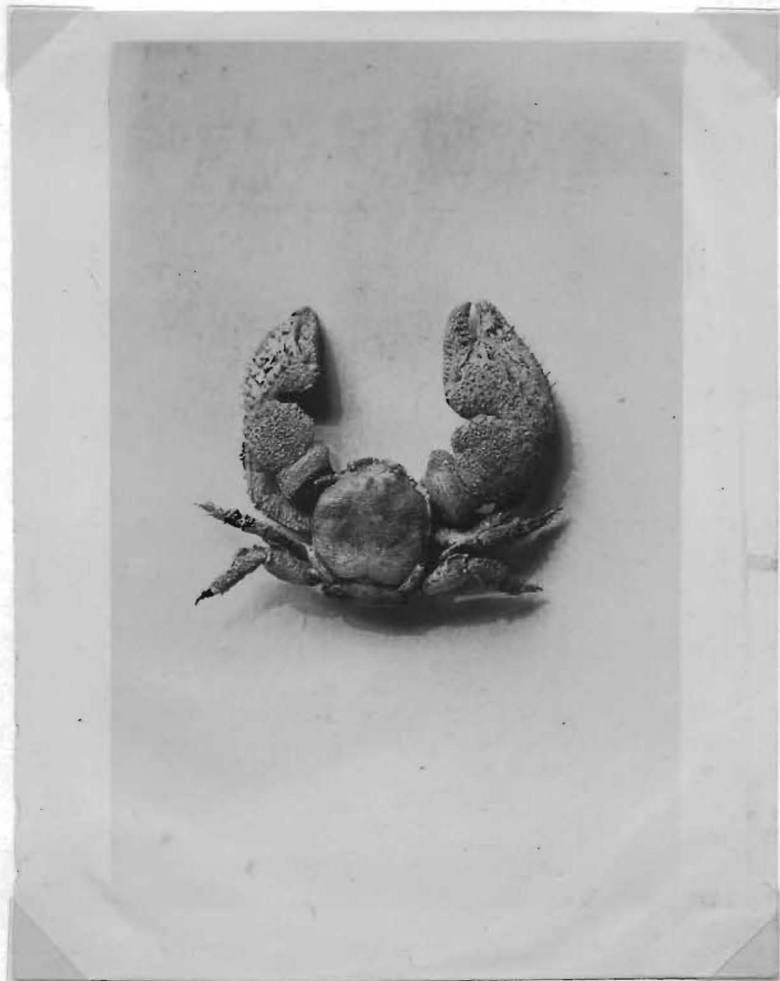
Pachycheles rudis Stimpson
Plate XXVI

Pachycheles rudis Stimpson; Lockington; Holmes; Rathbun; Baker; Schmitt.

Local name.--Thick clawed crab; sleepy crab.

Characters.--Chelipeds unequal, with a rugose, irregularly granulated and tuberculated upper surface, provided with a scant covering of coarse hairs. Immovable finger of larger hand exceeds one-half the length of the movable one. On the cutting edge of the movable finger, near its base, there is a large, white, double tooth. Near the cutting edge of the immovable finger is a large tooth. There are no large teeth on the anterior side of the carpus. Telson composed of five plates. Walking legs have light colored hair.

Plate XXVII



Pachycheles pubescens.

Male. 1 1/4 x N.

Dorsal view showing bristle tufts on
the hands.

(Antennae broken away close to their
bases.)

Dimensions.--Type: length of carapace 18 mm.

Color.--Brownish yellow to light yellow.

Stations.--1, 3, 4, 5, 7, 16, 17, 18. In crevices and pits in clam bored sandstone rocks.

Depths.--Between high and low tide marks.

Pacific Coast Distribution.--Kodiak, Alaska, to San Diego, California (Schmitt).

Pachycheles pubescens Holmes

Plate XXVII

Pachycheles pubescens Holmes; Balss; Schmitt.

Local name.--None.

Characters.--Chelipeds unequal, evenly rounded, uniformly granulated; granules practically hidden by short, thick, even pubescence, which covers the upper surface and fills the gape of the fingers with a dense, bushy growth. Numerous tufts of long, stiff hairs are scattered through the pubescence on the dorsal surface of the hands. Immobile finger is half or less than half as long as the movable one. Anterior edge of the carpus is cut into four large, triangular teeth with secondary teeth on their edges. Telson composed of seven plates.

Dimensions.--Type: length of carapace is 15.2 mm.

Color.--Light brown. Sandy color.

Stations.--3, 4, 5, 16. In pits and crevices of clam bored sandstone rocks.

Depths.--Around low tide line.

Pacific Coast Distribution.--Port Orchard, Puget Sound, Washington, to Monterey Bay, California (Schmitt).

Genus *Petrolishes* Stimpson

Carapace subovate; front triangular. Epimera entire. Chelipeds equal or subequal, broad and flattened; carpus elongated.

Plate XXVIII



Petrolisthes cinctipes.

Male. 1 1/4 x N.

Dorsal view showing lobe at inner proximal angle of the carpus.

Key to Coos Bay, Oregon Species of Petrolishes

- I. Carpus of chelipeds with parallel front and back margins, about twice as wide as long. Merus of ambulatory legs hairy.

Petrolishes eriomerus.

- II. Carpus of chelipeds with sides not parallel, and with a distinct lobe at its inner, proximal angle. Carpus one and one-half times as long as wide. Merus of ambulatory legs not hairy.

Petrolishes cinctipes.

Petrolisthes cinctipes (Randall)

Plate XXVIII

Porcellana cinctipes Randall.

Porcellana rupicola Stimpson.

Petrolisthes cinctipes Holmes; Rathbun; Baker; Schmitt.

Local name.--Scuttler crab.

Characters.--Carpus of chelipeds one and one-half times as long as wide, anterior and posterior margins converge distally. Anterior margin with large lobe at proximal end. Merus of ambulatory legs not hairy. Carapace with more longitudinal convexity than in *Petrolisthes eriomerus*.

Dimensions.--Type: Length of carapace 18.8 mm. Most are smaller than this.

Color.--Reddish brown with purplish blue lateral shade.

Stations.--1, 2, 3, 4, 5, 7, 8, 9, 10, 16, 17, 18, 19, 20. Among the rocks and in rock crevices around low tide line.

Depths.--From extreme high tide to high low tide line.

Pacific Coast Distribution.--Vancouver Island, British Columbia, to the Gulf of California (Rathbun).

Plate XXIX



Petrolisthes eriomerus.

Male. 1 1/4 x N.

Dorsal view showing long, parallel
sided carpus of chelipeds.

Petrolisthes eriomerus Stimpson

Plate XXIX

Petrolisthes eriomerus Stimpson; Holmes; Schmitt;
Way.

Local name.--Long armed crab.

Characters.--Carpus of chelipeds about twice as long as wide, front and posterior margins parallel. Lobe at inner, proximal angle of the carpus never prominent if present at all. Merus of ambulatory legs hairy. No small hairs on the antennae.

Dimensions.--Type: length of carapace 17.1 mm. Most are smaller than this.

Color.--Sometimes bright blue. Generally dark reddish brown with more or less of a blue cast along side margins.

Stations.--1, 4, 8, 16. Among the rocks and algae around low tide line.

Depth.--Between tide lines.

Pacific Coast Distribution.--British Columbia to Lower California (Schmitt).

Tribe BRACHYURA

Subtribe OXYSTOMATA

No representatives found.

Subtribe DROMIACEA

No representatives found.

Subtribe BRACHYGNATHA

Last pair of legs normal. Antennae short, never equal to one-half of the width of the carapace. Antennules usually lodged in special fossettes. Female openings sternal, rarely coxal. First Pleopods wanting in female.

Subtribe Brachygnatha. p. 33.

Key to Coos Bay, Oregon Superfamilies of Brachygnatha

- I. Fore part of body narrow. A distinct spined or pointed rostrum present. Superfamily Oxyrhyncha. p. 33.
- II. Fore part of body broad. Rostrum reduced or wanting. Superfamily Brachyrhyncha. p. 33.

Superfamily Oxyrhyncha

Key to Coos Bay, Oregon Families of Oxyrhyncha

- I. Chelipeds rarely much greater than other legs, very mobile. Orbits more or less incomplete. Family Inachidae. p. 33-34
- II. Chelipeds much longer and heavier than other legs, not very mobile. Orbits complete. No representatives found.

Family Inachidae (Maidae)

Basal joint of antennual well developed, usually fused with the epistome. Orbits more or less incomplete. Chelipeds rarely much greater than other legs, very mobile.

Key to Coos Bay, Oregon Genera of Inachidae

I. Basal joint of antennae extremely slender throughout its length and usually long.

A. Rostrum simple.

No representatives found.

B. Rostrum bifid. Postocular spine prominent. Dactyl one-half total hand length.

Genus *Oregonia*.

II. Basal joint of antennae not extremely slender, often very wide.

A. Basal joint of antennae truncate-triangular. Eyes with no true orbits.

1. Antennae concealed beneath rostrum.

Genus *Epialtus*.

2. Antennae not concealed beneath rostrum.

a. Lateral margins of carapace not markedly flattened or produced; with two large lobes or teeth on each side.

Genus *Pugettia*.

b. Lateral margins of carapace produced into flat winglike plates.

