

Revision of Some Species
Referred to *Antinoe*, *Antinoella*,
Antinoana, *Bylgides*, and *Harmothoe*
(Polychaeta: Polynoidae: Harmothoinae)

MARIAN H. PETTIBONE

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ABSTRACT

Pettibone, Marian H. Revision of Some Species Referred to *Antinoe*, *Antinoella*, *Bylgides*, and *Harmothoe* (Polychaeta: Polynoidae: Harmothoinae). *Smithsonian Contributions to Zoology*, number 545, 41 pages, 23 figures, 1993.—This revision is based on re-examination of type material and published records. Of the four species included under *Antinoe* by Kinberg, 1856, three are referred to *Harmothoe* Kinberg, 1856, with the type species, *A. microps*, remaining in the genus. In addition, *Antinoe* sensu Malmgren, 1865 (not Kinberg), with type species *A. sarsi*, is referred to *Bylgides* Chamberlin, 1919 (including *Antinoella* Augener, 1928, and *Antinoana* Hartman and Fauchald, 1971). *Antinoe* includes three species; *Bylgides*, 10 species, including new species *B. annenkovae* and *B. belfastensis*. A new genus and species, *Neobylgides scotiensis*, is added. Seven species of *Harmothoe* are described, including new species *H. stephensoni* and *H. discoveryae*.

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Revision of Some Species Referred to *Antinoe*, *Antinoella*, *Antinoana*, *Bylgides*, and *Harmothoe* (Polychaeta: Polynoidae: Harmothoinae)

Marian H. Pettibone

Introduction

Kinberg (1856, 1858) erected four polynoid species under *Antinoe*. Based on a study of the types and original descriptions, only the type species, *A. microps*, is retained in *Antinoe*. The other three species are referred to *Harmothoe* Kinberg, 1856. *Antinoe* sensu Malmgren, 1865 (not Kinberg, 1856) included the type species, *A. sarsi* Malmgren, a widely reported species. Malmgren's generic name was replaced by *Antinoella* Augener (1928), with the same type species, and has been widely used. However, *Bylgides* Chamberlin, 1919 (new name for *Bylgia* Théel, 1879, preoccupied), with type species *B. elegans*, predates *Antinoella* and is followed herein in this revision. *Neobylgides scotiensis*, new genus, new species, is added.

Three species, one doubtful, are included under *Antinoe* Kinberg. Under *Bylgides* Chamberlin, 10 species, including five new combinations, one variety, and two new species, are covered. Seven species of *Harmothoe* are described, including two new combinations and three new species.

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History Museum, London (BMNH, collections of the former British Museum (Natural History)), through A.I. Muir; Naturhistoriska Museet, Göteborg (NMG), through the late A. Eliason and B. Hansson; Naturhistoriska Riksmuseet, Stockholm (NRS), through R. Oleröd and L. Almkvist; Zoological Institute Academy of Sciences, Leningrad (ZIAS), through P. Uschakov; Zoologisches Staats Museum, Hamburg (ZMH), through G. Hartmann-Schröder; Zoologisches Museum der Humboldt-Universität, Berlin, (ZMHUB), through G. Hartwich; Zoologisk Museum Universitetet, Bergen (ZMUB), through J. Kjennerud and A.-A. Loshamn; University Zoological Museum, Copenhagen (ZMUC), through M.E. Petersen; Zoological Museum University of Oslo (ZMUO), through A.-A. Loshamn.

Lennart Almquist (NRS) was extremely helpful in providing translations from the Swedish of Malmgren (1865), Malm (1874), and Théel (1879), as well as locality names and additional information on the types and other specimens of the above authors in the Stockholm Museum (NRS). Correspondence with Alf-Arian Loshamn (ZMUO) and parts of his unpublished masters thesis (1980), provided by Mary E. Petersen (ZMUC), were helpful. The manuscript benefited from the suggestions of Thomas H. Perkins, Mary E. Petersen, and Brigitte Hilbig.

Family POLYNOIDAE Kinberg, 1856

Subfamily HARMOTHOINAE Willey, 1902

Genus *Antinoe* Kinberg, 1856

TYPE SPECIES.—*Antinoe microps* Kinberg, 1856, designated by Hartman, 1959:62. Gender: feminine.

REMARKS.—Kinberg (1856:385, 386; 1858:20, 21, pl. 6: fig. 30) erected *Antinoe* for the following four species collected by

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the *Eugenie* Expedition (types in NRS): (1) *A. aequisetata*, from Port Natal, South Africa; (2) *A. waahli*, from Port Jackson, Australia; (3) *A. pulchellus*, from La Plata, Argentina, and (4) *A. microps*, from Rio de Janeiro, Brazil. In her Catalog, Hartman (1959:61) listed the latter species as the type species for the genus, a valid subsequent designation (*International Code of Zoological Nomenclature*, Article 69(a)(iv)). The holotype of *A. microps* is described below. Augener (1918:137) referred *A. aequisetata* to *Harmothoe*. Based on the poor condition of the holotype and a deficient original description, the species is herein considered to be an indeterminable *Harmothoe* sp. Some of the records in the literature of *H. aequisetata* are referred below to *H. capensis* (Willey, 1904), new combination, and *H. discoveryae*, new species. Augener (1922:11) referred *A. waahli* to *Harmothoe*. The species is redescribed below under *Harmothoe*, and some records of *H. waahli* are referred to *H. praeclara* (Haswell, 1883), *H. stephensoni*, new species, and *H. tahitiensis*, new species. The syntypes of *A. pulchellus* were examined and described below under *Harmothoe*.

DIAGNOSIS.—Body short, up to 34 segments. Elytra 15 pairs, on segments 2, 4, 5, 7, alternate segments to 23, 26, 29, and 32. Elytra smooth, without tubercles or marginal fringe. Dorsal cirri with long styles, on segments lacking elytra. Prostomium bilobed, anterior lobes rounded, without cephalic peaks; median antenna with ceratophore in anterior notch; ceratophores of lateral antennae inserted anteroventrally; palps stout, tapered; 2 pairs of minute eyes. Tentaculophores of first segment lateral to prostomium, each with dorsal and ventral tentacular cirri. Parapodia biramous; notopodia conical, much shorter than neuropodia; neuropodia with presetal acicular lobes conical, with supraacicular projection; postsetal lobes shorter, rounded. Notosetae numerous, forming radiating

bundle, slightly stouter than neurosetae, nearly smooth, with spinous rows along one border and with blunt tips. Neurosetae forming fan-shape bundle, upper neurosetae more slender with longer spinous regions, lower neurosetae stouter with shorter spinous regions, all tapering to pointed tips (not capillary, not falcate).

Antinoe microps Kinberg, 1856

FIGURE 1

Antinoe microps Kinberg, 1856 ("1855"):385; 1858:20, pl. 6: fig. 30.—Hartman, 1949 ("1948"):28, pl. 2: figs. 1-5.

MATERIAL EXAMINED.—BRAZIL: Rio de Janeiro, *Eugenie* Expedition, holotype (NRS 407).

MEASUREMENTS.—*Type Material:* The holotype consists of 15 anterior and 10 posterior segments (25-34), with 9 middle segments (10-24) missing, 10+ mm long, 3 mm wide with setae (32 segments, in Kinberg, 1856). The body is now translucent and in rather poor condition. The eyes are faded and the elytra are missing (both are described and figured by Kinberg). The type was examined and redescribed by Hartman (1949:28).

DESCRIPTION.—Body flattened dorsoventrally, tapered posteriorly. Elytra rounded, without tubercles or marginal fringe, with C-shape pigmented areas (Kinberg, 1858, pl. 6: fig. 30M). Dorsal cirri with cylindrical cirrophores and long distal styles extending beyond tips of neurosetae; dorsal tubercles slightly bulbous (Figure 1C; Kinberg, 1858, pl. 6: fig. 30F).

Bilobed prostomium with rounded anterior lobes, without peaks; bulbous ceratophore of median antenna in anterior notch, with short style; small ceratophores of lateral antennae attached anteroventrally, with styles about $1/2$ as long as median

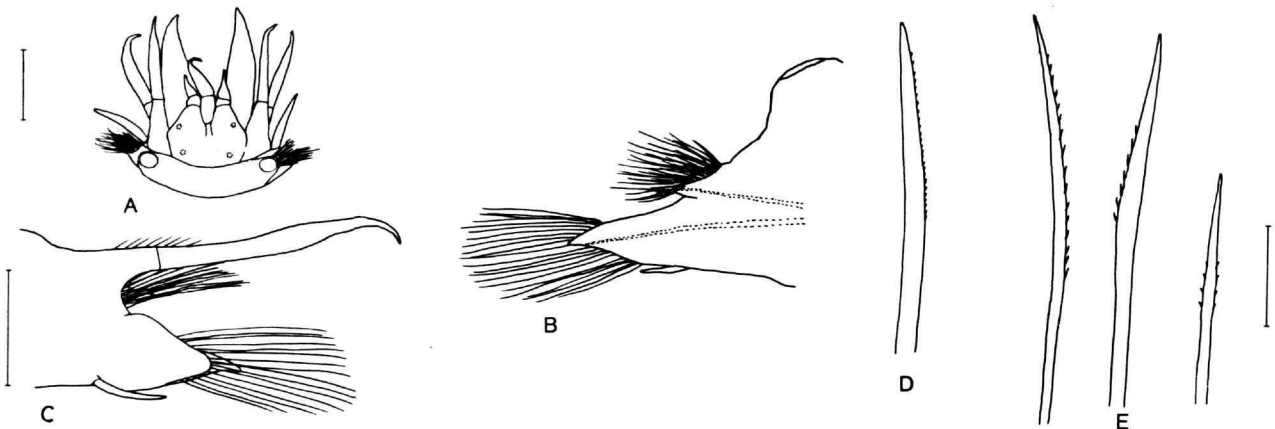


FIGURE 1.—*Antinoe microps* Kinberg (holotype, NRS 407): A, dorsal view of anterior end, eyes faded (dotted, taken from figure of Kinberg, 1858); B, right elytragerous parapodium, anterior view, acicula dotted; C, right cirriferous parapodium, posterior view; D, notoseta; E, upper, middle, and lower neurosetae. (Scales: A = 0.5 mm; B, C = 0.5 mm; D, E = 0.1 mm.)

antenna; palps stout, tapered; 2 pairs of minute eyes (now faded); tentaculophores lateral to prostomium, without setae; dorsal and ventral tentacular cirri subequal in length, longer than median antenna, and slightly shorter than palps; conical facial tubercle absent (Figure 1A; Kinberg, 1858, pl. 6: fig. 30B).

Second or buccal segment with first pair of prominent elytophores and ventral or buccal cirri longer than following ventral cirri, similar to tentacular cirri (Figure 1A). Pharynx not extended and not examined. Parapodia biramous; notopodium rounded, with projecting acicular lobe on lower side, much shorter than neuropodium; neuropodium with conical presetal acicular lobe with supraacicular tip projecting beyond tip of neuroaciculum, with shorter rounded postsetal lobe (Figure 1B,C; Hartman, 1949, pl. 2: fig. 1). Notosetae numerous (about 40), forming radiating bundle, extending to about tip of neuropodium (Figure 1B,C). Notosetae slightly stouter than neurosetae, short and long, nearly smooth, with short spinous rows on curved border (Figure 1D; Kinberg, 1858, pl. 6: fig. 30G; Hartman, 1949, pl. 2: figs. 2, 5). Neurosetae moderate in number (about 24), forming fan-shape bundle, wider basally, tapering to sharp-pointed tips (not capillary); upper neurosetae more slender, with more prominent spinous rows; middle and lower ones stouter, with longer bare tips (Figure 1E; Kinberg, 1856, pl. 6: fig. 30G; Hartman, 1949, pl. 2: figs. 3, 4). Ventral cirri short, tapered (Figure 1B,C). Pygidium with pair of anal cirri.

DISTRIBUTION.—Known only from type locality: Rio de Janeiro, Brazil.

Antinoe uschakovi (Ibarzábal, 1988), new combination

Antinoana uschakovi Ibarzábal, 1988:1-4, fig. 1A-I.

REMARKS.—The types from the Gulf of Batabaná, Cuba, deposited in the Instituto de Oceanología Academia de Ciencias de Cuba, and Zoological Institute Academy of Sciences, Leningrad, were not available for study. Based on the description and figures by Ibarzábal (1988), the species is referred herein to *Antinoe* Kinberg, and the following condensed description is given.

MEASUREMENTS.—*Type Material:* Holotype and 3 paratypes consisting of 27 segments, 6-7 mm long, 2-3 mm wide, according to Ibarzábal (1988).

DESCRIPTION.—Elytra 12 pairs, on segments 2, 4, 5, 7, alternate segments to 23 (with dorsal cirri on posterior 5 segments?). Elytra oval to subreniform, with small, oval border papillae and granulations (microtubercles?) on surface (Ibarzábal, 1988, fig. 1H,I). Long dorsal cirri alternating with elytra.

Bilobed prostomium without peaks, with 2 pairs of small eyes; median antenna with ceratophore in anterior notch, with style shorter than stout palps; lateral antennae with ceratophores inserted terminoventrally, removed from median antenna, with short styles; tentaculophores lateral to prostomium, with

setae and 2 pairs of subequal tentacular cirri, longer than median antenna (fig. 1A).

Biramous parapodia with notopodia shorter than neuropodia, both rami with projecting acicular lobes (fig. 1B). Notosetae stouter than neurosetae, short and long, with prominent spinous rows, tapering to pointed tips (fig. 1C,D). Neurosetae with spinous rows, tapering to slender pointed tips, upper neurosetae with bifid tips (fig. 1E-G).

DISTRIBUTION.—Caribbean Sea, southwestern shelf of Cuba; in 4-6 meters.

COMPARISONS.—*Antinoe uschakovi* differs from *A. microps* Kinberg in having elytra with border papillae, rather than lacking them; tentaculophores with setae, rather than achaetous; more prominent spinous rows on the notosetae; and upper neurosetae with bifid tips, rather than tips entire.

Antinoe finmarchica Malmgren, 1867, doubtful species

Malmgren (1867:137) described *A. finmarchica* from off Tromsø, northern Norway, very briefly and without figures. The type has not been found in the Swedish State Museum in Stockholm (NRS, pers. com. L. Almquist). The species is considered to be indeterminate.

Genus *Bylgides* Chamberlin, 1919

Antinoe sensu Malmgren, 1865 [not Kinberg, 1856; for *Antinoe sarsi* (Kinberg, MS) Malmgren, 1865 (= *Bylgides sarsi* (Malmgren, 1865))].

Bylgia Théel, 1879 [type-species: *Bylgia elegans* Théel, 1879, by monotypy; preoccupied by G. Muenster, 1839 (Crustacea) (= *Bylgides elegans* (Théel))].

Bylgides Chamberlin, 1919 [new name for *Bylgia* Théel, 1879, preoccupied; type species: *Bylgia elegans* Théel, 1879, by monotypy; gender: masculine (Int. Code Zool. Nom. Art. 30(b))].

Antinoella Augener, 1928 [as *Harmothoe* (*Antinoella*); type species: *Antinoella sarsi* (Malmgren, 1865), designated by Uschakov, 1955:160 (= *Bylgides sarsi* (Malmgren))].

Antinoana Hartman and Fauchald, 1971 [type species: *Antinoana fusca* Hartman and Fauchald, 1971, by original designation (= *Bylgides fuscus* (Hartman and Fauchald))].

DIAGNOSIS.—Segments up to 38. Elytra and elytophores 14-15 pairs, on segments 2, 4, 5, 7, alternate segments to 23, 26, 29, and 32; elytra with papillae, with or without microtubercles. Dorsal cirri on segments lacking elytra, with cylindrical cirrophores and distal styles; nodular to digitiform dorsal tubercles on cirriferous segments. Prostomium bilobed, with more or less distinct cephalic peaks, with 3 antennae, paired palps, and 2 pairs of eyes; median antenna with ceratophore in anterior notch; lateral antennae with ceratophores inserted ventrally. Tentaculophores of first or tentacular segment lateral to prostomium, each with aciculum, with or without few setae, and dorsal and ventral tentacular cirri. Second or buccal segment with first pair of elytophores, biramous parapodia, and long ventral buccal cirri lateral to mouth; with or without nuchal lobe; pharynx with 9 pairs of

border papillae and 2 pairs of hooked jaws. Parapodia biramous; notopodia and neuropodia well developed, extending into digitiform acicular lobes; neuropodia with longer presetal conical acicular lobe and supraacicular digitiform process and with shorter rounded postsetal lobe. Notozetae

much thicker than neurosetae, with numerous rows of spinules and short, pointed to blunt, smooth tips. Neurosetae with elongate spinous regions, all with capillary tips or some with blunt acicular tips. Ventral cirri on all segments, short, tapered. Pygidium with pair of anal cirri.

Key to the Species of *Bylgides*

1. All neurosetae with capillary tips, acicular neurosetae absent. Without nuchal lobe 2
Some acicular neurosetae present in addition to neurosetae with capillary tips. With or without nuchal lobe 4
2. Neurosetae with very short capillary tips [Figure 12F]. Eyes large [Figure 12A]. Segments? (incomplete). Elytra? (missing) *B. acutisetis* Loshamn
Neurosetae with long capillary tips [Figures 9F-H, 11H-J]. Eyes relatively small [Figures 8A,C, 10A, 11A]. Segments 35-37 3
3. Elytral papillae widest basally and heavily chitinized, with bulbous tips [Figure 8B,D]. Middle neurosetae without extra-large basal spines [Figure 9F-H] *B. promamme* (Malmgren), new combination
Elytral papillae cylindrical, not wider basally, and not heavily chitinized [Figure 10C]. Middle neurosetae with extra-large basal spines [Figures 10J, 11I] *B. groenlandicus* (Malmgren), new combination
4. Inflated rectangular nuchal lobe [Figure 6A,C,D]. Dorsal tubercles on cirriferous segments projecting laterally and forming flattened digitiform processes [Figure 6D,E] *B. annenkovae*, new species
Nuchal lobe absent. Dorsal tubercles without lateral extensions 5
5. Anterior pair of eyes more than twice as large as posterior pair, near anterior border of prostomium; smaller posterior pair small, near posterior border [Figure 13B]. Neurosetae with tips plumose, with long capillary extension [Figure 13J]. Elytra with microtubercles [Figure 13C] *B. macrolepidus* (Moore), new combination
Anterior pair of eyes not extra large. Neurosetae otherwise. Elytra with or without microtubercles 6
6. Elytra 15 pairs. Anterior pair of eyes about twice as large as posterior pair [Figures 2A,B, 5A] 7
Elytra 14 pairs or less. Anterior pair of eyes otherwise 8
7. Elytra without microtubercles [Figure 2E]. Neuropodial presetal acicular lobe with tapered, conical supraacicular process [Figure 3A,B] *B. elegans* (Théel)
Elytra with microtubercles [Figure 5B]. Neuropodial presetal acicular lobe with slender, digitiform supraacicular process [Figure 5C,D] *B. sarsi*, variety
8. Eyes moderately large, anterior pair larger than posterior pair [Figure 4A]. Elytra without microtubercles [Figure 4J]. Neuropodial presetal acicular lobe with digitiform supraacicular process [Figure 4D,E] *B. sarsi* (Malmgren), new combination
Eyes small, anterior and posterior pairs of subequal size [Figures 14A, 15A]. Elytra with either filiform or clavate papillae 9
9. Elytra with filiform papillae [Figure 14B]. Neuropodial presetal acicular lobe with tapered supraacicular process [Figure 14F,G] *B. fuscus* (Hartman and Fauchald), new combination
Elytra with clavate papillae and tubercle-papillae [Figure 15B]. Neuropodial presetal acicular lobe with digitiform supraacicular process [Figure 13C,D] *B. belfastensis*, new species

Bylgides elegans (Théel, 1879)

FIGURES 2, 3

Antioe sarsi Malmgren, 1865:75 [part].—Pettibone, 1954:215; 1956:547 [not Malmgren, 1865].

Antioe promamme Malmgren, 1867:136 [part].

Bylgia elegans Théel, 1879:21, pl. 1: figs. 13–15.

Bylgides elegans.—Chamberlin, 1919:40.—Loshamn, 1980:198, figs. 97, 98 [part, not fig. 99; thesis].—Uschakov, 1982:157.

Antinoella sarsi.—Pettibone, 1963:30 [not Malmgren, 1865].

Antinoella plumosa.—Fauchald, 1974:7 [part; not Fauchald, 1972].

MATERIAL EXAMINED.—KARA SEA: 72°35'N, 77°30'E, 34 m, muddy sand, Novaja Zemlja Expedition, sta 170 (no. 30, Théel), 11 Aug 1875, holotype of *B. elegans* (NRS 2374).

NORWAY: Finmark, Kalfjord, 146 m, Goës and Malmgren, collectors, 1861, syntype of *Antioe promamme* (NRS 2611). Klosterfjorden, between Tittlesnes and Fjellbergöy, 378–382 m, *Calocaris* bottom, sta 7-59, 4 Jun 1959, 1 specimen (ZMUB; as *Antinoella plumosa* by Fauchald, 1974). Spitsbergen Archipelago: Magdalena Bay, 73 m, Goës and Smitt, collectors, syntype of *Antioe promamme*

(NRS 2609).

CANADA: Labrador: 53°21'N–59°23'N, 59°59.5'W–64°03'W, 11–55 m, mud, sandy mud, and stony, "Blue Dolphin," D.C. Nutt, collector, 7 Jul to 23 Aug 1950, 7 Jul to 26 Aug 1951, 14 specimens (USNM 22283–5, 22301, 22303, 23753–4).

UNITED STATES: Alaska: Near Point Belcher, Icy Cape, off Point Barrow, W.H. Dall, collector, 1 specimen (USNM 18651). Cape Smyth, 5 m, U.S. Signal Service, 9 Aug 1883, 4 specimens (USNM 873). Point Barrow Base, washed ashore and mud screen trap through hole in ice, 9–11 m, G.E. MacGinitie, collector, 2 Aug 1948, 21 Aug to 16 Oct 1949, 11 Apr 1950, 62 specimens (USNM 21614–5, 21617–8, 22284; BMNH ZB 1973.13; NRS; ZIAS). Off Point Barrow, 70°42'N–71°34'N, 150°01'W–155°50'W, 10–175 m, "Nat-chik," J.J. Goner, collector, 13–16 Aug 1963, 5 specimens (USNM 32122–5).

BERING SEA: 62°15'N, 167°48'W, Lt. G.M. Stoney, collector, 13 Jun 1884, 21 specimens (USNM 4345–6).

MEASUREMENTS.—*Type Material:* The holotype of *Bylgia*

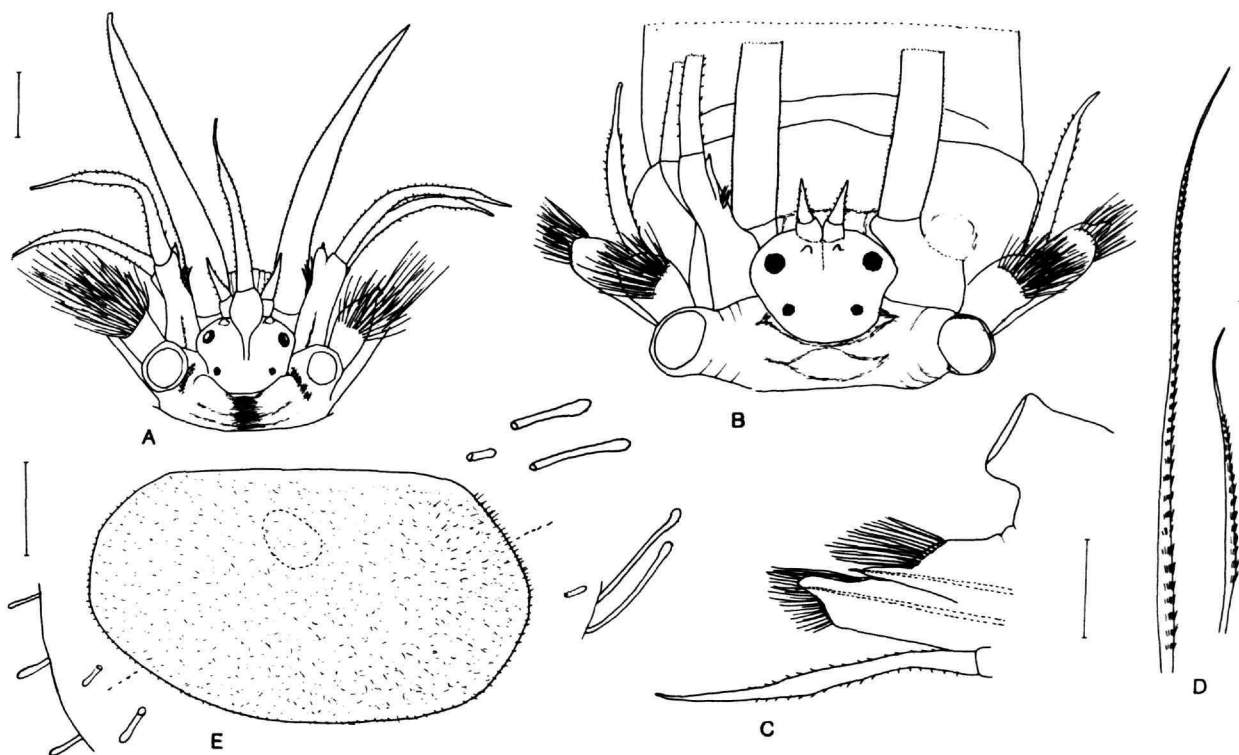


FIGURE 2.—*Bylgides elegans* (Théel) (A, specimen from Point Barrow, USNM 21618; B–E, holotype of *Bylgia elegans*, NRS 2374): A, dorsal view of anterior end; B, dorsal view of anterior end, pharynx fully extended, prostomium defective (median antenna, including ceratophore, missing), right tentaculophore cut off, only bases of pharynx, palps, and left tentacular cirri shown; C, right elytragerous parapodium from segment 2, anterior view, acicula dotted; D, upper and lower neurosetae from same; E, right elytron, with detail of papillae. (Scales: A, B = 1.0 mm; C = 1.0 mm; D = 0.1 mm; E = 2.0 mm.)

