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TAXONOMIC GUIDE TO THE POLYCHAETES OF THE NORTHERN GULF OF MEXICO

Volume III

Prepared by

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CHAPTER 17

Joan M. Uebelacker

FAMILY OPHELIIDAE Malmgren, 1867b

INTRODUCTION

Opheliids are small to fairly large worms, ranging in length to about 60 mm. The body is stout and grub-like, as in Travisia; slender, fusiform, and distinctly grooved ventrally and laterally as in Armandia and Ophelina; or inflated anteriorly and slender posteriorly, as in Euzonus. The prostomium is conical and may have a small anterior palpode, small subdermal eyespots and a pair of well-developed, eversible nuchal organs. Segments are multiannulate, with small biramous parapodia, and usually with cirriform branchiae. The setae are all simple and smooth or hispid. In some genera, such as Travisia and Ophelia, the parapodia are rudimentary, with setae appearing to arise from the body wall; in other genera, such as Armandia and Ophelina, the parapodia consist of small, rounded lobes which may bear subulate or papillar pre- and postsetal lobes and ventral cirri. Lateral eyes are sometimes present anterior to the parapodia on a number of medial segments. In certain genera, such as Travisia and Ophelia, sensory pits occur between the rami of the parapodia. Nephridiopores have been observed anteroventral to the neuropodia of medial segments in some large species. The pygidium is variable and may consist of stout lobes or a prolonged, cylindrical or hood-shaped anal tube bearing marginal papillae and often an internally inserted ventral cirrus. The proboscis is sac-like and unarmed, but often has a basal fringe of digitate filaments.

The Opheliidae appear most closely allied with the Scalibregmatidae, and the two families together compose the order Opheliida (Fauchald, 1977a:8). Hartmann-Schröder (1971:383) erected three subfamilies, the Opheliininae, Opheliinae, and Travisiinae; however, Fauchald (1977a:43) indicated that the small size of the family does not necessitate subfamily designations.

Eleven or twelve genera are currently recognized in the Opheliidae (Fauchald, 1977a:42; Pettibone, 1982:30), with no additions since 1919. The family includes 140-150 species. Six species in four genera have been identified from northern Gulf of Mexico BLM-OCS collections. Five of these species are well-known and one is a questionable assignment.

PRINCIPAL DIAGNOSTIC CHARACTERS

The genera of opheliids are distinguished mainly by characteristics of the ventral groove, branchiae, lateral eyes, and pygidium. The ventral groove (and lateral grooves) may be absent altogether, as in Travisia (Figure 17-2a), absent anteriorly and present posteriorly, as in Ophelia (Figure 17-4a), or present throughout the body from setiger 2, as in Armandia and Ophelina (Figure 17-10a). The ventral and lateral grooves are the consequence of a pair of ventrolateral ridges formed by strongly developed longitudinal muscle bands (Day, 1967:571). All genera encountered in Gulf of Mexico BLM-OCS collections possess branchiae; Kesun, Polyopthalmus and Tachytrypane lack them. Lateral eyes occur

only in Polyopthalmus and Armandia (Figures 17-6a,d; 8a,b). The pygidium is composed of several stout lobes in Travisia (Figure 17-2d); two stout ventrolateral cirri and several dorsal papillae in Ophelia (Figure 17-4d); and an anal tube in Armandia (Figures 17-6e, 8c) and Ophelina (Figures 17-10c, 12c).

The key specific characters include segment count, location of branchiae, and characteristics of the parapodial lobes and pygidial structures. The segment count is fairly uniform within a given species, although more variation may actually occur than has been previously reported, especially when juveniles are taken into consideration. The pattern of branchial distribution is similarly uniform, but does vary somewhat with the size of the specimen. In addition, branchiae may be lost due to rough handling during collection and preservation.

The parapodia are generally not of much diagnostic value, although the presetal lobes may be noticeably elongate on anterior setigers of some species (Figures 17-8a,b; 12b). The distribution of noto- and neuropodial lappets (Figure 17-2a,c,d) is important among species of Travisia. The pygidium is often developed into a more or less elongate anal tube which has specific significance. The anal tube may be cylindrical, opening terminally (Figures 17-6e, 8c, 10c), or hood-shaped, opening ventrally (Figure 17-12c). The disposition of ventral anal cirri, and the presence and number of marginal papillae contribute to species diagnoses.

The setae of opheliids are relatively uniform, and are seldom considered as key taxonomic structures.

Juvenile opheliids are particularly difficult to identify owing to their reduced segment and branchial count, and poor development of pygidial structures. The prostomium may be rounded rather than conical; prostomial and lateral eyespots (if present) are usually much more distinct than in adults. Larger specimens in poor condition may be nearly impossible to identify due to the difficulty of obtaining an accurate segment count, and to loss of or damage to the fragile pygidium.

BIOLOGICAL NOTES

Opheliids are fairly common in sandy substrates and also mud, from shallow water through depths of 5000 m or more. Opheliids of sandy beaches have been the subject of morphological and ecological research by Amoureux (1977) and others. According to Day (1967:570), opheliids burrow head downwards. Peristaltic action of the ventrolateral muscle ridges facilitates burrowing, and circulates a water current along the ventral groove and back out the lateral grooves over the branchiae.

According to Fauchald and Jumars (1979:229), opheliids are non-selective deposit feeders, although at least one species may selectively feed on organic matter including dead copepods. Most species apparently obtain nutrition from organic matter on ingested sediments. Sand grains were observed in the guts of a number of specimens examined in this study.

Reproduction in opheliids probably involves direct release of gametes into the sea followed by external fertilization and a planktonic larval stage (Schroeder and Hermans, 1975). Armandia and Polyophthalmus, the two genera equipped with lateral eyes, have been observed to swarm at night lights. P. pictus may follow a lunar spawning cycle.

The gametes of some opheliids are released through lateral pores on segments anterior to those bearing nephridiopores.

Larvae of Ophelia bicornis are able to postpone metamorphosis until a suitable substrate is located. They are attracted to sand from the adult environment, but are repelled by sand of a different grade or lacking a microbial coating (Schroeder and Hermans, 1975:154). Larvae of Armandia brevis develop 20 segments before metamorphosis; the nine posterior segments form afterwards.

Oocytes were observed in the coelom of one Gulf of Mexico BLM-OCS specimen of Travisia hobsonae.

SPECIES OF OPHELIIDAE RECORDED FROM GULF OF MEXICO BLM-OCS PROGRAMS

Key to the Genera of Opheliidae from the Gulf of Mexico BLM-OCS Programs

1a. Body with pronounced ventral groove at least posteriorly. . . . 2
1b. Body without pronounced ventral groove (Figure 17-2a). . . . . .Travisia, p. 17-3

2a. Ventral groove well-developed along entire length of body. . . . 3
2b. Ventral groove poorly developed or absent anteriorly (Figure 17-4a). . . . . .Ophelia, p. 17-5

3a. Lateral eyes present (Figures 17-6a,d; 8a,b) . . Armandia, p. 17-7
3b. Lateral eyes absent. . . . . .Ophelina, p. 17-13

Genus Travisia Johnston, 1840

TYPE SPECIES: Travisia forbesii Johnston, 1840.
REFERENCES:
Day, 1967:575.
Hartmann-Schröder, 1971:388.
Fauchald, 1977a:43.
DIAGNOSIS: Body fusiform or grub-like, without distinct ventral groove. Pygidium consisting of short, blunt lobes. Branchiae present; lateral eyes absent. Parapodia small, without presetal lobes. Lateral sense organs present between parapodial rami. Noto- and neuropodial lappets present posteriorly. Setae simple, capillary, hispid.

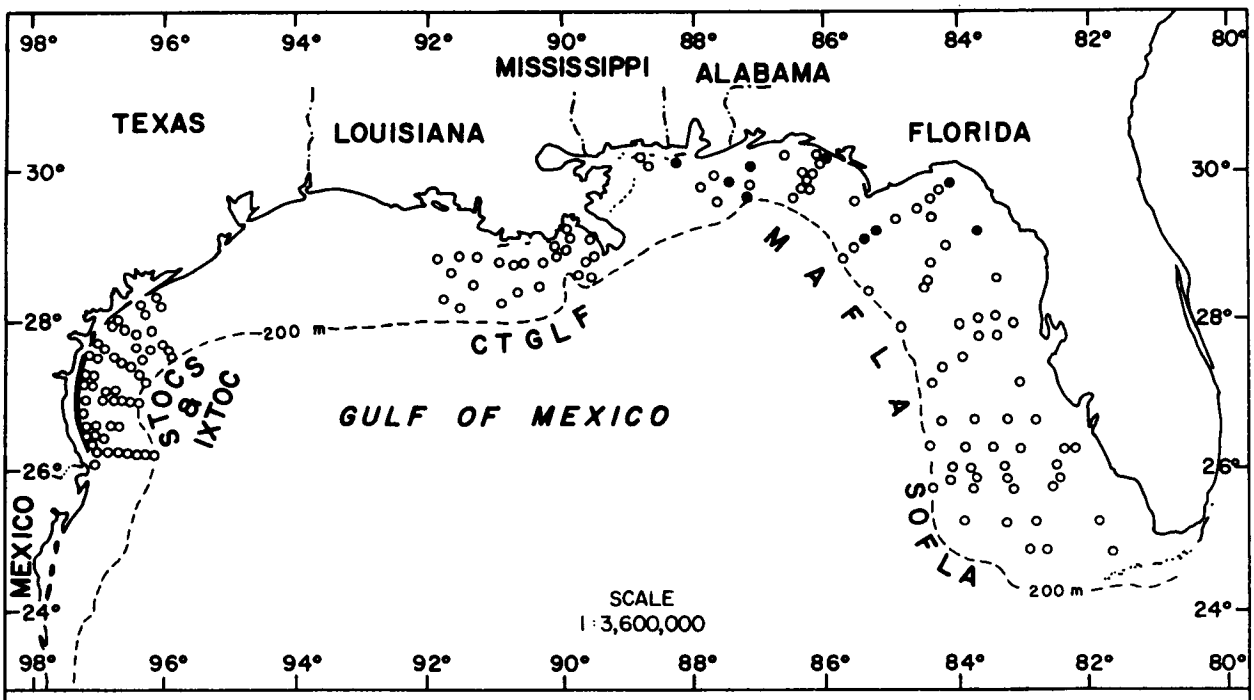

Figure 17-1. Distribution of Travisia hobsonae on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

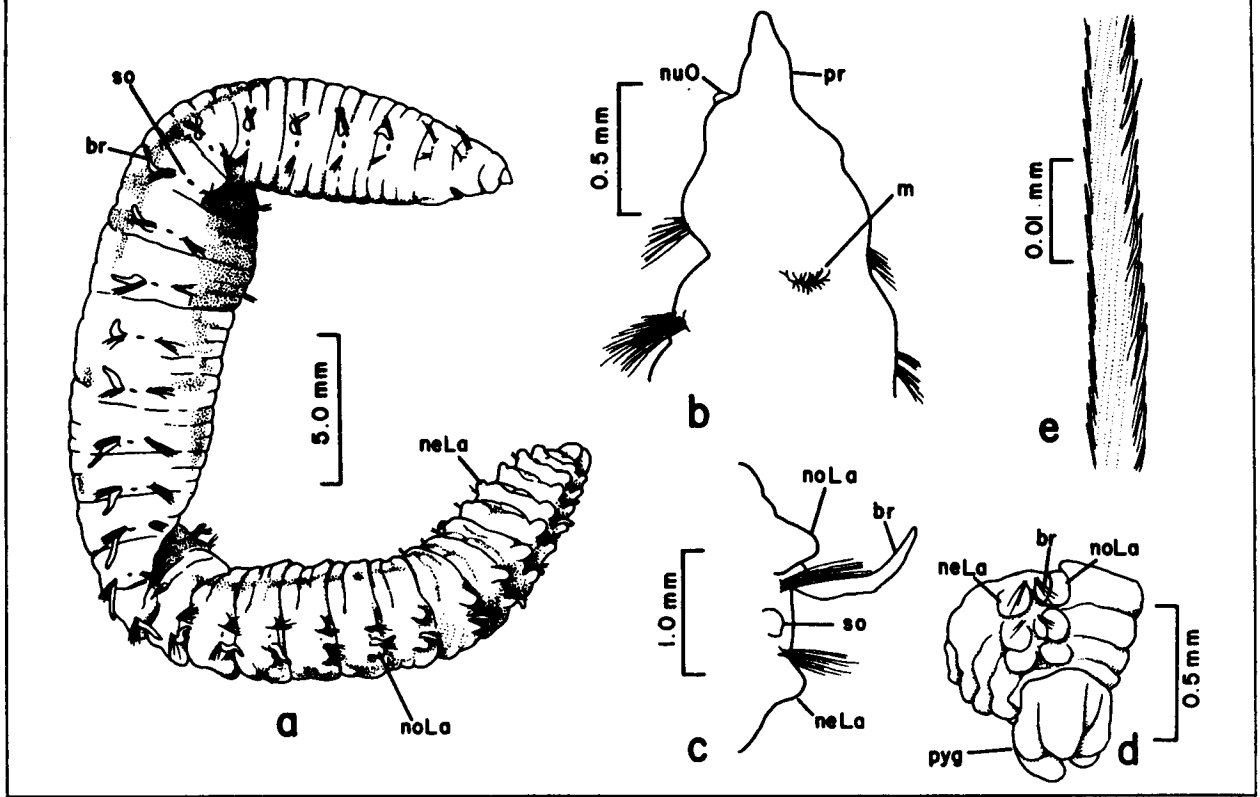

Figure 17-2. Travisia hobsonae: a, whole worm (lateral view); b, anterior end (ventral view); c, parapodium from setiger 19 (anterior view); d, pygidium (lateral view); e, portion of neuroseta.

Travisia hobsonae Santos, 1977
Figures 17-1, 2a-e

Travisia hobsonae Santos, 1977:559, fig. 1a-g.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2419G-8/77 (1 spec.), 2424H-7/76 (2 spec.), 2425J-7/76 (1 spec.), 2856E-8/77 (1 spec., USNM 75167), 2856I-9/77 (1 spec., USNM 75168), 2856-8/77 (2 spec., USNM 55995).
Supplementary Material:
Gulf of Mexico--NW Florida, Feb. 1970, J. Arneson coll., coll. of Vittor & Assoc. (1 spec.); Tampa Bay, May 1975, 1 m, clean sandy bottom, S. L. Santos coll. (USNM 53476, holotype).
DESCRIPTION:
Length, to 41.5 mm (previously reported to 27 mm); width, to 7 mm (previously reported to 4 mm). Body stout, grub-like (Figure 17-2a); complete specimens with 30-32 setigers and occasionally an additional achaetous preanal ring. Prostomium short, conical, with two small, eversible nuchal organs along posterodorsal margin (Figure 17-2b); eyespots absent. First setae emerging anterior to mouth. Branchiae present from setiger 2 to last setiger; long and slender in midbody region, shorter anteriorly and posteriorly. Shallow, indistinct ventral groove present from setiger 14 to posterior end. Sensory organs located between parapodial rami of all setigers (Figure 17-2a,c). Nephridiopores present on setigers 3-14. Notopodial lappets (Figure 17-2c) becoming conspicuous around setigers 10-17; neuropodial lappets, around setigers 16-18. Posterior segments dorsally crenulate on some specimens. Pygidium with five large lobes (Figure 17-2d) and sometimes several smaller lobes. Setae minutely hispid (Figure 17-2e). Largest specimen with oocytes in coelom.
REMARKS: T. hobsonae was previously known only from the west coast of Florida in Tampa Bay and Stump Pass.
PREVIOUSLY REPORTED HABITAT: Medium to fine sand.
GULF OF MEXICO BLM-OCS OCCURRENCE: Several occurrences off Alabama and northwestern Florida (Figure 17-1); 10-106 m; coarse to fine sand, sandy silt.
DISTRIBUTION: Gulf of Mexico.

Genus **Ophelia** Savigny, 1818

TYPE SPECIES: Ophelia bicornis Savigny, 1818.
REFERENCES:
Fauvel, 1927:129.
Ushakov, 1955:316.
Day, 1967:571.
Hartmann-Schröder, 1971:383.
Fauchald, 1977a:43.
DIAGNOSIS: Body fusiform, inflated anteriorly, with distinct ventral groove posteriorly starting at setigers 7-10. Branchiae usually present, starting on setigers 8-10. Lateral eyes absent. Parapodia small, without presetal lobes or noto- and neuropodial lappets. Lateral sense organs present between parapodial rami. Setae capillary. Pygidium with two large ventral lobes and numerous dorsal and lateral papillae.

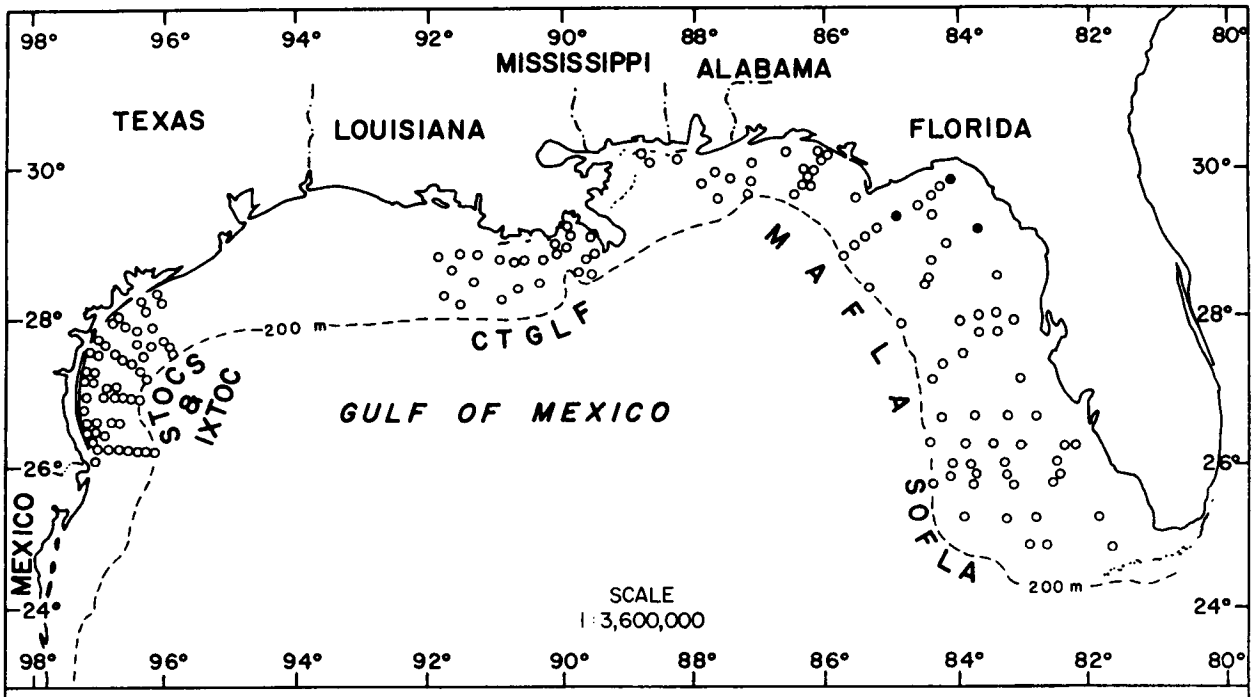

Figure 17-3. Distribution of Ophelia denticulata on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

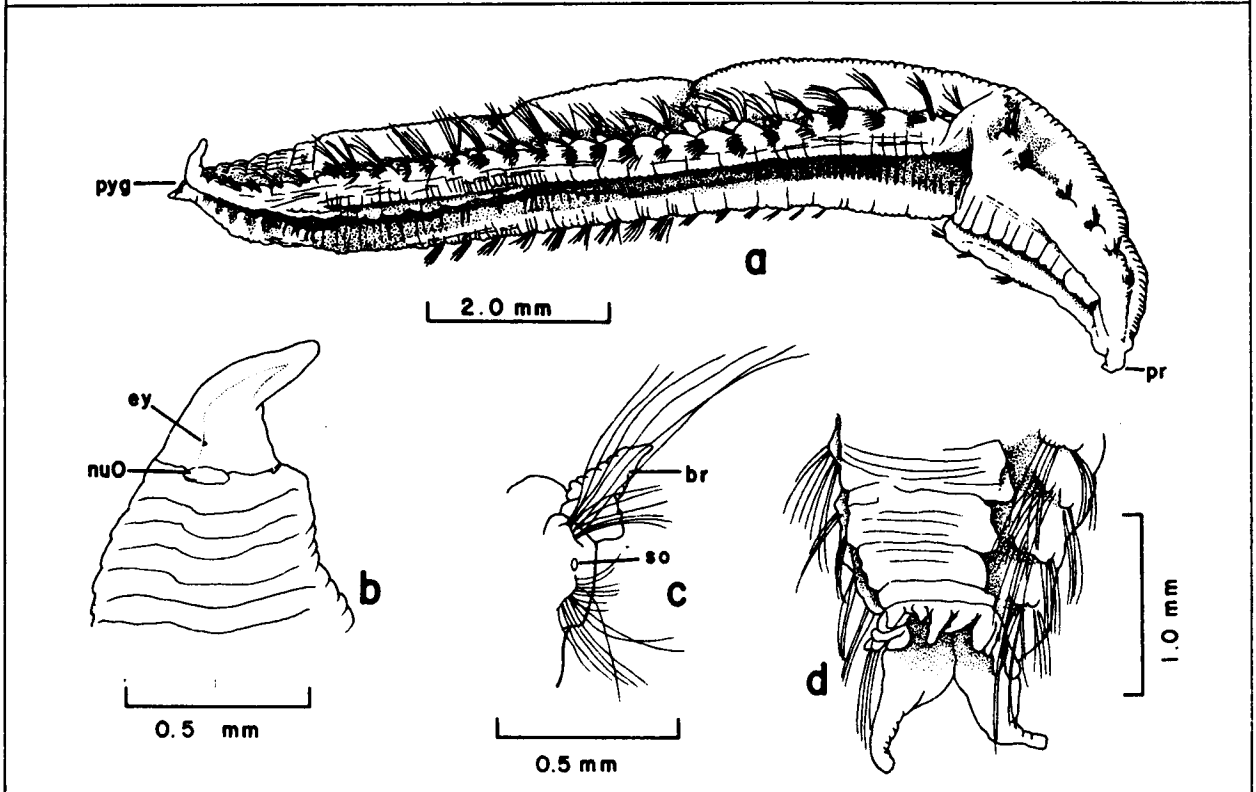

Figure 17-4. Ophelia denticulata: a, whole worm (ventrolateral view); b, anterior end (dorsolateral view); c, parapodium from setiger 13 (anterolateral view); d, pygidium (dorsal view).

Ophelia denticulata Verrill, 1875
Figures 17-3, 4a-d

Ophelia denticulata--Day, 1973:95.
Ophelia neglecta--Fauvel, 1927:132, fig. 46g,h.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2318H-11/77 (1 juv.), 2318C-2/78 (2 spec.), 2423D-7/76 (1 juv.), 2423E-7/76 (3 spec.), 2423-7/76 (1 spec., USNM 56150), 2423I-9/77 (1 juv., USNM 75165), No data (1 juv.).
Supplementary Material:
New England--off Block Island, 26 m, Aug. 1874, A. E. Verrill ID. (USNM 16123, type).
South Carolina--BLM Sta. 2B, 32°54'N, 79°12'W, Aug. 1977, 11 m, sand (1 spec., USNM 75114).
Gulf of Mexico--off Mississippi, COE Sta. 580-3, 30°10.9'N, 88°22.36'W, Oct. 1980, 10.9 m, clayey silt (1 spec.).
DESCRIPTION:
Length, to 33 mm (previously reported to 60 mm); width, to 4 mm (previously reported to 6 mm). Body fusiform, deeply grooved ventrally from setigers 7-10 to posterior end (Figure 17-4a); complete specimens with 27-33 setigers. Prostomium conical, with inconspicuous subdermal eyespots, and small nuchal organs along posterodorsal margin (Figure 17-4b). First setae emerging posterior to mouth. Branchiae smooth or crenulate, present from setigers 10 to 24-28; last 4-5 setigers abranchiate. Sensory organs located between parapodial rami (Figure 17-4c). Nephridiopores present on setigers 11-16. Posterior segments dorsally well-defined and crenulate on some specimens. Pygidium with 10-17 distal papillae in addition to two large ventral lobes (Figure 17-4d). All setae smooth, capillary; notosetae longer than neurosetae and branchiae.
REMARKS: Juveniles differ from adults in having fewer setigers (21-27), often with branchiae and ventral groove poorly developed. The smallest specimens have a short, rounded prostomium with three distinct eyespots. The pygidium may have few or no marginal papillae. O. denticulata is newly reported from the Gulf of Mexico.
PREVIOUSLY REPORTED HABITAT: Intertidal to 20 m, coarse sand.
GULF OF MEXICO BLM-OCS OCCURRENCE: Three stations off northwestern Florida (Figure 17-3); shallow water, 10-20 m; medium to medium-fine sand, silty fine sand.
DISTRIBUTION: English Channel, Atlantic coast of France, Maine to North Carolina, Gulf of Mexico.

Genus Armandia Filippi, 1861

TYPE SPECIES: Armandia cirrhosa Filippi, 1861.
REFERENCES:
Fauvel, 1927:135.
Day, 1967:576.
Fauchald, 1977a:42.
DIAGNOSIS: Body long, with distinct ventral groove from setiger 2 to posterior end. Prostomium with subdermal eyespots and a pair of large, eversible nuchal organs. Branchiae present, usually from setiger 2.

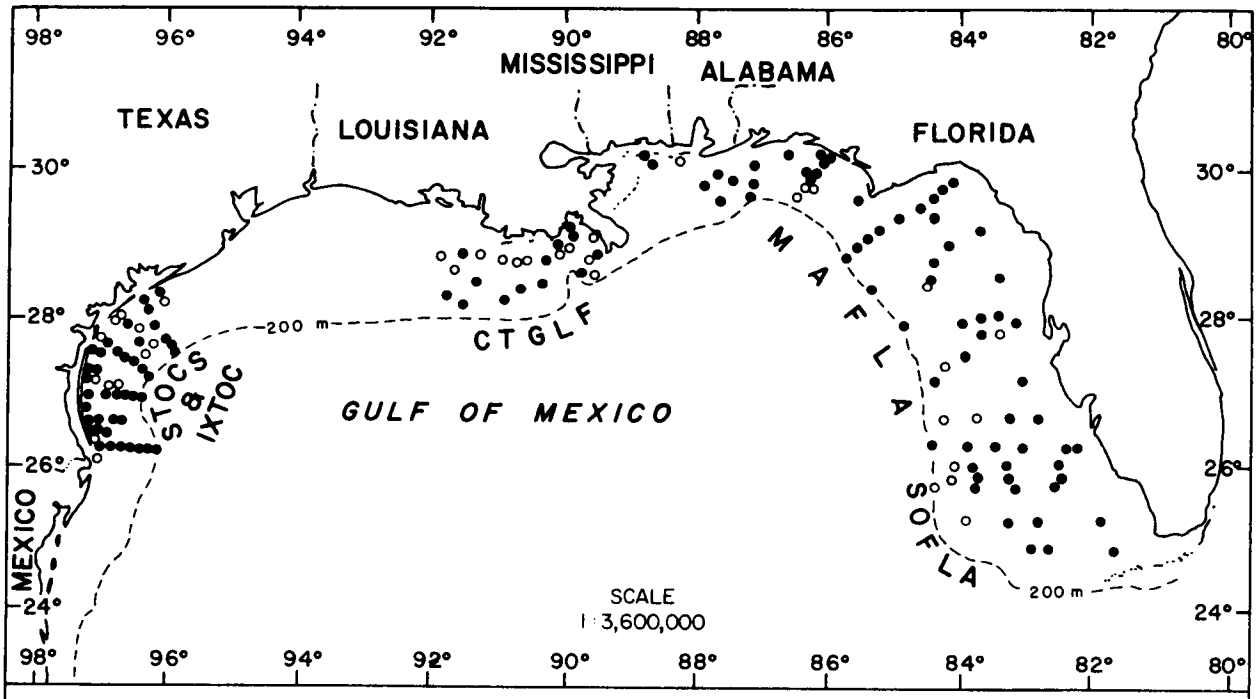

Figure 17-5. Distribution of Armandia maculata on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

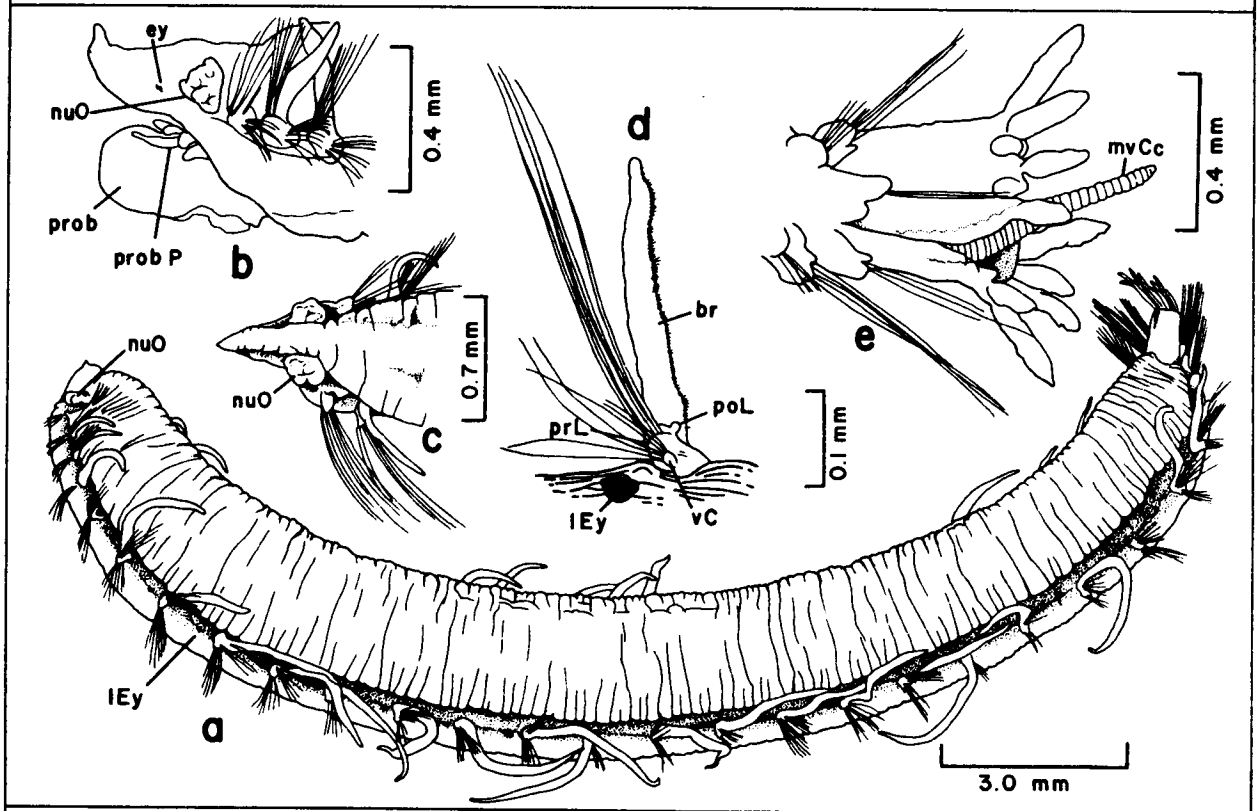

Figure 17-6. Armandia maculata: a, whole worm (lateral view); b, anterior end (lateral view); c, same (dorsal view); d, medial parapodium (ventral view); e, pygidium (ventral view).

Lateral eyes present. Parapodia with pre- and postsetal lobes and ventral cirri, without noto- and neuropodial lappets or interramal sense organs. Setae capillary. Pygidium with cylindrical or hood-shaped anal tube bearing internally attached midventral cirrus and semicircle of marginal cirri or papillae.

Key to the Gulf of Mexico BLM-OCS Species of Armandia

1a. Body with 29 or fewer setigers; anterior parapodia with short presetal lobes (Figure 17-6a,b,d). . . .**Armandia maculata**, p. 17-9

1b. Body with 35-52 setigers; anterior parapodia with long presetal lobes (Figure 17-8a,b). . . . . .**Armandia agilis**, p. 17-11

Armandia maculata (Webster, 1884)
Figures 17-5, 6a-e

Ophelina maculata Webster, 1884:322, pl. 11, figs. 54, 55.
Armandia maculata--Monro, 1933a:265.
Armandia maculata--Hartman, 1942a:129, fig. 14a.
Armandia maculata--Day, 1973:95.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 6A-11/80 (8 spec., USNM 75237), 16E-11/80 (1 spec., USNM 75238); MAFLA 2421C-7/76 (1 spec.), 2422E-7/76 (3 juv.), 2423I-7/76 (2 spec., USNM 75164), 2423-7/76 (2 spec., USNM 55994), 2424D-7/76 (1 spec.), 2528A-6/75 (2 spec.); CTGLF 03-5/78 (1 spec.); STOCS 1/II-5 2/76 (1 spec., USNM 75200), 1/II-6 2/76 (1 spec., USNM 75201), 4/II-6 2/76 (1 spec., USNM 75203), 6/II-5 3/76 (1 spec., USNM 75204), 1/III-2 W/76 (1 spec., USNM 75202); IXTOC S54-3 11/79 (1 spec., USNM 75122).
Supplementary Material:
Gulf of Mexico--off Louisiana, 29°02'09"N, 90°05'48"W, LOOP Sta. 477-7, Nov. 1979, 15.5 m (1 spec.).
DESCRIPTION:
Length, to 22.1 mm (previously reported to 19 mm); width, to 2.6 mm (previously reported to 2 mm). Body deeply grooved ventrally and laterally (Figure 17-6a); complete specimens with 29 setigers. Prostomium conical with acuminate tip (Figure 17-6b), or beaked (Figure 17-6c), with large, usually everted nuchal organs and three inconspicuous subdermal eyespots. Branchiae smooth, usually longer than setae, present from setigers 2 to 25-26. Parapodia low, rounded; with short, rounded presetal lobes; postsetal lobes and ventral cirri papilliform throughout (Figure 17-6d). Lateral eyes present on setigers 7 to 13-17, inconspicuous on larger specimens. Nephridiopores not observed. Anal tube (Figure 17-6e) cylindrical; with ventral slit; single, internally inserted, articled midventral caudal cirrus; and 0-28 digitiform to filiform marginal papillae. All setae capillary, notosetae longer and stouter than neurosetae (Figure 17-6d), setae often frayed basally. Proboscis sac-like with digitiform anterobasal proboscideal papillae (Figure 17-6b).
REMARKS: Small specimens may have fewer than 29 setigers (24-28) and fewer pairs of branchiae.
PREVIOUSLY REPORTED HABITAT: Intertidal to 40 m.

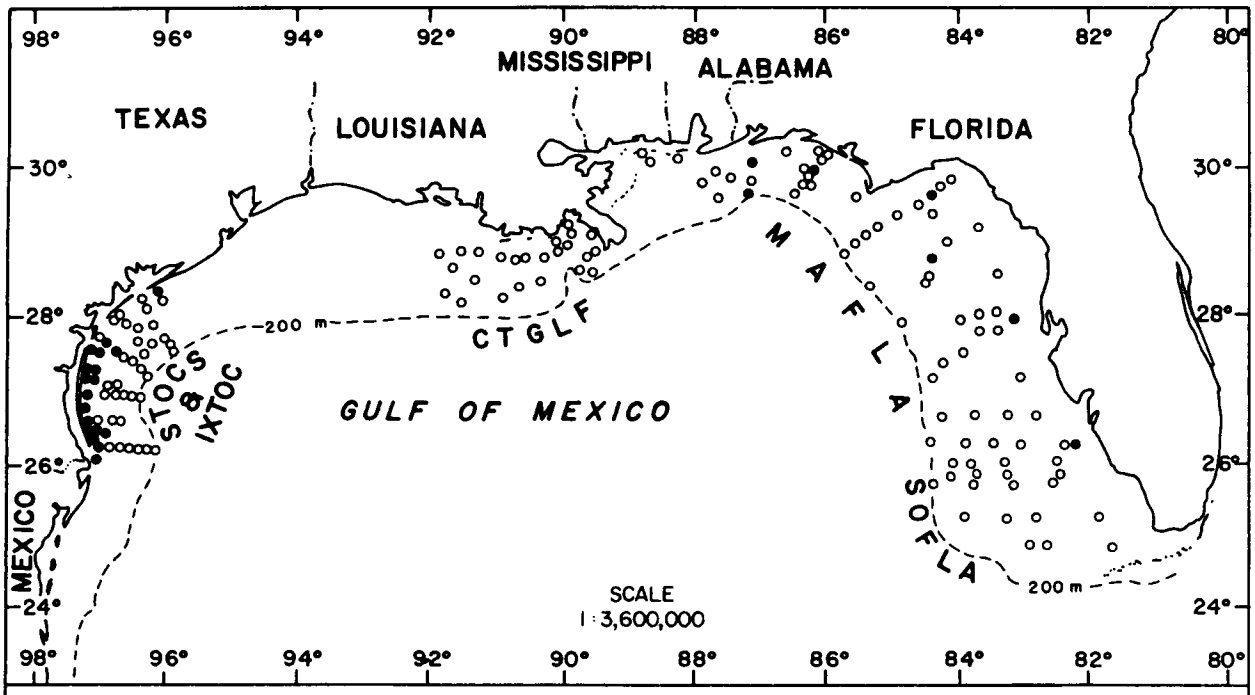

Figure 17-7. Distribution of Armandia agilis on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

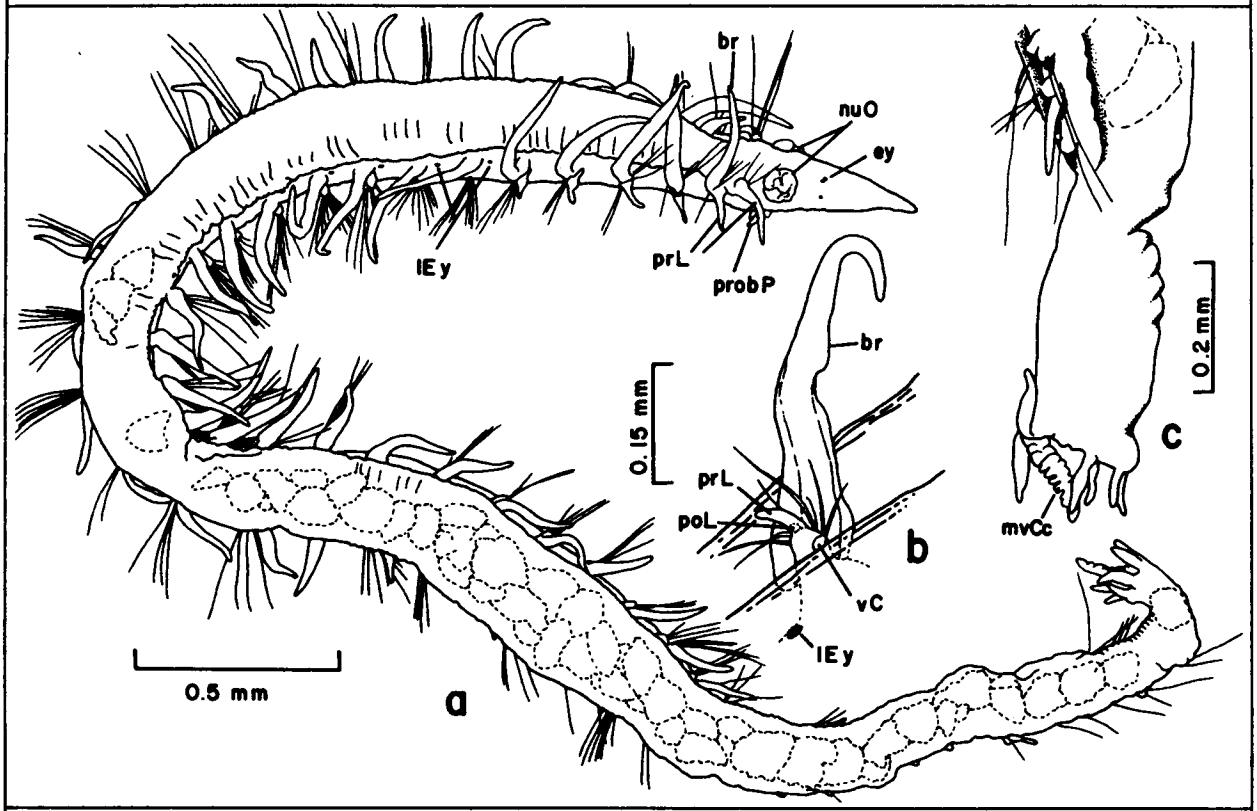

Figure 17-8. Armandia agilis: a, whole worm (dorsolateral view) showing sand grains in gut; b, parapodium from setiger 9 (ventral view); c, pygidium (lateral view).

GULF OF MEXICO BLM-OCS OCCURRENCE: Ubiquitous in northern Gulf (Figure 17-5); 4.5-189 m; sands, silts and clays.
DISTRIBUTION: Bermuda, North Carolina, Gulf of Mexico.

Armandia agilis (Andrews, 1891)
Figures 17-7, 8a-c

Ophelina agilis Andrews, 1891:289, pl. 15, figs. 21-26, 28.
Armandia agilis--Hartman, 1942a:129, fig. 12c,d; 1945:37; 1951a:97.
Armandia agilis--Renaud, 1956:30, fig. 20.
Armandia agilis--Day, 1973:95.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2207J-7/76 (1 spec., USNM 75163), 2316C-8/76 (2 spec.), 2421C-7/76 (1 spec.), 2856F-8/77 (1 spec.); STOCS 4/III-1 Sp/76 (15 spec., USNM 75197), 4/III-6 Sp/76 (24 spec., USNM 75198), 4/IV-2 (1 juv., USNM 75199); IXTOC S50-5 11/79 (1 spec., USNM 75120), S53-1 11/79 (2 juv., USNM 75121).
Supplementary Material:
Gulf of Mexico--Mississippi Sound, South End Beacon, Jan. 1973, (coll. of Vittor & Assoc., 2 spec.; USNM 55993, 1 spec.); off Alabama, 30°04.36'N, 88°17.32'W, COE Sta. 474-7, Mar. 1981, 18.3 m, sand, P. Wolf ID. (1 spec.).
DESCRIPTION:
Length, to 36.6 mm (previously reported to 60 mm); width, to 2.0 mm (previously reported to 2.5 mm). Body moderately grooved ventrally and laterally; complete specimens with 35-51 setigers. Prostomium long, conical, tip often acuminate; nuchal organs large, usually everted; three subdermal eyespots present (Figure 17-8a). Branchiae cirriform anteriorly, becoming basally expanded and lamelliform (Figure 17-8b) in midbody region, small and cirriform posteriorly, present from setigers 2 to 49-51 (2 to 24-34 on small specimens). Parapodia low, rounded; presetal lobes long, subulate anteriorly (Figure 17-8a), gradually diminishing in size through first 10-20 setigers; postsetal lobes and ventral cirri small, papilliform (Figure 17-8b). Lateral eyes small, present on setigers 7-10 to 14-30 (Figure 17-8a,b), inconspicuous or absent on larger specimens. Nephridiopores not observed. Anal tube long, cylindrical, not slit ventrally; with single, internally inserted, articled midventral cirrus, and 4-15 digitiform distal papillae (Figure 17-8c). Anal tube occasionally absent. All setae capillary, sometimes frayed basally, notosetae longer than neurosetae. Proboscis sac-like with digitate anterobasal proboscideal papillae.
REMARKS: In Gulf of Mexico specimens of both A. agilis and A. maculata, the lateral eyes become obscure with increasing body size. Thus, large specimens of these species could be erroneously assigned to the closely related genus Ophelina, which lacks lateral eyes.
PREVIOUSLY REPORTED HABITAT: Intertidal to 40 m; sand, gravel aggregates.
GULF OF MEXICO BLM-OCS OCCURRENCE: Scattered records off Florida, common off Texas (Figure 17-7); 4.5-106 m; coarse to fine-very fine sand, silty and clayey sand, silty clay, sandy silty clay.
DISTRIBUTION: North Carolina, Bahamas, Gulf of Mexico.

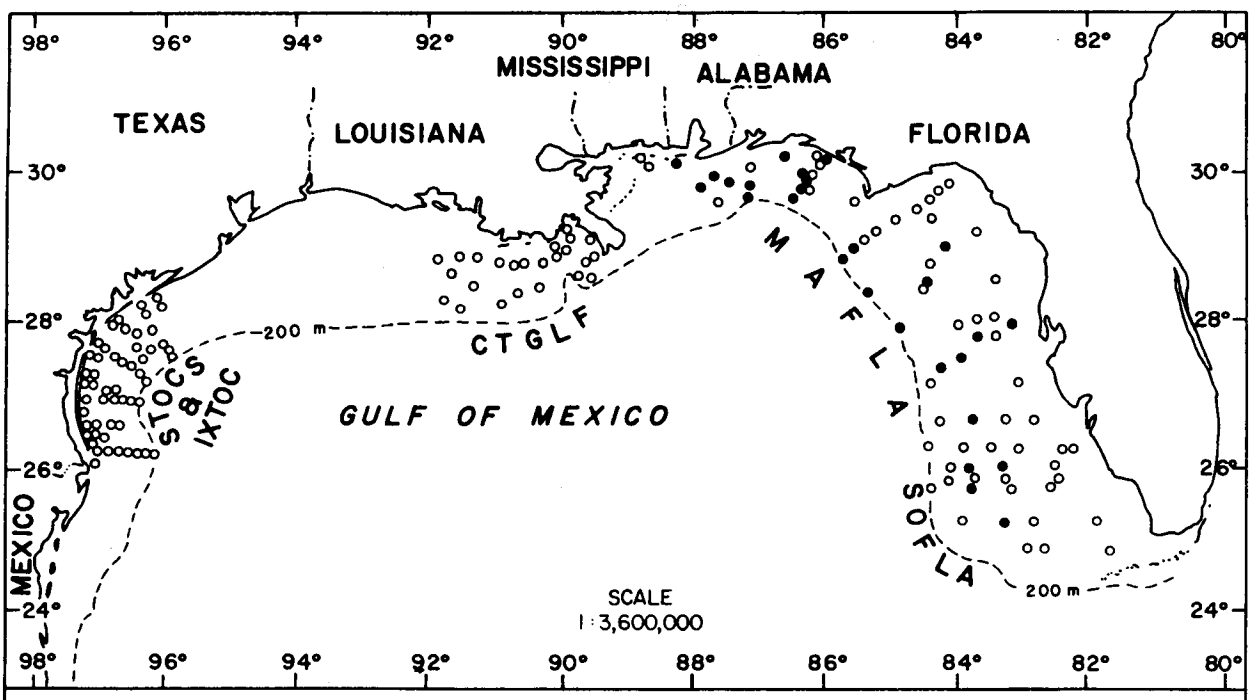

Figure 17-9. Distribution of Ophelina cylindricaudata on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

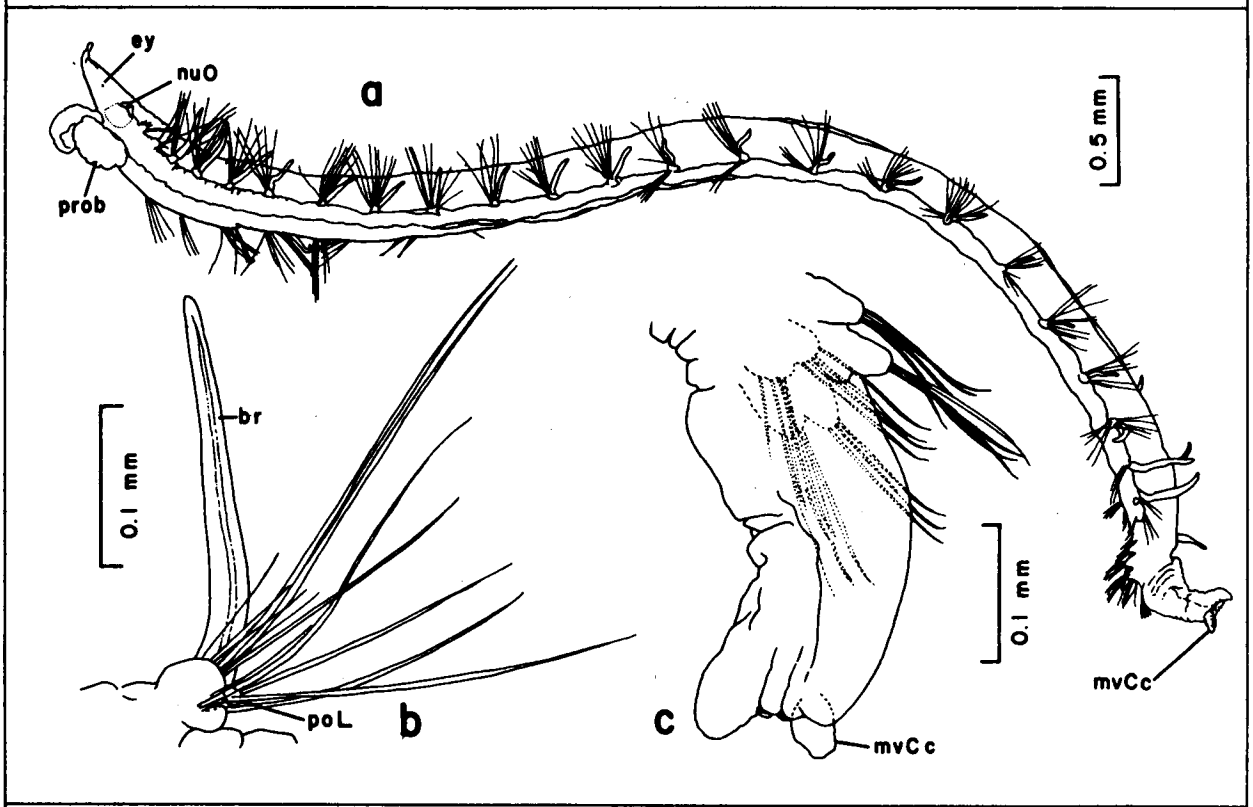

Figure 17-10. Ophelina cylindricaudata: a, whole worm (ventrolateral view); b, parapodium from setiger 2 (ventrolateral view); c, pygidium (lateral view).

Genus Ophelina Oersted, 1843

TYPE SPECIES: Ophelina acuminata Oersted, 1843.
REFERENCES:
Fauvel, 1927:133 (as Ammotrypane).
Ushakov, 1955:319 (as Ammotrypane).
Hartmann-Schröder, 1971:389.
Fauchald, 1977a:43.
DIAGNOSIS: Body long, with distinct ventral groove from setiger 2 to posterior end. Prostomium conical with a pair of large, eversible nuchal organs. Branchiae present from setiger 2, sometimes reduced or absent on middle segments. Lateral eyes absent. Parapodia with or without pre- and postsetal lobes and ventral cirri, without noto- and neuropodial lappets or interramal sense organs. Setae capillary. Pygidium with cylindrical or hood-shaped anal tube bearing internally attached midventral cirrus, with or without marginal papillae.

Key to the Gulf of Mexico BLM-OCS Species of Ophelina

1a. Body with 27-28 setigers; anal tube cylindrical with crenulate margin (Figure 17-10c). . . . . **Ophelina cylindricaudata**, p. 17-13
1b. Body with 35-43 setigers; anal tube hood-shaped with papillose margin (Figure 17-12c). . . . . **Ophelina** cf. **acuminata**, p. 17-15

Ophelina cylindricaudata (Hansen, 1878)
Figures 17-9, 10a-c

Ammotrypane cylindricaudatus--Fauvel, 1927:133, fig. 47f,g.
Ammotrypane cylindricaudatus--Ushakov, 1955:319, fig. 118E.
Ammotrypane cylindricaudatus--Hartman, 1965:188.
Ophelina cylindricaudata--Hartmann-Schröder, 1971:390.
Ophelina cylindricaudata--Day, 1973:96, fig. 13g.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 12-11/80 (3 spec., USNM 75239); MAFLA 2212J-8/77 (2 spec.), 2212D-2/78 (1 spec.), 2313C-11/77 (1 spec.), 2313E-11/77 (2 spec.), 2313I-11/77 (4 spec.), 2958I-8/77 (2 spec.).
Supplementary Material:
North Carolina--off Beaufort, Apr. 1965, 34°19'N, 75°56'W, 130 m, J. H. Day coll./ID., sandy mud (17 spec., USNM 51041).
DESCRIPTION:
Length, to 6.5 mm (previously reported to 19 mm); width, to 0.35 mm (previously reported to 1.5 mm). Body small, slender, moderately grooved ventrally and laterally (Figure 17-10a), complete specimens with 27-28 setigers. Prostomium with acuminate tip; subdermal eyespots present or absent; nuchal organs brown-pigmented. Branchiae cirriform, long anteriorly and posteriorly, much smaller in midbody region, present from setigers 2 to 22-24. Parapodia as rounded lobes, with papilliform postsetal lobe (Figure 17-10b), with or without papilliform presetal lobe. Ventral cirri absent. Nephridiopores not observed. Anal tube long, cylindrical, opening terminally; with internally inserted, globular or articled midventral cirrus; dorsal margin expanded, lateral

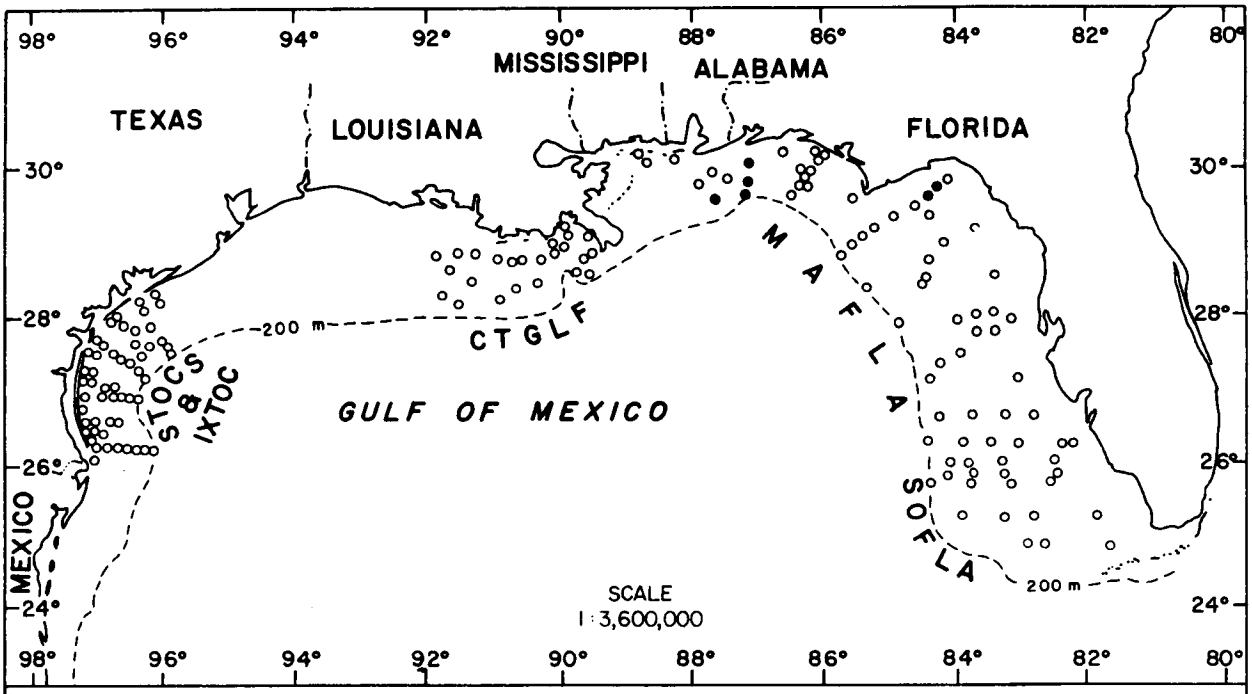

Figure 17-11. Distribution of Ophelina cf. acuminata on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

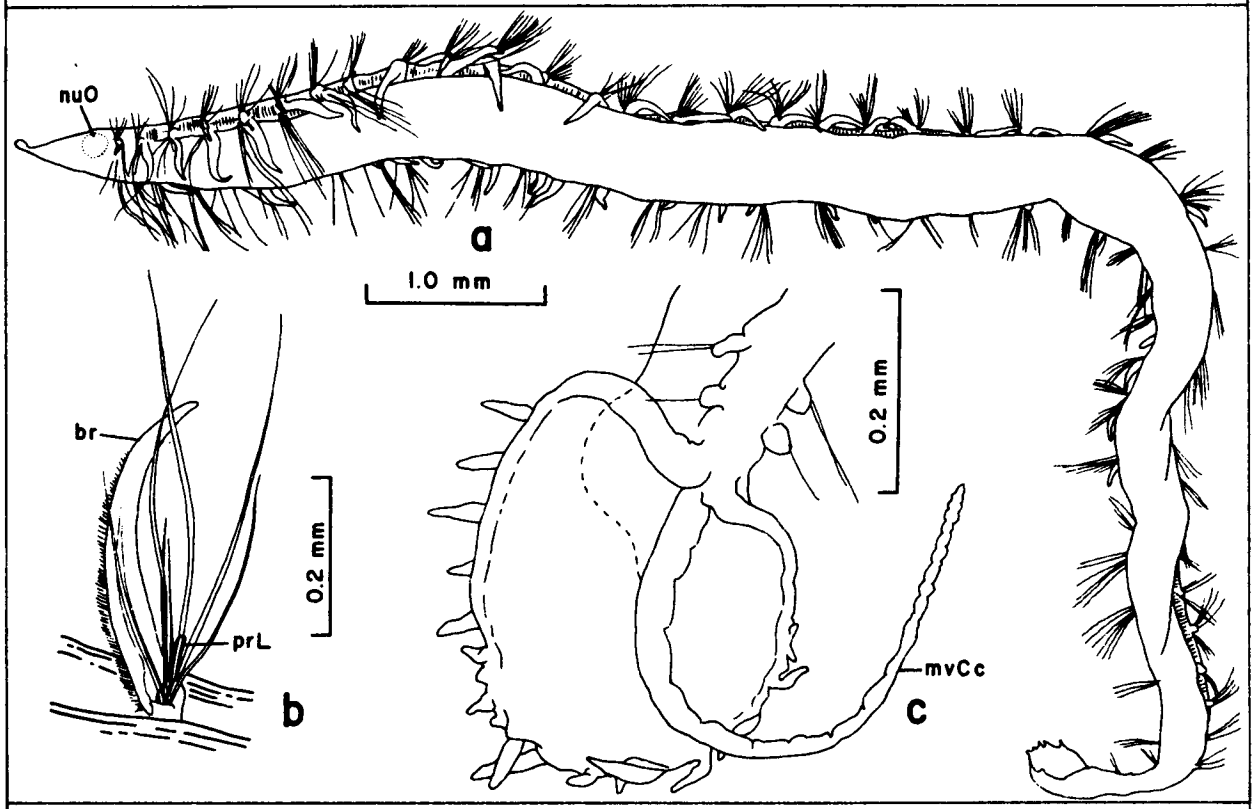

Figure 17-12. Ophelina cf. acuminata: a, whole worm (dorsal view); b, parapodium from setiger 4 (ventral view); c, pygidium (ventral view).

margins crenulate (Figure 17-10c). Setae smooth, capillary, those of last four setigers crowded, bristle-like (Figure 17-10a,c). Proboscis sac-like, without papillae.
REMARKS: O. cylindricaudata is newly reported from the Gulf of Mexico.
PREVIOUSLY REPORTED HABITAT: 30-1500 m.
GULF OF MEXICO BLM-OCS OCCURRENCE: Common in northeastern Gulf (Figure 17-9); 19-189 m; coarse to fine-very fine sand, silty fine to very fine sand, clayey and sandy silt.
DISTRIBUTION: Arctic, North Pacific south to Sea of Japan, North Atlantic south to Bermuda and North Carolina, Gulf of Mexico, Mediterranean.