Genus *Mimulus*.

B. Basal joint of antennae either produced outward or with one or more distal spines. Eyes with orbits.

1. No preocular spine.

No representatives found.

2. A preocular spine present.

a. Postocular spine flattened.

No representatives found.

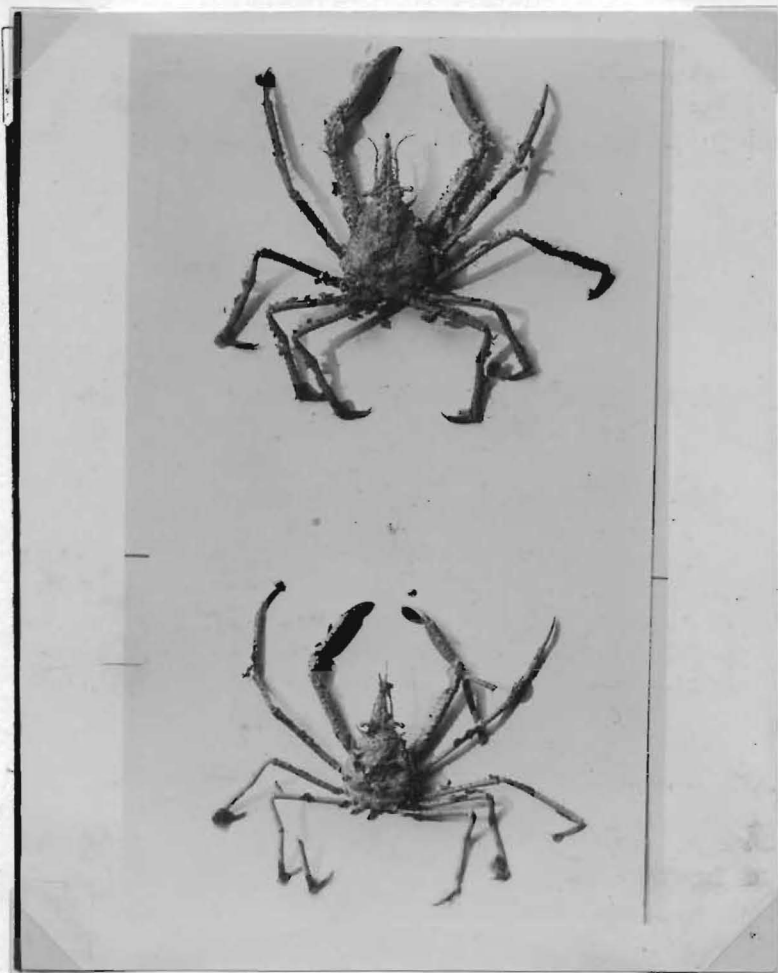
b. Postocular spine deeply cupped on anterior face and without hairs.

1. Rostrum composed of two long, slender, straight, cylindrical spines that diverge from the base.

Genus *Chorilia*. p. 32

ii. Rostrum composed of two short flattened horns.

Plate XXX



Oregonia gracilis

Both males. 1/2 x N.

Dorsal views showing long, bifid rostrum
with eyes at right angles.

a. Rostral horns flattened and leaflike
and one-fourth length of carapace
Genus *Scyra*.

b. Rostral horns very short. One-tenth of
carapace length.
No representatives found.

Genus *Oregonia* Dana

Carapace flattened, not spinose. Rostrum consisting of two long, slender, contiguous spines. Postocular spine present and prominent. Chelipeds slender.

Oregonia gracilis Dana

Plate XXX

Oregonia gracilis Dana; Doflein; Holmes; Rathbun;
Way; Schmitt.

Local name.--Spider crab.

Characters.--Carapace subtriangular, roughened by small prominences. Rostrum bifid, composed of two long, slender contiguous spines; postocular spine prominent, slender, acute and inclined forward. Chelipeds slender; hand long, slender, smooth and incurved. Dactyl one-half of the total length of the palm.

Dimensions.--Type: length 32.1 mm.

Color.--Tan to gray tan. Usually heavily decorated with seaweed and hydroids.

Stations.--11, 12, 14, 16.

Depths in feet.--75, 45, 35. At station 16 one specimen was found one-half of the way out on the sunken jetty just after a severe gale, which probably carried it up from station 14 onto the rocks of the jetty.

Pacific Coast Distribution.--Bering Sea, to Monterey Bay, California (Schmitt)

Genus *Epialtus* Milne Edwards

Carapace smooth or slightly tuberculated; two or more well developed lateral projections. Rostrum broad, triangular or oblong, bifid; or two spined or entire. Flagellum of the antennae concealed beneath the rostrum. Ambulatory legs stout and subcylindrical.

Only one species of this genus was found in this survey.

Plate XXXI



Pugetina
Epialtus productus

Male. 1/4 x N.

Dorsal view showing characteristic
rostrum shape.

Plate XXXII



Mimulus foliatus 3/4 x N.

Upper.--male. 1 x N.

Lower two.--females. 1 x N.

Dorsal views showing winglike projections of the carapace.

^{pus}
Epialtus productus Randall**Plate XXXI**

**Epialtus productus Randall; Rathbun; Holmes; Weymouth;
Baker; Way; Schmitt.**

Local name.--Kelp crab. Brown crab.

Characters.--Carapace smooth, sides in front of the back lateral teeth nearly parallel. Rostrum bifid, deeply notched. Preocular spine small, triangular; postocular spine also small. Chelipeds stouter and shorter than the first legs. (Except in old males such as the one shown in Plate XXVI.) Hand long and narrow, palm oblong, slightly carinated above, fingers slender.

Dimensions.--Type: length of the carapace of an old male from rostrum tip to back of carapace 140 mm.

Color.--Varies from a light yellow to tan, or even brown. Typically kelp colored. Under parts reddish. Males usually bright red beneath.

Stations.--1, 3, 4, 5, 7, 8, 9, 10, 15, 16, 17, 18, 20. Among the rocks and brown algae at and below low tide line.

Depths.--From mean tide level to 4 feet below low tide level.

Pacific Coast Distribution.--British Columbia to Lower California (Rathbun).

Genus Mimulus Stimpson

Carapace flattened, smooth, more or less pentagonal; lateral portions laminate, much produced, winglike. Rostrum short, bifid, horizontal. Orbits with pre and postocular spines but incomplete below. First ambulatory legs much longer than the others.

Mimulus foliatus Stimpson**Plate XXXII**

**Mimulus foliatus Stimpson; A. Milne Edwards; Holmes;
Rathbun; Weymouth; Schmitt.**

Local name.--None.

Characters.--Carapace flattened and marked with several undulations; lateral expansions a little reflexed, margin behind

Plate XXXIII



Pugettia gracilis.

Male. 1 x N.

Dorsal view showing winglike expansions of the carapace back of the eyes and carina on the upper merus surface.

incision twice the length of that in front. Rostral horns short, flattened, with convex outer margins, notch triangular and setose. Preocular tooth large, triangular, acute. Chelipeds of male large; hand oblong. Abdomen of female elliptical, seven jointed counting the telson.

Dimensions.--Type: length 31.2 mm.

Color.--Purplish red carapace. Legs reddish with gray bands.

Stations.--5, 9, 16. Found without exception in the closed, empty shells of Hinnites giganteus, that were still fastened to rocks at or below extreme low tide line.

Depths.--At or a few feet below lowest low tide line.

Pacific Coast Distribution.--Unalaska, Alaska, to Mazatlan, Mexico (Rathbun).

Genus Pugettia Dana

Upper surface of the carapace has spines or tubercles. Margin behind the eye expanded. Behind this expansion the carapace edge is constricted. Rostrum two spined. Flagellum of antennae not entirely covered by the rostrum. Preocular spine large.

Pugettia gracilis was the only species of the genus Pugettia found in this survey.

Pugettia gracilis Dana

Plate XXXIII

Pugettia gracilis Dana; Holmes; Rathbun; Weymouth; Way; Schmitt.

