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*HETERAPHRODITA ALTONI*, A NEW GENUS AND  
SPECIES OF POLYCHAETE WORM (POLYCHAETA,  
APHRODITIDAE) FROM DEEP WATER OFF OREGON,  
AND A REVISION OF THE APHRODITID GENERA

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Among some polychaetes collected off the mouth of the Columbia River, Oregon, by Mr. Miles S. Alton, were 11 specimens of a species of Aphroditidae collected at a single deep-water station in 900 fathoms. The aphroditid is herein described as a new species belonging to a new genus.

I have taken this opportunity to review the genera in the family. Two genera, *Pontogenia* Claparède and *Laetmonice* Kinberg, have been emended and several others have been put into synonymy. In the diagnosis of the Aphroditidae and key to the genera, as herein revised, I have included neither *Triceratia* Haswell, based on the indeterminable and perhaps incomplete *T. araeoceras* Haswell, 1883, from Australia nor *Hermionopsis* Seidler, based on the doubtful *H. levisetosa* Seidler, 1923, from Kerguelen.

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FAMILY APHRODITIDAE

*Diagnosis:* Body relatively large, short and broad, ovate, oblong, or spindle-shaped; flattened ventrally, arched dorsally; consisting of few segments (less than 60). Ventral surface of body and parapodia covered with minute spherical or conical papillae. Prostomium suboval, with single median antenna, comprised of ceratophore and terminal filament, and pair of long palps. Usually with a well-developed papillated facial tubercle ventral to median antenna and anterior to mouth. Peristomium consisting of first few segments around mouth. First or tentacular segment projecting laterally and ventrally to prostomium, with 2 pairs of tentacular cirri; uniramous scutigeros lobes with numerous capillary setae.

Parapodia biramous, supported by internal acicula; with large overlapping dorsal scales or elytra attached by strong muscular attachments to elytophores, usually 15 pairs (up to 20), located on segments 2, 4, 5, 7, on alternate segments to 25, then on every third segment; long dorsal cirri on segments lacking scales. All but one pair of parapodia with short ventral cirri; longer on second segment, lateral to mouth. Neuropodia conical, with few, stout, dark, simple neurosetae arranged in 3 tiers (may be more numerous and of different type in few anterior and posterior segments). Notopodia wide and low, with simple notosetae of several kinds, including capillary setae which may extend dorsally forming a dorsal feltage, more or less developed. Pharynx strong, muscular, eversible, with several rows of numerous soft papillae around opening, without chitinous jaws. Pygidium very small, without anal cirri. Adapted to burrowing in mud or creeping on soft bottom.

## KEY TO THE GENERA OF APHRODITIDAE

- 1A. Elytra covered by compact dorsal feltage (must be removed to see elytra) ..... 2
- 1B. Elytra not covered by compact dorsal feltage (fine capillary setae may form slightly developed dorsal feltage). Papillated facial tubercle well developed ..... 3
- 2A. With some stout, dark, amber-colored protective notosetae extending laterally or dorsolaterally. Prostomium without ocular peduncles. Papillated facial tubercle well developed. Neurosetae of few anterior segments numerous, bipinnate ..... *Aphrodita* Linné
- 2B. Without stout protective notosetae. Prostomium with short rounded ocular peduncles. Facial tubercle not developed. Neurosetae of few anterior segments few in number, with basal spur and variable number of extra teeth; not bipinnate ..... *Heteraphrodita*, new genus
- 3A. Notosetae including some dark, amber-colored protective setae with tips in form of barbed arrow (harpoon setae). Some anterior neurosetae bipinnate ..... *Laetmonice* Kinberg
- 3B. Notosetae curved over dorsum; without harpoon setae ..... 4
- 4A. Notosetae flattened, serrated. Prostomium with paired clublike ocular peduncles. Anterior neurosetae with some extra teeth (not bipinnate) ..... *Pontogenia* Claparède
- 4B. Notosetae sabrelike, smooth. Prostomium without ocular peduncles. Anterior neurosetae bipinnate ..... *Aphrogenia* Kinberg

Genus *Aphrodita* Linné, 1758

*Halithea* Savigny, in Lamarck, 1818. Type-species (herein designated):

*Aphrodita aculeata* Linné, 1758.