Ophelina cf. acuminata Oersted, 1843
Figures 17-11, 12a-c

Ammotrypane aulogaster--Fauvel, 1927:133, fig. 47a-e.
Ophelina acuminata--Day, 1967:579, fig. 25.2.i,j.
Ophelina acuminata--Hartmann-Schröder, 1971:391, fig. 138b,c; 1979b:140.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 20I-5/74 (1 spec.), 2644D-6/75 (1 spec.), 2645I-6/75 (1 spec.), 2645E-7/76 (1 spec., USNM 75166), 2645G-7/76 (1 spec.), 2645H-2/78 (1 spec.), 2645-2/78 (1 spec., USNM 56151).
DESCRIPTION:
Length, to 29.2 mm (previously reported to 60 mm); width, to 1.5 mm. Body moderately grooved ventrally and laterally; complete specimens with 35-43 setigers. Prostomium with acuminate tip and pair of large, brown-pigmented nuchal organs (Figure 17-12a); eyespots absent. Branchiae cirriform, similar in size throughout, from setigers 2 to 30-39, often absent medially and posteriorly. Parapodia as rounded lobes; presetal lobes well-developed and subulate anteriorly (Figure 17-12b), gradually diminishing in size; postsetal lobes and ventral cirri absent. Nephridiopores not observed. Anal tube long, hood-shaped, opening ventrally; with long, articled, internally inserted midventral cirrus; dorsal and lateral margins with about 16-20 papillae (Figure 17-12c). Setae smooth, capillary, sometimes frayed basally; notosetae longer than neurosetae. Proboscis sac-like, without papillae.
REMARKS: These specimens differ from O. acuminata in having fewer than 50-54 setigers, and in lacking paired caudal cirri flanking the midventral cirrus.
PREVIOUSLY REPORTED HABITAT: Sand, soft mud, mixed substrates; 12-5000 m.
GULF OF MEXICO BLM-OCS OCCURRENCE: Few occurrences off Alabama and northwestern Florida (Figure 17-11); 14-106 m; coarse to fine-very fine sand, silty fine sand.
DISTRIBUTION: Cosmopolitan.

CHAPTER 18

Jerry D. Kudenov

FAMILY SCALIBREGMATIDAE (Malmgren, 1867)

INTRODUCTION

The scalibregmatids are a group of small (up to 60 mm) worms, usually with no more than 60 segments. The body is either long and arenicoliform or short and maggot-like. The prostomium is usually incised with either two lobes or two distinct frontal horns anteriorly. Eyes may be present. Nuchal slits are often present. The proboscis is eversible, soft and unarmed. The buccal segment is normally without setae. Parapodia are biramous, with or without dorsal cirri on posterior segments. Setae are all simple, and include capillary setae accompanied by a few furcate setae. Acicular spines may be present on the first few segments. Branchiae, if present, are branched and are restricted to the first few anterior segments. The pygidium often has anal cirri.

The Scalibregmatidae are a small family of around 44 species distributed among 15 genera (Blake, 1981). Important taxonomic reviews of the scalibregmatids include those of Ashworth (1901), Furreg (1925), Kudenov and Blake (1978), and Blake (1981). Keys to the family were presented by Chamberlin (1919b), Fauvel (1927), and Fauchald (1977a), and a useful discussion on scalibregmatid morphology and systematics was provided by Day (1967). Six species in five genera are represented in the Gulf of Mexico BLM-OCS collections. Three species appear to be new to science (Kudenov, in prep.), and two of the three previously described taxa are newly reported from this region.

PRINCIPAL DIAGNOSTIC CHARACTERS

The main diagnostic characters used to identify scalibregmatid genera include body form, and the presence of parapodial cirri (Figure 18-10d), branchiae (Figures 18-10a, 12a) and acicular spines (Figure 18-2a,d-g). Primary specific characters include the development of the prostomium, its lateral processes (frontal horns) and eyes (Figures 18-2a, 4a, 10b), setal morphology, development of parapodia, the number of anal cirri, and the distribution of parapodial cirri, branchiae, acicular spines and lateral organs. The presence and development of nuchal organs is also important, and some emphasis is placed on the number and distribution of segmental annuli. The latter feature may be dependent on the state of contraction at the time of preservation.

Generally, the number of body segments is of lesser importance at the generic than at the specific level. The prostomium is either T-shaped or incised in nearly all genera, except Neolipobranchius which has an entire prostomium. The buccal segment or peristomium is generally both achaetous and apodous.

BIOLOGICAL NOTES

Unfortunately, few generalizations can be made about the biology of scalibregmatids since so few are collected in even the most intensive benthic surveys. Typically, members of this family inhabit muddy sediments, and are distributed bathymetrically from intertidal zones to depths of 9174 m. They are especially well-represented in deep seas, with around half of the described species occurring below depths of 1000 m. In fact, some genera and species are known only from abyssal depths. They are generally considered to be microphagous deposit-feeders living in excavated pockets of soft sediments up to 60 cm below the surface (Fauchald and Jumars, 1979), or inhabiting tubes formed by other species (Day, 1967). They apparently do not form their own tubes.

SPECIES OF SCALIBREGMATIDAE RECORDED FROM GULF OF MEXICO BLM-OCS PROGRAMS

Key to the Genera of Scalibregmatidae from the Gulf of Mexico BLM-OCS Programs

1a. Parapodial cirri absent; branchiae absent (Figures 18-2a, 6a). . 2
1b. Parapodial cirri present (Figures 18-8b, 10d, 12b); branchiae present or absent (Figures 18-10a, 12a). 3

2a. Acicular spines present (Figure 18-2a,d). **Asclerocheilus**, p. 18-2
2b. Acicular spines absent (Figure 18-6a). . . . . **Hyboscolex**, p. 18-8

3a. Acicular spines absent (Figure 18-8a); branchiae present . . . . . **Scalibregma**, p. 18-8
3b. Acicular spines present (Figures 18-10f, 12a,d); branchiae present or absent. 4

4a. Branchiae present (Figure 18-10a); dorsal and ventral cirri present (Figure 18-10d). . . . . **Sclerobregma**, p. 18-10
4b. Branchiae absent (Figure 18-12a); ventral cirri present; dorsal cirri absent (Figure 18-12b). . . . . **Sclerocheilus**, p. 18-12

Genus **Asclerocheilus** Ashworth, 1901

TYPE SPECIES: Lipobranchius intermedius Saint Joseph, 1894.
REFERENCES:

Ashworth, 1901:297.
Day, 1963:428.
Ushakov, 1955:315.

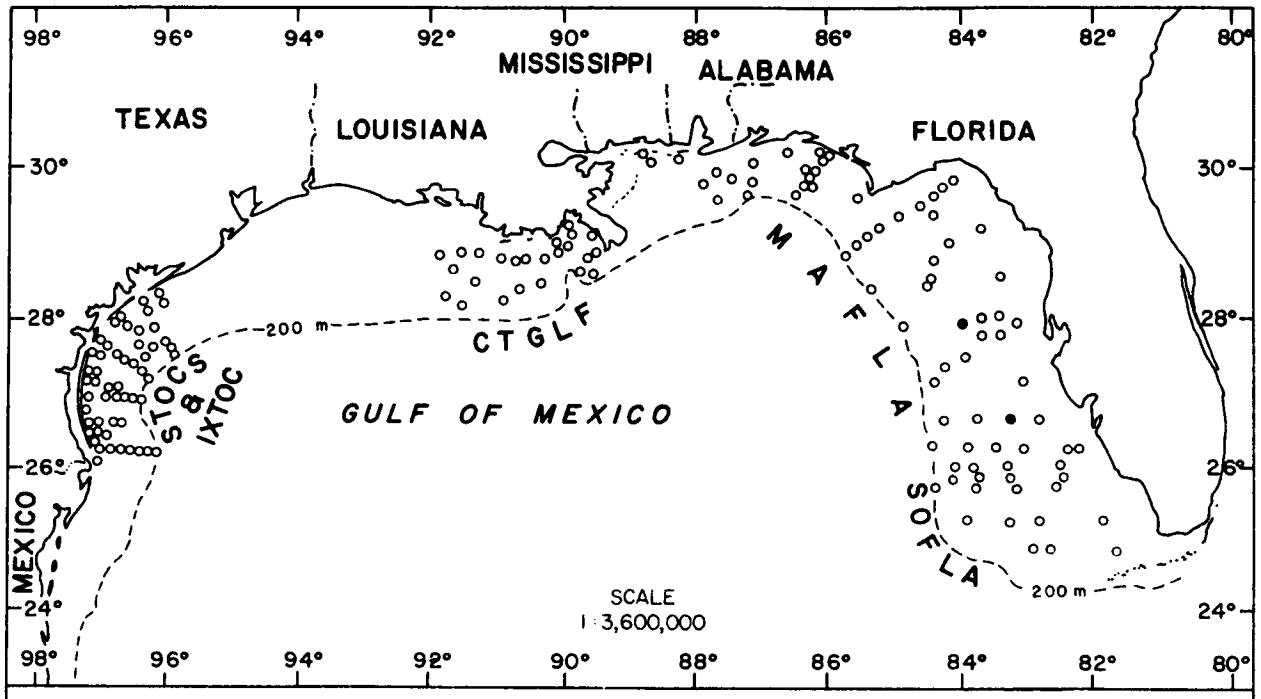

Figure 18-1 Distribution of Asclerocheilus beringianus on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

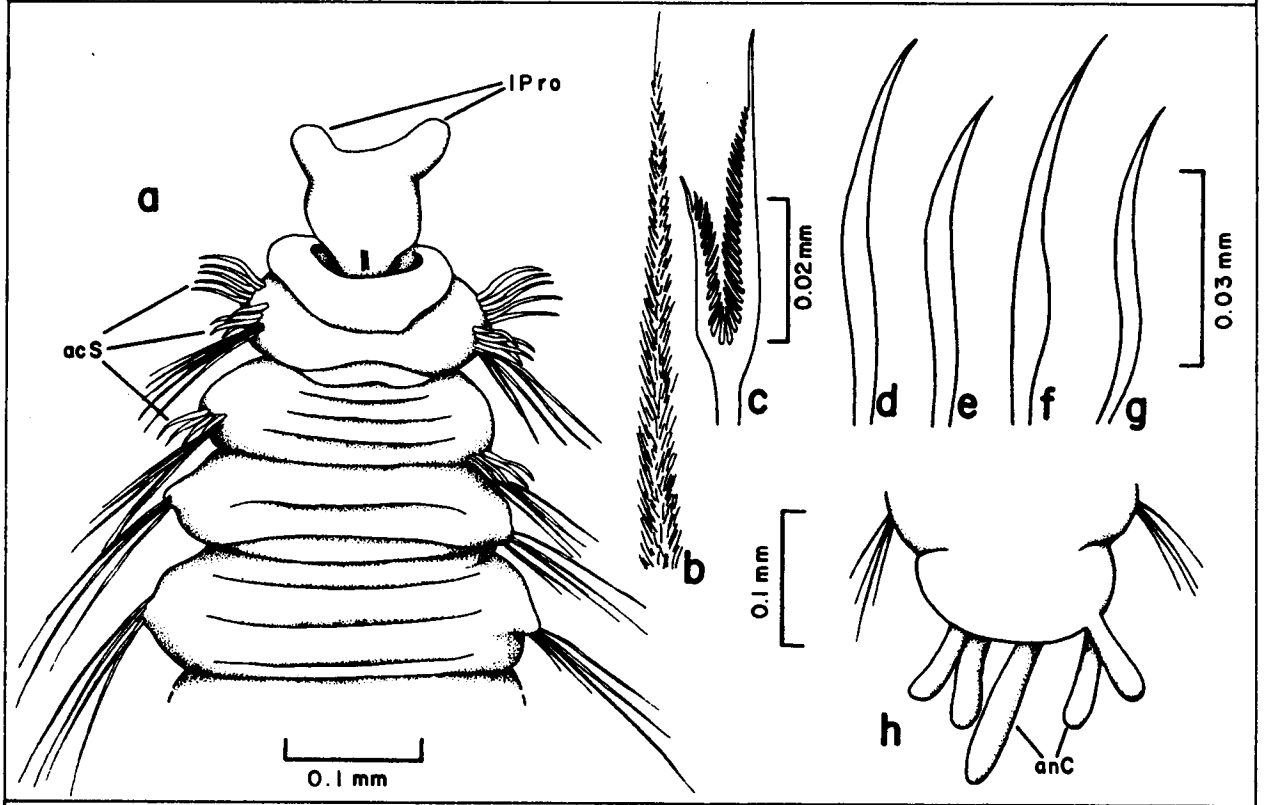

Figure 18-2. Asclerocheilus beringianus: a, anterior end, dorsal view; b, spinulose capillary seta; c, furcate seta, frontal view; d, acicular spine from setiger 1, first row, lateral view; e, same, from second row; f,g, same, from setiger 2; h, pygidium, dorsal view.

Kudenov and Blake, 1978:436.
Blake, 1981:1132.
DIAGNOSIS: Body arenicoliform. Prostomium T-shaped with distinct tentacular processes. Parapodia of posterior segments reduced. Dorsal and ventral cirri, and branchiae absent; acicular spines present.

Key to the Gulf of Mexico BLM-OCS Species of Asclerocheilus

1a. Notoacicular spines present on setigers 1-2; eyes absent (Figure 18-2a) . . . . . **Asclerocheilus beringianus**, p. 18-4
1b. Notoacicular spines present on setiger 1 only; eyes present (Figure 18-4a) . . . . . **Asclerocheilus sp. A**, p. 18-6

Asclerocheilus beringianus Ushakov, 1955
Figures 18-1, 2a-h

Asclerocheilus beringianus Ushakov, 1955:315, fig. 116i-1.
Asclerocheilus beringianus--Hartman, 1965:181.
Asclerocheilus beringianus--Levenstein, 1966:48.
Asclerocheilus beringianus--Hartman and Fauchald, 1971:122.
Asclerocheilus beringianus--Hobson, 1974:71.
Asclerocheilus beringianus--Hobson and Banse, 1981:60, fig. 12a.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 4B-8/81 (1 spec.); MAFLA 2211E-7/77 (1 spec.), 2211G-7/77 (1 spec.).
DESCRIPTION:
Length, to 6 mm (previously reported to 25 mm); width, to 0.5 mm (previously reported to 4 mm). Largest complete specimen with 39 setigers. Body widest anteriorly; coloration opaque white in alcohol. Prostomium with stout, blunt lateral processes (Figure 18-2a). Eyes absent. Buccal segment incomplete ventrally, visible dorsally and ventrally. Parapodia biramous, mound-shaped anteriorly, becoming reduced posteriorly. Spinulose capillary setae present in all rami (Figure 18-2b). Furcate setae with unequal tines (Figure 18-2c), present in all rami except notopodia of setigers 1-2. Acicular spines present only in notopodia of setigers 1-2 (Figure 18-2a,d-g); those of setiger 1 arranged in two rows with 5-6 spines in the first row (Figure 18-2d), and 3-4 in the second (Figure 18-2e); those of setiger 2 arranged in one row having 3-5 spines (Figure 18-2f,g). All acicular spines minutely hirsute. Segments annulated as follows: setigers 1 and 33-39 biannulate; setigers 2-4 and 26-32 triannulate; setigers 5-25 quadriannulate. Pygidium with five anal cirri (Figure 18-2h).
REMARKS: Specimens reported herein agree fairly well with previous descriptions of Asclerocheilus beringianus. This species is newly reported from the Gulf of Mexico.
PREVIOUSLY REPORTED HABITAT: Shelf to abyssal depths (19-5018 m); silty-fine to coarse sand.
GULF OF MEXICO BLM-OCS OCCURRENCE: Rarely encountered in northeastern Gulf (Figure 18-1); shallow to moderate shelf depths, 43-56 m; coarse to medium sand.

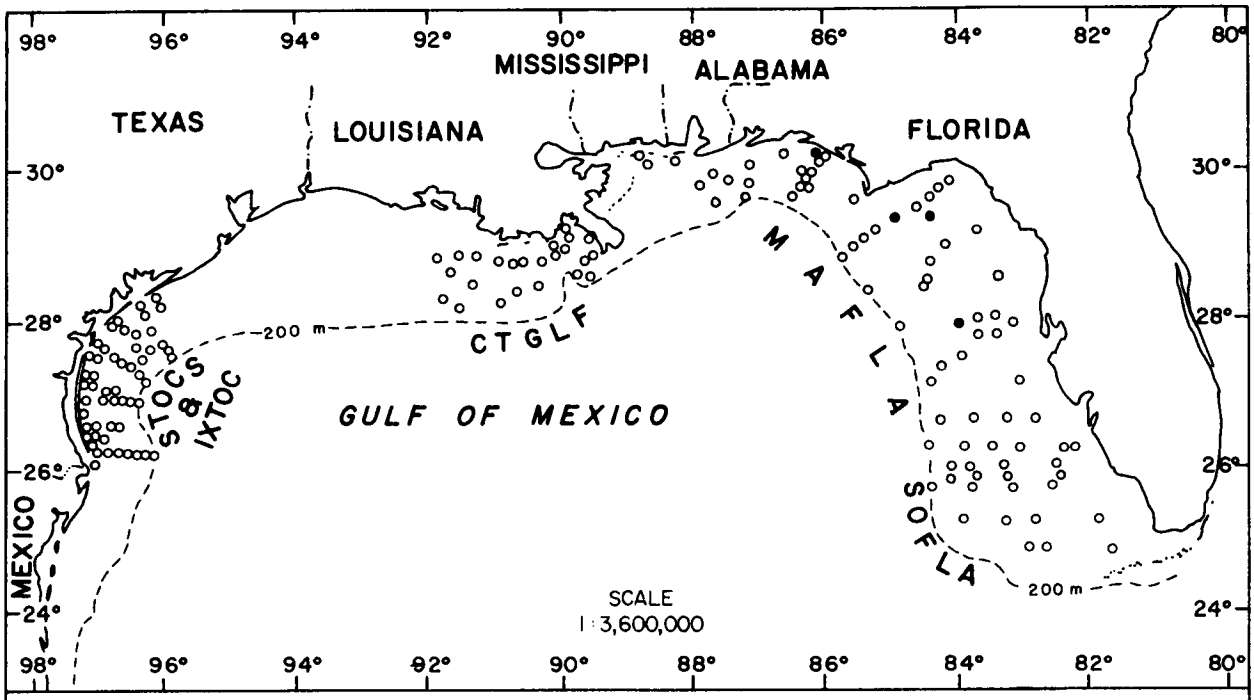

Figure 18-3. Distribution of Asclerocheilus sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

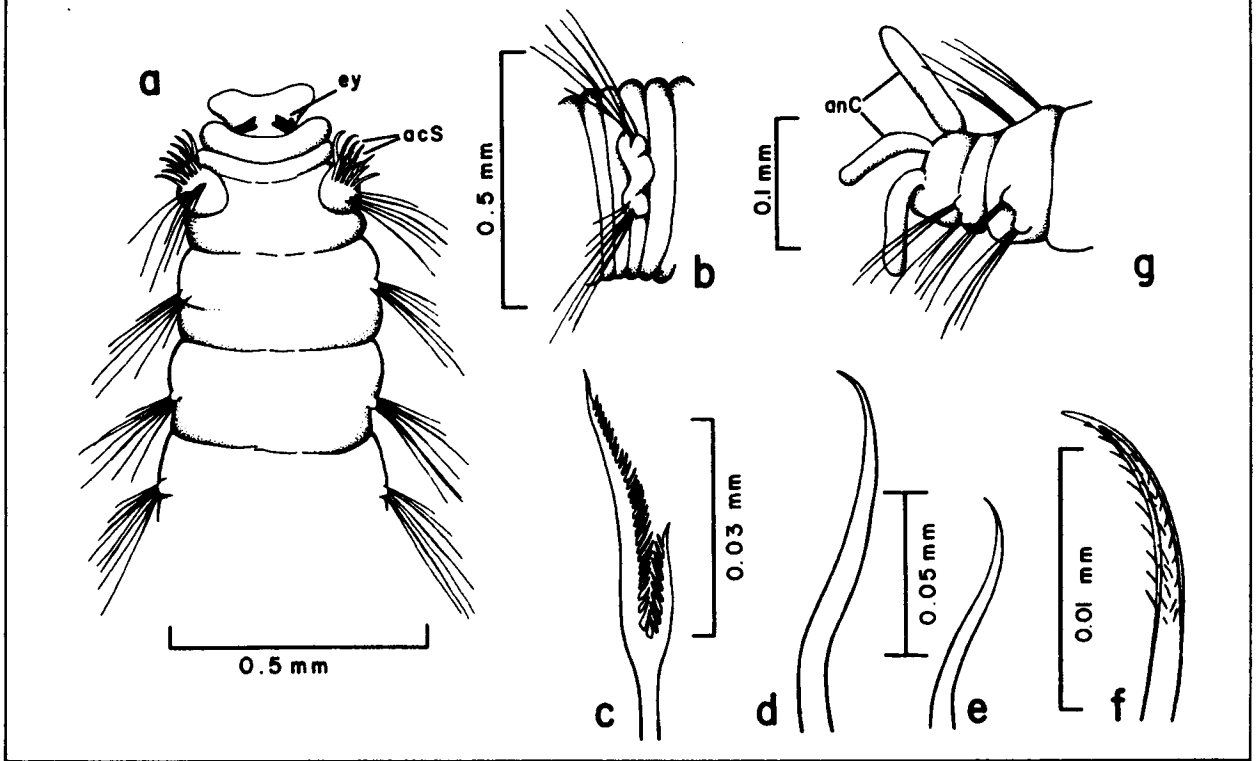

Figure 18-4. Asclerocheilus sp. A: a, anterior end, dorsal view; b, posterior parapodium, lateral view; c, furcate seta, frontal view; d, acicular spine from setiger 1, first row, lateral view; e, same, from second row; f, same, detail of tip and sheath, lateral view; g, pygidium, dorsolateral view.

DISTRIBUTION: Bering Sea, British Columbia, Washington, northwestern Atlantic, Gulf of Mexico.

Asclerocheilus sp. A
Figures 18-3, 4a-g

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2211H-6/76 (1 spec.), 2211G-11/77 (1 spec.), 2423J-8/77 (1 spec.), 2528H-No date (1 spec.), 2853C-8/77 (1 spec.).
DESCRIPTION:
Length, to 10 mm; width, to 0.9 mm. Largest complete specimen with 38 setigers. Body arenicoliform, widest anteriorly; coloration opaque white in alcohol. Prostomium T-shaped, wider than long, with stout, blunt lateral processes (Figure 18-4a). Eyes numbering two pairs, partially fused along inner margins. Buccal segment achaetous, apodous, uni- to biannulate dorsally and laterally, fused ventrally with setiger 1. Parapodia biramous, poorly developed, resembling small conical papillae anteriorly (Figure 18-4a), becoming flattened and mound-like posteriorly (Figure 18-4b). Smooth capillary setae present in all rami. Furcate setae with parallel tines of unequal lengths (Figure 28-4c), present in all rami except notopodia of setiger 1. Acicular spines curved, with distally pointed tips and minutely hirsute sheaths (Figure 18-4d-f), present only in notopodia of setiger 1. Acicular spines arranged in two transverse rows, with 5-6 larger spines in the first row (Figure 18-4d), and 4-5 smaller ones in the second row (Figure 18-4e). Body segments generally lacking distinct annuli, with anterior and posterior setigers sometimes biannulate, medial ones tri- to quadriannulate. Pygidium damaged, but having at least three anal cirri (Figure 18-4g).
REMARKS: Asclerocheilus sp. A is most closely allied to A. acirratus (Hartman, 1966a) and A. tropicus Blake, 1981, in having acicular spines only in the notopodia of setiger 1. There are two transverse rows of spines in both Asclerocheilus sp. A and A. tropicus, and one in A. acirratus. Asclerocheilus sp. A differs from A. tropicus in having stout, conical prostomial processes instead of flattened lateral wings; in having two pairs of eyes with dense ocelli, partially fused along their inner margins and arranged obliquely, instead of longitudinal lines of separate ocelli; in having acicular spines of two different sizes; in having furcate setae with parallel rather than divergent tines; in lacking reticulae on the body; and in having pygidial cirri. Asclerocheilus sp. A is also allied to A. ashworthi Blake, 1981, A. beringianus and A. heterochaetus Kudenov and Blake, 1978, in having only notoacicular spines. However, acicular spines are present on setigers 1-2 in both A. ashworthi and A. beringianus and setigers 1-4 in A. heterochaetus.
GULF OF MEXICO BLM-OCS OCCURRENCE: One of the more frequently encountered scalibregmatids from the northeastern Gulf (Figure 18-3); shallow shelf depths, 19-43 m; coarse sand to silty fine sand.

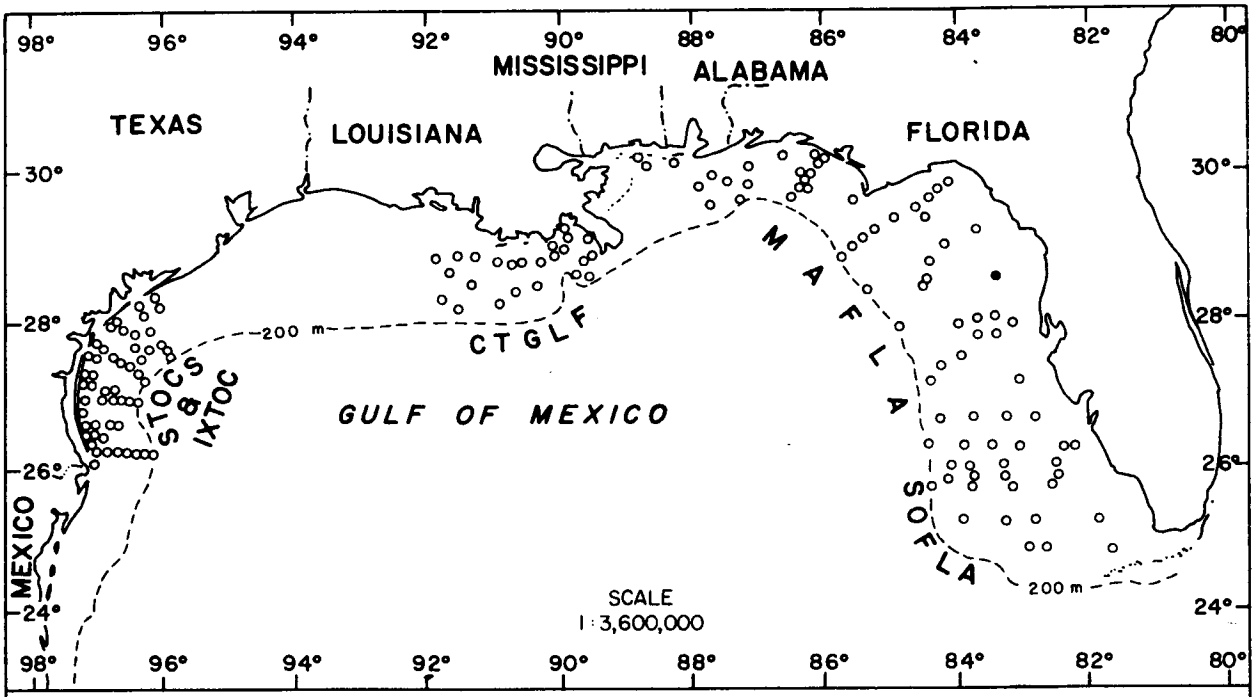

Figure 18-5. Distribution of Hyboscolex sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

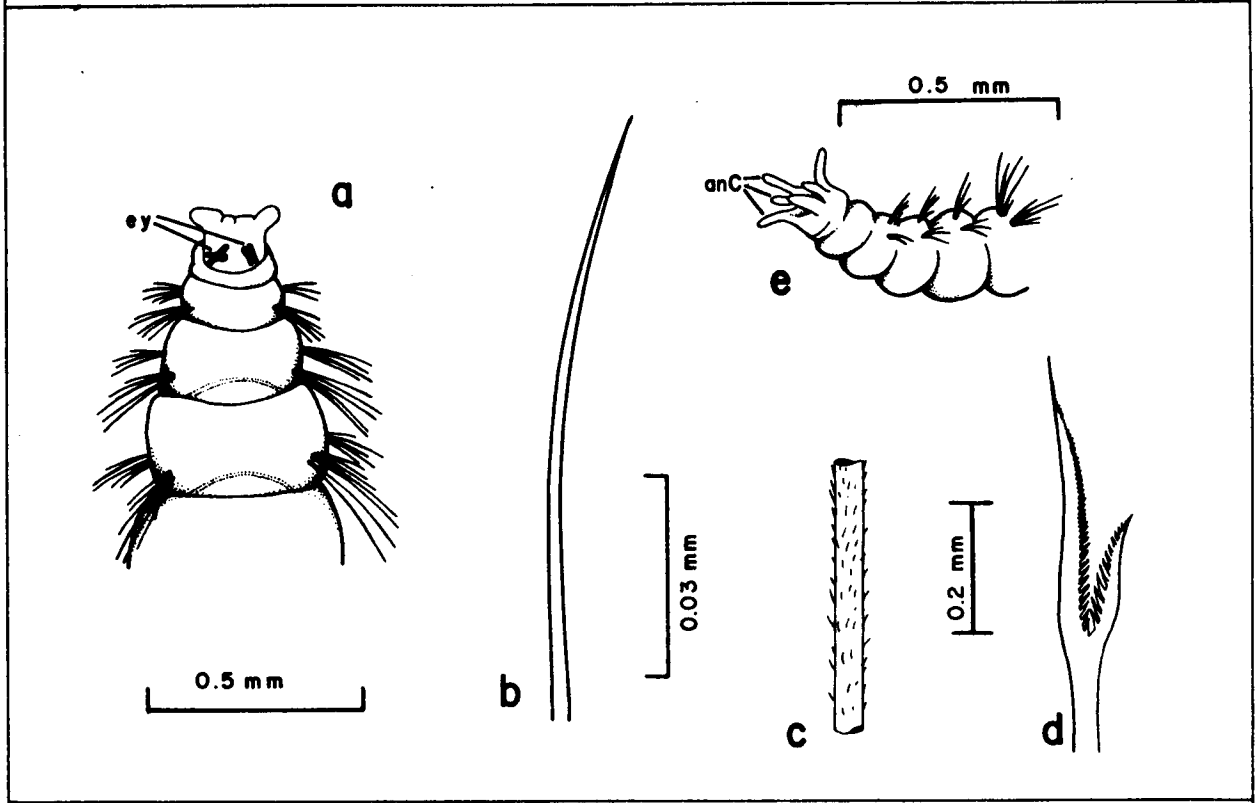

Figure 18-6. Hyboscolex sp. A: a, anterior end, dorsal view; b, spinulose capillary seta; c, same, detail of shaft; d, furcate seta, frontal view; e, pygidium, lateral view.

Genus **Hyboscolex** Schmarda, 1861

TYPE SPECIES: Hyboscolex longiseta Schmarda, 1861.
REFERENCES:
Schmarda, 1861:54.
Willey, 1904:266.
Day, 1967:588.
DIAGNOSIS: Body arenicoliform. Prostomium T-shaped with distinct lateral processes. Parapodia of posterior setigers reduced or sessile. Dorsal and ventral cirri, branchiae, and acicular spines absent.

Hyboscolex sp. A
Figures 18-5, 6a-e

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2852E-8/77 (4 spec.).
DESCRIPTION:
Length, to 8 mm; width, to 0.7 mm. Largest complete specimen with about 64 setigers. Body widest anteriorly; coloration opaque white in alcohol. Prostomium with stout lateral processes about as long as wide. Two pairs of eyes present, may be partially fused (Figure 18-6a). Buccal segment incomplete ventrally, visible dorsally and laterally, sometimes obscured when retracted into setiger 1. Parapodia biramous, projecting slightly above body wall, resembling flattened mounds anteriorly, becoming small conical lobes posteriorly. Spinulose capillary setae (Figure 18-6b,c), and furcate setae having unequal tines (Figure 18-6d), present in all rami. Segments annulated as follows: buccal segment and setigers 1, 44-59 uniannulate; setigers 2-4, 27-43 biannulate; setigers 5-6 triannulate; setigers 7-32 quadriannulate. Pygidium with 4-6 anal cirri (Figure 18-6e).
REMARKS: Hyboscolex sp. A is most closely allied to Hyboscolex pacificus (Moore, 1909a) in the shape of the prostomium, configuration of eyes, and number of anal cirri. It differs from H. pacificus in having quadriannulate, instead of triannulate body segments, and in having furcate setae with a tine ratio of 2.4, rather than 1.7. The use of tine ratios of furcate setae to separate scalibregmatid species appears to be valid for species of Asclerocheilus (Blake, 1981) and also for species of Hyboscolex (this study). However, a more detailed study of this character is required.
GULF OF MEXICO BLM-OCS OCCURRENCE: Rarely encountered in northeastern Gulf (Figure 18-5); shallow shelf depths, 22 m; medium sand.

Genus **Scalibregma** Rathke, 1843

TYPE SPECIES: Scalibregma inflatum Rathke, 1843.
REFERENCES:
Rathke, 1843:184.
Fauvel, 1927:123.
Imajima and Hartman, 1964:305.
Day, 1967:589.
Kudenov and Blake, 1978:428.
Blake, 1981:1146.

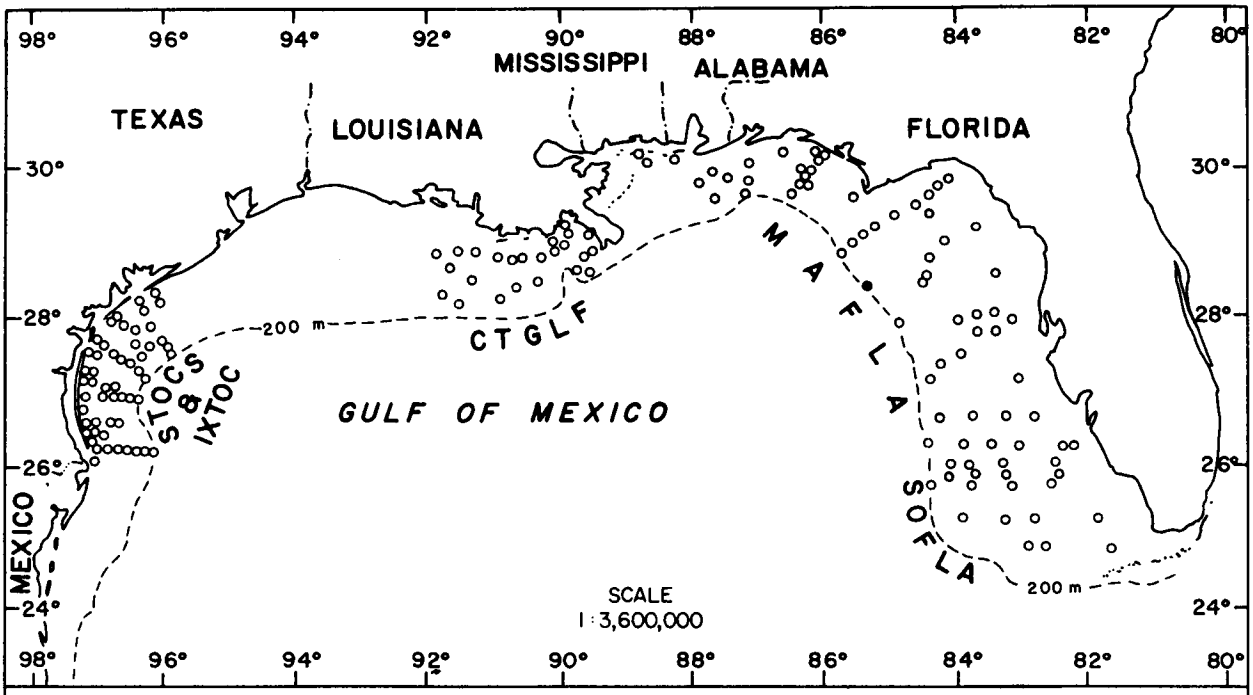

Figure 18-7. Distribution of Scalibregma inflatum on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

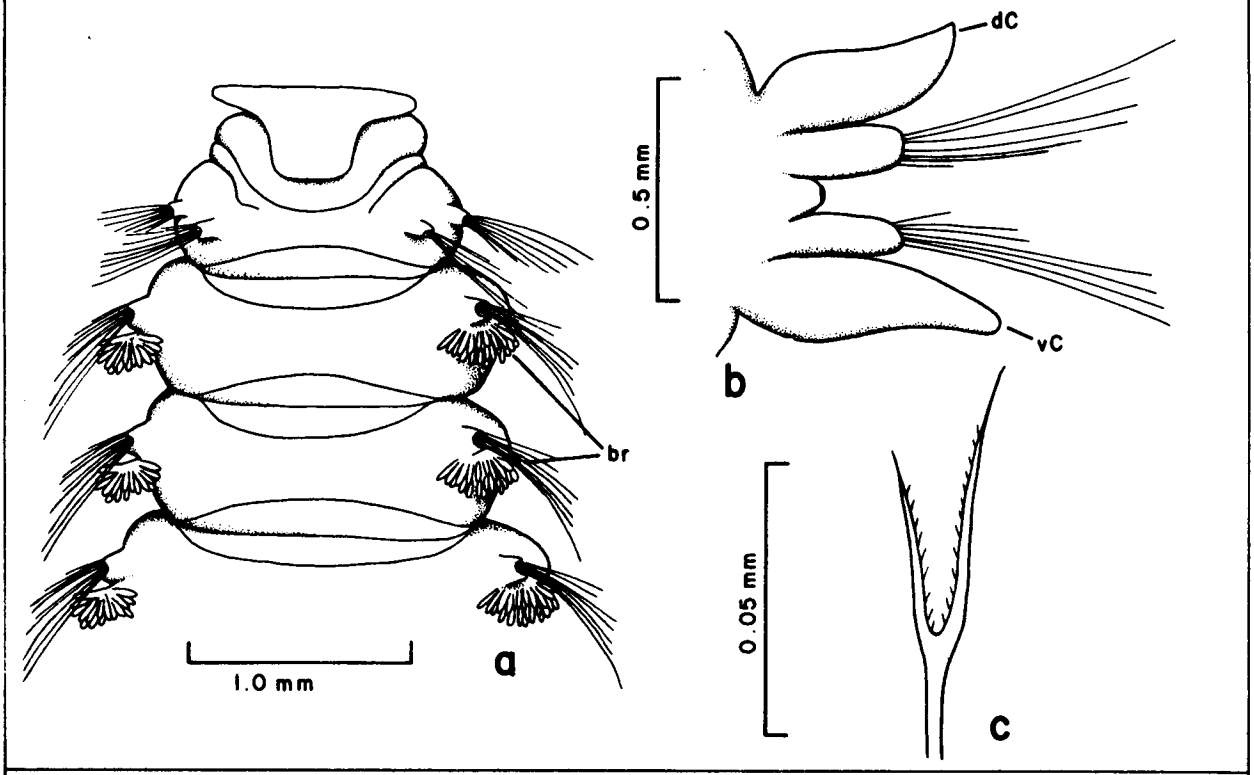

Figure 18-8. Scalibregma inflatum: a, anterior end, dorsal view; b, posterior parapodium, anterior view; c, furcate seta, frontal view (a, b after Kudenov & Blake, 1978, figs. 3, 6; c, after Day, 1967, fig. 27.2.h).

DIAGNOSIS: Body arenicoliform. Prostomium T-shaped with distinct tentacular processes. Parapodia of posterior segments with both dorsal and ventral cirri. Branchiae present; acicular spines absent.

Scalibregma inflatum Rathke, 1843
Figures 18-7, 8a-c

Scalibregma inflatum Rathke, 1843:184, pl. 9, figs. 15-21.
Scalibregma inflatum--Fauvel, 1927:123, fig. 44a-f.
Scalibregma inflatum--Imajima and Hartman, 1964:305.
Scalibregma inflatum--Day, 1967:590, fig. 27.2.e-i; 1973:96.
Scalibregma inflatum--Hartman, 1969:313, figs. 1-4.
Scalibregma inflatum--Kudenov and Blake, 1978:428, figs. 1, 2.
Scalibregma inflatum--Blake, 1981:1146.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2313H-7/76 (1 spec.), 2313K-11/77 (1 spec.).
DESCRIPTION:
Length, to 5 mm (previously reported to 60 mm); width, to 1 mm (previously reported to 10 mm). Largest specimen incomplete with 40 segments. Body widest anteriorly; coloration opaque white in alcohol. Prostomium with stout lateral processes; eyes absent (Figure 18-8a). Buccal segment incomplete ventrally, visible dorsally and laterally. Parapodia biramous, mound-shaped anteriorly, becoming elongate and conical with distinct dorsal and ventral cirri from setigers 16-18 to end of body (Figure 18-8b). Spinulose capillary setae, and furcate setae with unequal tines (Figure 18-8c), present in all rami. Anterior segments triannulate, becoming quadriannulate to end of body. Branchiae present on setigers 2-5 as dendritically branching tufts inserted behind notopodia. Pygidium with four or five anal cirri.
REMARKS: Specimens from the Gulf of Mexico are poorly preserved but generally conform to previous descriptions of Scalibregma inflatum.
PREVIOUSLY REPORTED HABITAT: Shelf depths to 4436 m; sandy silt to silty sand.
GULF OF MEXICO BLM-OCS OCCURRENCE: Rare in northeastern Gulf (Figure 18-7); 177 m; sandy silt.
DISTRIBUTION: Cosmopolitan.

Genus **Sclerobregma** Hartman, 1965

TYPE SPECIES: Sclerobregma branchiatum Hartman, 1965.
REFERENCES:
Hartman, 1965:184.
Bertelsen and Weston, 1980:708.
DIAGNOSIS: Body arenicoliform. Prostomium T-shaped with distinct lateral processes. Parapodia of posterior segments with both dorsal and ventral cirri. Branchiae and acicular spines present.

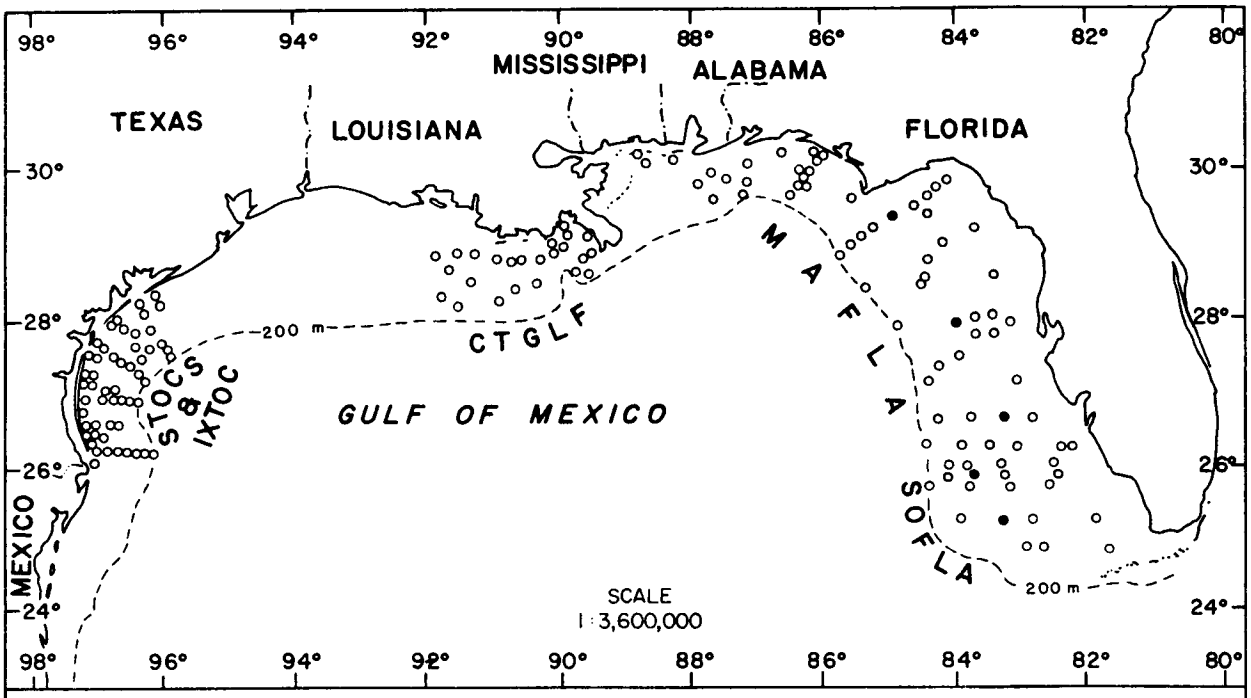

Figure 18-9. Distribution of Sclerobregma stenocerum on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

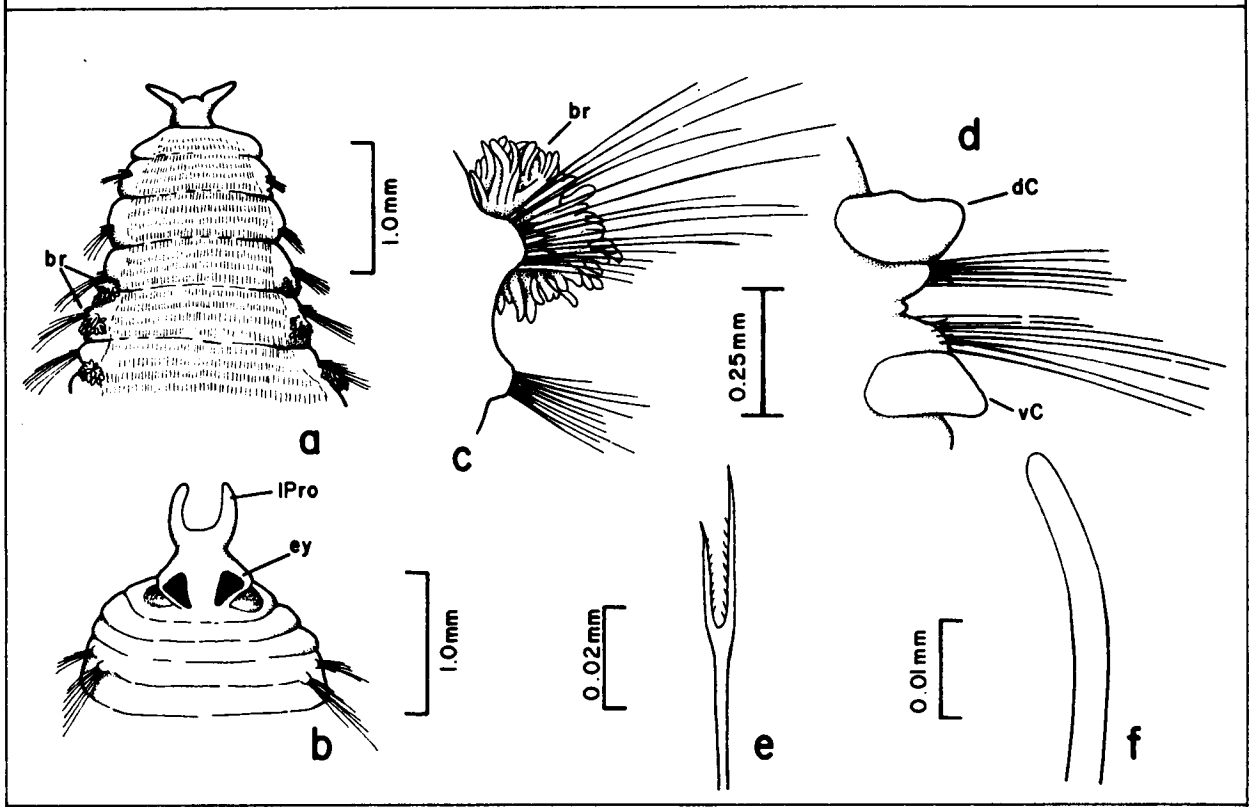

Figure 18-10. Sclerobregma stenocerum: a, anterior end, dorsal view; b, prostomium and first setiger, dorsal view; c, anterior parapodium, anterior view; d, posterior parapodium, anterior view; e, furcate seta, frontal view; f, acicular spine, lateral view (a, c-f after Bertelsen & Weston, 1980, figs. 2a, 3a-d).

Sclerobregma stenocerum Bertelsen and Weston, 1980
Figures 18-9, 10a-f

Sclerobregma stenocerum Bertelsen and Weston, 1980:708, figs. 1-3.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 4E-7/81 (1 spec.), 18B-11/80 (4 spec.), 24E-11/80 (1 spec.); MAFLA 2211I-8/77 (1 spec.), 2211E-2/78 (1 spec.), 2211F-2/78 (1 spec.), 2423I-8/77 (1 spec.), 2423J-8/77 (4 spec.), 2423K-8/77 (1 spec.).
DECRIPTION:
Length, to 15 mm (previously reported to 23.1 mm); width, to 2 mm (previously reported to 2.8 mm). Largest complete specimen with 35 setigers. Body widest anteriorly; coloration opaque white in alcohol. Prostomium with long, slender lateral processes, and one pair of large eyes (Figure 18-10a,b). Buccal segment incomplete ventrally, visible dorsally and laterally, biannulate. Nuchal organs present. Parapodia biramous, reduced anteriorly (Figure 18-10c), becoming prominent around setiger 16 to end of body with appearance of inflated dorsal and ventral cirri (Figure 18-10d). Smooth capillary setae present in all rami. Furcate setae (Figure 18-10e) present in all rami except notopodia of setigers 1-2. Acicular spines short, blunt, present in both rami of setigers 1-2 or 3 (Figure 18-10f). All setigers quadriannulate. Branchiae present on setigers 3-5, as dendritically branching tufts inserted behind notopodia (Figure 18-10c). Pygidium with at least three anal cirri.
REMARKS: Specimens from the Gulf of Mexico agree well with the original description of Sclerobregma stenocerum. This species is newly reported from the Gulf.
PREVIOUSLY REPORTED HABITAT: Shelf depths (17-218 m).
GULF OF MEXICO BLM-OCS OCCURRENCE: One of the more commonly encountered scalibregmatids in the northeastern Gulf (Figure 18-9); shallow to moderate shelf depths, 19-88 m; coarse to medium sand, silty fine sand.
DISTRIBUTION: North Carolina to Florida, Gulf of Mexico.

Genus **Sclerocheilus** Grube, 1863

TYPE SPECIES: Sclerocheilus minutus Grube, 1863.
REFERENCE:
Fauchald, 1977a:45.
DIAGNOSIS: Body elongate. Prostomium T-shaped with distinct lateral processes. Parapodia of posterior segments with ventral cirri only; dorsal cirri and branchiae absent. Acicular spines present.

Sclerocheilus sp. A
Figures 18-11, 12a-e

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2315A-11/77 (1 spec.), 2852E-8/77 (1 spec.).
DESCRIPTION:
Length, 3.5 mm; width, 0.7 mm. Largest complete specimen with 37 setigers. Body widest anteriorly; coloration opaque white in alcohol.

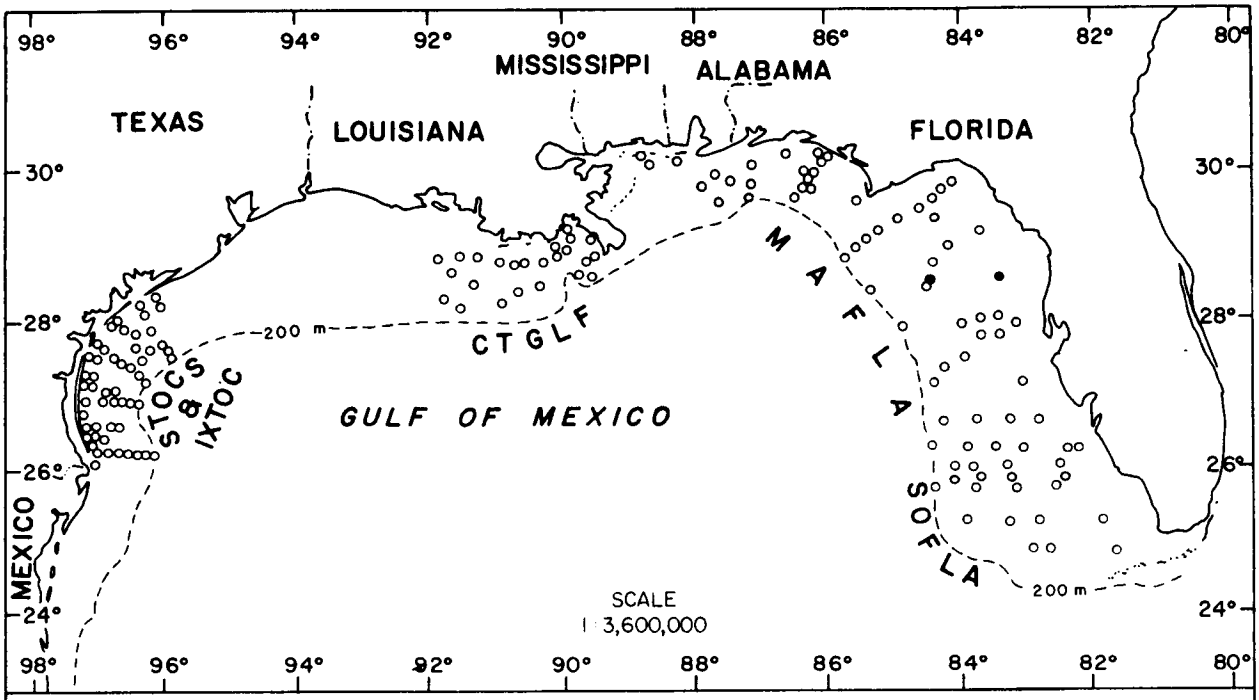

Figure 18-11. Distribution of Sclerocheilus sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

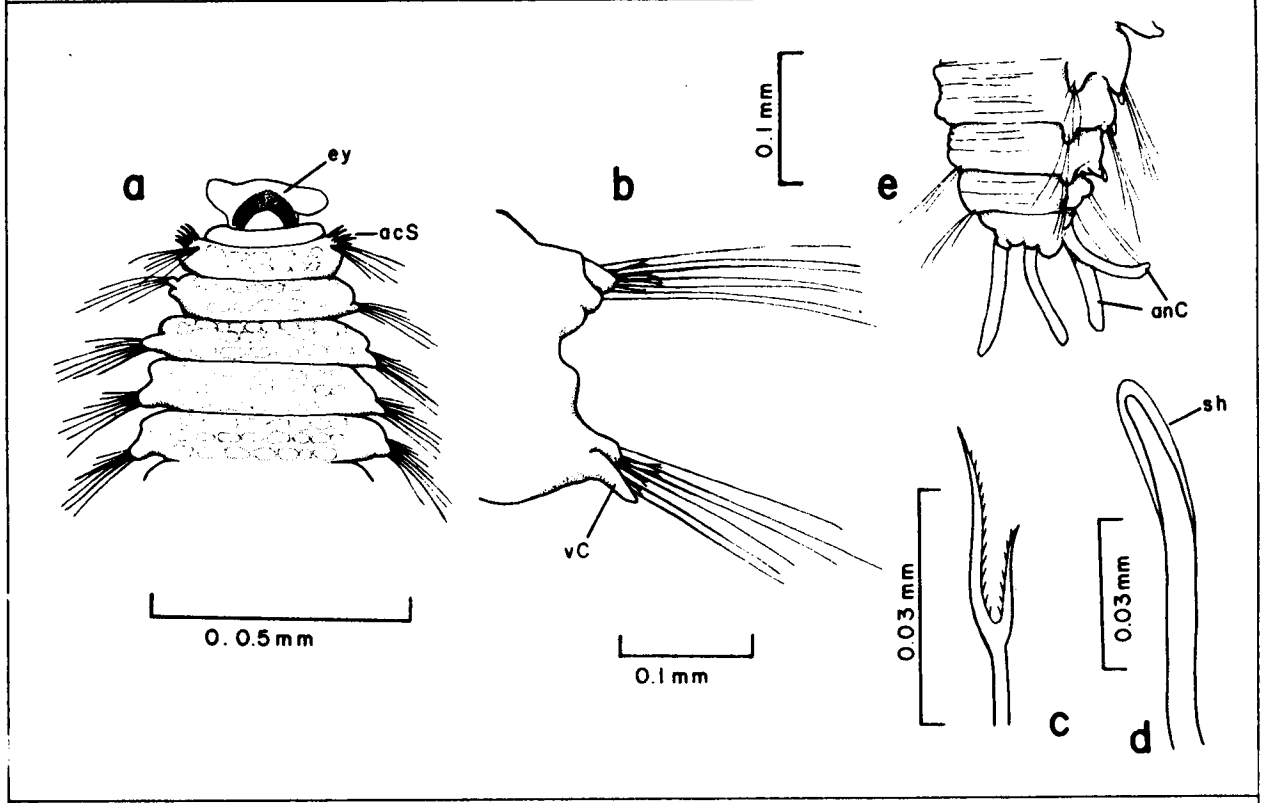

Figure 18-12. Sclerocheilus sp. A: a, anterior end, dorsal view; b, posterior parapodium, posterior view; c, furcate seta, frontal view; d, acicular spine, lateral view; e, pygidium, dorsal view.

Prostomium wider than long, with stout, blunt lateral processes (Figure 18-12a). Eyes numbering two pairs, connected medially by yoke of red pigment (Figure 18-12a). Buccal segment achaetous, apodous, uniannulate dorsally and laterally, fused ventrally with setiger 1. Parapodia biramous, well-developed, as triangular lobes anteriorly (Figure 18-12a), becoming more inflated posteriorly (Figure 18-12b). Dorsal cirri absent. Ventral cirri digitiform, inconspicuous, present on setigers 25-37 (Figure 18-12b,e). Smooth capillary setae present in all rami. Furcate setae with unequal tines (Figure 18-12c), present in all rami except notopodia of setiger 1. Acicular spines slightly curved with blunt tips and loose-fitting clear hyaline sheaths in notopodia of setiger 1 (Figure 18-12d), arranged in single transverse row of five spines. Segments annulated as follows: setigers 1-2 biannulate; setigers 3-5 triannulate; setigers 6 to end of body quadriannulate. Pygidium with two pairs of long anal cirri (Figure 18-12e).

REMARKS: Sclerocheilus sp. A is most closely allied to S. minutus Grube in having a single transverse row of acicular spines in the notopodia of setiger 1. Sclerocheilus sp. A differs from the latter in having blunt acicular spines with distal sheaths, eyes connected medially across the prostomium by a yoke of pigment, furcate setae with a greater difference in relative lengths of tines (with a tine ratio of 2.1 for Sclerocheilus sp. A and 1.3 for S. minutus; see Blake, 1981), inconspicuous ventral cirri rather than long cylindrical ones, and a few anterior segments triannulate instead of biannulate. The most distinctive feature of Sclerocheilus sp. A is the fusion of the two pairs of eyes. The ventral cirri are easily overlooked. Finally, the validity of tine ratios for use as a taxonomic tool to separate species of Sclerocheilus requires confirmation.

GULF OF MEXICO BLM-OCS OCCURRENCE: Rare, known from only two stations in northeastern Gulf (Figure 18-11); 22-38 m; medium sand, silty fine sand.

CHAPTER 19

Jerry M. Gathof

FAMILY PHYLLODOCIDAE Williams, 1851

INTRODUCTION

Phyllodocids are considered by most workers to be among the more primitive of polychaetes due to their overall lack of specialization. They are dorsoventrally flattened and range in size from small (2-3 mm) to extremely large worms (sometimes over 200 mm). The body shape is long and thread-like. Living specimens are brightly colored shades of red, yellow, or green, sometimes with transverse black bands dorsally; however, much of their color is lost upon fixation. The prostomium may be heart-shaped, rounded, or elongate, usually with two prominent subepidermal eyes located near the posterior margin. A median antenna or a small nuchal tubercle may be present. Four frontal antennae are usually present at the anterior margin of the prostomium. The peristomium may be partially fused to the prostomium, or entirely separate. Two to four pairs of tentacular cirri are usually present on the first 1-3 segments. Setae may begin on segment 2 or 3. Parapodia are uniramous in most species. When parapodia are biramous, the notopodium is small and is usually represented by an internal aciculum and a few simple setae. All setigers are similar throughout the length of the worm, with the exception of the dorsal cirri which usually change from anterior to posterior. Setae are characteristically compound spinigers. The pygidium is terminal and usually has two anal cirri.