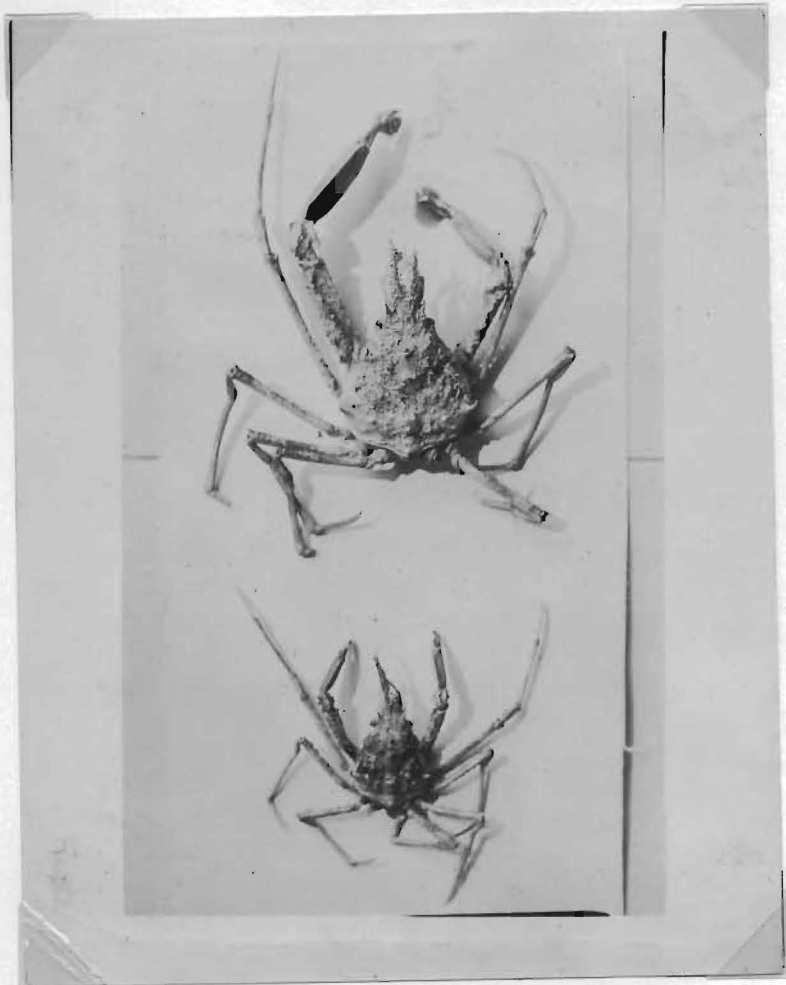
Local name.--Spider crab.

Characters.--Carapace broadly ovate, tuberculated; middle front tubercle small and sometimes even obsolete. Preocular tooth broad; postocular tooth triangular, acute and pointing somewhat forward. Hepatic expansion very wide. Postocular spine and first anterolateral tooth united by a leaflike expansion of the carapace. Ischium of the maxillipeds grooved. Merus of chelipeds has a prominent, irregularly toothed carina on upper side.

Dimensions.--Type, male: length 32 mm.

Color.--Upper surface brownish red. Lower surface yellow brown.

Plate XXXIV



Chorilia longipes

Upper: Male. 1 x N.

Lower: Female. 1 x N.

Dorsal views showing characteristic rostral spines and pyriform body.

(Tips of chelipeds of upper specimen distorted by glue used in fastening specimen to the card.)

Stations.--3, 4, 5, 7, 8, 9, 10, 15, 16, 17, 18, 20.
Among the rocks and algae around low tide line.

Depth.--From high tide line to a few feet below low low tide line.

Pacific Coast Distribution.--Aleutian Islands, to Southern California (Rathbun).

Genus *Chorilia* Dana

Carapace pyriform, inflated and spiny. Rostrum composed of two long, slender, spiny straight, cylindrical spines, diverging from the base. Preocular spine prominent, acute; posterior spine acute deeply cupped in front and without hairs. First pair of ambulatory legs much the longest.

Chorilia longipes Dana

Plate XXXIV

Chorilia longipes Dana.

Hyastenus longipes Rathbun.

Hyastenus (*Chorilia*) *longipes* Holmes.

Chorilia longipes Rathbun; Weymouth; Way; Schmitt.

Local name.--None.

Characters.--Carapace covered with sharp spines of unequal length. Rostrum long, spines nearly straight, pubescent and divergent. Hands of chelipeds long, slender, compressed; palm has a small tubercle on its outer side near the articulation; fingers long and slender. Legs covered by a short pubescence.

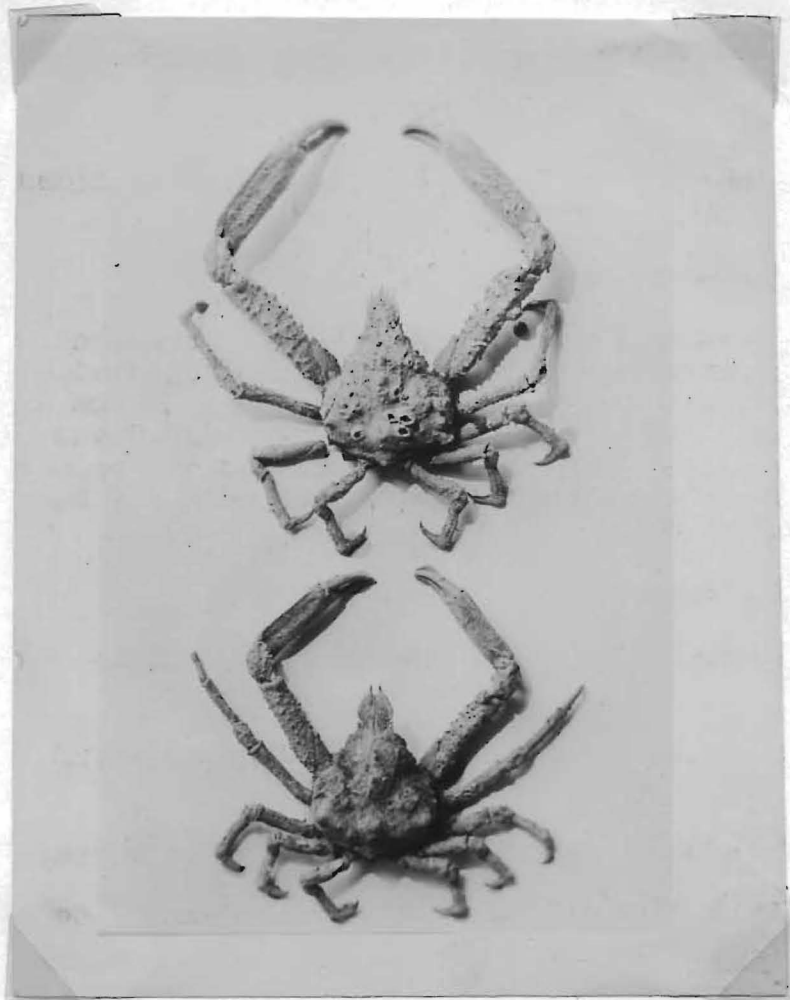
Dimensions.--Type, male: Length 32.2 mm.

Color.--Yellowish tan carapace. Tubercles of the carapace orange. Legs spotted with orange red. Fingers orange red.

Stations.--11. Taken by a fisherman's trawl from deep water.

Depth in feet.--75 feet.

Pacific Coast Distribution.--Kadiak, Alaska to off San Diego, California (Schmitt).



Seyra acutifrons

Both males. 1/2 x N.

Dorsal views showing characteristic
ovate rostral spines.

Genus *Scyra* Dana

Carapace subpyriform, tuberculated, but not spiny. Rostrum composed of two, short flattened ovate horns. Preocular spine present, acute; postocular spine deeply concave on its front face and without hairs. Orbits small, deep, with a fissure above and below, the lower and sometimes the upper being open.

Scyra acutifrons Dana

Plate XXXV

Scyra acutifrons Dana; Holmes; Rathbun; Weymouth; Way; Schmitt.

Local name.--Pear shape crab.

Characters.--Rounded tubercles on the carapace. Gastric region has an acute tubercle near the center, behind this one is a larger obtuse tubercle. Rostrum short, horns ovate-lanceolate, about one-fourth the length of the carapace. Chelipeds of the male large, hand long, narrow, compressed, palm below the wide carina often inflated; fingers deflexed and in old males are gaping at the base.

Dimensions.--Type, male: length 40 mm.

Color.--Grayish tan with reddish splotches on the legs and hands.

Stations.--3, 4, 9, 16. Under the larger rocks at low tide line.

Depth.--Between high low and low low tide lines.

Pacific Coast Distribution.--Kadiak, Alaska, to San Diego, California (Rathbun).

Superfamily Brachyrhyncha

Key to Coos Bay, Oregon Families of Brachygnatha

I. Carapace usually round or transversely oval, circular rather than square. Frontal region generally produced horizontally into lobes or teeth.

A. Antennules fold back longitudinally. Front with several teeth, one of which is median.

1. Carapace subcircular. Antennal flagella long and hairy.

Family Atelecyclidae.

p. 46

2. Carapace broadly oval; antennal flagella usually short and hairy.

Family Cancridae. p. 40.

- B. Antennules fold back transversely or obliquely. Front generally divided by median notch.

1. Carapace rather transversely oval. Fingers of chelipeds curved.

Family Xanthidae. p. 46

2. Carapace squarish. Fingers of chelipeds straight longitudinally.

No representatives found.

- II. Carapace usually square or squarish, somewhat quadrilateral in outline. Frontal region broad, bent down, usually without teeth or sharp lobes.

- A. Small commensal or symbiotic crabs. Carapace often membranaceous and frequently more or less rounded.

Family Pinnotheridae.

- B. Free living crabs. Carapace hard, its lateral margins strictly parallel or only a little arched.

1. Front wide, eye-stalks of medium size. Dactyls compressed.

Family Grapsidae.

2. Front narrow. Eye-stalks usually very long. Dactyls styliform.

No representatives found.

Family Cancridae

Carapace broadly oval, front with several teeth, one of which is median. Antennules fold back longitudinally. Antennal flagella short and hairy.

Genus Cancer Linnaeus

Carapace transverse, often indistinctly areolated, front narrow and cut into five lobes. Eye-stalks short.

Key to Coos Bay, Oregon Species of Cancer

- I. Carapace nearly circular in outline. It has no prominent angles at the sides; 12 to 13 teeth on the anterolateral margin.