*Milnesia* Quatrefages, 1865. Type-species (herein designated): *M. nuda* Quatrefages, 1865; = young form of *A. aculeata* Linné (according to Fauvel, 1923, p. 34).

*Aphroditella* Roule, 1898. Type-species (monotypy): *A. pallida* Roule, 1898; = young form of *A. aculeata* Linné (according to Fauvel, 1923, p. 34); = distinct species (according to Bellan, 1964, p. 19).

Type-species (designated by Malmgren, 1867, p. 3): *A. aculeata* Linné, 1758. Gender: feminine.

*Diagnosis:* Aphroditids with dorsal feltage well developed, concealing elytra completely. Elytra 15 pairs, smooth. Prostomium without ocular peduncles. Facial tubercle well developed, papillated. Notosetae all smooth, of 3 kinds: capillary setae forming matted dorsal feltage; dark, acicular, protective spines projecting dorsolaterally; iridescent capillary setae projecting laterally. Neurosetae dark, stout, smooth or with lateral spur, with slightly curved tips, with or without hood which may be frayed or pilose. Neurosetae of anterior few segments bipinnate.

Genus *Laetmonice* Kinberg, 1855; emended

*Hermione* Blainville, 1828. Type-species (monotypy): *Halithea hystrix* Savigny, in Lamarck, 1818. Not description and figure in Blainville; = questionably *Pontogenia chrysocoma* (Baird) (according to Claparède, 1868, p. 357). Preoccupied by Meigen, 1800, in Diptera; *vide* Neave, 1939, p. 625.

*Letmonicella* Roule, 1898. Type-species (monotypy): *L. spinosissima* Roule, 1898; = young of *L. filicornis* Kinberg (according to Fauvel, 1923, p. 36).

*Halogenia* Horst, 1915. Type-species (designated by Hartman, 1959, p. 55): *H. arenifera* Horst, 1915.

*Hermionia* Hartman, 1959. New name for *Hermione* Blainville, preoccupied.

Type-species (monotypy): *L. filicornis* Kinberg, 1855. Gender: feminine.

*Diagnosis:* Aphroditids with dorsal feltage poorly developed, not completely covering elytra. Elytra up to 20 pairs, smooth. Prostomium with short ocular peduncles. Facial tubercle well developed, papillated. Notosetae of 3 kinds: acicular, smooth or granular, arched over dorsum; stout, long, dark-amber colored, with tips in form of barbed arrow (harpoon setae); short to long capillary setae, sometimes forming a poorly-developed dorsal feltage. Neurosetae dark, stout, with slightly curved tips, with lateral spur, some with accessory denticles under rostrum or with unilateral fringe of long stiff filaments. Some bipinnate neurosetae on a few anterior segments.

*Remarks:* *Hermione* Blainville, as indicated in the synonymy above, is preoccupied. The name is further confused, as was pointed out by Claparède (1868, p. 357), by the fact that the species described under the name *Hermione hystrix* by Blainville was not the same as *Halithea hystrix* Savigny. Claparède suggested that the description and figures of Blainville should questionably be referred to *Pontogenia chrysocoma* (Baird) and that the confused name of *Hermione* Blainville be abandoned and replaced by that of *Laetmonice* Kinberg, since they seemed to be

generically synonymous. Unfortunately, this suggestion has not been followed, and *Hermione* has continued to be used until it was replaced by *Hermonia* Hartman (1959, p. 56), a new name for *Hermione* Blainville, preoccupied. However, this does not take into account the confused state of the type specimen of Blainville.

*Laetmonice* (or *Laetmatonice*, a secondary spelling by Kinberg that has been widely used) and *Hermione* have been separated mainly on the basis of the neurosetae: toothed but without a fringe of hairs in *Hermione*; toothed and with a fringe of hairs in *Laetmonice*. I agree with Claparède that the differences should be considered to be of specific but not of generic importance. *Halogenia* Horst falls in place under the emended *Laetmonice* Kinberg.