Recent revisions of the family include: Hartmann-Schröder (1971), who recognized the two subfamilies Phyllodocinae and Eteoninae; Ushakov (1972), who recognized the four subfamilies Phyllodocinae, Pontodorinae, Lopadorynchinae and Iospilinae; and Day (1967), who recognized two subfamilies, Phyllodocinae and Lopadorynchinae, based on benthic or pelagic habits, respectively. The classification followed here is based upon Fauchald (1977a), Ushakov (1972), and Hartmann-Schröder (1971). Many of the genera in this chapter have been considered subgenera by other authors, notably Day (1973) and Gardiner (1976). This classification was chosen to maintain consistency with recent and comprehensive works on the family.

Thirty-two genera and 294 species of phyllodocids were recognized by Fauchald (1977a). Thirteen genera and 18 species have been identified from the Gulf of Mexico BLM-OCS material, of which two species may be new to science.

PRINCIPAL DIAGNOSTIC CHARACTERS

Important generic characters include the arrangement of the proboscidial papillae (whether they are in rows or scattered at the base of the proboscis), presence of a median antenna, presence of a nuchal tubercle at the posterior margin of the prostomium (often set in a medial notch), the degree of fusion between the prostomium and the first two segments, and the arrangement of the tentacular cirri.

The number of tentacular cirri and their arrangement on the first three segments is of primary importance in separating phyllodocid genera. It is often difficult to determine the number and segment of insertion of these tentacular cirri, especially in smaller individuals. The most effective way to view the insertion of the tentacular cirri is to examine the worm dorsolaterally. From this angle, by manipulating the tentacular cirri, one can follow the intersegmental groove from dorsum to ventrum between the cirri and determine the point of origin for the particular cirrus in question. A schematic formula which has frequently been employed when working with phyllodocids aids in visualizing the arrangement of tentacular cirri and setae on the first three segments. For example, the tentacular formula for Anaitides groenlandica is $1 + 0\frac{1}{1} + S\frac{1}{N}$. The formula represents the first three segments as follows. The first segment has only one pair of tentacular cirri (1); the second segment lacks setae ($\frac{0}{1}$) but has one pair of dorsal and one pair of ventral tentacular cirri ($\frac{1}{1}$); the third segment has setae (S), a pair of dorsal tentacular cirri, and a pair of normal ventral cirri ($\frac{1}{N}$). Since this family has few species with notopodia, the (S) in these formulae refer to neurosetae. Some workers, including this author, use parentheses around segments which are fused or partially fused to indicate this relationship; others place letters in the numerator and denominator to indicate setal presence or absence. Basically, the same system holds throughout all works. An attempt to aid the reader in determining the origin of the tentacular cirri has been employed here by presenting a dorsolateral view of most species with the tentacular cirri cut away, exposing the points of attachment of the cirri. This will be particularly useful when examining small specimens.

Species of phyllodocids are often separated based on the shape of the dorsal cirri (cordate, lanceolate or rounded), origin of the setae (second or third segment), characteristics of the ventral cirri (rounded or elongate), and distribution of the proboscidial papillae. Setae in phyllodocids are quite similar within each genus. Typically, they are compound with a serrate blade tapering to a fine point. At the head of the shaft, there may be many small denticles, one or two large teeth, or a combination of large and small teeth. It is often difficult to determine the exact number of teeth, even under oil immersion.

Dissection of the proboscis is often necessary to distinguish between species. The proboscis can be divided into a basal region and a distal region. The basal region (usually the proximal third) may have scattered papillae (Figure 19-36a), papillae in rows (Figure 19-30b), or may lack papillae (Figure 19-18a). The distal end of the proboscis (usually the distal two-thirds) may have rugose ridges (Figure 19-34b) or may be smooth (Figure 19-18a). At the terminal end of the proboscis, there is usually a ring of larger, rounded papillae (Figure 19-30b). Jaws are typically absent.

BIOLOGICAL NOTES

Phyllodocids are active, errant worms common in shallow to deep waters, often occurring in crevices and under stones. Many species live on mud bottoms and have transverse black pigmentation dorsally. One genus, Eteone, is typically a sand dweller and consequently has little pigmentation dorsally. Those species which inhabit coral reefs are typically brilliantly colored. Symbiotic relationships have been

observed between Eumida sanguinea and Lanice conchilega (Terebellidae) in Dutch estuaries (Wolff, 1973). Most phyllodocids are considered to be actively hunting carnivores, capturing and devouring prey with their eversible proboscis. Eteone has been observed following mucus trails on the sand, tracking the prey to its burrow and consuming it there (Fauchald and Jumars, 1979:235). Some workers consider phyllodocids as scavengers (Wolff, 1973; Emson, 1977) and cannibalism is not uncommon. Many estuarine species (e.g., Anaitides mucosa) secrete massive quantities of mucus to protect themselves from salinity changes (Ushakov, 1972:61).

Phyllodocids swarm at the surface during reproduction and some species undergo setal changes as a result (Schroeder and Hermans, 1975:27). Eggs are laid in gelatinous masses which are characteristically green in color. The larvae may have a long pelagic existence before settling. There are both pelagic and benthic adults within this family.

SPECIES OF PHYLLODOCIDAE RECORDED FROM THE GULF OF MEXICO BLM-OCS PROGRAMS

Key to the Genera of Phyllodocidae from the Gulf of Mexico BLM-OCS Programs

1a. Two pairs of tentacular cirri on first segment (Figure 19-2d). . . . . .Eteone, p. 19-4

1b. Three or four pairs of tentacular cirri on two or three segments 2

2a. Three pairs of tentacular cirri on first two segments 3

2b. Three or four pairs of tentacular cirri on first three segments (Figure 19-10b). 4

3a. Setae present on segment 2; prostomium roughly heart-shaped; tentacular cirri swollen basally (Figure 19-6a). . .**Mystides**, p. 19-8
3b. Setae absent on segment 2; prostomium elongate; tentacular cirri filiform (Figure 19-8a). . . . . **Hesionura**, p. 19-12

4a. Median antenna present (Figures 19-10a, 12a). 5
4b. Median antenna absent 7

5a. First two segments distinct dorsally (Figure 19-10a) . . . . . .Eulalia, p. 19-12
5b. First two segments fused or partially fused dorsally. 6

6a. Ventral tentacular cirri of segment 2 extremely flattened with inferior margin expanded (Figure 19-12b) . . **Pterocirrus**, p. 19-16
6b. All tentacular cirri of similar form, cylindrical or spindle-shaped (Figure 19-14a). . . . . **Eumida**, p. 19-18

7a. Each of the first three segments with only one pair of tentacular cirri (Figure 19-16a) . . . . . .**Protomystides**, p. 19-20
7b. One of the first three segments with two pairs of tentacular cirri (Figure 19-18b). 8

8a. First two tentacular segments not distinct dorsally (Figures 19-18a, 20a). 9
8b. First two tentacular segments separate or partially fused dorsally but may be overlapped by posterior lobes of prostomium (Figure 19-30a). 11

9a. Nuchal tubercle present or absent; segments 1 and 2 fused to form a "collar" around prostomium (Figure 19-18a); dorsal cirri large, oval. . . . . **Paranaitis**, p. 19-21
9b. Nuchal tubercle absent; segments 1 and 2 not forming a "collar" around prostomium; dorsal cirri oval or cordate 10

10a. Dorsal tentacular cirri of segments 2 and 3 flattened (Figure 19-22a). . . . . .Nereiphylla, p. 19-25
10b. Dorsal tentacular cirri of segments 2 and 3 cylindrical (Figure 19-24a). . . . . .Genetyllis, p. 19-27

11a. Basal proboscidial papillae in distinct rows (Figure 19-30b) . . . . . .Anaitides, p. 19-31
11b. Basal proboscidial papillae irregularly scattered (Figure 19-36a) . . . . . Phyllodoce, p. 19-41

Genus **Eteone** Savigny, 1818

TYPE SPECIES: Nereis flava Fabricius, 1780.
REFERENCES:
Ushakov, 1955:101; 1972:172.
Pettibone, 1963:69.
Gardiner, 1976:105.
Fauchald, 1977a:49.
DIAGNOSIS: Prostomium wide posteriorly; with four small antennae anteriorly and a small, retractile nuchal tubercle posteriorly. One pair of

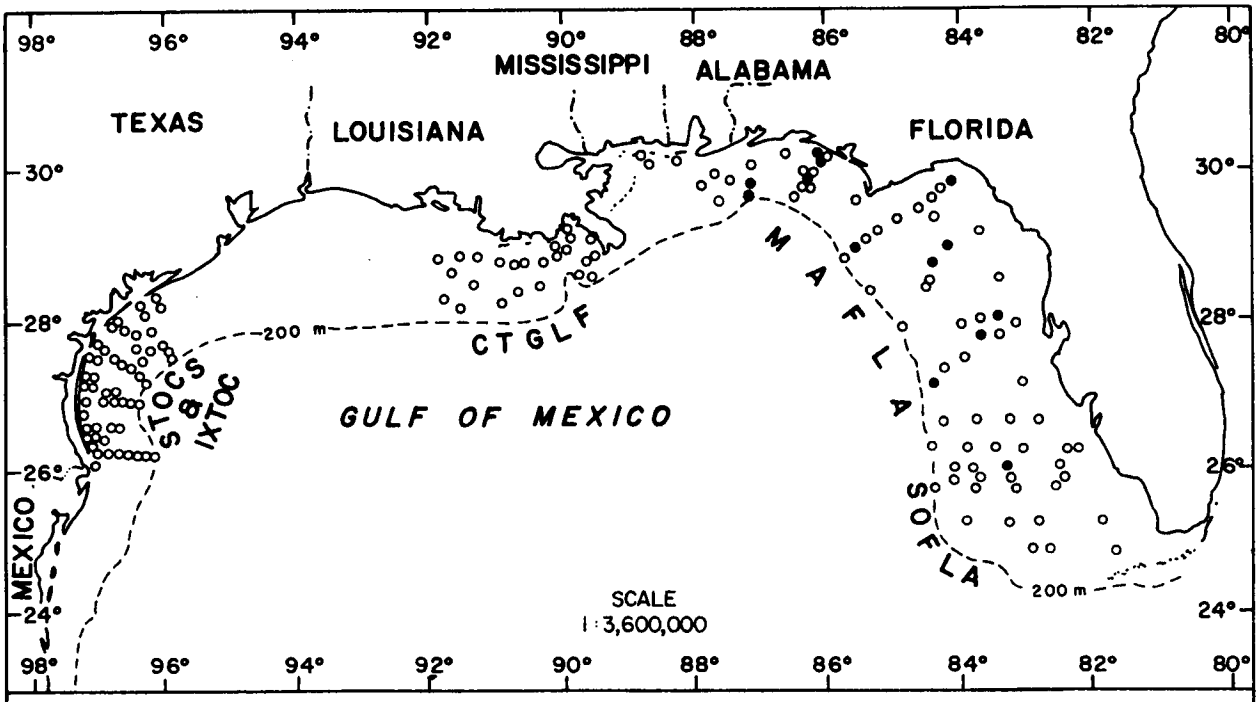

Figure 19-1. Distribution of Eteone heteropoda on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

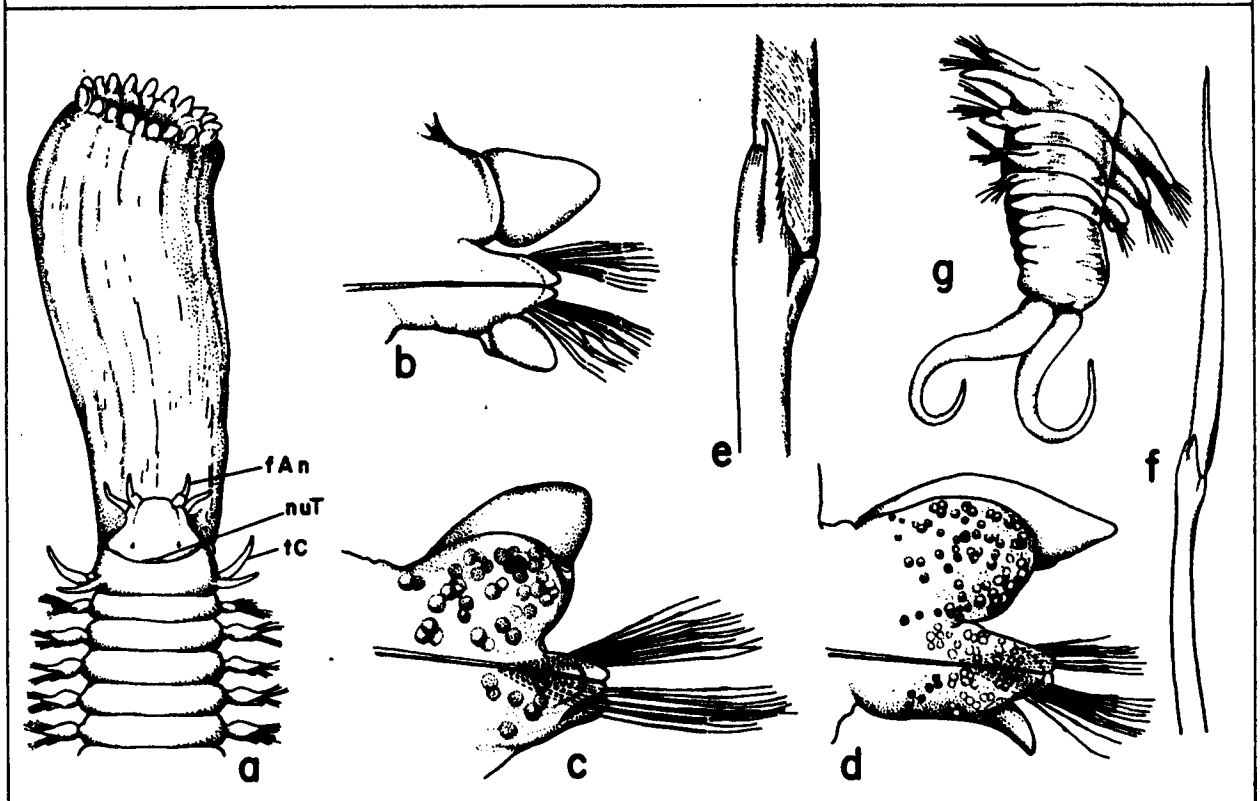

Figure 19-2. Eteone heteropoda: a, anterior end, dorsal view; b, sixth parapodium, anterior view; c, median parapodium, with ova, anterior view; d, posterior parapodium, with ova, anterior view; e, shaft head of typical seta, lateral view; f, complete seta, lateral view; g, pygidium (After Hartman 1951, pl. 9, figs. 1-5, 7, 8).

eyes, often fading upon fixation. Proboscis cylindrical, smooth or transversely wrinkled, with 19-20 large terminal papillae. Two pairs of cylindrical tentacular cirri on segment 1; segment 2 without dorsal cirri, with or without setae. All segments separate dorsally. Dorsal cirri small, foliaceous, not covering dorsum; ventral cirri oval, about as large as uniramous parapodia. Setae all composite spinigers. Pygidium with two long, pointed anal cirri.

Key to the Gulf of Mexico BLM-OCS Species of Eteone

1a. Setae present on segment 2; dorsal cirri of middle and posterior setigers asymmetrical with superior edge longer than inferior edge (Figure 19-2c,d). . . . . **Eteone heteropoda**, p. 19-6

1b. Setae absent on segment 2; dorsal cirri symmetrical throughout (Figure 19-4c). . . . . **Eteone lactea**, p. 19-8

Eteone heteropoda Hartman, 1951
Figures 19-1, 2a-g

Eteone heteropoda Hartman, 1951a:31, pl. 9, figs. 1-8.
Eteone heteropoda--Pettibone, 1963:72, fig. 16d.
Eteone heteropoda--Day, 1973:19.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 8A-11/80 (1 spec., USNM 89966); MAFLA 2208K-8/77 (1 spec.), 2209B-7/76 (1 spec.), 2209F-7/76 (1 spec.), 2533C-7/76 (1 spec.).
Supplementary Material:
Gulf of Mexico--Biloxi, Mississippi, M. W. Williams coll., O. Hartman ID. (holotype, USNM 21557); off Pascagoula, Mississippi, COE Sta. 035-3, Oct. 1980, 30°19.20'N, 88°33.30'W, 1.3 m, silty clay (1 spec.); Mobile Bay, Alabama, Mobil Oil 056B-7/79, 30°15'13"N, 88°03'08"W, 3.8 m, coarse sand (1 spec.), 057C-7/78, 30°15'13"N, 88°03'08"W, 4.0 m, coarse sand (1 spec.).
DESCRIPTION:
Length, to 55 mm (previously reported to 93 mm); width, to 3 mm (previously reported to 3 mm). Body pale, sometimes with sparse light brown pigmentation dorsally; holotype incomplete with 135 segments. Prostomium wider and entire posteriorly. Nuchal tubercle present (Figure 19-2a). Frontal antennae biarticulate. Eyes small. Proboscis smooth with 19 globular papillae terminally. Tentacular formula: $0\frac{1}{1} + S\frac{0}{N}$. Tentacular cirri filiform, ventral pair slightly longer, extending back to anterior margin of segment 3. Setae present on segment 2; dorsal cirri absent. Parapodial lobes notched distally. Dorsal cirri triangular anteriorly (Figure 19-2b), nearly symmetrical; becoming asymmetrical on median setigers (Figure 19-2c); posterior dorsal cirri asymmetrical with superior edge much longer than inferior edge (Figure 19-2d). Setae as compound spinigers with two large teeth at head of shaft (Figure 19-2e); blades long, finely serrate to tip (Figure 19-2f). Pygidium with two long anal cirri (Figure 19-2g).
REMARKS: BLM-OCS specimens match the holotype very well.
PREVIOUSLY REPORTED HABITAT: Intertidal to 200 m; burrowing in muddy sand mixed with shell.

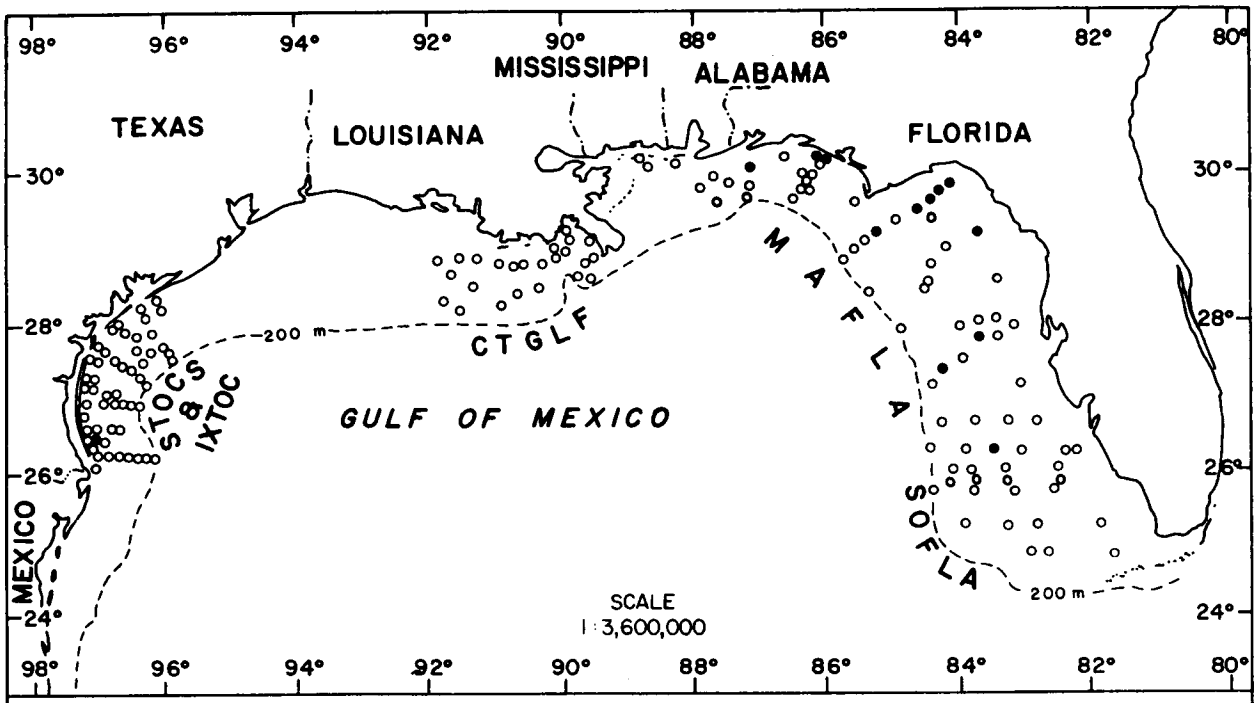

Figure 19-3. Distribution of Eteone lactea on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

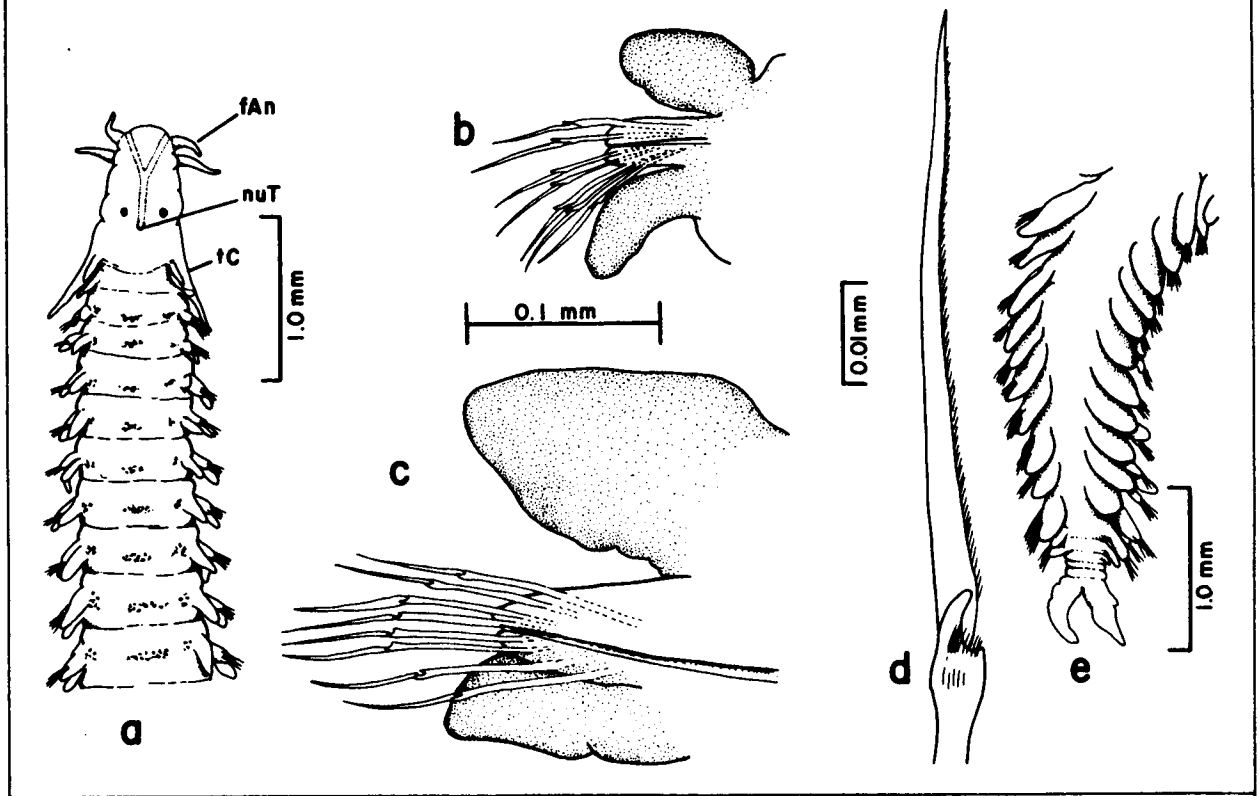

Figure 19-4. Eteone lactea: a, anterior end, dorsal view; b, eighth parapodium, anterior view; c, 100th parapodium, anterior view; d, typical seta; e, posterior end, dorsal view.

GULF OF MEXICO BLM-OCS OCCURRENCE: Numerous records in eastern Gulf (Figure 19-1); 10-121 m; sands, silts and clays.
DISTRIBUTION: Maine to North Carolina; Gulf of Mexico.

Eteone lactea Claparède, 1868
Figures 19-3, 4a-e

Eteone lactea--Fauvel, 1923:175, fig. 63a-d.
Eteone alba--Hartman, 1945:14, pl. 2, figs. 5, 6.
Eteone lactea--Pettibone, 1963:70, fig. 16a-c.
Eteone lactea--Ushakov, 1972:179, pl. 16, figs. 7-9.
Eteone lactea--Day, 1973:19.
Eteone lactea--Gardiner, 1976:105, fig. 5q-s.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2318J-7/76 (1 spec.), 2318F-11/77 (1 spec.), 2421E-7/76 (1 spec.), 2424-7/76 (1 spec., USNM 56122); IXTOC S21-12/81 (1 spec., USNM 89967).
Supplementary Material:
North Carolina--Cape Lookout, C. Jenner coll., S. L. Gardiner ID. (1 spec., USNM 52867).
Gulf of Mexico--Alabama, Mobile Bay, Little Dauphin Island, Jan. 1973 (1 spec.).
DESCRIPTION:
Length, to 80 mm (previously reported to 230 mm); width, to 1 mm (previously reported to 3.0 mm). Body pale with brown pigment patches on dorsum and at base of parapodia; largest complete specimen with 284 segments. Prostomium wider and entire posteriorly. Nuchal tubercle present (Figure 19-4a). Frontal antennae filiform. Eyes small. Proboscis with numerous circumoral muscle bands and 19 terminal papillae. Tentacular formula: $0\frac{1}{1} + 0\frac{0}{N}$. Tentacular cirri filiform. First ventral tentacular cirri extending back to segment 4, about 3-4 times as long as dorsal tentacular cirri. Segment 2 with short, stout ventral cirri; setae absent. Parapodial lobes notched distally. Dorsal cirri oval anteriorly (Figure 19-4b), more pointed posteriorly (Figure 19-4c); symmetrical throughout. Ventral cirri longer than parapodial lobes throughout. Setae as compound spinigers with two large, hooked teeth and many small denticles on shaft head; blades long, finely serrate to tip (Figure 19-4d). Pygidium with two stout, pointed lobes (Figure 19-4e).
PREVIOUSLY REPORTED HABITAT: Intertidal to 185 m; coarse sand, gravel and pieces of shell.
GULF OF MEXICO BLM-OCS OCCURRENCE: Scattered occurrences in eastern Gulf and one station off Texas (Figure 19-3); 9-74 m; sands, silts, and clays.
DISTRIBUTION: Europe, North Sea, Gulf of St. Lawrence to Florida, Gulf of Mexico.

Genus Mystides Theel, 1879

TYPE SPECIES: Mystides borealis Théel, 1879.
REFERENCES:
Hartmann-Schröder, 1963:204.

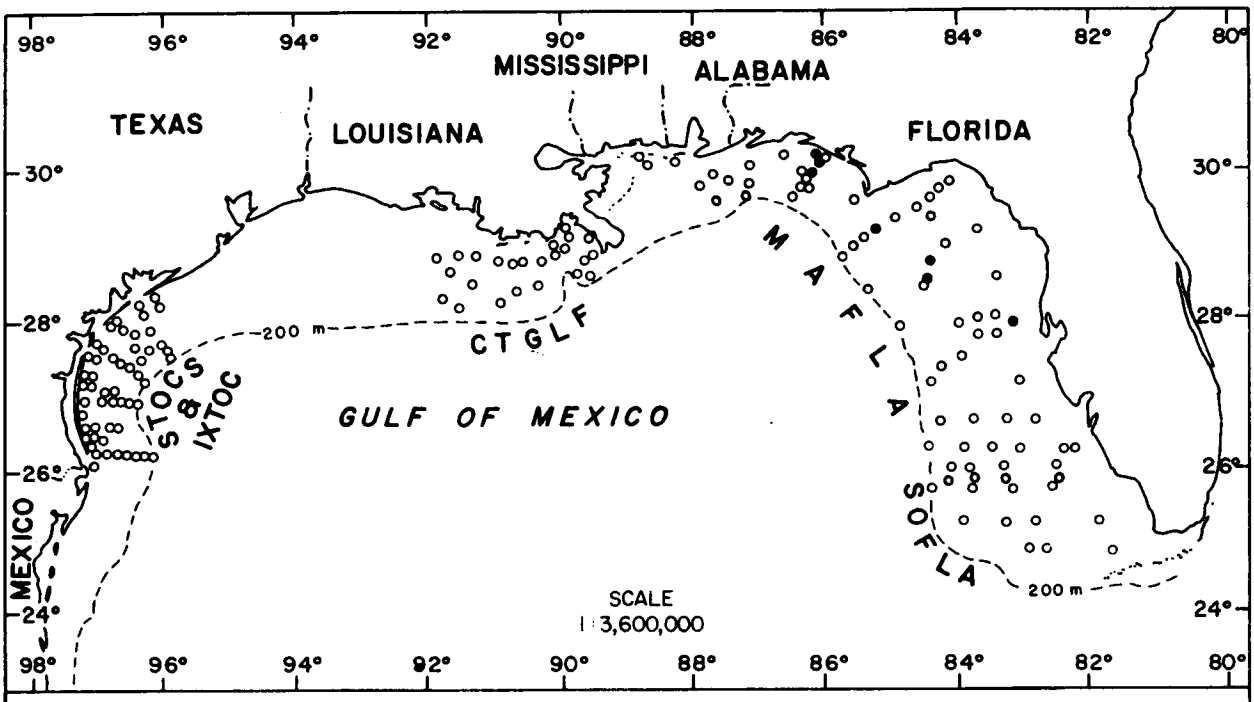

Figure 19-5. Distribution of Mystides borealis on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

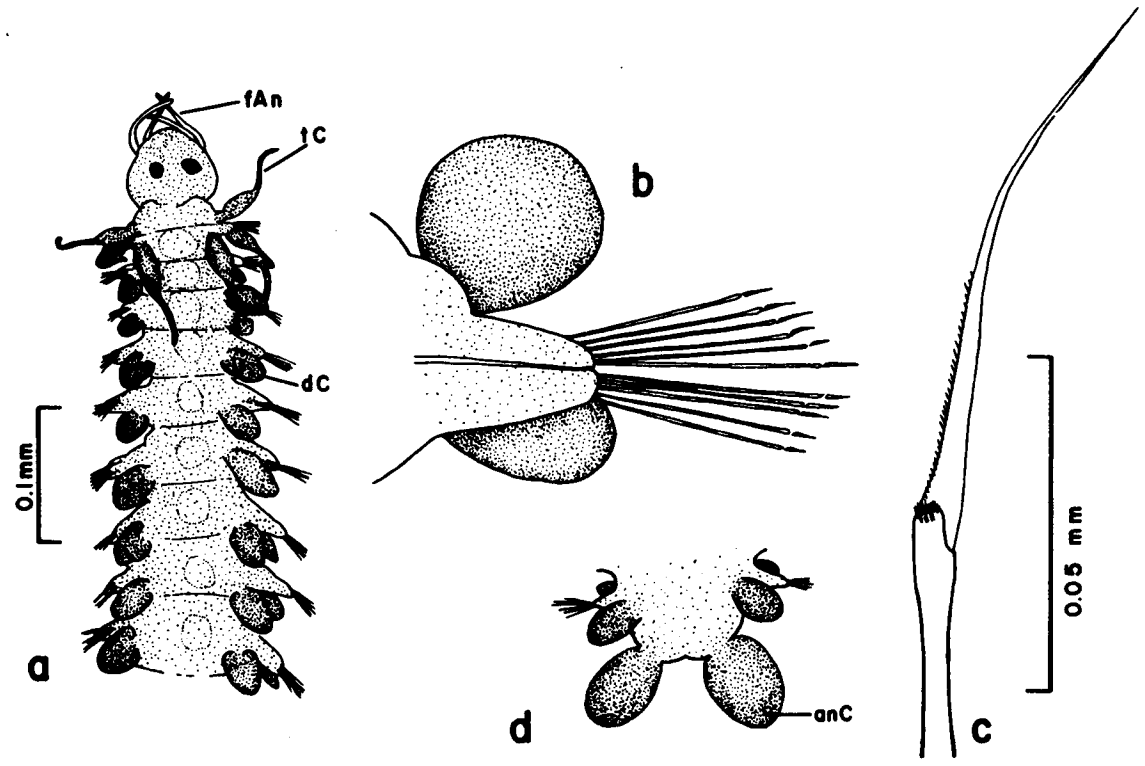

Figure 19-6. Mystides borealis: a, anterior end, dorsal view; b, middle parapodium; c, typical seta; d, posterior end, dorsal view (Figures b, d after Ushakov 1972, pl. 2, figs. 3, 2).

Day, 1967:141.
Ushakov, 1972:117.
Fauchald, 1977a:49.
DIAGNOSIS: Prostomium rounded to heart-shaped with four long, filiform antennae inserted at anterior margin. One pair of eyes. Proboscis densely covered with soft papillae. First two segments separate dorsally, with three pairs of tentacular cirri. Dorsal cirri present on segment 3. Dorsal cirri rounded; ventral cirri oval. Parapodia uniramous with composite spinigers. Pygidium with two anal cirri.

Mystides borealis Théel, 1879
Figures 19-5, 6a-d

Mystides borealis Theel, 1879:35, pl. 2, figs. 29-32.
Mystides borealis--Fauvel, 1923:180, fig. 65a-d.
Mystides borealis--Pettibone, 1954:232; 1963:74.
Mystides borealis--Hartmann-Schröder, 1963:206.
Mystides borealis--Ushakov, 1972:120, pl. 2, figs. 1-4.
Mystides borealis--Banse and Hobson, 1974:43.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2207C-8/77 (1 spec.), 2207D-8/77 (1 spec.), 2315A-7/76 (1 spec.), 2316D-7/76 (1 spec.), 2424I-7/76 (1 spec.), 2528-8/77 (2 spec., USNM 56126), 2530B-6/75 (1 spec.), 2531C-8/77 (1 spec.).
Supplementary Material:
Alaska--Point Barrow base, G. E. MacGinitie coll., Sept. 1949; M. Pettibone ID. (1 spec., USNM 22461).
DESCRIPTION:
Length, 5+ mm (previously reported to 16 mm); width, to 0.3 mm (previously reported to 0.8 mm). Body pale with brown-pigmented cirri; largest BLM-OCS specimen incomplete with 50 segments. Prostomium rounded, eyes large. Frontal antennae slightly longer than prostomium (Figure 19-6a). Tentacular formula: $1 + S\frac{1}{1}$. Tentacular cirri swollen basally, filamentous distally. Tentacular cirri of segment 1 extending back to segment 4; dorsal tentacular cirri of segment 2 longest, extending back to segment 5; ventral tentacular cirri of segment 2 extending back to segment 4. Setae present from segment 2. Parapodial lobes notched distally (Figure 19-6b). Dorsal cirri small, thick, broadly oval; ventral cirri similar but smaller. Setae all compound spinigers with teeth at head of shaft; blades long, finely serrate to tip (Figure 19-6c). Anal cirri large, oval (Figure 19-6d).
REMARKS: The proboscis was not observed in BLM-OCS specimens but is reported to be uniformly covered with small, soft, bottle-shaped papillae (Ushakov, 1972:120). Mystides borealis is herein newly reported from the Gulf of Mexico.
PREVIOUSLY REPORTED HABITAT: Intertidal to 107 m; sand, muddy sand with shells and on rocks.
GULF OF MEXICO BLM-OCS OCCURRENCE: Scattered records in northeastern Gulf (Figure 19-5); 19-45 m; coarse to medium sand, silty fine sand.
DISTRIBUTION: Mediterranean, Ireland, Gulf of St. Lawrence to Maine, Gulf of Mexico, Washington.

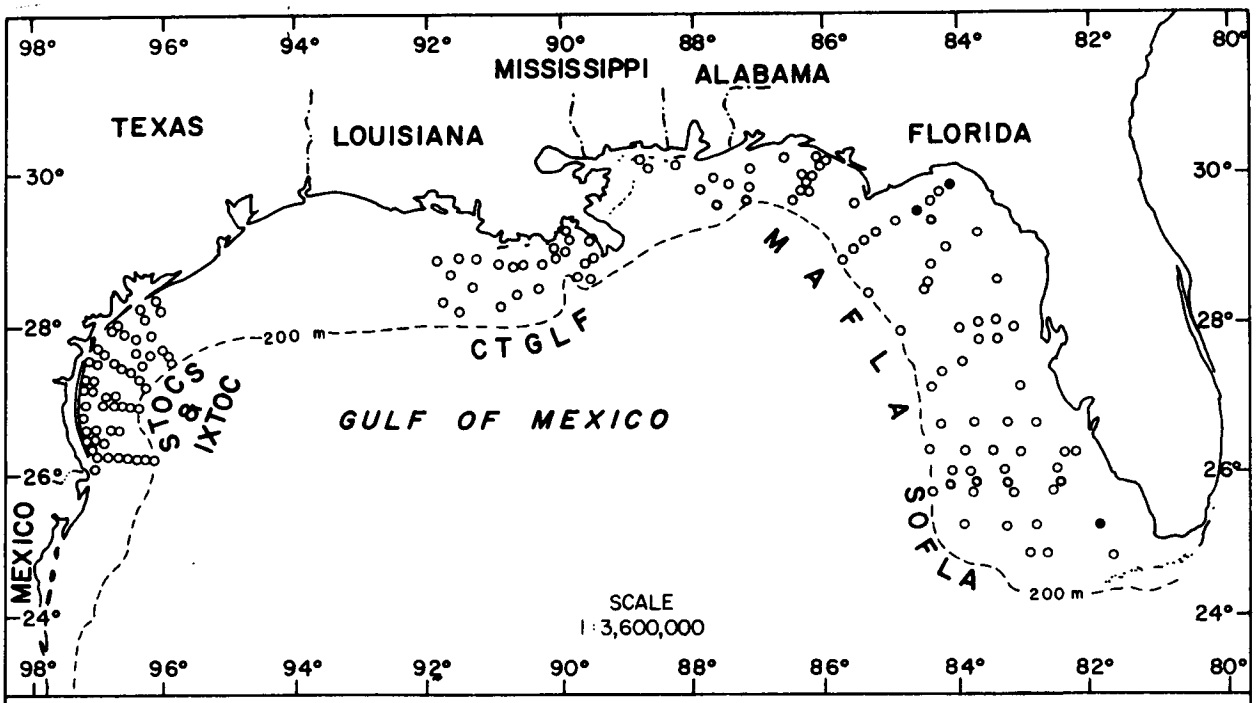

Figure 19-7. Distribution of Hesionura sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

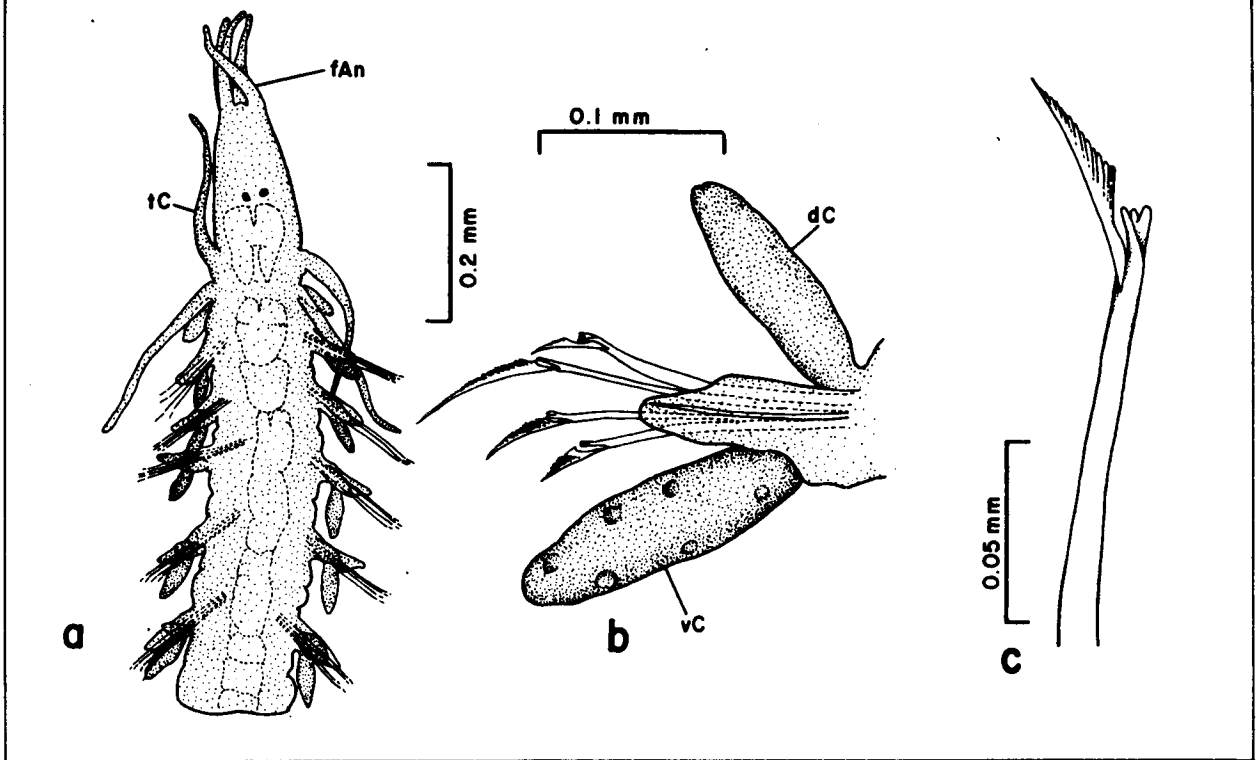

Figure 19-8. Hesionura sp. A: a, anterior end, dorsal view; b, parapodium, anterior view; c, superior tridentate spiniger.

Genus **Hesionura** Hartmann-Schröder, 1958

TYPE SPECIES: Hesionura fragilis Hartmann-Schröder, 1958.
REFERENCE:
Fauchald, 1977a:49.
DIAGNOSIS: Prostomium elongate, rounded anteriorly, without nuchal tubercle at posterior margin. Four long, filiform antennae at anterior margin of prostomium. One pair of eyes, close together medially. Three pairs of tentacular cirri on first two segments. Dorsal cirri absent on segment 3. Dorsal and ventral cirri long, oval. Parapodia uniramous with composite spinigers.

Hesionura sp. A
Figures 19-7, 8a-c

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 20B-11/80 (4 spec., USNM 89968), 20D-7/81 (2 spec., USNM 89969);
MAFLA 2419I-7/77 (2 spec.), 2422E-7/76 (1 spec., USNM 89970).
DESCRIPTION:
Length, to 5 mm; width, to 0.1 mm. Body slender, thread-like, with scattered patches of brown pigmentation dorsally; complete specimens with up to 73 segments. Prostomium (Figure 19-8a) narrowing anteriorly, twice as long as wide. Proboscis not observed. Tentacular formula: 1 + $0\frac{I}{1}$ + $S\frac{0}{N}$. Tentacular cirri of segment 1 filiform, extending posteriorly to segment 5; dorsal tentacular cirri of segment 2 filiform, extending posteriorly to segment 5; ventral cirri of segment 2 short, oval. Dorsal cirri short anteriorly, gradually increasing in length posteriorly. Parapodia uniramous with 4-5 setae (Figure 19-8b). Superior seta with tridentate shaft head and short blade (Figure 19-8c). Remaining setae with bidentate shaft heads and spinigerous blades of decreasing length. Dorsal cirri attached to base of parapodia, ventral cirri attached to parapodial lobe about midway along its length.
REMARKS: Hesionura sp. A closely resembles specimens identified as Hesionura elongata by Gardiner (USNM 52870), but has long-bladed spinigerous setae rather than the short-bladed falcigerous setae shown by Gardiner (1976:108, fig. 6d).
GULF OF MEXICO BLM-OCS OCCURRENCE: Three stations off west coast of Florida (Figure 19-7); shallow water, 10-24 m; coarse to medium-fine sand.

Genus **Eulalia** Savigny, 1818

TYPE SPECIES: Nereis viridis Linnaeus, 1767.
REFERENCES:
Ushakov, 1955:96; 1972:145.
Pettibone, 1963:84.
Gardiner, 1976:107.
Fauchald, 1977a:49.
DIAGNOSIS: Prostomium oblong, slightly rounded anteriorly, with four frontal antennae and single median antenna near large eyes. Proboscis cylindrical with papillae scattered or arranged in rows. First three segments separate dorsally, with four pairs of spindle-shaped tentacular

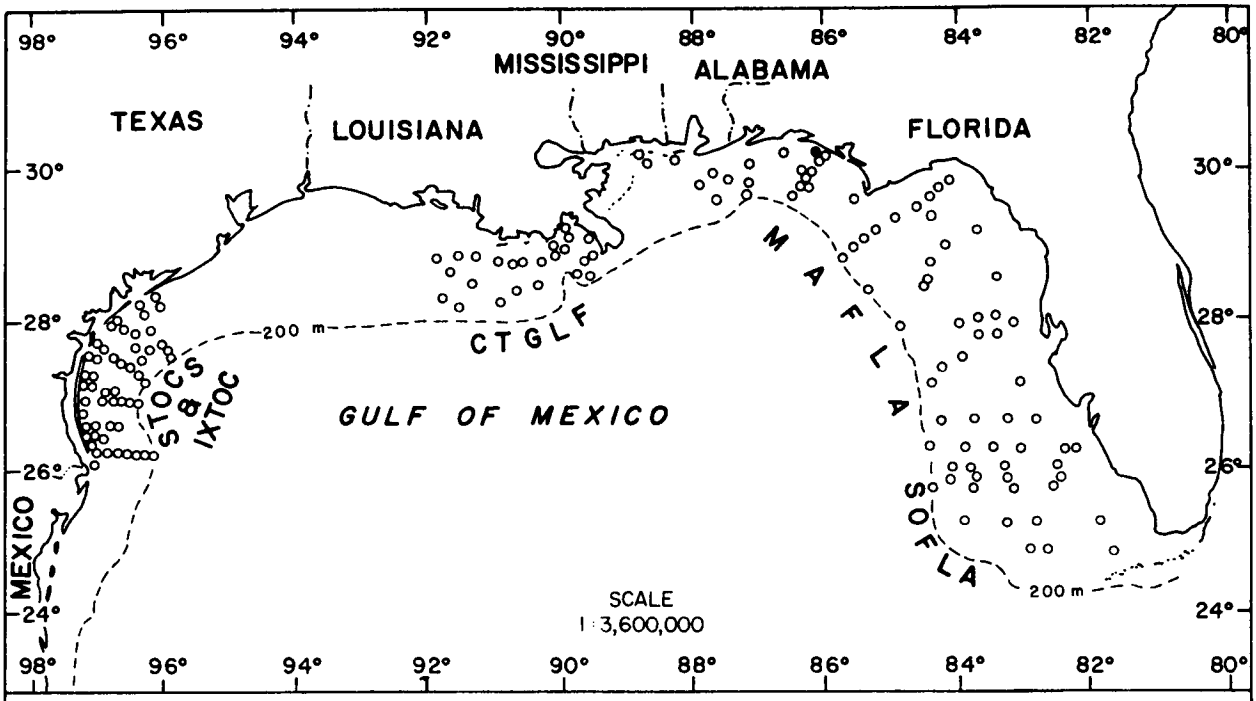

Figure 19-9. Distribution of Eulalia bilineata on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

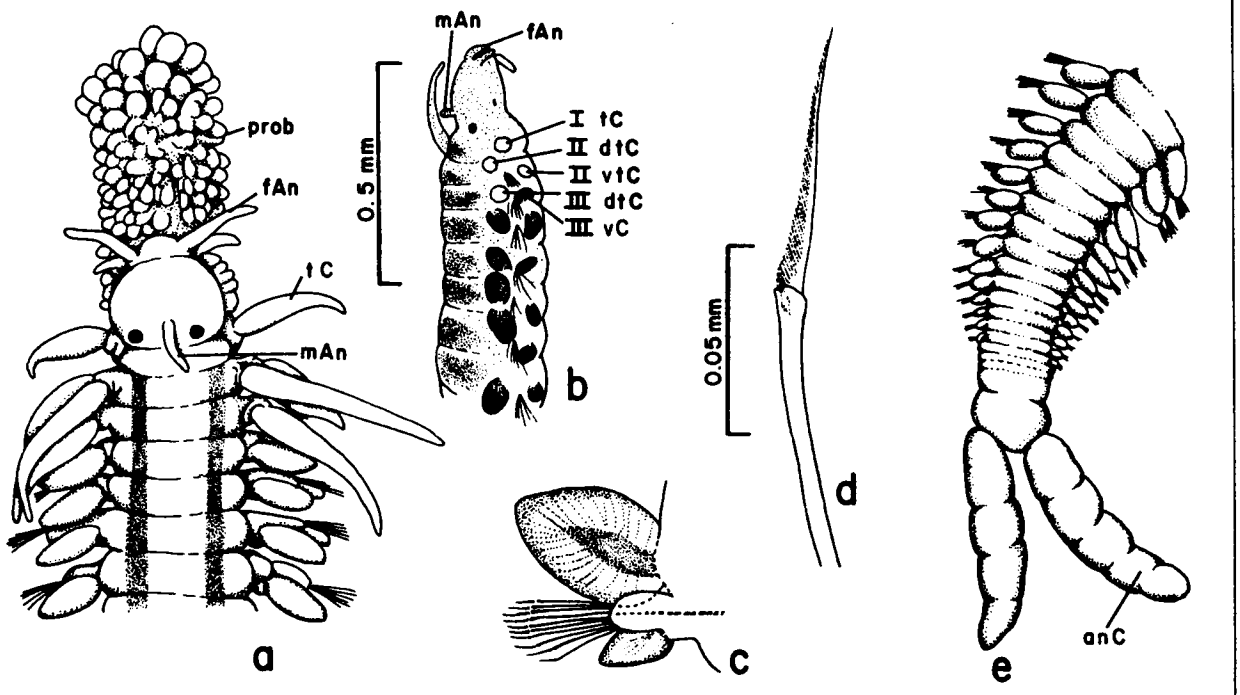

Figure 19-10. Eulalia bilineata: a, anterior end, dorsal view; b, same, dorsolateral view (tentacular cirri removed); c, middle parapodium, anterior view; d, typical seta; e, posterior end, dorsal view (Figures a, c, e after Imajima and Hartman 1964:pl. 13, figs. a, c, b).

cirri. Setae present or absent on segment 2. Dorsal cirri cordate or lanceolate. Parapodia uniramous with composite spinigers. Pygidium with two long anal cirri.

Eulalia bilineata (Johnston, 1840)
Figures 19-9, 10a-e

Eulalia bilineata Webster and Benedict, 1887:710, pl. 1, figs. 1-3, pl. 2, fig. 4.
Eulalia bilineata--Pettibone, 1963:86, fig. 20.
Eulalia bilineata--Imajima and Hartman, 1964:61, pl. 13, figs. a-d.
Eulalia (Hypoeulalia) bilineata--Day, 1967:164, fig. 5.4.k-m.
Eulalia bilineata--Hartman, 1968:261, figs. 1, 2.
Eulalia bilineata--Ushakov, 1972:148, pl. 8, figs. 5-8.
Eulalia bilineata--Day, 1973:20.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2528-8/77 (2 spec., USNM 56123), 2528E-2/78 (2 spec.).
Supplementary Material:
Maine--Eastport, H. E. Webster coll., Webster and Benedict ID. (USNM 394, 2 spec.).
DESCRIPTION:
Length, 12+ mm (previously reported to 32 mm); width, to 0.5 mm (previously reported to 1.2 mm). Body brown, heavily pigmented with two dorsal longitudinal black stripes (Figure 19-10a); largest BLM-OCS specimens incomplete with 153 segments. Prostomium pyriform with transverse groove posterior to filiform frontal antennae (Figure 19-10a). Eyes present along posterior margin of prostomium; median antenna inserted anterior to eyes. Proboscis densely covered with large, scattered papillae. Tentacular formula: $1 + S\frac{1}{1} + S\frac{1}{N}$ (Figure 19-10b). Tentacular cirri fusiform; those of segment 1 reaching posteriorly to segment 4; dorsal tentacular cirri of segment 2 reaching posteriorly to segment 7; ventral tentacular cirri of segment 2 reaching posteriorly to segment 5; dorsal tentacular cirri of segment 3 reaching posteriorly to segment 7. Ventral cirri of segment 3 normal. Setae present from segment 2. Parapodia slightly bilobed distally. Dorsal cirri lanceolate with acute tips (Figure 19-10c); ventral cirri small, lanceolate, extending beyond parapodial lobes. Setae as compound spinigers with many small denticles at head of shaft (Figure 19-10d); blades long, finely serrate to tip. Anal cirri transversely wrinkled (Figure 19-10e).
REMARKS: Eulalia bilineata is newly reported from the Gulf of Mexico.
PREVIOUSLY REPORTED HABITAT: Intertidal to 510 m; on rocks, with encrusting algae, in holdfasts of Laminaria; mud and grey sand.
GULF OF MEXICO BLM-OCS OCCURRENCE: Single location off Florida (Figure 19-9); 37 m; coarse sand.
DISTRIBUTION: Arctic, British Isles, South Africa, North and South America, Gulf of Mexico, Japan, Yellow Sea.

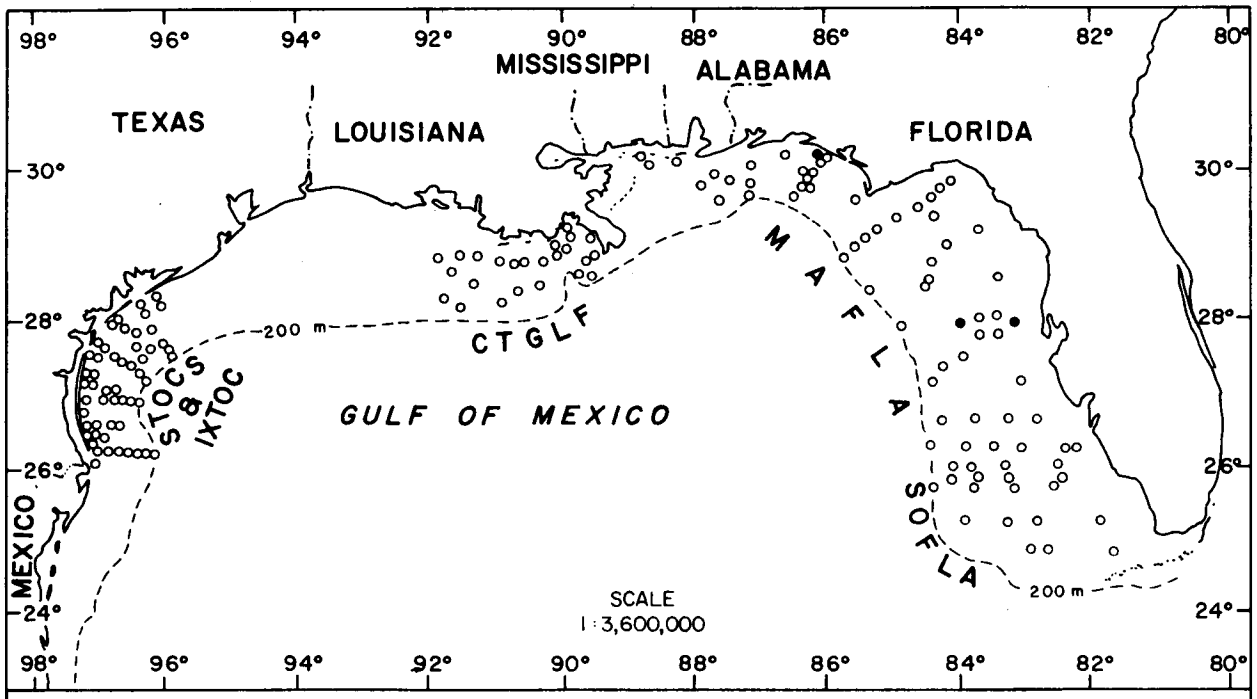

Figure 19-11. Distribution of Pterocirrus macrocerus on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

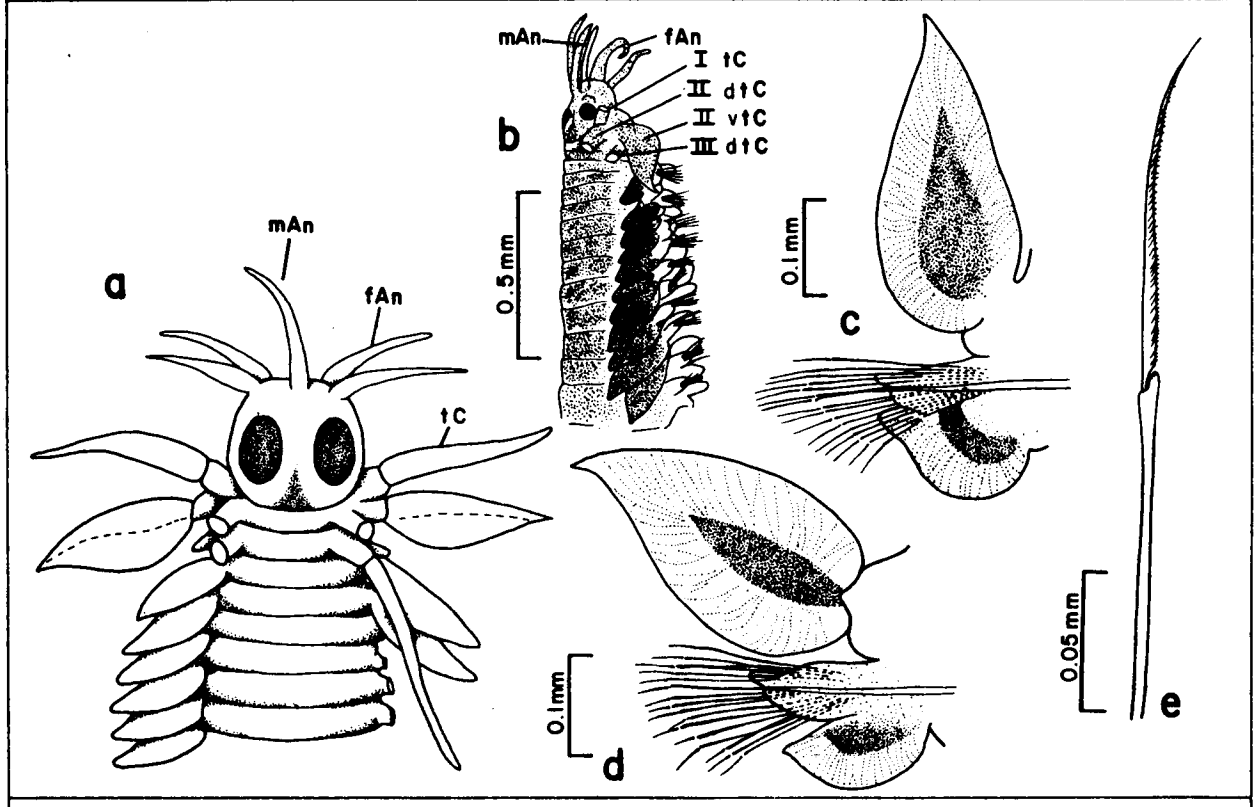

Figure 19-12. Pterocirrus macrocerus: a, anterior end, dorsal view; b, same, dorsolateral view (some tentacular cirri removed); c, anterior parapodium, anterior view; d, posterior parapodium, anterior view; e, typical seta (Figure a after Ushakov, 1972:pl. 11, fig. 6; remaining figures drawn from USNM 52874).

Genus **Pterocirrus** Claparède, 1868

TYPE SPECIES: Phyllodoce (Eulalia) macroceros Grube, 1860a.
REFERENCES:
Ushakov, 1972:159.
Fauchald, 1977a:50.
DIAGNOSIS: Prostomium rounded with four frontal antennae and single median antenna anterior to large eyes. Proboscis cylindrical with numerous scattered papillae. First segment reduced dorsally and fused to segment 2. Four pairs of tentacular cirri; ventral cirri of segment 2 flattened. Setae may be absent on segments 2 or 3. Dorsal cirri cordate or lanceolate. Parapodia uniramous with composite spinigers. Pygidium with two long, pointed anal cirri.