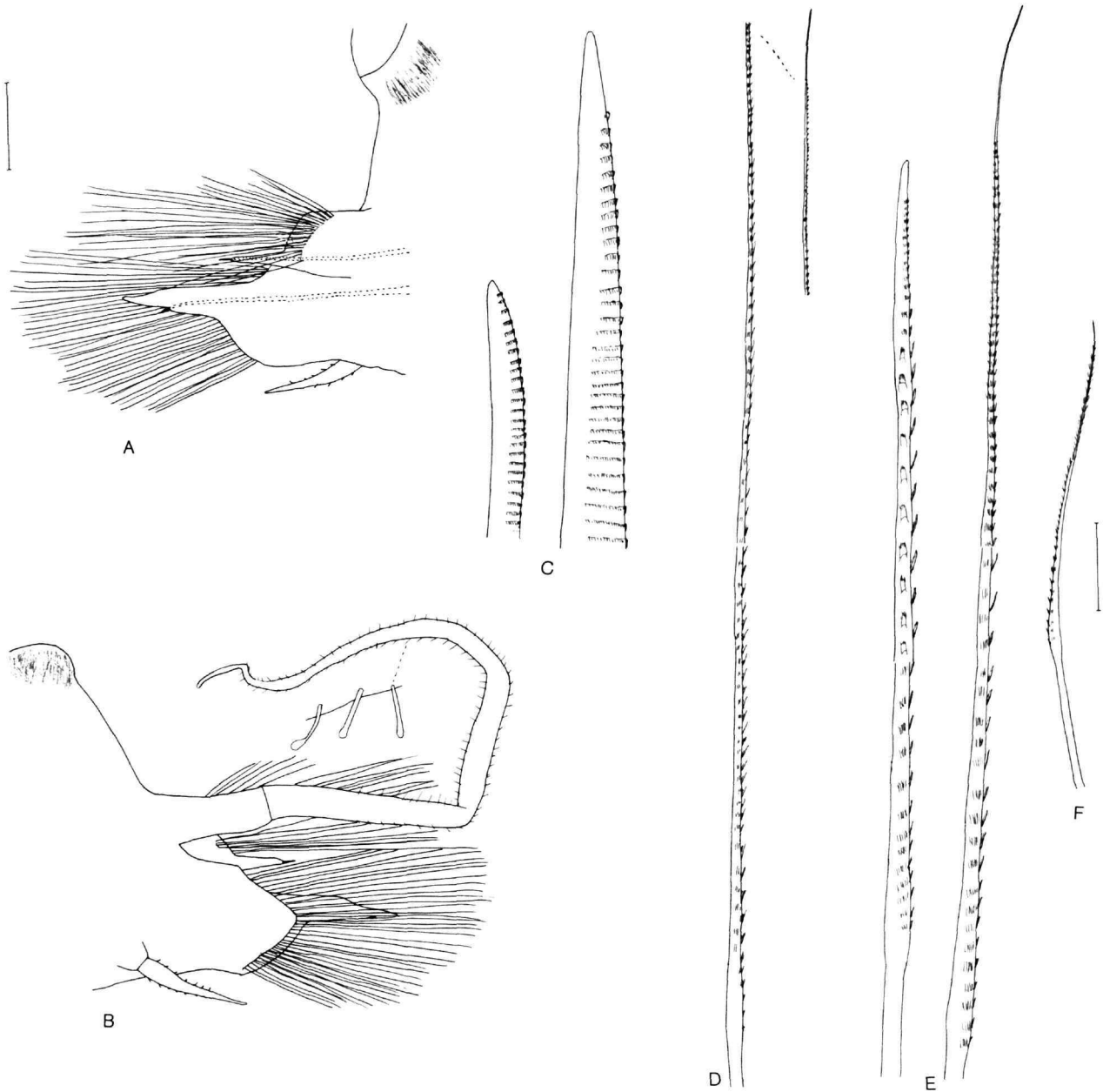


FIGURE 3.—*Bylgides elegans* (Théel) (holotype of *Bylgia elegans*, NRS 2374): A, right elytragerous parapodium, anterior view, acicula dotted; B, right cirriferous parapodium, posterior view, with detail of papillae; C, short and long notosetae; D, upper neuroseta; E, two middle neurosetae; F, lower neuroseta. (Scales: A, B = 1.0 mm; C-F = 0.1 mm.)

elegans is a complete specimen, with the pharynx extended, 47 mm long (59 mm including pharynx), 17 mm wide with setae, and 37 segments. The prostomium is defective, with the ceratophore of the median antenna missing and the cephalic

peaks much closer together than usual (Figure 2B).

Nontype Material: Specimens from Alaska 21–68 mm long, 10–27 mm wide with setae, segments 36–38.

DESCRIPTION.—Body flattened, tapering slightly anteriorly

and posteriorly. Dorsum greyish green or light brown mid-dorsally, with brown pigment along sides (Figure 2A). Fifteen pairs of large oval elytra covering dorsum, attached on prominent elytophores. Elytra translucent to opaque, with medial brownish grey crescent-shape areas; surfaces appearing smooth, with delicate papillae along border and scattered on surface; papillae cylindrical, with clavate tips (Figure 2E; Théel, 1879, pl. 1: figs. 13, 15). Dorsal cirri with cylindrical cirrophores on posterior sides of notopodia, with long styles extending far beyond setae; styles with scattered papillae with clavate tips; dorsal tubercles nodular, pigmented (Figure 3B).

Prostomium bilobed, rounded anteriorly, with small cephalic peaks distinct or poorly developed, with anterior pair of eyes anterior to greatest width, about 2 times larger than posterior pair; ceratophore of median antenna large, bulbous, in anterior notch of prostomium; style long and papillate, with filamentous tip (missing on holotype); ceratophores of lateral antennae short, rounded, fused medially ventral to median antenna, with styles short, subulate, papillate; palps long, tapered, very finely papillate (Figure 2A,B; Théel, 1879, pl. 1: fig. 14). Tentaculophores lateral to prostomium, with small projecting acicular lobe and 1–4 short notosetae on inner side; tentacular cirri similar to but slightly longer than median antenna, dorsal one slightly longer than ventral one; facial tubercle absent (Figure 2A,B).

Second or buccal segment without nuchal fold, with first pair of prominent elytophores and long ventral buccal cirri lateral to mouth, similar to tentacular cirri, longer than following ventral cirri; notosetae similar to those in following notopodia; neurosetae spinose with capillary tips (Figure 2A–D). Pharynx with 9 pairs of border papillae and 2 pairs of dark amber-color jaws.

Parapodia prominent, biramous, with yellowish or golden setae. Notopodium shorter than neuropodium, rounded, with projecting acicular lobe on lower side; neuropodium with longer conical presetal acicular lobe, with supraacicular process, and shorter rounded postsetal lobe (Figure 3A,B). Notoetae numerous, forming radiating bundle, much thicker than neurosetae, with numerous spinous rows; some notosetae short, slightly curved with short bare tips and some longer, straight, with longer bare tips (Figure 3A–C). Neurosetae numerous, forming fan-shape bundles. Upper neurosetae slender, with long spinous regions, tapering to capillary tips (Figure 3D); middle ones stouter, with prominent spinous regions, some tapering to capillary tips and some with slightly hooked, bare, blunt tips (Figure 3E); lower neurosetae slender, shorter, with capillary, plumose tips (Figure 3F). Ventral cirri short, subulate, papillate (Figure 3A,B).

Nephridial papillae short, bulbous, beginning on segment 5. Pygidium with anus medial to parapodia of last 2 segments, with pair of anal cirri (sometimes single long anal cirrus).

DISTRIBUTION.—Circumpolar, Kara Sea; Spitsbergen Archipelago, Norway, to Labrador, Canada; Alaska to Bering Sea; in 9–382 meters.

Bylgides sarsi (Malmgren, 1865), new combination

FIGURE 4

- Antinoe sarsi* (Kinberg, MS) Malmgren, 1865:75, pl. 9: fig. 6 [part, Baltic form]; 1867:136 [part, forma *minor*].
Antinoe sarsii [sic].—Malm, 1874:75 [part, forma *balthica*].
Harmothoe sarsi.—Eliason, 1920:20.—Sarvala, 1971:231–309 [ecology].
Harmothoe sarsi sarsi.—Meunier, 1930:16 [Baltic form].—Mulicki, 1959:163–174 [ecology, in southern Baltic].
Harmothoe (Antinoella) sarsi.—Eliason, 1962b:14.
Harmothoe (Antinoella) sarsi sarsi.—Hartmann-Schröder, 1971:62, fig. 18a–e [part].
Antinoella sarsi.—Wolff, 1973:90.
Bylgides sarsi.—Uschakov, 1982:153 (M. Pettibone, in litt.).

MATERIAL EXAMINED.—BALTIC SEA: Gotland, Östersjön, near St. Anne, 20 Aug 1862, Malmgren collection, 4 syntypes of *A. sarsi* (NMG 34). Off South and Southeast of Sweden and Gotland, 55°N, 15°E–59°N, 19°E, 4–110 m, sand and clay bottoms, F.A. Smitt and Hj. Widegren, collectors, 1864, Malmgren collection: Ystad; Karlskrona; Visby and Kapellshamn in Gotland; Oskarshamn; Öro Island near Västervik; Västervik; Gamleby; Bråviken; islands of Arkö and Marskär, 110+ syntypes of *A. sarsi* Malmgren and *A. sarsii* forma *balthica* Malm (NRS 5765–5776; BMNH 1865.9.23.18; USNM 48464). Baltic Sea, Lindstroem, collector, 13 small specimens (USNM 262). The Baltic, SE of Gotska Sandön, 58°07'N, 19°59'E, 165–180 m, O. Nybelin, collector, 15 Jun 1927, 2 large specimens (USNM 43218, from A. Eliason). Western Baltic near Bornholm, in stomachs of cod, April 1987, 8 specimens (USNM 119862, from ZMUC, M.E. Petersen).

DENMARK: *Kattegat*: Off Frederikshavn, 8–20 m, 3 specimens (ZMUC). Off Døkkedal, off entrance to Limfjorden, 2–10 m, 12 specimens (ZMUC). Limfjorden, 14 specimens (ZMUC; USNM 119861, from M.E. Petersen). *Wadden Sea*: SE of Rømø, 2 specimens (ZMUC).

NETHERLANDS: Province of Zuid-Holland, Isle of Goeree-Overflakkee, in burrow of *Arenicola marina*, W.T. Wolff, collector, 9 Sep 1963, 2 small specimens (USNM 48465).

MEASUREMENTS.—*Type Material*: Larger syntypes 21–25 mm long, 11–14 mm wide with setae, with 32–33 segments and 14 pairs of elytra. Young syntypes 3–6 mm long, 2.5–3 mm wide, with 13–25 segments.

Nontype Material: Two large specimens (USNM 43218) 39–42 mm long, 20–23 mm wide with setae, with 33–34 segments and 14 pairs of elytra.

DESCRIPTION.—Body flattened, tapering slightly anteriorly and posteriorly, with parapodia and setae of each side about equal to width of body. Color somewhat variable, dorsum uniformly greenish to blackish green with lighter transverse ciliated bands, 2 per segment, extending onto dorsal tubercles and elytophores. Smaller specimens with pigment broken up. Elytra up to 14 pairs, on segments 2, 4, 5, 7, alternate segments to 23, 26, and 29, with 4–5 posterior segments with dorsal cirri. Elytra large, rounded to oval, covering dorsum; surface slick, shiny, dotted with cylindrical papillae with slightly clavate tips

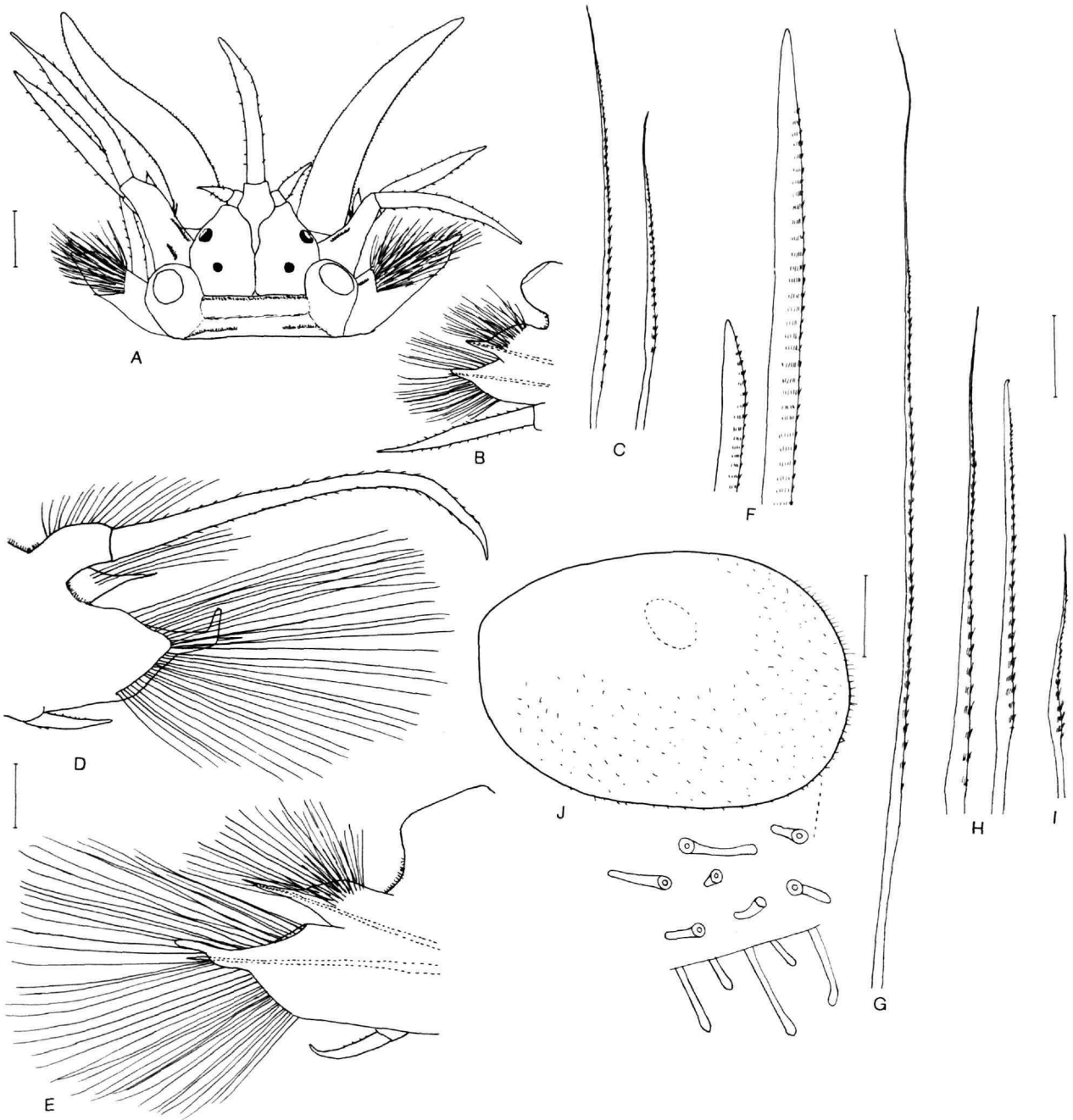


FIGURE 4.—*Bylgides sarsi* (Malmgren), new combination (syntype of *Antinoe sarsi*, USNM 48464, from NRS 5770): A, dorsal view of anterior end; B, right elytragerous parapodium from segment 2, anterior view, acicula dotted; C, upper and lower neurosetae from same; D, right cirriferous parapodium, posterior view; E, right elytragerous parapodium, anterior view, acicula dotted; F, short and long notosetae; G, upper neuroseta; H, two middle neurosetae; I, lower neuroseta; J, right middle elytron, with detail of papillae. (Scales A = 0.5 mm; B,D,E = 0.5 mm; C, F-I = 0.1 mm; J = 1.0 mm.)

and round chitinous bases; papillae also along posterior and lateral borders; without microtubercles (Figure 4J; Malmgren, 1865, pl. 9: fig. 6C.E). Dorsal cirri with cylindrical cirrophores on posterior sides of notopodia, with long styles extending beyond neurosetae, with scattered short clavate papillae (Figure 4D; Malmgren, 1865, pl. 9: fig. 6B); dorsal tubercles nodular.

Prostomium bilobed, with small rounded cephalic peaks; anterior pair of eyes anterior to greatest prostomial width, slightly larger than posterior pair; ceratophore of median antenna large, bulbous, in anterior notch; style rather short, with short clavate papillae; ceratophores of lateral antennae short, rounded, fused medially ventral to median antenna, with styles short, subulate, papillate; palps stout, tapered, very finely papillate (Figure 4A; Malmgren, 1865, pl. 9: fig. 6A). Tentaculophores each with small projecting acicular lobe and 2–4 short notosetae on inner side; tentacular cirri similar to but slightly longer than median antenna, dorsal ones slightly longer than ventral ones; without facial tubercle (Figure 4A).

Second segment without nuchal fold, with first pair of prominent elytriphores and long ventral buccal cirri lateral to ventral mouth, similar to tentacular cirri, longer than following ventral cirri; notopodia and neuropodia subequal in length; notosetae similar to notosetae of following segments; neurosetae all with fine tips (Figures 4B,C). Pharynx with 9 pairs of border papillae and 2 pairs of amber-color jaws.

Parapodia prominent, biramous, with golden setae. Notopodium shorter than neuropodium, rounded, with projecting acicular lobe on lower side; neuropodium with longer presetal conical acicular lobe with supraacicular digitiform process, and with shorter, rounded postsetal lobe (Figure 4D,E). Notosetae numerous, forming radiating bundle, much thicker than neurosetae, with numerous spinous rows, some short, slightly curved, with short bare tips and some longer, straight, with longer bare tips (Figure 4F; Malmgren, 1865, pl. 9: fig. 6Dr). Neurosetae numerous, forming fan-shape bundles. Upper neurosetae slender, with long spinous regions, tapering to capillary tips (Figure 4G; Malmgren, 1865, pl. 9: fig. 6Ds); middle neurosetae stouter, with shorter spinous regions, some tapering to capillary tips and some with slightly hooked bare tips (Figure 4H; Malmgren, 1865, pl. 9: fig. 6Ds'); lower neurosetae shorter, tapering to capillary tips (Figure 4I; Malmgren, 1865, pl. 9: fig. 6Ds"). Ventral cirri short, subulate, with minute bulbous papillae (Figure 4D,E).

Nephridial papillae short, cylindrical, beginning on segment 5. Pygidium with anus medial to parapodia of last segment, with pair of anal cirri (on smaller specimens, anal cirri very long, up to more than $1/2$ length of body).

BIOLOGY.—The very exhaustive study of *B. sarsi* (as *Harmothoe*) by Sarvala (1971) furnished a great deal of information on the population structures and dynamics of this species, which he studied chiefly in the mesohaline waters from bottom and plankton samples near Tvärminne, southern Finland, in the deeper parts of the Gulf of Finland, the Åland

and Bothnian Seas, and the northern Baltic. The species was found in depths of 0.3–80 m, with maximum density at 21–40 m, mostly on soft bottoms, but not dependent on any specific type of bottom. The temperature range at which *B. sarsi* occurred was between 1.6°C and 14°C, (maximum 17°C), with greatest biomass between 3°C and 12°C (maximum between 3°C and 6°C). High temperature restricted the occurrence of the species in shallow water due to the cold-stenothermy of the larvae. The species is euryhaline. Its abundance decreased when salinity exceeded 17‰, with highest densities occurring in 6–7‰. *Bylgides sarsi* was able to withstand low oxygen levels and thrive on hydrogen sulfide bottoms, similar in this regard to *Arenicola marina*.

Bylgides sarsi has a semipelagic mode of life, showing diurnal vertical movements. The worms creep on the surface of the mud, especially on moonless nights, and rise above the bottom to midwater during the night, swimming rapidly. This semipelagic mode of life allows the species to escape poor oxygen conditions near the bottom. *Bylgides sarsi* is carnivorous, with more than $1/3$ of its food consisting of small pelagic species, mainly crustaceans. Feeding occurs mainly at night, immediately above or on the bottom, also to some extent in upper-water layers and in bottom mud. The worms also appear to be scavengers to some extent, feeding on dead planktonic organisms that sink to the bottom. Interspecific competition appears to be low. In the northern Baltic, *B. sarsi* was the only polychaete inhabiting the oozy bottom, where it reached its greatest abundance. There is a strong predator pressure on the species, which serves as food for many fishes.

Bylgides sarsi reaches its maximum number of segments during the third summer, in worms 20 mm long. The largest specimens caught in the study area were 25–30 mm long by 10–13 mm wide, with 32–34 setigers (= 33–35 segments). The maximum length attained in the Gotland Deep was 54 mm (mean length of 34 mm).

Some *B. sarsi* developed gonads during the first winter, 4 months after metamorphosis, but most did not mature until the second winter. Breeding took place only once a year within a relatively restricted period. The age of worms in the study area seldom exceeded two years. Early developmental stages of trochophores, metatrochophores, and nectochaetes were found in the plankton. Larvae were found in the plankton between February and August, but were numerous only from April to June–July. Larvae were very sparse at temperatures above 6°C, and their highest densities were found near the bottom. There was no selection of substratum. The larvae metamorphosed when they reached 7 setigerous segments, and recently metamorphosed young were found in the same water layers as the larvae, often high above the bottom. Larval development averaged 1.5–2 months, metamorphosis taking place in June. The main period of settling was in late June and early July. It was estimated that 16%–19% of settled *B. sarsi* reached the age of one year and less than 1% survived as long as two years.

Based on a study of Mulicki (1959) in the southern Baltic in the Gulf of Gdańsk, Poland, *B. sarsi* was found in depths of 22–230 m, with greatest biomass at 40–100 m, with temperature of 1.5°C–14°C, and salinity of 7–20‰.

DISTRIBUTION.—Baltic Sea, found almost everywhere except in inner parts of Gulf of Finland, Gulf of Bothnia, and in shallow gulfs and bays with low salinity and high temperatures. In deeper parts of Gulf of Finland, Åland and Bothnia seas in 0.3–80 m; Swedish east coast from Åland to Karlskrona in 4–110 m; Gotland Deep in 150–180 m; southern Baltic in Gulf of Gdańsk in 22–230 m; Øresund in 12–34 m; Eastern Kattegat in 2–29 m; Kiel Bay, Germany; Netherlands on Isle of Goeree-Overflakkee, with *Arenicola marina* (Sarvala, 1971).

***Bylgides sarsi* (Malmgren, 1865), variety**

FIGURE 5

Antinoe sarsi.—Lovén, 1863:468.

Antinoe sarsii [sic] forma *balthica* Malm, 1874:75 [part].

MATERIAL EXAMINED.—BAL TIC SEA: Östersjön, Gotland, Sweden, one specimen of original material of *Antinoe sarsii* forma *balthica* Malm, Malmgren collection, through S. Lovén (USNM 74313, from BMNH 1865.9.23.18).

REMARKS.—The specimen comes from the type locality Östersjön, the record by Malm (1874) for his forma *balthica*. Malm provided only a brief description indicating how this

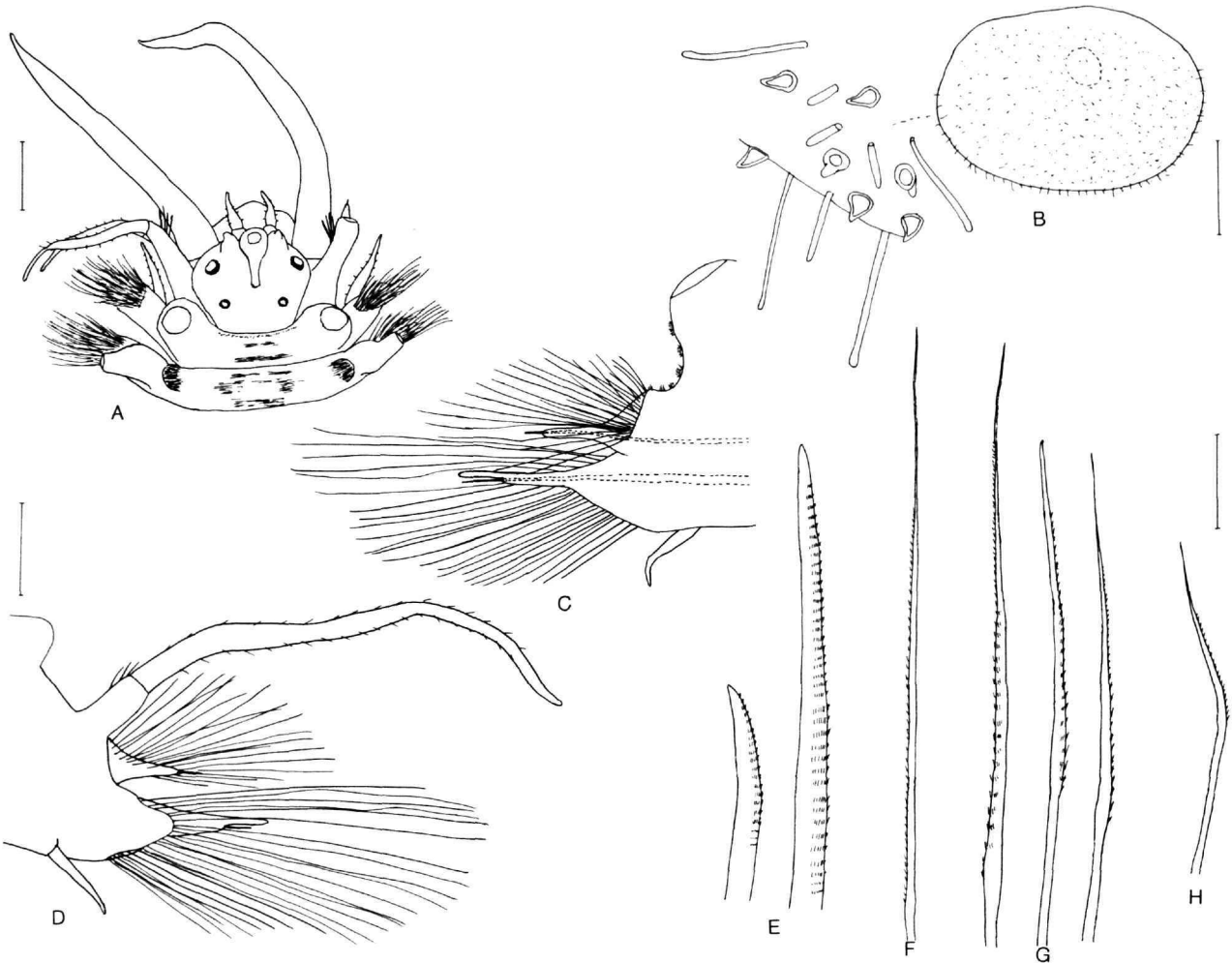


FIGURE 5.—*Bylgides sarsi* (Malmgren), variety (USNM 74313, from BMNH 1865.9.23.18): A, dorsal view of anterior end, styles of median antenna, right tentacular cirri, and dorsal cirri of segment 3 missing; B, right middle elytron, with details of papillae and microtubercles; C, right elytragerous parapodium, anterior view, acicula dotted; D, right cirrigerous parapodium, posterior view; E, short and long notosetae; F, upper neuroseta; G, three middle neurosetae; H, lower neuroseta. (Scales: A = 0.5 mm; B = 1.0 mm; C, D = 0.5 mm; E–H = 0.1 mm.)

form differed from his forma *occidentalis* from Bohuslän, Sweden. No depths were given for either collection from the Baltic. The specimen differs in a few respects from the other specimens referred to *B. sarsi*, but I hesitate to refer it to a new species. A short description is provided so the specimen can be compared with the above description of *B. sarsi*.

