Hobsonia florida

A tube-dwelling polychaete worm

Phylum: Annelida
Class: Polychaeta
Order: Terebellida
Family: Ampharetidae

Taxonomy: *Hobsonia florida* was originally described as *Amphicteis gunneri floridus* by Hartman (1951) and, after examination of paratypes, was synonymized with *Hypaniola grayi* (Pettibone, 1953) which was later included with *Amphisomytha* in the genus *Lysippides* (Day, 1964). Zottoli (1974) separated *Amphicteis gunneri floridus* into two species: *A. gunneri* and *A. floridus* based on the number of nephridial pairs, abdominal segments, lack of anal cirri and lack of rudimentary notopodia on abdominal segments. This species was then moved to the newly designated genus, *Hobsonia* in 1979 (Banse). Banse recognized this new genus based on a unique combination of external characters and internal anatomy and provides characters against it being a member of *Hypaniola*, *Amphicteis* or *Lysippides* (Banse 1979).

Description

Size: Individuals range in length from 8–15 mm (Zottoli 1974). The specimens on which we base this description are up to 12 mm in length and 1.5 in width (from the Columbia River).

Color: Orange with whitish spots (Banse 1979). White when preserved.

General Morphology: Rather conical and large anteriorly, becoming small at posterior end. Conspicuous thoracic dorsal to ventral transition (Fig. 1).

Body: Approximately 43 segments with eight smooth cylindrical branchiae, snout-like prostomium. Fine paleae anteriorly, capillary notosetae and uncinigerous neurosetae present (Fig. 3).

Anterior: Prostomium has four lobes and is well developed and prolonged into a snout (Hartman 1951). Lobes may be more noticeable in preserved specimens, as some live animals are smooth (Pettibone 1953). Glandular ridges present, but not in all specimens (Banse 1979).

Trunk: Thorax is stout, with 17 setigerous segments and two anterior asetigerous segments (Fig. 1). Abdomen is with 22–28 segments (species *florida,* Zottoli 1974) (23–26 segments, genus *Hobsonia*, Banse 1979). Abdomen has neuropodia only, no notopodia. Instead, only rudimentary lobes in anterior segments (species *florida,* Banse 1979) (Fig. 1). Abdomen narrow and reduced. Dissected specimens with 26 segments where 23 are setigerous and the last three are without setae (Fig. 1).

Posterior: Pygidium without anal cirri or papillae (species *florida,* Zottoli 1974) and is slightly lobed. Posterior segments can be turned inward. A pair of eyespots in young at posterior end of worm are visible in live specimens and in some freshly preserved adults (Banse 1979), but were not observed in the illustrated specimen.

Parapodia: Reduced and biramous in thorax. Uniramous neuropodia only in abdomen (Fig. 1). Seventeen notopodia begin on segment four (Pettibone 1953) and each consists of a single lobe with a fascicle of capillary setae (Fig. 3a). Notopodium with a small cirrus. Fourteen thoracic neuropodia and 23 abdominal. Thoracic neuropodia begin on segment seven (setiger four) (Pettibone 1953) and each is made up of a single row of uncini in a torus (Fig. 1, 4). Thoracic uncini have four teeth and abdominal uncini have five (Fig. 3c) (Pettibone 1953). A long dorsal cirrus is present on abdominal neuropodia (Banse 1979) (Fig. 4).

Setae (chaetae): Fascicles of about eight (on each side) fine and flattened setae on segment three (Banse 1979) with delicate