Pterocirrus macroceros (Grube, 1860)
Figures 19-11, 12a-e

Eulalia (Pterocirrus) macroceros--Fauvel, 1932:167, fig. 60d-g.
Eulalia (Pterocirrus) macroceros--Ushakov, 1955:100.
Eulalia (Pterocirrus) macroceros--Day, 1967:152, fig. 5.4.a-c; 1973:20.
Pterocirrus macroceros--Ushakov, 1972:160, pl. 11, figs. 6-9.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2207D-8/77 (1 spec.), 2207G-8/77 (1 spec.), 2211H-2/78 (1 spec.), 2528-6/75 (1 spec., USNM 56124).
Supplementary Material:
North Carolina--Morehead City, S. L. Gardiner coll./ID. (1 spec., USNM 52874).
DESCRIPTION:
Length, 35+ mm (previously reported to 20 mm); width, to 2.0 mm. Body brown, dorsally pigmented with intersegmental bands; all specimens incomplete with up to 132 segments. Prostomium rounded to pyriform, with four long filiform antennae at anterior margin. Median antenna located anterior to large, black eyes (Figure 19-12a). Proboscis not observed. Tentacular formula: $(1 + 0\frac{1}{1}) + 0\frac{1}{N}$ (Figure 19-12b). First segment fused to prostomium. Tentacular cirri of segment 1 fusiform, extending posteriorly to segment 5; dorsal tentacular cirri of segment 2 extending posteriorly to segment 6; ventral tentacular cirri of segment 2 flattened with foliaceous inferior margin; dorsal tentacular cirri of segment 3 fusiform, extending posteriorly to segment 7; ventral cirri of segment 3 normal. Setae present from segment 4. Parapodial lobes notched distally, superior portion longer than inferior (Figure 19-12c). Dorsal cirri lanceolate with pointed tips anteriorly (Figure 19-12c), longer posteriorly (Figure 19-12d), sometimes longer than width of body in large specimens. Setae compound spinigers with few small denticles at head of shaft (Figure 19-12e); blades long, finely serrate to tip.
REMARKS: Pterocirrus macrocerus is newly reported from the Gulf of Mexico.
PREVIOUSLY REPORTED HABITAT: Intertidal to 30 m; common on coral.
GULF OF MEXICO BLM-OCS OCCURRENCE: Three stations off west coast of Florida (Figure 19-11); 19-43 m; coarse to very fine sand.
DISTRIBUTION: Mediterranean, Morocco to Senegal, South Africa, Gulf of Mexico, Washington.

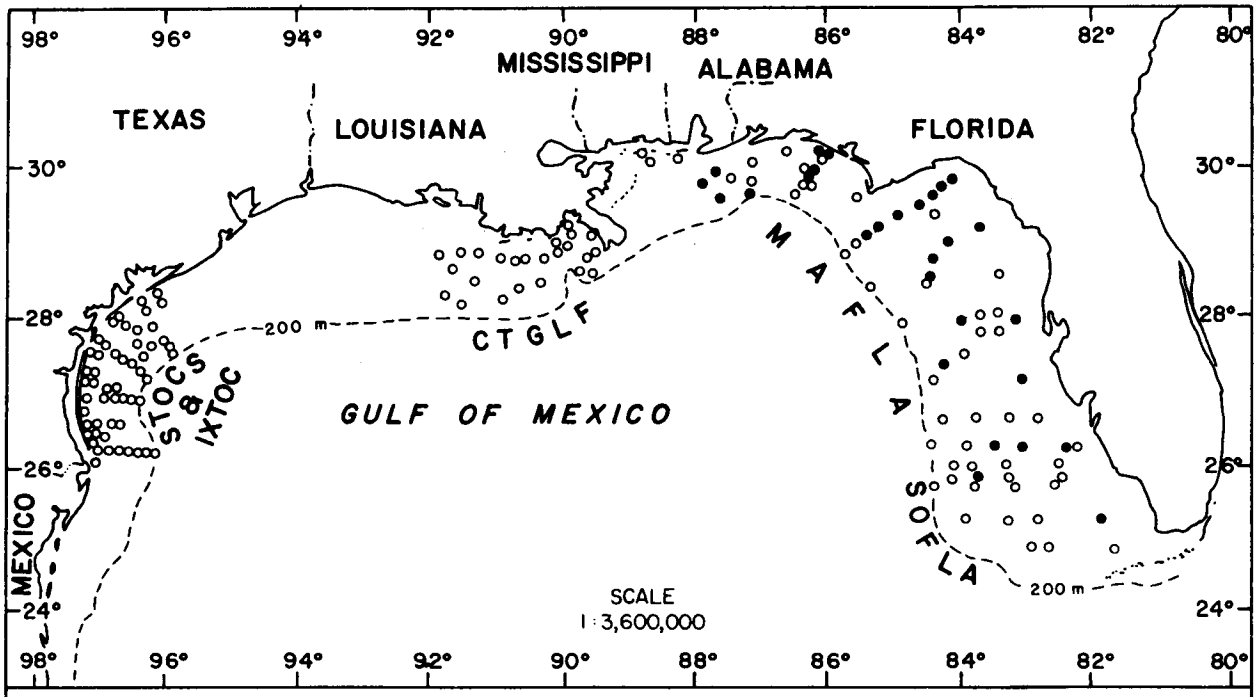

Figure 19-13. Distribution of Eumida sanguinea on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

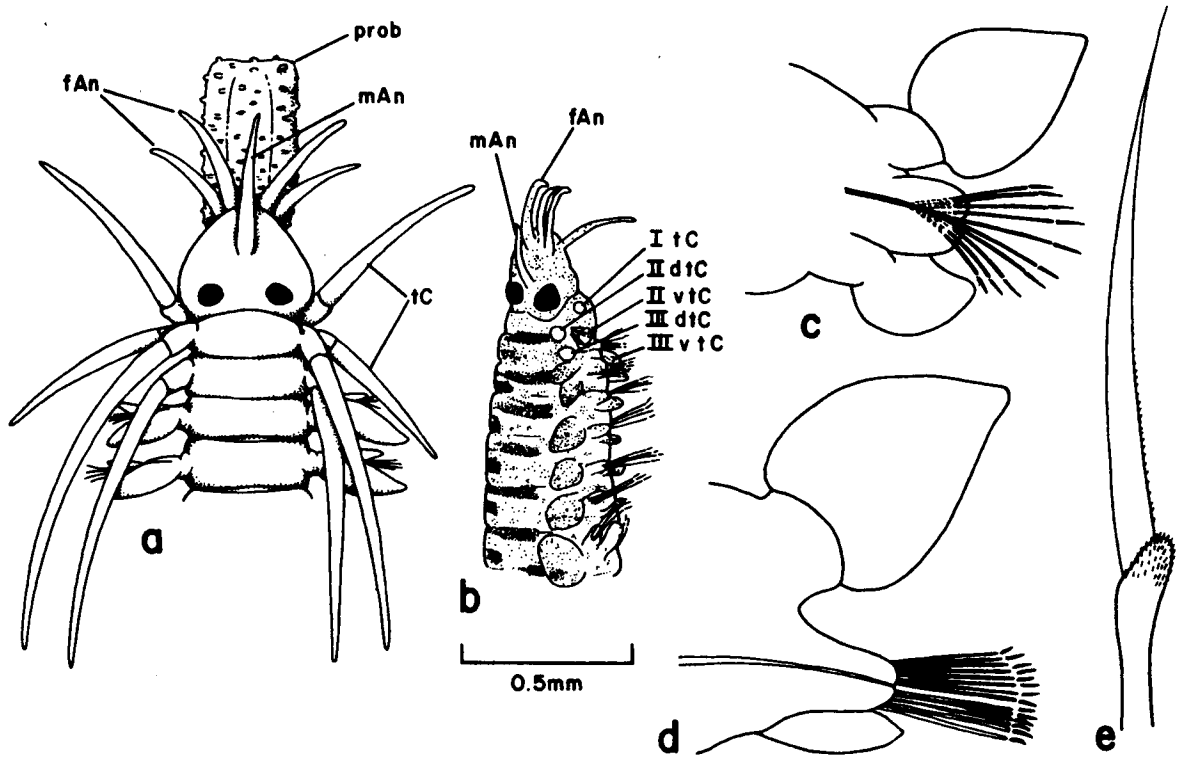

Figure 19-14. Eumida sanguinea: a, anterior end, dorsal view; b, same, dorsolateral view (tentacular cirri removed); c, anterior parapodium; d, posterior parapodium; e, typical seta (Figures a, c after Pettibone 1963, fig. 21a, b; figure d after Ushakov 1972, pl. 10, fig. 5; figure e after Day, 1967, fig. 5.5.c).

Genus **Eumida** Malmgren, 1865

TYPE SPECIES: Eulalia sanguinea Oersted, 1843.
REFERENCES:
Pettibone, 1963:88.
Ushakov, 1972:152.
Fauchald, 1977a:49.
DIAGNOSIS: Prostomium heart-shaped, with four frontal antennae and single median antenna anterior to large eyes. Proboscis cylindrical, smooth or with small papillae, sometimes transversely wrinkled. First segment reduced dorsally, fused with segment 2. Four pairs of cylindrical, flattened, or spindle-shaped tentacular cirri with first pair lateral to prostomium. Dorsal cirri cordate or lanceolate. Parapodia uniramous with composite spinigers. Pygidium with two pointed anal cirri.

Eumida sanguinea Oersted, 1843
Figures 19-13, 14a-e

Eulalia (Eumida) sanguinea--Fauvel, 1923:166, fig. 59f-k.
Eumida sanguinea--Pettibone, 1963:88, fig. 21a,b.
Eulalia (Eumida) sanguinea--Day, 1967:155, fig. 5.5.a-c; 1973:20.
Eumida sanguinea--Ushakov, 1972:153, pl. 10, figs. 4, 5.
Eulalia (Eumida) sanguinea--Gardiner, 1976:109, fig. 6h-j.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 20D-7/81 (3 spec., USNM 89972), 18A-4/81 (1 spec., USNM 89971); MAFLA 2211G-8/77 (1 spec.), 2422F-7/76 (1 spec.), 2423B-7/76 (2 spec.), 2423C-7/76 (2 spec.), 2423D-7/76 (1 spec.), 2423F-7/76 (1 spec.), 2528-11/77 (1 spec., USNM 56125), 2529B-6/75 (1 spec.), 2851F-7/76 (1 spec.);
Supplementary Material:
North Carolina--Bogue Sound, Feb. 1972, S. L. Gardiner coll./ID. (2 spec., USNM 52872).
DESCRIPTION:
Length, 11+ mm (previously reported to 60 mm); width, to 1.0 mm (previously reported to 1.5 mm). Body brown with checkerboard pattern dorsally; largest specimen incomplete with 73 segments. Prostomium cordate, covering first segment dorsally; four filiform frontal antennae attached at anterior margin; median antenna inserted anterior to large eyes (Figure 19-14a). Proboscis with widely scattered papillae. Tentacular formula: $(1 + S\frac{1}{1}) + S\frac{1}{N}$ (Figure 19-14b). Tentacular cirri filiform, attached to cirrophores basally; first tentacular cirri extending posteriorly to segment 5; dorsal tentacular cirri of segment 2 extending posteriorly to segment 11; ventral tentacular cirri of segment 2 extending posteriorly to segment 6; dorsal tentacular cirri of segment 3 extending to segment 10. Ventral cirri oval anteriorly, becoming more pointed posteriorly. Setae present from segment 2. Parapodial lobes notched distally, equal in length (Figure 19-14c). Dorsal cirri long, cordate with pointed tips throughout (Figure 19-14d). Setae as compound spinigers with few denticles at head of shaft; blades long, finely serrate to tip (Figure 19-14e).
PREVIOUSLY REPORTED HABITAT: Intertidal to 169 m; found on shells, rocks, pilings with tunicates, sponges, and sea grass. Symbiotic

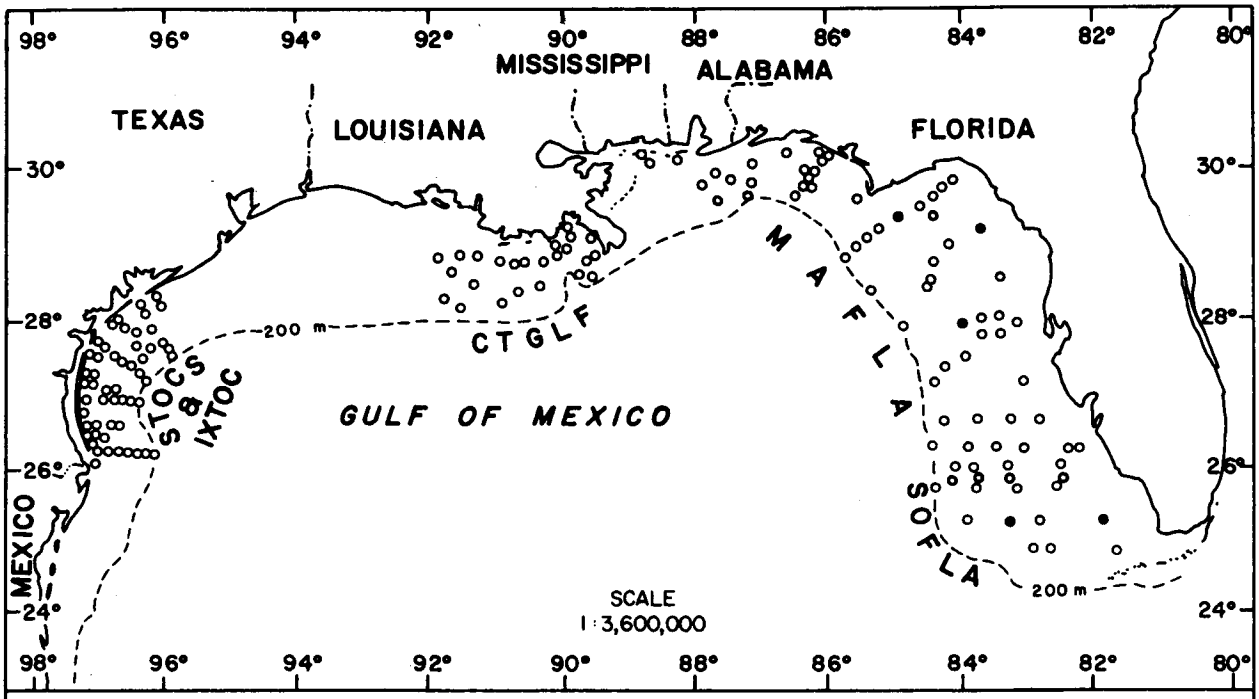

Figure 19-15. Distribution of Protomystides bidentata on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

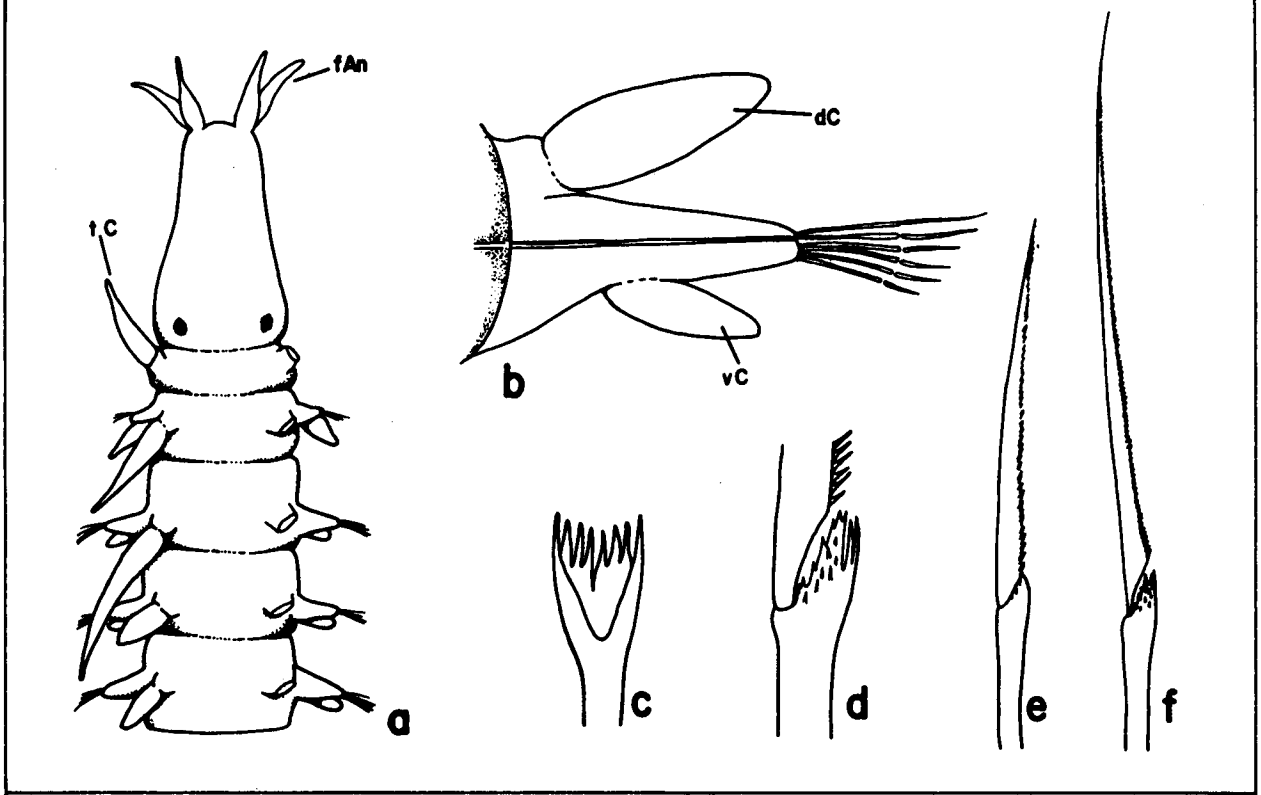

Figure 19-16. Protomystides bidentata: a, anterior end, dorsal view; b, middle parapodium; c, superior view of setal shaft head with blade removed; d, lateral view of setal shaft head; e, inferior seta; f, superior seta (Figures a-f after Day 1973, fig. 3a-f).

relationships have been observed between E. sanguinea and the terebellid polychaete Lanice conchilega.
GULF OF MEXICO BLM-OCS OCCURRENCE: Numerous records in northeastern Gulf (Figure 19-13); 10-106 m; silty sand to coarse sand.
DISTRIBUTION: Mediterranean; France; Norway; Iceland; east and west coast of North and South America including Gulf of Mexico; Japan; Indian Ocean; New Zealand; South Africa.

Genus Protomystides Czerniavsky, 1882

TYPE SPECIES: Mystides bidentata Langerhans, 1880.
REFERENCES:
Hartmann-Schröder, 1963:230.
Day, 1967:143.
Ushakov, 1972:123.
Gardiner, 1976:106.
Fauchald, 1977a:50.
DIAGNOSIS: Prostomium long, pyriform, with four frontal antennae. One pair of eyes, often fading upon fixation. Median antenna absent. Proboscis with scattered papillae. Three or four pairs of tentacular cirri on first three segments. Setae beginning on segment 2. Dorsal cirri long, pointed; ventral cirri similar but smaller. Parapodia uniramous with composite spinigers.

Protomystides bidentata (Langerhans, 1880)
Figures 19-15, 16a-f

Mystides (Protomystides) bidentata--Saint Joseph, 1888:308, pl. 13, figs. 183-185.
Protomystides bidentata--Hartmann-Schröder, 1963:230, figs. 43-45.
Protomystides bidentata--Hartman, 1965:62.
Protomystides bidentata--Ushakov, 1972:124.
Protomystides bidentata--Day, 1973:19, fig. 3a-f.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 20D-7/81 (1 spec., USNM 89973), 24-4/81 (1 spec., USNM 89974); MAFLA 2211F-7/76 (1 spec.), 2318D-7/76 (1 spec.), 2423C-7/76 (1 spec., USNM 89975).
Supplementary Material:
North Carolina--Beaufort, Sept. 1975, J. H. Day coll./ID. (1 spec., USNM 51017).
DESCRIPTION:
Length, to 12 mm (previously reported to 12 mm); width, to 0.1 mm. Body pale, thread-like; complete specimens with up to 115 segments. Prostomium with four fusiform antennae at anterior margin (Figure 19-16a); eyes present at posterior margin. Proboscis diffusely papillose. Tentacular formula: $1 + S\frac{1}{N} + S\frac{1}{N}$. Tentacular cirri filiform, attached to short cirrophores basally. Tentacular segments separate dorsally. Tentacular cirri of segment 1 extending posteriorly to segment 3; dorsal tentacular cirri of segment 2 extending posteriorly to segment 4; ventral cirri of segment 2 normal, extending just beyond parapodial lobes; dorsal tentacular cirri of segment 3 extending posteriorly to segment 6.

Ventral cirri of segment 3 normal, not extending beyond parapodial lobes. Setae present from segment 2. Dorsal cirri long, oval (Figure 19-16b); ventral cirri similar but smaller. Setae as compound spinigers with serrate shaft heads (Figure 19-16c,d); blades grading in length (Figure 19-16e,f).
REMARKS: Protomystides bidentata is newly reported from the Gulf of Mexico.
PREVIOUSLY REPORTED HABITAT: Intertidal to 2,400 m.
GULF OF MEXICO BLM-OCS OCCURRENCE: Several stations off Florida (Figure 19-15); 19-88 m; coarse to medium sand, silty fine sand, silt/clay.
DISTRIBUTION: Mediterranean, tropical Atlantic, Brazil, Gulf of Mexico.

Genus **Paranaitis** Southern, 1914

TYPE SPECIES: Anaitis wahlbergi Malmgren, 1865.
REFERENCES:
Pettibone, 1963:75.
Ushakov, 1972:140.
Gardiner, 1976:110.
Fauchald, 1977a:50.
DIAGNOSIS: Prostomium broadly oval to heart-shaped, with four frontal antennae; with or without nuchal tubercle at posterior margin. One pair of eyes. Proboscis smooth or with papillae in rows. Segments 1 and 2 fused to form "collar" around prostomium; segments 1-3 with four pairs of cylindrical tentacular cirri. Dorsal cirri oval; ventral cirri elongate-oval. Parapodia uniramous with composite spinigers. Pygidium with elongate or oval anal cirri.

Key to the Gulf of Mexico BLM-OCS Species of Paranaitis

1a. Nuchal tubercle present at posterior margin of prostomium (Figure 19-18a); anal cirri long, tapered; posterior dorsal cirri symmetrical (Figure 19-18d). . . . . **Paranaitis polynoides**, p. 19-21
1b. Nuchal tubercle absent (Figure 19-20a); anal cirri short, rounded; posterior dorsal cirri asymmetrical (Figure 19-20d). . . . . **.Paranaitis speciosa**, p. 19-23

Paranaitis polynoides (Moore, 1909b)
Figures 19-17, 18a-e

Paranaitis polynoides--Ushakov, 1972:141.
Paranaitis polynoides--Banse and Hobson, 1974:44.
Paranaitis polynoides--Gardiner, 1976:110.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2207E-8/77 (1 spec.), 2209B-7/76 (1 spec.), 2316D-7/76 (1 spec.), 2422D-7/76 (1 spec.), 2528D-11/77 (1 spec.), 2528I-2/78 (1 spec.), 2528J-2/78 (1 spec.), 2531E-2/78 (1 spec.), 2643-5/74 (1 spec., USNM 56127), 2854D-8/77 (1 spec.); CTGLF 01-1/79 (1 spec., USNM 89976).
Supplementary Material:
Gulf of Mexico--Mobile Bay, Alabama, Mobil Oil 056C-1/79, 30°15'13"N,

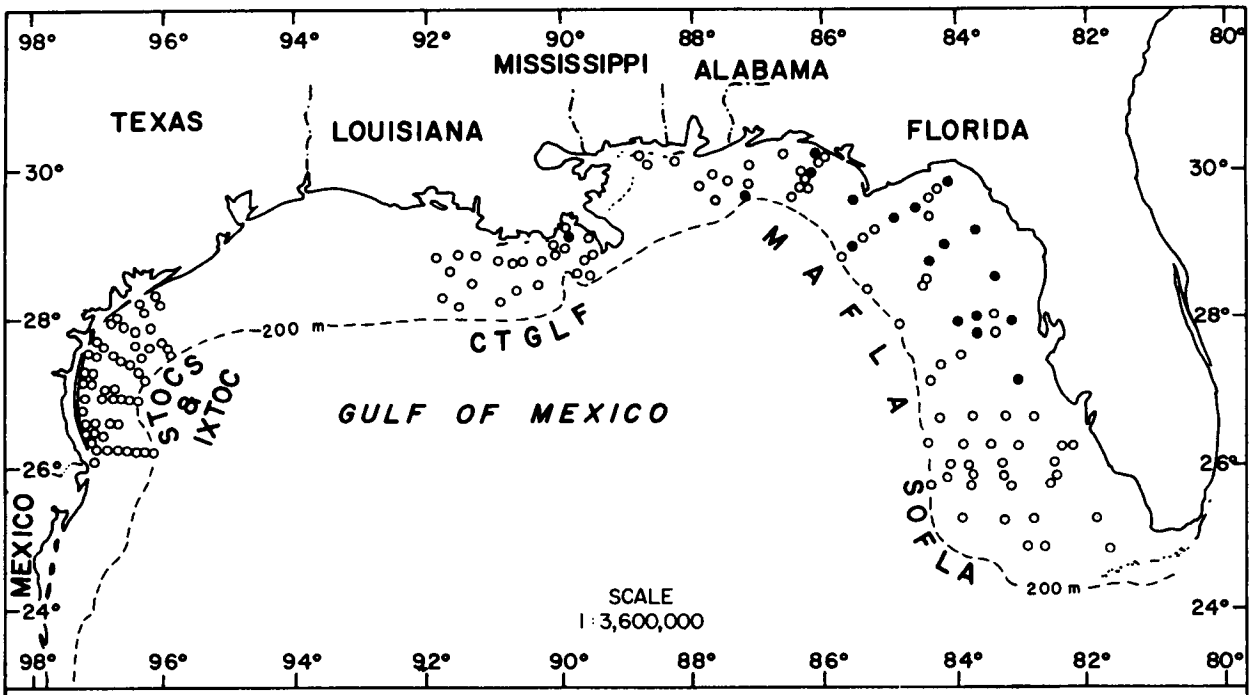

Figure 19-17. Distribution of Paranaitis polynoides on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

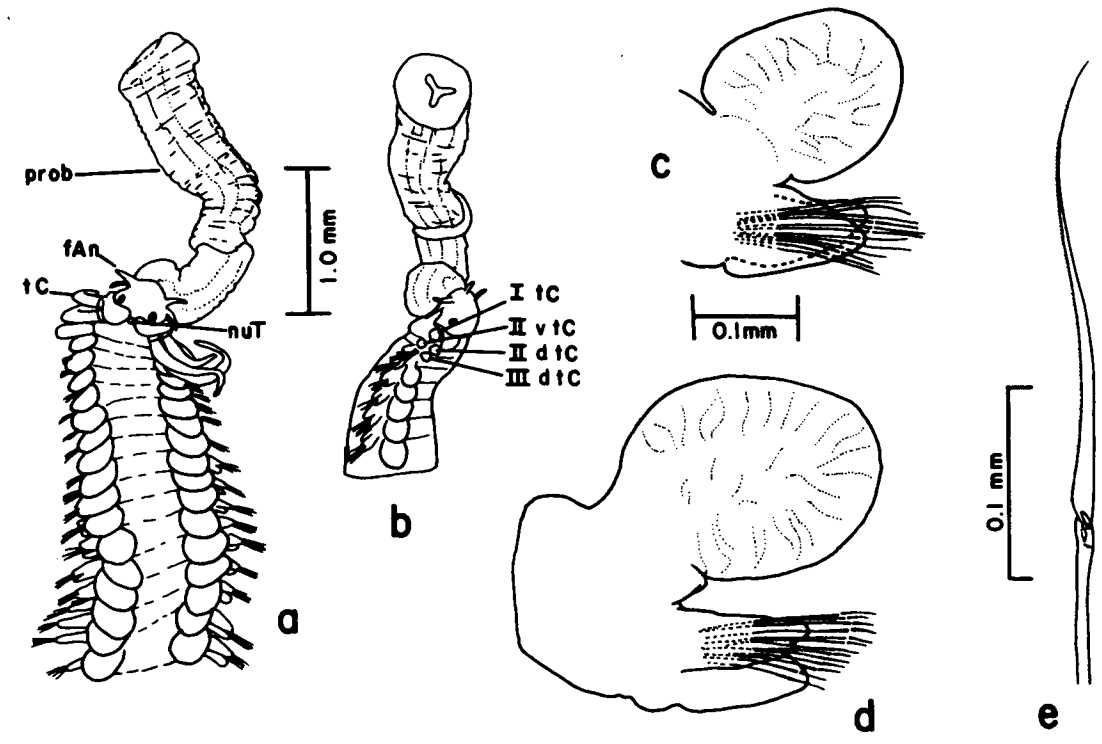

Figure 19-18. Paranaitis polynoides: a, anterior end, dorsal view; b, same, dorsolateral view (tentacular cirri removed); c, anterior parapodium, posterior view; d, posterior parapodium, posterior view; e, typical seta.

88°03'08"W, 3.8 m (1 spec.); off Dauphin Island, Alabama, COE Sta. 585-2-4/81, 30°10.78'N, 88°13.98'W, 13.9 m, sand (1 spec.).
California--Monterey Bay, J. P. Moore ID. (holotype, USNM 17267).
DESCRIPTION:
Length, to 63.0 mm (previously reported to 95 mm); width, to 2.5 mm (previously reported to 4.0 mm). Body pale, without pigmentation dorsally; complete specimens with over 183 segments. Prostomium oval, with median occipital lingula at posterior margin; nuchal tubercle at posterior end of lingula (Figure 19-18a). Frontal antennae located on anterolateral margins of prostomium. Eyes black. Proximal third of proboscis smooth, distal two-thirds with transverse folds. Tentacular formula: $(1 + 0\frac{1}{1}) + S\frac{1}{N}$ (Figure 19-18b). Tentacular cirri filiform, attached to cirrophores basally. Tentacular cirri of segment 1 extending back to segment 6; dorsal tentacular cirri of segment 2 extending back to segment 10; ventral tentacular cirri of segment 2 extending back to segment 6; dorsal tentacular cirri of segment 3 extending back to segment 9; ventral cirri of segment 3 normal, oval. Setae beginning on segment 3. Parapodial lobes notched distally, equal in length. Dorsal cirri rounded anteriorly (Figure 19-18c); oval, nearly symmetrical posteriorly (Figure 19-18d), overlapping on the dorsum. Ventral cirri oblong, about same length as parapodial lobes. Setae all compound spinigers with 1-2 large teeth at head of shaft; blades long, finely serrate to tip (Figure 19-18e).
REMARKS: Some BLM-OCS specimens of P. polynoides were incorrectly identified as P. speciosa. Paranaitis polynoides is newly reported from the Gulf of Mexico.
PREVIOUSLY REPORTED HABITAT: Intertidal to 2,480 m; burrowing in sand mixed with mud, gravel and shell.
GULF OF MEXICO BLM-OCS OCCURRENCE: Scattered occurrences off west coast of Florida and one station off Louisiana (Figure 19-17); 10-82 m; coarse to very fine sand, silty sand.
DISTRIBUTION: North Carolina, Gulf of Mexico, western Pacific, Sea of Japan, western California.

Paranaitis speciosa (Webster, 1880)
Figures 19-19, 20a-e

Anaitis speciosa Webster, 1886:131, figs. 4-8, 9.
Paranaitis speciosa--Pettibone, 1963:75, fig. 17a.
Paranaitis speciosa--Day, 1973:22.
Paranaitis speciosa--Gardiner, 1976:110, fig. 6q,r.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2209I-7/76 (1 spec.), 2209E-2/78 (1 spec.), 2422E-7/76 (1 spec.), 2528D-8/77 (1 spec.), 2640H-9/77 (1 spec., USNM 89977), 2748G-2/78 (1 spec.).
Supplementary Material:
Gulf of Mexico--Mobile Bay, Alabama, Mobil Oil Sta. 051C-4/79, 30°15'13"N, 88°03'08"W, 6.2 m, clayey sand (1 spec.), 052D-7/78, 30°15'13"N, 88°03'08"W, 6.5 m, sandy clay, (1 spec.); Louisiana, off New Orleans, LOOP Sta. 467-5-1/80, 29°06'17"N, 90°07'45"W, 8.8 m (1 spec.).
New Jersey--Great Egg Harbor, H. E. Webster coll./ID. (4 spec., USNM 340).

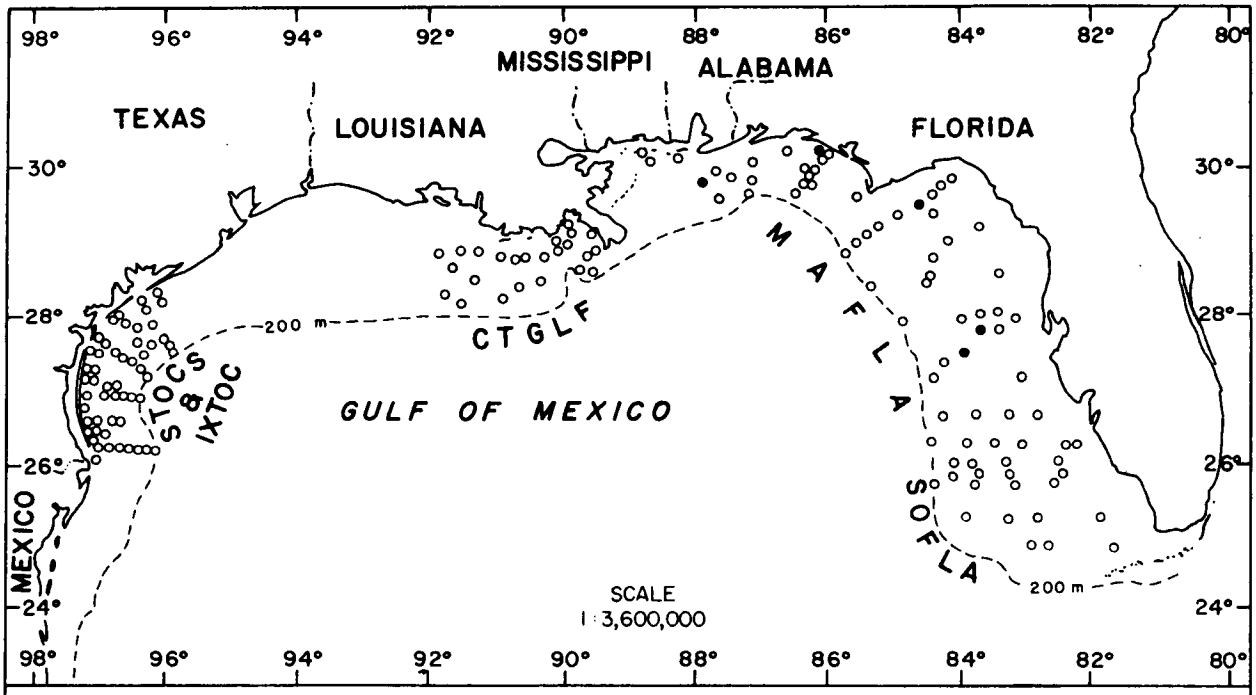

Figure 19-19. Distribution of Paranaitis speciosa on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

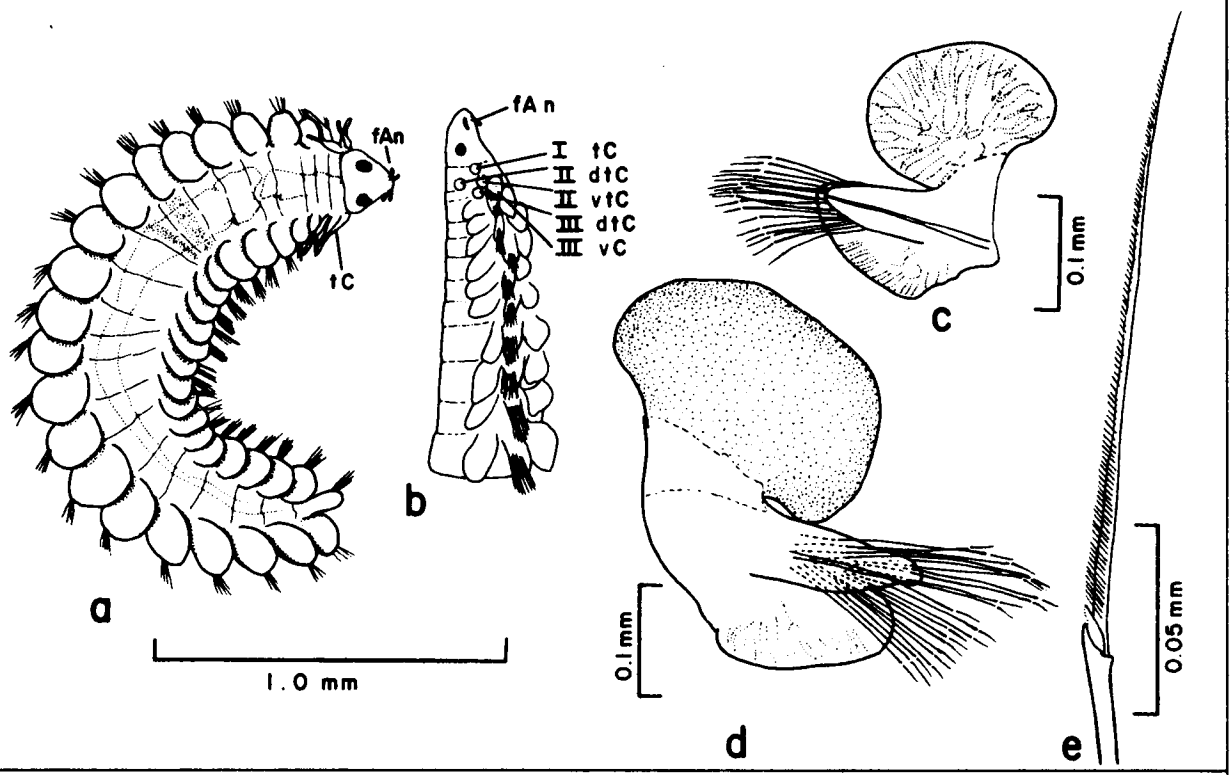

Figure 19-20. Paranaitis speciosa: a, anterior end, dorsal view; b, same, dorsolateral view (tentacular cirri removed); c, anterior parapodium, anterior view; d, posterior parapodium, anterior view; e, typical seta.

DESCRIPTION:
Length, to 6.0 mm (previously reported to 18 mm); width, to 1.5 mm (previously reported to 3 mm). Body pale, not pigmented dorsally except on segments 9 and 10; complete specimens with up to 39 segments. Prostomium triangular, entire posteriorly; nuchal tubercle absent (Figure 19-20a). Frontal antennae filiform, present at anterior margin of prostomium. Eyes large, black. Tentacular formula: $(1 + 0\frac{1}{1}) + S\frac{1}{1}$ (Figure 19-20b). Tentacular cirri clavate, without cirrophores. Tentacular cirri of segment 1 extending posteriorly to segment 4; dorsal tentacular cirri of segment 2 extending posteriorly to segment 5; dorsal tentacular cirri of segment 3 extending posteriorly to segment 5; ventral cirri of segment 3 normal, oval. Setae beginning on segment 3. Parapodial lobes entire distally (Figure 19-20c). Dorsal cirri asymmetrical throughout, superior margin longer than inferior (Figure 19-20d); overlapping dorsally. Ventral cirri oval, extending to tips of parapodial lobes or beyond. Setae all compound spinigers with two large teeth and several smaller teeth on shaft head; blades long, finely serrate to tip (Figure 19-20e).
REMARKS: The proboscis was not observed in Gulf of Mexico BLM-OCS specimens, but was previously reported as being papillose (Pettibone, 1963:75).
PREVIOUSLY REPORTED HABITAT: Intertidal to 185 m; found in beds of Mytilus edulis, on tubes of Diopatra cuprea, in sands, muds, clays and shells.
GULF OF MEXICO BLM-OCS OCCURRENCE: Scattered occurrences off western Florida and Alabama (Figure 19-19); 24-50 m; sands, silts, clays.
DISTRIBUTION: Maine to North Carolina; Gulf of Mexico.

Genus **Nereiphylla** Blainville, 1828

TYPE SPECIES: Nereiphylla paretti Blainville, 1828.
REFERENCES:
Hartman, 1945:14; 1951a:34.
Fauchald, 1977a:49.
DIAGNOSIS: Prostomium small, rounded, with four fusiform frontal antennae, without median antenna or nuchal tubercle. One pair of large eyes. Proboscis cylindrical, with diffuse papillae, or wrinkled. Segments 1 and 2 fused, reduced dorsally. Four pairs of flattened tentacular cirri. Dorsal cirri rounded or cordate. Parapodia uniramous with composite spinigers. Pygidium with two conical anal cirri.

Nereiphylla fragilis Webster, 1879
Figures 19-21, 22a-e

Phyllodice (sic) fragilis Webster, 1879:214, pl. 3, figs. 32-37.
Nereiphylla fragilis--Hartman, 1945:14, pl. 2, figs. 1-4; 1951a:34.
Phyllodoce (Nereiphylla) fragilis--Day, 1973:22.
Phyllodoce (Nereiphylla) fragilis--Gardiner, 1976:112, fig. 7c-g.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2211F-8/77 (1 spec.), 2211H-8/77 (1 spec.), 2316I-11/77 (1 spec.), 2316K-11/77 (1 spec., USNM 89978), 2422E-7/76 (1 spec).

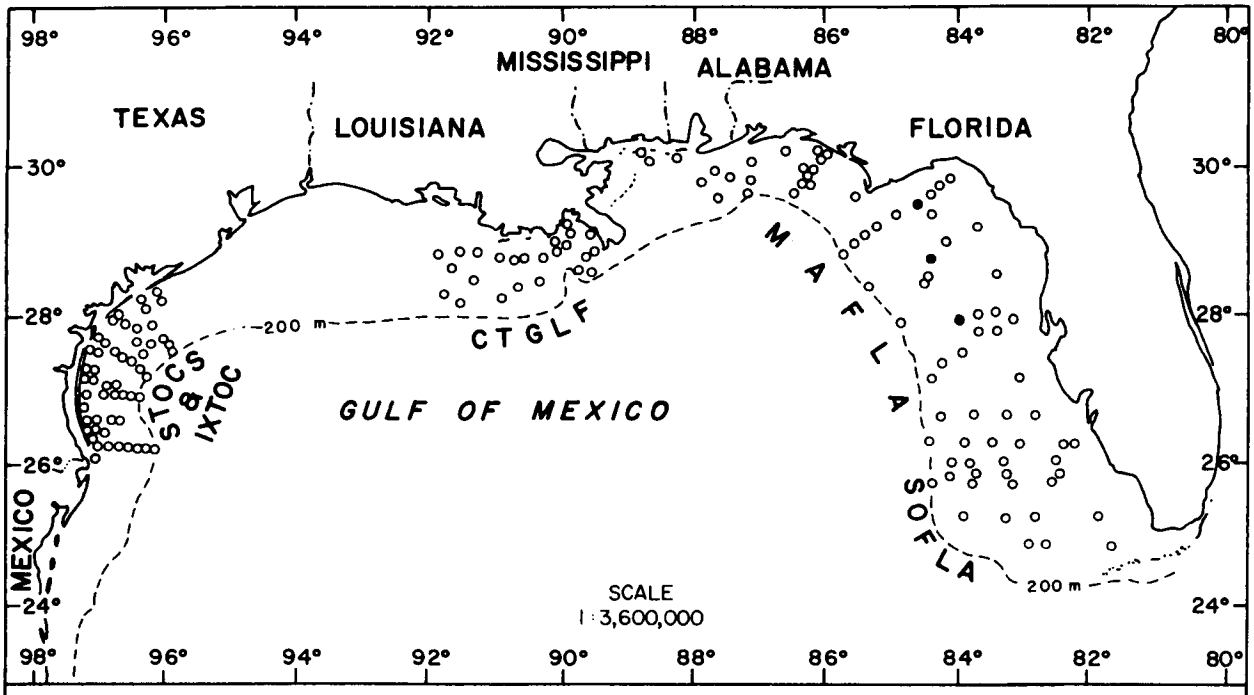

Figure 19-21. Distribution of Nereiphylla fragilis on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

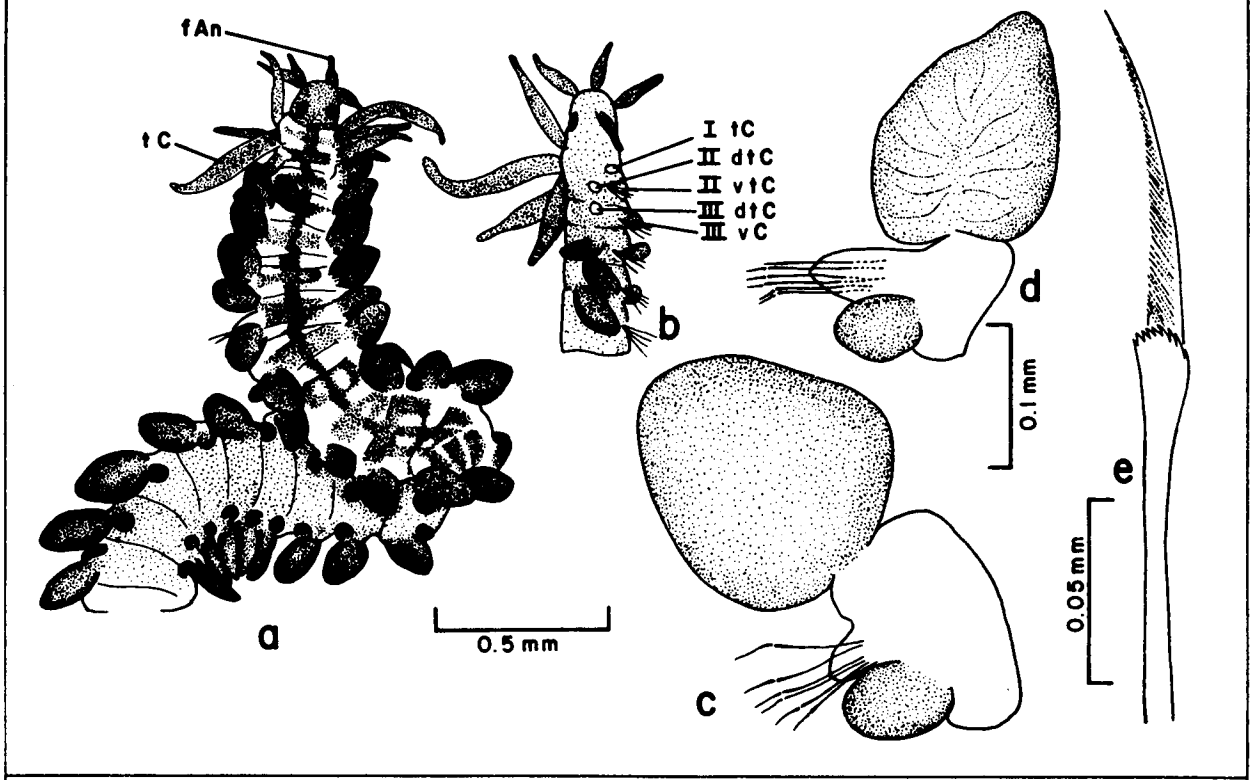

Figure 19-22. Nereiphylla fragilis: a, anterior end, dorsal view; b, same, dorsolateral view (right tentacular cirri removed); c, seventh parapodium, anterior view; d, posterior parapodium, anterior view; e, typical seta.

DESCRIPTION:
Length, 4.0+ mm (previously reported to 4 mm); width, to 0.2 mm (previously reported to 0.5 mm). Body brown, heavily pigmented, without black bands dorsally; all specimens incomplete with up to 43 setigers. Prostomium rounded anteriorly, entire posteriorly; without nuchal tubercle (Figure 19-22a). Eyes black. Frontal antennae fusiform. Tentacular formula: $(1 + S\frac{1}{1}) + S\frac{1}{N}$ (Figure 19-22b). Tentacular cirri flattened, attached to short cirrophores basally. Tentacular cirri of segment 1 extending back to segment 6; dorsal tentacular cirri of segment 2 broadly flattened, extending back to segment 9, ventral tentacular cirri of segment 2 filiform, extending back to segment 5; dorsal tentacular cirri of segment 3 flattened, extending back to segment 6; ventral cirri of segment 3 short, ovate. Setae present on segments 2 and 3. Parapodial lobes notched distally. Dorsal cirri ovate anteriorly (Figure 19-22c), cordate posteriorly (Figure 19-22d). Setae as compound spinigers with 6-8 teeth at head of shaft; blades short, serrate with diagonal striations (Figure 19-22e).
REMARKS: Nereiphylla fragilis may be synonymous with Phyllodoce (Nereiphylla) nana (Fauvel, 1923:156), since the two differ only in the shape of the dorsal cirri (Gardiner, 1976:112).
PREVIOUSLY REPORTED HABITAT: Intertidal to 40 m; on pilings, shells, oysters and sponges.
GULF OF MEXICO BLM-OCS OCCURRENCE: Three stations off west coast of Florida (Figure 19-21); 24-43 m; coarse sand, silty fine sand.
DISTRIBUTION: Virginia to Florida, Gulf of Mexico.

Genus **Genetyllis** Malmgren, 1865

TYPE SPECIES: Genetyllis lutes Malmgren, 1865.
REFERENCES:
Ushakov, 1972:126.
Fauchald, 1977a:49.
DIAGNOSIS: Prostomium rounded with four frontal antennae, without median antenna or nuchal tubercle. Proboscis with scattered soft papillae. Segments 1 and 2 fused dorsally, reduced. Four pairs of cylindrical tentacular cirri. Setae present from segment 2. Dorsal cirri cordate or oval. Parapodia uniramous with composite spinigers. Pygidium with two anal cirri.

Key to the Gulf of Mexico BLM-OCS Species of Genetyllis

1a. Dorsal tentacular cirri of segment 2 long, extending beyond segment 10 (Figure 19-24a,b); ventral cirri extending beyond parapodial lobes posteriorly (Figure 19-24d,e) . . . . . **Genetyllis sp. A**, p. 19-29

1b. Dorsal tentacular cirri of segment 2 short, extending only to segment 5 (Figure 19-26a); ventral cirri not extending beyond parapodial lobes posteriorly (Figure 19-26d) . . . . . **Genetyllis castanea**, p. 19-29

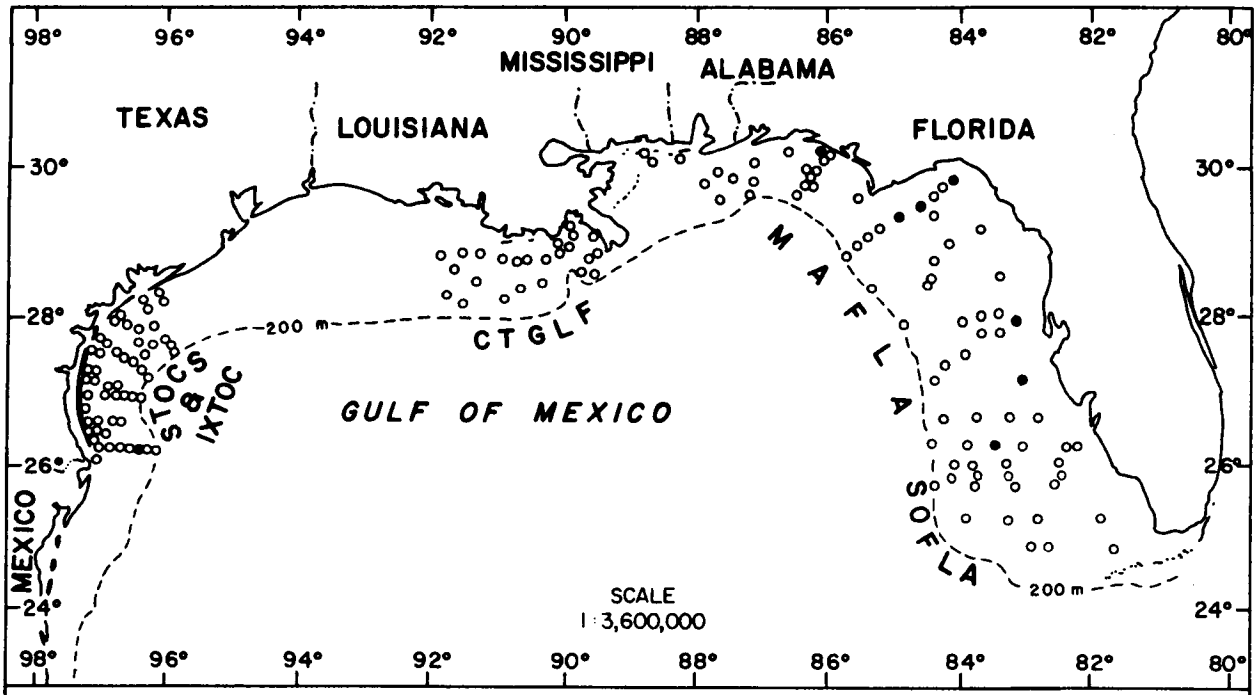

Figure 19-23. Distribution of Genetyllis sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

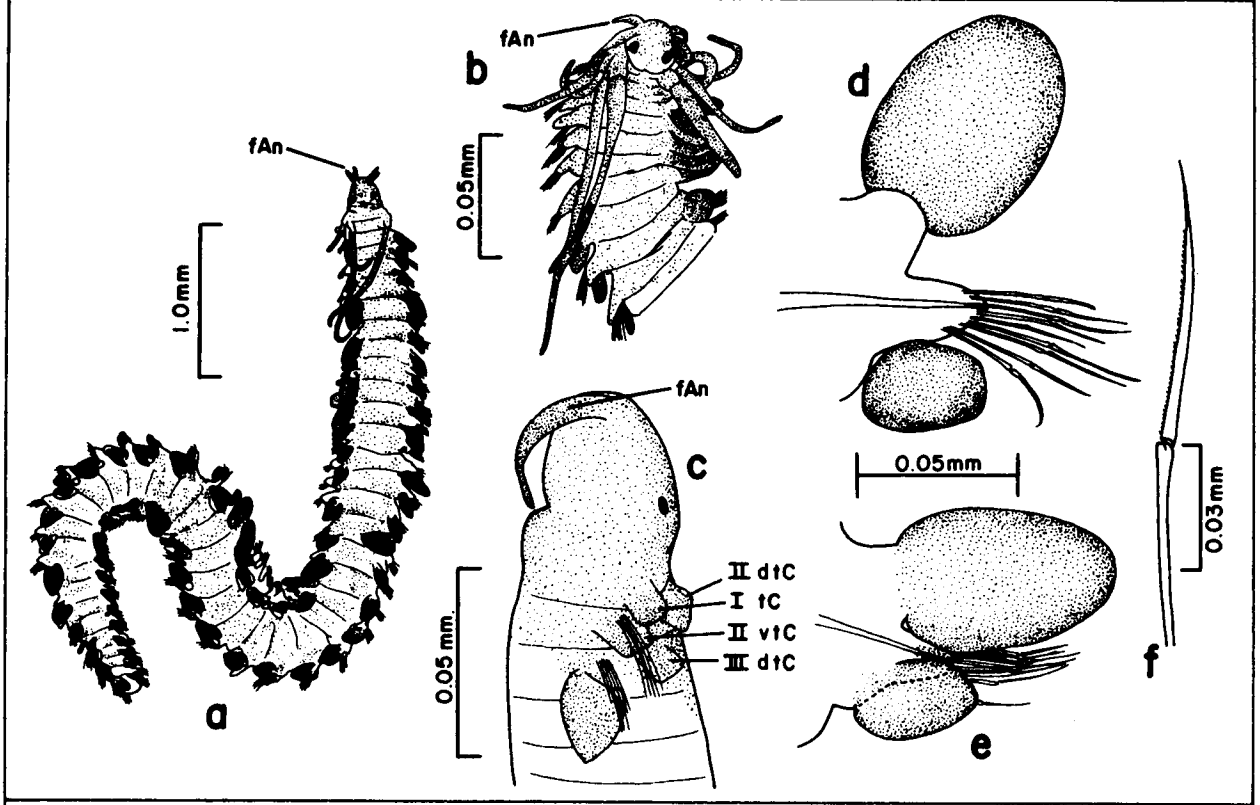

Figure 19-24. Genetyllis sp. A: a, whole worm, dorsal view; b, anterior end, dorsal view; c, same, lateral view (tentacular cirri removed); d, anterior parapodium, anterior view; e, posterior parapodium, anterior view; f, typical seta.

Genetyllis sp. A
Figures 19-23, 24a-f

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2104D-7/76 (1 spec.), 2207D-8/77 (1 spec.), 2207J-8/77 (1 spec.), 2419I-8/77 (1 spec., USNM 89980), 2422D-7/76 (1 spec.), 2423E-7/76 (1 spec.), 2528K-8/77 (1 spec.), 2528E-2/78 (1 spec.), 2851H-8/76 (1 spec.); STOCS 6/IV-W/76 (1 spec., USNM 89979).
DESCRIPTION:
Length, 6.0+ mm; width, to 0.2 mm. Body small, heavily pigmented, uniformly brown dorsally (Figure 19-24a); all specimens incomplete with up to 55 setigers. Prostomium nearly heart-shaped, with lateral incisions posteriorly; without nuchal tubercle (Figure 19-24b). Eyes black. Frontal antennae fusiform, dorsal pair longer. Tentacular formula: $(1 + S\frac{1}{1}) + S\frac{1}{N}$ (Figure 19-24c); tentacular cirri arising from cirrophores. First pair of tentacular cirri filiform, extending back to segment 7; dorsal tentacular cirri of segment 2 long, rounded basally, extending back to segment 12; ventral tentacular cirri of segment 2 filiform, extending back to segment 7; dorsal tentacular cirri of segment 3 long, extending back to segment 11; ventral cirri of segment 3 short, leaf-like. Setae present on second and third tentacular segments. Parapodial lobes not noticeably notched distally. Dorsal cirri oval anteriorly (Figure 19-24d), more cordate posteriorly (Figure 19-24e). Ventral cirri ovate, extending beyond parapodial lobes throughout. Setae all compound spinigers, blades serrate (Figure 19-24f).
REMARKS: Genetyllis sp. A most closely resembles Genetyllis castanea (USNM 52882; S. Gardiner ID.), but differs from the latter in having long tentacular cirri, oval dorsal cirri anteriorly and ventral cirri exceeding the parapodial length throughout.
GULF OF MEXICO BLM-OCS OCCURRENCE: Scattered occurrences off west coast of Florida and one location off southern Texas (Figure 19-23); 10-65 m; coarse to fine-very fine sand, silty fine sand, clayey sand.