#### Genus *Aphrogenia* Kinberg, 1855

*Type-species* (monotypy): *A. alba* Kinberg, 1855. Gender: feminine.

*Diagnosis*: Aphroditids without dorsal feltage covering elytra. Elytra 13 pairs, with scattered papillae. Prostomium with eyes sessile, without ocular peduncles. Notoetae all smooth, of 2 kinds: stout, smooth, sabrelike, curved over dorsum; fine, capillary. Neurosetae dark, stout, with basal spur. Neurosetae of anterior few segments with extra teeth, some bipinnate.

#### Genus *Pontogenia* Claparède, 1868; emended

*Pontogenessa* Monro, 1924. *Type-species* (monotypy and original designation): *P. obscura* Monro, 1924.

*Type-species* (monotypy): *Hermione chrysocoma* Baird, 1865. Gender: feminine.

*Diagnosis*: Aphroditids with dorsal feltage poorly developed, not concealing elytra completely. Elytra up to 18 pairs, smooth, Prostomium with clublike ocular peduncles. Facial tubercle well developed, papillated. Notoetae of 3 kinds: long, capillary setae; large, golden yellow, flattened paleal setae arched over dorsum, serrated or toothed along curved margin; short, capillary setae. Neurosetae dark, stout, with slightly curved tips, smooth or with lateral spur. Neurosetae of anterior few segments smooth or with extra teeth, not bipinnate.

*Remarks*: According to the generic definition by Monro, *Pontogenessa* was distinguished from *Pontogenia* by the neurosetae which are simple, lacking the lateral spur characteristic of *Pontogenia*. The distinction is herein considered to be of specific rather than generic importance.

#### **Heteraphrodita**, new genus

*Type-species*: *H. altoni*, new species. Gender: feminine.

*Diagnosis*: Aphroditids with dorsal feltage well developed, concealing elytra completely. Elytra 13 pairs, smooth. Prostomium with short rounded ocular peduncles. Facial tubercle absent. Notoetae of 2 kinds: long, capillary, forming matted dorsal feltage; short, capillary;