MEASUREMENTS.—*Nontype Material*: Length 16 mm, width with setae 6 mm, segments 33.

DESCRIPTION.—Dorsum with grayish green transverse bands with darker pigment on nodular dorsal tubercles (Figure 5A) and ring on pygidium. Elytra 15 pairs, on segments 2, 4, 5, 7, alternate segments to 23, 26, 29, and 32, with dorsal cirri on last segment. Elytra oval, with surface dotted with low conical microtubercles on anterior part, larger on posterior part, with long cylindrical papillae on surface and along lateral and posterior borders (Figure 5B).

Prostomium bilobed, with prominent cephalic peaks; anterior pair of eyes anterior to greatest prostomial width, about twice as large as posterior pair; ceratophore of median antenna bulbous, in anterior notch, style missing; ceratophores of lateral antennae rounded, inserted ventrally, with styles short, subulate, papillate; palps stout, long, tapered (Figure 5A).

Parapodia biramous, both rami with prominent projecting acicular processes; neuropodial presetal acicular lobe with slender digitiform supraacicular process (Figure 5C,D). Notosetae much thicker than neurosetae, short to long, with numerous spinous rows and short, bare, tapered tips (Figure 5E). Upper neurosetae slender, with long spinous regions and long capillary tips (Figure 5F); middle neurosetae stouter, some with slender capillary tips and some with slightly hooked, bare, blunt tips (Figure 5G); lower neurosetae short, slender, with faint spinous rows, tapering to capillary tips (Figure 5H).

DISTRIBUTION.—Known only from the type locality, Östersjön, Gotland, Sweden.

COMPARISONS.—The variety differs from *B. sarsi* mainly in having 15 pairs of elytra instead of 14 and elytra with microtubercles instead of lacking them.

Bylgides annenkovae, new species

FIGURES 6, 7

Antinoe promamme Malmgren, 1867:136 [part; records from Finmark, northern Norway, and Spitsbergen Archipelago].

Polynoe (Antinoe) sarsi.—Hansen, 1880:227; 1882:15 [part; record from Bear Island; not Malmgren, 1865].

Antinoe badia.—Pettibone, 1956:547 [part; record from Franz Josef Land; not Théel, 1879].

Antinoella annenkovae Pettibone (in litt.).—Averincev, 1977:145 [no description].

Bylgides annenkovae Pettibone in Loshamn, 1980:214–217, fig. 105a–j [unpublished thesis].—Levenstein, 1981:34 [footnote].—Ushakov, 1982:158.

MATERIAL EXAMINED.—KARA SEA: 79°27'N, 76°40'E, G.P. Gorbunov, collector, 1930, 3 paratypes (ZIASL 10/17431;

USNM 43600, identified as *Harmothoe sarsi* by N. Annenkova).

FRANZ JOSEF LAND: Aberdore Channel east of Alger Island, 0–18 m, Baldwin-Zeigler Polar Expedition 1901, 2 paratypes (USNM 18830, as *Antinoe badia* by Pettibone, 1956).

NORWAY: *Spitsbergen Archipelago*: Treurenburg Bay, 37–55 m, clay with stones, Spitsbergen Exp. 1861, paratype (NRS 2608, syntype of *Antinoe promamme*). *Bear Island*: Between Spitsbergen Archipelago and Norway, 27 m, Norwegian North Atlantic Expedition 1876–1878, holotype and paratype (ZMUB 53354–5, as *Polynoe (Antinoe) sarsi* by Hansen, 1880, 1882). *Finmark*: Northern Norway, S. Lovén, collector, 1836–1838, paratype (NRS 2610, syntype of *Antinoe promamme*).

MEASUREMENTS.—*Type Material*: Large holotype from Bear Island (ZMUB 53354) 41 mm long, 18 mm wide with setae, 36 segments; smaller paratype (ZMUB 53355, in 2 pieces) 25 mm long, 17 mm wide, 35 segments. Three paratypes from Kara Sea 35–40 mm long, 18–20 mm wide, 36–37 segments. Paratype from Spitsbergen 38 mm long, 16 mm wide, 37 segments. Paratypes from Franz Josef Land have been dry, largest complete paratype 40 mm long, 22 mm wide, 35 segments; other paratype incomplete, with 29 segments. Small paratype from Finmark 18 mm long, 9 mm wide, 35 segments.

DESCRIPTION.—Body flattened, tapering slightly anteriorly and posteriorly, dorsally with 2 transverse bands per segment (Figure 6D). Fifteen pairs of large, oval to subreniform elytra, covering dorsum, attached on prominent elytriphores (Figures 6A,C,D); elytra with minute papillae on borders and on surface, some larger cylindrical and oval papillae on surface, heavily chitinized on basal part (Figure 6B). Dorsal cirri with cylindrical cirrophores on posterior sides of notopodia; styles long, extending slightly beyond setae, with short bulbous papillae and filamentous tips; dorsal tubercles on segment 3 inflated, bulbous with flattened digitiform processes projecting laterally on remaining cirriferous segments; areas between cirrophores and dorsal tubercles ciliated (Figure 6D,E).

Prostomium bilobed, oval, with more or less distinct cephalic peaks; anterior pair of eyes anterior to greatest prostomial width, moderate in size, slightly larger or subequal in size to posterior pair; ceratophore of median antenna large, bulbous, in anterior notch of prostomium; style about as long as palps, with scattered minute papillae and slight indication of subterminal enlargement and filamentous tip; lateral antennae with ceratophores distinct, inserted ventrally and fused medially, with styles short, subulate, papillate; palps stout, tapered, minutely papillate (Figure 6A,C,D). Tentaculophores lateral to prostomium, with small projecting acicular lobe and 0–3 short notosetae on inner side; tentacular cirri similar to median antenna, dorsal one slightly longer than ventral one (Figure 6D); facial tubercle absent.

Second segment with inflated, subrectangular, dorsal, nuchal lobe, first pair of prominent elytriphores, biramous parapodia

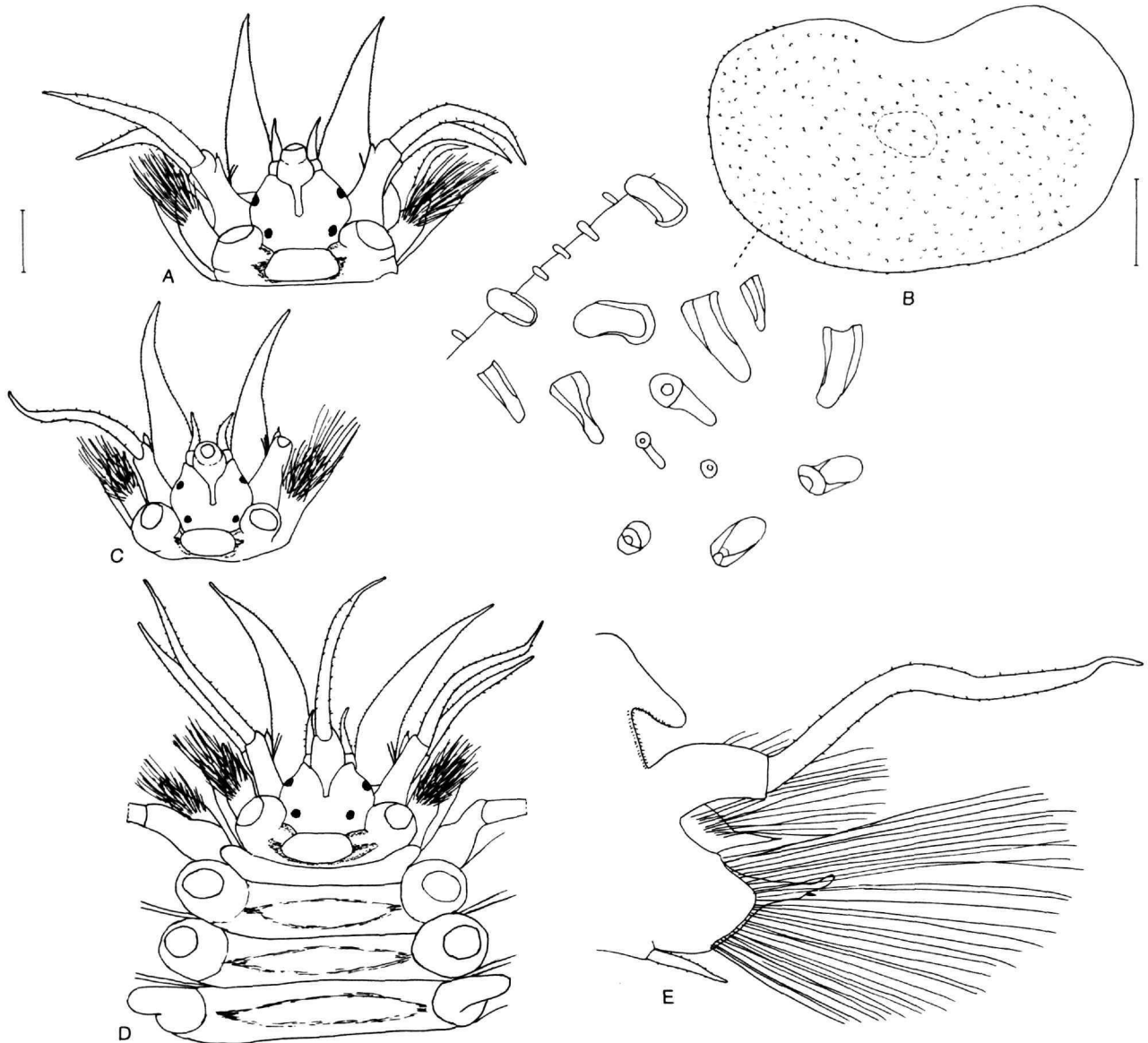


FIGURE 6.—*Bylgides annenkovae*, new species (A,B, holotype from Bear Island, ZMUB 53354; C, smaller paratype from same, ZMUB 53355; D,E, paratype from Kara Sea, USNM 43600): A, dorsal view of anterior end, style of median antenna missing; B, middle left elytron, with detail of surface and border papillae; C, dorsal view of anterior end, styles of median antenna, left ventral and right dorsal and ventral tentacular cirri missing; D, dorsal view of anterior end, including anterior 6 segments, tips of dorsal cirri and parapodia not shown; E, right cirriferous parapodium, posterior view. (Scales: A,C,D = 1.0 mm; B,E = 1.0 mm.)

with rami subequal in length, and long ventral buccal cirri lateral to ventral mouth, similar to tentacular cirri, and longer than following ventral cirri; notosetae short, similar to those of following segments; neurosetae long, upper neurosetae similar to upper ones of following segments, lower neurosetae slender,

with spinous rows, tapering to slender sharp tips (Figures 6A,C,D, 7A,B). Pharynx not extended and not examined.

Parapodia prominent, biramous, with yellowish or golden setae; notopodium shorter than neuropodium, rounded, with projecting acicular lobe on lower side; neuropodium with

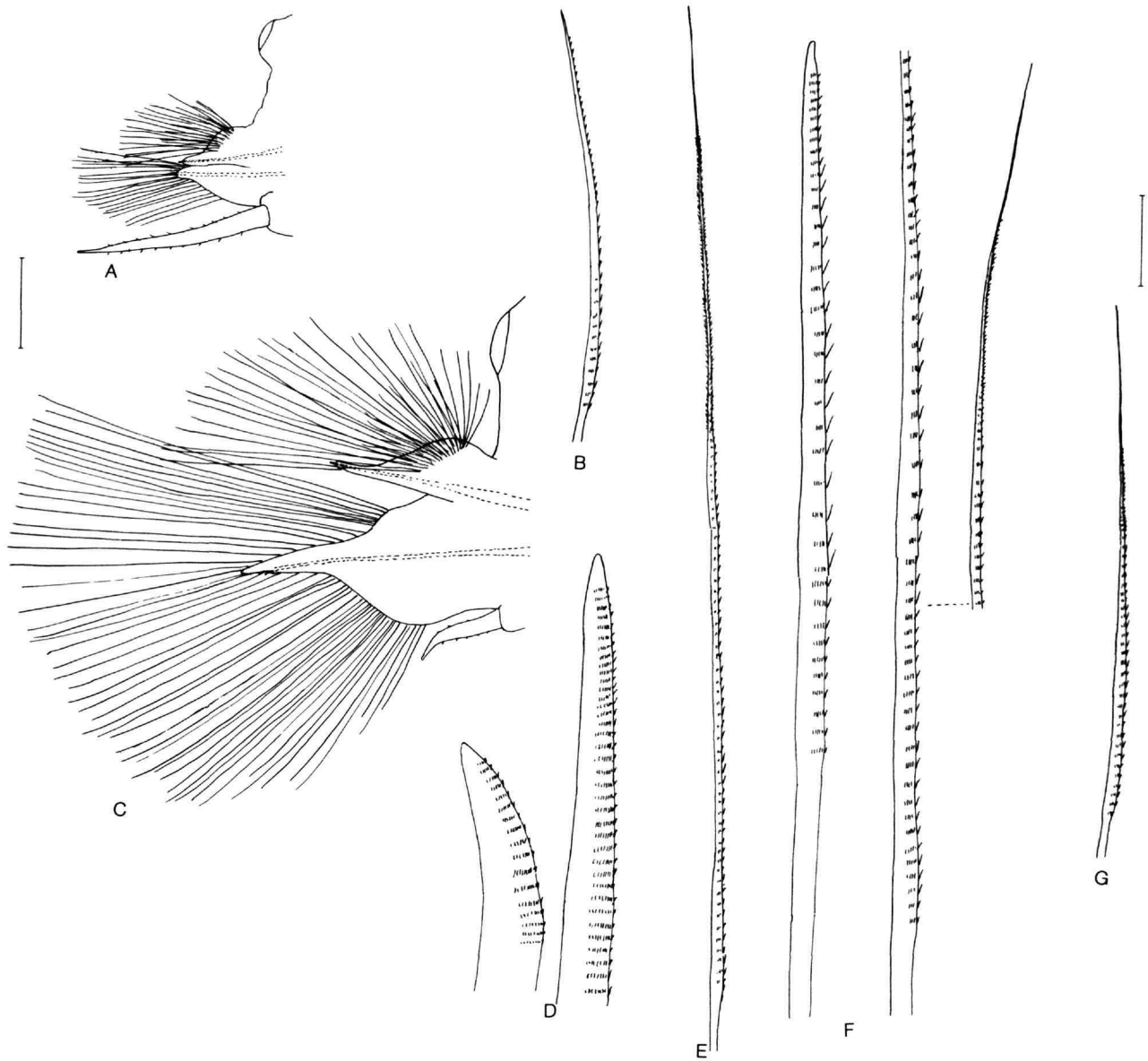


FIGURE 7.—*Bylgides annenkovae*, new species (holotype, ZMUB 53354): A, right parapodium from segment 2, anterior view, acicula dotted; B, lower neuroseta from same; C, right elytragerous parapodium, anterior view, acicula dotted; D, short and long notosetae; E, upper neuroseta; F, two middle neurosetae; G, lower neuroseta. (Scales: A,C = 1.0 mm; B, D-G = 0.1 mm.)

subconical postsetal lobe and longer presetal acicular lobe, with supraacicular digitiform free portion (Figures 6E, 7C). Notosetae numerous, forming radiating bundle, much stouter than neurosetae, with numerous spinous rows; some notosetae short, slightly curved, others long, straight, both types with rather short bare tips (Figure 7D). Neurosetae very numerous, forming

fan-shape bundle. Upper neurosetae slender, with long spinous regions, tapering to capillary tips (Figure 7E); middle neurosetae stouter, with prominent spinous regions, few tapering to long capillary tips, and numerous ones with slightly hooked bare tips (Figure 7F); lower neurosetae slender, shorter, with capillary tips (Figure 7G). Ventral cirri short, tapered, with

scattered bulbous papillae (Figures 6E, 7C).

Nephridial papillae short, bulbous, beginning on segments 5–7. Pygidium with anus medial to parapodia of last segment, with pair of anal cirri.

DISTRIBUTION.—Eastern Arctic from Kara Sea to Spitsbergen and northern Norway; in 0–55 meters.

ETYMOLOGY.—The species is named for Nadezda Pavlovna Annenkova, one of the early outstanding polychaete workers.

COMPARISONS.—*Bylgides annenkovae* differs from the other species of *Bylgides* possessing some acicular neurosetae chiefly in the presence of a prominent nuchal lobe on segment 2 and digitiform lateral processes on the dorsal tubercles.

***Bylgides promamme* (Malmgren, 1867), new combination**

FIGURES 8, 9

Antinoe sarsi (Kinberg, MS) Malmgren, 1865:75 [part].

Antinoe promamme Malmgren, 1867:136 [part; records from Spitsbergen].

Polynoe badia Théel, 1879:18, pl. 1: figs. 9, 10, 12 [part; not *P. badia* variety; not fig. 11 (= *B. groenlandicus*)].

Polynoe (Laenilla) glaberrima Hansen, 1880:227, pl. 3: figs. 1–5, 8 [fide Loshamn, 1980].

Polynoe glaberrima Hansen, 1882:29, pl. 3: figs. 6–11 [fide Loshamn, 1980].

Antinoe badia.—Pettibone, 1956:547 [part; not record from Franz Josef Land].

Bylgides promamme Pettibone in Loshamn, 1980:209, figs. 103a–j, 104 [unpublished thesis].—Uschakov, 1982:153.

Bylgides promamme [sic].—Levenstein, 1981:34 [footnote].

MATERIAL EXAMINED.—KARA SEA: 74°30'N, 73°25'E, 28 m, sandy mud, sta 32 (no. 58, Théel), 3 Sep 1876, lectotype and paralectotype of *P. badia* (NRS 2371). 72°35'N, 77°30'E, 34 m, sandy mud, sta 170 (no. 30, Théel), 11 Aug 1875, paralectotype of *P. badia* (NRS 2373). 80°04'N, 76°52'E, "Litke" sta 79, 11 Aug 1948, 4 specimens (USNM 43596, exchange from ZIAS 357/5876, as *Antinoella badia*).

NORWAY: *Spitsbergen Archipelago*: Storfjorden, 9–33 m, fine clay, A.J. Malmgren, collector, lectotype of *A. promamme* (NRS 2601) and paralectotype (ZMUB). Geneva Bay, 21 Aug 1864, paralectotype of *A. promamme* (NRS 2603). Treurenburg Bay, 36–55 m, clay with stones, 5 paralectotypes of *A. promamme* (NRS 2607). Wyde Bay, 73 m, fine clay, Göes and Smitt, collectors, paralectotype of *A. promamme* (NRS 2604).

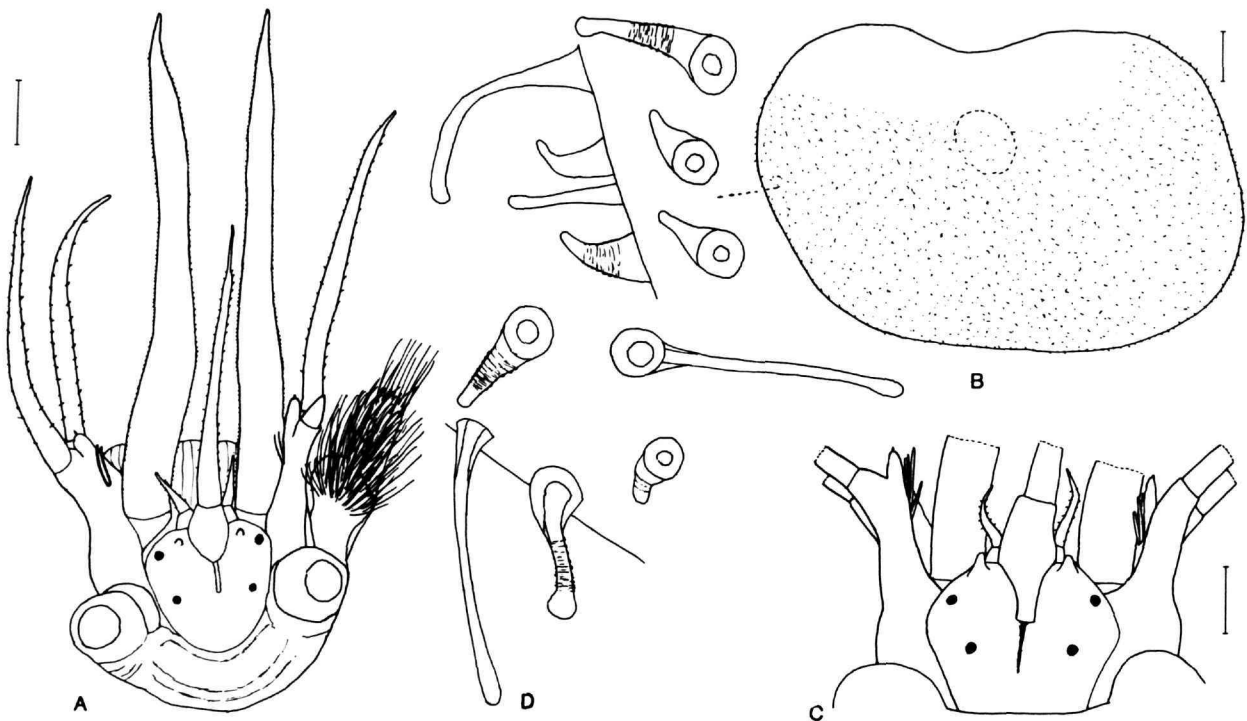


FIGURE 8.—*Bylgides promamme* (Malmgren), new combination (A, B, lectotype of *Antinoe promamme*, NRS 2601; C, paralectotype of *A. promamme*, NRS 2607; D, lectotype of *Polynoe badia*, NRS 2371): A, anterior end, dorsal view, pharynx partially extended, right dorsal tentacular cirrus smaller, regenerating; B, right middle elytron, with detail of border and surface papillae; C, anterior end, dorsal view, only bases of appendages shown; D, elytral border and surface papillae (not to scale). (Scales: A = 1.0 mm; B = 1.0 mm; C = 0.5 mm.)

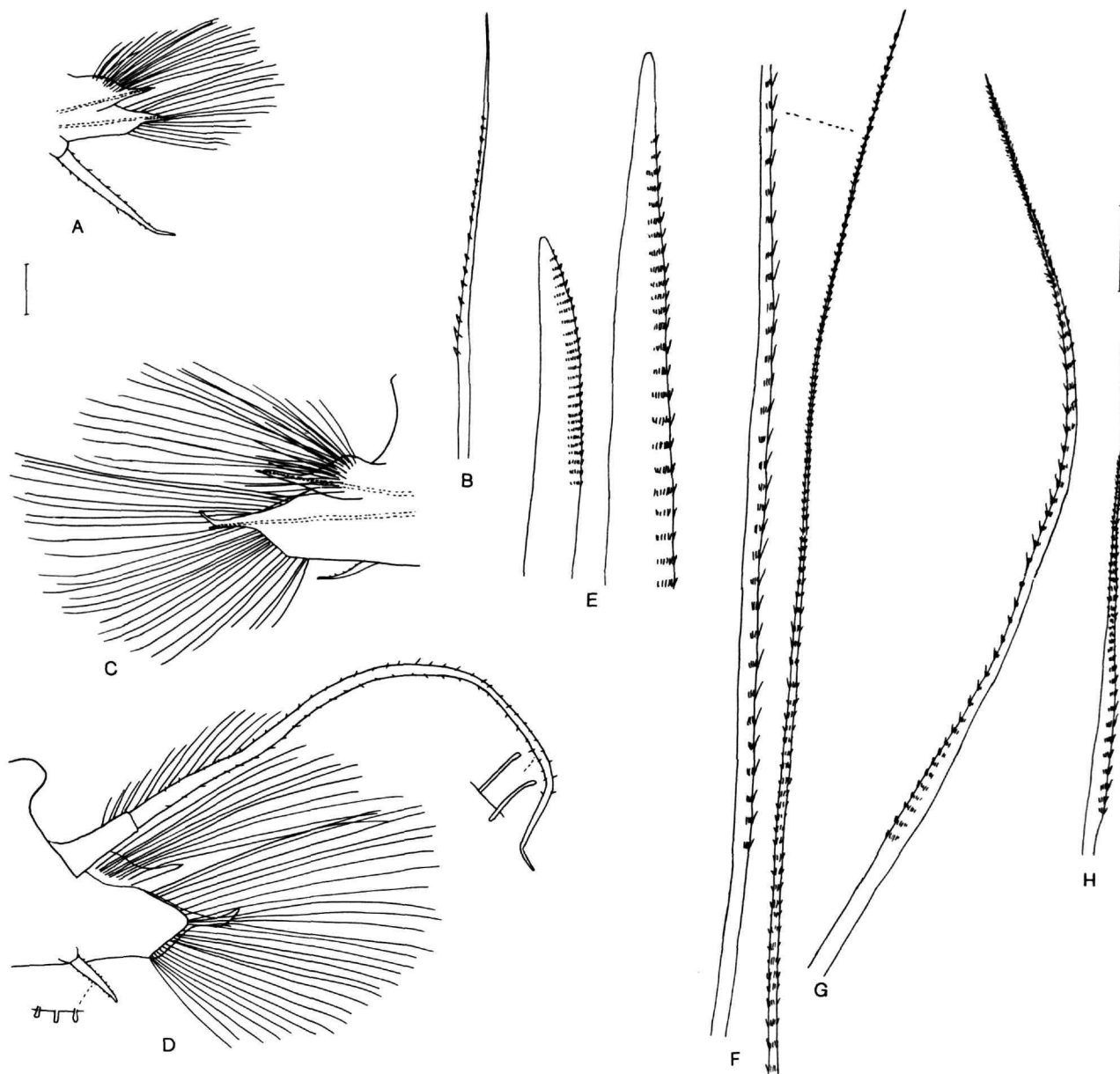


FIGURE 9.—*Bylgides promamme* (Malmgren), new combination (lectotype of *Antinoe promamme*, NRS 2601): A, left elytragerous parapodium from segment 2, anterior view, acicula dotted; B, lower neuroseta from same; C, right elytragerous parapodium, anterior view, acicula dotted; D, right cirriferous parapodium, posterior view, with detail of papillae; E, short and long notosetae; F, upper neuroseta; G, middle neuroseta; H, lower neuroseta. (Scales: A,C,D = 1.0 mm; B, E-H = 0.1 mm.)