Genetyllis castanea (Marenzeller, 1879)
Figures 19-25, 26a-e

Carobia castanea Marenzeller, 1879:127, pl. 3, fig. 2a-c.
Phyllodoce (Genetyllis) castanea--Day, 1967:149, fig. 5.3.e,f; 1973:22.
Genetyllis castanea--Ushakov, 1972:127.
Phyllodoce (Genetyllis) castanea--Gardiner, 1976:113, fig. 7h-k.
Phyllodoce (Genetyllis) castanea--Hartmann-Schröder, 1979b:82, figs. 23-26.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 2D-11/80 (1 spec., USNM 89981).
Supplementary Material:
North Carolina--Brunswick County, Sept. 1974, S. L. Gardiner coll./ID. (1 spec., USNM 52882).
DESCRIPTION:
Length, 40+ mm (previously reported to 40.0 mm); width, to 1.5 mm (previously reported to 3.0 mm). Body reddish-brown with faint segmental bars dorsally; BLM-OCS specimen incomplete with 82 setigers. Prostomium

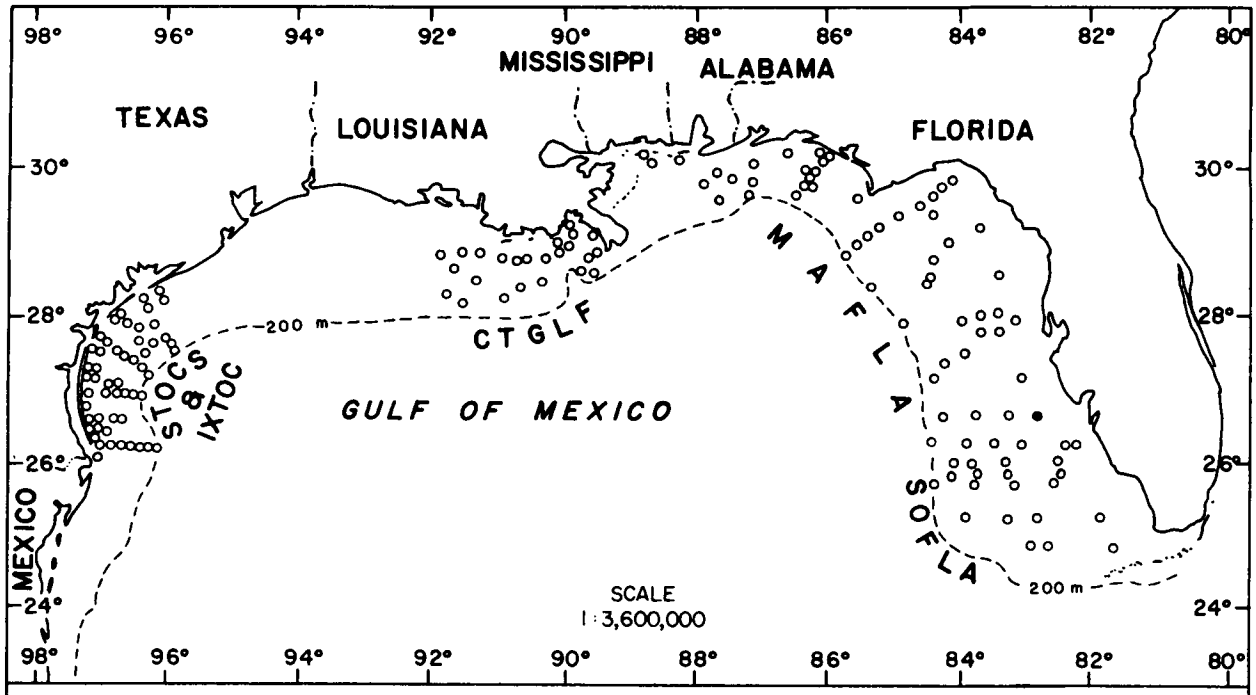

Figure 19-25. Distribution of Genetyllis castanea on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

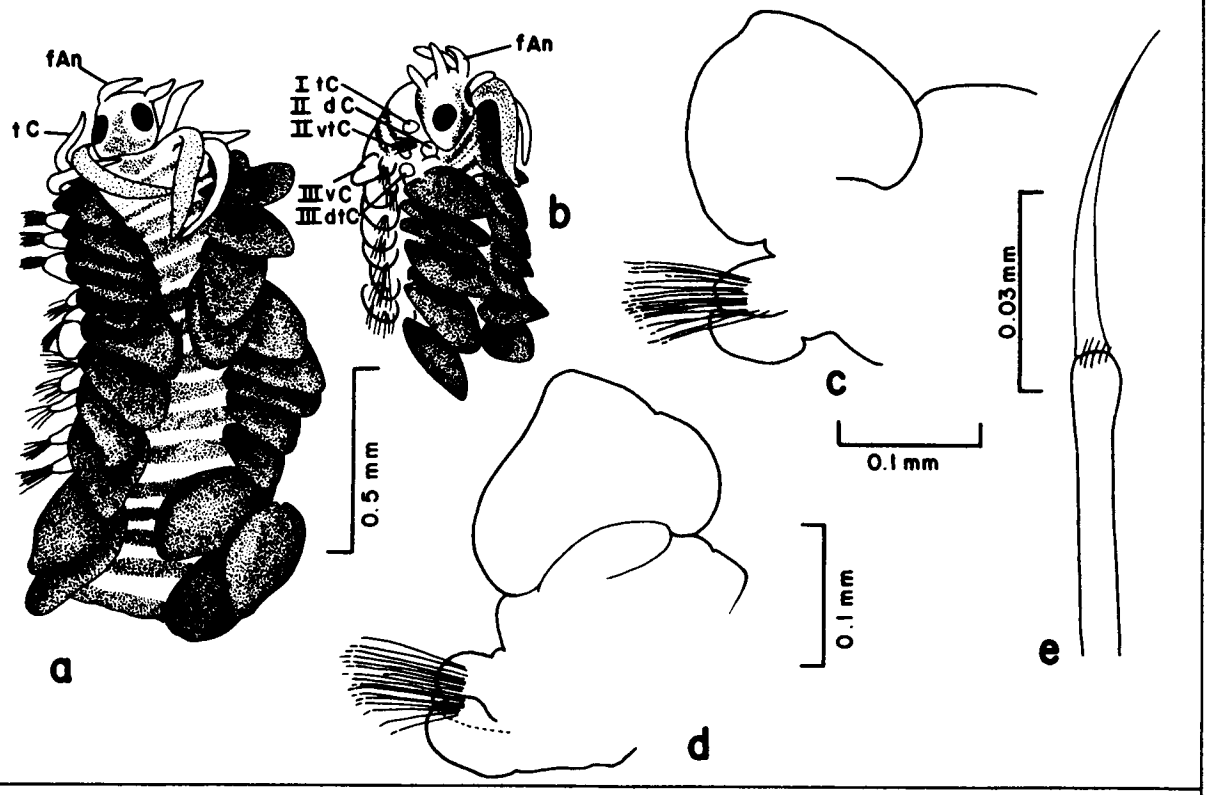

Figure 19-26. Genetyllis castanea: a, anterior end, dorsal view; b, same, dorsolateral view (tentacular cirri removed); c, anterior parapodium, anterior view; d, posterior parapodium, anterior view; e, typical seta.

globular, without nuchal tubercle (Figure 19-26a); eyes large, black. Frontal antennae fusiform, located at anterior margin of prostomium. Tentacular formula: $(1 + S\frac{1}{1}) + S\frac{1}{N}$ (Figure 19-26b). Tentacular cirri of segment 1 extending back to segment 5; dorsal tentacular cirri of segment 2 extending back to segment 6; ventral tentacular cirri of segment 2 extending back to segment 4; dorsal tentacular cirri of segment 3 extending back to segment 8; ventral cirri of segment 3 normal, oval. Setae present on second and third tentacular segments. Parapodial lobes notched distally, equal in length. Dorsal cirri cordate throughout (Figure 19-26c), posteriorly becoming wider basally (Figure 19-26d). Ventral cirri ovate, extending to tips of parapodial lobes. Dorsal and ventral cirri heavily pigmented. Setae as compound spinigers with 8-9 teeth at head of shaft (Figure 19-26e); blades long, finely serrate to tip.
REMARKS: Genetyllis castanea is similar to Nereiphylla fragilis, differing only in the relative flatness of the second and third pairs of dorsal tentacular cirri. Gardiner examined live specimens of N. fragilis and found flattened, lanceolate dorsal tentacular cirri. It would be interesting to examine live specimens of G. castanea to see if they, too, have lanceolate tentacular cirri which become somewhat distorted upon fixation.
PREVIOUSLY REPORTED HABITAT: Intertidal to 500 m; on coral and pilings.
GULF OF MEXICO BLM-OCS OCCURRENCE: One station off west coast of Florida (Figure 19-21); 24 m; medium sand.
DISTRIBUTION: Widely distributed in tropical and subtropical oceans.

Genus Anaitides Czerniavsky, 1882

TYPE SPECIES: Phyllodoce groenlandica Czerniavsky, 1882.
REFERENCES:
Hartmann-Schröder, 1971:104.
Fauchald, 1977a:48.
DIAGNOSIS: Prostomium rounded or heart-shaped; with four frontal antennae anteriorly; with occipital incision posteriorly, usually containing nuchal tubercle. Posterior margin of prostomium straight or with lobes overlapping segment 1. One pair of eyes. Proboscis cylindrical or hexihedral with oval or conical papillae in rows basally; smooth distally. Segments 1 and 2 partially fused dorsally or separate. Four pairs of cylindrical or slightly flattened tentacular cirri on first three segments. Dorsal cirri cordate, ovate or rounded; ventral cirri elongate or rounded. Parapodia uniramous with composite spinigers. Pygidium with two anal cirri tapering to point.
REMARKS: Some workers (Pettibone, 1963; Ushakov, 1972) considered Anaitides a subgenus under the genus Phyllodoce. While many morphological characters are similar between these two genera, the basal proboscidial papillae occur in rows in Anaitides and are scattered in Phyllodoce.

Key to the Gulf of Mexico BLM-OCS Species of Anaitides

1a. Segment 3 with setae. 2
1b. Segment 3 without setae 3

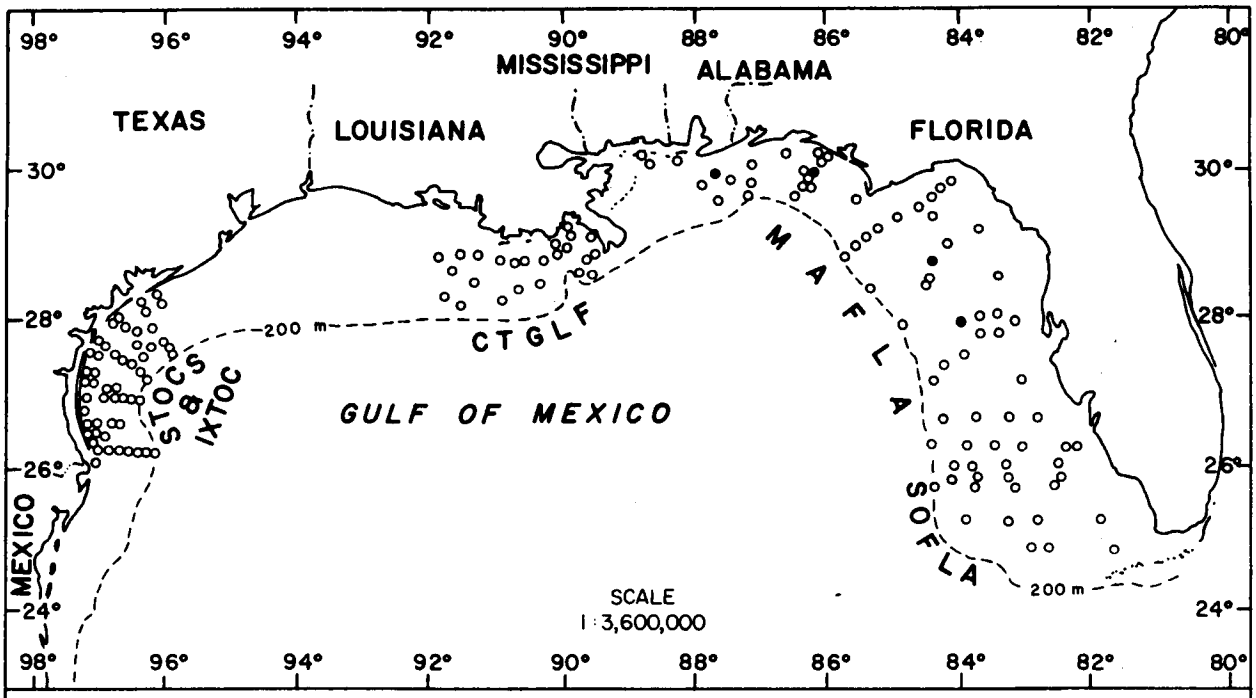

Figure 19-27. Distribution of Anaitides mucosa on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

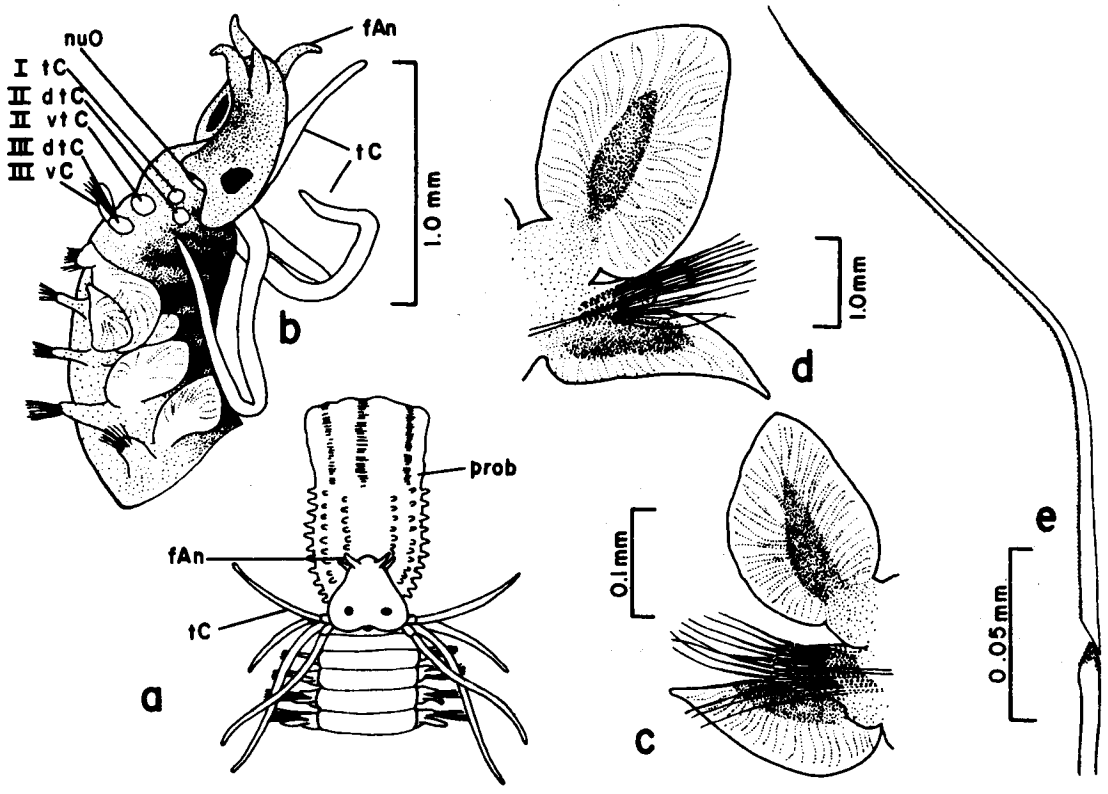

Figure 19-28. Anaitides mucosa: a, anterior end, dorsal view; b, same, dorsolateral view (tentacular cirri removed); c, anterior parapodium, anterior view; d, posterior parapodium, anterior view; e, typical seta (Figure a after Pettibone 1963, fig. 18f).

2a. Ventral cirri with pointed tips extending beyond parapodial lobes anteriorly (Figure 19-28c) . . . . . .**Anaitides mucosa**, p. 19-33

2b. Ventral cirri with rounded tips, about same length as parapodial lobes anteriorly (Figure 19-30e) . . . . . **Anaitides groenlandica**, p. 19-35

3a. Parapodial lobes dissimilar in length, superior lobe much longer (Figure 19-32f); dorsal cirri with rounded tips . . . . . **Anaitides longipes**, p. 19-37

3b. Parapodial lobes similar in length (Figure 19-34c); dorsal cirri with pointed tips . . . . . .**Anaitides madeirensis**, p. 19-39

Anaitides mucosa Oersted, 1843
Figures 19-27, 28a-e

Phyllodoce (Anaitides) mucosa--Fauvel, 1923:152, fig. 54a-e.
Phyllodoce (Anaitides) mucosa--Pettibone, 1963:81, fig. 18f,g.
Anaitides mucosa--Hartman, 1968:235, figs. 1, 2.
Anaitides mucosa--Hartmann-Schröder, 1971:111, fig. 35c-e.
Phyllodoce (Anaitides) mucosa--Ushakov, 1972:135, pl. 6, fig. 1.
Phyllodoce (Anaitides) mucosa--Day, 1973:22.
Phyllodoce (Anaitides) mucosa--Gardiner, 1976:113, fig. 7 1-m.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2211D-7/76 (1 spec.), 2316E-7/76 (1 spec.), 2531-8/77 (1 spec., USNM 56131), 2641H-6/75 (1 spec.).
Supplementary Material:
North Carolina--Beaufort, J. H. Day coll./ID. (6 spec., USNM 51024).
DESCRIPTION:
Length, 60+ mm (previously reported to 100 mm); width, to 1.0 mm (previously reported to 3 mm). Body brown with transverse black bands; all specimens incomplete with up to 170 segments. Prostomium heart-shaped, notched posteriorly; nuchal tubercle present in notch (Figure 19-28a). Eyes black. Frontal antennae filiform. Proboscis with papillae in ten rows basally. Nuchal organs located anterior to first tentacular cirri but may be retracted. Tentacular formula: $(1 + 0\frac{1}{1}) + S\frac{1}{N}$ (Figure 19-28b). Tentacular cirri filiform, attached to cirrophores basally. Tentacular cirri of segment 1 extending back to segment 6; dorsal tentacular cirri of segment 2 extending back to segment 14; ventral tentacular cirri of segment 2 extending back to segment 12; dorsal tentacular cirri of segment 3 extending back to segment 6; ventral cirri of segment 3 normal. Setae present from third tentacular segment. Parapodial lobes notched distally, equal in length. Dorsal cirri distally tapering anteriorly (Figure 19-28c), more rounded posteriorly (Figure 19-28d). Ventral cirri pointed, extending well beyond parapodial lobes throughout. All setae as compound spinigers with numerous teeth on shaft head; blades long, serrate to tip (Figure 19-28e).
REMARKS: One specimen was observed with irregular rows of papillae basally on the proboscis, but otherwise it matched the characters for A. mucosa.
PREVIOUSLY REPORTED HABITAT: Intertidal to 173 m; found on pilings, muddy sand and sand mixed with gravel.

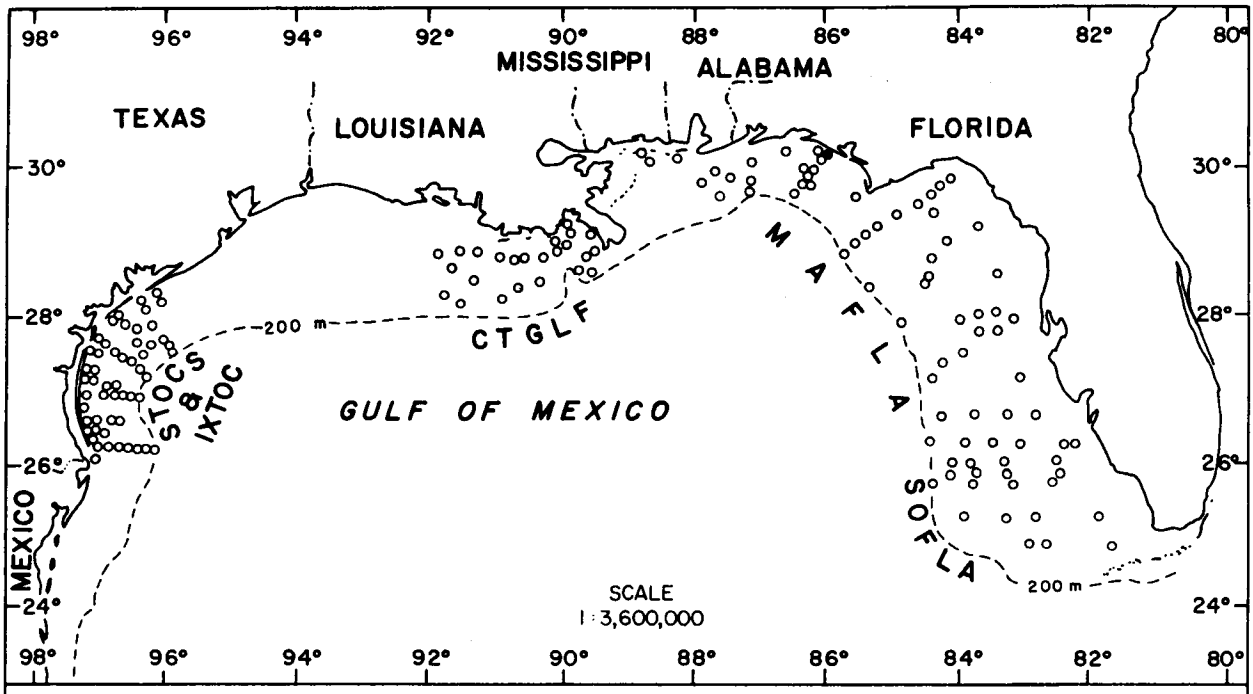

Figure 19-29. Distribution of Anaitides groenlandica on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

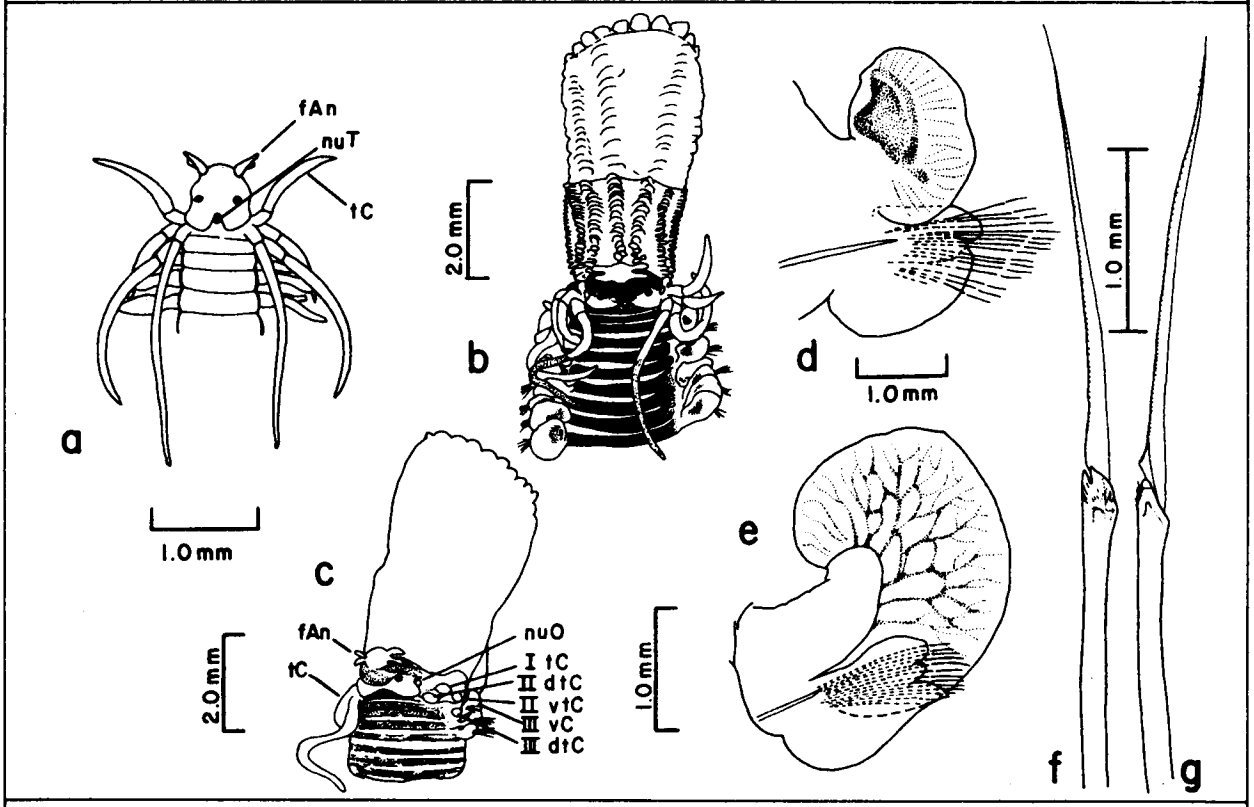

Figure 19-30. Anaitides groenlandica: a, anterior end, dorsal view; b, same (proboscis everted); c, same, dorsolateral view (tentacular cirri removed); d, eighth parapodium, posterior view; e, posterior parapodium, posterior view; f, typical seta; g, same, lateral view (Figure a after Gardiner 1976, fig. 7n).

GULF OF MEXICO BLM-OCS OCCURRENCE: Scattered occurrences off Florida (Figure 19-27); 35-45 m; coarse sand, silty fine sand.
DISTRIBUTION: Mediterranean, France, North Atlantic, Hudson Bay to the Gulf of Mexico, Alaska to Mexico.

Anaitides groenlandica Oersted, 1843
Figures 19-29, 30a-g

Phyllodoce (Anaitides) groenlandica--Pettibone, 1963:80, fig. 18e.
Anaitides groenlandica--Hartmann-Schröder, 1971:107, fig. 34d-f.
Phyllodoce (Anaitides) groenlandica--Ushakov, 1972:133, pl. 5, figs. 1-4.
Phyllodoce (Anaitides) groenlandica--Day, 1973:22.
Phyllodoce (Anaitides) groenlandica--Gardiner, 1976:113, fig. 7n-o.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2529J-7/76 (1 spec., USNM 89982).
Supplementary Material:
North Carolina--Cape Lookout, C. Jenner coll., S. L. Gardiner ID. (1 spec., USNM 52883); IEC 732MO 008-005, 30°09.5'N, 88°08.6'W, 16 m, sand, June 1980 (1 spec.).
DESCRIPTION:
Length, to 67 mm (previously reported to 270 mm); width, to 4 mm (previously reported to 6 mm). Body yellowish-brown with wide, transverse black segmental bands; BLM-OCS specimen with 54 segments. Prostomium cordate, elongate when proboscis is retracted (Figure 19-30a), broadly cordate when proboscis is everted (Figure 19-30b,c). Prostomium notched posteriorly, with nuchal tubercle. Eyes small, black. Frontal antennae short, thick. Proboscis with 12 rows of ovate papillae along proximal third; remaining two-thirds with raised ridges continuing to distal ring of 17 large, globular papillae (Figure 19-30b). Nuchal organs located above tentacular cirri of segment 1. Tentacular formula: $(1 + 0\frac{1}{1}) + S\frac{1}{N}$ (Figure 19-30c). Tentacular cirri filiform, attached to cirrophores. Tentacular cirri of segment 1 extending back to segment 8; dorsal tentacular cirri of segment 2 extending back to segment 16; ventral tentacular cirri of segment 2 extending back to segment 7; dorsal tentacular cirri of segment 3 extending back to segment 13; ventral cirri of segment 3 ovate. Setae present from third tentacular segment. Parapodial lobes notched distally, similar in length. Dorsal and ventral cirri ovate anteriorly (Figure 19-30d), more pointed posteriorly (Figure 19-30e). Setae with two large teeth at tip of shaft when viewed at an angle (Figure 19-30f), and many smaller teeth laterally (Figure 19-30g); blades finely serrate to tip.
REMARKS: Anaitides groenlandica is newly reported from the Gulf of Mexico.
PREVIOUSLY REPORTED HABITAT: Intertidal to 1700 m; found on mud, sand, shell, gravel, mixed bottoms.
GULF OF MEXICO BLM-OCS OCCURRENCE: One station off Florida (Figure 19-29); 38 m; coarse sand.
DISTRIBUTION: Arctic, Iceland to English Channel, Hudson Bay to North Carolina, Gulf of Mexico, Bering Sea to southern California, Japan.

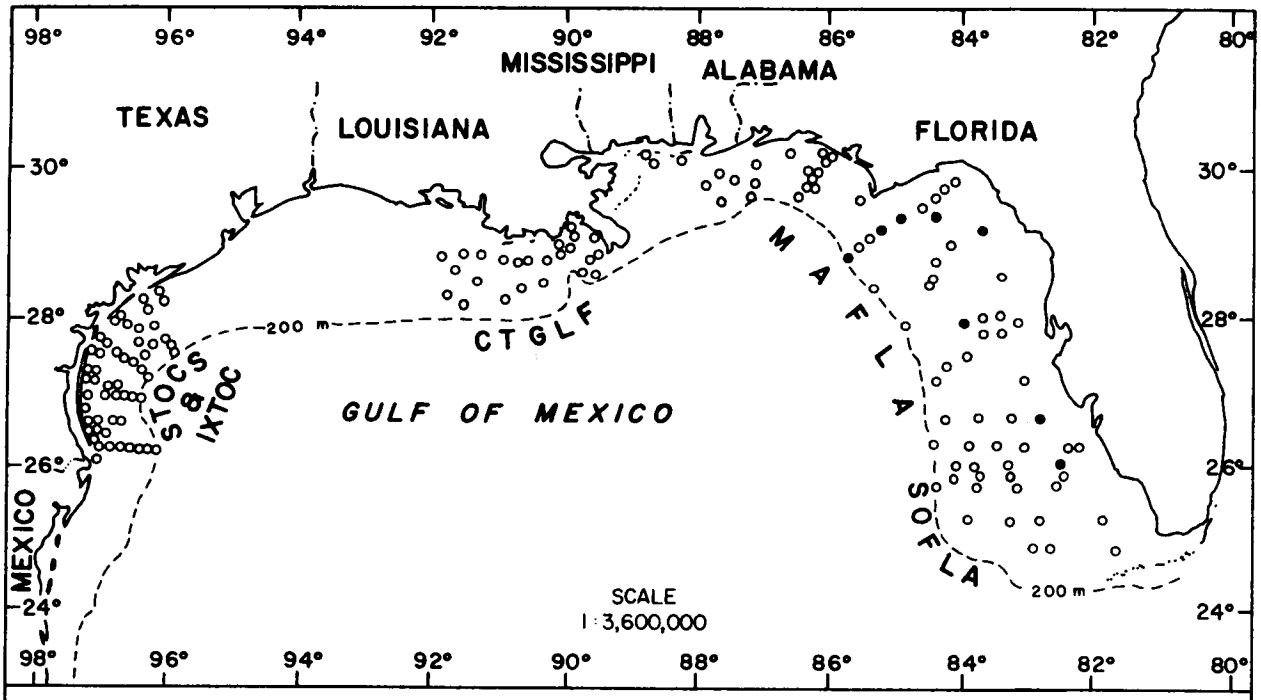

Figure 19-31. Distribution of Anaitides longipes on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

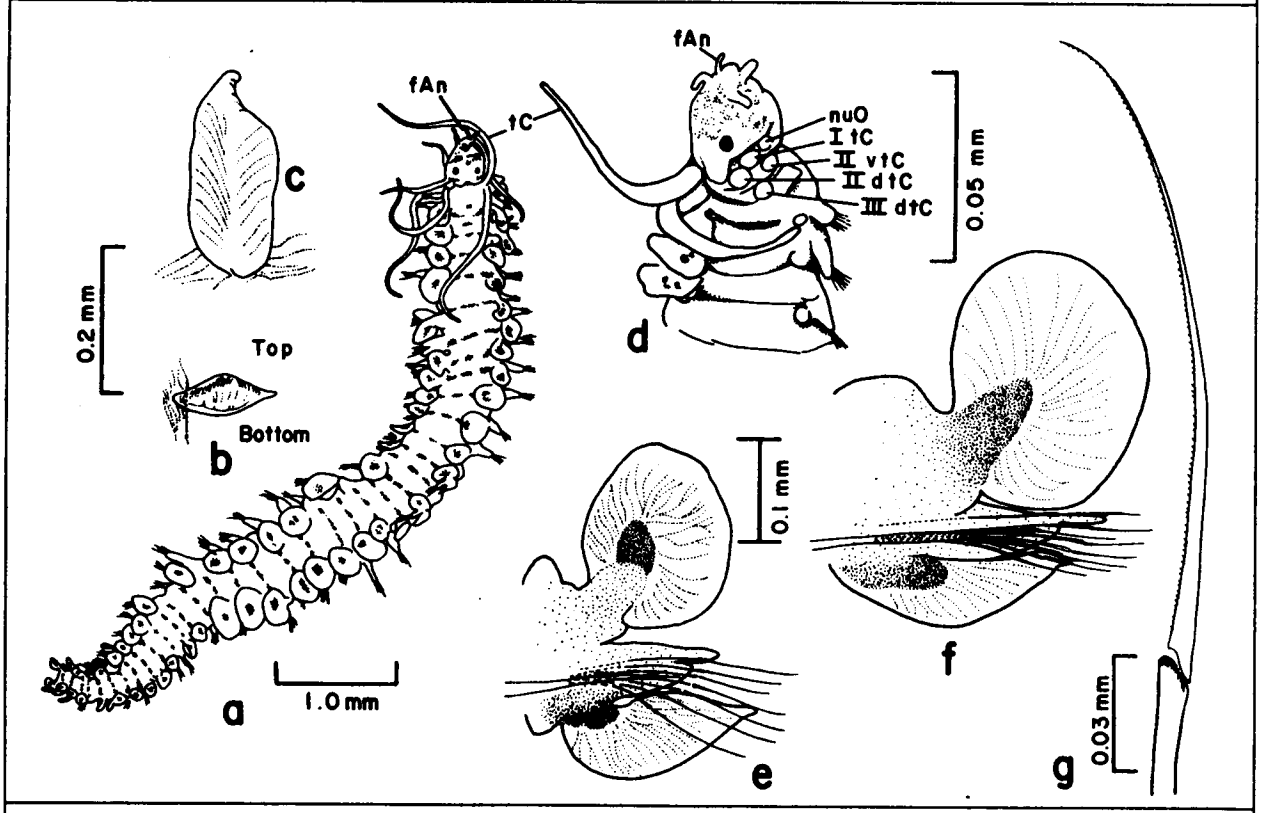

Figure 19-32. Anaitides longipes: a, whole worm, dorsal view; b, basal proboscidial papilla; c, distal proboscidial papilla; d, anterior end, dorsolateral view (tentacular cirri removed); e, eighth parapodium, posterior view; f, posterior parapodium, posterior view; g, typical seta.

Anaitides longipes Kinberg, 1866
Figures 19-31, 32a-g

Phyllodoce (Anaitides) longipes--Hartman, 1964:49, pl. 15, figs. 3, 4; 1968:229, figs. 1-3.
Phyllodoce (Anaitides) longipes--Day, 1967:144, fig. 5.2.a-c; 1973:23.
Phyllodoce (Anaitides) longipes--Gardiner, 1976:115, fig. 7p.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 2D-5/81 (1 spec., USNM 89983), 6D-7/81 (1 spec., USNM 89984); MAFLA 2210B-7/76 (1 spec.), 2211F-7/76 (1 spec., USNM 89985), 2318G-7/76 (1 spec.), 2423D-7/76 (1 spec.), 2423I-7/76 (1 spec.), 2423J-7/76 (1 spec.), 2424-7/76 (1 spec.), 2747C-2/78 (1 spec.), 2853E-7/77 (1 spec.), 2959F-7/76 (1 spec.).
Supplementary Material:
Florida--Hutchinson Island, Gallagher, Camp & Kennedy colls., T. H. Perkins ID., June 1972 (2 spec., USNM 54297), May 1974 (3 spec., USNM 56129).
Gulf of Mexico--off Alabama, Anderson artificial reef, 0155-8/76 (1 spec.).
DESCRIPTION:
Length, 28+ mm (previously reported to 10 mm); width, to 1.2 mm (previously reported to 1 mm). Body yellow with three intersegmental pigment patches across dorsum, setigers 2-5 pigmented dorsally; all specimens incomplete with up to 123 setigers. Prostomium heart-shaped, notched posteriorly; nuchal tubercle present (Figure 19-32a). Eyes black. Frontal antennae filiform. Proboscis covered with small papillae in rows basally (Figure 19-32b), and large leaf-like papillae distally (Figure 19-32c). Nuchal organs located anteroventral to first dorsal cirri (Figure 19-32d). Tentacular formula: $(1 + 0\frac{1}{1}) + 0\frac{1}{N}$. All tentacular cirri filiform, attached to cirrophores basally. Tentacular cirri of segment 1 extending back to segment 6; dorsal tentacular cirri of segment 2 extending back to segment 11; ventral tentacular cirri of segment 2 extending back to segment 6; dorsal tentacular cirri of segment 3 extending back to segment 10; ventral cirri of segment 3 ovoid, pointed. Setae absent on third tentacular segment. Parapodial lobes notched distally, superior lobe long (Figure 19-32e). Dorsal cirri rounded anteriorly, more ovoid posteriorly (Figure 19-32f). Ventral cirri pointed, extending beyond parapodial lobes anteriorly, becoming shorter posteriorly. Setae all compound spinigers with 6-7 small teeth at head of shaft; blades long, finely serrate to tip (Figure 19-32g).
REMARKS: Anaitides longipes has been reported by Day (1967:144) to have rugose ridges on the distal half of the proboscis. BLM-OCS specimens examined have long pointed papillae distally. A. longipes is newly reported from the Gulf of Mexico.
PREVIOUSLY REPORTED HABITAT: Intertidal to 750 m; coarse to fine sand.
GULF OF MEXICO BLM-OCS OCCURRENCE: Scattered records off west coast of Florida; 19-175 m; sands, silts, clays.
DISTRIBUTION: South Africa, North Carolina, Gulf of Mexico, California, Chile, Antarctic.

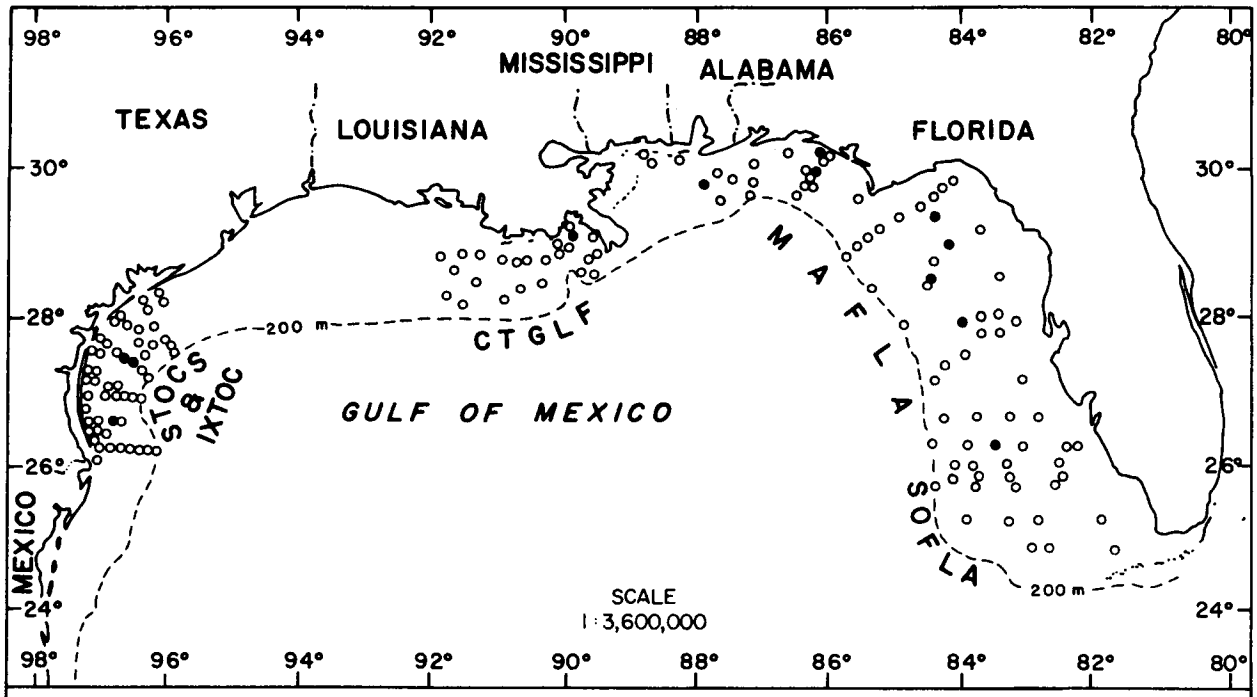

Figure 19-33. Distribution of Anaitides madeirensis on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

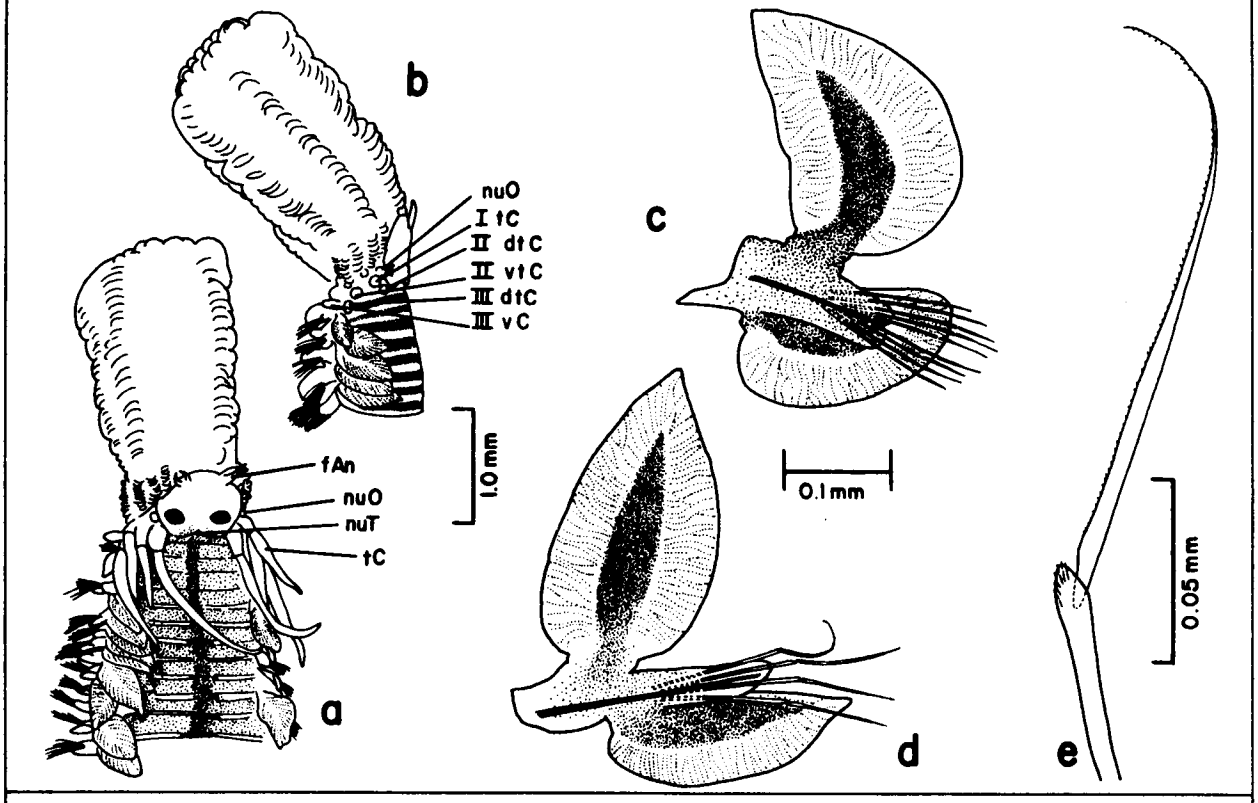

Figure 19-34. Anaitides madeirensis: a, anterior end, dorsal view; b, same, dorsolateral view (tentacular cirri removed); c, third parapodium, anterior view; d, 190th parapodium, posterior view; e, typical seta.

Anaitides madeirensis Langerhans, 1880
Figures 19-33, 34a-e

Phyllodoce (Anaitides) madeirensis--Fauvel, 1932:150, figs. d-h.
Phyllodoce (Anaitides) madeirensis--Day, 1967:145, fig. 5.2.d-g; 1973:23.
Phyllodoce (Anaitides) madeirensis--Ushakov, 1972:138, pl. 6, figs. 7, 8.
Phyllodoce (Anaitides) madeirensis--Gardiner, 1976:115, figs. 7q, 8a-c.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2104J-2/78 (1 spec.), 2211I-7/76 (1 spec.), 2315A-7/76 (1 spec.), 2317A-8/77 (1 spec.), 2528-11/77 (1 spec., USNM 56130), 2528E-2/78 (1 spec.), 2531G-2/78 (1 spec.), 2640-2/78 (1 spec.), 2853G-8/77 (1 spec.); CTGLF 01-6/78 (1 spec., USNM 89987), 01-10/78 (1 spec., USNM 89988); STOCS 2/II-5 4/76 (1 spec., USNM 89989), 2/II-6 3/76 (1 spec., USNM 89990), 5/II-4 No date (1 spec., USNM 89991); IXTOC S51-4 12/79 (1 spec., USNM 89986).
Supplementary Material:
North Carolina--off Beaufort, Mar. 1969, C. Jenner coll., S. L. Gardiner ID. (1 spec., USNM 52884).
DESCRIPTION:
Length, 77+ mm (previously reported to 90 mm); width, to 3 mm (previously reported to 2 mm). Body light brown-pigmented dorsally, sometimes with a dark middorsal stripe; all specimens incomplete with over 175 segments. Prostomium heart-shaped, notched posteriorly; nuchal tubercle present in notch (Figure 19-34a). Eyes black. Frontal antennae filiform. Proboscis covered basally with six rows of 6-10 papillae each. Remaining four-fifths of proboscis with six rugose ridges extending to terminal ring of seven papillae. Nuchal organs located anterodorsal to first tentacular cirri. Tentacular formula: $(1 + 0\frac{1}{1}) + 0\frac{1}{N}$ (Figure 19-34b). Tentacular cirri filiform, attached to cirrophores basally. Tentacular cirri of segment 1 extending back to segment 8; dorsal tentacular cirri of segment 2 extending back to segment 13; ventral tentacular cirri of segment 2 extending back to segment 7; dorsal tentacular cirri of segment 3 extending back to segment 10; ventral cirri of segment 3 short, bluntly oval. Setae absent on third tentacular segment. Parapodial lobes notched distally. Dorsal cirri lanceolate anteriorly (Figure 19-34c) and posteriorly (Figure 19-34d). Ventral cirri rounded on anterior setigers, pointed on posterior setigers; extending beyond parapodial lobes throughout. Setae all compound spinigers with 6-8 small teeth at head of shaft; blades long, finely serrate to tip (Figure 19-34e).
REMARKS: Anaitides madeirensis is reported to have six rows of proboscidial papillae basally and a dorsal row of 6-9 papillae medially. Gulf specimens lack the dorsal row of papillae whereas specimens examined from the east coast of the U. S. (USNM 52884) have it. Day (1973:23) synonymized Phyllodoce madeirensis and P. oculata, and noted that Lopadorhynchus erythrophyllus may also prove to be synonymous. I agree that P. madeirensis and L. erythrophyllus are very similar and may be synonymous.
PREVIOUSLY REPORTED HABITAT: Intertidal to 200 m; on coral.
GULF OF MEXICO BLM-OCS OCCURRENCE: Scattered occurrences throughout northern Gulf (Figure 19-33); 16-53 m; sands, silts, clays.

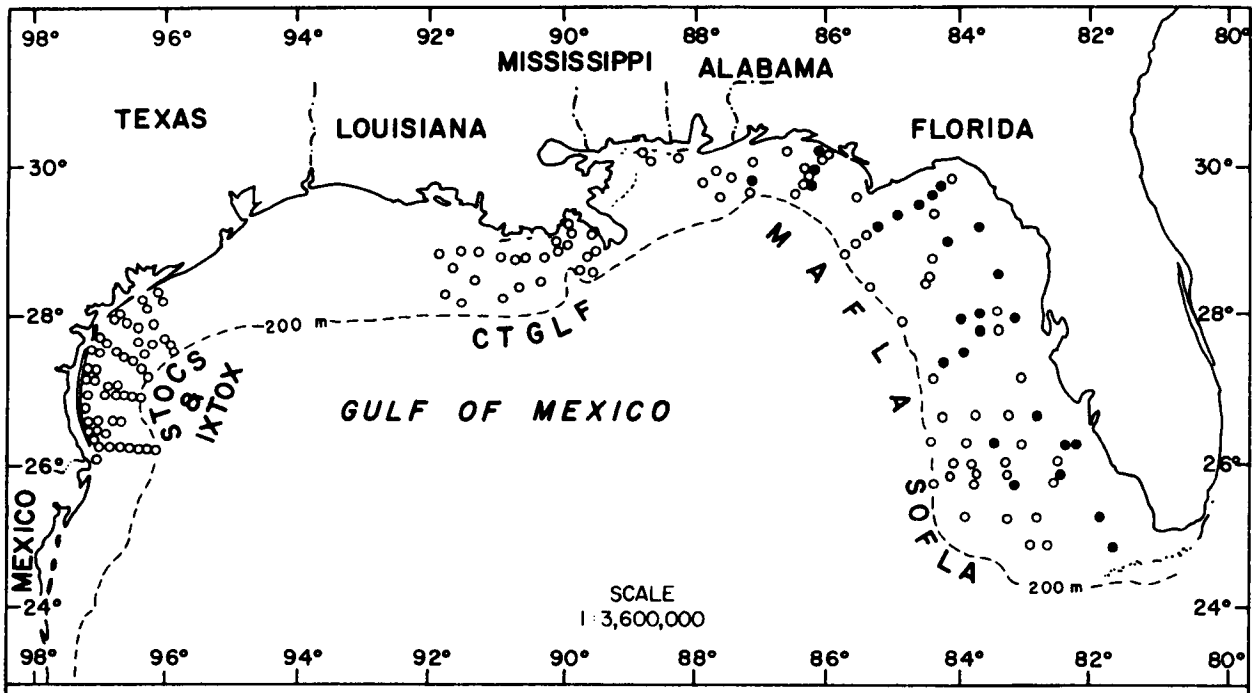

Figure 19-35. Distribution of Phyllodoce arenae on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

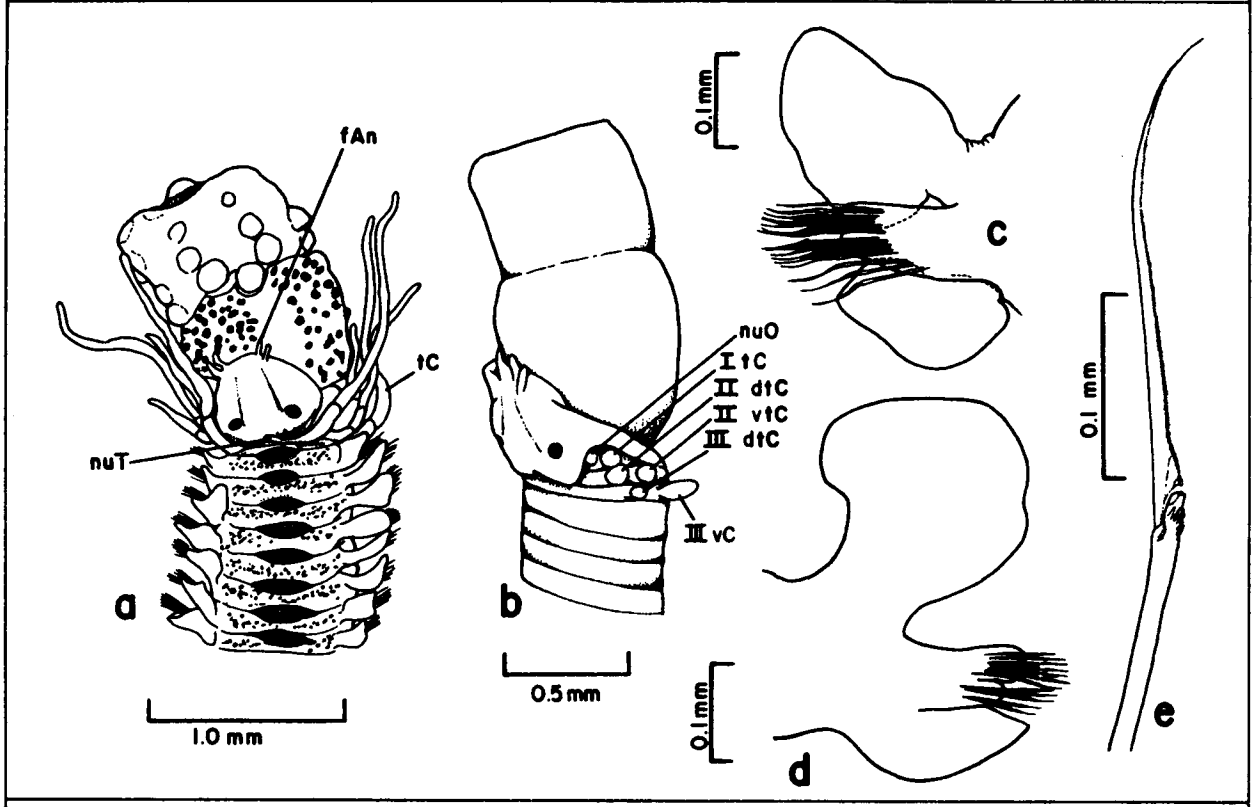

Figure 19-36. Phyllodoce arenae: a, anterior end, dorsal view; b, same, dorsolateral view (tentacular cirri removed); c, fifth parapodium, anterior view; d, posterior parapodium, posterior view; e, typical seta.

DISTRIBUTION: Cosmopolitan in tropical seas.

Genus **Phyllodoce** Savigny, 1818

TYPE SPECIES: Phyllodoce laminosa Savigny, 1818.
REFERENCES:
Ushakov, 1955:90.
Pettibone, 1963:77.
Fauchald, 1972a:50.
Gardiner, 1976:111.
DIAGNOSIS: Prostomium heart-shaped, with occipital incision posteriorly usually containing nuchal tubercle. Prostomium with lateral lobes overlapping segment 1, or rounded with posterior margin straight. Four frontal antennae located at anterior margin of prostomium. One pair of eyes. Proboscis cylindrical or hexahedral with oval or conical papillae scattered basally; with 16-20 large terminal papillae and sometimes large globular papillae distally. Segments 1 and 2 partially fused dorsally or separate. Four pairs of cylindrical or slightly flattened tentacular cirri on first three segments. Dorsal cirri cordate, ovoid or rounded; ventral cirri elongate or rounded. Parapodia uniramous with composite spinigers. Pygidium with two long anal cirri tapering to a point.

Phyllodoce arenae Webster, 1880
Figures 19-35, 36a-e

Phyllodoce (Anaitides) arenae--Pettibone, 1963:82, fig. 18a-c.
Phyllodoce (Anaitides) arenae--Day, 1973:23.
Phyllodoce (Anaitides) arenae--Gardiner, 1976:117, fig. 8d.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 20E-4/81 (1 spec., USNM 89992); MAFLA 2209F-7/76 (1 spec.), 2210A-8/77 (1 spec.), 2210J-7/76 (1 spec.), 2211B-7/76 (1 spec.), 2211C-7/76 (1 spec.), 2211J-8/77 (1 spec.), 2317A-7/76 (1 spec.), 2317A-8/77 (1 spec.), 2318K-11/77 (1 spec., USNM 89993), 2423J-7/76 (1 spec.), 2531I-8/77 (1 spec.), 2534G-6/75 (1 spec.), 2644I-6/75 (1 spec.), 2852E-9/77 (1 spec.), 2959F-8/77 (1 spec.).
DESCRIPTION:
Length, to 82.0 mm (previously reported to 100 mm); width, to 0.6 mm (previously reported to 2.5 mm). Body brown with transverse black intersegmental bands middorsally; complete specimens with over 150 setigers. Prostomium heart-shaped, notched posteriorly; nuchal tubercle present (Figure 19-36a). One pair of black eyes. Proboscis covered with small, pigmented papillae scattered along basal two-thirds except for middorsal strip; remaining third with six rows of large spherical papillae (Figure 19-36a). Nuchal organs located above tentacular cirri of segment 1 but may be retracted. Tentacular formula: $(1 + 0\frac{1}{1}) + 0\frac{1}{N}$ (Figure 19-36b). Tentacular cirri filiform, attached to cirrophores basally. Tentacular cirri of segment 1 extending back to segment 4; dorsal tentacular cirri of segment 2 extending back to segment 13; ventral tentacular cirri of segment 2 extending back to segment 9; dorsal tentacular cirri of segment 3 extending back to segment 9;

ventral cirri of segment 3 short, flattened. Setae absent on third tentacular segment. Parapodial lobes notched distally, similar in length. Dorsal cirri long anteriorly (Figure 19-36c), more ovoid posteriorly (Figure 19-36d). Ventral cirri pointed, extending beyond parapodial lobes throughout. Setae all compound spinigers with 5-6 teeth at head of shaft; blades long, finely serrate to tip (Figure 19-36e).

REMARKS: Phyllodoce arenae is very similar to P. panamensis (Day, 1973:24), differing primarily in color patterns. Specimens previously identified as P. (Anaitides) panamensis in BLM-OCS material are herein considered to be P. arenae. They agree with P. arenae in every respect except in having a median dorsal pigmented stripe. This may be a juvenile pigmentation pattern since the largest of these specimens was only 8 mm in length.

PREVIOUSLY REPORTED HABITAT: Intertidal to 195 m; found in coarse sand and muddy sand with shell fragments.

GULF OF MEXICO BLM-OCS OCCURRENCE: Numerous records off west coast of Florida (Figure 19-35); 11-75 m; coarse to medium sand, silty fine to very fine sand, clayey sandy silt.

DISTRIBUTION: Maine to North Carolina, Gulf of Mexico.

CHAPTER 20

Jerry M. Gathof

FAMILY APHRODITIDAE Malmgren, 1867

INTRODUCTION

Aphroditids are small to large (up to 90 mm), errant polychaetes with oval bodies, tapering abruptly at both ends. Members of the family are characterized by the presence of stout notosetae in tufts on the dorsum, elytra, and in some species, a thick mat of slender capillary setae forming a felt-like covering over the dorsum. The resulting furry appearance has given rise to the common name "sea mouse" for members of this family.

The prostomium is small, with a dorsally inserted median antenna and a facial tubercle located ventrally between a pair of long palps. Eyes, when present, may be sessile or located on ocular peduncles. The peristomial segment is directed anteriorly with two pairs of long tentacular cirri and capillary notosetae. Parapodia are biramous and well-developed. Notosetae consist of slender capillaries and stout spines, which may be serrated, smooth or harpoon-shaped. Neurosetae may be bipinnate (on anterior segments), or falcate, with or without a basal spur. Dorsal cirri are present on segments lacking elytra. Ventral cirri are short and usually papillose on basal cirrophores. The ventrum may be longitudinally grooved and is often heavily papillose.

The family Aphroditidae was erected by Malmgren in 1867. Some workers (Ushakov, 1955; Day, 1967) have included the sigalionids, polyodontids, aphroditids and polynoids as subfamilies under the family Aphroditidae, but most authors preferred to maintain separate family designations for these four groups.

Seven genera and 63 species of aphroditids were recognized by Fauchald (1977a); nine genera and about 70 species by Pettibone (1982). Two genera and three species have been identified from the BLM-OCS material. All three of these species may be new to science.

PRINCIPAL DIAGNOSTIC CHARACTERS

The principal diagnostic characters used in the identification of aphroditids include the shape of the prostomium, nature of the eyes, presence of felt-like capillary notosetae, and shape and dentition of the noto- and neurosetae.

The prostomium is small and oval, sometimes covered by the elytra and dorsal feltage of segment 2. A median antenna with a basal ceratophore and distal style is attached to the prostomium between the eyes (Figure 20-6a); and a facial tubercle is attached ventral to the median antenna between a pair of long, tapered palps. Eyes may be sessile, as in Aphrodita, or mounted on ocular peduncles (Figures 20-2b, 4a, 6a). Both types may lack ocular pigment.

Notosetae occur from segment 2 or 3 as stout, golden-colored, curved spines, and may be either serrated (Figure 20-4d) or smooth (Figure 20-2f). In addition, capillary setae are present (Figure 20-6c), above and/or below the curved notosetae, and covering the elytra to a

variable degree. Harpoon-shaped notosetae are present in the genus Laetmonice.

Neurosetae may be bipinnate anteriorly (Figures 20-2h, 4e) with one or two basal spurs (Figures 20-2k, 4f) and 1-5 subterminal teeth (Figure 20-2i, 4g), basally spurred with a feathered apex as in Laetmonice pellucida, or smooth with pilose tips as in Aphrodita japonica.

The pharynx is large, muscular and eversible, with numerous papillae around the opening. If present, chitinous jaws are rudimentary and take the form of four thickened, muscular prominences.

BIOLOGICAL NOTES

Aphroditids are typically slow-moving polychaetes inhabiting soft, muddy bottoms. According to Day (1967), they lack jaws and may feed by plowing through the mud, ingesting microscopic animals. However, Fauchald and Jumars (1979:198) reported that aphroditids are jawed carnivores specializing on slow-moving or sessile animals if encountered, but otherwise preying opportunistically on microscopic animals. The thick felt-like setae that cover the dorsum of some species, along with the elytra, are thought to keep the branchial structures free of fine sediments which may interfere with respiration. Little has been reported on reproduction in this family.