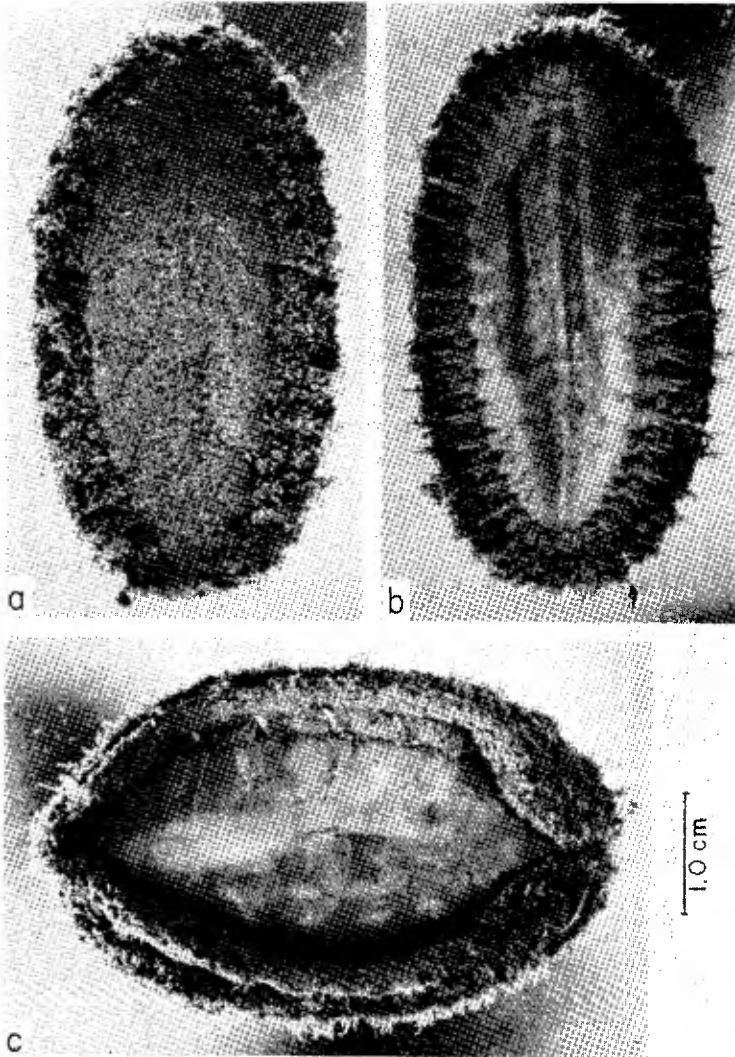


FIG. 1. *Heteraphrodita altoni*, new species. a, dorsal view; b, ventral view; c, dorsal view, with dorsal feltage cut back exposing the clytra.

without stout protective notosetae. Neurosetae with 1 or 2 basal spurs, hooked tips, and subdistal spinous sheaths along one side, in some setae digitiform spinous processes extending beyond distal tips. Neurosetae of anterior few segments similar to those following, not bipinnate.

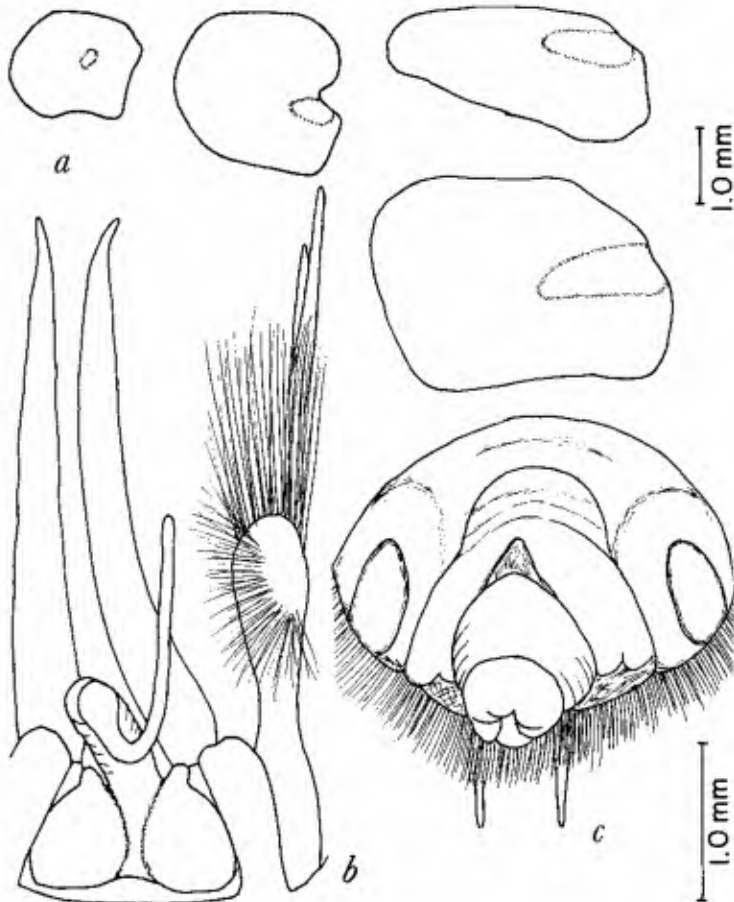


FIG. 2. *Heteraphrodita altoni*, new species. a, first four right elytra; b, dorsal view prostomium, right parapodium of first or tentacular segment, and elongated elythrochlores of segment 2; c, dorsal view posterior end, including segments 25 (last elytragerous) and 26 (last cirrigerous), with dorsal feltage cut open exposing the conical pygidium and anus, last pair elytra removed, tips of last pair dorsal cirri shown, projecting posteriorly.