CANADA: *Baffin Island*: 65°43'N, 65°05'W, 132–245 m, D. Dean and J. Blake, collectors, HERO cr 3, sta 20E, 14 Aug 1968, 1 specimen (USNM 97534). *Labrador*: Halfway from Cape Mugford to Hebron, 110 m, Owen Bryant, collector,

28 Oct 1908, 2 specimens (USNM 15538). Lake Melville, St. Lewis Sound, Hebron Fjord, 59°24'N–62°21'N, 55°56.5'W–63°51'W, 31–183 m, mud, D.C. Nutt, collector, "Blue Dolphin," 29 Jul to 8 Aug 1949, 11 Jul to 30 Aug 1950, 7 Jul

to 26 Aug 1951, 31 Jul 1952, 27 specimens (USNM 21612-3, 22297-22300, 22302, 23738-42, 25035; ZIAS; as *Antinoe badia* by Pettibone, 1956).

UNITED STATES: *Arctic Alaska*: Off Point Barrow, 70°43'N, 150°01'W, 18 m, J.J. Gonor, collector, "Natchik" sta 7-9, 14 Aug 1963, 6 specimens (USNM 32131-3).

MEASUREMENTS.—*Type Material*: Lectotype of *Antinoe promamme* from Spitsbergen (NRS 2601) 44 mm long, 23 mm wide with setae, 36 segments; 5 paralectotypes (NRS 2607) 31-37 mm long, 12-17 mm wide, 33-37 segments. Lectotype of *Polynoe badia* from Kara Sea (NRS 2371) 48 mm long, 24 mm wide, 36 segments; paralectotype, with pharynx fully extended, 38 mm long, 28 mm wide, 25 segments plus regenerating posterior end of 5 small segments; young paralectotype (NRS 2373) 22 mm long, 11 mm wide, 35 segments, with pharynx fully extended.

Nontype Material: Additional 2 specimens from Kara Sea (USNM 43596) 36-40 mm long, 20-21 mm wide, 36 segments.

DESCRIPTION.—Body flattened, slightly tapered anteriorly and posteriorly, with very long parapodia, as long as body width (not including setae), and neurosetae longer than parapodia. Dorsum with 2 transverse ciliated bands per segment, extending onto bases of elyptrophores and dorsal tubercles; ventrad with ciliated bands between ventral cirri and nephridial papillae. Without color or with 2 light tannish dorsal bands per segment. Elytra large, opaque, shiny, oval to subreniform, covering dorsum; elytral papillae present on most of exposed surface and along border; papillae widest basally with chitinous circular bases, contractile and variable in shape, tapering subdistally, with bulbous tips (Figure 8B,D). Dorsal cirri with long cylindrical cirrophores on posterior sides of notopodia, with long slender styles extending far beyond neurosetae, with rather long clavate papillae and filamentous tips; dorsal tubercles nodular (Figure 9D).

Prostomium bilobed, oval, with small distinct cephalic peaks; eyes rather small, anterior pair slightly larger than posterior pair, anterior to greatest width of prostomium; ceratophore of median antenna large, bulbous, in anterior notch of prostomium; style shorter than palps, with scattered, minute papillae, slight indication of subterminal enlargement, and filamentous tip; lateral antennae with ceratophores inserted ventrally, fused medially on basal part, with styles short, subulate, papillate; palps stout, tapered, minutely papillate (Figure 8A,C). Tentaculophores lateral to prostomium, with small acicular lobe and 2-4 stout, short notosetae on inner side; tentacular cirri similar to median antenna, subequal in length (Figure 8A,C); facial tubercle absent.

Second segment without nuchal lobe, with first pair of prominent elyptrophores, biramous parapodia with rami subequal in length, and long ventral buccal cirri lateral to mouth, similar to tentacular cirri and longer than following ventral cirri; notosetae shorter than neurosetae, similar to those of following segments; upper neurosetae similar to those of following segments, lower neurosetae more slender, with

spinous rows, tapering to slender sharp tips (Figures 8A, 9A,B). Pharynx with 9 pairs of border papillae and 2 pairs of amber-color jaws.

Parapodia biramous, with yellowish or golden setae. Notopodium shorter than neuropodium, rounded, with projecting acicular lobe on lower side; neuropodium with subconical postsetal lobe and longer presetal acicular lobe, with supraacicular digitiform projection (Figure 9B,D). Notosetae much stouter than neurosetae, forming radiating bundle, with numerous spinous rows; some notosetae short, slightly curved, with short bare tips, others nearly as long as neurosetae, straight, with longer bare tips. (Figure 9E). Neurosetae very numerous, slender, all with capillary tips, upper neurosetae longest, with long spinous region, large spinous rows basally, and fine hairs distally (Figure 9F); middle and lower neurosetae shorter, tapering to fine tips (Figure 9G,H). Ventral cirri short, tapered, with scattered clavate papillae (Figure 9C,D).

Nephridial papillae short, bulbous, beginning on segment 5. Pygidium with anus medial to parapodia of last segment, with pair of anal cirri.

DISTRIBUTION.—Spitsbergen Archipelago, Kara Sea, Arctic Alaska, Baffin Island, Labrador; in 9-245 meters.

Bylgides groenlandicus (Malmgren, 1867), new combination

FIGURES 10, 11

- Antinoe sarsi* Malmgren, 1865:75 [part].
Antinoe groenlandica Malmgren, 1867:136.
Antinoe promamme Malmgren, 1867:136 [part].
Antinoe sarsii [sic] forma *occidentalis* Malm, 1874:75.
Antinoe angusta Verrill, 1874:36.—Hartman, 1942:23, figs. 13-18.
Antinoe sarsi.—Hansen, 1878:1; 1882:44 [part; not Malmgren, 1865].
Polynoe badia Théel, 1879:18, pl. 1: fig. 11 [part, *P. badia* variety].
Harmothoe longisetis.—Wesenberg-Lund, 1951:15 [part; not Grube, 1863].
Harmothoe (Antinoella) promamme.—Eliason, 1962a:220 [not Malmgren, 1867].
Antinoella angusta.—Pettibone, 1963:31, fig. 7k-m.
Antinoella plumosa Fauchald, 1972:90, fig. 1; 1974:7 [part, sta. 48 and 65].
Harmothoe (Antinoella) sarsi promamme.—Hartmann-Schröder, 1974:176 [not Malmgren, 1867].
Bylgides groenlandica Pettibone, in Loshamn, 1980:205, fig. 101a-e [unpublished thesis].—Levenstein, 1981:32 [footnote].—Uschakov, 1982:153.

MATERIAL EXAMINED.—KARA SEA: 71°05'N, 63°20'E, 120-153 m, mud, Nova Semlja Expedition 1875, sta 147 (no. 19, Théel), syntype of *P. badia* variety (NRS 2612). 70°20'N, 62°40'E, 85 m, mud, sta 16 (no. 49, Théel), 2 small syntypes of *P. badia* variety (NRS 2372).

NORWAY: *Spitsbergen Archipelago*: Storfjorden, 9-18 m, fine clay, A.J. Malmgren, collector, 1864, syntype of *A. promamme* (NRS 2602). Wyde Bay, 73 m, fine clay, Göes and Smitt, collectors, 2 syntypes of *A. promamme* (NRS 2605, 2606). *North Atlantic off Norway*: Fjord south of Florö, 61°30'N, 05°25'E, 456 m, Norwegian North Atlantic Expedition 1875, 1 specimen (ZMUB 1999, as *A. sarsi* by Hansen, 1878). 63°05'N, 03°05'E, 763-960 m, clay, Norwegian North Atlantic Expedition 1876-1878, sta 31 and 33, 2 specimens (ZMUB 2105, as *A. sarsi* by Hansen, 1878).

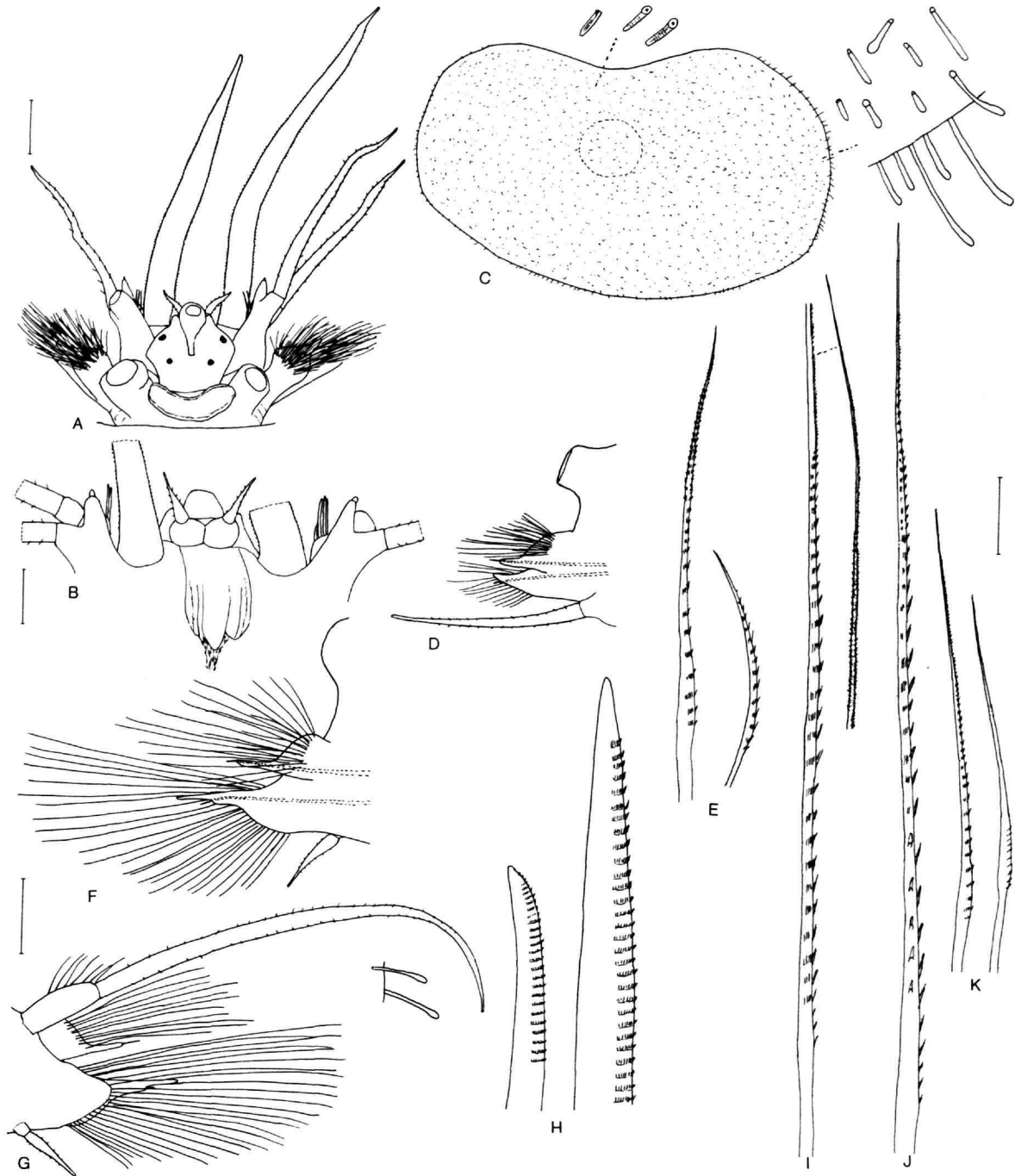


FIGURE 10.—*Bylgides groenlandicus* (Malmgren), new combination (syntype of *Antinoe promamme*, NRS 2602): A, anterior end, dorsal view, left dorsal tentacular cirrus missing; B, anterior end, ventral view, only bases of appendages shown; C, right elytron, with detail of border and surface papillae; D, right elytragerous parapodium from segment 2, anterior view, acicula dotted; E, upper and lower neurosetae from same; F, right elytragerous parapodium, anterior view, acicula dotted; G, right cirriferous parapodium, posterior view; H, short and long notosetae; I, upper neuroseta; J, middle neuroseta; K, two lower neurosetae. (Scales: A = 1.0 mm; B = 0.5 mm; C,D,F,G = 1.0 mm; E, H-K = 0.1 mm.)

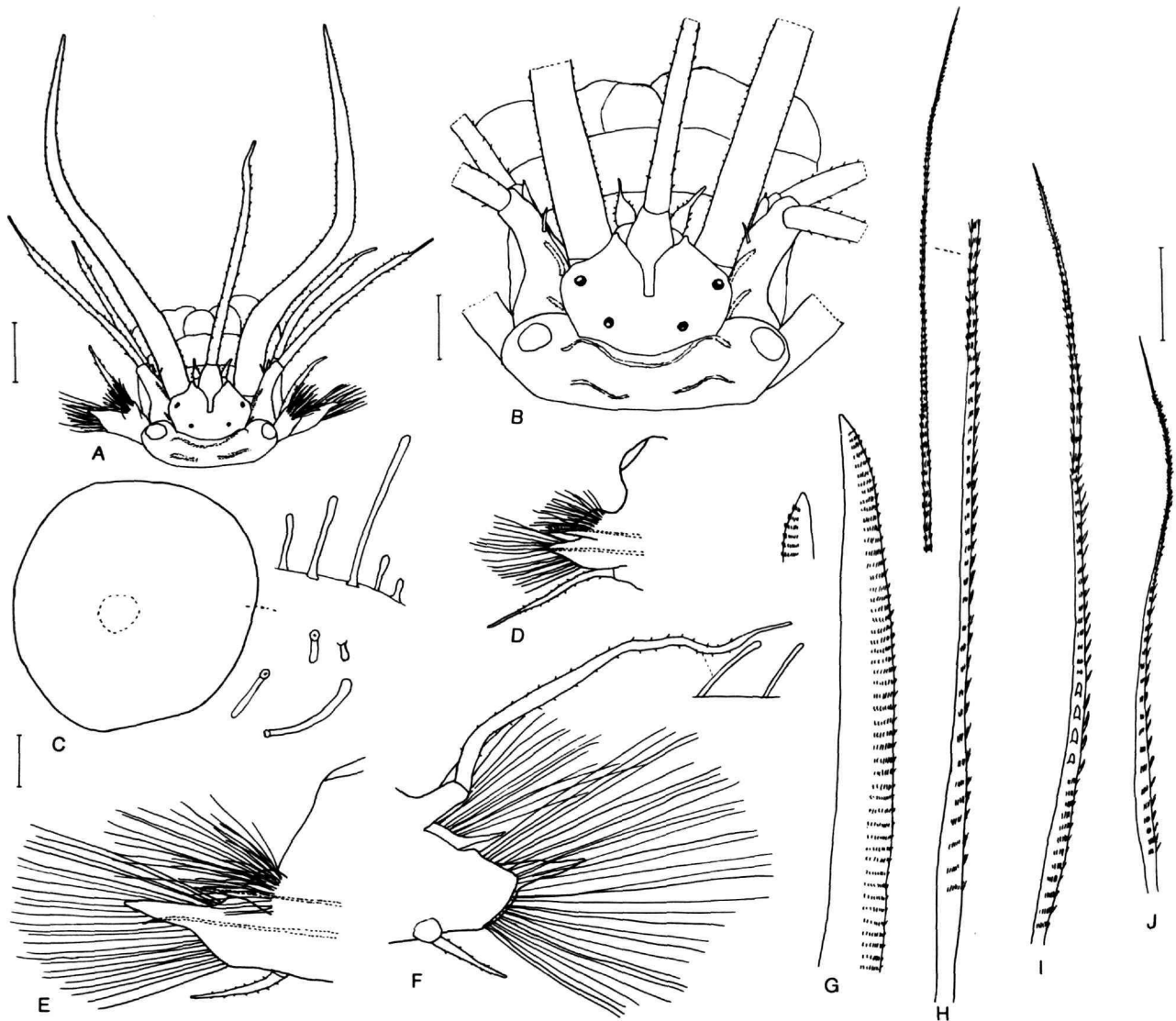


FIGURE 11.—*Bylgides groenlandicus* (Malmgren), new combination (syntype of *Polynoe badia*, variety, NRS 2612): A, anterior end, dorsal view, pharynx partially extended; B, same, enlarged, only bases of appendages shown; C, elytron, with detail of border and surface papillae; D, right elytragerous parapodium of segment 2, anterior view, acicula dotted; E, right elytragerous parapodium, anterior view, acicula dotted; F, right cirriferous parapodium, posterior view, with detail of papillae; G, long notoseta and tip of short notoseta; H, upper neuroseta; I, middle neuroseta; J, lower neuroseta. (Scales: A = 2.0 mm; B = 1.0 mm; C-F = 1.0 mm; G-J = 0.1 mm.)

Sognefjorden, SW of mouth of Vadheimsfjorden, 61°08'N, 05°45'E, 1272 m, Brattegaard, collector, 4-5 May 1966, holotype of *A. plumosa* (ZMUB 52203). Sörfjorden, NW of Ullensvang, 60°19'N, 06°38'E, 350 m, mud, very fine sand, few rocks, sta 65, 24 Aug 1956, 1 specimen (ZMUB, as *A. plumosa* by Fauchald, 1974). Öynefjorden, E of Grønevik, 60°05'N, 05°57'E, 465-468 m, stiff clayey mud, sta 248,

21 Aug 1956, 1 specimen (ZMUB, as *A. plumosa* by Fauchald, 1974). Off Norway, 588-600 m, sta HZ 30, 12 Jun 1963, 17 specimens (ZMUB; ZMUO; USNM 59826, as *A. plumosa* by Fauchald, 1974).

SWEDEN: *West Coast*: Kosterfjord, R. Warberg and A. Eliason, collectors, 50-230 m, sta 9, 33, 45, 71, 15 Jul, 4 Aug 1925, 14 Jul 1926, 16 Aug 1927, 5 specimens (NMG 8748,

8753-4, 8756; USNM 43234, as *H. (A.) promamme* by Eliason, 1962a). Gullmarfjord, Skårbergen, 110-146 m, A. Stuxberg, collector, 25 Jun, 1 Jul 1887, 16 specimens (NMG 1255-7; identified as *H. sarsi occidentalis* by I. Arwidsson).

SKAGERRAK: 58°21'N, 05°26'E, 345 m, silt and clay, sta 12c,d, 6 Jan 1968, 5 specimens (ZMH P-13173, as *H. (A.) sarsi promamme* by Hartmann-Schröder, 1974).

GREENLAND: North Greenland, Omenak, 55 m, O. Torell, collector, 1859, syntype of *A. groenlandica* (NRS 2599). Ablartok, 512 m, O. Torell, collector, 1859, 3 syntypes of *A. groenlandica* (NRS 2600).

ICELAND: 66°18'N, 18°36'W, 360 m, "Dana" sta 5982, 19 Jul 1938, 1 specimen (ZMUC, as *H. longisetis* by Wesenberg-Lund, 1951).

CANADA: *North Atlantic off Newfoundland*: 44°46'N, 59°55'W, 238 m, *Albatross* sta 2499, 6 Jul 1885, 2 specimens (USNM 26638).

UNITED STATES: *Gulf of Maine*: Murray and Wilkinson basins, 42°25'N-43°10'N, 69°31'W-69°48'W, 172-280 m, *Verrill* cruise 67-53, sta 1, 2, 5-7, 11, 31 Jul, 1 Aug 1967, R.R. Hessler, T.J. Schopf, collectors, 36 small specimens (USNM 43617-22). *Massachusetts*: Off Cape Ann and Cape Cod, 238 m, *Speedwell* sta 173, 344, 24 Aug 1878, 10 Sep 1879, 2 specimens (USNM 7568-9, as *A. angusta* by Verrill, 1874).

MEASUREMENTS.—*Type Material*: Syntype of *Antinoe groenlandica* from Omenak, North Greenland (NRS 2599) in poor condition lacking elytra; 3 syntypes from Ablartok (NRS 2600) consisting of small fragments. Syntype from Storfjorden, Spitsbergen (NRS 2602), in good condition with 37 segments, 36 mm long, 15 mm wide; 2 syntypes from Wyde Bay (NRS 2605-6) with 35-36 segments, 31-32 mm long, 12-14 mm wide, pharynx extended.

Syntype of *Polynoe badia*, variety from Kara Sea (NRS 2612) large, with posterior end missing, 31+ segments, 50+ mm long, 21 mm wide; pharynx removed; 2 small syntypes (NRS 2372) with 35 segments, 11 mm long, 5 mm wide.

Holotype of *Antinoella plumosa* from Sognefjorden, Norway (ZMUB 52203), consisting of 2 fragments with posterior end missing, 28+ segments, 14+ mm long, 7 mm wide, elytra missing. Additional specimen from Öynejfjorden (ZMUB) with 36 segments, 20 mm long, 7 mm wide, with elytra.

Type specimens of *Antinoe angusta* from near George's Bank, off Maine, in 274 m not found (not in USNM nor in Peabody Museum, see Hartman, 1942:23). Two specimens from off Cape Ann and Cape Cod, Massachusetts, identified by Verrill (USNM 7568-9), with 32-36 segments, 11-24 mm long, 7-9 mm wide.

Nontype Material: Two specimens from Norwegian fjord in 456-960 m, identified by Hansen, 1878 (ZMUB 1999, 2105) with 34-36 segments, 12-14 mm long, 7-8 mm wide. Two specimens from off Norway in 588-600 m, identified by Fauchald, 1974 (USNM 59826) with 37 segments, 32-35 mm long, 12-14 mm wide. Specimen from Kosterfjord, Sweden in 200 m, identified by Eliason, 1962a (USNM 43234) with 37

segments, 36 mm long, 15 mm wide. Largest of 11 small specimens from Gulf of Maine in 239 m (USNM 43618) with 33 segments, 10 mm long, 4 mm wide.

DESCRIPTION.—Body flattened, slightly tapered anteriorly and posteriorly, with parapodia about as long as body width and setae about as long as parapodia. Dorsum with 2 transverse ciliated bands per segment, tannish to brownish except for light ciliated bands, greenish on dorsal tubercles and elytriphores (Figures 10A, 11A,B). Elytra large, oval to subreniform, covering dorsum, opaque, shiny, with scattered short, delicate, slender papillae, cylindrical basally, with or without clavate tips (Figures 10C, 11C). Dorsal cirri with long cylindrical cirrophores on posterior sides of notopodia; styles long, slender, extending far beyond neurosetae, with rather long clavate papillae (Figures 10G, 11F); dorsal tubercles nodular.

Prostomium bilobed, oval, with large cephalic peaks closely allied to ceratophore of median antenna; eyes rather small, subequal in size, or anterior pair slightly larger than posterior pair, anterior to greatest width of prostomium; ceratophore of median antenna large, bulbous, in anterior notch of prostomium; style long, with scattered clavate papillae, subterminal enlargement, and filamentous tip; lateral antennae with short rounded ceratophores inserted ventrally and fused medially, styles short, subulate, papillate; palps stout, long, tapered, very finely papillate (Figures 10A,B, 11A,B). Tentaculophores lateral to prostomium, with digitiform acicular lobe and 1-4 stout, short notosetae on inner side; tentacular cirri similar to median antenna, dorsal tentacular cirrus slightly longer than ventral cirrus (Figures 10A,D, 11A,B); facial tubercle absent.

Second segment without nuchal lobe, with first pair of prominent elytriphores, biramous parapodia with rami subequal in length, and long ventral buccal cirri lateral to mouth, similar to tentacular cirri, longer than following ventral cirri; notosetae shorter and stouter than neurosetae, similar to those of following segments; upper neurosetae similar to those of following segments, lower neurosetae with short sharp tips (Figures 10A,D,E, 11A,D). Pharynx with 9 pairs of border papillae and 2 pairs of jaws.

Parapodia biramous, with golden setae; notopodium shorter than neuropodium, rounded, with projecting acicular lobe on lower side; neuropodium with subconical postsetal lobe and longer presetal acicular lobe with supraacicular digitiform process (Figures 10F,G, 11E,F). Notosetae numerous, forming radiating bundle, much stouter than neurosetae, with numerous spinous rows; some notosetae short, slightly curved, with short bare tips, others long, straight, with longer bare tips (Figures 10H, 11G). Neurosetae very numerous, slender, all with long capillary tips (unless broken), upper neurosetae longer, with longer spinous regions, larger spinous rows basally, and fine hairs distally (Figures 10I, 11H); some middle neurosetae with extra large spines in basal part (Figures 10J, 11I); lower neurosetae shorter, tapering to fine tips (Figures 10K, 11J). Ventral cirri short, tapered, with scattered clavate papillae (Figures 10F,G, 11E,F).

Nephridial papillae short, bulbous, beginning on segment 5. Pygidium with anus medial to parapodia of last segment, with pair of anal cirri.

DISTRIBUTION.—Greenland, Spitsbergen Archipelago, Kara Sea, North Atlantic off Norway and west coast of Sweden, Iceland, Skagerrak, off Newfoundland, Gulf of Maine, Massachusetts; in 9–1272 meters.

***Bylgides acutisetis* Loshamn, 1981**

FIGURE 12

Antinoella sarsi.—Fauchald, 1974:8 [not Malmgren, 1865].

Antinoella plumosa.—Fauchald, 1974:7 [part; not Fauchald, 1972].

Eunoe nodosa.—Fauchald, 1974:8 [part; not Sars, 1861].

Bylgides acutisetis Loshamn, 1980:217, fig. 107a–g [thesis]; 1981:8, fig. 3A–G.