Cancer oregonensis.

71.

II. Carapace markedly wider than long, with marked angle where front and back margins meet. Nine to twelve teeth on anterolateral margin.

A. Portion of carapace between eyes produced forward with five nearly equal teeth. Finger black on inner margin.

Cancer productus.

B. Front between eyes made up of five unequal teeth and spacing of teeth is unequal. Finger tips either black or white.

1. Fingers of cheliped dark tipped.

a. Carpus of chelipeds has two spines, one above at distal end and the other below on the inner angle.

i. Carapace not hairy.

No representatives found.

ii. Carapace is hairy.

x. Tenth tooth back of eye easily seen and eleventh is present.

Cancer gibbosulus.

xx. Eleventh tooth not present.

No representatives found.

b. Carpus has spine at distal end, but none below on the inner angle.

i. Under parts red spotted.

Cancer antennarius.

ii. Under parts uniform light color.

No representatives found.

2. Fingers of cheliped white tipped.

a. Tenth tooth back of eye on margin larger than others. Dactyls flattened and fringed with hair.

Cancer magister.

b. Posterior tooth of margin not markedly large. Dactyls long, slender, round and naked.

Cancer gracilis.

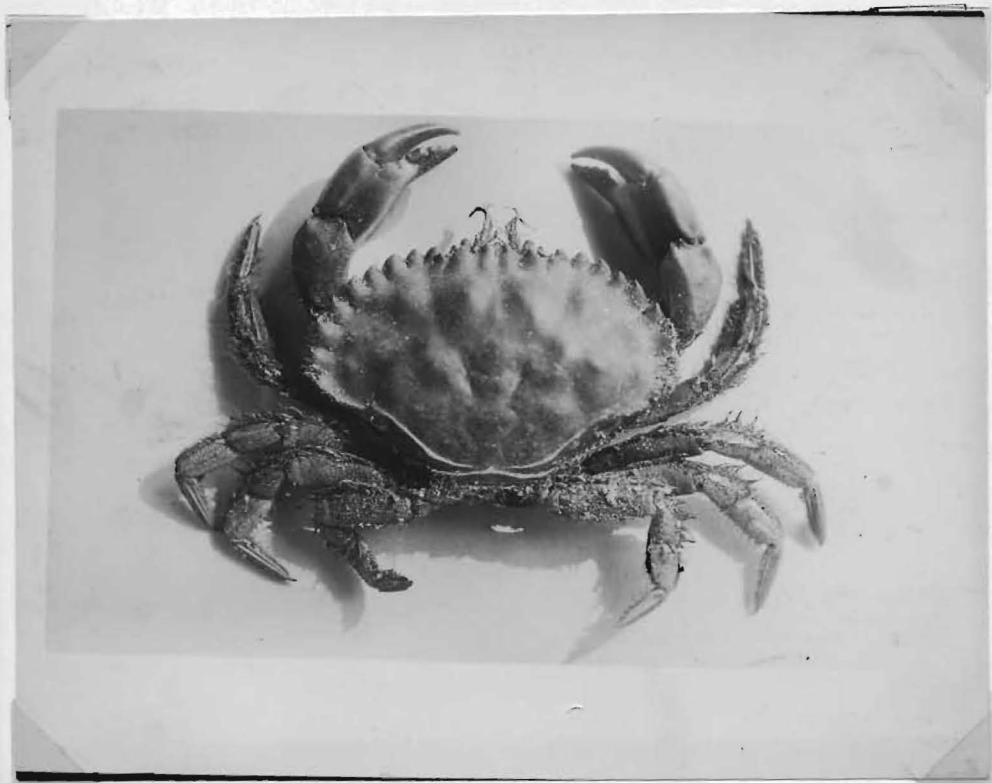


Cancer productus

Male. $1/2$ x N.

Dorsal view showing the five equally produced teeth of the rostrum.

Plate XXXVII



Cancer antennarius

Male. 1/2 x N.

Dorsal view showing hairy legs and characteristic toothing of the rostrum.

Cancer productus Randall

Plate XXXVI

Cancer productus Randall; Dana; Lockington; Rathbun;
Holmes; Weymouth; Way; Schmitt.

Local name.--Red crab. Japanese crab. Bull crab. Rock crab. Poison crab.

Characters.--Front markedly produced between the orbits into five nearly equal teeth which are practically equally spaced. Closed fissures occur between the teeth of the anterolateral carapace margin. Carpus has large tooth at the antero-internal angle and a smaller one behind the upper hinge joint. Dark color on the cheliped dactyls reaches less than one-half the length of the outer margin.

Dimensions.--Type: length 70 mm.

Color.--Red to red brown above. Orange yellow below. Young specimens often with white lines on carapace.

Stations.--2, 4, 6, 7, 10, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25. Among and under rocks, algae and old piling on a sandy bottom.

Depths.--Between high and low tide lines. At stations 24 and 25 only in summer.

Pacific Coast Distribution.--Kakiak, Alaska, to Magdalena Bay, Lower California (Schmitt).

Cancer antennarius Stimpson

Plate XXXVII

Cancer antennarius Stimpson; Rathbun; Holmes; Weymouth;
Schmitt.

Local name.--Hairy crab.

Characters.--Carapace smooth, widest at the eighth tooth; eleventh tooth distinct. Carapace front not produced, its three middle teeth separated from the outer two, middle tooth below its two neighbors. Dark color on the fingers of the chelipeds reaches more than one-half the length of the outer margins. Under parts spotted with red. An ambulatory leg dactyl has eight longitudinal sulci, three superior, three inferior, one anterior and one posterior.

Dimensions.--Type: length 60 mm.

Color.--Dark red with faint gray yellow mottling. Under parts ivory white and spotted with red.

Plate XXXVIII



Cancer gibbosulus

Male. 1 x N.

Dorsal view showing pubescence of
the carapace and spiny tipped carapace
teeth.

Stations.--4, 5, 16. Among the rocks an algae between high low and low low tide lines.

Depth.--Between high low and low low tide lines.

Pacific Coast Distribution.--Queen Charlotte Sound, British Columbia, to Magdalena Bay, Lower California (Rathbun).

Cancer gibbosulus (De Haan)

Plate XXXVIII

Corystes (*Trichocera*) *gibbosula* De Haan.

Cancer gibbosulus Rathbun; Weymouth; Schmitt.

Local name.--None.

Characters.--Carapace markedly aerolated, pubescent, hairs rather harsh; anterolateral margin, including outer angle of the orbit, with nine strongly produced and forward-curving teeth, all but first two tipped with spines, behind these a well developed tooth directed upward, and a spine representing the eleventh; front with five acute teeth, the three middle ones smaller than the outer two, Chelipeds hairy; upper surface of the hand with two rows of three to five spines, outer surface with five costae marked with hairs and small spines. Dark color on fingers reaching less than one-half the length of their outer margins. Ambulatory legs hairy; dactyls slightly, longer than the propodi, straight, tipped with nearly straight, corneous spines.

Dimensions.--Type: length 32 mm.

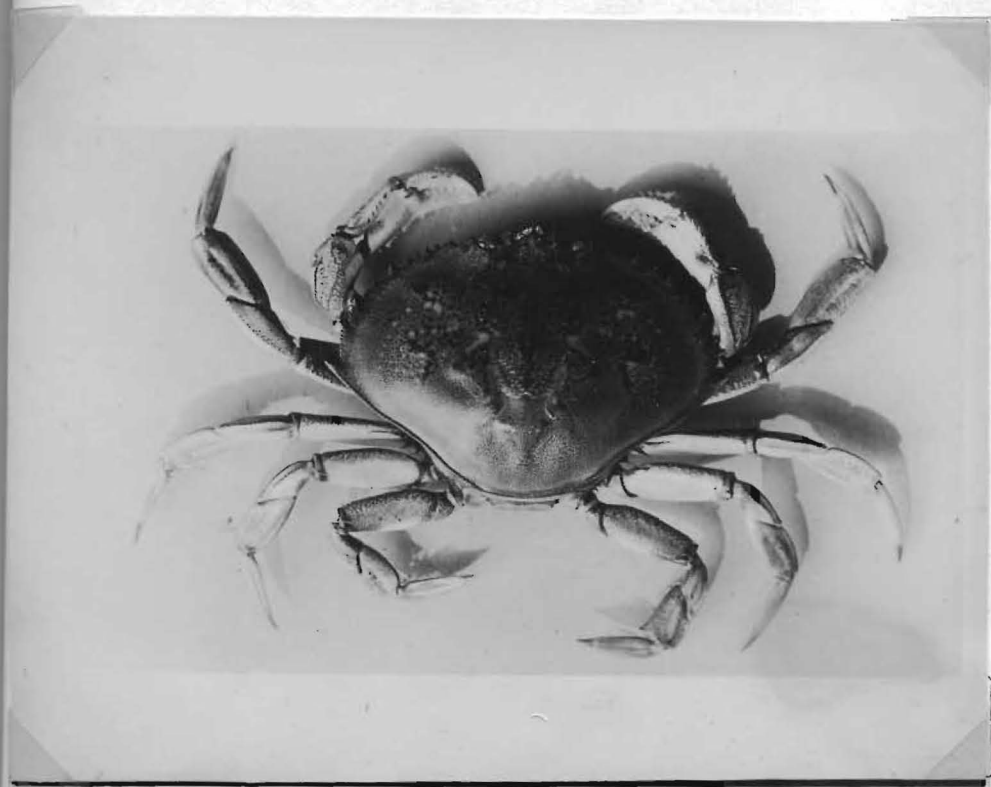
Color.--Pinkish white to light tan splotted with symmetrical areas of reddish. Legs banded with reddish.