*Remarks:* *Heteraphrodita* differs from the other genera of aphroditids in lacking stout protective notosetae and in lacking a distinct facial tubercle anterior to the mouth. In common with *Aphrodita*, it has a well-developed dorsal feltage completely covering the elytra. In common with *Pontogenia*, the neuropodia of the anterior few segments lack bipinnate neurosetae.

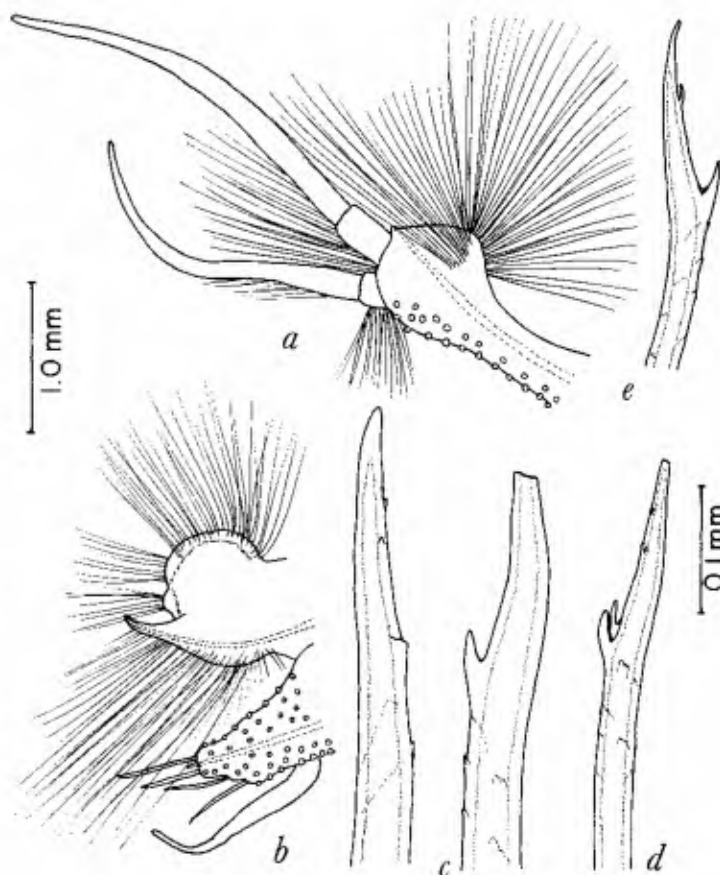


FIG. 3. *Heteraphrodita altoni*, new species. a, left parapodium of first or tentacular segment, outer or posterior view; b, right parapodium of second or buccal (first elytragerous) segment, inner or anterior view; c, tips of two upper neurosetae from same; d, tip of middle neuroseta from same; e, tip of lower neuroseta from same.

***Heteraphrodita altoni*, new species**

Figs. 1-5

The species is based on 11 specimens collected in a trawl haul by the M/V *Commando* at a single station off Oregon, southwest of the mouth of the Columbia River, 45°45'N, 125°09'W, 900 fathoms, 29 May 1964, M. S. Alton, collector. The holotype and 10 paratypes are deposited in the United States National Museum, USNM 33035 and 33034. The species is named for Mr. Miles S. Alton, who collected the specimens.