MATERIAL EXAMINED.—NORWAY: Western Norway, Hardangerfjorden, Ålfjorden, midway along northern part, 59°41'N, 05°34'E, 450–465 m, soft muddy bottom, sta ZF85, 31 Oct 1957, 2 paratypes (ZMUB, as *E. nodosa* by Fauchald, 1974). Husnesfjorden, across from Sunde, 59°49'N,

05°38'E, 440–460 m, soft bottom with sponges, sta ZF89, 2 Nov 1957, 7 paratypes (ZMUB; ZMUO; USNM 59827 as *A. sarsi* by Fauchald, 1974). Skåneviksfjorden, SE of Toftedalven, 59°44'N, 05°51'E, 345–350 m, soft bottom, sta ZF110, 13 Nov 1958, holotype (ZMUB, as *A. plumosa* by Fauchald, 1974).

MEASUREMENTS.—*Type Material*: Holotype and 9 paratypes represented only by anterior and middle fragments, with elytra lacking. Holotype with 12+ segments, 6+ mm long, 10 mm wide with setae. Seven paratypes from sta ZF89 with 11–14+ segments, up to 10+ mm long, 14 mm wide. Largest paratype from sta ZF85 with 15+ segments, 16+ mm long, 16 mm wide.

DESCRIPTION.—Dorsum marked with brown to reddish color pattern, forming nearly continuous bands on some elytragerous segments and lateral bands on some cirriferous segments, continuing on dorsal tubercles and cirrophores of dorsal cirri (Figure 12A,B). Dorsal cirri with short cylindrical cirrophores on posterior sides of notopodia, with long slender styles extending far beyond neurosetae, with scattered delicate, short papillae (Figure 12D); dorsal tubercles nodular, slightly inflated (Figure 12B).

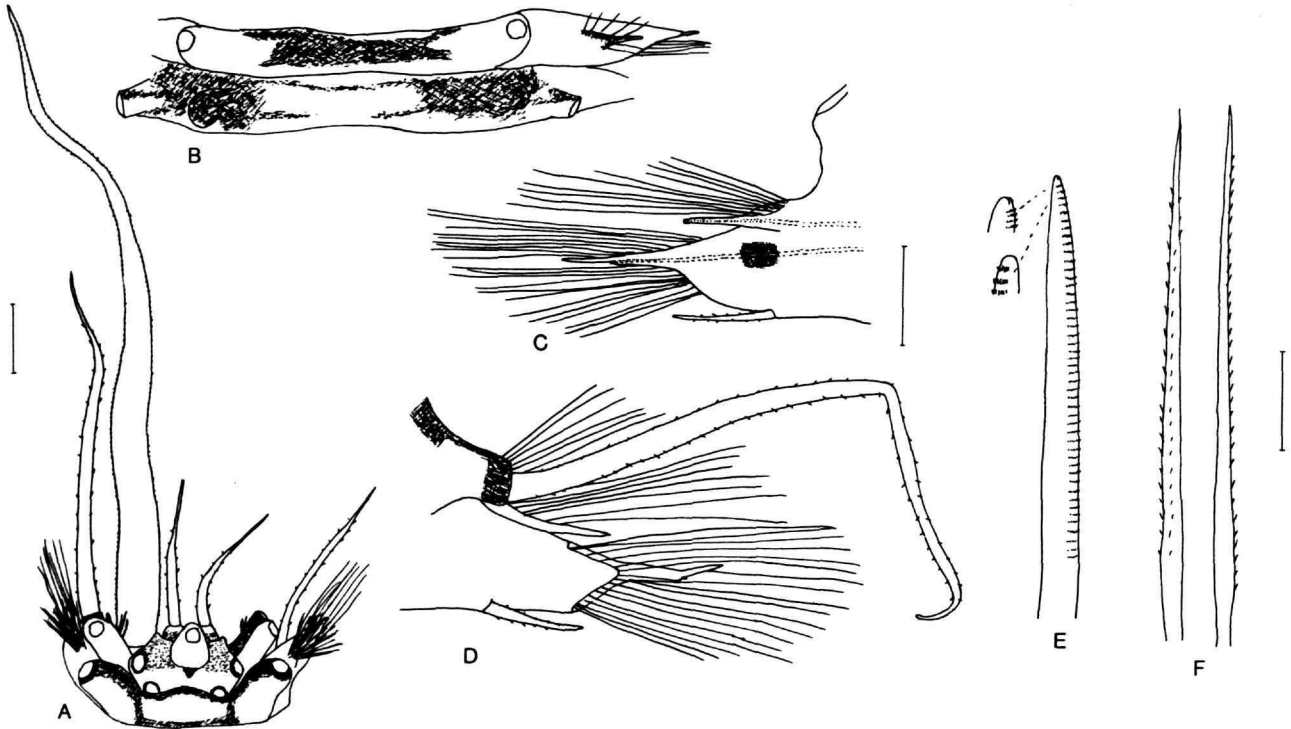


FIGURE 12.—*Bylgides acutisetis* Loshamn (paratype, USNM 59827): A, anterior end, dorsal view, right palp, styles of median antenna, left dorsal tentacular and buccal cirri, and right dorsal and ventral tentacular cirri missing; B, dorsal view of segments 9 (elytragerous) and 10 (cirriferous), showing pigmentation pattern; C, right elytragerous parapodium, anterior view, acicula dotted; D, right cirriferous parapodium, posterior view; E, notoseta, with detail of tips; F, neurosetae. (Scales: A,B = 1.0 mm; C,D = 1.0 mm; E,F = 0.1 mm.)

Prostomium bilobed, much wider than long, with distinct cephalic peaks; dotted with brown pigment on anterior $1/2$; 2 pairs of very large eyes, anterior pair in region of greatest width, about twice as large as posterior pair; ceratophore of median antenna large, bulbous, style missing; ceratophores of lateral antennae short, inserted ventrally and fused medially, styles short, papillate, with long filamentous tips; palps long, stout, tapered, with longitudinal rows of short papillae (Figure 12A; Loshamn, 1981, fig. 3A). Tentaculophores lateral to prostomium, with small acicular lobe and 1–4 short notosetae on inner side; 2 pairs of tentacular cirri long, papillate, with filamentous tips (Figure 12A; Loshamn, 1981, fig. 3A). Inflated facial ridge and upper lip brownish.

Second or buccal segment with slight indication of nuchal lobe, with first pair of prominent elytophores, biramous parapodia, with notopodia shorter than neuropodia, and long ventral buccal cirri lateral to mouth, similar to tentacular cirri, longer than following ventral cirri (Figure 12A); notosetae shorter and stouter than neurosetae, slightly curved, otherwise similar to those of following segments; neurosetae similar to those of following segments, all ending in tapered, slender tips. Pharynx (cut open) dark purple, with 9 pairs of border papillae and 2 pairs of jaws.

Parapodia biramous, with light golden setae. Notopodium shorter than neuropodium, rounded, with slender projecting acicular lobe on lower side; neuropodium with subconical postsetal lobe and longer projecting presetal acicular lobe with supraacicular digitiform free part (Figure 12C,D). Notoetae moderate in number, shorter and stouter than neurosetae, short to long, straight, with faint close-set spinous rows along one side and slightly tapered blunt bare tips (Figure 12E; Loshamn, 1981, fig. 3B). Neurosetae numerous, with rather short spinous regions, inconspicuous spinous rows basally and more prominent spines distally, sharply tapered to short capillary tips (Figure 12F; Loshamn, 1981, fig. 3C–F). Ventral cirri short, tapering, with scattered short papillae (Figure 12C,D).

Nephridial papillae short, inconspicuous, beginning on segment 6. Posterior end not known.

DISTRIBUTION.—Western Norway (Hardangerfjorden); in 345–465 meters.

COMPARISONS.—The species is somewhat doubtful due to the absence of complete specimens and lack of elytra. It differs from other species of *Bylgides* in its short neurosetae with short spinous regions, ending in sharply tapered, capillary tips.

Bylgides macrolepidus (Moore, 1905), new combination

FIGURE 13

Antinoe macrolepida Moore, 1905:538, pl. 35: figs. 21–23; 1908:336; 1910:358.—Berkeley and Berkeley, 1948:14, fig. 15.—Loi, 1980:123.

Antinoella macrolepida.—Uschakov, 1958:78, fig. 1A–E.—Hartman, 1968:41, figs. 1–3.—Banse et al., 1968:523.

Bylgides macrolepida.—Uschakov, 1982:157, pl. 57: figs. 1–6.

MATERIAL EXAMINED.—UNITED STATES: *Alaska*: Chatham Strait off Freshwater Bay, Behm Canal in vicinity of Yes Bay, 269–537 m, green mud, *Albatross* sta 4236, 4237, 4264, 8/25 Jul 1903, holotype and 3 paratypes (USNM 5509, 5561–3). Clarence Strait, S.E. Alaska, 421 m, “John N. Cobb,” 29 Mar 1950, 1 specimen (USNM 32232). Gulf of Alaska, 59°51′30″N, 142°66′50″W, 53–100 m, R/V *Western Viking* sta 12–15, 11 Jul 1976, 3 specimens (USNM 63097). *Washington*: Puget Sound, 47°42′N, 122°26′W, 196 m, K. Banse, collector, 27 Nov 1967, 1 specimen (USNM 36461). *Oregon*: S.W. mouth of Columbia River, 46°97′N, 124°12.4′W, 91 m, “Commando,” M.S. Alton, collector, 12 May 1963, 1 small specimen (USNM 33991). *California*: Off central California, 35°14′N, 121°07′W, 460 m, *Albatross* sta 3195, 5 Apr 1890, 1 specimen (USNM 26643). Monterey Bay, 406 m, *Albatross* sta 4525, 26 May 1904, 1 specimen (USNM 16885).

CANADA: *British Columbia*: Gulf of Georgia, Halibut Bank and off Nanaimo, Vancouver Island, 163–311 m, *Albatross* sta 4192, 4194, 19/20 Jun 1903, 2 paratypes (USNM 5557, 5559). Off Comox Spit and Maple Point, Pendu Harbor, Vancouver Island, E. and C. Berkeley, collectors, 15 Aug 1934, 6 specimens (USNM 35014).

MEASUREMENTS.—*Type Material*: Holotype 45 mm long, 18 mm wide including setae, 39 segments. Four paratypes 32–35 mm long, 14–15 mm wide, 37–39 segments.

Nontype Material: Smaller specimen from British Columbia 25 mm long, 10 mm wide, 39 segments. Small specimen from off Oregon 9 mm long, 4 mm wide, 35 segments.

DESCRIPTION.—Body flattened, tapering slightly anteriorly and more so posteriorly. Dorsum reddish brown, with narrow, light, transverse intersegmental lines; ventral surface and parapodia pale or dark brown, purplish, or black. Fifteen pairs of large elytra covering dorsum, attached on prominent elytophores. Elytra subcircular or elliptical, pale, marbled with brown, with 2 large crescentic spots, soft, membranous, appearing smooth, with scattered conical microtubercles and clavate papillae on surface and on posterior and lateral margins (Figure 13C). Dorsal cirri with cylindrical cirrophores on posterior sides of notopodia and long papillate styles with filamentous tips extending beyond setae; dorsal tubercles nodular (Figure 13G); on posterior segments, dorsal tubercles somewhat elongated and directed posteriorly.

Prostomium bilobed, rounded anteriorly, with very small cephalic peaks; anterolateral pair of very large eyes and slightly bulging small posterolateral pair; ceratophore of median antenna large, bulbous, in anterior notch of prostomium, with long papillate style, with subterminal enlargement and filamentous tip; ceratophores of lateral antennae short, rounded, fused medially ventral to median antenna, with styles short, tapered, papillate; palps stout, long, tapered, finely papillate (Figure 13B; Moore, 1905, pl. 35: fig. 21; Uschakov, 1982, pl. 57: fig. 1). Prostomium of smaller specimen with subtriangular cephalic peaks and smaller anterior pair of eyes (Figure 13A).

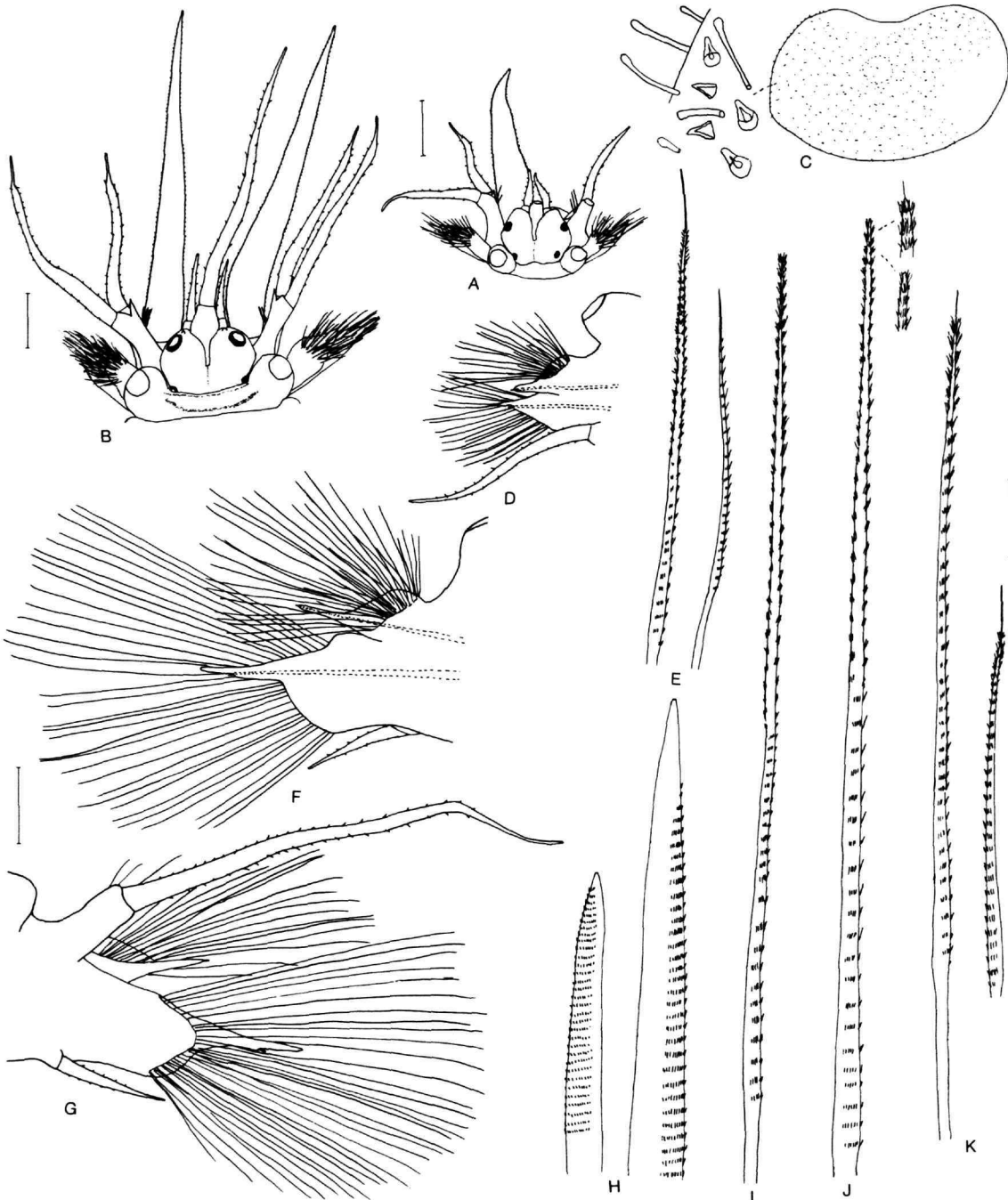


FIGURE 13.—*Bylgides macrolepidus* (Moore), new combination (A, small specimen from off Oregon, USNM 33991; B-K, holotype of *Antinoe macrolepada*, USNM 5509): A, dorsal view of anterior end, styles of median antenna, right dorsal tentacular cirrus, and palp missing; B, dorsal view of anterior end; C, left elytron, with detail of border and surface papillae and microtubercles; D, right elytragerous parapodium from segment 2, anterior view, acicula dotted; E, upper and lower neurosetae from same; F, right elytragerous parapodium, anterior view, acicula dotted; G, right cirriferous parapodium, posterior view; H, short and long notosetae; I, upper neuroseta; J, middle neuroseta, with detail of tips; K, lower neurosetae. (Scales: A = 0.5 mm; B = 1.0 mm; D,F,G = 1.0 mm; C = 2.0 mm; E, H-K = 0.1 mm.)

Tentaculophores lateral to prostomium, with small projecting acicular lobe and 2–4 short notosetae on inner side; dorsal and ventral tentacular cirri similar to but shorter than median antenna (Figure 13B; Moore, 1905, pl. 35: fig. 21); facial tubercle absent.

Second segment without nuchal fold, with first pair of prominent elytophores, biramous parapodia with rami subequal in length, and ventral buccal cirri lateral to mouth, similar to tentacular cirri, and longer than following ventral cirri (Figure 13B,D). Notosetae similar to those of following segments; neurosetae all with capillary tips, similar to lower neurosetae of following parapodia (Figure 13E).

Parapodia prominent, biramous, long, equal to body width. Notopodium shorter than neuropodium, rounded, with projecting acicular lobe on lower side; neuropodium with longer presetal, conical acicular lobe, with supraacicular distal free part, and shorter rounded postsetal lobe (Figure 13F,G; Uschakov, 1982, pl. 57: fig. 2). Notosetae numerous, forming radiating bundle, much stouter than neurosetae, with numerous spinous rows and bluntly pointed tips; shorter notosetae with short, bare tips and longer notosetae with longer bare tips (Figure 13H; Moore, 1905, pl. 35: fig. 23). Neurosetae very numerous, forming fan-shape bundles. Neurosetae long, slender, with long spinous regions and delicate tips; upper ones with slender plumose tips (Figure 13I); middle neurosetae stouter, with tips slightly hooked, plumose, with or without capillary extension (Figure 13J); lower neurosetae with tips plumose, with long capillary extension (Figure 13K; Moore, 1905, pl. 35: fig. 22a). Ventral cirri slender, subulate, finely papillate (Figure 13F,G).

Nephridial papillae short, bulbous, beginning on segment 6. Pygidium with anus medial to parapodia of last segment, with pair of anal cirri.

DISTRIBUTION.—Southern Sakhalin in Sea of Okhotsk, North American coast from Gulf of Alaska to central California; in 53–537 meters.

***Bylgides fuscus* (Hartman and Fauchald, 1971),
new combination**

FIGURE 14

Antinoe pelagica.—Støp-Bowitz, 1948:9, fig. 5 [not Monro, 1930].

Antinoana fusca Hartman and Fauchald, 1971:21, pl. 1: figs. a–h [part?].

MATERIAL EXAMINED.—NORTHWEST ATLANTIC OCEAN: 39°48.7'N, 70°40.8'W, 1102 m, Woods Hole Oceanographic Institution *Chain* cruise 87 sta 11, 6 Jul 1965, holotype (AHF 884). 42°59'N, 51°15'W, 1100 m, *s/s Michael Sars* sta 7, 30 Jun 1910, 1 specimen (ZMUB 41565, as *A. pelagica* by Støp-Bowitz, 1948).

MEASUREMENTS.—*Type Material:* Holotype with 31 segments, last 2 very small, 8 mm long by 4.5 mm wide with setae; few posterior elytra remaining. None of the parapodia have been cut off, thus this is probably not the specimen figured in

Hartman and Fauchald (1971). According to the description by Hartman and Fauchald (1971), the species has a length of 10–11 mm, is 4 mm wide without setae, and has 25–26 segments. The holotype differs from the specimen described in the original description and figures in some respects, as noted below.

Nontype Material: Specimen from *Michael Sars* (ZMUB 41565) with 34 segments (2 middle ones now missing), 12+ mm long, 6 mm wide.

DESCRIPTION.—Body of holotype flattened, tapering anteriorly and posteriorly, with parapodia and setae as long as body width, with 2 dorsal transverse ciliated bands per segment. Color tannish middorsally. Elytophores 14 pairs, on segments 2, 4, 5, 7, alternate segments to 23, 26, 29, followed by 2 very small segments (15 pairs on specimen from *Michael Sars* sta, with 15th pair on segment 32 and 2 additional small segments; elytra 11–12 pairs according to Hartman and Fauchald, 1971). Elytra large, covering dorsum, oval, with long filiform papillae on surface and lateral and posterior borders, without microtubercles (Figure 14B) (according to Hartman and Fauchald, 1971, pl. 1c, elytra with microtubercles in addition to papillae). Dorsal cirri with cylindrical cirrophores; long styles with clavate papillae, extending to about tips of neurosetae; dorsal tubercles nodular (Figure 14G).

Prostomium bilobed, wider than long, with weakly developed cephalic peaks; 2 pairs of rather small eyes, anterior pair in region of greatest width, slightly larger than posterior pair near posterior border; bulbous ceratophore of median antenna in anterior notch, style missing (nearly as long as palps, papillate, according to Hartman and Fauchald, 1971); rounded ceratophores of lateral antennae inserted ventrally, with short, subulate, papillate styles; palps stout, long, tapered, minutely papillate (Figure 14A; Hartman and Fauchald, 1971, pl. 1a). Tentaculophores lateral to prostomium, with projecting acicular lobe and 3–4 short notosetae on inner side; tentacular cirri missing (Figure 14A) (long, papillate, according to Hartman and Fauchald, 1971, pl. 1a).

Second segment with first pair of bulbous elytophores, biramous parapodia, and ventral buccal cirri that are long, papillate, longer than following ventral cirri (Figure 14A,C); notosetae similar to upper notosetae of following segments (Figure 14D); neurosetae all ending in capillary tips (Figure 14E).

Parapodia biramous, with notopodium shorter than neuropodium, rounded basally, with projecting acicular lobe on lower side, tip of notoaciculum emergent; neuropodium with conical presetal acicular lobe, tip of neuroaciculum projecting subdistally on under side; postsetal lobe shorter, rounded (Figure 14F,G; Hartman and Fauchald, 1971, pl. 1b). Notosetae numerous, forming radiating bundle, much stouter than neurosetae; upper notosetae short, curved, and lower ones longer, straight, both with close-set spinous rows and short bare blunt tips (Figure 14F–H; Hartman and Fauchald, 1971, pl. 1d,e). Neurosetae numerous, forming fan-shape bundle, slen-

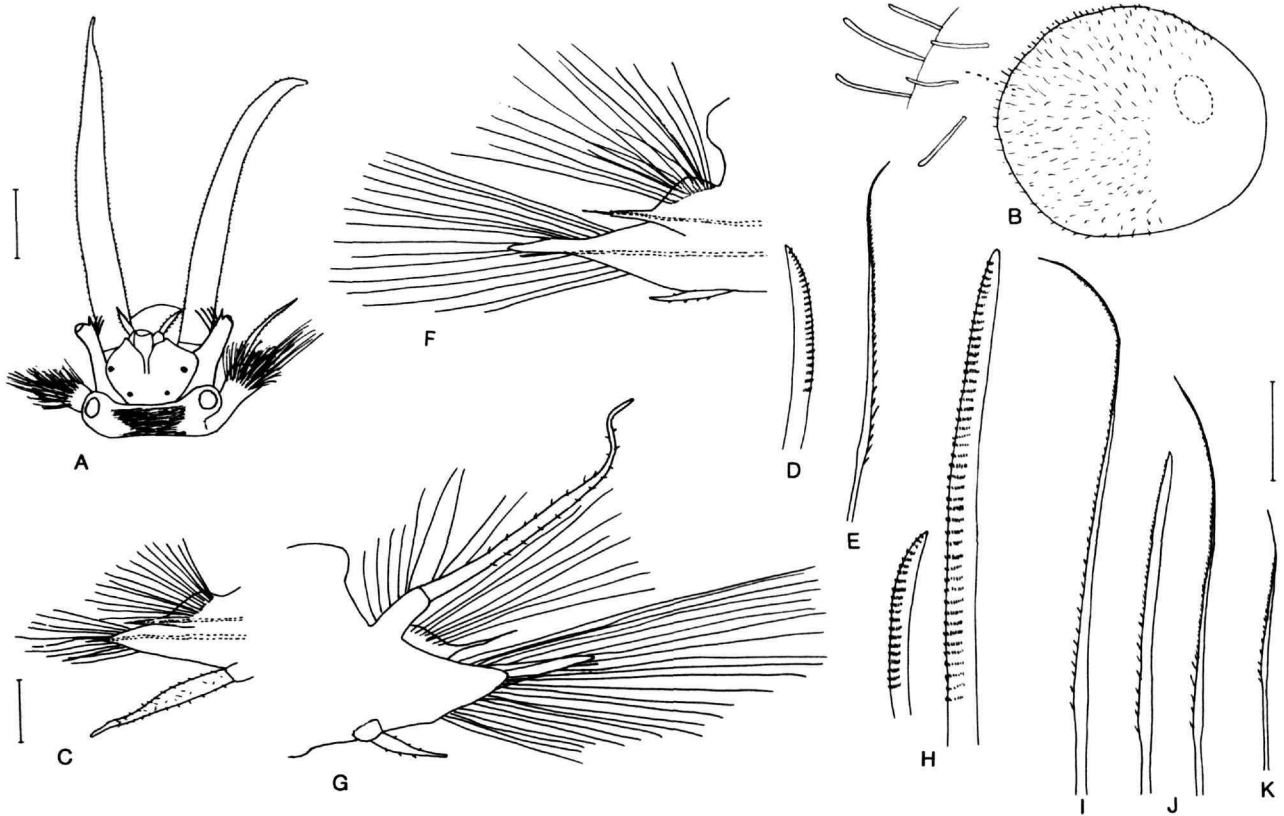


FIGURE 14.—*Bylgides fuscus* (Hartman and Fauchald), new combination (holotype of *Antinoana fusca*, AHF 884): A, dorsal view of anterior end, styles of median antenna and tentacular cirri missing; B, left 12th elytron from segment 23, with detail of papillae; C, right elytragerous parapodium from segment 2, anterior view, acicula dotted; D, notoseta from same; E, upper neuroseta from same; F, right elytragerous parapodium, anterior view, acicula dotted; G, right cirriferous parapodium, posterior view; H, short and long notosetae; I, upper neuroseta; J, middle neuroseta; K, lower neuroseta. (Scales: A = 0.5 mm; B,C,F,G = 2.0 mm; D,E, H-K = 0.1 mm.)

der, widest basally, spinous along border, with longest spines more basally, tapering to slender capillary tips; some middle neurosetae with slightly hooked blunt tips (Figure 14F,G,I-K) (according to Hartman and Fauchald, 1971, pl. 1f-h, whip-like tips of neurosetae minutely bifid; not observed on holotype). Ventral cirri short, subulate, papillate (Figure 14F,G). Nephridial papillae small, beginning on segment 6.