Stations.--8, 16. On the rocks and among the algae. Always near a sandy area.

Depths.--From low low tide line to 4 feet below this line.

Pacific Coast Distribution.--Port Althorp, Alaska, to San Geronimo Island, Lower California (Schmitt).

Plate XXXIX

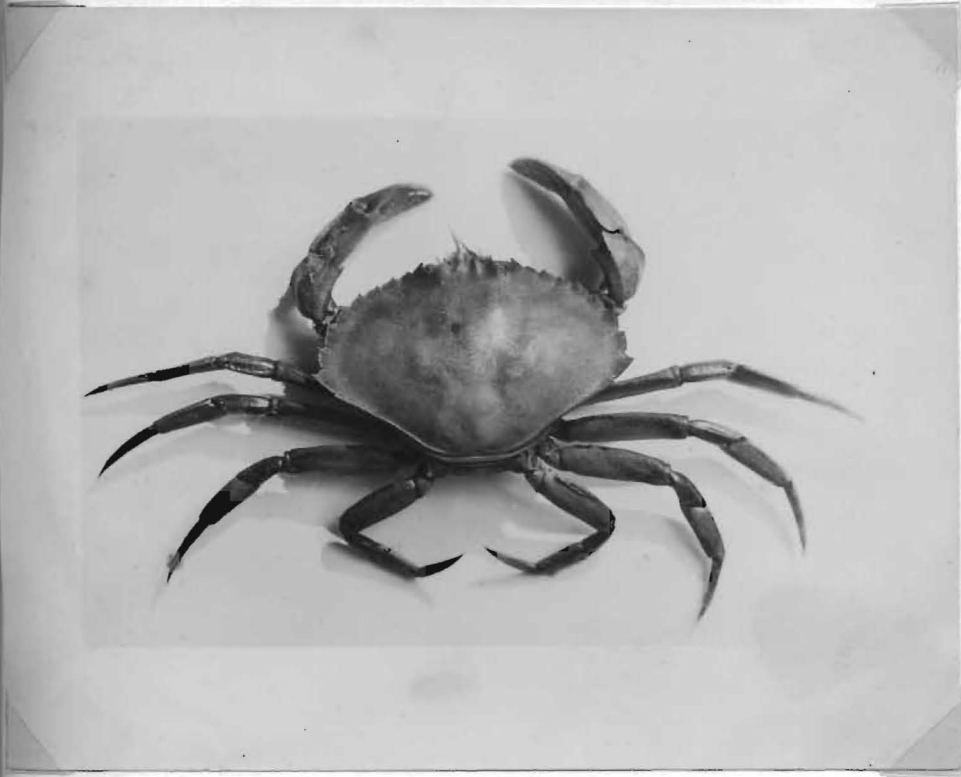


Cancer magister

Male. 1 x N.

Dorsal view showing strongly produced last spine on carapace.

Plate XL



Cancer gracilis

Male. 1/2 x N.

Dorsal view showing long, rounded dactyls.

Cancer magister Dana

Plate XXXIX

Cancer magister Dana; Rathbun; Holmes; Weymouth;
Way; Schmitt.

Local name.--Edible crab. Common crab.

Characters.--Carapace widest at tenth anterolateral tooth. Anterolateral teeth serrated anteriorly. Front not produced, the three middle teeth small, the middle one slightly larger than the other two; outermost pair larger than the other three and not reaching farther forward. Carpus of the chelipeds has a single spine above at the distal end. Fingers of chelipeds with no dark color. Dactyls of the ambulatory legs much flattened.

Dimensions.--Type: length 36 mm. Many specimens are much larger than this.

Color.--Reddish brown overlaid with gray above. Light orange to yellow below. Inner sides of the hands crimson.

Stations.--2, 4, 6, 8, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25. Among the algae on sandy bottom.

Depths.--From high low tide line down to 30 feet below this line.

Pacific Coast Distribution.--Unalaska, to Magdalena Bay, Lower California (Rathbun).

Cancer gracilis Dana

Plate XL

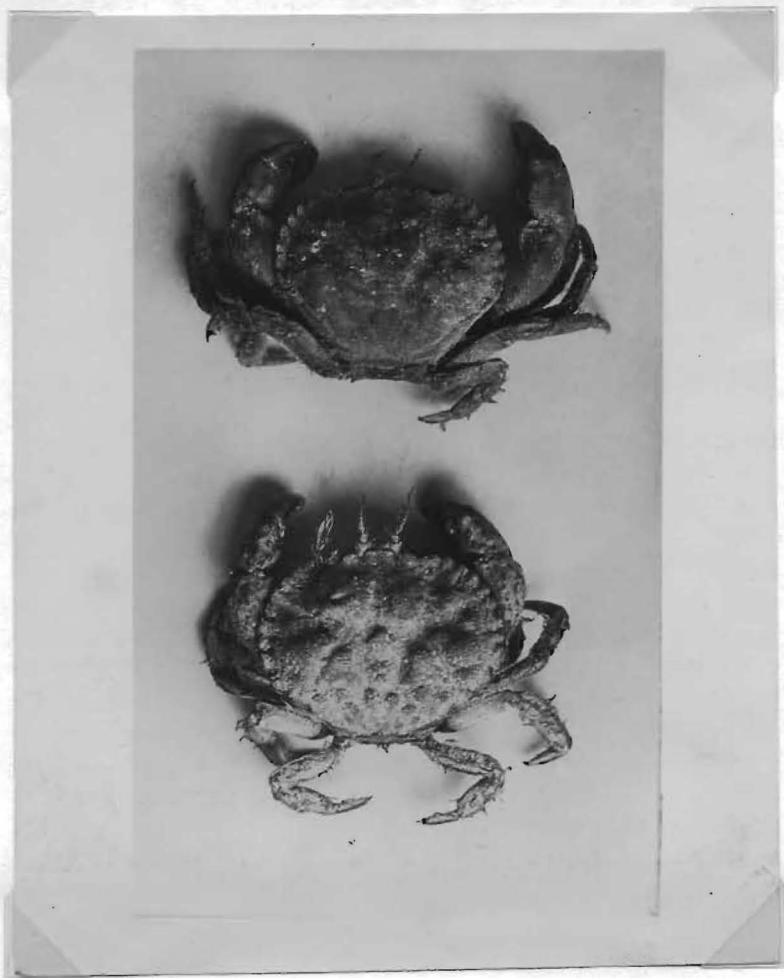
Cancer gracilis Dana; Holmes; Rathbun; Weymouth; Way;
Schmitt.

Local name.--Red handed crab.

Characters.--Carapace somewhat convex, slightly aerolated; anterolateral teeth low, not spiny pointed. Front not produced; the three middle teeth reach farther forward than the outer pair; the central tooth is smaller than the others but projects farther forward. Carpus of chelipeds has two spines, one above, at the distal angle, and a second below this on the inner angle. No dark color on the fingers of the chelipeds. Dactyls of the ambulatory legs slender and not flattened.

Dimensions.--Type: length 56 mm.

Plate XLI



Cancer oregonensis

Above.--Male. 1 x N.

Below.--Female. 1 x N.

Dorsal views showing somewhat circular carapace.

Color.--Brownish olive. Under parts and legs yellowish. Upper one-half of the hands red.

Stations.--10, 14, 15, 16. Buried in the sand under dense algae growth.

Depths in feet.--Three to forty-five feet.

Pacific Coast Distribution.--Kasaan Bay, Prince of Wales Island, to Playa Maria Bay, Lower California (Rathbun).

Cancer oregonensis (Dana)

Plate XLI

Trichocera oregonensis Dana.

Trichocarcinus oregonensis Holmes.

Trichocarcinus walkeri Holmes.

Cancer oregonensis, Rathbun; Weymouth; Way; Schmitt.

Local name.--Lumpy crab.

Characters.--Carapace elliptical, somewhat evenly rounded at the sides. Carapace widest at the eighth tooth; twelve or thirteen teeth; fronto-orbital width nearly one-half that of the carapace. Carpus of the chelipeds with a spine at the front inside angle, below which there is a tooth. Hand thick and high. The short upper edge of the palm has two rows of small tubercles, outer surface has five granulated lines. Fingers of the chelipeds has dark color extending more than one-half the length of their outer margins.

Dimensions.--Type: length 26 mm.

Color.--Dark red above with the aerolations brighter red. Very light red beneath.

Stations.--1, 3, 4, 9, 10, 16, 17, 18. Among the rocks and in crevices and holes of the rocks.

Depth.--Between high low and low low tide lines.

Pacific Coast Distribution.--Aleutian Islands, to Lower California (Holmes).

Plate XLII



Telmessus cheiragonus

Male. 1 x N.

Dorsal view showing characters of peculiar carapace shape.

(Left first ambulatory leg missing.)