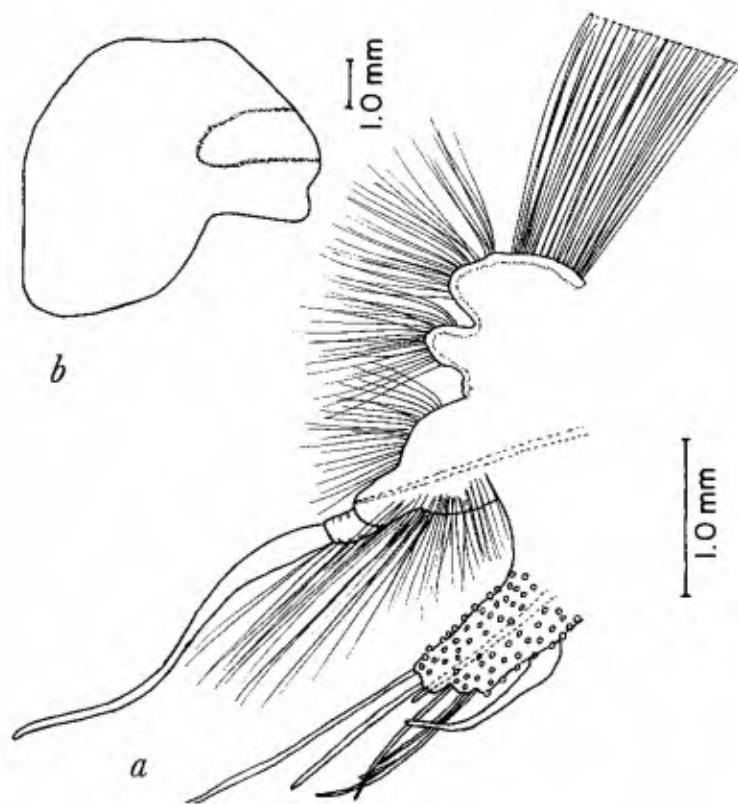


FIG. 4. *Heteraphrodita altoni*, new species. a, right parapodium of third (cirriferous) segment, anterior view (only bases of upper notopodial feltage setae shown); b, eighth right elytron.

*Description:* Length 17 to 28 mm, width 12 to 14 mm, segments 26, last 2 to 3 small. Body suboval, flattened ventrally, arched dorsally, rounded anteriorly and posteriorly (Fig. 1). Parapodia and ventral surface of body thickly covered with globular to capitate papillae (Figs. 3, a, b; 4, a; 5, a, b). Dorsal surface smooth, thin-walled, covered by elytra and well-developed dorsal feltage, which is uniformly covered with fine mud. Additional thick spreading bundles of short capillary notosetae, to which fine mud adheres, giving an exceedingly bushy appearance to the dorsolateral parts of the body, above and between the parapodia.

Elytra 13 pairs, with firm muscular attachments to elytophores, on segments 2, 4, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, and 25. Elytra smooth, transparent, partly encrusted with brownish material. First pair of elytra