REMARKS.—Discrepancies in the original description, when compared with the holotype, suggest the possibility that the numerous specimens (15 lots, more than 800 specimens), reported by Hartman and Fauchald (1971) from slope and abyssal depths (196–4680 m) in the northwest Atlantic as *Antinoana fusca*, are a mixture of species.

Bylgides belfastensis, new species

FIGURE 15

MATERIAL EXAMINED.—UNITED STATES: Gulf of Maine,

Belfast, at footbridge over Passagassawakeag River, 44°25'54"N, 68°55'52"W, Loyd Clark, collector, Nov, Dec 1969, from C.D. Long, holotype (USNM 74572), 2 paratypes (USNM 74573, 74574).

MEASUREMENTS.—*Type Material*: Holotype incomplete, with 16 segments, 7 mm long, 7 mm wide including setae. Paratype (USNM 74573) complete but with 14 normal segments, plus 5 small, regenerating segments and growth zone, 7 mm long, 6 mm wide. Paratype (USNM 74574) incomplete, with 22 segments, 8 mm long, 4 mm wide.

DESCRIPTION.—Dorsum transversely banded with blackish grey pigmentation, narrow anterior and wider posterior bands, with spots on dorsal tubercles and on anteromedial sides of elyptrophores. Elytra 11 pairs (no specimens complete), on large bulbous elyptrophores; elytra large, oval, overlapping, covering dorsum, delicate, with clavate papillae on posterior and lateral borders and on surface; some tubercle-papillae with prominent circular bases on anterior part of elytra (Figure 15B). Dorsal

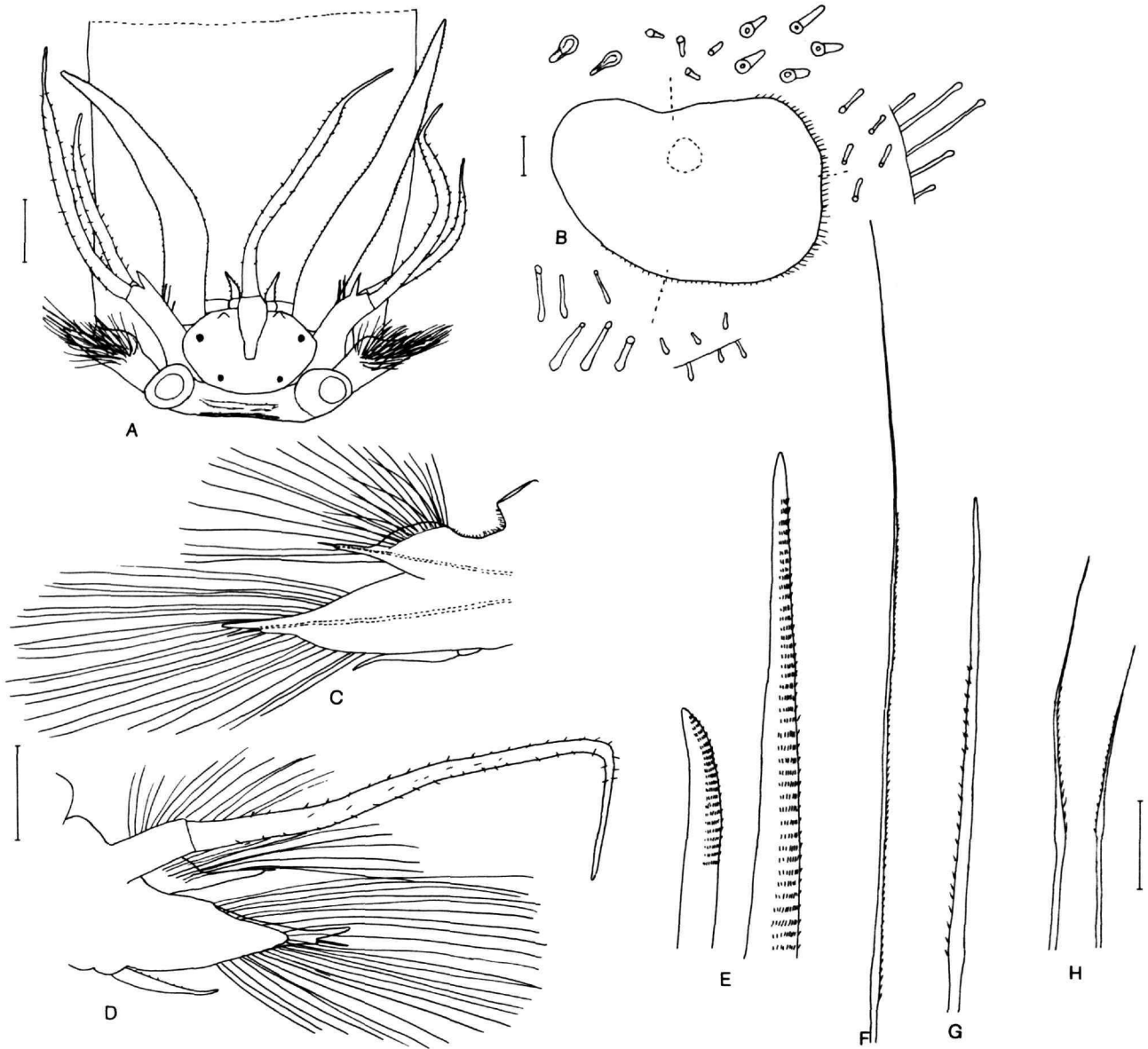


FIGURE 15.—*Bylgides belfastensis*, new species (holotype, USNM 74572): A, dorsal view of anterior end, pharynx fully extended (only basal part shown); B, right elytron, with detail of clavate papillae and tubercle-papillae on border and surface; C, right elytrigerous parapodium, anterior view, acicula dotted; D, right cirriferous parapodium, posterior view; E, short and long notosetae; F, upper neuroseta; G, middle neuroseta; H, lower neuroseta. (Scales: A = 0.5 mm; B = 0.5 mm; C,D = 0.5 mm; E-H = 0.1 mm.)

cirri with cylindrical cirrophores on posterodorsal sides of notopodia and long papillate styles extending far beyond setae; dorsal tubercles nodular (Figure 15D).

Prostomium bilobed, wider than long, with small cephalic peaks; 2 pairs of rather small eyes, anterior pair in region of greatest width, slightly larger than posterior pair near posterior

border; median antenna with large ceratophore in anterior notch, style long, papillate, with filiform tip; small ceratophores of lateral antennae inserted ventrally, with very short papillate styles; palps stout, tapering, minutely papillate, longer than median antenna (Figure 15A). Tentaculophores lateral to prostomium, with projecting acicular lobe and 2-3 short

notosetae on inner side; dorsal tentacular cirri similar to median antenna, ventral tentacular cirri shorter (Figure 15A).

Second segment without nuchal fold, with first pair of elyptrophores, biramous parapodia, and ventral buccal cirri lateral to mouth, similar to but shorter than tentacular cirri, longer than following ventral cirri (Figure 15A). Extended pharynx with 9 pairs of border papillae and 2 pairs of jaws.

Parapodia biramous, with notopodium shorter than neuropodium, rounded, with projecting acicular lobe on lower side; neuropodium conical, with projecting presetal acicular lobe and digitiform supraacicular process; postsetal lobe shorter, rounded (Figure 15C,D). Notosetae numerous, forming radiating bundle, much stouter than neurosetae, with close-set spinous rows and rather short, bare, blunt tips; notosetae short, curved, and long, straight (Figure 15C-E). Neurosetae numerous, long, slender, forming fan-shape bundle; upper neurosetae with long spinous regions and long capillary tips (Figure 15F); some middle neurosetae stouter, with long, bare, tapered, blunt tips (Figure 15G); lower neurosetae with shorter spinous regions and shorter capillary tips (Figure 15H). Ventral cirri short, tapered, with minute, globular papillae on upper side (Figure 15C,D). Nephridial papillae indistinct. Pygidium unknown.

DISTRIBUTION.—Gulf of Maine; surface water.

ETYMOLOGY.—The species is named for the collecting site, Belfast, Maine.

COMPARISONS.—*Bylgides belfastensis* is close to *B. fuscus* (Hartman and Fauchald). They differ in the form of the elytral papillae and the form of the neuropodial presetal acicular lobes.

Neobylgides, new genus

TYPE SPECIES.—*Neobylgides scotiensis*, new species. Gender: masculine.

DIAGNOSIS.—Segments up to 47. Elytra and elyptrophores 15 pairs, on segments 2, 4, 5, 7, alternate segments to 23, 26, 29, and 32; elytra without microtubercles and papillae. Dorsal cirri on segments lacking elytra, with cylindrical cirrophores and distal styles; nodular to digitiform dorsal tubercles on cirrigerous segments. Prostomium bilobed, without cephalic peaks, with paired palps and 3 antennae; median antenna with ceratophore in anterior notch, lateral antennae with ceratophores inserted ventrally. Tentaculophores of first or tentacular segment lateral to prostomium, each with achaetous acicular lobe on inner side and pair of dorsal and ventral tentacular cirri. Second or buccal segment without nuchal lobe, with first pair of elyptrophores, biramous parapodia, and long ventral buccal cirri lateral to mouth; pharynx with 9 pairs of border papillae and 2 pairs of hooked jaws. Parapodia biramous; shorter notopodia with bulbous base and long acicular process; neuropodia subconical with presetal acicular lobe and distal digitiform process; postsetal lobe shorter. Notosetae relatively few, forming radiating bundle, stout, acicular, smooth, much stouter than neurosetae. Neurosetae very numerous, forming fan-shape bundle, tapering to fine tips, with feathery spinous

rows up to $1/2$ of exposed length. Ventral cirri on all segments, short, tapered. Pygidium with pair of anal cirri.

Among the genera of Harmothoinae, *Neobylgides* agrees with *Harmothoe* Kinberg and *Bylgides* Chamberlin in the number of segments, number and arrangement of the elytra, and the morphology of the biramous parapodia. Characteristic for the new genus are the elytra lacking microtubercles and papillae, the elongated distal digitiform process on the neuropodial presetal acicular lobe, relatively few of the stout, acicular notosetae lacking spinous rows, and the numerous long neurosetae tapering to fine tips and with numerous feathery spinous rows.

Neobylgides scotiensis, new species

FIGURE 16

MATERIAL EXAMINED.—SOUTHERN OCEAN: Scotia Sea, 61°47'S, 43°40'W, 616–642 m, R/V *Islas Orcada* cruise 876, sta 121, 21 Feb 1976, holotype (USNM 74739).

MEASUREMENTS.—*Type Material*: Holotype with 47 segments, 135 mm long, 50 mm wide with setae.

DESCRIPTION.—Body flattened ventrally, arched dorsally, widest in middle, tapering anteriorly and posteriorly; dorsum with 5 or so raised brownish ridges per segment (Figure 16A). Color light to dark purplish on head appendages, elytra, elyptrophores, parapodia, and dorsal cirri. Elytra and prominent elyptrophores 15 pairs, on usual segments; elytra round to oval, leaving middorsum and posterior 15 segments uncovered; elytra delicate, with thickened areas around places of attachment, without microtubercles and papillae (Figure 16A,C,D).

Prostomium bilobed, without cephalic peaks, wider than long; median antenna with large ceratophore in anterior notch, inflated basally and directed dorsally; style very long with subterminal bulbous area and filamentous tip; lateral antennae with short ceratophores inserted ventral to ceratophore of median antenna, with short styles about length of prostomium, similar in shape to median antenna; palps very long, stouter basally, tapering distally; eyes rather small, in widest part of prostomium, anterior pair larger than posterior pair; tentaculophores lateral and anterior to prostomium, each with prominent acicular lobe on inner side and pair of dorsal and ventral tentacular cirri, similar to but shorter than median antenna; with rather prominent 3-lobed facial ridge (Figure 16A,B).

Second segment with first pair of large elyptrophores, biramous parapodia, and ventral buccal cirri attached basally, lateral to mouth, longer than following ventral cirri, similar to but shorter than tentacular cirri (Figure 16A,B). Pharynx not extended (cut open), with 9 pairs of dark border papillae and 2 pairs of hooked jaws.

Parapodia biramous, with short notopodia rounded basally, with long projecting acicular process on lower side; neuropodia larger, subconical, with long presetal acicular lobe with terminal digitiform process and shorter triangular postsetal lobe (Figure 16E,F). Notosetae golden, relatively few, forming radiating bundle, much stouter than neurosetae, short to long,

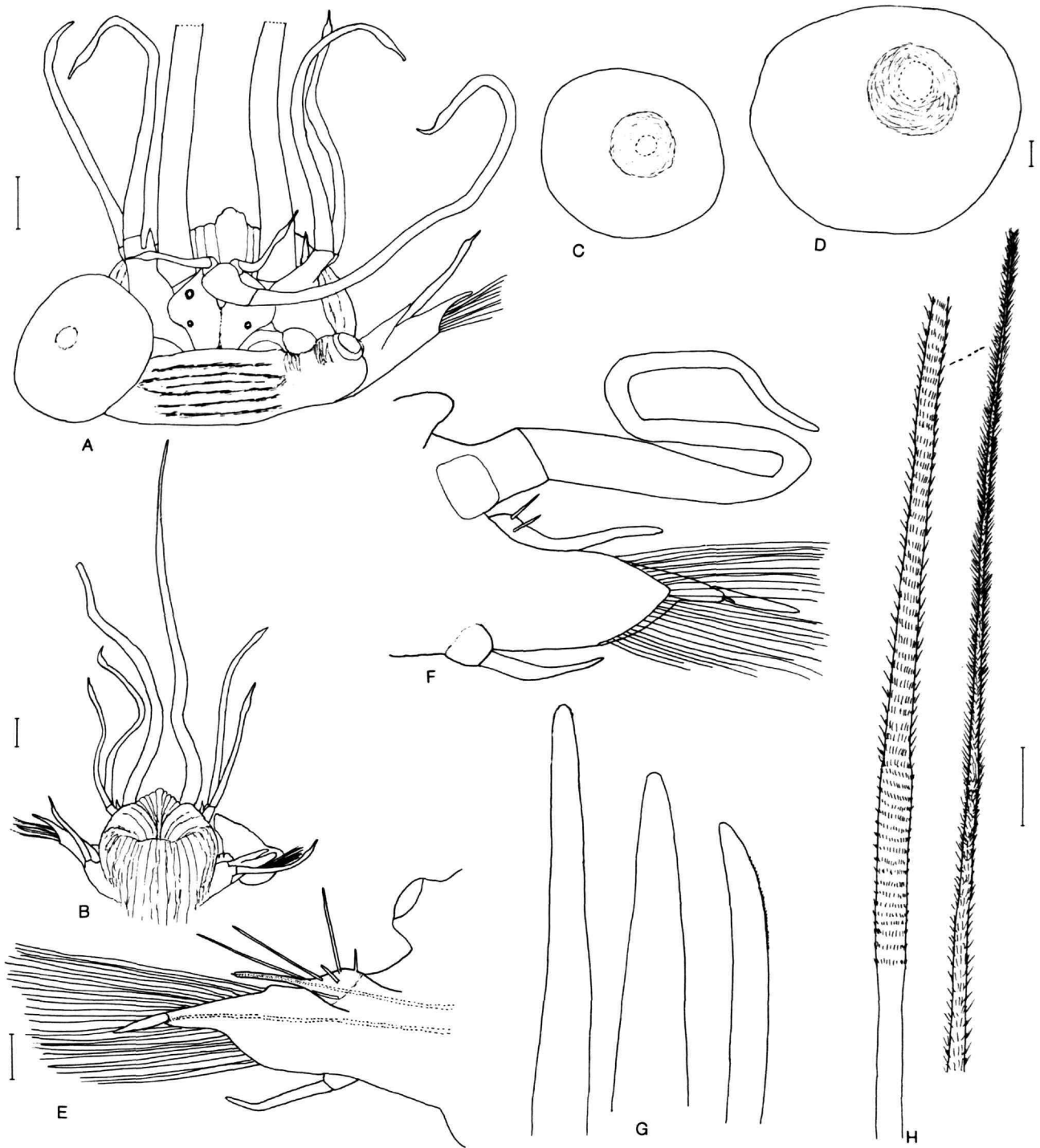


FIGURE 16.—*Neobygides scotiensis*, new species (holotype, USNM 74739): A, dorsal view of anterior end, tips of long palps not shown, pharynx partially extended, right first elytron removed; B, ventral view of anterior end, tip of right palp broken off, antennae hidden from view; C, right 1st elytron from segment 2; D, right middle elytron; E, right elytragerous parapodium, anterior view, acicula dotted; F, right cirriferous parapodium, posterior view; G, long and short notosetae; H, neuroseta. (Scales: A = 2.0 mm; B = 2.0 mm; C,D = 1.0 mm; E,F = 1.0 mm; G,H = 0.1 mm.)

smooth; short notosetae slightly curved, with fine serrations on curved border (Figure 16E-G). Neurosetae very numerous, appearing as golden brush, very long, stout basally, tapering gradually to fine tips, with numerous spinous rows giving feathery appearance (Figure 16E,H). Dorsal cirri with cirrophores stout, cylindrical, with thick glandular areas basally on anterior and posterior sides; styles smooth, very long, extending far beyond neurosetae; dorsal tubercles nodular to digitiform (Figure 16F). Ventral cirri short, tapered, smooth (Figure 16E,F). Pygidium with dorsally corrugated anal tube between 3 posterior smaller segments, posterior dorsal opening, and pair of long anal cirri (right one broken off).

DISTRIBUTION.—Southern Ocean, Scotia Sea; in 616–642 meters.

ETYMOLOGY.—The species is named for the collecting area of the Scotia Sea.

Genus *Harmothoe* Kinberg, 1856

TYPE SPECIES.—*Harmothoe spinosa* Kinberg, 1856. Gender: feminine.

DIAGNOSIS.—Segments up to 45. Elytra and elytriphores 15 pairs, on segments 2, 4, 5, 7, alternate segments to 23, 26, 29, and 32; elytra with microtubercles, with or without macrotubercles, with or without papillae. Dorsal cirri on segments lacking elytra, with cylindrical cirrophores and distal styles; nodular dorsal tubercle on cirriferous segments. Prostomium bilobed, with distinct cephalic peaks, 3 antennae, and paired palps; ceratophore of median antenna in anterior notch; lateral antennae with ceratophores inserted ventrally; usually with 2 pairs of eyes present. Tentaculophores of first or tentacular segment lateral to prostomium, each with small acicular process, with or without few setae, and with pair of dorsal and ventral tentacular cirri. Second or buccal segment with first pair of elytriphores, biramous parapodia, and long ventral buccal cirri lateral to mouth; pharynx with 9 pairs of border papillae and 2 pairs of hooked jaws. Parapodia biramous, both rami with elongate acicular processes; neuropodia usually with supraacicular digitiform process. Notosetae as stout as or stouter than neurosetae, with well-marked spinous rows and blunt to pointed tips. Neurosetae with elongate spinous regions and slightly hooked tips, at least some with secondary subterminal tooth. Ventral cirri short, tapered, on all segments. Pygidium

with pair of anal cirri.

Seven species of *Harmothoe* are covered in this report, as indicated in the "Key to Species," including the three additional species described by Kinberg (1856, 1858) under his genus *Antinoe* and found to differ from *A. microps*, the type species of the genus designated by Hartman (1959:62). These types, deposited in the Naturhistoriska Riksmuseet, Stockholm (NRS), were examined and include the following species.

Antinoe pulchellus Kinberg, 1856, from the mouth of the La Plata River, Argentina. The syntypes were examined by Hartman (1949:25; 1959:62); she concluded that the species might "require a new generic category." It is referred below to *Harmothoe pulchella* (Kinberg), new combination.

Antinoe waahli Kinberg, 1856, from Port Jackson, Australia. The species was referred to *Harmothoe* by Augener (1913:112; 1922:11), based on examination of the type. The type material from Australia is described below under *H. waahli* (Kinberg). Some of the specimens from western Australia that were referred to *H. waahli* by Augener (1913:112), and later by Monro (1938:614), were subsequently referred to *H. praeclara* (Haswell, 1883) by Augener (1922:14; 1924:285). Those specimens are described below under *H. praeclara*. A specimen from South Africa, identified as *H. waahli* by Monro (1933:489), is referred below to *H. stephensoni*, new species. Some specimens from Tahiti, referred to *H. waahli* by Monro (1939b:171), are described below under *H. tahitiensis*, new species.

Antinoe aequiseta Kinberg, 1856, from Port Natal, South Africa. The holotype in the Swedish State Museum (NRS) now consists of a posterior end of 17 segments and is thus unsatisfactory. The original description and figures are deficient, particularly in regard to the elytra, which were evidently missing because they were not described or figured. It is considered to be an indeterminable *Harmothoe* sp. Based on material from "South-West" Africa, Augener (1918:137) referred the species to *Harmothoe* and included in its synonymy *Parmenis capensis* Willey (1904) from the Cape of Good Hope. Augener's specimens, deposited in the Hamburg Museum (ZMH 8730/8780), consist of fragments and appear to be a mixture of at least two species. Some of the specimens of *H. aequiseta* by Day (1953, 1960, 1967) from South Africa are described below under *Harmothoe capensis* (Willey), new combination, and *H. discoveryae*, new species.

Key to the Seven Species of *Harmothoe* Described Herein

1. Prostomium with anterior pair of eyes lateral, in region of greatest width, visible dorsally [Figures 17A, 22A] 2
 Prostomium with anterior pair of eyes anteroventral, not visible dorsally [Figures 18A, 19A, 20A, 21A-C, 23A] 3
2. Elytra with papillae on lateral border [Figure 17B]. Segment 2 without nuchal lobe [Figure 17A]. Neuropodial supraacicular process large, digitiform [Figure 17C]. Lower neurosetae with entire tips . . . *H. pulchella* (Kinberg), new combination

- Elytra with papillae on lateral and posterior borders [Figure 22B]. Segment 2 with crescent-shape nuchal lobe [Figure 22A]. Neuropodial supraacicular process small, digitiform [Figure 22E,F]. All neurosetae with bifid tips [Figure 22H] *H. capensis* (Willey), new combination
3. Anterior lobes of prostomium rounded, without distinct cephalic peaks [Figure 21A-C]. Elytra with low rounded microtubercles and some larger tubercles [Figure 21D,E]. Long notosetae truncate, with split tips [Figure 21I] *H. tahitiensis*, new species
- Anterior lobes of prostomium with well-developed cephalic peaks [Figures 18A, 19A, 20A, 23A]. Elytra and notosetae otherwise 4
4. Elytra with microtubercles confined to anterior region, without papillae [Figure 18C,D] *H. waahli* (Kinberg)
- Elytra with microtubercles throughout [Figures 19B, 20B, 23B-D] 5
5. Elytra without lateral fringe of papillae, microtubercles low, conical [Figure 20B]. Bare tips of long notosetae with flange [Figure 20G] *H. stephensoni*, new species
- Elytra with lateral fringe of papillae [Figures 19B, 23C-E]. Tips of notosetae without flange [Figures 19D, 23J] 6
6. Elytra with some tubercles 2-5 branched, some long, thorn-like [Figure 23B-D] *H. discoveryae*, new species
- Elytra with microtubercles round to conical [Figure 19B] *H. praeclara* (Haswell)

***Harmothoe pulchella* (Kinberg, 1856), new combination**

FIGURE 17

Antinoe pulchellus Kinberg, 1856:385.—Hartman, 1959:62 [catalog].
Antinoe pulchella.—Kinberg, 1858:20, pl. 6: fig. 29, pl. 10: fig. 56.
Antinoe (?) *pulchella*.—Hartman, 1949:29, pl. 2: figs. 10-14 [examination of syntypes].

MATERIAL EXAMINED.—ARGENTINA: South Atlantic Ocean, south of La Plata River, *Eugenie* Expedition, 90 m, 4 syntypes (NRS 399).

MEASUREMENTS.—*Type Material*: Four syntypes in poor condition; anterior fragment in best condition consisting of 13 segments, 4 mm long, 4 mm wide with setae; pharynx has been removed, jaws figured by Kinberg, 1958, pl. 10: fig. 56; complete syntype with 35 segments, 17 mm long, and 6 mm wide. All elytra missing except for one free in vial.

DESCRIPTION.—Elytrophores 15 pairs, on usual segments. Elytra large, oval, with papillae on lateral border and some on surface, with conical microtubercles throughout and single oval macrotubercle near posterior margin (on single elytron remaining) (Figure 17B; Kinberg, 1858, pl. 6: fig. 29H). Prostomium bilobed, with distinct cephalic peaks; ceratophore of median antenna large, oval, in anterior notch, with style missing; lateral antennae with distinct ceratophores inserted ventrally, with styles short, subulate, papillate; palps stout, tapered; 2 pairs of eyes, anterior pair slightly larger than posterior pair, located laterally in greatest width of prostomium, smaller posterior pair posterolateral; tentaculophores lateral to prostomium, each with small acicular lobe, 2 notosetae on inner side, and pair of papillate dorsal and ventral tentacular cirri, with subterminal

enlargements and filamentous tips, tentacular cirri slightly shorter than palps (Figure 17A; Kinberg, 1858, pl. 6: fig. 29B).

Segment 2 with first pair of elytraphores, biramous parapodia, and long ventral buccal cirri, similar to tentacular cirri (Figure 17A); notosetae similar to following notosetae; neurosetae more slender than following neurosetae, with long spinous regions; upper neurosetae with bifid tips, lower neurosetae with slender, entire tips.