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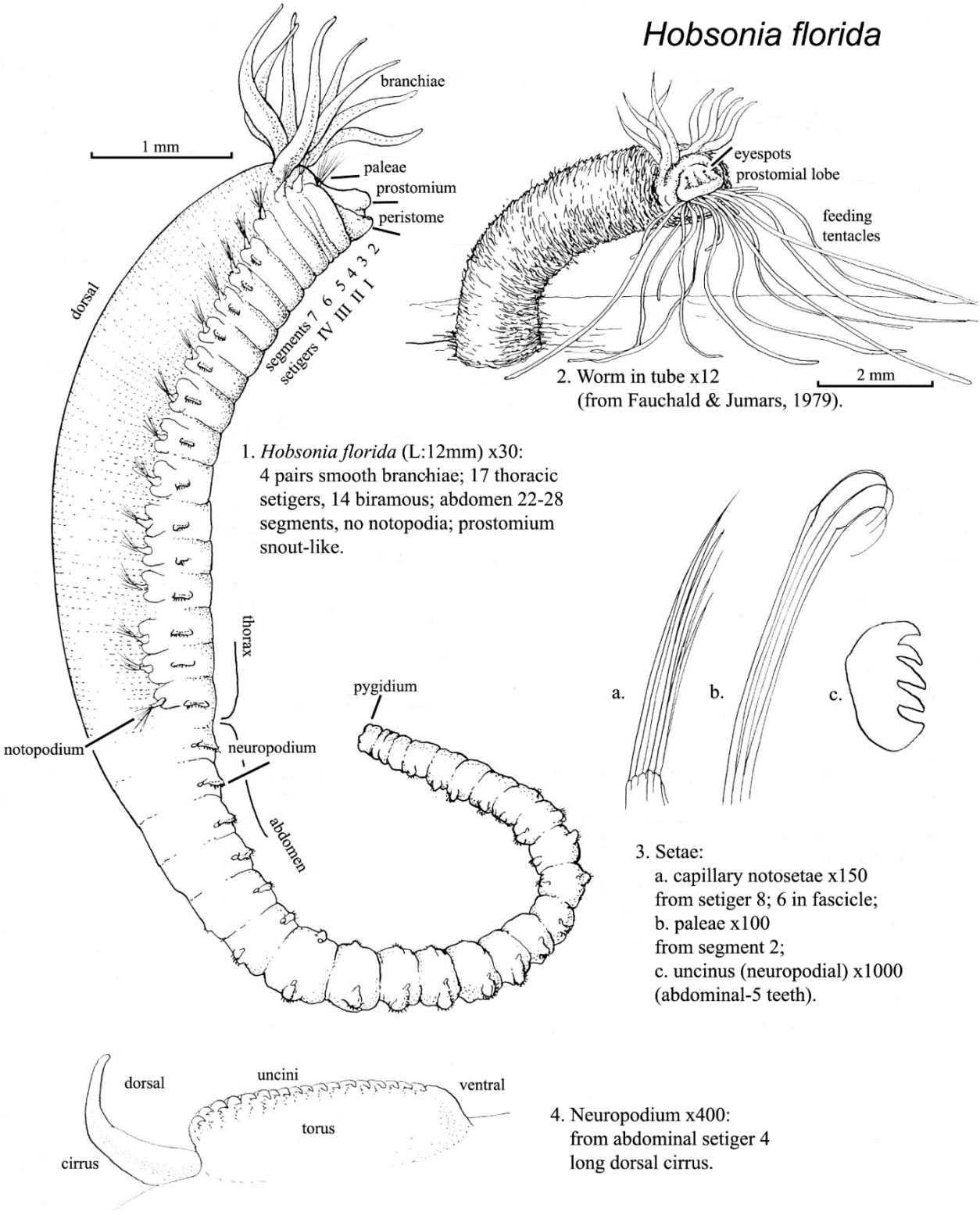

1. *Hobsonia florida* (L:12mm) x30:
4 pairs smooth branchiae; 17 thoracic setigers, 14 biramous; abdomen 22-28 segments, no notopodia; prostomium snout-like.

2. Worm in tube x12
(from Fauchald & Jumars, 1979).

3. Setae:
a. capillary notosetae x150
from setiger 8; 6 in fascicle;
b. paleae x100
from segment 2;
c. uncinus (neuropodial) x1000
(abdominal-5 teeth).