Family Atelecyclidae

Carapace subcircular front with several teeth, with either a median notch or a tooth. Antennules fold back longitudinally. Third maxillipeds overlapping the endostome.

Genus *Telmessus* White

Carapace broader than long, somewhat pentagonal, front three lobed; median lobe cut into four teeth; lateral lobes form the inner angles of the eyes. Chelipeds short, ambulatory legs moderately long.

Telmessus cheiragonus (Tilesius)

Plate XLIII

Cancer cheiragonus Tilesius.

Telmessus cheiragonus Benedict; Holmes; Rathbun;
Way; Schmitt.

Local name.--Hel grass crab.

Characters.--Carapace deeply areolated; lateral lobes of the front triangular. Lateral teeth of the carapace triangular, six in number, points of teeth bent forward, the fourth tooth forms the lateral angle of the carapace and has four denticles on the anterior edge; surface of carapace set with large granules from which arise numerous bristles of even length.

Dimensions.--Type: length 32 mm.

Color.--Yellow green to yellow brown.

Stations.--14, 15, 16, 19. In a few feet of water among dense green algae growth.

Depths in feet.--Extreme low water line down to 25 feet.

Pacific Coast Distribution.--Bering Sea, to California (Holmes).

Family Xanthidae (Pilumnidae)

Carapace somewhat transversely oval; front moderately broad, often toothed, in the latter case it always has a median notch; anterolateral margins arcuate and they have several lobes, teeth or spines. Fingers of the chelipeds more or less curved.

Plate XLIII



Lophopanopeus bellus

Male. 1 x N.

Dorsal view showing characteristic
teeth and markings of the carapace.

(Left third ambulatory leg missing.)

Genus *Lophopanopeus* Rathbun

Carapace somewhat hexagonal or subquadrate; front short and divided by a nearly closed or a closed fissure. Postorbital tooth small. Front one-half of the anterolateral margin almost straight and with one low tooth; posterior one half of the anterolateral margin almost longitudinal and it has three prominent, subequal teeth. Abdomen of the male five jointed.

Lophopanopeus bellus (Stimpson)

Plate XLIII

Xantho bella Stimpson.

Lophoxanthus bellus A. Milne Edwards; Holmes.

Lophopanopeus bellus Rathbun; Weymouth; Way; Schmitt.

Local name.--None.

Characters.--Carapace roughened anterolaterally; frontal lobes a little sinuous and oblique, outer tooth faintly indicated. Hand smooth without a tooth on the upper margin. Dark color of the fingers does not run back on the palm. Carpal joints of the ambulatory legs slightly bilobed on the upper margin; propodal joints have a convex anterior margin without lobes.

Dimensions.--Type: length 24 mm.

Color.--No set color. Specimens are red, blue, cream, gray, brown or various mixtures of these colors; that is, part red and part cream, etc.

Stations.--1, 3, 4, 5, 9, 10, 12, 16, 17, 18. In sand under the rocks.

Depths.--From low tide line to 40 feet below.

Pacific Coast Distribution.--Alaska, to Lower California (Schmitt).

Family Pinnotheridae Dana

Carapace somewhat quadrilateral, more or less rounded, usually somewhat membranous. Front, orbits and eye-stalks very small; anterolateral margins entire. Abdomen of male narrow; abdomen of female often as large as the carapace. Small commensal or symbiotic crabs living in mantle cavity of clams and mussels, in worm tubes, etc.

Plate XLIV



Pinnotheres concharum

Male. $3 \frac{1}{2}$ x N.

Dorsal view showing characteristic
carapace outline.

Key to Coos Bay, Oregon Genera of Pinnotheridae

I. Carapace little if any wider than long.

A. Carapace hard in both male and female, smoothly convex; third walking leg longest.

Genus *Scleroplax*.

B. Carapace soft in female, hard in the male, not smoothly convex from the center. Anterolateral margins high or defined by a ridge. Second or fourth walking legs the longest.

1. With longitudinal sulcus extending backward from the upper margin of each orbit and enclosing a median area.

Genus *Fabia*.

2. Without longitudinal sulci.

Genus *Pinnotheres*.

II. Carapace at least one and one-half times as wide as long.

Genus *Pinnixa*

Genus *Pinnotheres* Latreille

Carapace smooth, membranous or hard, suborbicular or pentagonal, without longitudinal sulci behind orbits. Ischium of outer maxillipeds rudimentary, merus large walking legs of moderate length and subequal.

Pinnotheres concharum (Rathbun)

Plate XLIV

Cryptophrys concharum Rathbun; Holmes; Weymouth;
Rathbun; Schmitt.

(The male of *Fabia subquadrata* according to Wells in his paper on Pinnotheridae of Puget Sound. Pub. Puget Sound Biol. Sta.)

Characters.--Carapace subpentagonal, hard, slightly longer than wide; front and front-lateral margins defined by a rim of coarse setae; orbits circular. Abdomen and sternum smooth; abdomen constricted between the last two segments. Chelipeds stout and margined with hair; fingers incurved at outer end; dorsal margin of propodi of second and third walking legs thickly margined with hair whose length exceeds the width of the propodi. Order of length of walking legs 2, 3, 1, 4.

Plate XLV



Fabia subquadrata

Females. 3 x N.

Dorsal views showing peculiar,
inflated carapace.

Dimensions.--Type, male: length 5 mm.

Color.--Male: light tan on posterior portion of carapace to a tan on front part.

Stations.--3, 8, 10. In living Mytilus edulis and Mytilus californianus.

Depth.--Around low tide line.

Pacific Coast Distribution.--British Columbia, to San Diego, California (Schmitt).

Genus *Fabia* Dana

Carapace smooth, membranous, subquadrate, with longitudinal sulci leading back from upper margin of orbits and enclosing a median area. Outer maxilliped with ischium rudimentary and merus large. Legs slender; second walking leg the longest.

Fabia subquadrata Dana

Plate XLV

Fabia subquadrata Dana; Holmes

Raphonotus subquadratus Rathbun; Weymouth.

Fabia subquadrata Rathbun; Schmitt; Wells.

Characters.--Carapace subquadrilateral, membranous, smooth, marked with longitudinal sulci leading back from orbit margins and enclosing a median area; front smoothly rounded and usually with shallow, transverse, pubescent sulcus running between the upper line of the orbits. Chelipeds smooth; palms widening slightly to distal end, inner surface hairy; fingers slightly curved, movable finger with prominent tooth near middle of inner margin. Walking legs slender.

Dimensions.--Type female: length 9.5 mm.

Color.--Light brown.

Stations.--3, 8. In the shells of mytilus edulis and mytilus californianus.

Depths.--Around low tide line.

Pacific Coast Distribution.--Alaska, to Laguna Beach, California (Rathbun).

Plate XLVI



Pinnixa faba

Upper.--male. 2 x N.

Lower.--female. 2 x N.

Genus *Pinnixa* White

Carapace wider than long, somewhat membranous. Ischium of outer maxilliped small, merus large. Third pair of walking legs longer and stouter than the other pairs.

Key to Coos Bay, Oregon Species of *Pinnixa*

I. Dactyls of third walking legs with corneous tips strongly falcate.

A. Fingers of chelipeds incurved at tip to form a gap when closed. Outer margin of orbits angular.
Pinnixa littoralis.

B. Fingers of chelipeds not incurved to form a gap when closed. Outer margin of orbits rounded.
Pinnixa faba.

II. Dactyls of third walking legs with the corneous tips not strongly falcate, but continuing the line of the dactyl.

A. Dactyls of third and fourth walking legs much shorter than those of first and second.
Pinnixa tubicola.

B. Dactyls of third and fourth walking legs nearly equal to those of first and second pair.

1. With tooth near middle margin of the movable finger.
Pinnixa schmitti.

2. No tooth on inner margin of movable finger.
No representatives found.

Pinnixa faba (Dana)

Plate XLVI

Pinnotheres faba Dana.

Pinnixa faba Holmes; Rathbun; Weymouth; Rathbun; Schmitt; Wells.

Characters of female.--Carapace oval, uneven, membranous with deep median groove extending back from interorbital area; gastric region high, sloping to posterior margin. Chelipeds large; palms widening distally; fingers not gaping when closed; movable finger with low tooth on inner margin near base.

Plate XLVII



Pinnixa littoralis

Above.--Female. 2 x N.
Below.--Male. 2 x N.

Dorsal views showing characteristic
carapace and abdomen shapes.

Characters of male.--Carapace hard, median groove slight. Chelipeds stout; movable finger with triangular tooth on inner margin near base; fixed finger horizontal, notched distally to receive movable finger which is strongly deflexed, leaving a gap when closed. Merus of third walking leg more than twice as long as wide. Order of length of walking legs 3, 2, 1, 4.

Dimensions.--Type: length 11 mm.

Color.--Orange yellow with whitish patches on the male carapace.

Stations.--18, 19. In the clams, Saxidomus nuttallii and Schizothaerius nuttallii.

Depth.--Around low tide line.

Pacific Coast Distribution.--Prince of Wales Island, Alaska, to Humboldt Bay, California.(Rathbun).

Pinnixa littoralis Holmes

Plate XLVII

Pinnixa littoralis Holmes; Rathbun; Weymouth; Way; Nininger; Schmitt; Wells.

Local name.--Empire clam crab.