Parapodia biramous, with notopodia short, conical, on anterodorsal side of larger neuropodia; neuropodial acicular lobe subconical, with supraacicular digitiform process; postsetal lobe shorter, rounded; notosetae very numerous, forming radiating bundle; neurosetae numerous, forming fan-shape bundle (Figure 17C; Hartman, 1949, pl. 2: fig. 10). Notosetae slightly stouter than neurosetae, with numerous spinous rows and short, tapered, bare, blunt tips, sometimes worn, appearing slightly bifid (Figure 17D; Kinberg, 1858, pl. 6: fig. 29S; Hartman, 1949, pl. 2: fig. 13). Upper neurosetae more slender and with longer spinous regions than middle neurosetae, all with bifid tips (Figure 17E; Kinberg, 1858, pl. 6: fig. 29U; Hartman, 1949, pl. 2: figs. 11, 12, 14); few lower neurosetae with entire tips. Dorsal cirri with cylindrical cirrophores on posterior sides of notopodia, with papillate styles extending beyond neurosetae (Kinberg, 1858, pl. 6: fig. 29F); dorsal tubercles nodular. Ventral cirri short, tapered. Pharynx with 9 pairs of border papillae and 2 pairs of hooked jaws (Kinberg, 1858, pl. 10: fig. 56).

DISTRIBUTION.—South Atlantic Ocean, Argentina, mouth of La Plata River; in 90 meters.

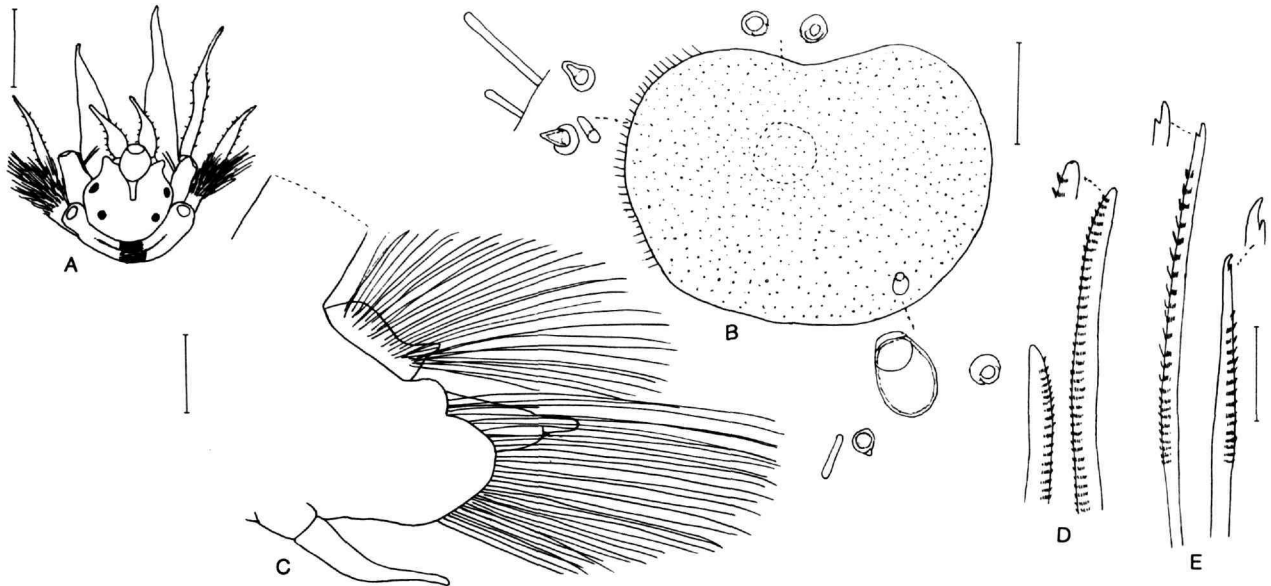


FIGURE 17.—*Harmothoe pulchella* (Kinberg), new combination (syntype of *Antinoe pulchellus*, NRS 399): A, dorsal view of anterior end, styles of median antenna, right dorsal tentacular cirri, and left dorsal and ventral tentacular cirri missing; B, left elytron (free in vial), with detail of papillae, microtubercles, and macrotubercles; C, right cirriferous parapodium, posterior view, only base of cirrophore shown; D, short and long notosetae, with detail of tip of worn notoseta; E, upper and middle neurosetae, with detail of tips. (Scales: A = 0.5 mm; B = 0.5 mm; C = 0.2 mm; D,E = 0.1 mm.)

Harmothoe waahli (Kinberg, 1856)

FIGURE 18

Antinoe waahli Kinberg, 1856:385; 1858:19, pl. 6: fig. 28, pl. 10: fig. 55.—Haswell, 1883:289.

Polynoe mytilicola Haswell, 1883:289 [foot-note, provisional name].

Harmothoe waahli.—Augener, 1913:112, pl. 2: fig. 9 [part]; 1922:11, fig. 3 [examination of holotype].

MATERIAL EXAMINED.—AUSTRALIA: South Pacific Ocean, Port Jackson, Sydney, 22 m, *Eugenie* Expedition, holotype of *Antinoe waahli* (NRS 405). Freemantle Bay, Wambro Sound, SW Australia, 12.5–14.5 m, Hamburg Southwestern Australian Expedition sta 53, Michaelsen and Hartmeyer, collectors, 29 Sep 1905, 1 specimen (ZMH 10058, identified by Augener, 1913).

MEASUREMENTS.—*Type Material*: Holotype in very poor shape, consisting of anterior fragment of 18 segments, pharynx having been removed (figured by Kinberg), eyes now faded, and posterior fragment of 15 segments (23–37), with 5 segments missing; few elytra remain. According to Kinberg (1858), length 24 mm, width 6 mm with setae, segments 37.

DESCRIPTION.—Elytra 15 pairs on usual segments, covering dorsum (Kinberg, 1858, pl. 6: fig. 28A). Elytra large, oval, without border papillae, with rounded microtubercles confined to anterior and anteromedial areas; mottled brownish pigmen-

tion on posteromedial areas and transverse band across region of elytraphore to lateral side (Figure 18B–D; Kinberg, 1858, pl. 6: fig. 28H).

Prostomium bilobed, with distinct cephalic peaks; ceratophore of median antenna large, oval, in anterior notch, style papillate with filamentous tip; lateral antennae with small ceratophores inserted ventrally, with styles short, subulate, papillate; palps stout, tapered; anterior pair of eyes anteroventral, not visible dorsally, posterior pair near posterior border of prostomium; tentaculophores lateral to prostomium, each with single seta on inner side and pair of papillate dorsal and ventral tentacular cirri, with subterminal enlargements and filamentous tips, tentacular cirri slightly shorter than palps (Figure 18A; Kinberg, 1858, pl. 6: fig. 28B).

Segment 2 with transverse dorsal ciliated bands, first pair of large elytraphores, biramous parapodia, and long ventral buccal cirri, similar to tentacular cirri (Figure 18A).

Parapodia biramous, notopodia short, rounded, with projecting acicular lobe on lower side; neuropodia with subconical presetal acicular lobe with supraacicular digitiform process and shorter rounded postsetal lobe; notosetae numerous, forming radiating bundle; neurosetae numerous, forming fan-shape bundle (Figure 18E,F). Notosetae slightly stouter than neurosetae, short to long, with numerous spinous rows and short tapered tips (Figure 18G; Kinberg, 1858, pl. 6: fig. 28Gs).

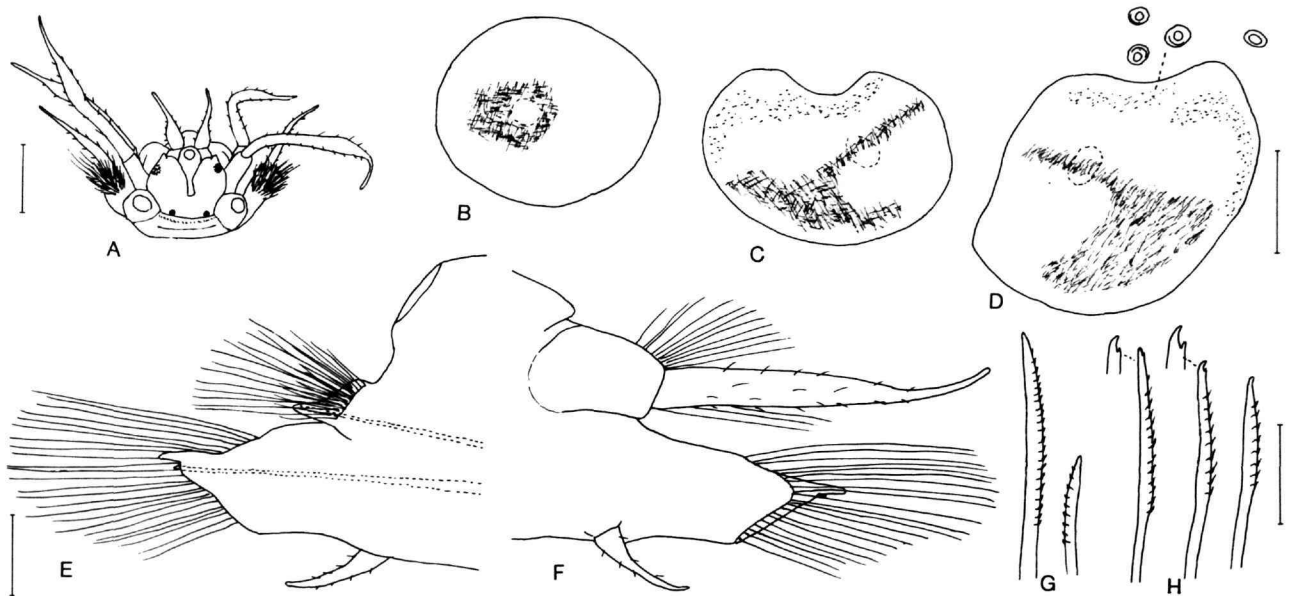


FIGURE 18.—*Harmothoe waahli* (Kinberg) (specimen from Warnbro Sound, SW Australia, ZMH 10058): A, dorsal view of anterior end, style of median antenna and palps missing, pharynx partially extended; B, left 1st elytron from segment 2; C, right 2nd elytron from segment 4; D, left middle elytron, with detail of microtubercles; E, right elytragerous parapodium, anterior view, acicula dotted; F, right cirriferous parapodium, posterior view; G, long and short notosetae; H, upper, middle, and lower neurosetae, with detail of tips. (Scales: A = 0.5 mm; B-D = 0.5 mm; E,F = 0.2 mm; G,H = 0.1 mm.)

Upper neurosetae with longer spinous regions, with or without slight indication of secondary tooth; middle neurosetae with distinct bifid tips; lower neurosetae with shorter spinous regions, with or without secondary tooth; neurosetae mostly with secondary tooth or indication of one (Figure 18H; Kinberg, 1858, pl. 6: fig. 28Gu). Dorsal cirri with long cylindrical cirrophores on posterior sides of notopodia, with papillate styles extending to tips of neurosetae or beyond; dorsal tubercles nodular (Figure 18F; Kinberg, 1858, pl. 6: fig. 28F). Ventral cirri short, tapering. Pharynx with 9 pairs of border papillae and 2 pairs of hooked jaws (Kinberg, 1858, pl. 10: fig. 55).

DISTRIBUTION.—South Pacific Ocean, Australia; in 12–27 meters (Haswell, 1883).

Harmothoe praeclara (Haswell, 1883)

FIGURE 19

- Antioe praeclara* Haswell, 1883:290, pl. 9: figs. 1–12.
Antioe ascidiicola Haswell, 1883:291, pl. 9: fig. 16.
Antioe pachylepis Haswell, 1883:292.
Harmothoe spinosa.—Ehlers, 1907:5 [not Kinberg, 1856].
Harmothoe waahli.—Augener, 1913:112 [part].—Monro, 1938:614 [not Kinberg, 1856].

Harmothoe praeclara.—Augener, 1922:14, fig. 4; 1924:285 [synonymy].—Day, 1975:184 [synonymy].

Harmothoe terminocolata Monro, 1924:42, figs. 5, 6.

Harmothoe impar.—Monro, 1939a:97 [part; not Johnston, 1839].

MATERIAL EXAMINED.—AUSTRALIA: *Queensland*: North Queensland, Thursday Island, mouth of Parramatta River, among colonies of ascidians, Haswell, collector, holotype of *Antioe ascidiicola* (AMS 11280). *New South Wales*: Vaucluse Point near Sydney, Bottle and Glass Rocks, in sand under rocks, low tide, H. Paxton, collector, 23 Oct 1968, 4 specimens (USNM 58240). *Victoria*: Port Jackson, 0–9 m, HMS *Alert*, 4 syntypes of *Harmothoe terminocolata* (BMNH 1925.1.28.10–14). Port Phillip Bay, 4.5 miles SW of Picnic Point, 18 m, M/V *Melita*, C.F. Roper, collector, Apr 1976, 9 specimens (USNM 54148). *Tasmania*: Hobart, shore, British, Australian, and New Zealand Antarctic Research Expedition, Mar 1931, 1 specimen (BMNH 1942.3.3.1., as *Harmothoe impar* by Monro, 1939a). *Western Australia*: Swan River, Freshwater Bay, between Fremantle and Perth, sta 39, 26 May 1905 and Sharks Bay, Sunday Island, 5.5 m, sta 26, Michaelsen and Hartmeyer, collectors, 17 Jun 1905, 6 specimens (ZMH 7812, 7891; ZMHUB 5244, as *H. waahli* by Augener, 1913, corrected to *H. praeclara* by Augener, 1922, 1924). Crawley Bay, Swan River, D.L. Serventy, collector, 17

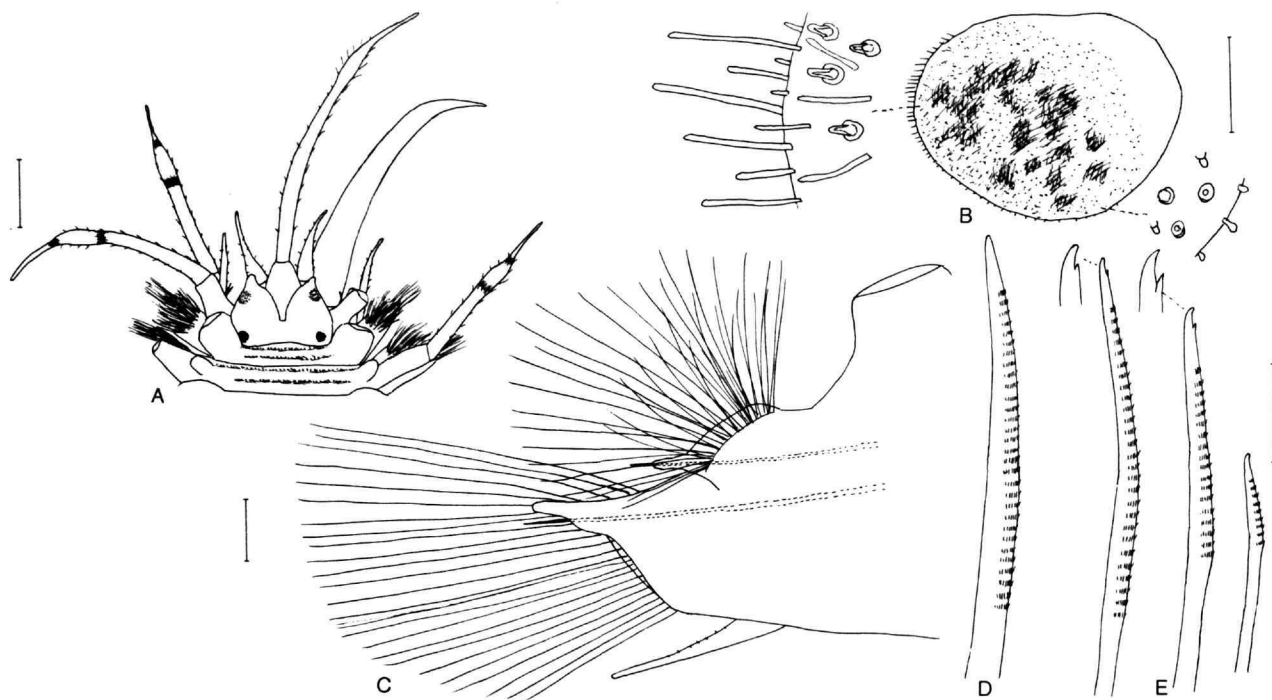


FIGURE 19.—*Harmothoe praeclara* (Haswell) (specimen from Otago, New Zealand, ZMH P-E 144): A, dorsal view of anterior end, left palp, right dorsal and ventral tentacular cirri, and left dorsal cirrus of segment 3 missing; B, left elytron, with detail of papillae and microtubercles; C, right elytragerous parapodium, anterior view, acicula dotted; D, long notoseta; E, upper, middle, and lower neurosetae, with detail of tips (Scales: A = 0.5 mm; B = 1.0 mm; C = 0.2 mm; D,E = 0.1 mm.)

Aug 1935, 4 specimens (BMNH 1938.10.31.1-3; USNM 55014, as *H. waahli* by Monro, 1938).

NEW ZEALAND: Off Otago coast, 1906, Benham collection, 1 specimen (ZMH P-E 144, as *Harmothoe spinosa* by Ehlers, 1907).

MEASUREMENTS.—*Type Material*: Types of *Antinoe praeclara* and *A. pachylepis* from Port Jackson, Victoria, Australia, not located in the Australian Museum. Holotype of *Antinoe ascidiicola* with 38 segments, last one very small, 29 mm long, 8 mm wide with setae; no color remaining. Four syntypes of *Harmothoe terminoculata* all complete, with 37–39 segments, 11–18 mm long, and 4–8 mm wide with setae.

Nontype Material: Figured specimen from Otago, New Zealand (ZMH P-E 144) incomplete, with 29 segments, 14 mm long, 6 mm wide with setae. Two specimens from Freshwater Bay, Swan River (ZMHUB 5244) with 37–38 segments, 9–14 mm long, 4.5–6 mm wide. Two specimens from Crawley Bay, Swan River (BMNH 1938.10.31.1–3) with 39 segments, 19–23 mm long, 8 mm wide. One of specimens from New South Wales (USNM 58240) with 37 segments, 16 mm long, 5 mm wide, with developing eggs under elytra.

DESCRIPTION.—Elytra 15 pairs on usual segments, covering

dorsum. Elytra large, oval, with fringe of lateral marginal papillae and some submarginal papillae posteriorly and laterally; surface covered with conical microtubercles except near anteromedial border; with mottled brownish pigmentation (Figure 19B; Monro, 1924, fig. 6). Dorsum brownish, with 2 transverse ciliated bands per segment (Figure 19A).

Prostomium bilobed, with distinct cephalic peaks; ceratophore of median antenna large, oval, in anterior notch, papillate style with subterminal enlargement and filamentous tip; lateral antennae with small ceratophores inserted ventrally, styles short, subulate, papillate; palps stout, tapered; anterior pair of eyes anteroventral, not visible dorsally, larger than posterior pair near posterior border; tentaculophores lateral to prostomium, each with 0–4 notosetae on inner side and pair of papillate dorsal and ventral tentacular cirri, similar to but shorter than median antenna (Figure 19A; Monro, 1924, fig. 5).

Segment 2 with first pair of elytraphores, biramous parapodia, and long ventral buccal cirri, similar to tentacular cirri (Figure 19A).

Parapodia biramous, notopodia short, rounded, with projecting acicular lobe on lower side; neuropodia with subconical presetal acicular lobe with supraacicular digitiform process and

shorter rounded postsetal lobe; notosetae numerous, forming radiating bundle; neurosetae numerous, forming fan-shape bundle (Figure 19C). Notosetae slightly stouter than neurosetae, short to long, with distinct spinous rows and rather long, bare, tapered tips (Figure 19D). Upper neurosetae with longest spinous regions and small bifid tips; middle neurosetae with shortest spinous regions and distinctly bifid tips; lower neurosetae with short spinous regions and entire tips; all neurosetae with rather long, bare tips (Figure 19E). Dorsal cirri with long cylindrical cirrophores on posterior sides of notopodia, with papillate styles extending beyond neurosetae; dorsal tubercles nodular (Figure 19A). Ventral cirri short, tapering, with minute papillae (Figure 19C). Pharynx with 9 pairs of border papillae and 2 pairs of hooked jaws.

DISTRIBUTION.—South Pacific Ocean, Australia, New Zealand; low tide to 18 meters.

Harmothoe stephensoni, new species

FIGURE 20

Harmothoe waahli.—Fauvel, 1923:4.—Monro, 1933:489, figs. 1–3.—Day, 1953:400 [not Kinberg, 1856].

Harmothoe (Lagisca) waahli.—Day, 1960:281; 1967:72, fig. 1.11.g–k [not Kinberg, 1856].

MATERIAL EXAMINED.—SOUTH AFRICA: South Atlantic Ocean, Stil Bay, University of Cape Town Ecological Survey, T.A. Stephenson, collector, Jan 1932, holotype (BMNH 1932.11.24.8, as *H. waahli* by Monro, 1933).

MEASUREMENTS.—*Type Material*: Holotype, female with eggs in body cavity, in 2 pieces, with 44 segments, 19 mm long, 5 mm wide with setae.

DESCRIPTION.—Body flattened, tapering slightly anteriorly and more so posteriorly, with 2 dorsal transverse ciliated bands

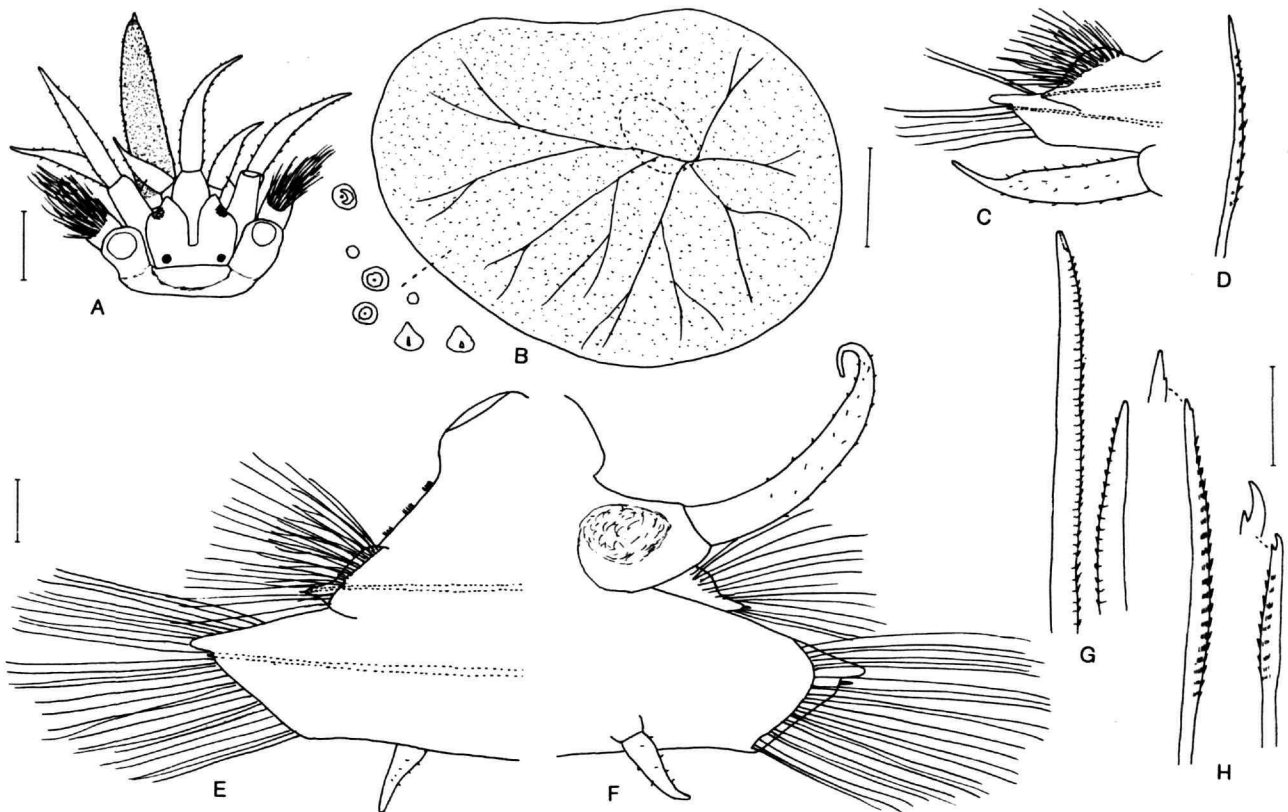


FIGURE 20.—*Harmothoe stephensoni*, new species (holotype, BMNH 1932.11.24.8): A, dorsal view of anterior end, right palp and right dorsal tentacular cirrus missing, anteroventral eyes dotted; B, right elytron, with detail of microtubercles and micropapillae; C, right elytragerous parapodium from segment 2, anterior view, acicula dotted; D, upper neuroseta from same; E, right elytragerous parapodium, anterior view, acicula dotted; F, right cirriferous parapodium, posterior view; G, long and short notosetae; H, upper and middle neurosetae, with detail of tips. (Scales: A = 0.5 mm; B = 0.5 mm; C,E,F = 0.2 mm; D,G,H = 0.1 mm.)

per segment, without color. Elytra 15 pairs on usual segments, covering dorsum except for some posterior segments. Elytra large, oval, delicate, with "veins" radiating from scar of attachment to elyrophore, dotted with low conical microtubercles throughout and some scattered micropapillae (Figure 20B; Monro, 1933, fig. 1; Day, 1967, fig. 1.11.h).

Prostomium bilobed with subtriangular cephalic peaks; ceratophore of median antenna in anterior notch, large, bulbous, with style rather short, with scattered short papillae; ceratophores of lateral antennae inserted ventrally, styles short, subulate, with short papillae; palps stout, tapered, thickly papillate; anterior pair of eyes anteroventral, hidden from dorsal view, larger than posterolateral pair; tentaculophores lateral to prostomium, each with single seta on inner side and pair of dorsal and ventral tentacular cirri, similar to median antenna (Figure 20A; Day, 1967, fig. 1.11.g).

Segment 2 with first pair of large elyrophores, biramous parapodia, and long ventral buccal cirri similar to tentacular cirri (Figure 20A,C); notosetae similar to following notosetae; neurosetae more slender than following neurosetae, with tips both entire and bifid (Figure 20D).