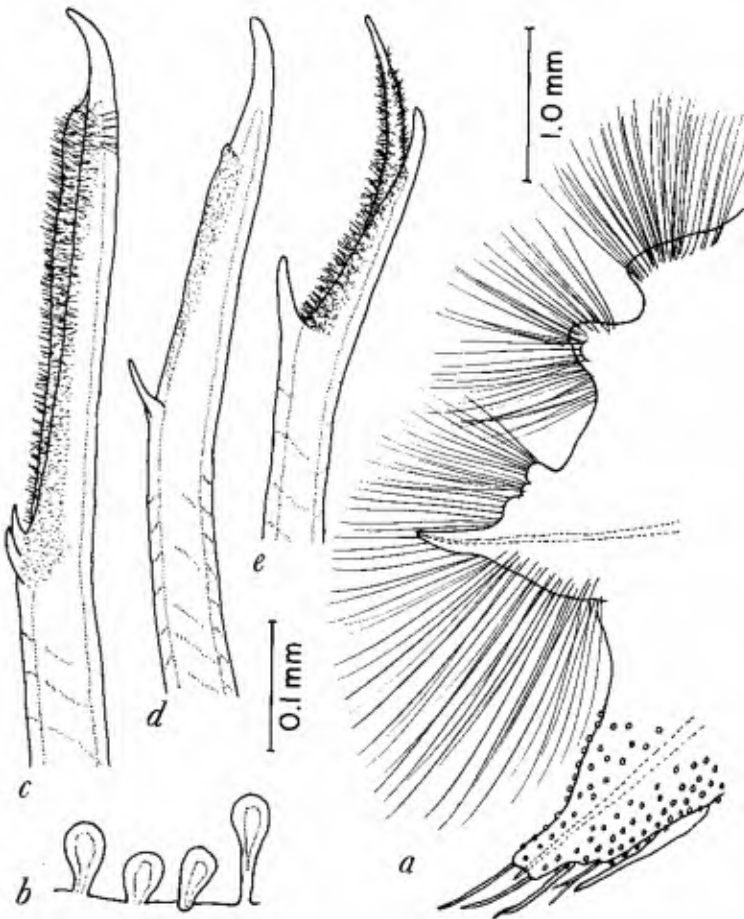


FIG. 5. *Heteraphrodita altoni*, new species. a, right parapodium of segment 15 (elytragerous), anterior view; b, few papillae from neuropodium of same; c, upper neuroseta from same; d, middle neuroseta from same; e, lower neuroseta from same.

small, rounded, with central attachment to elongated cylindrical elytophores (Fig. 2, a, b). Remainder of elytra increasing in size to middle of body, then decreasing in size posteriorly; oval areas on lateral halves of elytra indicating attachments to short elytophores. Elytra variable in shape, subrectangular, oblong to subreniform (Figs. 2, a; 4, b). Posterior 2 or 3 pairs of elytra projecting posteriorly, curling around the anal

region; their posterior tips usually visible, projecting from under the dorsal feltage.

Prostomium (Fig. 2, b) bilobed, wider than long, with middorsal raised area continuous with elongated ceratophore of median antennae; style of antenna wider basally, tapering distally; a pair of short rounded anterior ocular peduncles; no eyes visible; a pair of long stout tapering ventral palps on short basal palpophores; palps appearing smooth under low magnification but scattered, tapered papillae visible under high magnification.

Proboscis thick, muscular, without jaws, with numerous fine, branched papillae around opening. First or tentacular segment (Figs. 2, b; 3, a) with elongated uniramous parapodia projecting laterally and anteriorly to prostomium; parapodia enlarged distally, forming rounded lobes with acicula and several radiating bundles of capillary notosetae, with globular papillae along ventral sides; 2 pairs tentacular cirri, with cylindrical cirrophores on outer or posterior sides of lobes; styles elongated, tapering, upper pair longer than palps, lower pair more delicate and shorter than dorsal pair. Upper lip of mouth only slightly inflated; facial tubercle absent.

Second or buccal segment with first pair of small elytra attached on elongated elytraphores (Fig. 2, a, b). Parapodia biramous, extending anterior and lateral to mouth (Fig. 3, b). Neuropodia cylindrical, covered with globular papillae; aciculum in middle part of lobe, with distal tip projecting between the 2 upper neurosetae; neurosetae few in number (about 7), stout, in 3 rows, upper 2 setae longer, stouter, reddish-amber colored, one seta with basal tooth or spur, other seta with tooth absent or broken off (Fig. 3, c); middle neuroseta yellowish, with 2 closely approximated basal spurs (Fig. 3, d); lower 3 or 4 setae yellowish, with single basal spur, with or without additional small subdistal tooth (Fig. 3, e). Surface of basal parts of neurosetae irregularly somewhat diagonally roughened; some with irregularly distributed small tubercles; distal tips and spurs occasionally broken off. Ventral cirri wider basally, tapering distally, extending beyond tips of neurosetae, somewhat longer than the following ventral cirri. Lower parts of notopodia with projecting acicular lobes containing curved acicula tapering to slender tips; upper parts of lobes rounded, inflated; both parts encircled with short capillary setae, lower bundles of setae somewhat longer than others and extending laterally.

Third segment with first pair of dorsal cirri and biramous parapodia, lateral to mouth (Fig. 4, a). Neuropodia similar to those following, with ventral cirri extending slightly beyond tips of neuropodia. Lower parts of notopodia with subconical acicular lobes, encircled with numerous capillary setae, the lower setae longer and extending laterally; acicular lobes bearing cylindrical cirrophores of dorsal cirri; styles of dorsal cirri long, tapering, extending beyond the tips of the capillary setae; upper parts of notopodia bilobed, smaller lower lobes with short capillary setae, upper larger lobes with short capillary setae extending dorsolaterally

and bundles of long capillary setae extending mediocorsally and forming part of the dorsal feltage. Third segment forming ventral lip of mouth.