Characters of female.--Carapace oval, membranous, a little pointed at the sides, gastric region with a deep, longitudinal, median groove. Front evenly rounded. Chelipeds large; palms oblong, widening distally; fingers crossed at the tips, gaping when closed; movable finger without tooth near the base. Fixed finger has a shallow notch at the tip. Corneous tips of the dactyls of the walking legs strongly falcate. Order of length of legs 3, 2, 1, 4.

Characters of the male.--Carapace hard, only slightly uneven, median groove slight. Inner margin of the dactyl of the cheliped entire. Third walking leg noticeably the stoutest, merus twice as long as wide.

Dimensions.--Male: length 7 mm.
Female: length 13 mm.

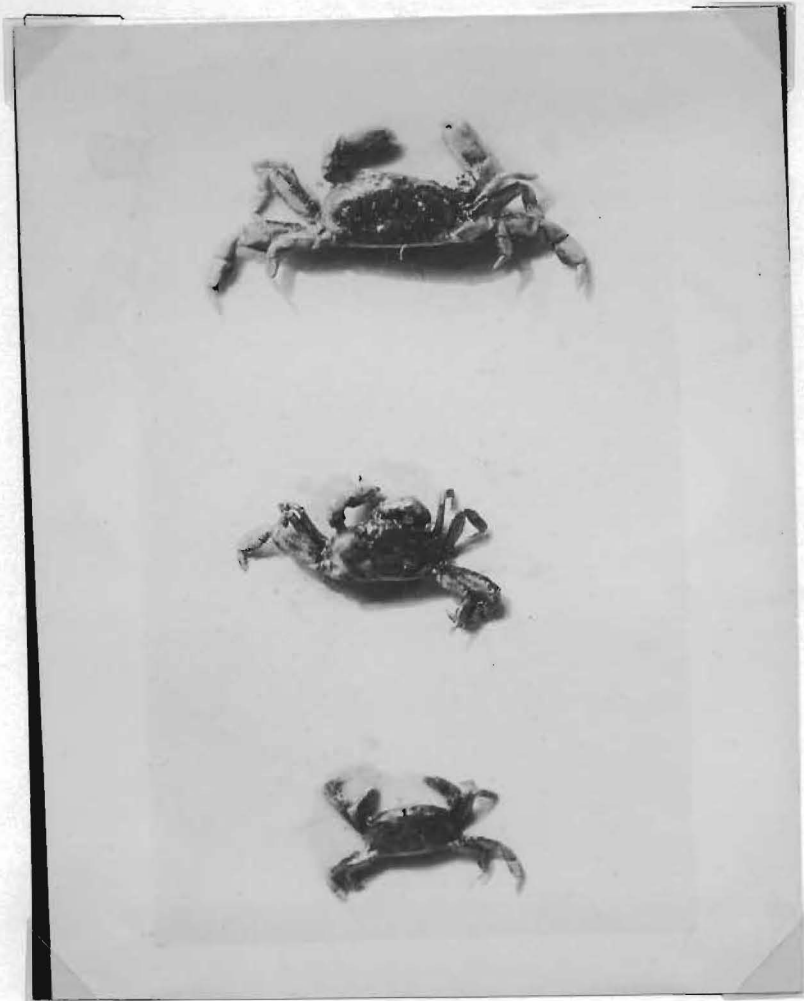
Color.--Yellow white with light orange or brown yellow patches on the carapace and legs.

Stations.--15, 18, 19, 20, 21. Found in Schizothaerius nuttallii, or free. If free they are always in the near vicinity of this clam.

Depths.--Between high low and low low tide lines.

Pacific Coast Distribution.--Alaska, to San Diego, California (Wells).

Plate XLVIII



Pinnixa schmitti

Top view.--Male. 2 1/3 x N.

Lower views.--Females. 2 1/3 x N.

Dorsal views showing characteristic
cheliped shape.

(Some ambulatory legs missing from two
lower specimens.)

Plate XLIX



Pinnixa occidentalis

Male. 3 x N.

Dorsal view showing long propodus
of the third legs.

(First and second right ambulatory
legs missing.)

Pinnixa schmitti Rathbun

Plate XLVIII

Pinnixa occidentalis Rathbun.

Pinnixa schmitti Rathbun; Schmitt; Wells.

Local name.--None.

Characterst.--Carapace oblong, hard, smooth; anterolateral margin ridged, tuberculate; gastric region with slight, median groove; cardiac ridge low, rounded transverse, with a smooth ridge running forward from each end to the middle of the anterolateral margin. Palm oblong, margins slightly convex; fixed finger short, horizontal; movable finger deflexed downward. Order of length of the walking legs is 3, 2, 1, 4. Dactyls almost straight and about as long as the propodi.

Dimensions.--Type male: length $3 \frac{1}{3}$ mm.

Color.--Color ranges from black through brown to a dirty yellow.

Stations.--2, 4, 15, 18, 19, 21. In sand tubes of a worm in water around 20 feet deep. In the burrows of Eupogetia pugettensis or in the sand near these burrows.

Depths in feet.--From low tide line to 25 feet below low tide line.

Pacific Coast Distribution.--Alaska, to San Francisco Bay, California (Wells).

Pinnixa occidentalis Rathbun

Plate XLIX

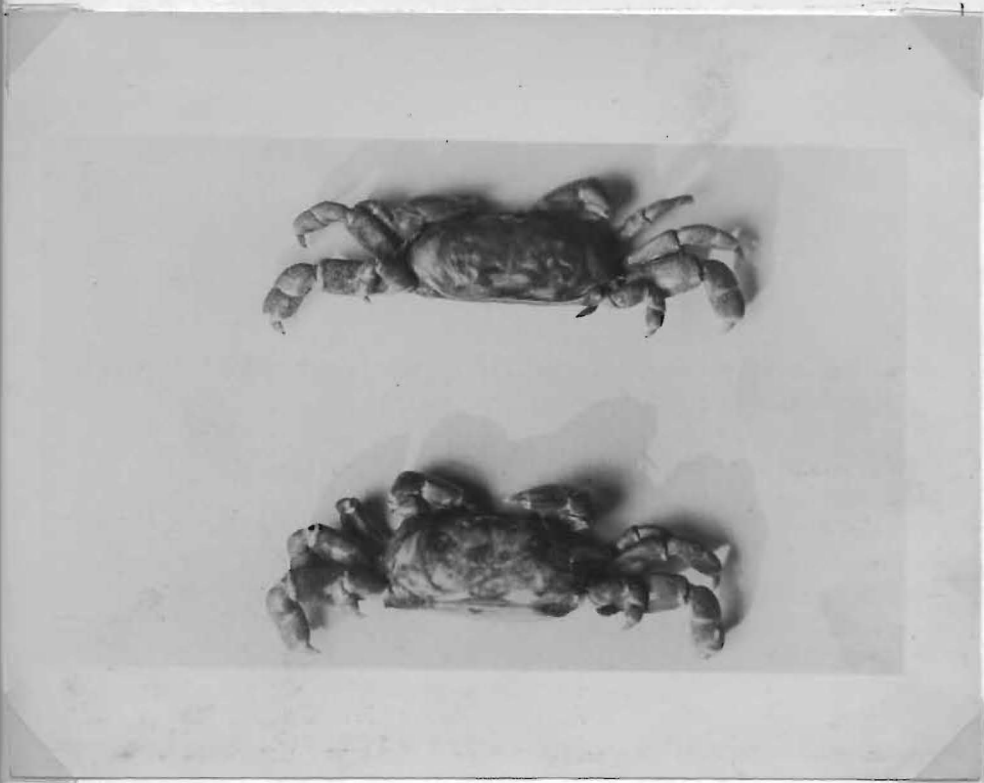
Pinnixa occidentalis Rathbun; Holmes; Weymouth; Rathbun; Schmitt.

Pinnixa californiensis Rathbun; Holmes; Rathbun; Weymouth.

Local name.--None.

Characters.--Carapace uneven; about twice as long as wide. Chelipeds stout, setose; palm broad, flat, shining on outside; immovable finger short, deflexed, cutting edge with sharp tooth in the middle and a small one near the tip. Movable finger much curved. Ambulatory legs setose, first pair shorter than the

Plate I



Pinnixa tubicola

Above.--Male. 3 x N.
Below.--Female. 3 x N.

Dorsal views showing thick propodi
and small dactyls.

chelipeds, weak; second pair longer and stronger than the first; third pair long and strong, propodus longer than wide.

Dimensions.--Type: length 4.2 mm.

Color.--Brown to yellow.

Stations.--19. Taken from sand samples brought up from 14 feet of water. One specimen found in beach sand at low tide line.

Depth.--14 feet.

Pacific Coast Distribution.--Unalaska, to Magdalena Bay, Lower California (Schmitt).

Pinnixa tubicola Holmes

Plate I

Pinnixa tubicola Holmes; Rathbun; Weymouth; Way; Schmitt; Wells.

Local name.--None.

Characters.--Carapace elongate oval, hard, smooth, outer portion of the anterolateral margin very slightly ridged. Chelipeds smooth; palm narrows distally, lower margin very convex. Fingers short, each with a small tooth near the middle of the inner margin, tips crossed when closed. Order of length of walking legs 3, 2, 1, 4. Fourth leg very short, hardly reaching the distal end of the merus of the third leg. Propodi of the third and fourth legs much wider than the base of the dactyls.