SPECIES OF APHRODITIDAE RECORDED FROM GULF OF MEXICO BLM-OCS PROGRAMS

Key to the Genera of Aphroditidae from the Gulf of Mexico BLM-OCS Programs

1a. Capillary notosetae few, not forming dorsal feltage; stout, curved notosetae smooth or faintly serrate along convex margin. . . . . **Aphrogenia**, p. 20-2

1b. Capillary notosetae numerous, forming dorsal feltage; stout, curved notosetae distinctly serrate along convex margin. . . . . **Pontogenia**, p. 20-4

Genus **Aphrogenia** Kinberg, 1855

TYPE SPECIES: Aphrogenia alba Kinberg, 1855.

REFERENCES:

Fauvel, 1917:169.

Hartman, 1948:16.

Fauchald, 1977a:53.

DIAGNOSIS: Elytra round, numbering up to 15 pairs. Prostomium with globular ocular lobes, each having dorsal and ventral eyes. Facial tubercle present. Notosetae including long, smooth, curved spines and

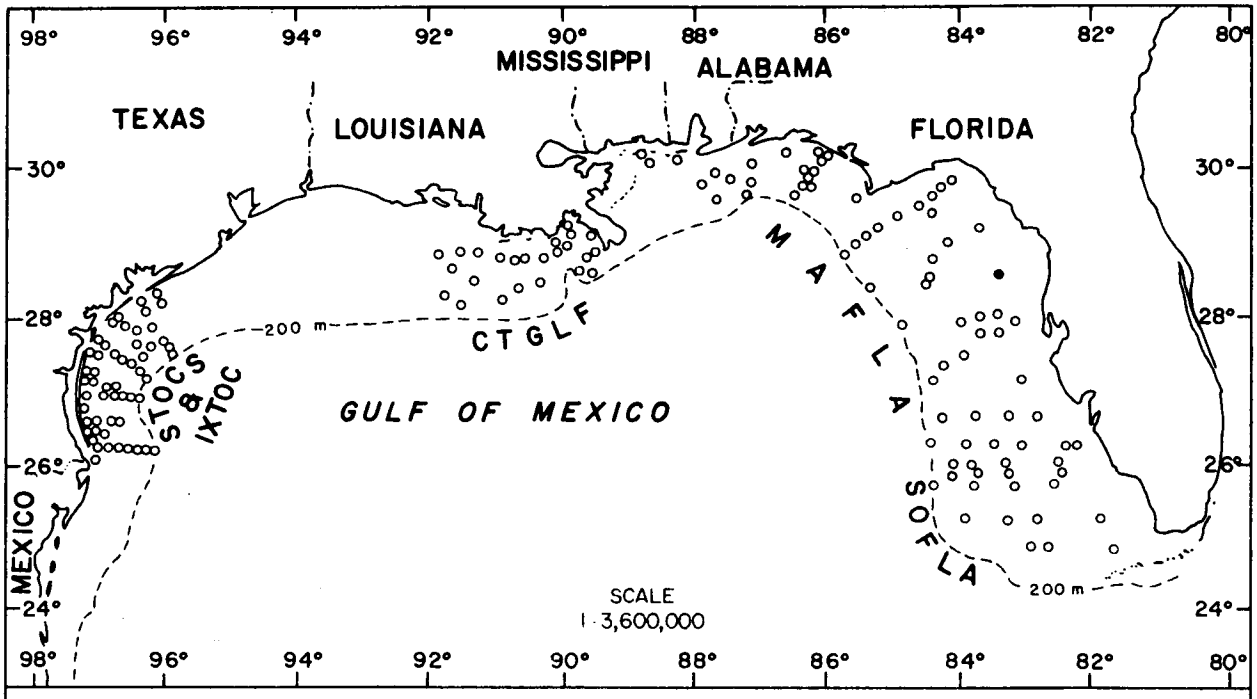

Figure 20-1. Distribution of Aphrogenia sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

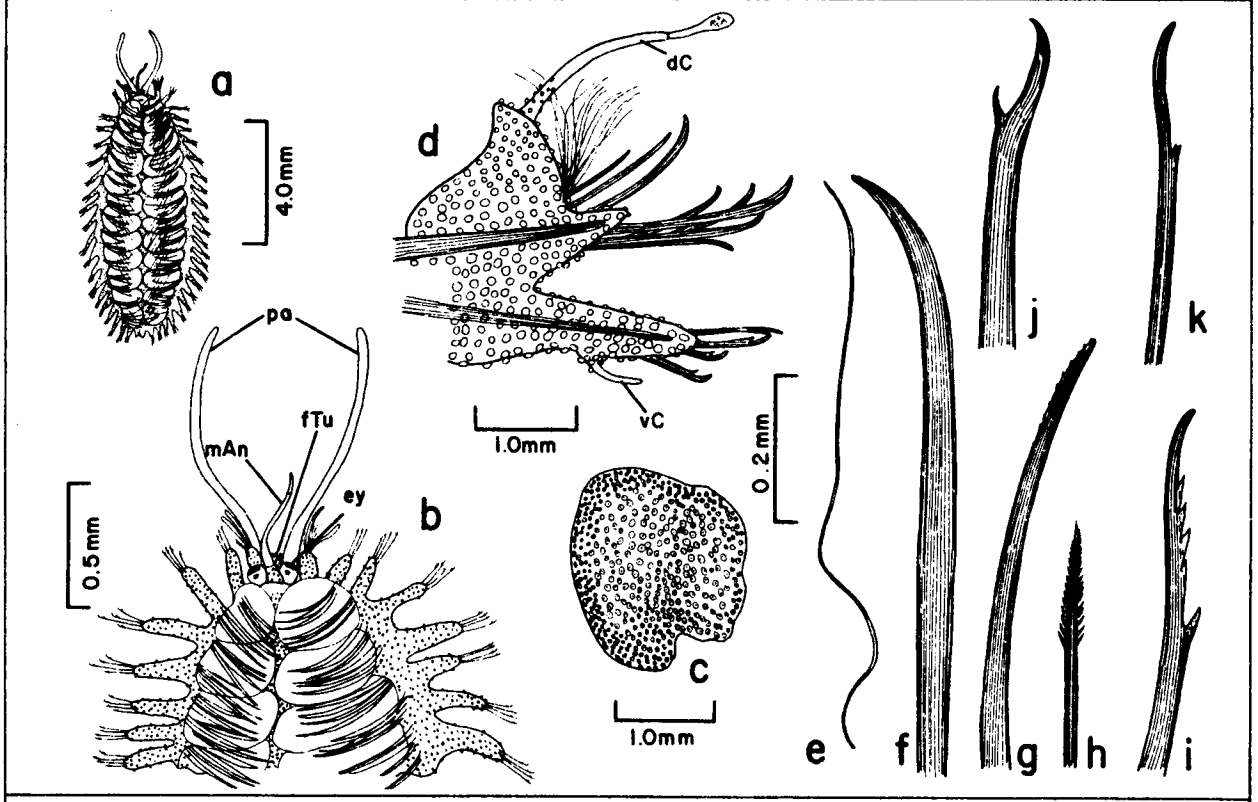

Figure 20-2. Aphrogenia sp. A: a, whole worm, dorsal view; b, anterior end, dorsal view; c, elytron from anterior segment; d, eighth parapodium; e, capillary seta; f, smooth notoseta; g, serrate notoseta; h, bipinnate neuroseta from segment 2; i, neuroseta with subdistal teeth; j, neuroseta; k, neuroseta with two basal spurs.

capillary setae, not forming thick dorsal felt. Neurosetae stout, falcate, with 1-5 subdistal teeth. Neurosetae of first few setigers bipinnate.

Aphrogenia sp. A
Figures 20-1, 2a-k

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2852F-No date (1 spec.).
DESCRIPTION:
Length, 8 mm; width, 3 mm. Body oval (Figure 20-2a), complete with 25 setigers. Prostomium globular, heavily papillose middorsally (Figure 20-2b). Median antenna jointed near tip, basal ceratophore papillose; about one-third length of palps. Facial tubercle present ventrally between palps, heavily papillose. Ocular lobes each with small eye dorsally and larger one ventrally. Palps long, slender. Peristomial segment with fine capillary setae and two pairs of tentacular cirri. Elytra rounded with dorsal macro- and microtubercles (Figure 20-2c). Dorsal cirri long, slender, jointed, distally swollen. Ventral cirri small, basal cirrophores papillose. Parapodia covered with globular papillae (Figure 20-2d). Notopodia with fine, felt-like capillary setae (Figure 20-2e) and stout, smooth (Figure 20-2f) or faintly serrate (Figure 20-2g), curved notosetae. Neurosetae of segments 2-4 including bipinnate setae (Figure 20-2h), and basally spurred, falcate spines with 2-5 subterminal teeth (Figure 20-2i). Neurosetae of following segments including 5-6 thick falcigers with single basal spur (Figure 20-2j) and one falciger with bifid basal spur (Figure 20-2k).
REMARKS: This specimen differs from Aphrogenia alba Kinberg, 1855, in having neurosetae of the middle region with two basal spurs.
GULF OF MEXICO BLM-OCS OCCURRENCE: One station off Florida (Figure 20-1); 5 m; medium sand.

Genus Pontogenia Claparède, 1868

TYPE SPECIES: Hermione chrysocoma Baird, 1865.
REFERENCES:
Fauvel, 1923:38.
Fauchald, 1977a:54.
DIAGNOSIS: Elytra oval to reniform, numbering 15 pairs. Prostomium with ocular peduncles having dorsal and ventral eyes. Facial tubercle present. Notosetae curved, crenulate, directed medially. Felt-like setae present dorsally. Neurosetae stout, falcate, with basal spur, with or without subdistal teeth; neurosetae of first few segments bipinnate.

Key to the Gulf of Mexico BLM-OCS Species of Pontogenia

1a. Neurosetae with basal spur(s) and 1-4 subdistal teeth (Figure 20-4f,g). . . . . **Pontogenia sp. A**, p. 20-6
1b. Neurosetae with single subdistal tooth (Figure 20-6f). . . . . **Pontogenia sp. B**, p. 20-6

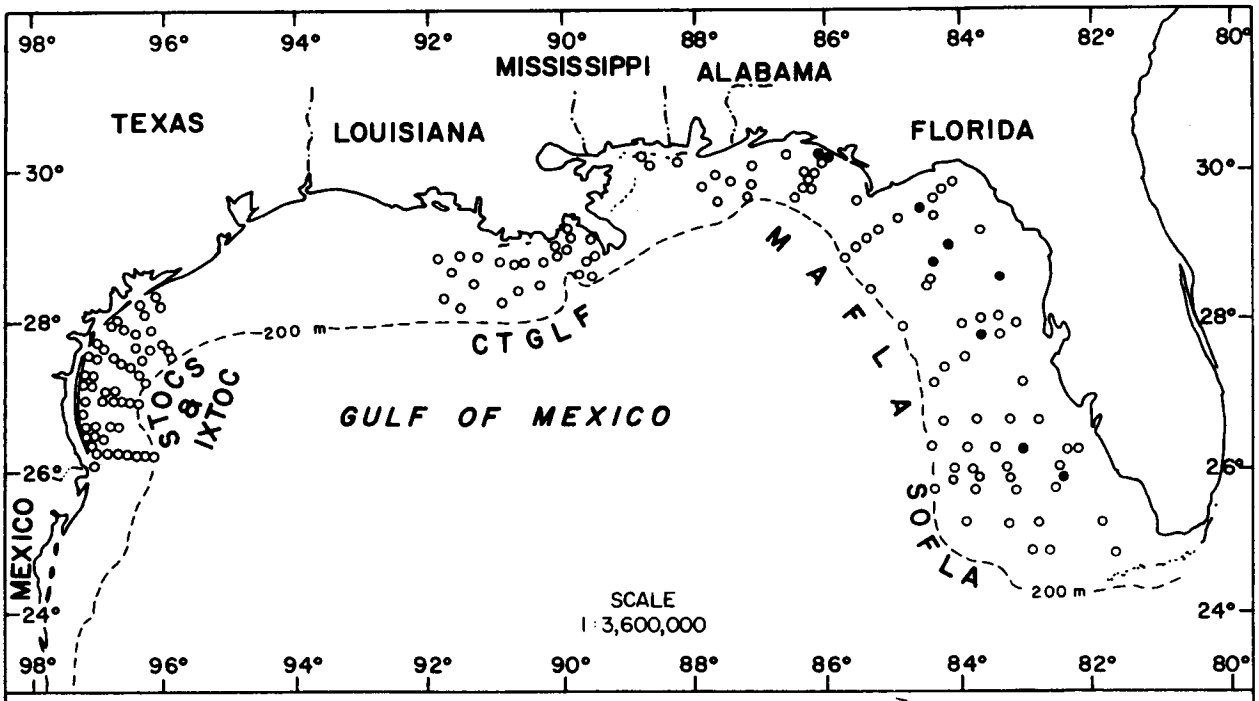

Figure 20-3. Distribution of Pontogenia sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

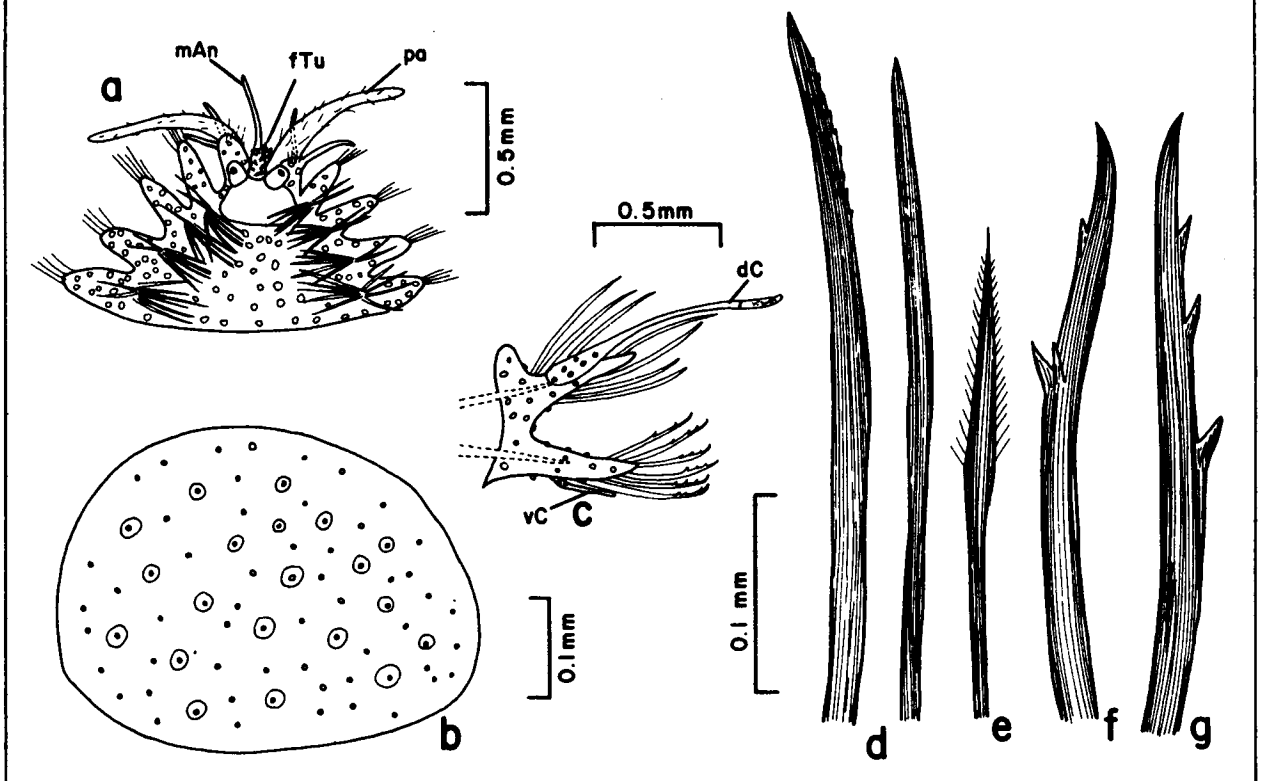

Figure 20-4. Pontogenia sp. A: a, anterior end, dorsal view; b, elytron from segment 9; c, eighth parapodium; d, notosetae; e, bipinnate neuroseta from segment 2; f, neuroseta with two basal spurs; g, neuroseta.

Pontogenia sp. A
Figures 20-3, 4a-g

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 14-4/81 (1 spec.); MAFLA 2103B-2/76 (3 spec.), 2103C-2/76 (1 spec.), 2103I-2/76 (1 spec.), 2209H-9/75 (1 spec.), 2209D-2/76 (1 spec.), 2209E-2/76 (1 spec.), 2316D-11/77 (1 spec., USNM 75174), 2317I-2/76 (1 spec.), 2422F-7/76 (1 spec.), 2422J-7/76 (1 spec.), 2528E-9/75 (1 spec.), 2528H-9/77 (1 spec.), 2529B-5/75 (1 spec.), 2852H-8/77 (1 spec.).
DESCRIPTION:
Length, to 3.5 mm; width, to 1.5 mm. Body oval, complete specimens with up to 21 segments. Prostomium globular, without papillae. Median antenna basally papillose (Figure 20-4a), two-thirds length of palps. Palps long, with long, fine papillae. Facial tubercle small, papillose, located between palps. Tentacular segment with anteriorly directed capillary setae, and two pairs of tentacular cirri. Elytra round, without pigment, numbering six pairs; first pair small, located on segment 6; subsequent elytra located on alternating setigers, increasing in size posteriorly. Macro- and microtubercles present on dorsal surface of elytra (Figure 20-4b). Dorsal cirri long, slender, distally jointed and pigmented. Parapodia biramous, sparsely papillose (Figure 20-4c). Capillary notosetae present, not covering dorsum; stout, curved notosetae with serrations in double rows (Figure 20-4d). Neurosetae of first two segments bipinnate (Figure 20-4e). Neurosetae of following segments including single, thick, brown, superior seta with two basal spurs and 1-3 subdistal teeth (Figure 20-4f); and several golden-brown setae with single basal spur and 2-5 subdistal teeth (Figure 20-4g).
REMARKS: Specimens closely resemble Pontogenia laeviseta Hartman, 1939a, in the shape of the peristomium, neurosetae and parapodia. They differ from the latter in that the notosetae are dentate along the convex margin only, rather than the whole surface. The small size of these specimens, along with the unusual arrangement of the elytra, suggest that they may be juveniles.
GULF OF MEXICO BLM-OCS OCCURRENCE: Scattered occurrences off Florida (Figure 20-3); moderate depths, 22-38 m; coarse to fine sand, silty very fine sand, clayey sandy silt.

Pontogenia sp. B
Figures 20-5, 6a-f

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2315-7/76 (1 spec., USNM 75173); 2315-11/77 (1 spec.).
DESCRIPTION:
Length, to 23 mm; width, to 5 mm. Body oval; larger specimen complete with 35 setigers. Dorsum covered with felt-like capillary setae (Figure 20-6a); recurved notosetae projecting through felt. Prostomium smooth, without papillae; median antenna two-thirds length of palps, jointed near tip (Figure 20-6a), basal ceratophore papillose. Palps with long, fine papillae to base. Facial tubercle present between palps, heavily papillose. Eyes pedunculate, with ocular pigment on dorsal and ventral surfaces. Segment 1 with fine capillary setae and two pairs of distally

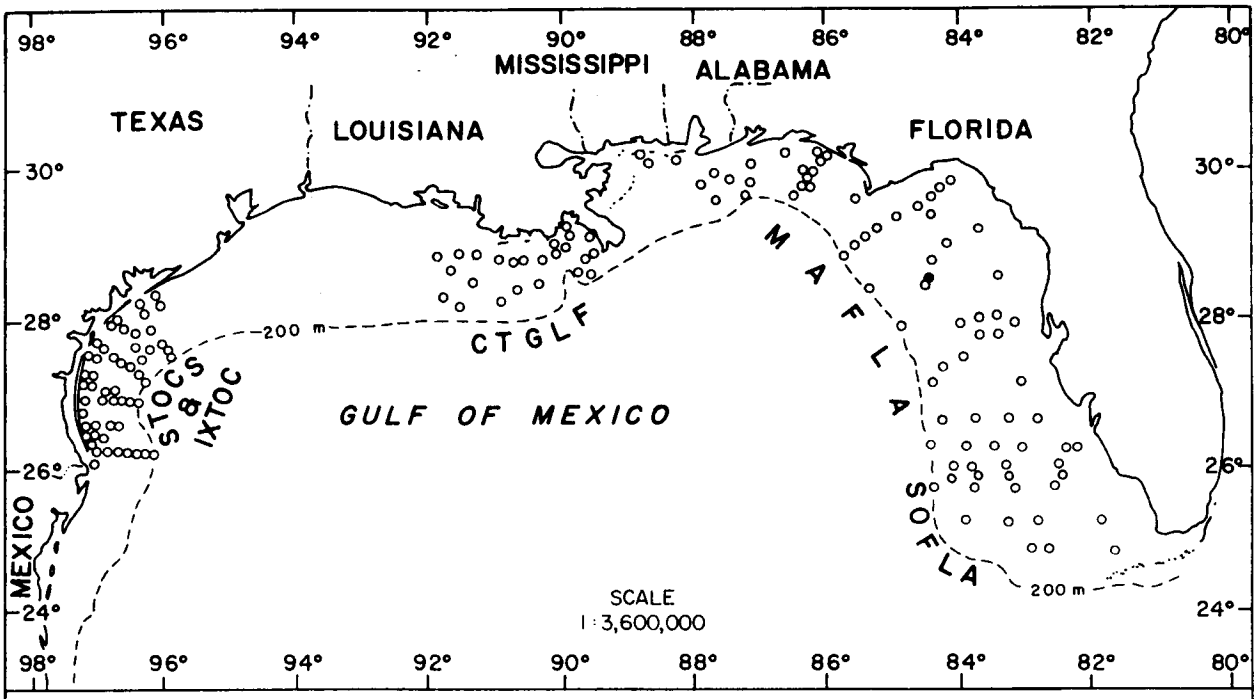

Figure 20-5. Distribution of Pontogenia sp. B on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

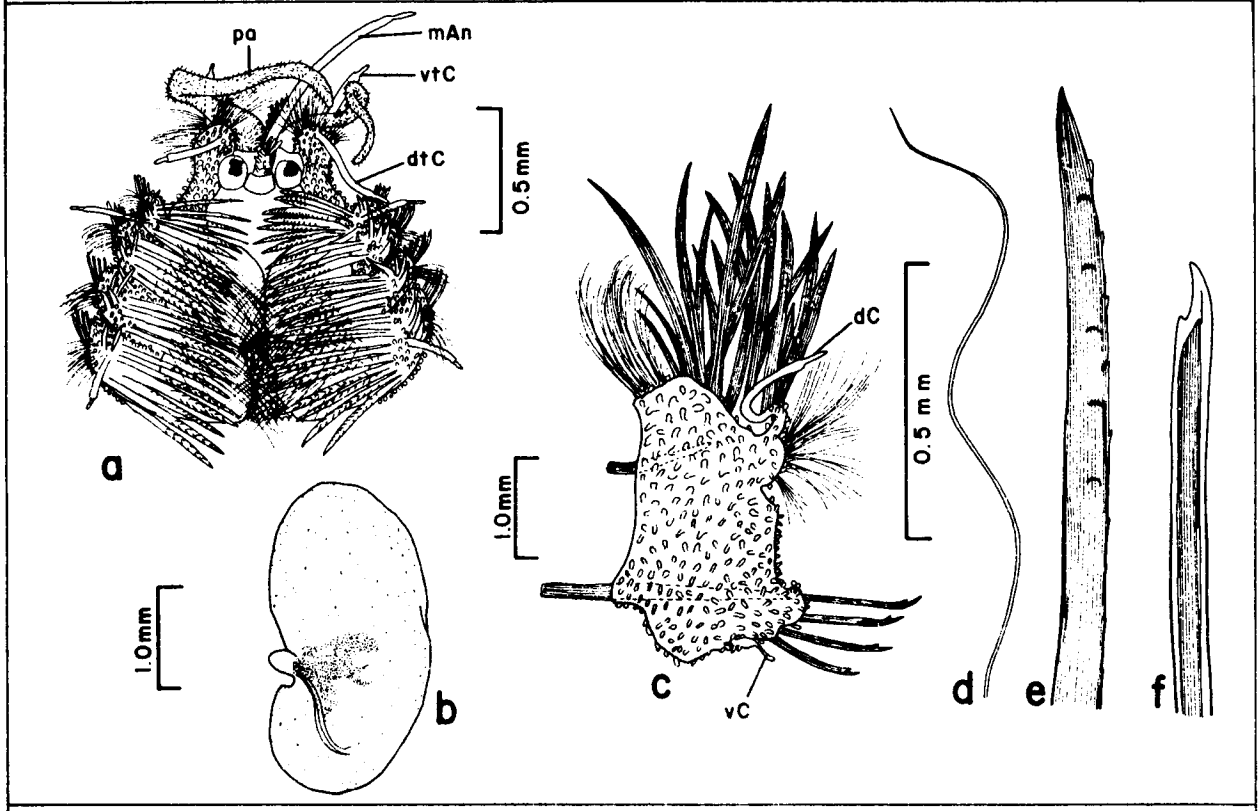

Figure 20-6. Pontogenia sp. B: a, anterior end, dorsal view; b, elytron from middle segment; c, eighth parapodium; d, capillary seta; e, notoseta; f, neuroseta.

articulate tentacular cirri. Elytra reniform, without papillae; brown pigment present near elytrophore attachment (Figure 20-6b). Dorsal cirri long, slender, present on segments without elytra. Parapodia biramous, heavily papillose (Figure 20-6c). Notosetae including fine, felt-like capillary setae (Figure 20-6d) and stout spines with serrations in double rows (Figure 20-6e). Neurosetae stout, golden-brown, falcate with single subdistal tooth (Figure 20-6f).

REMARKS: Pontogenia sp. B most closely resembles P. chrysocoma as described by Fauvel (1923:38), but differs from the latter in having serrations in double rows on the stout notosetae, rather than in single rows (Pettibone, pers. comm.).

GULF OF MEXICO BLM-OCS OCCURRENCE: One station off Florida (Figure 20-5); 38 m; silty fine sand.

CHAPTER 21

Donald Weston

FAMILY POLYNOIDAE Malmgren, 1867b

INTRODUCTION

Polynoids are medium- to large-bodied polychaetous annelids, oval to elongate in dorsal outline, and dorsoventrally flattened in cross-section. As in most other members of the superfamily Aphroditacea, the dorsum bears distinct scales known as elytra. The elytra may be large enough to overlap at the midline, completely concealing the body of the worm, or they may be smaller, exposing the mid-dorsum. Elytra are characteristically attached on segments 2, 4 and 5, thereafter on alternate segments, alternating with the dorsal cirri. Posteriorly, their attachment is variable but they are usually more widely spaced.

The prostomium is bilobed anteriorly, with a faint to prominent median groove. Eyes usually number two pairs in trapezoidal arrangement with the anterior pair larger, but they may be absent altogether. One, two, or commonly, three antennae are inserted anteriorly, the median antenna generally being longer than the lateral ones. Antennae are smooth, or lightly to densely covered with papillae. A pair of stout, anteriorly directed palps are inserted ventrally on the prostomium. The peristomial or tentacular segment has two pairs of tentacular cirri directed anteriorly, lateral to the prostomium. The tentacular cirri protrude from basal lobes, each of which bears an internal aciculum and sometimes a few projecting setae, similar in size and form to the notosetae of the following parapodia. A muscular, protrusible pharynx is present, with two pairs of heavy, interlocking jaws and a distal circle of papillae (usually nine pairs, but occasionally more).

The parapodia are biramous or subbiramous and more or less similar along the body. The notopodium is located on the anterodorsal surface of the neuropodium. Both rami bear internal acicula. Notosetae are usually present, but may be lacking in some genera. The neuropodium is distally cleft, terminating in pre- and postsetal lobes, the former containing the aciculum. Neurosetae are always present, usually with distally expanded, spinous regions. All setae are simple. The paired dorsal elytra are attached to bulbous projections called elytrophores (Figure 21-12c). On the non-elytra bearing segments, dorsal cirri are located medial to the notopodia. The dorsal cirri have basal cirrophores and long, usually papillose styles. More or less developed dorsal tubercles are located medial to the dorsal cirri in positions corresponding to the elytrophores. Ventral cirri are inserted ventrally on all neuropodia. Segmental or nephridial papillae are located on the ventrum at the bases of the parapodia, usually beginning on segment 6 or 8 and continuing to the end of the body. The pygidium bears a single pair of anal cirri similar in shape to the dorsal cirri.

The Polynoidae are a diverse family including about 120 genera and over 600 species (Pettibone, 1982:14). No recent reviews of the family are available but some generic revisions have been published, many by Dr. Marian Pettibone of the Smithsonian Institution. Important works include McIntosh (1900), Fauvel (1923), Hartman (1938, 1939a), Ushakov

(1955), Pettibone (1953b, 1963, 1969a,b, 1975, 1976a, 1977a), and Hartmann-Schröder (1971, 1974a).

Twelve species are included in the present study, only one of which has been previously described. Eleven are likely either new species or genera.

PRINCIPAL DIAGNOSTIC CHARACTERS

The main diagnostic characters used in the identification of polynoids are: 1) the shape of the prostomium, particularly in relation to the insertion of the lateral antennae; 2) the number of elytral pairs and the presence, arrangement and structure of elytral tubercles and marginal papillae; 3) the morphology of the parapodia; and 4) the morphology and distribution of the setae.

The Prostomium.

The shape of the prostomium and the presence of median and lateral antennae are useful in defining subfamilies and genera in the Polynoidae. The subfamily Macellicephalinae is distinguished by the extreme reduction or absence of the lateral antennae, while the Iphioninae have well-developed lateral antennae but lack the median antenna. In the Lepidonotinae and Harmothoinae, all three antennae are well-developed, but differ in their mode of insertion on the prostomium.

Terminal insertion of the lateral antennae, as in the Lepidonotinae, refers to their insertion directly on anterior prolongations of the prostomium, with an indistinct line of demarcation between the styles of the lateral antennae and the prostomium proper (Figure 21-6b). In species having ventral insertion of the lateral antennae, as in the Harmothoinae, the anterolateral corners of the prostomium are usually developed into blunt to sharply pointed cephalic peaks. The lateral antennae are inserted ventrally to the peaks and/or to the ceratophore of the median antenna. Usually only the tips of the lateral ceratophores are visible when viewed dorsally (Figure 21-24d). Terminoventral insertion, as in some Harmothoinae, is intermediate between the two previous forms. In this case, the lateral ceratophores are located terminally on the prostomium, but are clearly separated dorsally from the prostomium by a transverse groove (Figure 21-10a). Ventrally, the ceratophores of the lateral antennae are situated beneath the ceratophore of the median antenna.

The Elytra.

The number of elytral pairs is an important generic character in polynoid systematics. When elytra are missing, their arrangement can be determined from the position of the elytrophores; however, if the body is incomplete, generic identification may be impossible. Adults may have as few as 12 pairs, as in Lepidonotus, or up to 90 pairs, as in Lepidasthenia. The first pair of elytra is located on segment 2 (with the tentacular segment as the first segment), and depending on their size, may completely conceal the prostomium and all but the tips of the prostomial appendages. The second and third pairs of elytra are located on segments 4 and 5, respectively; subsequent pairs appear on every other segment to at least segment 23. In the posterior portion of the body, elytra may be located on alternate segments, every third segment,

or some other pattern. Rarely the arrangement may be irregular, and asymmetrical in the posterior region as in Polyeunoa.

The elytra may be smooth or may possess small to large projections on the dorsal surface. The presence, arrangement and structure of these chitinous projections are important for specific identifications, which may be impossible if all the elytra have been lost during collection and preservation. The smaller projections, or microtubercles, range in shape from nodular to multipronged, and are usually visible only under high magnification. Some species additionally have larger protuberances, or macrotubercles, which may be either scattered over the elytral surface or arranged in rows along the posterior border. The presence of a marginal fringe of clavate to filiform papillae on the lateral and posterior borders of the elytra, as well as surface papillae, may also be diagnostic for some species.

The Parapodia.

The shape and morphology of the parapodia can provide useful generic and specific characters. Polynoid parapodia are normally subbiramous (i.e., notopodia represented only by an internal aciculum, notosetae absent) as in species of Perolepis and Lepidasthenia (Figure 21-4c), or they can be biramous as in species of Malmgreniella (Figure 21-14c) and Harmothoe. The notopodia, located on the anterodorsal surface of the neuropodia, are usually rounded to conical, bear an internal aciculum, and may or may not have a projecting acicular process. The dorsal cirri may be short relative to the length of the neuropodia as in Lepidasthenia sp. A (Figure 21-4c), or quite long as in Malmgreniella sp. C (Figure 21-14c). They are usually more or less distinctly papillose as in Harmothoe sp. C (Figure 21-18b). The neuropodia are much longer than the notopodia and always bear setae. The distal end of the neuropodium is usually deeply cleft, forming pre- and postsetal lobes. The presetal lobe, which bears the aciculum, is usually longer and more slender than the postsetal lobe. The relative sizes of the lobes are important at the species level. In Harmothoe sp. A, for example, the presetal lobe is longer than the postsetal lobe (Figure 21-20c), whereas in Harmothoe sp. B, the lobes are more similar in size and shape (Figure 21-22c). A supra-acicular process may be present on the presetal lobe as in Harmothoe sp. C (Figure 21-24e) or it may be lacking as in Genus B (Figure 21-10c). The ventral cirri are usually smooth but may be papillose as in Harmothoe sp. B (Figure 21-22c) and Harmothoe sp. C (Figure 21-24e).

The Setae.

Setal morphology is an important diagnostic character in generic and specific determinations. Polynoid setae are always simple and usually spinous. Notosetae are absent in some genera. When present, they range in form from hair-like and capillary to stout and blunt, frequently with transverse spinous plates. The tips of the notosetae are usually unidentate, rarely notched or bidentate. Neurosetae are always present, showing a great diversity in shapes and sizes, but usually with expanded, distal, spinous regions. The upper neurosetae are often more slender with longer spinous regions than those lower in the bundle. The tips of the setae may be either uni- or bidentate, and both kinds are sometimes present within a bundle. Examination of the setae under an oil immersion objective is often necessary to discern the true nature of the tips.

BIOLOGICAL NOTES

Polynoids are common inhabitants of intertidal and shallow-water habitats, though seldom are numerically dominant. A small minority of species are found in abyssal depths (Hartman, 1971). They may live on a wide variety of substrata, from mud to hard bottoms, and are frequently found nestled among algae, seagrasses, hydroids, or oysters. A few species are pelagic. Many polynoids are commensal with other organisms, most notably echinoderms and tube-dwelling polychaetes.

With few exceptions, polynoids are carnivorous, feeding on small crustaceans, echinoderms, polychaetes, gastropods, sponges, and hydroids (Fauchald and Jumars, 1979). Thormora johnstoni exhibits an aberrant parasitic feeding mode as it sucks fluids from the abdomen of its polychaete host Palola viridis (Hauenschild et al., 1968).

Polynoids generally have a planktotrophic larval stage, though in some species release of the trochophore larvae may be delayed by brooding of the eggs under the elytra or between the parapodia. Harmothoe imbricata shows plasticity in its reproductive mode (poecilogony) in different geographic areas and under different environmental conditions, by either releasing planktotrophic larvae immediately after spawning (Cazaux, 1968) or brooding the larvae under the elytra to the late trochophore stage (Pettibone, 1963 and numerous others). Some species are known to be hermaphroditic (Schroeder and Hermans, 1975).

SPECIES OF POLYNOIDAE RECORDED FROM GULF OF MEXICO BLM-OCS PROGRAMS

Key to the Genera of Polynoidae from the Gulf of Mexico BLM-OCS Programs

1a. Lateral antennae inserted terminally on anterior extensions of prostomium (Figures 21-2a, 4b) (subfamily **Lepidonotinae**) 2

1b. Lateral antennae inserted ventrally or terminoventrally to anterior lobes of prostomium (Figure 21-24d) (subfamily **Harmothoinae**) 5

2a. Parapodia subbiramous, notopodia represented by small acicular lobes; notosetae absent (Figure 21-4c) 3

2b. Parapodia biramous, notopodia with projecting acicular lobes; notosetae present (Figure 21-6c) 4

3a. Neurosetae of middle and posterior setigers deeply cleft, tapering to capillary tips (Figure 21-2d,e) . . . . . .**Perolepis**, p. 21-5
3b. Neurosetae of middle and posterior setigers bidentate, each tooth short, blunt (Figure 21-4e,f). . . . . .**Lepidasthenia**, p. 21-7

4a. Elytra numbering 12 pairs; notosetae numerous, more than ten per bundle (Figure 21-6c). . . . . **Lepidonotus**, p. 21-10
4b. Elytra numbering more than 25 pairs; notosetae few in number, less than ten per bundle . . . . . .**Lepidametria***

5a. Notosetae with widely spaced spinous pockets (Figure 21-8c); neurosetae with basal semilunar pockets and distal spinous rows (Figure 21-8f) . . . . . **Genus A**, p. 21-14
5b. Noto- and neurosetae with faint to distinct spinous rows, not forming pockets (Figure 21-20d,f). 6

6a. Most or all notosetae more slender than neurosetae. 7
6b. All notosetae at least as stout as neurosetae 9

7a. All notosetae with blunt tips (Figure 21-10d,e). . . . . .**Genus B**, p. 21-14
7b. Most or all notosetae with acute tips (Figure 21-12e,f). 8

8a. Few upper notosetae with blunt tips (Figure 21-12d); ventrum without paired, segmental, foliaceous appendages. . . . . .**Genus C**, p. 21-17
8b. All notosetae with pointed tips; ventrum with paired, segmental, foliaceous appendages. . . . . **Phyllohartmania****

9a. Notosetae faintly spinous (Figures 21-14d, 16d). . . . . .**Malmgreniella**, p. 21-18
9b. Notosetae heavily spinous (Figures 21-20d, 22d). . . . . .**Harmothoe**, p. 21-24

*Not represented in Gulf of Mexico BLM-OCS collections but Lepidametria commensalis Webster, 1879, is reported from the Gulf of Mexico off Florida, in shallow water (Hartman, 1951a:17).
**Not represented in Gulf of Mexico BLM-OCS collections but Phyllohartmania taylori Pettibone, 1961, is reported from the Gulf of Mexico off Florida, in shallow water (Pettibone, 1961:170).

Genus **Perolepis** Ehlers, 1908

TYPE SPECIES: Perolepis regularis Ehlers, 1908.
REFERENCES:
Ehlers, 1908:51.
Ushakov, 1973:1616.
Pettibone (in prep.).
DIAGNOSIS: Body long, with numerous segments. Numerous pairs of elytra present on segments 2, 4, 5, 7, alternate segments to 23, and every third segment to end of body. Prostomium lepidonotoid, with lateral

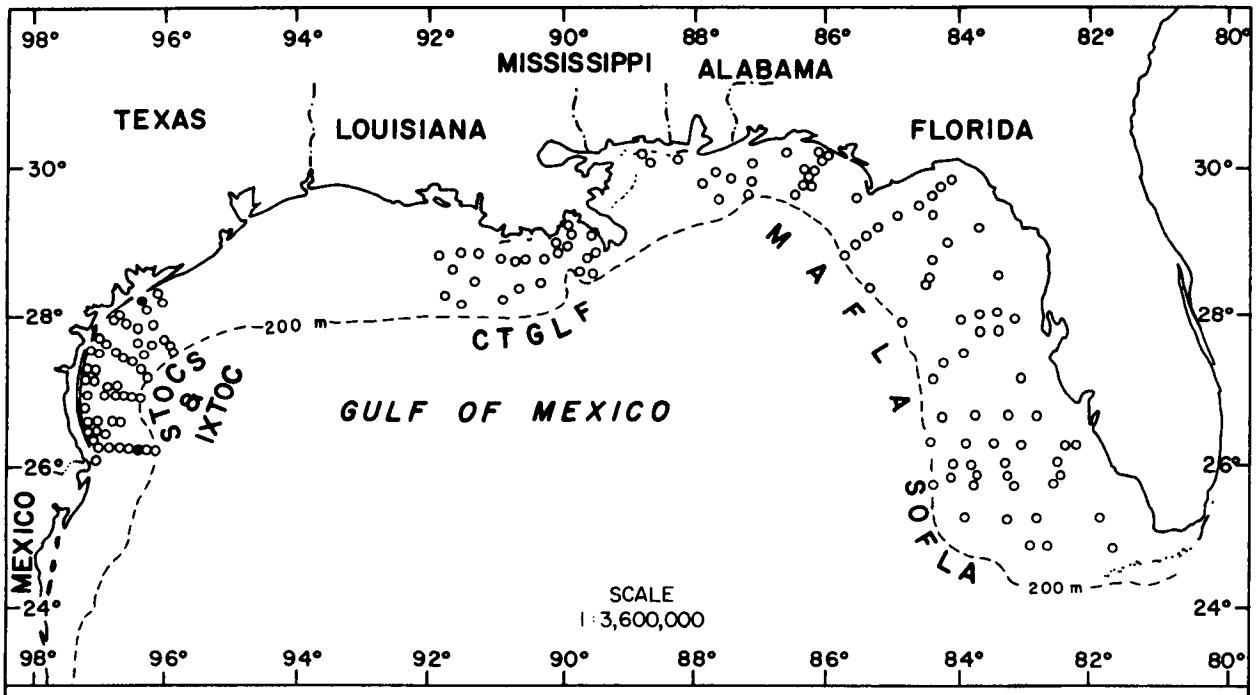

Figure 21-1. Distribution of Perolepis sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

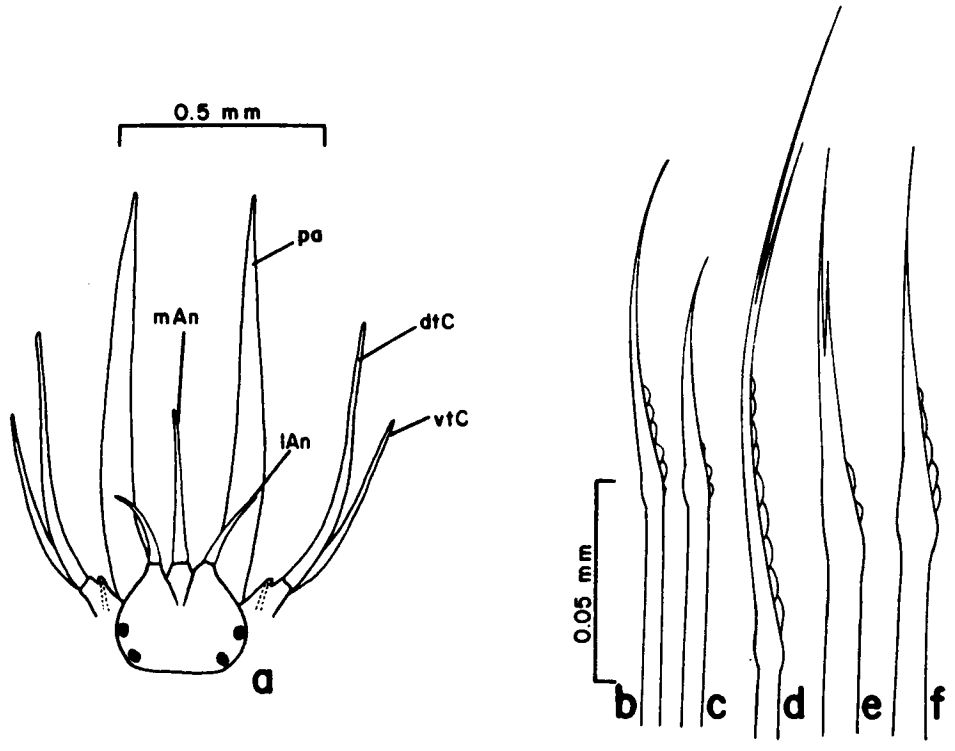

Figure 21-2. Perolepis sp. A: a, prostomium and tentacular segment, dorsal view; b, upper neuroseta from segment 5; c, lower neuroseta from same; d, upper neuroseta from segment 15; e, middle neuroseta from same; f, lower neuroseta from same.

antennae inserted on anterior continuations. Parapodia subbiramous, notopodia represented by small acicular lobes, without setae. Neuropodia with rounded anterior [presetal] and posterior [postsetal] vertical lobes. Neurosetae with well-developed pectinate plates; some with unequally cleft tips.
REMARKS: The above generic diagnosis (except bracketed terms) was composed by Dr. M. H. Pettibone and is included herein with her permission.

Perolepis sp. A
Figures 21-1, 2a-f

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
STOCS 4/I-Sp/76 (2 spec.), 6/IV-Sp/76 (1 spec.).
DESCRIPTION:
Length, to 6.5 mm; width, to 3.5 mm. Dorsum unpigmented except for faint transverse bands across posterior segments. Elytra smooth, circular, not covering dorsum, with faint brown pigmentation along posterior edges, without tubercles or marginal fringe. Complete specimen (juvenile?) with 13 pairs of elytra located on segments 2, 4, 5, 7, alternate segments to 23, and 26. Prostomium with two pairs of eyes, anterior pair located laterally at widest point (Figure 21-2a). Lateral antennae inserted terminally; styles of lateral and median antennae smooth, gradually tapering to filamentous tips (Figure 21-2a). Basal lobes of tentacular segment each with small acicular process, without setae; tentacular cirri long, dorsal pair nearly three times as long as prostomium, ventral pair somewhat shorter. Dorsal cirri smooth, extending to or just slightly beyond setal tips. Ventral cirri evenly tapering, short, extending one-third distance from their insertion to end of parapodial lobes. Parapodia long, each about equal in length to width of body, subbiramous. Notopodia represented only by small acicular lobe on dorsal surface of neuropodium; notosetae absent. Neuropodial lobes rounded, presetal lobe somewhat longer than postsetal lobe. Neurosetae of anterior segments with few spinous rows, terminating in acute tips (Figure 21-2b), similar throughout ramus with lower ones somewhat shorter (Figure 21-2c). Cleft neurosetae first appearing on segment 7 and continuing to end of body; upper ones more slender than lower ones, deeply cleft terminally, with long, fine, unequal tips (Figure 21-2d). Middle neurosetae stouter, with fewer spinous rows and shallower terminal cleft (Figure 21-2e). Lower neurosetae (Figure 21-2f) similar to middle ones, but without terminal cleft.
REMARKS: This species, represented in the BLM-OCS collections by three small specimens, is distinctive because of its uniquely cleft neurosetae.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Texas (Figure 21-1); 27-65 m; clayey sand.

Genus **Lepidasthenia** Malmgren, 1867b

TYPE SPECIES: Polynoe elegans Grube, 1840.
REFERENCES:
Fauvel, 1923:86.

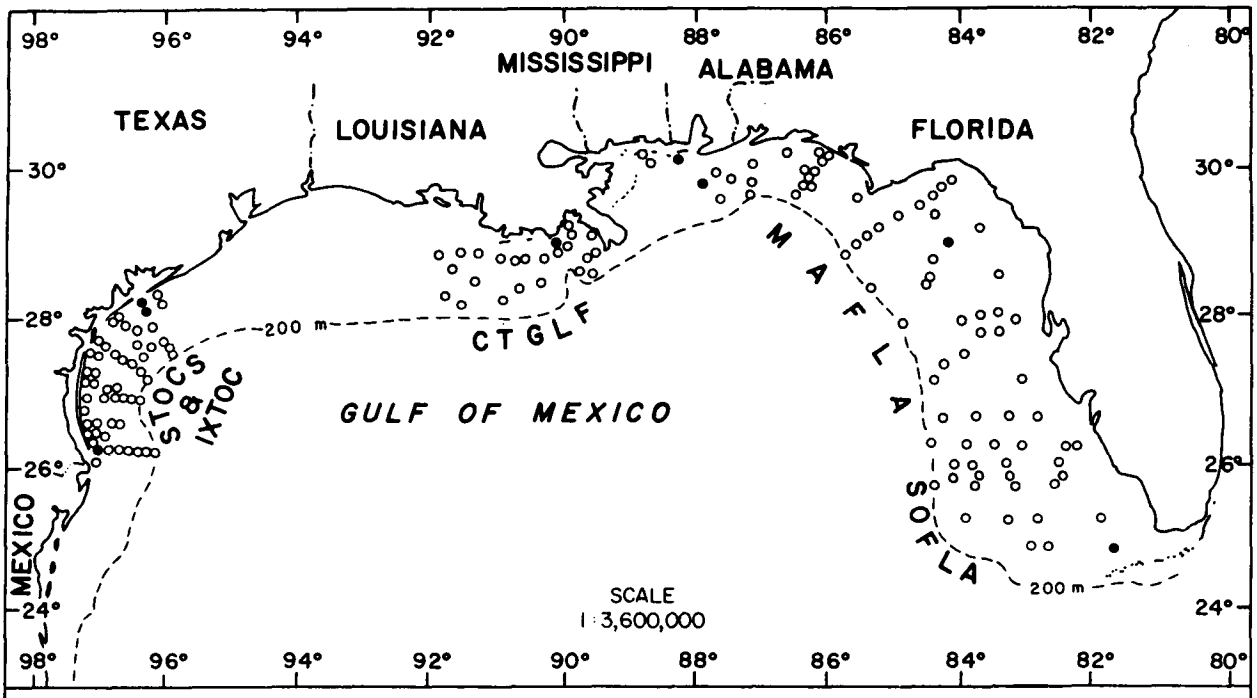

Figure 21-3. Distribution of Lepidasthenia sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

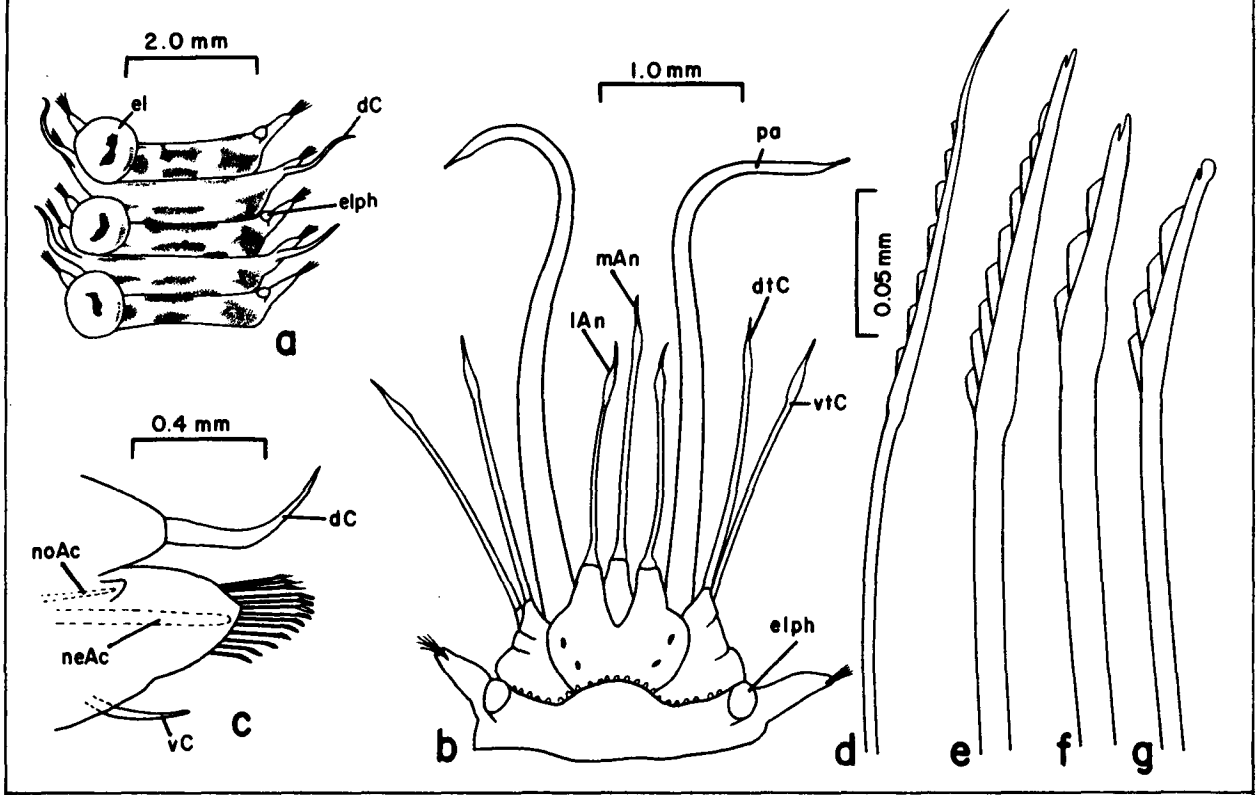

Figure 21-4. Lepidasthenia sp. A: a, segments 5-9 (right elytra removed), dorsal view; b, prostomium and first two segments (elytra removed), dorsal view; c, middle left parapodium, anterior view; d, upper neuroseta; e, supra-acicular neuroseta; f, subacicular neuroseta; g, middle neuroseta from segment 3.

Pettibone, 1953b:50.
Ushakov, 1955:128.
DIAGNOSIS: Body long, with numerous segments (up to 200 or more). Numerous pairs of elytra, present on segments 2, 4, 5, 7, alternate segments to 23, and every third segment thereafter; elytra small, not covering dorsum. Lateral antennae inserted terminally on anterior continuations of prostomium. Parapodia subbiramous, with vestigial notopodia having only conical acicular lobes; notosetae absent. Neuropodia deeply cut dorsally and ventrally, diagonally truncate, with rounded pre- and postsetal lobes. Neurosetae mostly spinous, with bidentate tips.

Key to the Gulf of Mexico Species of Lepidasthenia

1a. Upper neurosetae more slender than other neurosetae, tapering to fine, entire tips (Figure 21-4d). . . **Lepidasthenia sp. A**, p. 21-9
1b. Upper neurosetae as thick as other neurosetae, with bifid tips. . . . . .**Lepidasthenia varius***

*Not found in Gulf of Mexico BLM-OCS collections, but originally described from Dry Tortugas, Florida (Hartman, 1956:271).

Lepidasthenia sp. A
Figures 21-3, 4a-g

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 25A-4/81 (1 spec., USNM 89668); MAFLA 2317A-2/78 (1 spec.), 2639B-6/75 (1 spec.), 2640B-9/77 (1 spec., USNM 89670); CTGLF 02-1/79 (1 spec., USNM 89665); STOCS 4/I-3 S/76 (1 spec., USNM 89666), 4/IV-4 F/76 (1 spec., USNM 89667); IXTOC N38-2 12/80 (1 spec., USNM 89669).
Supplementary Material:
Gulf of Mexico--7 mi. south of Cameron, LA, coll. of McNeese State Univ., DN-2 B08105 (39 spec.).
DESCRIPTION:
Length, to 40 mm; width, to 4.0 mm. Largest specimen fragmented, incomplete with total of about 75 segments. Body linear, dorsally pigmented with transverse brown bands persisting in preserved specimens. Anterior segments alternately bearing one or two bands per parapodium (Figure 21-4a), posterior segments with single transverse band across anterior border and three pigment spots across posterior border. Dorsolateral pigment spots also present posterior to dorsal cirrophores and elytrophores. Elytra circular, smooth, bearing semilunar dark spots medial to points of elytrophore attachment, and faint dark areas along inner margins. Prostomium 1.5 times wider than long, with two pairs of lightly pigmented eyes; lateral antennae inserted terminally (Figure 21-4b). Antennae and tentacular cirri three times as long as prostomium, with subterminal swellings abruptly tapering to fine tips; median antenna slightly longer than lateral ones. Palps smooth, approximately seven times as long as prostomium. Anterior margin of segment 2 with row of small, globular papillae extending across dorsum between elytrophores (Figure 21-4b). Anterior dorsal cirri similar in shape and length to tentacular cirri; posterior cirri shorter, evenly tapering, extending to

setal tips. Ventral cirri evenly tapered, not reaching tips of neuropodia (Figure 21-4c). Notopodium with small acicular lobe; notosetae absent. Upper few (2-4) neurosetae slender, serrate, tapering to fine tips (Figure 21-4d); may be lacking on anterior few setigers. Remaining neurosetae stout, with bifid tips, occasionally mixed with entire ones; subacicular neurosetae stouter, with terminal serrate portion shorter than on supra-acicular neurosetae (Figure 21-4e,f). Anterior few setigers with bidentate neurosetae having more swollen and rounded tips (Figure 21-4g).

REMARKS: Lepidasthenia sp. A is distinguished from L. varius Treadwell, 1917, by the presence of slender, fine-tipped superior neurosetae in the former; however, these setae may be absent in some specimens. In the SOFLA specimen (USNM 89668), only one anterior parapodium had the fine-tipped superior neurosetae. Also, in smaller specimens of Lepidasthenia sp. A, most of the neurosetae were clearly unidentate; however, bidentate neurosetae were forming within the parapodium, indicating that as the worm matures, unidentate setae are gradually replaced by bidentate ones.

GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida, Alabama, and Texas (Figure 21-3); 15-35 m; silty clay, sandy clay, silty to clean sand.

Genus **Lepidonotus** Leach, 1816

TYPE SPECIES: Aphrodita squamatus Linnaeus, 1767.

REFERENCES:
McIntosh, 1900:273.
Pettibone, 1963:16.
Ebbs, 1966:493.
Fauchald, 1977a:63.

DIAGNOSIS: Body with 26 segments. Twelve pairs of elytra present on segments 2, 4, 5, 7, and alternate segments to 23. Prostomium with lateral antennae inserted terminally. Parapodia biramous. Notosetae spinous, finer than neurosetae. Neurosetae stout, distally spinous, with slightly hooked, unidentate or bidentate tips.

Key to the Gulf of Mexico Species of Lepidonotus

1a. All neurosetae unidentate (Figure 21-6e,f). . . . . **Lepidonotus sublevis**, p. 21-10

1b. Some neurosetae bidentate. . . . . **Lepidonotus variabilis***

*Not found in Gulf of Mexico BLM-OCS collections, but previously reported from the Gulf by numerous authors (see Perkins and Savage, 1975:21).

Lepidonotus sublevis Verrill, 1873
Figures 21-5, 6a-e

Lepidonotus sublevis Verrill, 1873:581, pl. 10, fig. 42.
Lepidonotus pallidus Treadwell, 1939a:3, figs. 10-12.
Lepidonotus sublevis--Hartman, 1942b:22, figs. 7-12; 1951a:17.
Lepidonotus sublevis--Pettibone, 1963:18, fig. 3e.