Remainder of body similar, except for differences in the feltage notosetae of the cirriferous segments (Fig. 5, a). Neuropodia cylindrical, ending distally in 3 step-like lobes, covered with scattered globular to clavate papillae (Fig. 5, b). Neurosetae stout, reddish to yellow amber-colored, arranged in 3 tiers; upper group composed of 2 setae, above and below the aciculum, the tip of which projects slightly; middle lobe with 1 or 2 shorter setae; lower lobe with 3 or 4 still shorter setae. Neurosetae of upper group (Fig. 5, c) with distally curved tip and 2 closely approximated basal spurs; between the tip and the spurs, a wide spinous sheath along the concave margin. Neurosetae of middle region (Fig. 5, d) with single basal spur, hooked tip, and poorly indicated sheath region. Neurosetae of lower region (Fig. 5, e) with single basal spur, hooked tip, and well-developed spinous sheath extending as a spinous process beyond the tip of the seta proper. Basal parts of the neurosetae diagonally roughened. Ventral cirri wider basally, tapering distally and extending nearly to tips of neuropodial lobes. Notopodia elongated dorsoventrally; lower parts forming subconical acicular lobes containing acicula; thick bundles of short capillary setae extending dorsally, posteriorly and ventrally from the acicular lobes, the ventral groups somewhat longer than the others. Two additional thick radiating bundles of short capillary setae emerging more dorsally on the notopodia. Fine mud adhering to these 3 groups of iridescent capillary setae, giving an exceedingly bushy appearance to dorsolateral regions of the body. On the cirriferous segments, in addition to the 3 groups of short capillary notosetae, compact thick bundles of long iridescent capillary notosetae emerging above the upper bundles of notosetae and fanning out anteriorly, dorsally and posteriorly; the latter portions partially overlapping the radiating bundles of notosetae of the following cirriferous notopodia. These dorsal groups of notosetae on the cirriferous segments intermeshing and forming a compact dorsal feltage to which fine mud adheres. Dorsal cirri with elongated cylindrical cirrophores located posterior to the upper bundles of short notosetae; styles of dorsal cirri long, slender, tapering, extending well beyond the notosetae.

Neuropodia of few posterior segments smaller, with fewer neurosetae—1 upper, 1 middle, and 2 lower; neurosetae with 1 or 2 basal spurs, hooked tips, and spinous sheaths more or less developed. Pygidium (Fig. 2, c) a conical lobe projecting posterodorsally, with bulbous lips around anus at summit of cone. Base of pygidium encircled by segments 25 (last elytriferous) and 26 (last cirriferous). Posterior 2 or 3 pairs of elytra projecting posteriorly, encircling the conical pygidium.

*Remarks:* *Heteraphrodita altoni* resembles in many respects the description and figures of *Aphrodita intermedia* McIntosh, 1885, from off West Indies, collected in 390–460 fathoms. Based particularly on the lack of notopodial protective setae and the peculiar type of neurosetae described and figured by McIntosh, *A. intermedia* is herein referred to

*Heterophradita*. The two specimens of *H. intermedia* described by McIntosh were considerably smaller than the specimens of *H. altoni* (about 5 mm long and about half as wide in the former, compared with length of 17–28 mm and width of 12–14 mm in the latter). Prostomium lacks ocular peduncles in *H. intermedia*, according to McIntosh, although it was stated that the specimens were softened, making it difficult to observe the prostomial structures; short rounded ocular peduncles are present in *H. altoni*. Only one type of neurosetae was described and figured for *H. intermedia*—neurosetae with basal spurs, hooked tips, and with translucent filiform densely pilose processes projecting beyond the hooked tips (McIntosh, 1885, pl. 6A, Fig. 1); in *H. altoni*, this type is mainly confined to the lower row of neurosetae (Fig. 5, e); in the middle and upper series, there may be 1 or 2 basal spurs, and the hairy sheaths along one side of the setae do not extend up to the hooked tips. However, the differences may be correlated with age and size of the animals.

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