4. Neuropodium x400:
from abdominal setiger 4
long dorsal cirrus.

flexed tip (Fig. 1, 3b). Paleae are not much more obvious than capillary notosetae.
Eyes/Eyespots: Two small eyes behind glandular ridges on prostomium (Fig. 2) are observed in preserved specimens. Live animals can have clusters of pigment spots on the underside of upper lip (Banse 1979).
Anterior Appendages: Up to 20 feeding tentacles that are fine, grooved and transparent. Lateral feeding tentacles are shorter than ventral ones (Fig. 2). Tentacles are very distensible and retractile into mouth (Ampharetidae, Kozloff 1974; Blake 1975) and can be as long as the worm (Banse 1979). No palps or other prostomial appendages (Fig. 2).
Branchiae: Dorsal branchiae can have white transverse pigment bands, making them appear to be jointed (Fauchald and Jumars 1979) (not observed in the illustrated specimen). There are four branchial pairs which are cylindrical, smooth and pointed. The first pair is attached to segment three (the segment bearing paleae) and subsequent pairs are attached to segments 3–5 (Fig. 1).
Burrow/Tube: A mucus-lined tube composed of sediment particles and debris on the outside which gives the tube a shaggy, annulated appearance (Fig. 2). Tube length is about five times worm body length and the upper 1/3 projects above substrate (Zottoli 1974). Juveniles build first tubes a few days after settling (Fauchald and Jumars 1979).
Pharynx:
Genitalia:
Nephridia: Two pairs of long nephridia are present in segments six and seven (Banse 1979).

Possible Misidentifications

Ampharetidae are small worms, usually less than 5 cm long (Kozloff 1974), with clearly defined thorax and abdomen, both of which have neuropodia with uncini. The notosetae are capillary in the thorax and are reduced or absent in the abdomen (Fauchald 1977). They have two to four pairs of simple branchiae, and completely retractable feeding tentacles (Blake 1975). There are numerous ampharetid genera and many of them are deepwater inhabitants. Some of the intertidal and shallow water genera include:

Amage (Malmgren, 1866) has been found in Puget Sound (Banse 1979). This genus lacks paleae, unlike *Hobsonia.* Like *Hobsonia,* it has smooth branchiae, which are all of 1 type (Kozloff 1974).

Ampharete sp. have 14 thoracic setigers (not 17, as in *Hobsonia).* Like *Hobsonia, Ampharete labrops* (Hartman, 1951), widespread in California (Blake and Ruff 2007), has four pairs of smooth branchiae (Blake 1975), but the latter species can be differentiated because it has numerous eyespots on the margin of its large upper lip, as well as two small ones on the upper side. It has 13 abdominal uncinigers and two anal cirri. *Ampharete arctica* (Malmgren, 1866), native to Norway (Hartman 1969) is found in Puget Sound (Kozloff 1974). Its four pairs of branchiae are in two rows: three pairs in the first row and one pair in the second row near the midline. *Ampharete acutifrons* (Grube, 1860) has been reported from Alaska, British Columbia, and Washington, and has long anal cirri (Banse 1979). Its four pairs of branchiae are also in two rows where there are two pairs in each row (Gallagher 1979).

Anobothrus sp. has four pairs of branchiae and anterior paleae (like *Hobsonia*), but has only 15 thoracic setigers and 12 uncinigers (*H. florida* has 17 and 14, respectively). It has one thoracic setiger (setiger 10 or 11) with elevated and modified notosetae (Fauchald 1977).

Hypaniola kowalewskii (Grimm in Annenkova, 1972) possibly found only in Europe. Like *Hobsonia,* it has four pairs of smooth branchiae and small paleae. Unlike *Hobsonia,* this currently monotypic genus (Fauchald 1977) lacks glandular prostomial ridges.

Melinna species are similar to *Hobsonia* in having four pairs of smooth branchiae and only 14 thoracic uncinigers. Unlike *Hobsonia, Melinna* has nuchal hooks anterior to the branchiae and a dorsal crest on segment six. *Melinna oculata* is found from central California to Oregon, but is subtidal

(Blake and Ruff 2007). *Melinna elizabethae* is found in the Arctic and northeastern Pacific (Banse 1979).

Schistocomus hiltoni (Chamberlin, 1919) is the most common local form (Blake 1975) and has 15 thoracic setigers and lacks paleae. *Schistomocomus hiltoni* has only 15 thoracic setigers and three pairs of pinnate and one pair of smooth branchiae. In *H. florida* the branchiae are all smooth and there are 17 thoracic setigers. It is found most often on open coasts (Blake 1975).