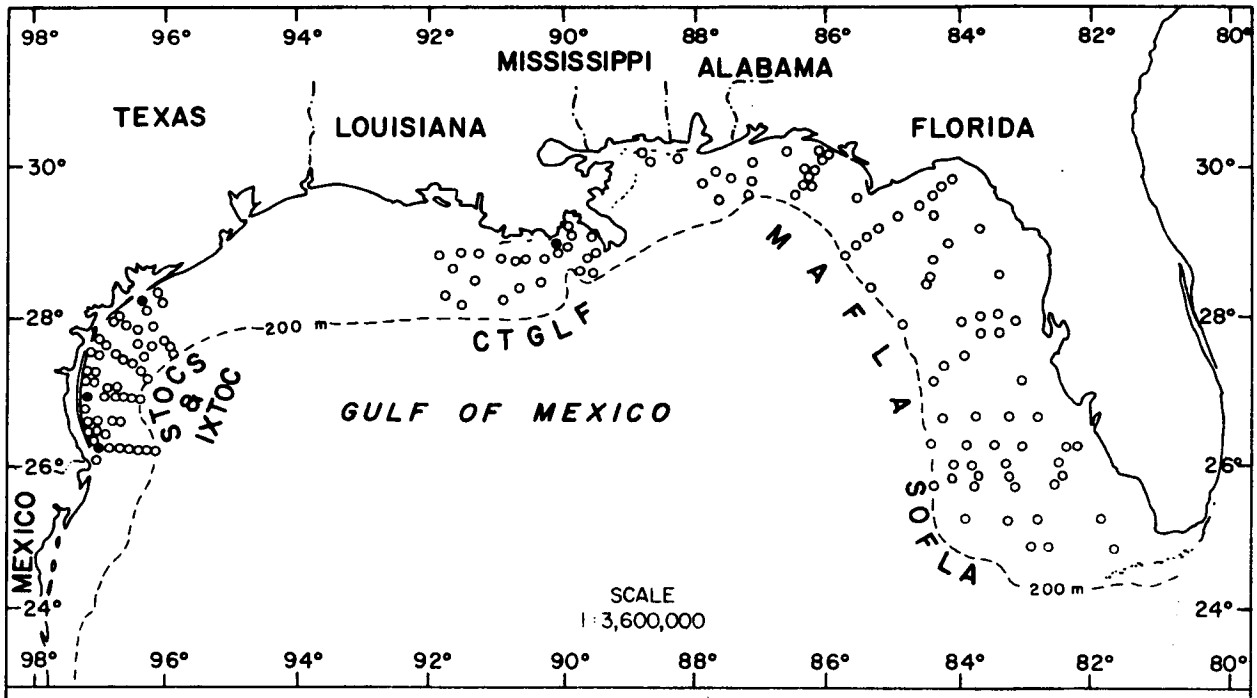

Figure 21-5. Distribution of Lepidonotus sublevis on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

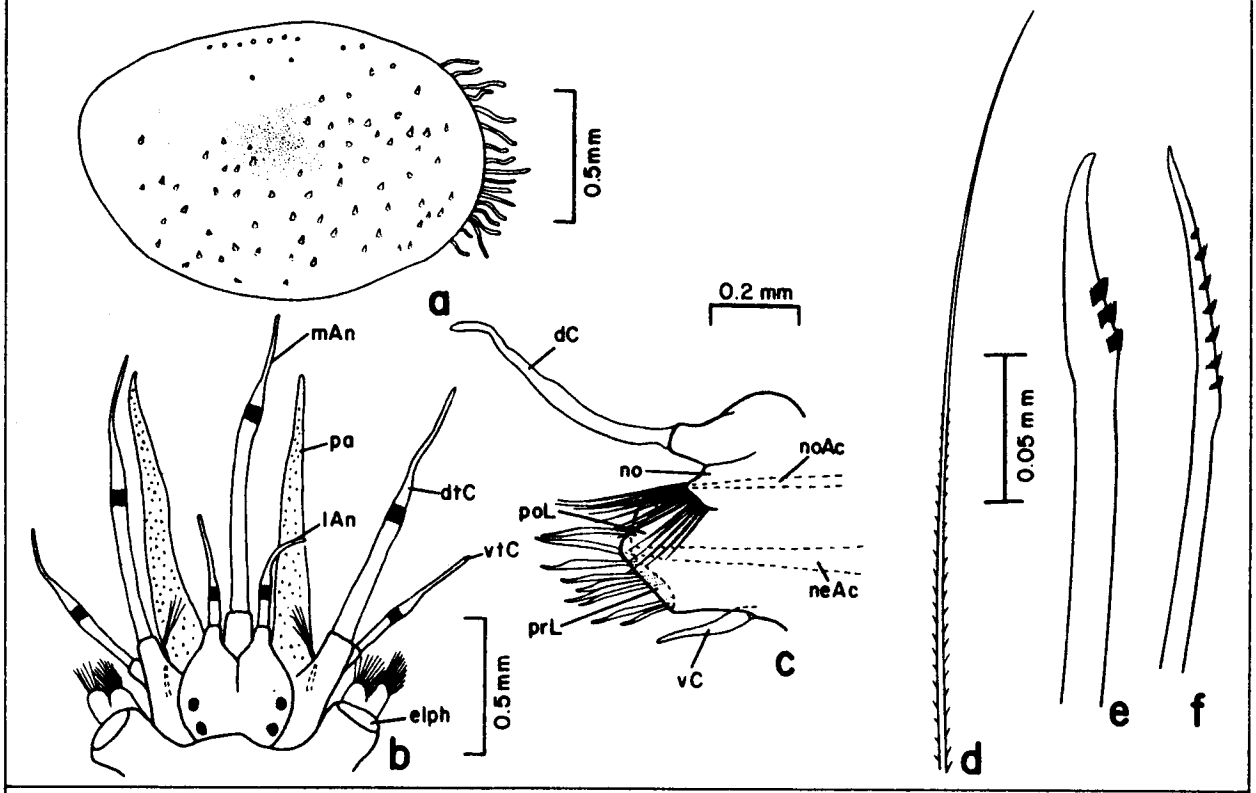

Figure 21-6. Lepidonotus sublevis: a, right elytron; b, prostomium and first two segments (elytra removed), dorsal view; c, middle right parapodium, anterior view; d, notoseta; e, typical neuroseta; f, neuroseta from segment 2.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
CTGLF 02-5/78 (1 spec., USNM 89671); STOCS 4/I-W/76 (1 spec., USNM 89673), 4/III-6 S/76 (1 spec., USNM 89675), 4/I-3 S/76 (1 spec., USNM 89674), 4/IV-5 Sp/76 (1 spec., USNM 89672).
DESCRIPTION:
Length, to 13 mm (previously reported to 34 mm); width, to 3.5 mm (previously reported to 10 mm). Largest specimen complete with 26 segments. Dorsum with faint, transverse, brown bands; elytra mottled, with dark areas medial to points of elytrophore attachment. Elytra oval, overlapping and covering dorsum, with conical microtubercles and long marginal papillae along lateral borders (Figure 21-6a), occasionally with additional tuft of marginal papillae on posterior borders. Prostomium slightly longer than wide, with two pairs of eyes, anterior pair located at widest part, posterior pair located slightly forward of posterolateral corners (Figure 21-6b). Style of median antenna over twice as long as lateral antennae and three times as long as prostomium. Antennae, tentacular and dorsal cirri with subterminal swellings encircled by dark pigmented bands, with long acuminate tips. Palps minutely papillose, 3-4 times as long as prostomium. Tentacular segment with acicula and several spinous capillary setae. Dorsal cirri with large cirrophores, styles similar in shape to tentacular cirri, extending well beyond tips of neurosetae. Ventral cirri subulate, reaching just beyond bases of lower neurosetae. Notopodia located on anterodorsal surface of parapodia; neuropodia distally cleft, with postsetal lobe slightly shorter than presetal lobe (Figure 21-6c). Notosetae all spinous, capillary (Figure 21-6d). Neurosetae stout, with few spinous rows and slightly hooked tips (Figure 21-6e); upper ones with more numerous spinous rows than lower ones. Neurosetae of segment 2 more slender, with longer spinous regions than subsequent neurosetae. Pygidium with two anal cirri having subterminal swelling encircled by brown bands. Nephridial papillae beginning on segment 8, continuing to end of body.
REMARKS: Gardiner (1976) used the presence of bidentate neurosetae and an additional tuft of marginal papillae on the posterior borders of the elytra as characteristics distinguishing Lepidonotus variabilis Webster, 1879, from L. sublevis. However, in the MAFLA material, it was found that specimens of L. sublevis, as defined by the presence of unidentate neurosetae, may also possess this additional tuft of marginal papillae on the elytra. Similar variation in specimens from the Gulf of Mexico was noted by Hartman (1951a:18). Voucher material from STOCS and CTGLF collections belonging to L. sublevis was previously identified as L. variabilis, possibly due to this discrepancy.
PREVIOUSLY REPORTED HABITAT: Free-living or commensal with the sea pansy Renilla mulleri (Hedgpeth, 1950:75) and the hermit crabs Pagurus pollicaris, P. longicarpus, P. impressus and Clibanarius vittatus (Gardiner, 1976:86); intertidal to 100 m.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Louisiana and Texas (Figure 21-5); 12-15 m; sandy silt, clayey to clean sand.
DISTRIBUTION: Massachusetts to Florida, Gulf of Mexico.

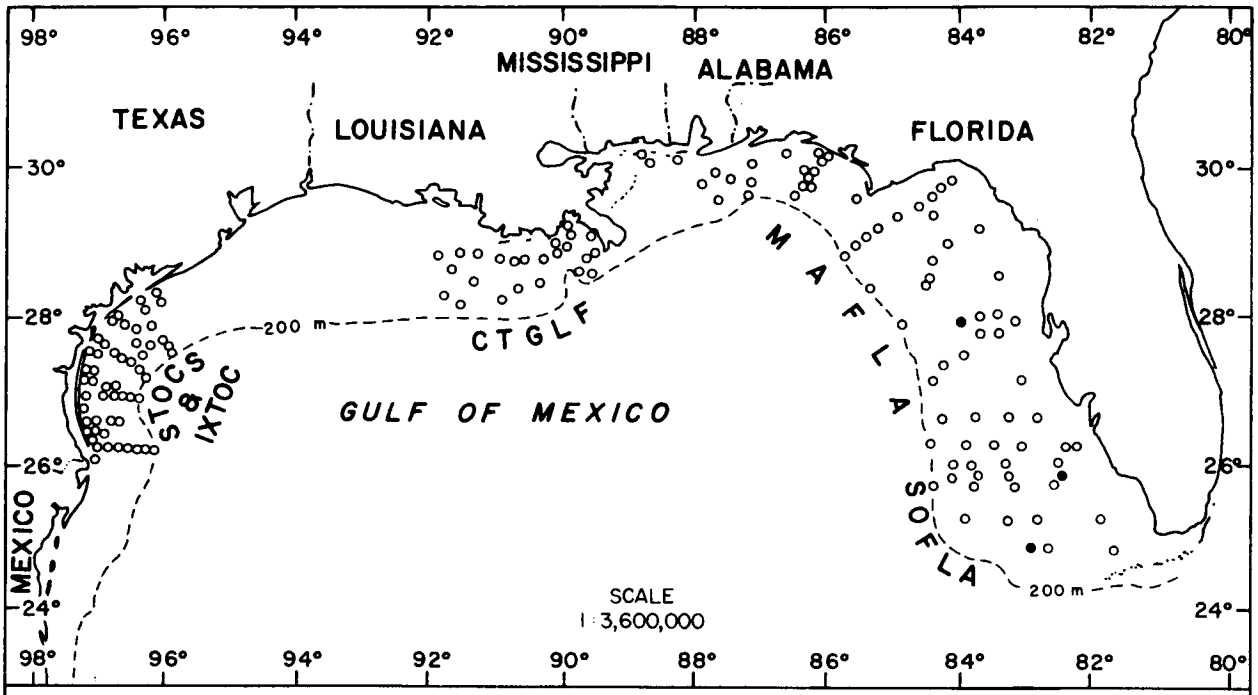

Figure 21-7. Distribution of polynoid Genus A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

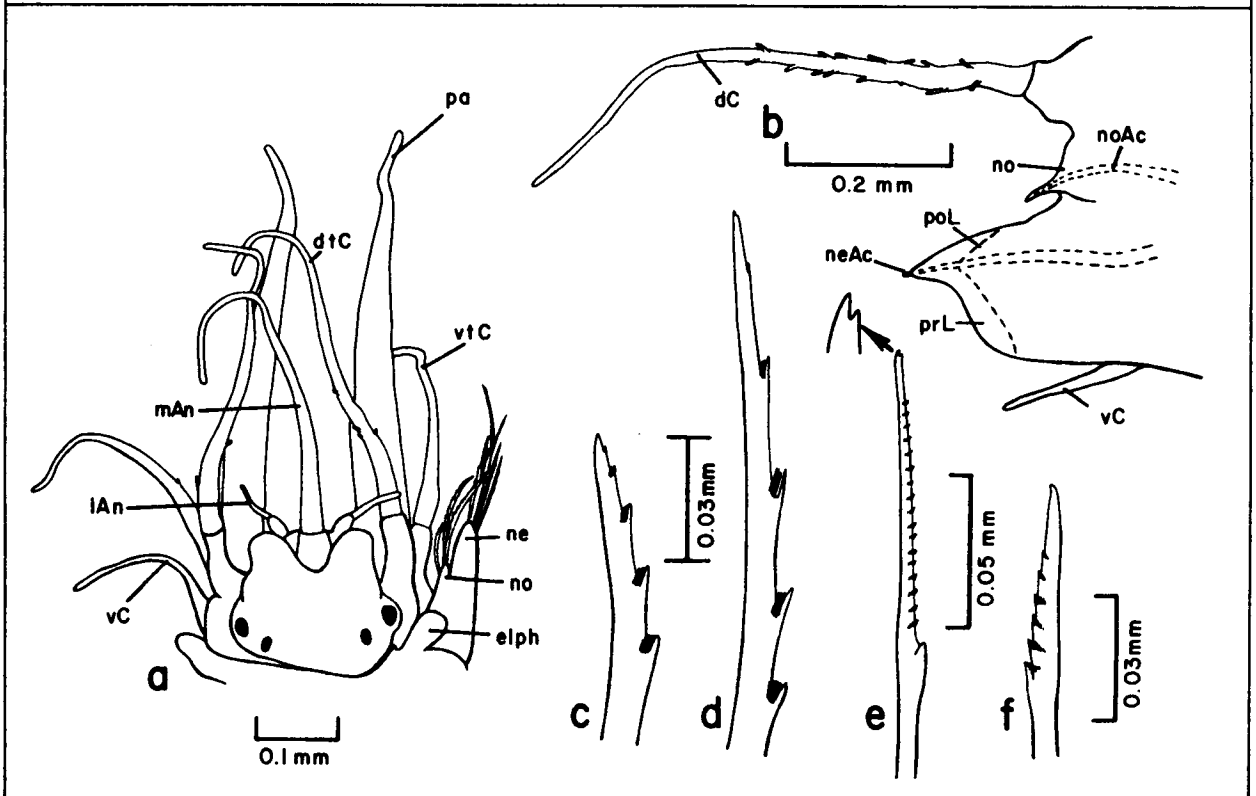

Figure 21-8. Genus A: a, anterior end, dorsal view; b, right middle parapodium (setae omitted), anterior view; c, upper notoseta; d, middle notoseta; e, neuroseta; f, lowermost neuroseta.

Genus A
Figures 21-7, 8a-f

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 14D-8/81 (3 spec.-1 ovig., USNM 89676), 28D-5/81 (1 spec., USNM 89677); MAFLA 2211I-8/77 (1 spec., 89678).
DESCRIPTION:
Length, to 2.2 mm; width, to 0.8 mm. Only complete specimen with 20 segments. Elytra absent from all specimens; elytrophores present on segments 2, 4, 5, 7, 9, 11, 13 and 15. Prostomium with rounded anterior lobes, lacking distinct cephalic peaks; two pairs of eyes present posteriorly (Figure 21-8a). Median antenna slender, equal in length to dorsal tentacular cirri; lateral antennae much shorter, inserted ventrally (Figure 21-8a). Tentacular segment with two pairs of long, filiform tentacular cirri; dorsal pair longer than ventral pair, with few clavate papillae. Nuchal fold absent. Dorsal cirri long, filiform, with few clavate papillae basally (Figure 21-8b). Ventral cirri smooth, reaching ends of neuropodial postsetal lobes. Notopodia conical with long acicular lobes, acicula protruding. Neuropodia with conical presetal lobes having protruding acicula, and shorter, bluntly conical postsetal lobes (Figure 21-8b). Notosetae stouter than neurosetae; upper notosetae shorter with 2-3 widely spaced spinous pockets and entire tips (Figure 21-8c), middle and lower notosetae longer with five widely spaced spinous pockets and distally bifid tips (Figure 21-8d). Upper and middle neurosetae with several closely spaced spinous rows, basal pockets, and bifid tips (Figure 21-8e), lower ones with 5-6 closely spaced spinous rows, basal pocket, and entire tips (Figure 21-8f).
REMARKS: Genus A is similar to Subadyte Pettibone, 1969a, but differs from the latter in having notosetae with few widely spaced spinous pockets, in having notosetae stouter than the neurosetae, in lacking the nuchal fold of segment 2, and in possessing lower neurosetae with entire instead of bifid tips. Genus A is also similar to Paradyte Pettibone, 1969a, but the notosetae of the latter are described as having spines instead of spinous pockets along their convex borders. In addition, all subacicular neurosetae of Paradyte are unidentate, whereas in Genus A, only the lowermost neurosetae have entire tips. Genus A is also similar to Scalisetosus McIntosh, 1885, but differs from the latter in having notosetae with spinous rows instead of only a few spines. In addition, Genus A differs from the three above genera in possessing only 20 segments instead of 40 or more.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida (Figure 21-7); 26-87 m; coarse to fine sand.

Genus B
Figures 21-9, 10a-g

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2211I-7/76 (1 spec., USNM 89679), 2211E-8/77 (1 spec., USNM 89680), 2211C-11/77 (1 juv.), 2640D-7/76 (1 spec.).
DESCRIPTION:
Length, to 6 mm; width, to 3.2 mm. Largest specimen incomplete with 16 segments. Body unpigmented. Juvenile specimen with 11 pairs of elytra;

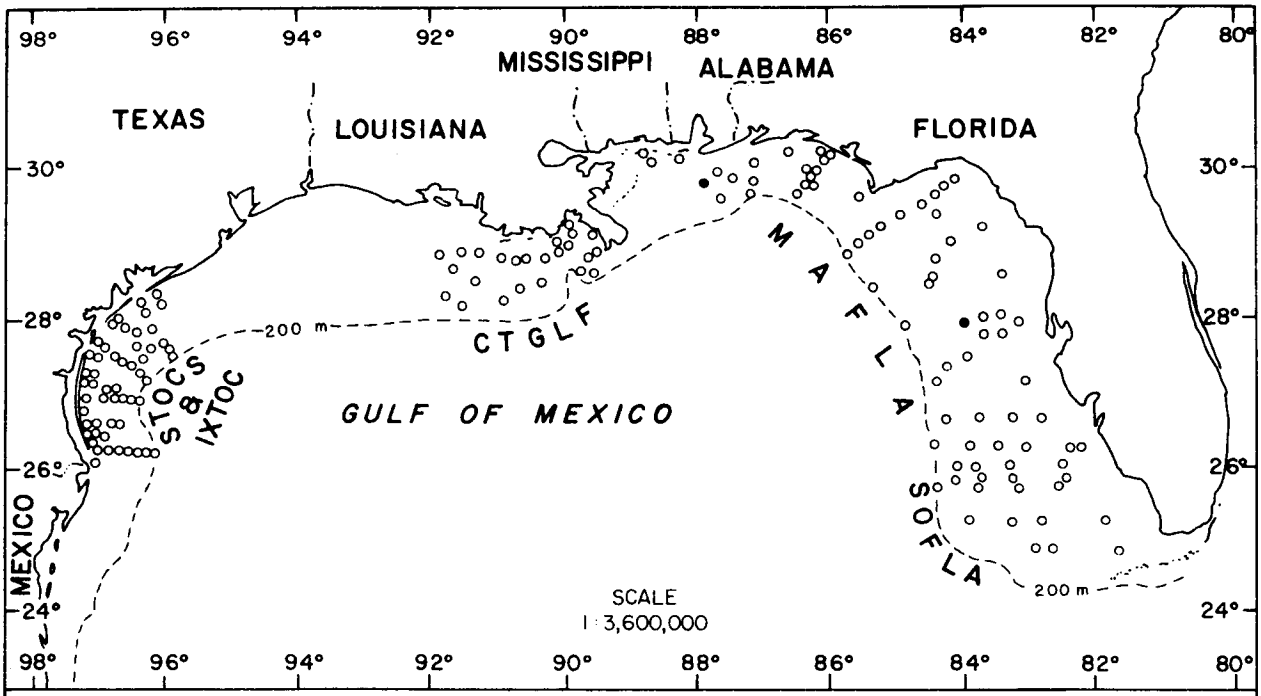

Figure 21-9. Distribution of polynoid Genus B on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

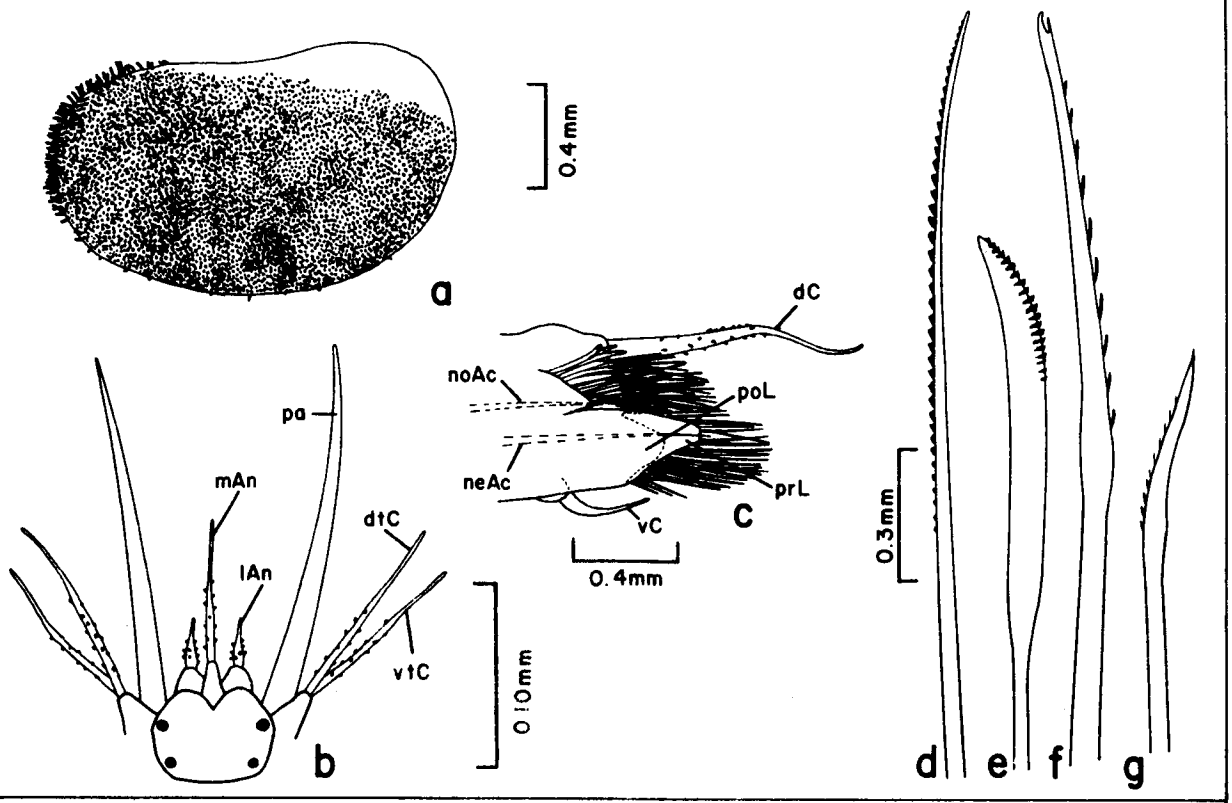

Figure 21-10. Genus B: a, left elytron; b, prostomium and tentacular segment, dorsal view; c, left parapodium, anterior view; d, notoseta from posterior part of bundle; e, notoseta from upper part of bundle; f, middle neuroseta; g, lower neuroseta.

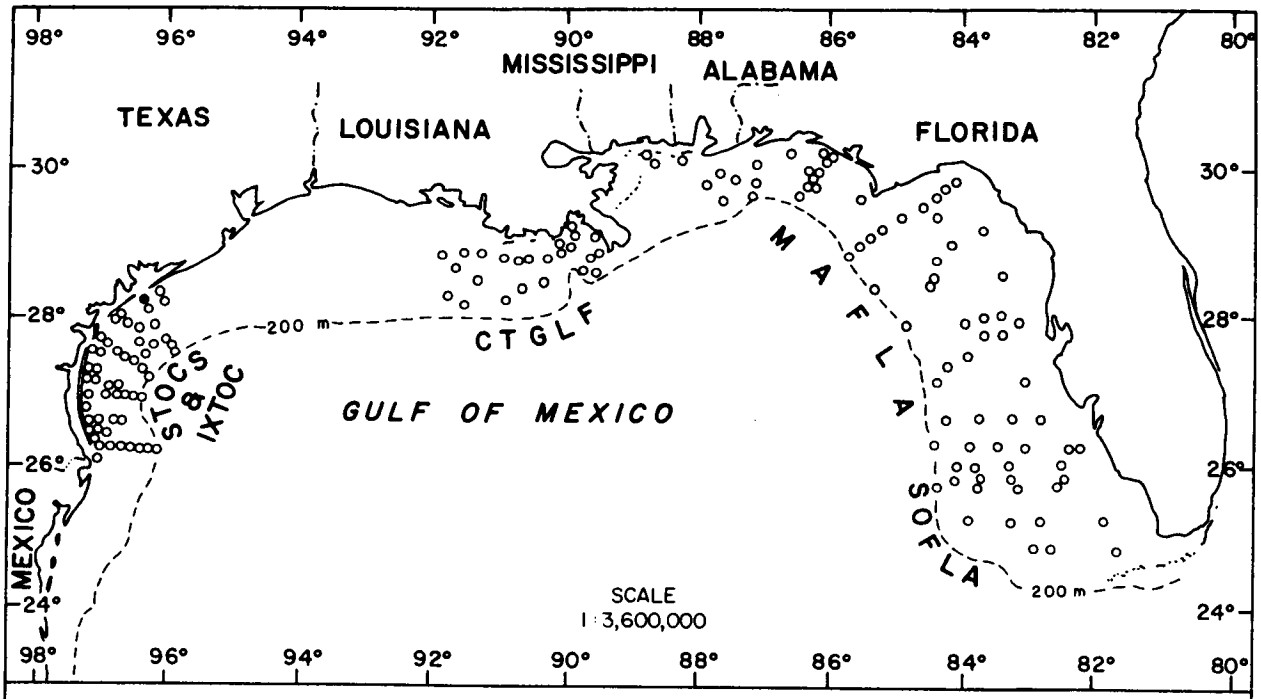

Figure 21-11. Distribution of polynoid Genus C on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

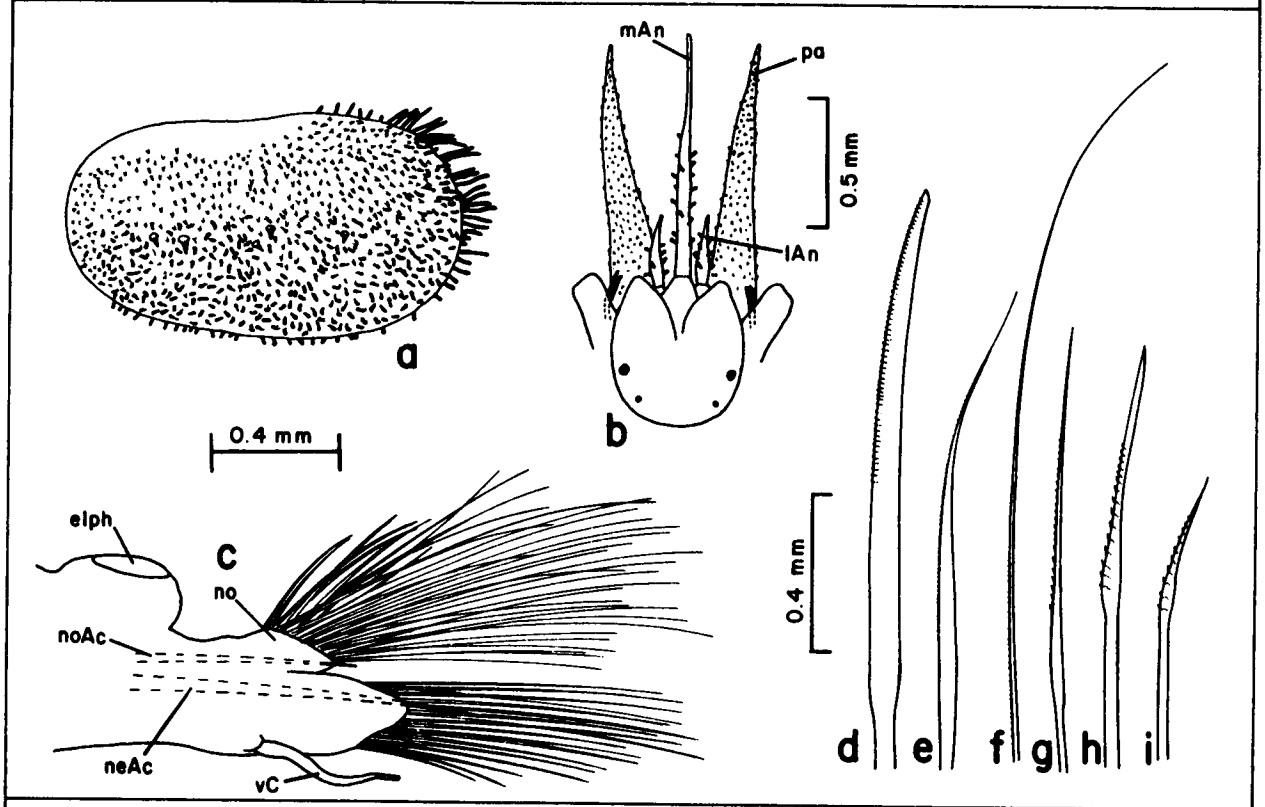

Figure 21-12. Genus C: a, right elytron; b, prostomium and tentacular segment (tentacular cirri missing), dorsal view; c, right middle parapodium, posterior view; d, upper notoseta from segment 5; e, same, from middle segment; f, middle notoseta from same; g, upper neuroseta; h, middle neuroseta; i, lower neuroseta.

all mature specimens incomplete. Elytra transparent, large, covering dorsum, with long filiform papillae on and near lateral borders (Figure 21-10a). Surface of elytra, except for narrow anterior band, densely covered with low, rounded to conical microtubercles; macrotubercles lacking. Prostomium (Figure 21-10b) wider than long, with two pairs of eyes, anterior pair slightly larger than posterior pair, located at widest point. Median antenna with long ceratophore and style tapering to filiform tip, 1.5-2 times as long as prostomium. Lateral antennae with large, prominent ceratophores inserted terminoventrally; styles subulate, with filiform tips, somewhat longer than half prostomial length. Palps minutely papillose, four times as long as prostomium (Figure 21-10b). Basal lobes of tentacular segment with acicula; setae lacking. Tentacular cirri slightly longer than median antenna, with filiform tips. Antennae and cirri with scattered, short, clavate papillae. Dorsal cirri tapering to filiform tips, extending well beyond tips of setae; ventral cirri evenly tapered, not quite reaching ends of neuropodial postsetal lobes (Figure 21-10c). Notopodia conical, with protruding acicula. Neuropodia with longer, conical, presetal lobes having protruding acicula; and shorter, rounded, postsetal lobes. Notosetae including numerous (approximately 80 per fascicle), slender, evenly tapered setae with close-set spinous rows (Figure 21-10d); and fewer, stout, slightly curved, distally serrate setae (Figure 21-10e) in single rows in upper part of bundle. Upper neurosetae with long spinous regions and unidentate tips; middle neurosetae with approximately ten spinous rows and bidentate tips (Figure 21-10f); lower neurosetae smaller, with about ten spinous rows and sharply pointed tips (Figure 21-10g).

REMARKS: Genus B could not be assigned to any presently recognized genus because all adult specimens were incomplete, and therefore the exact number of pairs of elytra could not be determined.

GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida and Alabama (Figure 21-9); 35-43 m; coarse to medium sand.

Genus C

Figures 21-11, 12a-i

MATERIAL EXAMINED:

Gulf of Mexico BLM-OCS:

STOCS 4/I-6 F/77 (1 spec., USNM 89681).

DESCRIPTION:

Length, 3.0 mm; width, 2.7 mm. Body broad; only specimen incomplete with 14 segments. Pigmentation absent. Elytra (Figure 21-12a) large, oval; lateral borders with numerous, long, filiform papillae; posterior borders with shorter, clavate papillae. Anterior half of each elytron densely covered with low, sharply conical microtubercles; posterior half with short, clavate papillae; central part with 4-5 taller, bluntly conical macrotubercles about 3-4 times the height of surrounding conical microtubercles. Prostomium (Figure 21-12b) longer than wide, anterior lobes triangular. Two pairs of eyes present; anterior pair located laterally, posterior to widest point of prostomium; posterior pair smaller, located posterolaterally. Style of median antenna 1.5-2 times length of prostomium, with long filiform tip. Lateral antennae with small ceratophores inserted ventrally; styles subulate, about half as long as prostomium. All antennae with scattered, clavate papillae.

Palps similar in length to median antenna; densely covered with short clavate papillae. Basal lobes of tentacular segment each with aciculum and two projecting setae. Styles of tentacular cirri and dorsal cirri missing. Ventral cirri evenly tapered, reaching ends of postsetal neuropodial lobes. Neuropodial lobes conical, presetal lobes longer than postsetal lobes, with distally projecting acicula (Figure 21-12c). Notosetae of three kinds: 1) upper, stout, finely serrate, blunt-tipped setae (Figure 21-12d), most numerous on anterior segments; 2) upper, finely serrate setae, tapering to capillary tips (Figure 21-12e), present on middle and posterior segments; and 3) numerous, hair-like, serrate capillary setae (Figure 21-12f), present throughout. Neurosetae of three kinds: 1) upper ones with long spinous regions, tapering to slender, sharp tips (Figure 21-12g); 2) middle ones distally broader, with 10-20 spinous rows, and pointed bare tips (Figure 21-12h); and 3) lower ones similar to middle ones, but with shorter spinous regions and slender, sharp tips (Figure 21-12i).
REMARKS: The Gulf of Mexico BLM-OCS specimen of Genus C could not be assigned to any presently recognized genus because it was incomplete posteriorly.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Texas (Figure 21-11); 10 m; clayey sand.

Genus **Malmgreniella** Hartman, 1967

TYPE SPECIES: Malmgreniella dicirra Hartman, 1967.
REFERENCE:
Hartman, 1967:37.
DIAGNOSIS: Segments numbering up to 56. Elytra numbering up to 15 pairs, on segments 2, 4, 5, 7, alternate segments to 23, and 26, 29, 32; microtubercles few or lacking. Prostomium bilobed, without distinct cephalic peaks; anterior lobes rounded or triangular; lateral antennae with distinct ceratophores, inserted terminoventrally or ventrally. Parapodia biramous; notopodia small, with projecting acicular lobes on lower side; neuropodia larger, with longer, conical presetal lobes and shorter, rounded postsetal lobes. Notosetae acicular; spinous rows faint or lacking. Neurosetae with bare, hooked tips.
REMARKS: The above generic diagnosis was modified from a diagnosis composed by Dr. M. H. Pettibone (pers. comm.), and is included with her permission. She is presently describing some of the species included herein. At present, Malmgreniella is known only for the type species, which differs from all of the species encountered herein in having alternately long and short dorsal cirri.

Key to the Gulf of Mexico BLM-OCS Species of Malmgreniella

1a. All neurosetae with entire tips (Figure 21-14e-g). . . . . .**Malmgreniella sp. A**, p. 21-20

1b. At least some neurosetae with bifid tips (Figure 21-16e,f) . . . 2

2a. Elytra pigmented; upper and middle neurosetae with short, broad secondary tooth located well below apex (Figure 21-16e,f). . . . . .**Malmgreniella sp. B**, p. 21-20

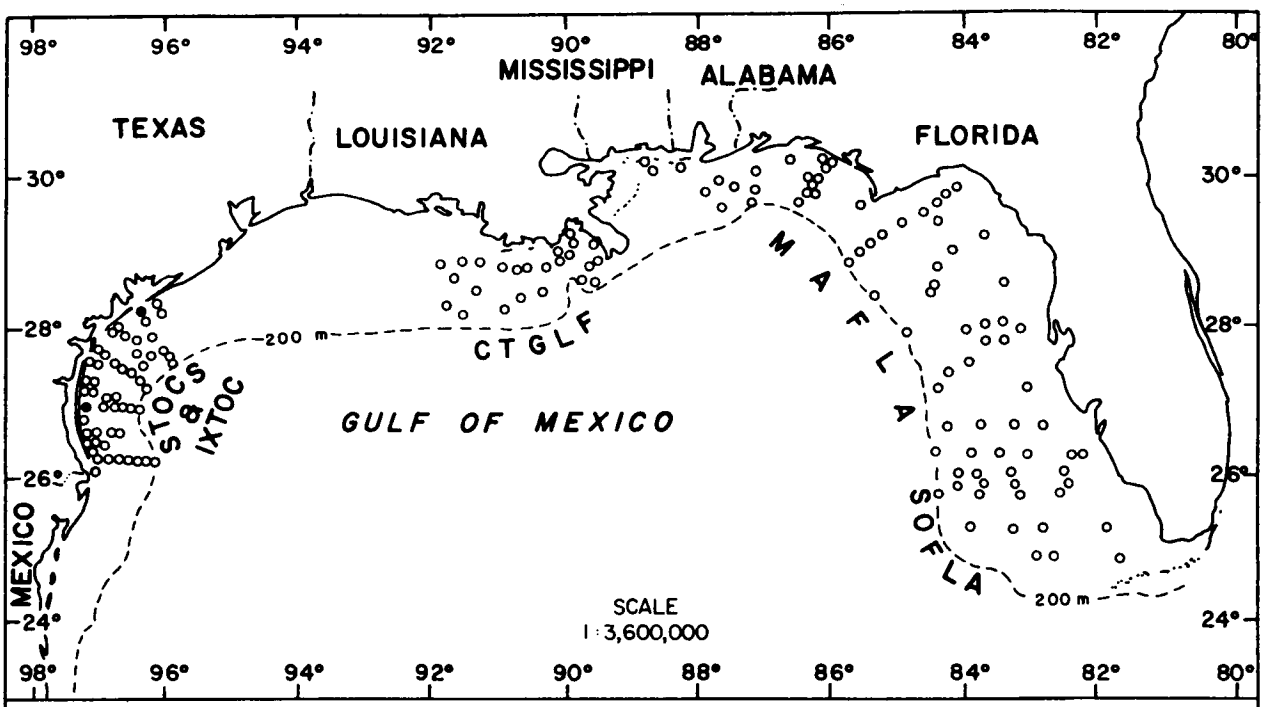

Figure 21-13. Distribution of Malmgreniella sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

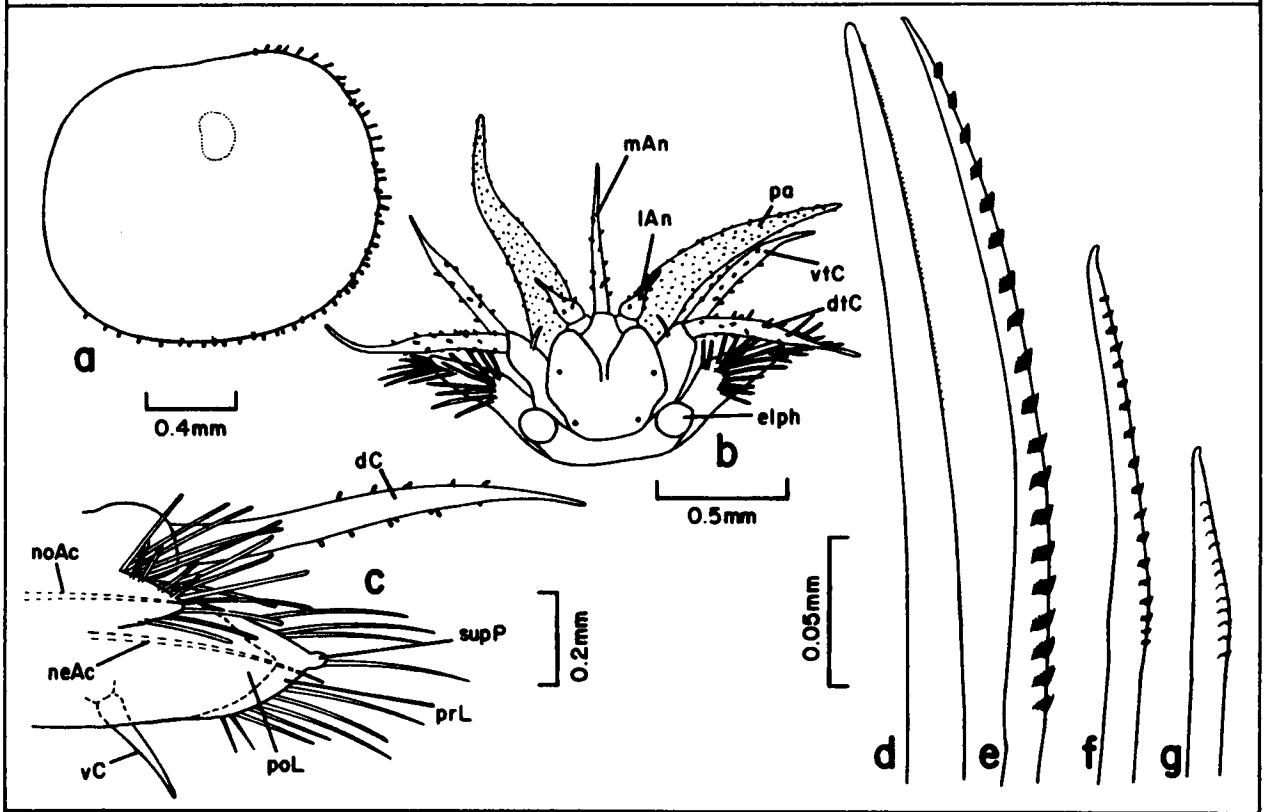

Figure 21-14. Malmgreniella sp. A: a, right elytron; b, prostomium and first two segments, dorsal view; c, left parapodium, anterior view; d, notoseta; e, upper neuroseta; f, middle neuroseta; g, lower neuroseta.

2b. Elytra unpigmented; upper neurosetae entire or with small secondary tooth just below apex (Figure 21-18d,e); middle neurosetae usually with long, slender secondary tooth (Figure 21-18f). . . . . .**Malmgreniella sp. C**, p. 21-22

Malmgreniella sp. A
Figures 21-13, 14a-g

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
STOCS 4/III-4 S/76 (1 spec., USNM 89682); IXTOC N40-5 12/79 (1 spec., USNM 89683).
Supplementary Material:
Gulf of Mexico--Mobile Bay, Alabama, Billy Goat Hole, Feb. 1973 (1 spec.), Mobil Oil Sta. 001-E, July 1978 (1 spec.), 058-D, July 1978 (2 spec.).
Virginia--York River, Boesch Sta. 5-2/70 (11 spec.).
DESCRIPTION:
Length, to 9 mm; width, to 3.2 mm. Body unpigmented, with 33 segments. Elytra numbering 14-15 pairs; smooth, with short marginal fringe on lateral and posterior borders (Figure 21-14a), usually colorless (in alcohol) but rarely with light pigmentation over elytrophore attachments and near medial borders. Prostomium nearly as long as wide, with two pairs of small eyes (Figure 21-14b). Style of median antenna 1-1.5 times as long as prostomium. Lateral antennae subulate, ceratophores inserted terminoventrally. Palps minutely papillose, broad, approximately twice as long as prostomium. Tentacular lobes each with a single seta; tentacular cirri with filiform tips, dorsal pair similar in length to palps, ventral pair somewhat shorter. Dorsal cirri abruptly tapering distally to short filiform tips, extending at least to setal tips (Figure 21-14c). Antennae, tentacular and dorsal cirri with scattered clavate papillae. Ventral cirri smooth, extending to bases of lower neurosetae. Notopodia located anterodorsally on neuropodia, with projecting acicula. Neuropodial presetal lobes conical, with tips of acicula projecting below knob-like supra-acicular process; postsetal lobes shorter, rounded (Figure 21-14c). Notosetae at least as stout as neurosetae, blunt-tipped with faint serrations along convex side (Figure 21-14d). Neurosetae with 10-20 spinous rows and slightly hooked tips; upper ones with long, expanded spinous portion (Figure 21-14e); middle and lower ones with shorter spinous regions and hooked tips (Figure 21-14f,g). Anal cirri nearly as stout as palps, about 1.5 times as long as posterior dorsal cirri.
REMARKS: This species is commensal with the common brittle star, Microphiolis atra, in both Mobile and Chesapeake Bays.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Texas (Figure 21-13); 10-15 m; sand-silt-clay, clean sand.

Malmgreniella sp. B
Figures 21-15, 16a-g

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 25B-11/80 (2 spec., USNM 89684); MAFLA 2209J-11/77 (1 spec.),

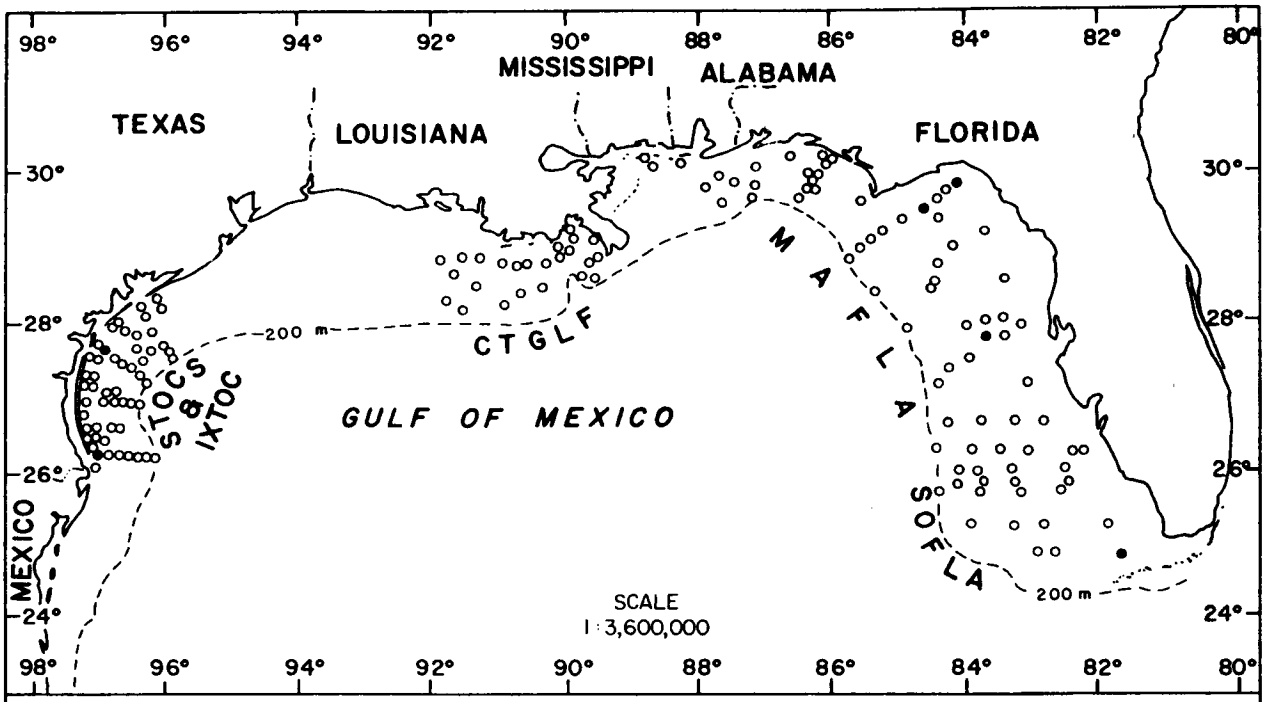

Figure 21-15. Distribution of Malmgreniella sp. B on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

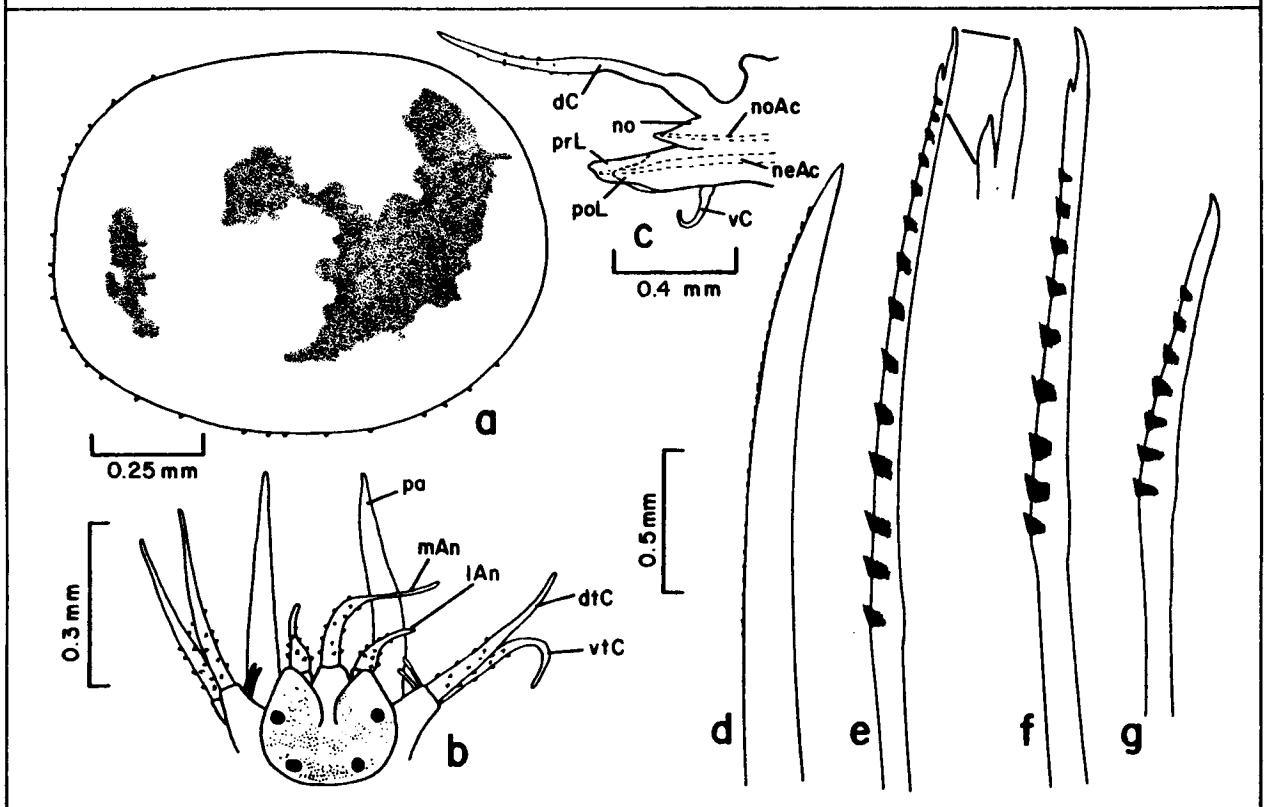

Figure 21-16. Malmgreniella sp. B: a, left middle elytron; b, prostomium and tentacular segment, dorsal view; c, right middle parapodium (setae omitted), posterior view; d, notoseta; e, upper neuroseta; f, middle neuroseta; g, lower neuroseta.

2419-2/73 (2 spec., USNM 89686), 2422G-7/76 (1 spec.); STOCS 1/II-3 F/76 (1 spec., USNM 89688), 4/IV-5 F/76 (1 spec., USNM 89687), 4/IV-2 F/77 (1 spec., USNM 89685).
Supplementary Material:
Gulf of Mexico--Mobile Bay, Alabama, Mobil Oil Sta. 051-A, Aug. 1978 (8 spec.); 7 mi. south of Cameron, LA, Sta. M10A-2 B08105 (1 spec.).
DESCRIPTION:
Length, to 6 mm; width, to 2.1 mm. Body with up to 35 segments; broadest at midlength, gradually tapering anteriorly and posteriorly. Dorsum unpigmented anteriorly, posterior third with transverse diamond-shaped bands on each segment. Ventral surface with dark, broad, medial longitudinal stripe continuing laterally on each segment to bases of parapodia, sometimes developed only on posterior segments. Elytra numbering 15 pairs, oval, without tubercles; with sparse, minute, marginal papillae on lateral and posterior borders; with darkly pigmented areas on points of elytrophore attachments, extending medially to large semilunar pigmented regions; and with lighter, isolated pigment spots near lateral borders (Figure 21-16a). Elytral pigmentation less developed on some specimens, with only small spots on points of attachment and dark areas on medial sides. Prostomium finely speckled with brown pigment, usually more dense along posterior margin; anterior lobes triangular, lacking distinct peaks; with two pairs of small, dark eyes, anterior pair just anterior to widest part of prostomium (Figure 21-16b). Ceratophores of lateral antennae inserted ventrally; styles subulate, with filiform tips. Palps smooth, evenly tapering, 2-3 times as long as prostomium. Median antenna and tentacular cirri similar in length, slightly shorter than palps, tapering to filiform tips, sparsely papillose with short, clavate papillae. Basal lobes of tentacular cirri each with 1-2 setae. Dorsal cirri tapering to filiform tips, with few, widely scattered, short papillae. Ventral cirri evenly tapering to filiform tips, extending to tips of neuropodial postsetal lobes. Notopodia conical. Neuropodia distally cleft; with pointed presetal lobes bearing a small supraacicular process; and shorter, more rounded postsetal lobes (Figure 21-16c). Notosetae stouter than neurosetae, numbering approximately 25 per bundle, faintly spinous along distal half (Figure 21-16d). Neurosetae mostly bidentate with secondary tooth located well below apex; upper neurosetae (Figure 21-16e) with long spinous regions and broad secondary tooth; middle neurosetae (Figure 21-16f) with uni- or bidentate tips; lower neurosetae (Figure 21-16g) with unidentate tips. Pygidium with two anal cirri slightly longer than posterior dorsal cirri.
REMARKS: This species differs from Malmgreniella sp. A in having upper and middle neurosetae with bifid tips.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida and Texas (Figure 21-15); 15-34 m; fine sand, clayey sand, silty clay.

Malmgreniella sp. C
Figures 21-17, 18a-g

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 20E-11/80 (1 spec., USNM 89690), 20C-7/81 (1 spec., USNM 89691); MAFLA 2422F-7/76 (2 spec., USNM 89689), 2960K-2/78 (1 spec.).

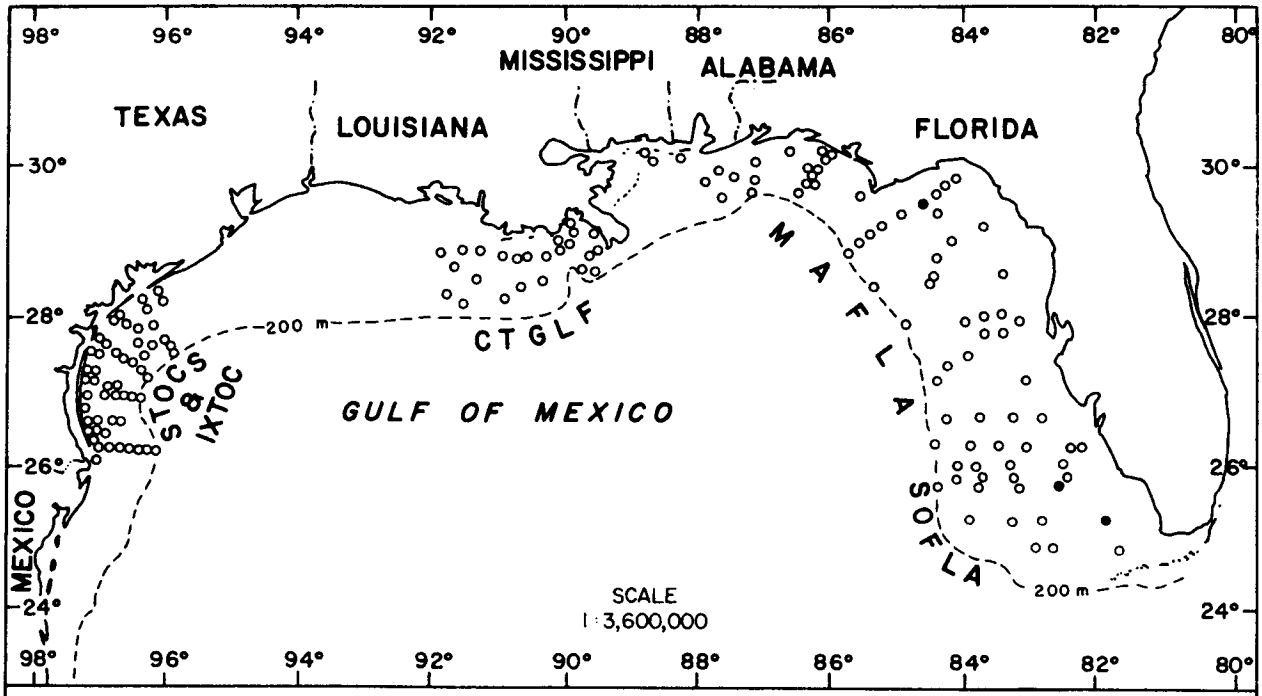

Figure 21-17. Distribution of Malmgreniella sp. C on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

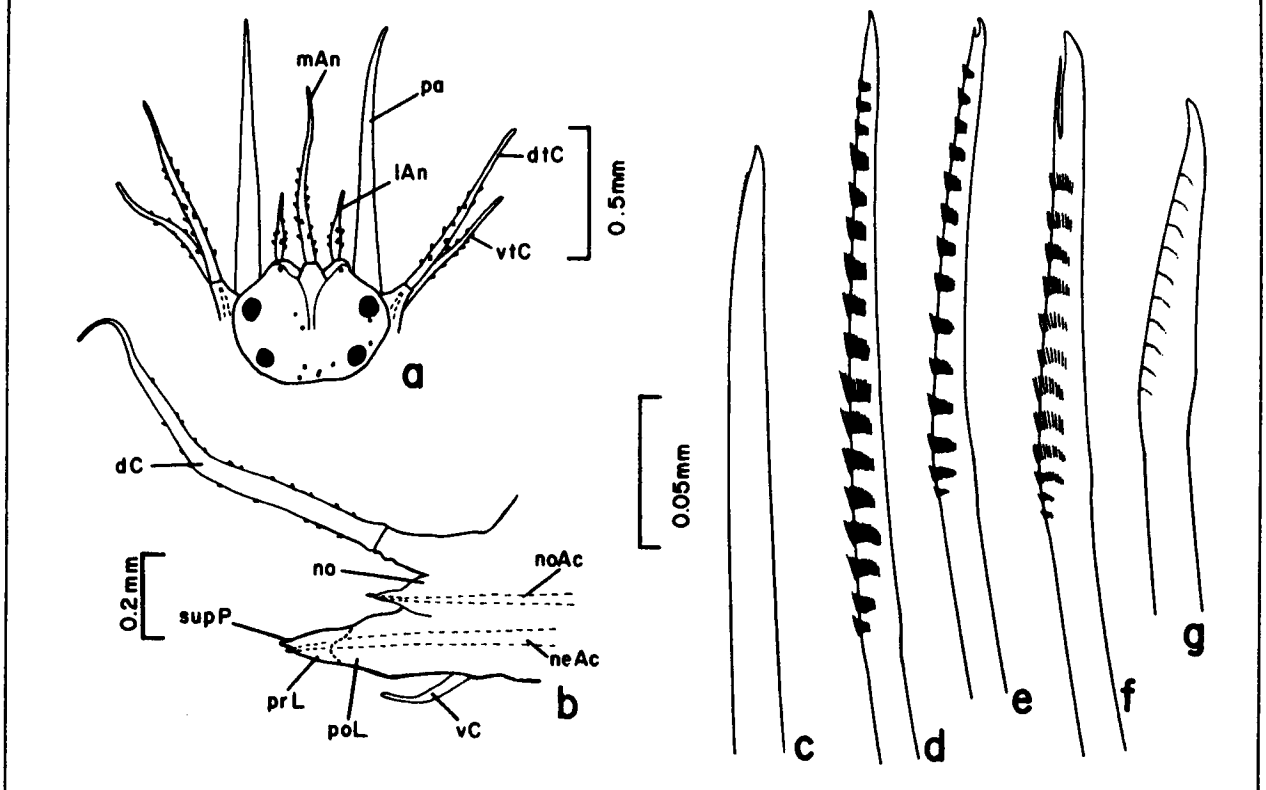

Figure 21-18. Malmgreniella sp. C: a, prostomium and tentacular segment, dorsal view; b, right middle parapodium (setae omitted), anterior view; c, notoseta; d, upper neuroseta with entire tip; e, same, with bidentate tip; f, middle neuroseta; g, lower neuroseta.