Parapodia biramous; notopodium smaller than neuropodium, rounded, with projecting acicular lobe on lower side; neuropodium with subconical presetal acicular lobe with short supraacicular process and shorter, rounded postsetal lobe; notosetae numerous, forming spreading bundle; neurosetae moderate in number, forming fan-shape bundle (Figure 20C,E,F). Notosetae stouter than neurosetae, with rather weakly developed spinous rows, short ones with tapered, bare tips, some long ones with tips showing faint terminal groove (Figure 20G; Monro, 1933, fig. 2). Upper neurosetae with long spinous regions and rather long, bare tips, entire or with slight indication of secondary tooth; middle and lower neurosetae with short spinous regions, mostly with secondary tooth (Figure 20H; Monro, 1933, fig. 3). Cirrophores of dorsal cirri thick, cylindrical, with raised glandular area on posterior side; styles rather thick, tapered distally and extending about to tips of neurosetae, with scattered, short clavate papillae; dorsal tubercles nodular (Figure 20F). Ventral cirri short, subulate, with short papillae (Figure 20E,F).

DISTRIBUTION.—South Atlantic Ocean, South Africa; intertidal to 64 meters (Day, 1960).

ETYMOLOGY.—The species is named for Professor T.A. Stephenson, the collector of the holotype.

Harmothoe tahitiensis, new species

FIGURE 21

Harmothoe atra.—Monro, 1928:472 [not Horst, 1915].

Harmothoe waahli.—Monro, 1939b:171 [not Kinberg, 1856].

MATERIAL EXAMINED.—TAHITI: Tahiti and Tamiona reef, in coral, "St. George" Pacific and Panamanian Expedition 1923–1924, C. Crossland, collector, holotype (BMNH 1928.1.11.9) and paratype (USNM 55023, as *H. atra* by

Monro, 1928). Tahiti, same collection, 4 paratypes (BMNH 1941.4.4.205-7, as *H. waahli* by Monro, 1939b).

AUSTRALIA: *Queensland*: Northern Queensland, Eagle Cay off Lizard Island, 2–3 m, among dead coral, *Acropora* sp., R. and J. Brock, collectors, 17 Nov 1977, 1 specimen (USNM 64564).

MEASUREMENTS.—*Type Material*: Holotype, male with sperm, in 2 fragments totaling 36 segments (20 + 16), 9 mm long, 3 mm wide; paratype from same collection, male with sperm, in 2 fragments, totaling 35 segments (18 + 17), 7 mm long, 2 mm wide.

DESCRIPTION.—Body small, fragile, fragmenting easily, flattened, tapering anteriorly and more so posteriorly. Dorsum transversely banded with dark pigment. Elytra 15 pairs on usual segments, large, oval, covering dorsum, with rounded to conical microtubercles on most of surface and some larger, rounded tubercles near posterior border, with scattered micropapillae on lateral and posterior borders and on surface, without fringe of long papillae; elytra splashed with brown to black pigment on inner sides and near point of attachment to elyrophores (Figure 21D,E).

Prostomium bilobed, with anterior lobes rounded, without distinct cephalic peaks; median antenna with cylindrical ceratophore in anterior notch, with papillate style up to twice length of prostomium; small ceratophores of lateral antennae inserted ventrally, nearly hidden from view; palps stout, tapered, up to twice length of prostomium; larger, anterior pair of eyes anteroventral, hidden from view dorsally, smaller, posterior pair posterodorsal; tentaculophores lateral to prostomium, each with single notoseta on inner side and pair of dorsal and ventral tentacular cirri, similar to median antenna (Figure 21A–C).

Second segment with first pair of large elyrophores, biramous parapodia, and long papillate ventral buccal cirri, similar to tentacular cirri (Figure 21C,F); notosetae very numerous, similar to following notosetae; neurosetae more slender than following neurosetae, upper and middle neurosetae with bifid tips, lower ones with entire slender tips.

Parapodia biramous; notopodium smaller than neuropodium, rounded, with projecting acicular lobe on lower side; neuropodium with longer, subconical presetal acicular lobe, with thick, supraacicular process and shorter, rounded postsetal lobe; notosetae very numerous, forming bushy bundle; neurosetae numerous, forming fan-shape bundle (Figure 21F–H). Notosetae slightly stouter than neurosetae, short to long, with close-set spinous rows, short notosetae tapering to pointed, bare tips, longer ones with tips somewhat truncate and notched, giving appearance of being split (perhaps worn?) (Figure 21I). Upper neurosetae with longest spinous regions, all with bare, bifid tips (Figure 21J). Dorsal cirri with cylindrical cirrophores, bulbous basally; styles papillate, with subterminal inflated area and long filamentous tips extending beyond neurosetae; dorsal tubercles small, nodular (Figure 21H). Ventral cirri short, subulate, with scattered papillae (Figure 21G,H).

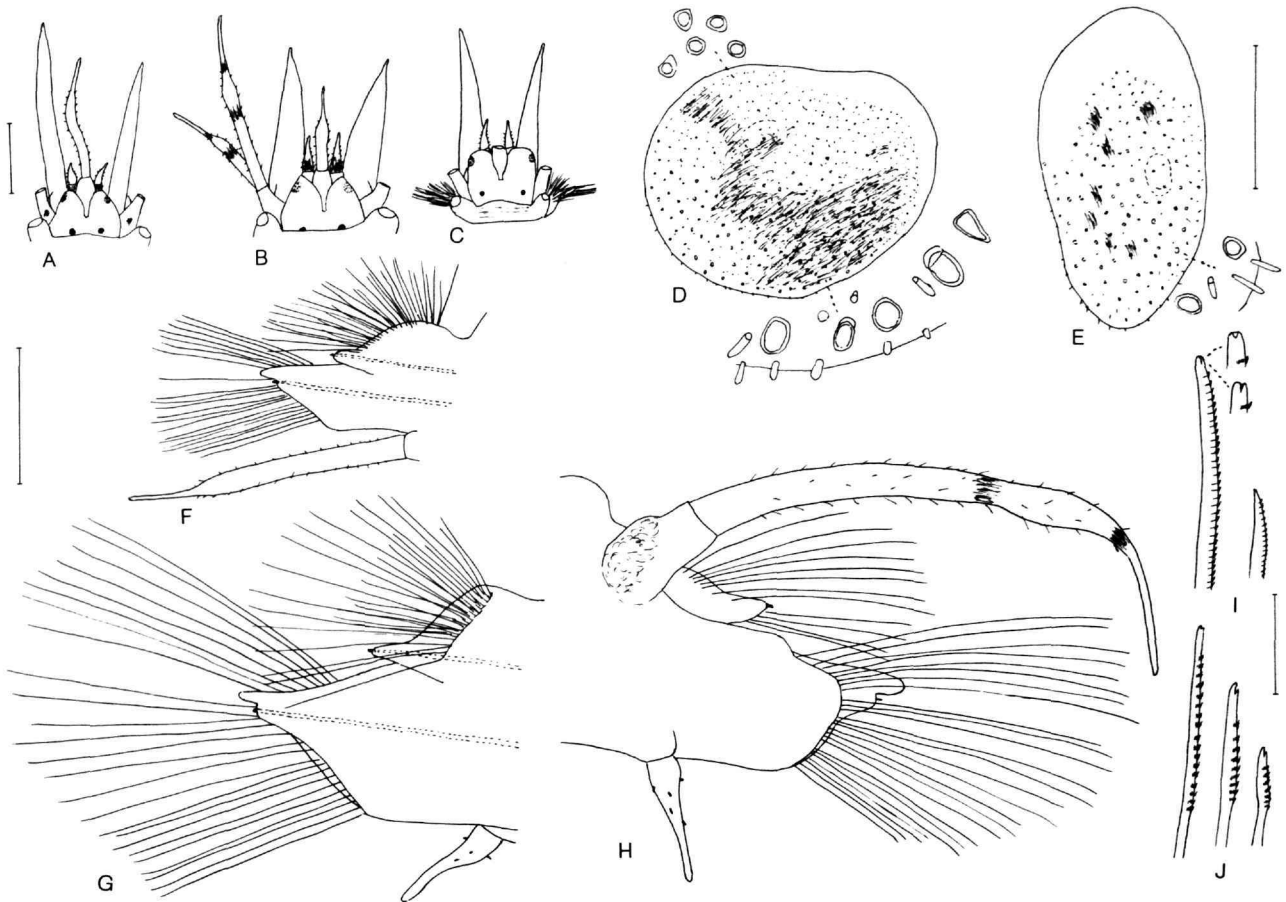


FIGURE 21.—*Harmothoe tahitiensis*, new species (A,B, paratypes, BMNH 1941.4.4.2-5-7; C-J, holotype, BMNH 1928.1.11.9): A, dorsal view of anterior end, tentacular cirri missing; B, dorsal view of anterior end, style of median antenna small, regenerating, right dorsal and ventral tentacular cirri missing; C, dorsal view of anterior end, style of median antenna and tentacular cirri missing; D, left elytron from anterior region, with detail of tubercles and papillae; E, right elytron from posterior region, with detail of tubercles and papillae; F, right elytragerous parapodium from segment 2, anterior view, acicula dotted; G, right elytragerous parapodium from middle region, anterior view, acicula dotted; H, right cirriferous parapodium, posterior view; I, long and short notosetae, with detail of tips; J, upper, middle, and lower neurosetae. (Scales: A-C = 0.5 mm; D,E = 0.5 mm; F-H = 0.2 mm; I,J = 0.1 mm.)

DISTRIBUTION.—Southwest Pacific Ocean, Tahiti, Australia; intertidal.

ETYMOLOGY.—The species is named for the collecting site.

***Harmothoe capensis* (Wiley, 1904), new combination**

FIGURE 22

Parmenis capensis Wiley, 1904:258, pl. 13: figs. 7, 8, 27-29.—Augener, 1918:137.

Harmothoe equisetata [sic].—Monro, 1933:491 [not Kinberg, 1856].

Harmothoe aequiseta.—Day, 1953:400 [part?]; 1960:274 [part?; not Kinberg, 1856].

Harmothoe aequiseta aequiseta.—Day, 1967:66 [part?; not Kinberg, 1856].

MATERIAL EXAMINED.—SOUTH AFRICA: South Atlantic Ocean, Woodstock Beach, Table Bay, among tangle of roots of sea bamboo, W.F. Purcell, collector, Aug 1896, holotype of *Parmenis capensis* (BMNH 1911.2.1.33). Stil Bay, University of Cape Town Ecological Survey, T.A. Stephenson, collector, Jan 1932, 1 specimen (BMNH 1932.11.24.6, as *H. equisetata* [sic] by Monro, 1933).

REMARKS.—Augener (1918:137) and Day (1953:400) included *Parmenis capensis* under *Harmothoe aequiseta* (Kinberg). Based on a study of Kinberg's type and the deficient original description, Kinberg's species is considered to be an indeterminable species of *Harmothoe*. At least some of the

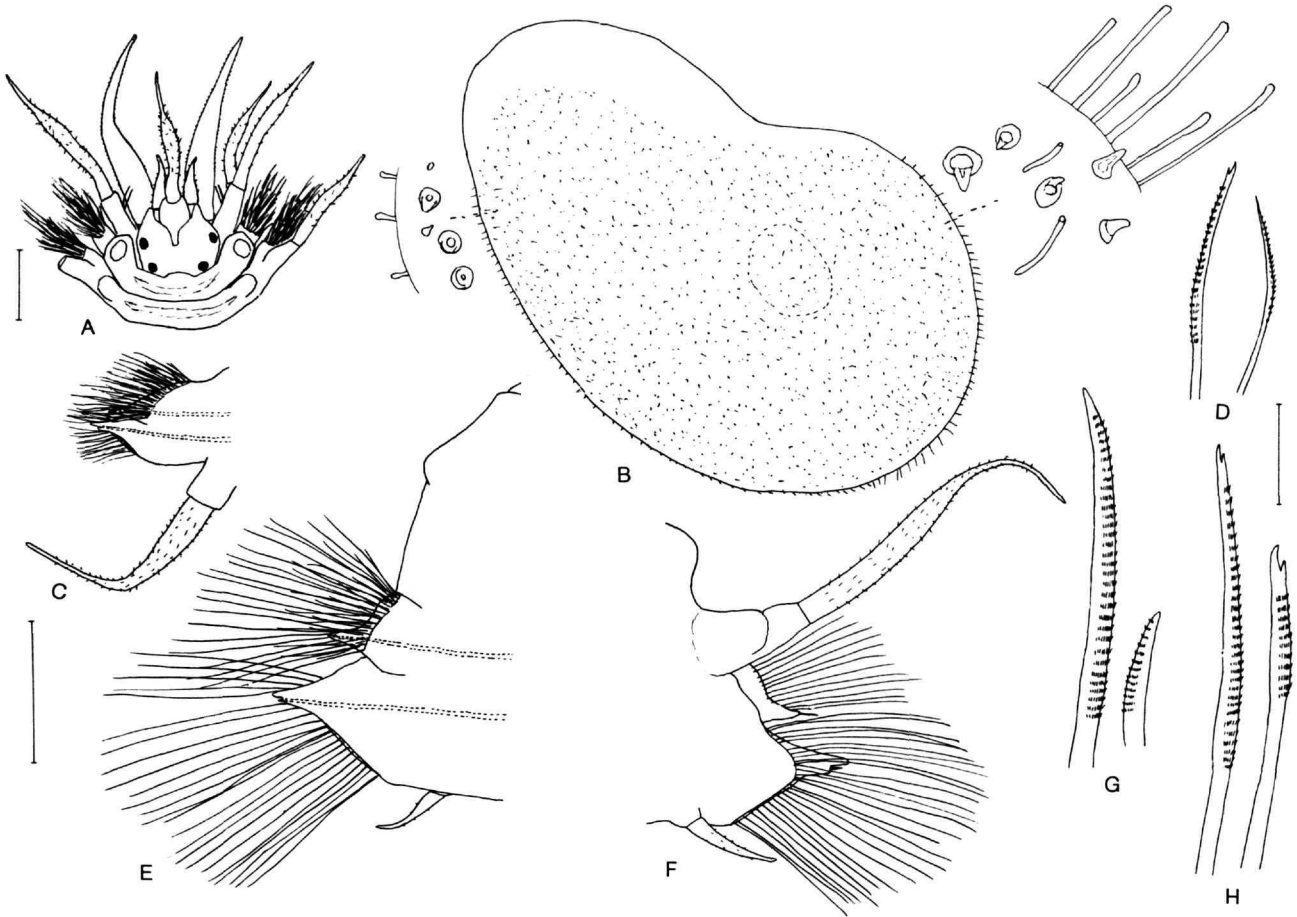


FIGURE 22.—*Harmothoe capensis* (Willey) (holotype of *Parmenis capensis*, BMNH 1911.2.1.33): A, dorsal view of anterior end, left ventral tentacular cirrus and left dorsal cirrus of segment 3 missing; B, right elytron, with detail of microtubercles and papillae; C, right elytragerous parapodium from segment 2, anterior view, acicula dotted; D, upper and lower neurosetae from same; E, right elytragerous parapodium, anterior view, acicula dotted; F, right cirriferous parapodium, posterior view; G, long and short notosetae; H, upper and middle neurosetae. (Scales: A = 0.5 mm; B,C,E,F = 0.5 mm; D,G,H = 0.1 mm.)

records of *H. aequiseta* from South Africa by Day (1953, 1960, 1967) may refer to *H. capensis*.

MEASUREMENTS.—*Type Material:* Holotype of *Parmenis capensis*, female packed with eggs, 15 mm long, 5 mm wide with setae, 40 segments, with minute parapodium only on right side of last segment.

DESCRIPTION.—Body flattened, tapering slightly anteriorly and posteriorly, with 2 transverse dorsal ciliated ridges per segment (Figure 22A). Elytra 15 pairs, on usual segments, large, covering dorsum, oval to subreniform, nearly covered by low, rounded and conical microtubercles, latter absent from small anteromedial area, with papillae on lateral and posterior borders and on surface (Figure 22B; Willey, 1904, pl. 13: figs.

27, 29).

Prostomium bilobed, with prominent cephalic peaks; ceratophore of median antenna large, bulbous, in anterior notch, style moderate in length, thickly papillate with filamentous tip; ceratophores of lateral antennae inserted ventrally, nearly hidden by cephalic peaks, styles short, subulate; palps stout, tapered, minutely papillate; anterior pair of eyes lateral, in region of greatest width of prostomium, posterior pair posterolateral; tentaculophores lateral to prostomium, each with 2 setae on inner side and pair of dorsal and ventral tentacular cirri, similar to median antenna (Figure 22A; Willey, 1904, pl. 13: figs. 7, 8).

Segment 2 with small crescent-shape nuchal lobe, first pair

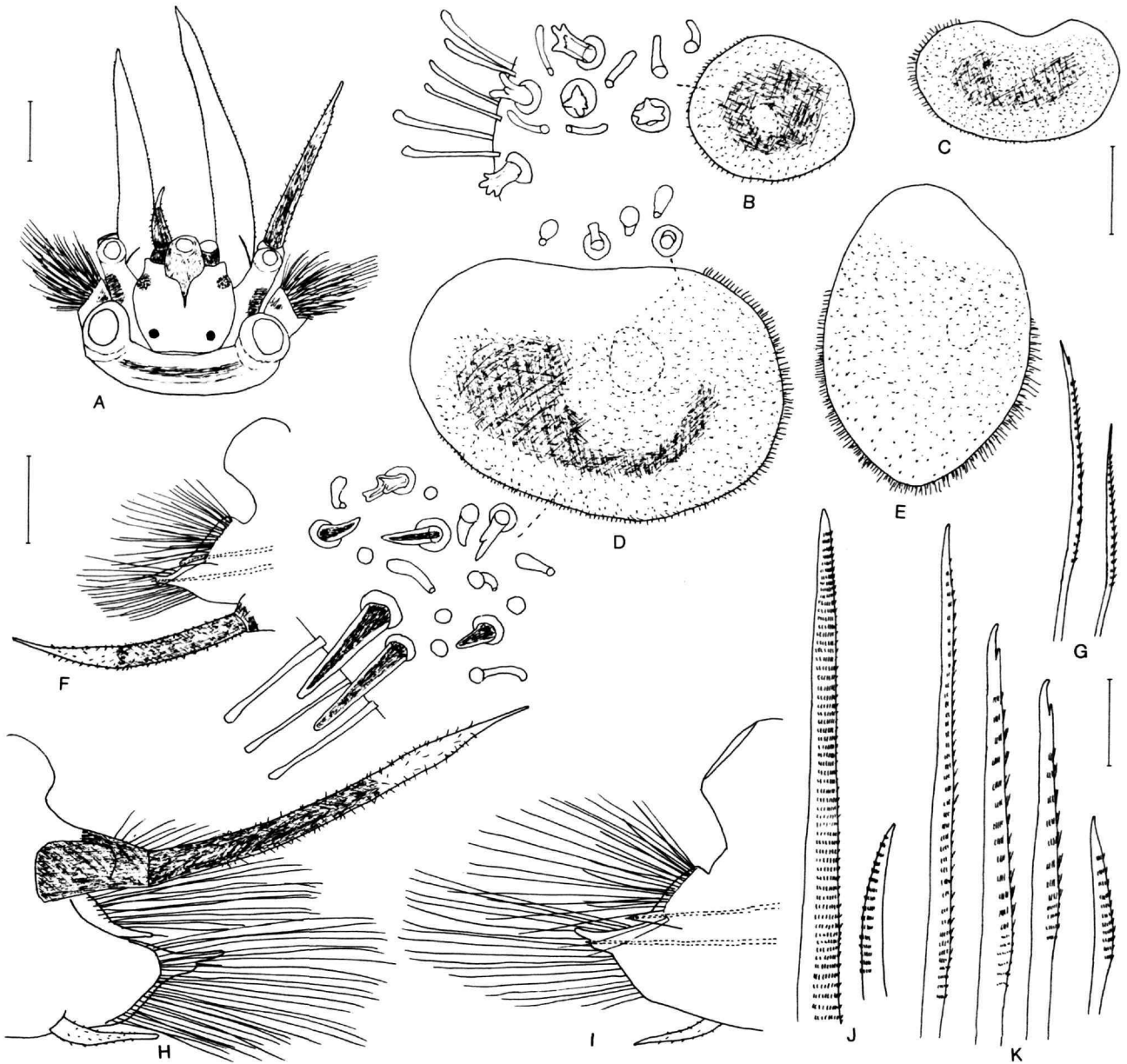


FIGURE 23.—*Harmothoe discoveryae*, new species (holotype, BMNH 1930.10.8.23): A, dorsal view of anterior end, styles of median and right lateral antennae, right dorsal and left dorsal and ventral tentacular cirri missing; B, left 1st elytron from segment 2, with detail of microtubercles and papillae; C, left 2nd elytron from segment 4; D, right middle elytron, with detail of microtubercles and papillae; E, right 15th elytron from segment 32; F, right elytragerous parapodium from segment 2, anterior view, acicula dotted; G, upper and lower neurosetae from same; H, right cirriferous parapodium, posterior view; I, right elytragerous parapodium, anterior view, acicula dotted; J, long and short notosetae; K, one upper, two middle, and one lower neurosetae. (Scales: A = 0.5 mm; B-E = 1.0 mm; F,H,I = 0.5 mm; G,J,K = 0.1 mm.)

of large elytophores, biramous parapodia, and long ventral buccal cirri, similar to tentacular cirri (Figure 22A,C); notosetae

similar to following notosetae; upper and middle neurosetae similar to upper neurosetae of following segments, but more

slender; lower neurosetae tapering to slender entire tips (Figure 22D).

Parapodia biramous; notopodium smaller than neuropodium, rounded, with projecting acicular lobe on lower side; neuropodium with subconical presetal acicular lobe with small, supraacicular process and shorter rounded postsetal lobe; notosetae very numerous, forming radiating bundle; neurosetae numerous, forming fan-shape bundle (Figure 22E,F; Willey, 1904, pl. 13: fig. 27). Notosetae short to long, about as stout as neurosetae, with close-set spinous rows and tapered, pointed, bare tips (Figure 22G). Upper neurosetae with long spinous regions, middle and lower ones with shorter spinous regions, all with bifid, bare tips (Figure 22H; Willey, 1904, pl. 13: fig. 28). Cirrophores of dorsal cirri long, cylindrical, with bulbous glandular area on posterior side; styles thickly papillate, with tips filamentous, extending beyond neurosetae; dorsal tubercles nodular (Figure 22A,F). Ventral cirri short, subulate, papillate (Figure 22E,F). Pygidium posterior to last pair of parapodia, with pair of anal cirri, similar to papillate dorsal cirri.

DISTRIBUTION.—South Atlantic Ocean, South Africa; intertidal.

Harmothoe discoveryae, new species

FIGURE 23

Harmothoe crosetensis.—Monro, 1930:57 [part; not McIntosh, 1885].

Harmothoe aequiseta.—Day, 1953:400 [part?]; 1960:274 [part?; not Kinberg, 1856].

Harmothoe aequiseta aequiseta.—Day, 1967:66, fig. 1.9.f-k [part?; not Kinberg, 1856].

MATERIAL EXAMINED.—SOUTH AFRICA: South Atlantic Ocean, Simon's Town, False Bay, Basin of H.M. Dockyard, 0–2 m, *Discovery* sta 90, 10 Jul 1926, holotype (BMNH 1930.10.8.231), 2 paratypes (BMNH 1930.10.8.232–3), paratype (USNM 55028, as *H. crosetensis* by Monro, 1930 and as *H. aequiseta* by Day, 1960). Knysna Estuary, 34°05'S, 23°03'E, University of Cape Town Ecological Survey sta KNY 211, paratype (BMNH 1963.1.3, as *H. aequiseta* by Day, 1953).

REMARKS.—Day (1960:274) referred the specimens identified by Monro (1930:57) as *H. crosetensis* from *Discovery* sta 90, collected in Simon's Town, South Africa, to *H. aequiseta*; they are referred herein to *H. discoveryae*.

MEASUREMENTS.—*Type Material:* Holotype, female with eggs in body cavity, with 39 segments, 25 mm long, 7.5 mm wide with setae. Paratype from Knysna Estuary with 38 segments, 20 mm long, 7 mm wide.

DESCRIPTION.—Body flattened, slightly tapering anteriorly

and posteriorly, with 2 transverse brown bands per segment dorsally. Elytra 15 pairs, on usual segments, large, covering dorsum, oval to subreniform, with well-developed fringe of long, clavate papillae along lateral and posterior borders and on surface; surface nearly covered with microtubercles; some microtubercles small, conical and others larger, sharply conical, thorn-like, with dark centers, especially near posterior borders, some with 2–5 prongs, especially on 1st and 2nd elytra; elytra mottled with brown pigment (Figure 23B–E; Day, 1967, fig. 1.9.g).

Prostomium bilobed, with distinct cephalic peaks; ceratophore of median antenna large, bulbous, in anterior notch, with papillate style moderate in length; ceratophores of lateral antennae inserted ventrally, with styles short, subulate, papillate; palps stout, tapering, minutely papillated, more than twice length of prostomium; large anterior pair of eyes anteroventral, hidden from view dorsally, smaller posterior pair posterodorsal; tentaculophores lateral to prostomium, each with single, stout notoseta on inner side and pair of long, papillate dorsal and ventral tentacular cirri (Figure 23A; Day, 1967, fig. 1.9.f).

Segment 2 with first pair of elytraphores, biramous parapodia, and long ventral buccal cirri, similar to tentacular cirri; notosetae numerous, similar to following notosetae; neurosetae more slender than following neurosetae, upper neurosetae with bifid tips, lower neurosetae with slender, bare, entire tips (Figure 23A,F,G).

Parapodia biramous; notopodium smaller than neuropodium, rounded, with projecting acicular lobe on lower side; neuropodium with longer, subconical presetal acicular lobe with digitiform supraacicular process and shorter, rounded postsetal lobe; notosetae very numerous, forming spreading bundle; neurosetae numerous, forming fan-shape bundle (Figure 23A,H,I). Notosetae stouter than neurosetae, short to long, with close-set spinous rows, tapering to short, bare, pointed tips (Figure 23J; Day, 1967, fig. 1.9.j). Upper neurosetae with longer spinous regions, few upper neurosetae with entire tips, few lower ones with entire, slightly hooked tips, rest with bifid tips (Figure 23K; Day, 1967, fig. 1.9.k). Dorsal cirri with long, cylindrical cirrophores, with inflated glandular area on posterior side; styles long, thickly papillate, with tips filamentous, extending beyond neurosetae; dorsal tubercles nodular (Figure 23H). Ventral cirri short, papillate (Figure 23H,I). Pygidium with anus medial to last pair of parapodia, with pair of long anal cirri.

DISTRIBUTION.—South Atlantic Ocean, South Africa; in 0–2 meters.

ETYMOLOGY.—The species is named for the R.R.S. *Discovery*, the collecting ship.

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