The genus *Hobsonia* (Banse, 1979) is distinguished by its lack of anal cirri, its great number of abdominal segments (23-26) and its lack of all but rudimentary notopodial lobes in the abdomen (Banse 1979).

Ecological Information

Range: Type locality is off the coast of Florida in the Gulf of Mexico (Hartman 1951) and *Hobsonia florida* is a common non-indigenous species to the NE Pacific (Castillo et al. 2000) where its range extends from British Columbia to Washington and Oregon (Banse 1979).

Local Distribution: Oregon sites include the Columbia River, Young's and Yaquina Bay (Castillo et al. 2000), Astoria, Siletz and Salmon Rivers.

Habitat: Salt marshes near river mouths in intertidal and subtidal estuarine mud (Zottoli 1974; Banse 1979). Worms live in tubes projecting obliquely above surface where orientation depends on available food (Fauchald and Jumars 1979).

Salinity: Salinity can range from 0–27 (Zottoli 1974). Juveniles can reach sexual maturity in areas of low salinity (Banse 1979). *Hobsonia florida* has been collected in Long Island Sound, New York at salinities ranging from 4–8 (Olson et al. 2009).

Temperature: Larvae were reared at temperatures ranging from 20–30˚C (Zottoli 1974).

Tidal Level: Intertidal and subtidal.

Associates: Common associates include the amphipod, *Corophium salmonis,* which replaces *H. florida* in succession (Gallagher 1979). Atlantic coast associates include polychaetes in the genera *Leitoscoloplos, Heteromastus, Polydora.*

Abundance: Densities reached 150/10 cm^2 in Skagit, Washington three weeks after colonization (Gallagher 1979).

Life-History Information

Reproduction: Spawning from late May to early September (New Hampshire, Zottoli 1974). Females release eggs (approximately 100) which are fertilized within the tube from sperm moved into the tube by ciliary currents (Blake 2000). Irregularly-shaped eggs, each approximately 200 µm in diameter (Washington, Banse 1979), do not develop inside a sac, but are lose within the tube. The female remains inside the tube during their development (Zottoli 1974).

Larva: The development and larvae of *Hobsonia florida (=Amphicteis floridus*) were described by Zottoli (1974). Larvae remain in the tube until the three-setiger stage (two days) and settle into the benthos where they immediately build their own tubes (Olson et al. 2009). Early larvae have notosetae that are spatulate and are replaced by capillary setae and a single anterior tentacle. All tentacles are developed once the larva reaches six-setiger stage and they are used in feeding by the eight-setiger stage. At 11 segments, branchiae are apparent and develop sequentially, such that all three pairs are present when the worms are 18 segments in length. Once the larva has 16–17 segments its uncini are patterned as in adults (Blake 2000; Olson et al. 2009).

Juvenile: Newly recruited juveniles are 200 µm (Gallagher et al. 1983).

Longevity:

Growth Rate: Growth from one to 18 setigers in 36 days. Branchiae develop by 11-setiger stage and larvae are easily raised in the lab (Zottoli 1974). *Hobsonia florida* are among the earliest colonist in succession (e.g. sand flats, Skagit, Washington). When a population crashes, it is replaced by amphipods and other polychaetes (Gallagher 1979).

Food: A surface deposit feeder, *H. florida* picks up particles with feeding tentacles. Ampharetids eats detritus, unicellular algae and larval invertebrates (Fauchald and Jumars 1979). Worms begin feeding as newly settled juveniles of 2–3 setigers, by muscular pumping of lips, before tentacles

develop (Zottoli 1974). When feeding, an adult stretches out of tube, spreads tentacles over substratum and suspends branchiae in water (Fauchald and Jumars 1979) (Fig. 2). Food ingestion and particle selection is dependent on particle surface texture and size. Research suggests that particles are sorted on the basis of specific gravity once in the gut (Self and Jumars 1978).

Predators: The amphipod *Eogammarus confervicolus* preys on juvenile *Hobsonia florida* (Gallagher 1979).

Behavior: Mostly sessile, but moves by continuous tube-building especially when food is scarce (Fauchald and Jumars 1979).

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