Dimensions.--Type: length 4 mm.

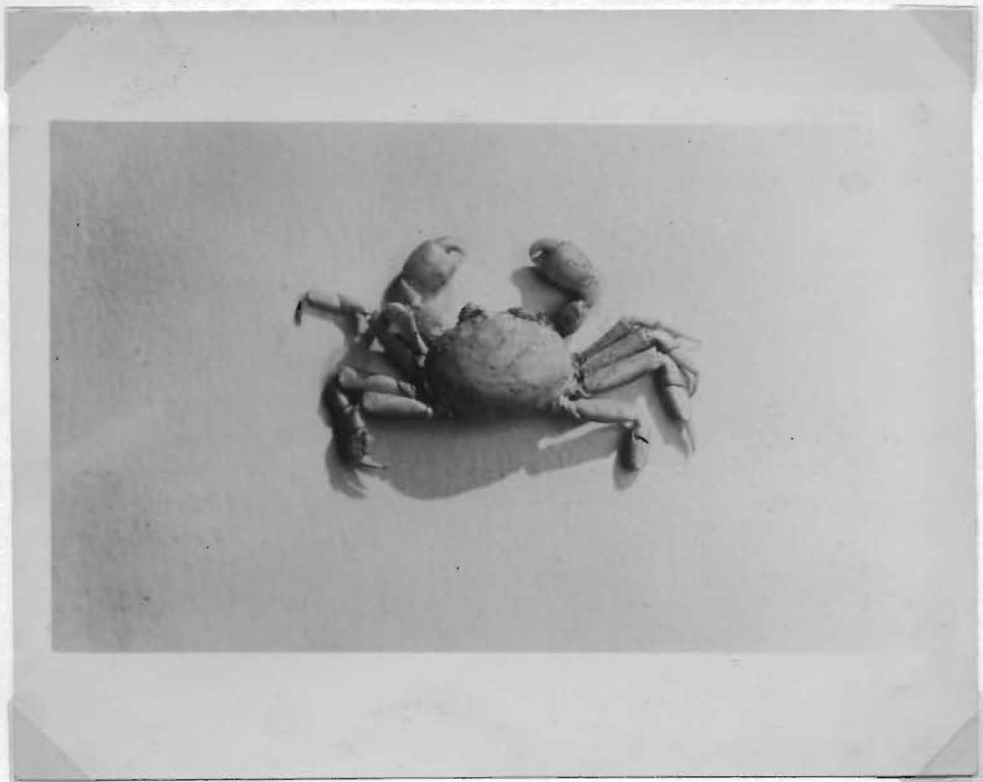
Color.--Gold brown with gray white spots on the carapace. Light yellow lower parts.

Stations.--1, 3, 4, 5, 9, 16, 17, 19. In the tubes of Amphytrite at low tide line. In the tube of a large, green Amphytrite like worm.

Depth.--Between low and high tide lines.

Pacific Coast Distribution.--Puget Sound, to San Diego, California (Rathbun).

Plate LI



Scleroplax granulata

Male. 2 x N.

Dorsal view showing rounded convex
carapace and peculiar shape of hands.

Genus *Scleroplax* Rathbun

Carapace transverse, hard, very convex. Merus of outer maxilliped longer than broad. Walking legs similar, slender, third pair the longest.

Scleroplax granulata Rathbun

Plate LI

Scleroplax granulata Rathbun.

Pinnixa (*Scleroplax*) *granulata* Holmes.

Scleroplax granulata Rathbun; Weymouth; Way; Rathbun; Schmitt; Wells.

Local name.--None.

Characters.--Carapace subpentagonal, hard elevated in center and sloping convexly to all margins; front advanced between the orbits. Chelipeds of female weak; fixed finger horizontal; fingers slightly curved, not meeting when closed. Chelipeds of male larger; fixed finger very short; movable finger abruptly deflexed. Walking legs subequal, order of length 3, 2, 1, 4; first pair the weakest; dactyls slender, almost straight and equal to the propodi in length.

Dimensions.--Type: length 7 mm.

Color.--Light yellow with a trace of brownish. Some specimens darker in shade than others.

Stations.--19, 21. In the sandy beaches in vicinity of tube worms and *Eupogebia* burrows.

Depth.--Around low tide line.

Pacific Coast Distribution.--Puget Sound, to Lower California (Rathbun).

Family Grapsidae

Carapace quadrate, flattened, or moderately convex; lateral margins practically parallel, frequently toothed; front almost always decidedly broad; orbits and eye-stalks of medium size. Antennules fold back transversely or obliquely. Third maxillipeds have a gap between them.

Plate LIII



Pachygrapsus crassipes

Left.--Male. 1/2 x N.
Right.--Female. 1/2 x N.

(Dactyl of fourth left walking leg of
the female gone.)

Key to Coos Bay, Oregon Genera of Grapsidae

I. Carapace considerably broader than long. Carapace transversely striated. External maxillipeds with wide gap between them.

A. Orbits normal, deep, concave.

Genus *Pachygrapsus*.

B. Orbits not normal, with posterior surface bulging outward, convex instead of concave.

No representatives found.

II. Carapace considerably broader than long. Carapace more or less smooth. External maxillipeds only moderately gaping.

Genus *Hemigrapsus*.

Genus *Pachygrapsus* Randall

Carapace marked with transverse lines. Outer maxillipeds with wide gap between them; merus as broad as or broader than long and bearing the palp at its summit. Abdomen of male covers the sternum at its base.

Pachygrapsus crassipes Randall

Plate LII

Pachygrapsus crassipes Randall; deMan; Holmes;
Rathbun; Weymouth; Baker; Rathbun; Schmitt.

Local name.--Green shore crab.

Characters.--Carapace squarish, moderately convex, lateral margins strongly arcuate; upper surface transversely striated. Frontal interorbital margin practically straight, sides with a single tooth behind the prominent postorbital. Cheliped of adult male larger than all the preceding joints combined. Raised line present on upper surface of the palm of the hand. Merus of last pair of walking legs with posterodistal angle entire.

Dimensions.--Type: length 37 mm.

Color.--Red and green striped. Chelipeds veined in red. Cuticle of joints a bright, light green.

Stations.--4, 7, 10, 16a. Among the rocks high on the beach.

Plate LIII



Hemigrapsus nudus

Male. 1/2 x N.

Dorsal view showing red spotting
of the chelipeds.

(Barnacle on the frontal region.)

Depth.--Between high high and high low tide lines.

Pacific Coast Distribution.--Oregon, to the Gulf of California (Rathbun).

Genus Hemigrapsus

Carapace not markedly striated; two teeth behind the orbital angle. Outer maxillipeds gape only moderately; merus large and not produced at the antero-external angle; palp joined in a notch at about the middle of the distal margin. Abdomen of male does not cover the sternum at its base.

Key to the Coos Bay, Oregon Species of Hemigrapsus

- I. Ambulatory legs hairy. Hands of the chelipeds not spotted red.
Hemigrapsus oregonensis.
- II. Ambulatory legs smooth. Hands of the chelipeds spotted red.
Hemigrapsus nudus.

Hemigrapsus nudus Dana

Plate LIII

Pseudograpsus nudus Dana.

Heterograpsus nudus Rathbun.

Brachynotus nudus Holmes.

Hemigrapsus nudus Rathbun; Weymouth; Rathbun; Schmitt; Way.

Local name.--Red shore crab.

Characters.--Carapace posteriorly flat, smooth and punctate, anteriorly convex, undulated, slightly granulated. Front broad and arcuate. Chelipeds smooth, dotted with red spots. Patch of hair on the inner surface of the hand. Ambulatory legs naked, moderately short. Dactyls short, stout and scaly.

Dimensions.--Type: length 50 mm.

Color.--Purplish red to red. Chelipeds always red spotted.

Plate LIV



Hemigrapsus oregonensis

Male. 1 x N.

Dorsal view showing characteristic
carapace notching and markings.

Stations.--1, 2, 4, 5, 7, 9, 10, 16, 17, 18, 19. Everywhere among and under the rocks.

Depth.--Between highest and lowest tide lines.

Pacific Coast Distribution.--Sitka, Alaska, to Gulf of California (Rathbun).

Hemigrapsus oregonensis (Dana)

Plate LIV

Pseudograpsus oregonensis Dana.

Heterograpsus nudus Rathbun.

Brachynatus oregonensis Holmes.

Hemigrapsus oregonensis Rathbun; Weymouth; Rathbun; Schmitt; Way.

Local name.--Gray shore crab.

Characters.--Carapace front is undulated, but not so flattened behind; posterior portion not punctate. Front with a deep sinus in the middle. Front is four lobed. Chelipeds smooth, not red spotted, usually black spotted or stippled. Patch of hair on the inner surface of the hand in males. Walking legs hairy. Dactyls narrower than in *Hemigrapsus nudus*.

Dimensions.--Type: length 26 mm.

Color.--Gray usually. Hands gray white to cream. There is much variation in color.

Stations.--16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26. Everywhere among and under the rocks.

Depth.--Between high and low tide lines.

Pacific Coast Distribution.--Alaska, to Gulf of California (Rathbun).

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