DESCRIPTION:
Length, to 11 mm; width, to 2.8 mm. Body unpigmented, linear, with up to 37 segments of nearly uniform width, tapered posteriorly. Elytra numbering 15 pairs, unpigmented, transparent, without tubercles or fringe. Prostomium (Figure 21-18a) with two pairs of large, dark eyes, and scattered pigment spots usually located on anterior lobes of prostomium and between posterior eyes. Ceratophores of lateral antennae inserted terminoventrally, styles subulate, with filiform tips, approximately half as long as prostomium (Figure 21-18a). Basal lobes of tentacular segment with acicula; setae lacking. Median antenna and dorsal tentacular cirri evenly tapering, similar in length, 1.5 times as long as prostomium; ventral tentacular cirri slightly shorter. Antennae and cirri with scattered, short, clavate papillae. Palps smooth, 2-3 times as long as prostomium. Dorsal cirri with long, filiform tips, extending far beyond setal tips, with scattered clavate papillae. Ventral cirri evenly tapered, reaching slightly beyond bases of lower neurosetae. Neuropodia with pre- and postsetal lobes, presetal lobes longer with supra-acicular process (Figure 21-18b). Notosetae about as stout as neurosetae, nearly smooth except for few minute serrations below tips (Figure 21-18c). Upper neurosetae slender, with numerous spinous rows and entire (Figure 21-18d) or bidentate tips (Figure 21-18e); middle neurosetae few (0-2), stouter, with fewer spinous rows and deeply bidentate tips, secondary tooth unusually long and fine, sometimes difficult to see (Figure 21-18f); lower neurosetae stout, serrations faint or lacking, tips hooked (Figure 21-18g).
REMARKS: This species differs from Malmgreniella sp. A in having some neurosetae with bifid tips, and from Malmgreniella sp. B in lacking setae on the tentacular segment.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida (Figure 21-17); 22-27 m; coarse to fine sand.

Genus Harmothoe Kinberg, 1855

TYPE SPECIES: Harmothoe spinosa Kinberg, 1855.
REFERENCES:
Kinberg, 1855:386.
Pettibone, 1953b:28.
Fauchald, 1977a:62.
DIAGNOSIS: Body with about 40 segments. Elytra numbering 15 pairs; on segments 2, 4, 5, 7, alternate segments to 23; and 26, 29, 32; covering dorsum; with numerous microtubercles and sometimes macrotubercles. Prostomium with blunt to pointed cephalic peaks; lateral antennae inserted ventrally. Notosetae at least as stout as neurosetae, with prominent spinous rows. Neurosetae with large distal spinous region and uni- or bidentate tips.

Key to the Gulf of Mexico Species of Harmothoe

1a. Antennae, tentacular and dorsal cirri lightly papillose (Figures 21-20b, 22b); elytra without macrotubercles. 2
1b. Antennae, tentacular and dorsal cirri densely papillose (Figure 21-24d); elytra with macrotubercles (Figure 21-24a). 3

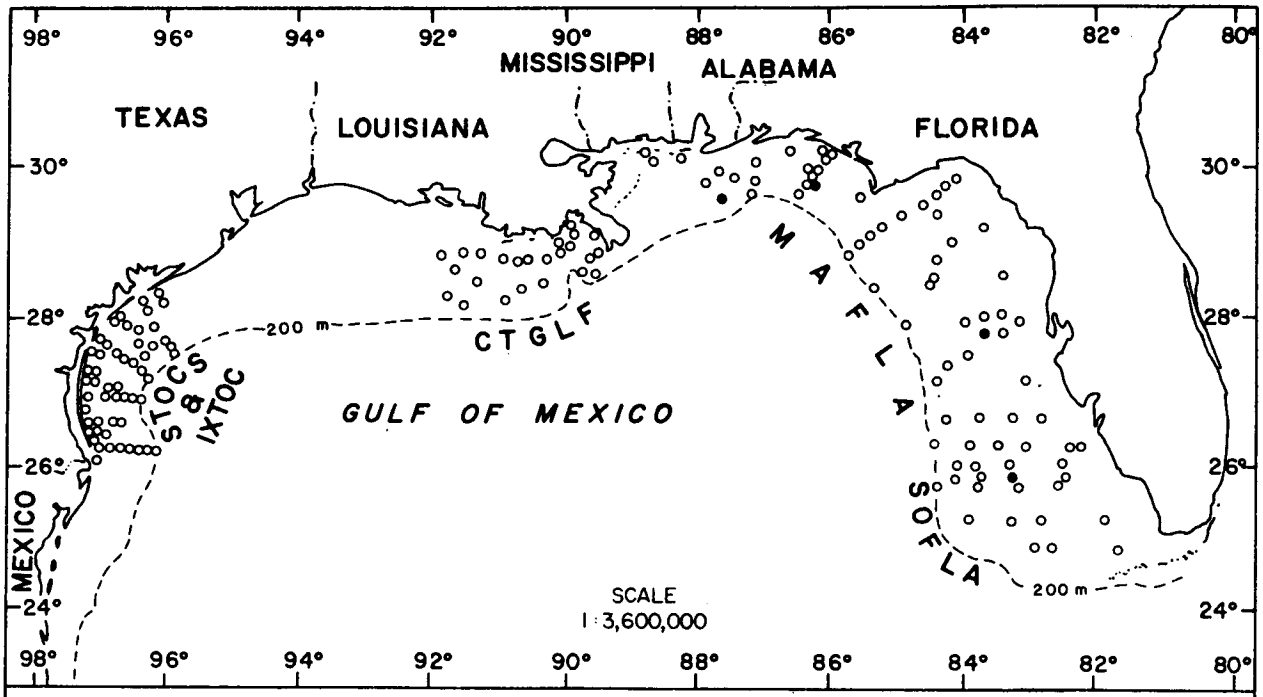

Figure 21-19. Distribution of Harmothoe sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

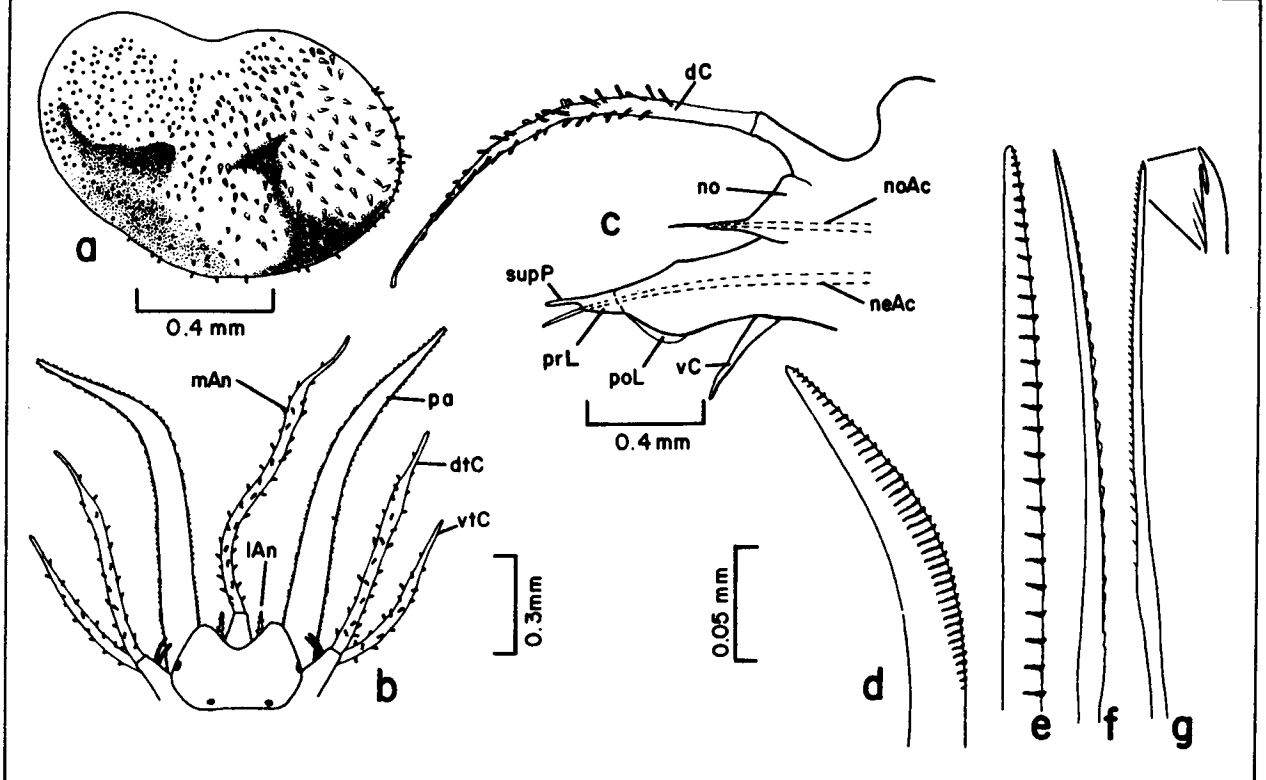

Figure 21-20. Harmothoe sp. A: a, right elytron; b, prostomium and tentacular segment, dorsal view; c, right middle parapodium (setae omitted), anterior view; d, upper notoseta; e, middle notoseta; f, upper neuroseta; g, middle neuroseta.

2a. Median antenna equal in length to palps (Figure 21-20b); middle neurosetae finely spinous with minutely bidentate tips (Figure 21-20g) . . . . . **Harmothoe sp. A**, p. 21-26

2b. Median antenna half length of palps (Figure 21-22b); middle neurosetae heavily spinous with strongly bidentate tips (Figure 21-22h). . . . . .**Harmothoe sp. B**, p. 21-28

3a. Surface of elytra divided posteriorly into polygonal areas; macrotubercles stout, conical, usually bidentate; microtubercles nodular. . . . . **Harmothoe aculeata***

3b. Surface of elytra not divided posteriorly into polygonal areas; macrotubercles knob-like, with numerous small distal spines; microtubercles pronged, with 1-6 denticles (Figure 21-24c). . . . . .**Harmothoe sp. C**, p. 21-30

*Not found in Gulf of Mexico BLM-OCS collections, but previously reported from the Gulf by numerous authors (see Perkins and Savage, 1975:20).

Harmothoe sp. A
Figures 21-19, 20a-g

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 16D-4/81 (1 spec., USNM 89692); MAFLA 2209I-11/77 (1 spec., USNM 89693), 2534E-7/76 (1 spec.), 2534F-7/76 (1 spec., USNM 89694), 2643H-9/75 (1 spec.).
DESCRIPTION:
Length, to 12.5 mm; width, to 4.0 mm. Largest specimen complete with 35 segments. Body linear over anterior two-thirds, tapering posteriorly; unpigmented except for dark brown styles of dorsal cirri. Elytra (Figure 21-20a) mottled brown, generally with central pigmented areas and broad, dark arcs along medial posterior margins; microtubercles scattered, low, blunt on anterior half of elytra, becoming sharply conical on posterior half. Lateral and posterior margins of elytra with sparse clavate papillae. Prostomium (Figure 21-20b) wider than long; with blunt, slightly elevated cephalic peaks, and two pairs of faintly pigmented eyes; anterior pair larger, located dorsolaterally just anterior to widest part. Median antenna extremely long, with slight subterminal swelling and filiform tip, approximately four times as long as prostomium; lateral antennae short, subulate, inserted ventrally, reaching only to distal end of median ceratophore. Palps with minute papillae, similar in length to median antenna. Facial tubercle prominent, dark brown. Basal lobes of tentacular segment with two stout setae; tentacular cirri shorter than median antenna but similar in shape. Antennae, tentacular and dorsal cirri with long clavate papillae. Dorsal cirri long, with filiform tips, extending beyond setal tips. Ventral cirri subulate, extending slightly beyond ends of neuropodial postsetal lobes. Notopodia sharply conical. Neuropodial presetal lobes prolonged, sharply acute, with long, filiform, supra-acicular process, aciculum protruding; postsetal lobes much shorter, bluntly conical (Figure 21-20c). Notosetae stouter than neurosetae, heavily spinous with blunt tips; upper ones (Figure 21-20d) sharply curved; lower ones (Figure 21-20e) longer, straight. Upper neurosetae strongly serrate with entire tips

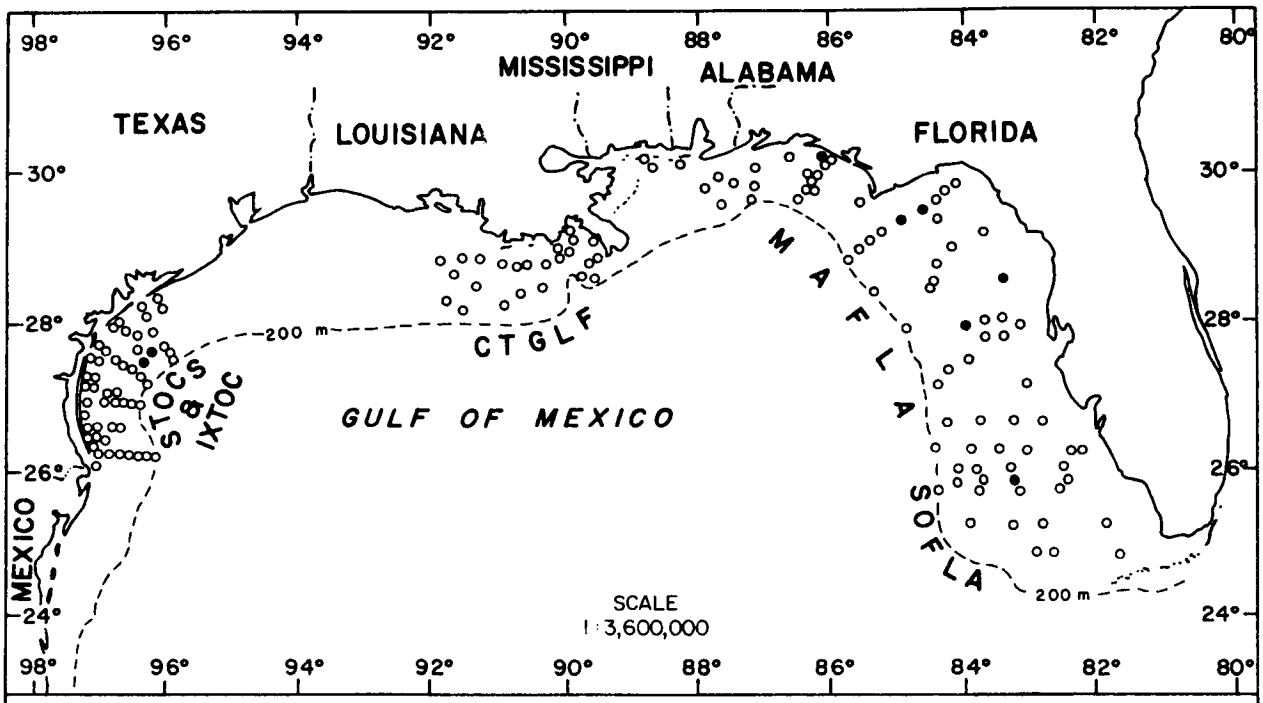

Figure 21-21. Distribution of Harmothoe sp. B on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

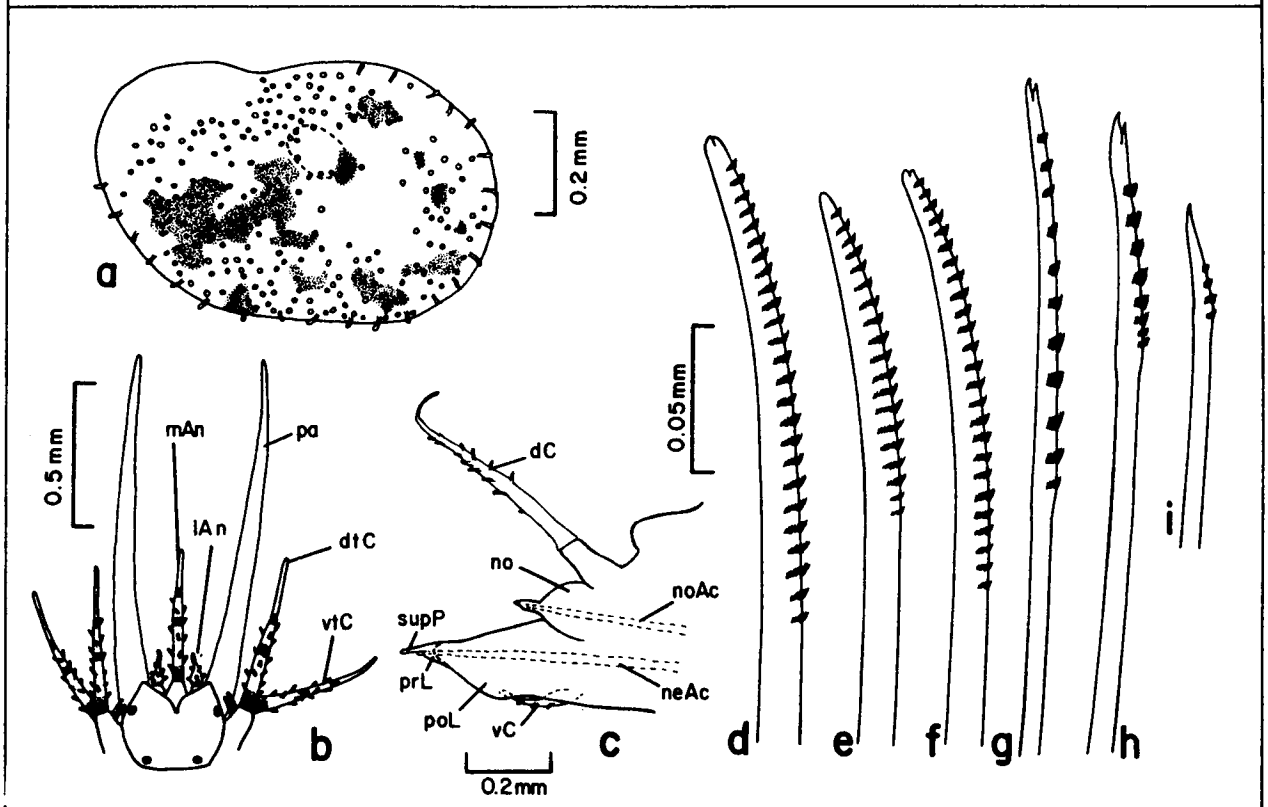

Figure 21-22. Harmothoe sp. B: a, right elytron; b, prostomium and tentacular segment, dorsal view; c, right middle parapodium (setae omitted), anterior view; d, notoseta with incised tip; e, notoseta with entire tip; f, notoseta with minutely bidentate tip; g, upper neuroseta; h, middle neuroseta; i, lower neuroseta.

(Figure 21-20f); middle and lower ones (Figure 21-20g) finely spinous, with minutely bidentate tips.
REMARKS: Harmothoe sp. A is unique among the species of the genus in possessing an extremely long median antenna and very short lateral antennae.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida (Figure 21-19); 34-73 m; coarse to fine sand, clayey sandy silt.

Harmothoe sp. B
Figures 21-21, 22a-i

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 16C-7/81 (4 spec., USNM 89695); MAFLA 2211C-7/76 (4 spec.), 2211D-6/75 (5 spec.), 2211C-8/77 (1 spec.), 2211I-8/77 (1 spec.), 2422D-7/76 (1 spec.), 2423C-7/76 (8 spec., USNM 89696), 2528-6/75 (1 spec.), 2852D-7/76 (3 spec.); STOCS HR1-3 W/76 (1 spec., USNM 89697), SB3-2 S/76 (1 spec., USNM 89698).
Supplementary Material:
Gulf of Mexico--65 mi. south of Cameron, LA, 28°45'N, 93°20'W, 20 m, June 1981 (2 spec.).
DESCRIPTION:
Length, to 14 mm; width, to 2.5 mm. Body long, linear, with 37 segments. Dorsum unpigmented, ventrum with light pigmentation on posterior segments. Elytra (Figure 21-22a) mottled with dark brown pigmentation, including spots just posterior to attachment of elytrophores; anterior elytra more darkly pigmented. Elytra located on segments 2, 4, 5, 7, 9...23, 26, 29 and 32; clavate papillae present on lateral and posterior borders (Figure 21-22a); microtubercles rounded basally, tapering to chisel-like tips on anterior part of elytra; low, blunt and mound-like on posterior part. Prostomium (Figure 21-22b) slightly wider than long, with prominent, sharply pointed cephalic peaks. Anterior pair of eyes lateral, visible from dorsal view, located anterior to widest point of prostomium; posterior pair located along posterior border. Lateral antennae short, subulate, papillose; inserted ventrally. Styles of median antenna and tentacular cirri similar in length, covered with numerous long, clavate papillae, with three bands of pigment on base, middle and near tip. Palps 4-6 times as long as prostomium. Basal lobes of tentacular segment with aciculum and 1-2 setae. Styles of dorsal cirri with filiform tips, extending far beyond setal tips, pigmented and papillose as on median antenna and tentacular cirri. Ventral cirri subulate, with filiform tips. Notopodia conical with protruding acicula. Neuropodia with sharply conical presetal lobes having supra-acicular digitiform process; postsetal lobes shorter, more rounded (Figure 21-22c). Notosetae numerous, heavily spinous, tips mostly with small incision (Figure 21-22d), a few entire (Figure 21-22e) and a few distinctly notched (Figure 21-22f). Upper and middle neurosetae (Figure 21-22g,h) mostly bifid; lower ones entire (Figure 21-22i).
REMARKS: Harmothoe sp. B is most similar to H. spinifera (Ehlers, 1864), but differs from the latter in having anterior eyes which are visible dorsally, and in having distinctly notched notosetae.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida and Texas (Figure 21-21); 19-82 m; silty sand, coarse to fine sand.

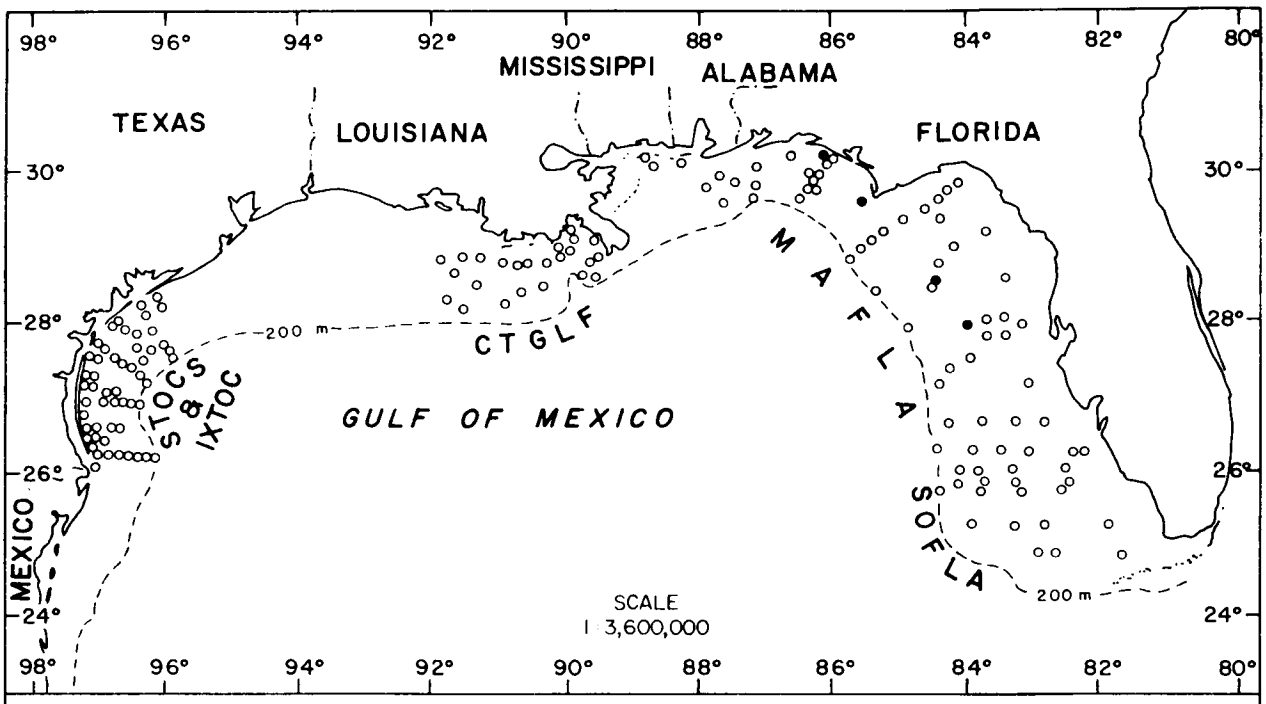

Figure 21-23. Distribution of Harmothoe sp. C on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

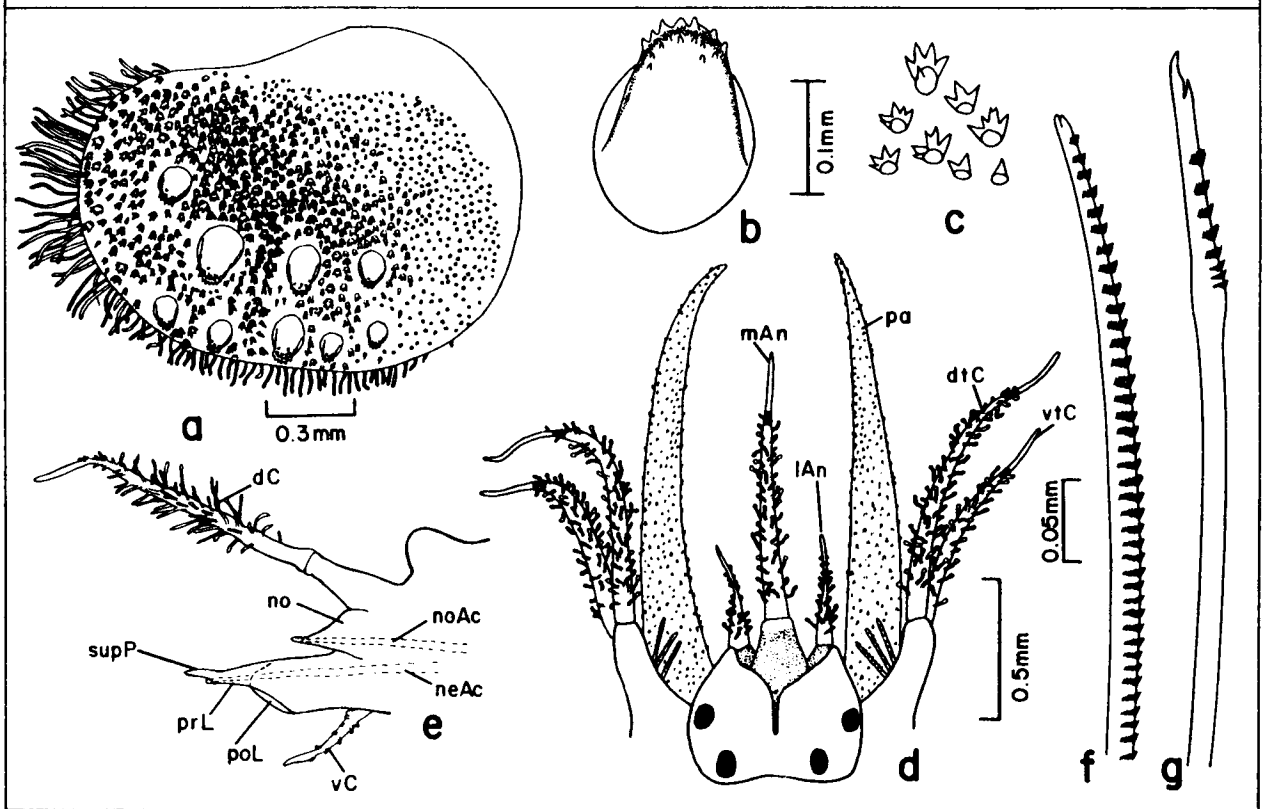

Figure 21-24. Harmothoe sp. C: a, left elytron; b, elytral macrotubercle; c, elytral microtubercles; d, prostomium and tentacular segment, dorsal view; e, right middle parapodium (setae omitted), anterior view; f, notoseta; g, neuroseta.

Harmothoe sp. C
Figures 21-23, 24a-g

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2211E-7/76 (1 spec.), 2315A-11/77 (1 spec.), 2528G-6/75 (1 spec., USNM 89700), 2854E-8/77 (2 spec., USNM 89699).
Supplementary Material:
North Carolina--NE of Cape Lookout, 331, E-8-77, 34°34'N, 76°13'W, 37 m (1 spec.).
DESCRIPTION:
Length, to 10 mm; width, to 3.2 mm. Body long, with 37 segments; dorsum and ventrum unpigmented; ceratophores of antennae, upper lip and bases of buccal ventral cirri dark brown. Elytra with brown macrotubercles in two rows along posterior borders (Figure 21-24a); macrotubercles knob-like, with numerous blunt spines distally (Figure 21-24b); microtubercles conical to crown-shaped, with 1-6 prongs (Figure 21-24c), densely covering all but medial anterior surface of elytra. Numerous long marginal papillae present on posterior and lateral borders of elytra. Prostomium (Figure 21-24d) with prominent cephalic peaks, and two pairs of large, darkly pigmented eyes, anterior pair ventrolateral. Lateral antennae with evenly tapering styles. Palps papillose, about 3.5 times as long as prostomium. Median antenna and tentacular cirri equal in length, each with subdistal dark band; densely covered with long clavate to filiform papillae; length of papillae equal to or greater than width of style. Basal lobes of tentacular segment each with three stout setae (Figure 21-24d), similar in form to notosetae. Dorsal cirri long, extending beyond setal tips (Figure 21-24e), pigmented and papillose similar to tentacular cirri. Ventral cirri sparsely papillose, evenly tapering, reaching tips of neuropodial postsetal lobes. Notopodia sharply conical, located on anterodorsal sides of neuropodia. Neuropodia with short, blunt postsetal lobes; and longer, sharply conical presetal lobes having projecting aciculum below digitiform supra-acicular process (Figure 21-24e). Notosetae numerous, slightly stouter than neurosetae, with long spinous regions and blunt tips having terminal incisions (Figure 21-24f). Most neurosetae with deeply bidentate tips (Figure 21-24g), a few lower neurosetae with entire tips. Pygidium with a single pair of papillose anal cirri, nearly twice as long as posterior dorsal cirri.
REMARKS: Harmothoe sp. C closely resembles both H. impar (Johnston, 1839) and H. fragilis Moore, 1910, but can be distinguished from them by the presence of multipronged microtubercles on the elytra. Additionally, the elytral macrotubercles are not as clearly set off from the elytral surface as in H. impar, or distally smooth as in H. fragilis.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida (Figure 21-23); 38-43 m; coarse sand, silty sand.

CHAPTER 22

Paul S. Wolf

FAMILY POLYODONTIDAE Buchanan, 1894

INTRODUCTION

The Polyodontidae are a family of large tubicolous scale worms; one species, Polyodontes lupinus (Stimpson, 1856) is reported to be over 300 mm long. The tubes of the polyodontids are tough and fibrous, composed of long threads formed by spinning glands, woven together with mud. These threads are coiled inside the body cavity, and are colored a bright gold, making them quite obvious.

The prostomium usually has four eyes, with the anterior pair sometimes very large and borne on ommatophores (Figure 22-2a). Two or three antennae are present on the prostomium. A pair of slender, tapering palps emerges from beneath the prostomium. They may be smooth or may possess papillae arranged in either regular or irregular rows. The tentaculophores of the first tentacular segment are directed anteriorly, each with a pair of smooth or papillose tentacular cirri, two acicula, and one or two bundles of fine notosetae. Specialized neurosetae are present from segment 9, the same segment in which notopodial spinning glands begin. Elytra are attached to elytrophores on segments 2, 4, 5, 7 and alternate segments thereafter. They are circular to oval in outline, without ornamentation, but may be pigmented. In most species, only the first few pairs overlap middorsally. The parapodia are biramous with small, conical notopodia in the anterior parapodia. From segment 9, the notopodia form broad lamellae placed anterodorsally on the upper half of the neuropodium (Figures 22-4e, 6g). Neuropodia are well-developed throughout, long and slender on segment 2, becoming broader and shorter on segment 3. Branchiae, when present, are saclike, located on the anterior and/or posterior surfaces of the notopodia. In Polyodontes lupinus, for example, some anterior parapodia possess numerous branchiae on the anterior surface (Figure 22-4f) and 1-2 branchiae on the posterior surface (Figure 22-4g). Notosetae are arranged in fan-shaped bundles; they are simple, and smooth to spinous (Figures 22-2k, 6h). The notosetae of anterior segments are more numerous and much longer than those of middle and posterior segments. The neurosetae are arranged in upper, middle, and lower groups containing one or two different kinds of setae (Figure 22-2i). Generally, the upper group is composed of simple setae with hispid or spinous margins (Figures 22-2o,p,s; 4o,p; 6i,o,p). The middle group is composed of aristate or distally hirsute spines (Figures 22-2t, 6q), and the lower group contains slightly geniculate, cusped or spiraled setae (Figures 22-4n, 6s). The pharynx is muscular and eversible, and distally bears two pairs of chitinous jaws and the opening is surrounded by large papillae.

The only recent revision of the polyodontids was done by Strelzov (1968b). Pettibone, who is currently reviewing the family, stated (1982:14) that it contains eight genera and about 45 species. Only two genera and three species, of which two may be new to science, are found in Gulf of Mexico BLM-OCS material.

PRINCIPAL DIAGNOSTIC CHARACTERS

Polyodontids are separated generically by the presence or absence of ommatophores, number of antennae, and presence or absence of true penicillate neurosetae. Ommatophores, which are present in Polyodontes and Panthalis among other genera, are large stalks which bear the anterior pair of eyes. The ommatophores are fused in Neopanthalis Strelzov, 1968b, and separated in Eupolyodontes Buchanan, 1894, Polyodontes Renier, 1832 (Figure 22-2a), and Panthalis Kinberg, 1855. When ommatophores are present, the anterior pair of eyes are quite large, darkly pigmented, and lentigerous. Eupanthalis McIntosh, 1876, lacks ommatophores; thus the eyes are termed sessile.

Polyodontids may possess two antennae (Neopanthalis and Eupolyodontes), or three antennae (Polyodontes, Panthalis, and Eupanthalis). When three antennae are present, they are usually similar in shape and length and the median one may arise from a ceratophore (Figure 22-4a).

The genera Polyodontes and Panthalis differ in that true penicillate setae are absent in the former and present in the latter. True penicillate setae are relatively short, simple, and bear numerous long hairs distally. In some species, the hairs are limited to the distal end of the seta; in others the hairs continue subdistally for a short distance. Pseudopenicillate setae are generally longer than true penicillate setae, and the hairs continue farther down the setal shaft (Figure 22-2q). Pseudopenicillate setae are present in some species of Polyodontes.

Setal morphology, particularly that of the neurosetae, is quite diverse among the polyodontids. It is unfortunate, however, that species descriptions lack detailed treatment of the setae. The notosetae are similar throughout, i.e., very fine, faintly spinous to hispid, and tapering to fine tips. They are more numerous and longer on anteriormost segments. Their ornamentation may be a useful specific character. Notosetae are hispid in Polyodontes lupinus (Figure 22-4h), minutely spinous in Polyodontes sp. A (Figure 22-2k), and serrate in Eupanthalis sp. A (Figure 22-6h).

Polyodontids possess several forms of neurosetae, placed in discrete groups within the neuropodia. Segment 2 bears only one or two kinds of neurosetae having minutely serrate or cusped margins (Figures 22-2m-o; 4i,j). From segments 3-8 the neurosetae are arranged in two groups. A medially located group is composed of spines with smooth, hispid, or aristate distal ends (Figures 22-2p; 4k,m; 6k). A lower group is composed of slightly geniculate or curved setae with cusped or spirally fringed blades (Figures 22-4n; 6m,n).

From segment 9 on, an upper group of neurosetae is added, emerging anteriorly on the neuropodium and behind the notopodium, composed of two kinds. One kind may be penicillate as in Panthalis, pseudopenicillate as in Polyodontes sp. A (Figure 22-2q) and Eupanthalis sp. A (Figure 22-6o), or minutely serrate as in Polyodontes lupinus (Figure 22-4p). The second kind of upper neuroseta is distinctly spiked (Figure 22-2s). These spiked setae begin on the same segment (9) as the spinning glands and may function in directing the threads in tube building.

Also from segment 9, the middle group of neurosetae consists of stout spines that have gradually become larger and more prominent since their first appearance on segment 2. The spines may be aristate as in Polyodontes lupinus (Figure 22-4q), pubescent as in Eupanthalis sp. A (Figure 22-6q), or somewhat variable, as in Polyodontes sp. A (Figure

22-2t,u). The morphology of the spines may be an important specific character, but they are often worn or broken, and may be variable within the same individual. The neurosetae of the lower group are similar to those from segment 3 on. The marginal ornamentation, e.g., cusps, spines, and hairs, gradually becomes more prominent.

Elytra are not ornamented in the Polyodontidae; thus, they do not vary a great deal within the family and are herein not considered to be taxonomically important.

Another possible specific character mentioned herein is the arrangement of papillae on the palps. When present, the papillae may be arranged in irregular rows as in Eupanthalis perlae Fauchald, 1977b, and Polyodontes oculea (Treadwell, 1901), or in regular rows as in Polyodontes sp. A (Figure 22-2b) and Eupanthalis sp. A (Figure 22-6b). These arrangements are consistent for the material examined; however, more material and other species need to be examined to confirm the validity of this character.

BIOLOGICAL NOTES

Little is known about the biology of polyodontids except that they construct long, tough, fibrous tubes. Day (1967:93) reported that the tubes are woven into a criss-crossed spiral and may extend a meter or more into the mud. In Polyodontes lupinus, the tube is covered with mud externally, but examination of cross-sections of the tube reveals that the mud is held together by the threads produced from the worm's spinning glands.

As reported in Fauchald and Jumars (1979:240), Darboux (1899) and Blegvad (1914) considered the polyodontids to be carnivores, while Day (1967) referred to them as scavengers or omnivores. Pettibone (1982:14) called them carnivorous, pulling out of their tubes to catch their prey.

At least one polyodontid, Polyodontes lupinus, is known to harbor a commensal. The gastropod Cochliolepis parasitica Stimpson, 1858, lives under the elytra of the worm or within its tube. The gastropod is not parasitic, as reported by Stimpson (1858) and Hartman (1945), but an herbivore or detritivore that may even perform a cleaning function (Moore, 1972).

SPECIES OF POLYODONTIDAE RECORDED FROM GULF OF MEXICO BLM-OCS PROGRAMS

Key to the Genera of Polyodontidae from the Gulf of Mexico BLM-OCS Programs

1a. Ommatophores present (Figure 22-2a). . . . . **Polyodontes**, p. 22-5
1b. Ommatophores absent (Figure 22-6a). . . . . **Eupanthalis**, p. 22-8

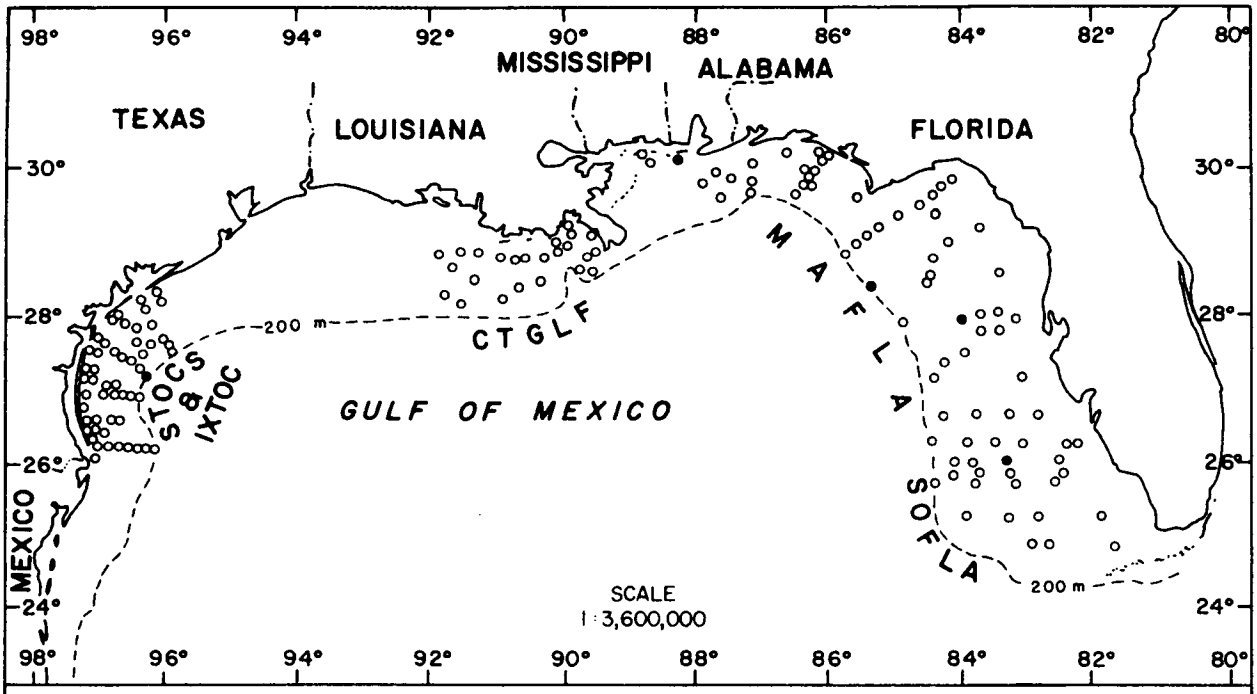

Figure 22-1. Distribution of Polyodontes sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

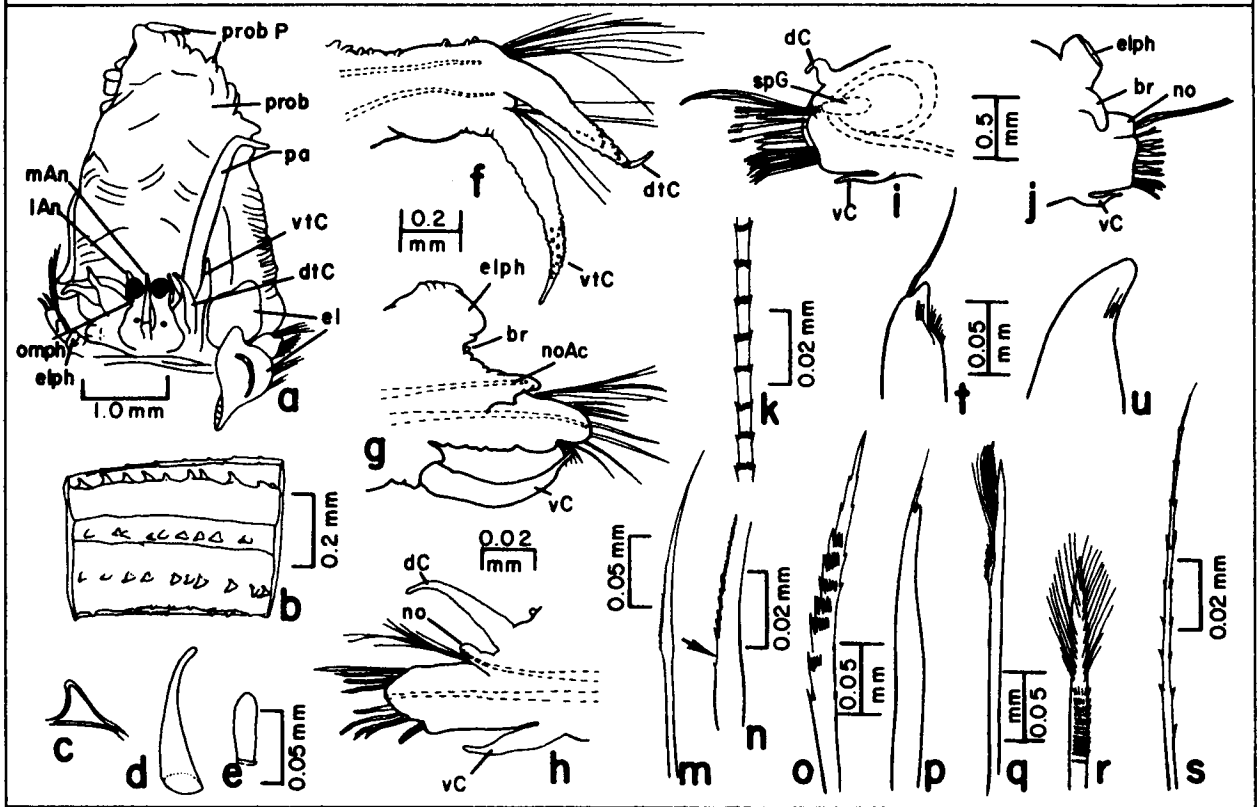

Figure 22-2. Polyodontes sp. A: a, anterior end; b, middle portion of palp, lateral view; c, conical papilla from same; d, e, long and short papillae from near distal end of palp; f, tentacular parapodium, inner view; g, second parapodium, anterior view; h, third parapodium, anterior view; i, middle parapodium, anterior view; j, same, posterior view; k, portion of notoseta from tentacular segment; m, n, upper neuroseta from segment 2; o, lower neuroseta from same; p, neuropodial spine from segment 3; q, pseudopenicillate neuroseta, lateral view, from middle segment; r, same, frontal view; s, spiked neuroseta from middle segment; t, aristate neuropodial spine from same; u, smooth neuropodial spine from same.

Genus **Polyodontes** Renier, 1832

TYPE SPECIES: Phyllodoce maxillosa Ranzani, 1817.
REFERENCES:
Hartman, 1939a:81.
Day, 1967:94.
Fauchald, 1977a:66.
DIAGNOSIS: Prostomium with four eyes, anterior pair borne on ommatophores. Three antennae present. Branchial vesicles present. Neurosetae including geniculate setae, tapered spinulose or pseudopenicillate setae, and distally hirsute or aristate spines.

Key to the Gulf of Mexico BLM-OCS Species of Polyodontes

1a. Pseudopenicillate neurosetae present (Figure 22-2q); palps and tentacular cirri papillose (Figure 22-2b,f). . . . . **Polyodontes sp. A, p. 22-5**

1b. Pseudopenicillate neurosetae absent; palps and tentacular cirri smooth (Figure 22-4b). . . . . **.Polyodontes lupinus, p. 22-7**

Polyodontes sp. A
Figures 22-1, 2a-u

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 8E-11/80 (1 spec., USNM 86851); MAFLA 2211D-8/77 (1 spec.), 2211C-11/77 (1 spec., USNM 86852), 2211J-11/77 (1 spec.), 2313D-7/76 (1 spec.), 2639A-5/75 (1 spec.); STOCS 3/II-2 F/76 (1 spec., USNM 86850).
DESCRIPTION:
Length, 26+ mm; width, to 7 mm. Largest specimen incomplete with 31 segments. Prostomium with four eyes, anterior pair large, borne on ommatophores (Figure 22-2a). Median and lateral antennae slender, filiform, extending just beyond anterior margins of ommatophores. Palps long, slender, with lateral rows of conical papillae and dorsal and ventral rows of small mound-like papillae (Figure 22-2b). Conical papillae with tips hooked forward, located basally on the palps (Figure 22-2c), gradually becoming longer and more slender distally (Figure 22-2d); mound-like papillae also becoming longer distally but remaining smaller than longest conical papillae (Figure 22-2e). Elytra circular in outline, without ornamentation, second pair (on segment 4) much smaller than other elytra. Tentaculophores papillose dorsally, with two acicula, two bundles of notosetae, and one pair of papillose tentacular cirri (Figure 22-2f). Parapodia of segment 2 (Figure 22-2g) with small notopodia, larger neuropodia and long ventral cirri. Parapodia of segment 3 (Figure 22-2h) with long dorsal cirri, similar noto- and neuropodia, and shorter ventral cirri. Subsequent segments (Figure 22-2i) with notopodia wide, flattened on anterodorsal side of neuropodia. Neuropodia broad, ventral cirri shorter than those of segment 3. Single, small, mound-like branchia present just above notopodium on posterior surface of some parapodia (Figure 22-2j). Notosetae similar throughout, simple, with spinous margins (Figure 22-2k), tapering to fine tips; long and more numerous on anterior segments, gradually becoming shorter and fewer in number posteriorly. Additional thread-like

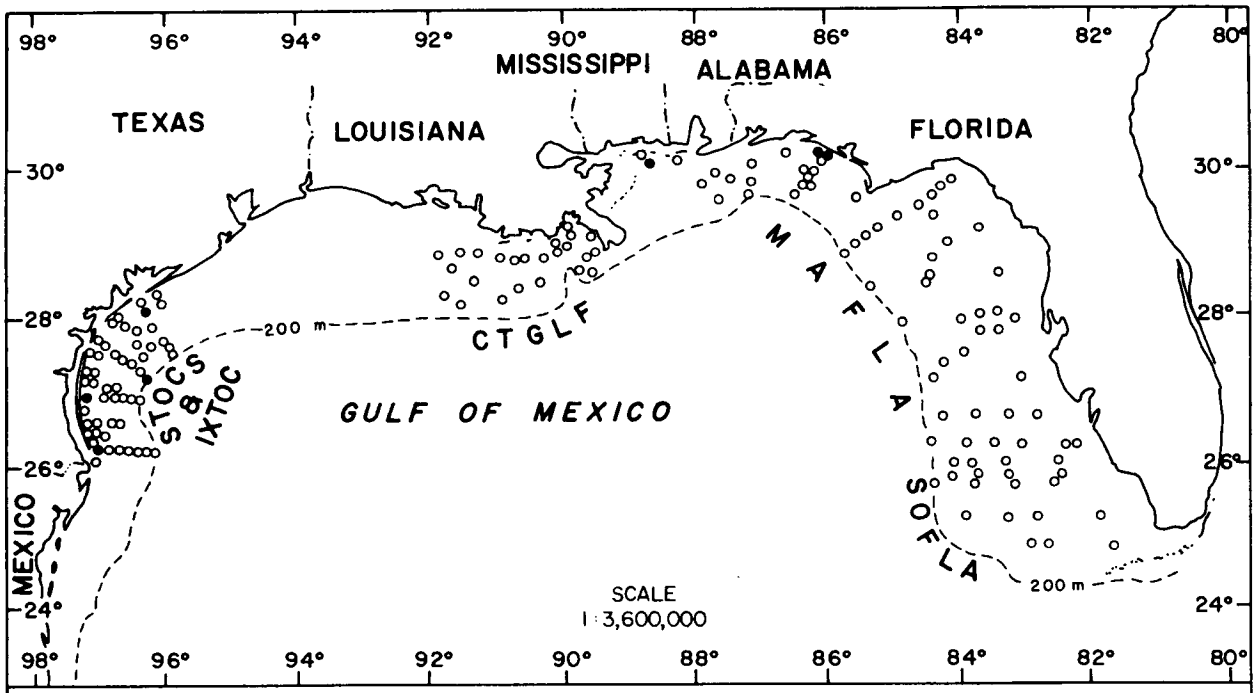

Figure 22-3. Distribution of Polyodontes lupinus on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

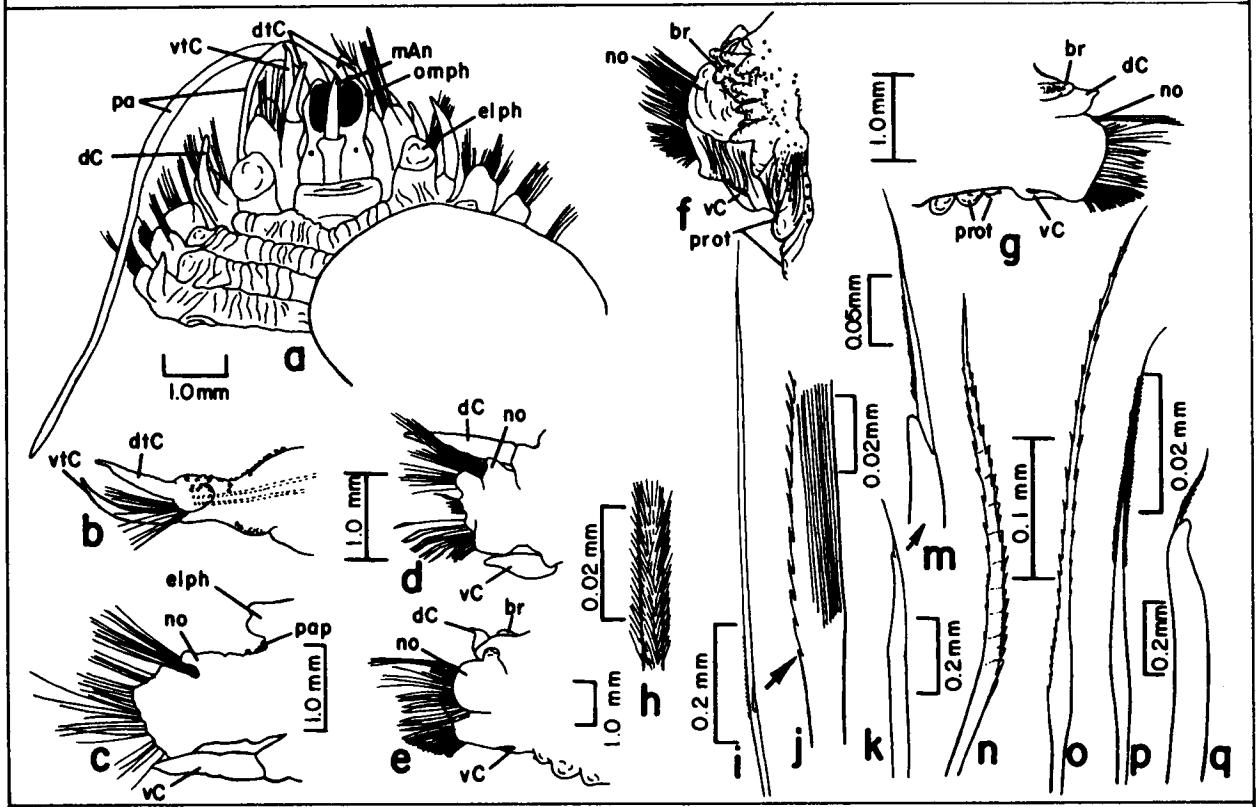

Figure 22-4. Polyodontes lupinus: a, anterior end; b, tentacular parapodium, inner view; c, second parapodium, anterior view; d, third parapodium, anterior view; e, middle parapodium, anterior view; f, 15th parapodium, anterior view; g, middle parapodium, posterior view; h, portion of notoseta from tentacular segment; i, j, neuroseta from segment 2; k, m, neuropodial spine from segment 3; n, lower neuroseta from same; o, spiked neuroseta from middle segment; p, upper neuroseta from same; q, neuropodial spine from same.

notosetae emerging from notopodial spinning glands beginning on segment 9 (Figure 22-2i). Neurosetae of segment 2 including upper group of slender setae with serrate margin at swollen area (Figure 22-2m,n), and lower group of stout geniculate setae with spinous margins and dentate cusps (Figure 22-2o). Neurosetae of segments 3-8 similar to those of segment 2 but with additional middle group of 4-6 aristate spines (Figure 22-2p). Beginning on segment 9, neurosetae including upper group of pseudopenicillate (Figure 22-2q,r) and spiked setae (Figure 22-2s), middle group of 5-10 spines with smooth to aristate and pubescent tips (Figure 22-2t,u), and lower group of geniculate, spirally serrate setae. Pygidium not observed.

REMARKS: Specimens of Polyodontes sp. A examined herein exhibited much variation among some features. The neuropodial spines ranged from aristate and pubescent (Figure 22-2t) to smooth (Figure 22-2u). The pseudopenicillate setae may terminate distally in a short spine (Figure 22-2q) or may taper to a long fine tip. Branchiae varied in size and were not present on all parapodia. Polyodontes sp. A is similar to P. pustulata (Treadwell, 1924), differing primarily in that the papillae on the palps are arranged in regular rows in the former, and irregularly in the latter. Also, descriptions of P. pustulata and other species of Polyodontes do not mention the possession of spiked neurosetae (as in Figure 22-2s). These are, however, quite small and may have been overlooked. Pettibone (pers. comm.) plans to resurrect the genus Acoetes Audouin and Milne Edwards, 1832, which will include Polyodontes sp. A.

GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida, Alabama, and Texas (Figure 22-1); 32-177 m; coarse to fine sand, clayey and sandy silt, silty clay.

Polyodontes lupinus (Stimpson, 1856)
Figures 22-3, 4a-q

Acoetes lupina Stimpson, 1856:116.
Acoetes lupina--Andrews, 1891:280.
Polyodontes lupina--Hartman, 1945:10; 1951a:19.
Polyodontes lupina--Day, 1973:9.
Polyodontes lupinus--Gardiner, 1976:91, fig. 3f-j.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2528-7/76 (1 spec., USNM 55799), 2529G-7/76 (1 spec.); CTGLF 03-9/79 (1 spec., USNM 86858); STOCS 1/I-1 S/76 (1 spec., USNM 86855), 3/II-2 F/76 (1 spec., USNM 86850), 4/III-4 S/76 (1 spec., USNM 86854), 4/III-6 Sp/76 (1 spec., USNM 86857), 4/IV-5 W/76 (1 spec., USNM 86856); IXTOC S53-6 11/79 (1 spec., USNM 86853).
Supplementary Material:
Gulf of Mexico--Alabama, Mobile Bay, Mobil Oil Sta. 052F, Jan. 1980, P. Wolf ID. (1 spec.); Texas, Galveston Harbor, 10 m, Sta. 3-8, Mar. 1965, M. Pettibone ID. (2 spec., USNM 71438).
DESCRIPTION:
Length, 166+ mm (previously reported to 600 mm); width, to 12 mm (previously reported to 25 mm). Largest specimen incomplete with about 121 segments. Prostomium with four eyes, anterior pair large, borne on ommatophores (Figure 22-4a). Median and lateral antennae slender, filiform, extending just beyond anterior margins of ommatophores; median

antenna arising from papillose ceratophore. Lateral antennae mostly hidden by ommatophores. Palps long, slender, smooth. Elytra circular to oval in outline, without ornamentation. Tentaculophores papillose dorsally and ventrally, each with two acicula, one bundle of notosetae, and one pair of smooth tentacular cirri (Figure 22-4b). Parapodia of segment 2 (Figure 22-4c) with group of small papillae below elytrophores and with small notopodia on dorsal edge of neuropodia; neuropodia larger, broad, with long ventral cirri. Parapodia of segment 3 (Figure 22-4d) with long dorsal cirri, small notopodia on anterodorsal side of neuropodia; neuropodia broad, ventral cirri shorter than those of segment 2. Subsequent parapodia (Figure 22-4e) with broad, flattened notopodia on anterodorsal side of neuropodia; neuropodia broad, ventral cirri shorter than those of segment 3. Numerous branchial vesicles on anterior and posterior surfaces of parapodia from segments 10 to about 35 (Figure 22-4f), then reduced to one per parapodium on dorsal anterior margin of notopodium (Figure 22-4e), and 1-2 on posterior surface (Figure 22-4g). Additionally with three large sac-like protuberances on ventral base of parapodium (Figure 22-4e-g). Notosetae similar throughout, slender, hispid (Figure 22-4h), tapering to fine tips; long and more numerous on anterior segments, gradually becoming shorter and fewer in number posteriorly. Additional thread-like notosetae emerging from notopodial spinning glands beginning on segment 9. Neurosetae of segment 2 with minutely serrate margins (Figure 22-4i,j). Neurosetae of segments 3-8 including upper group of setae similar to those of segment 2, middle group of aristate spines (Figure 22-4k,m), and lower group of geniculate, cusped setae (Figure 22-4n). Neurosetae from segment 9 including upper group of spiked setae (Figure 22-4o), and setae similar to those of segment 2 but having longer marginal hairs (Figure 22-4p); middle group of aristate spines (Figure 22-4q); and lower group of geniculate setae, cusped basally, becoming plumose distally. Pygidium not observed.

REMARKS: The Gulf of Mexico BLM-OCS specimens and the supplementary material appear quite similar to Polyodontes oculea (Treadwell, 1901). The only difference that can be gleaned from the literature is that P. oculea has papillose palps instead of the smooth palps observed herein.

PREVIOUSLY REPORTED HABITAT: Intertidal to 160 m; sand, mud, sand mixed with gravel and shell.

GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida, Mississippi, and Texas (Figure 22-3); 15-131 m; coarse sand, silty clayey sand, silty clay.

DISTRIBUTION: North Carolina to Gulf of Mexico.

Genus **Eupanthalis** McIntosh, 1876

TYPE SPECIES: Eupanthalis kinbergi McIntosh, 1876.

REFERENCES:

Day, 1967:94.

Fauchald, 1977a:66.

DIAGNOSIS: Prostomium with four sessile eyes, ommatophores absent. Three antennae present. Branchial vesicles absent. Neurosetae including geniculate setae, tapered spinulose or pseudopenicillate setae, and distally hirsute or aristate spines.

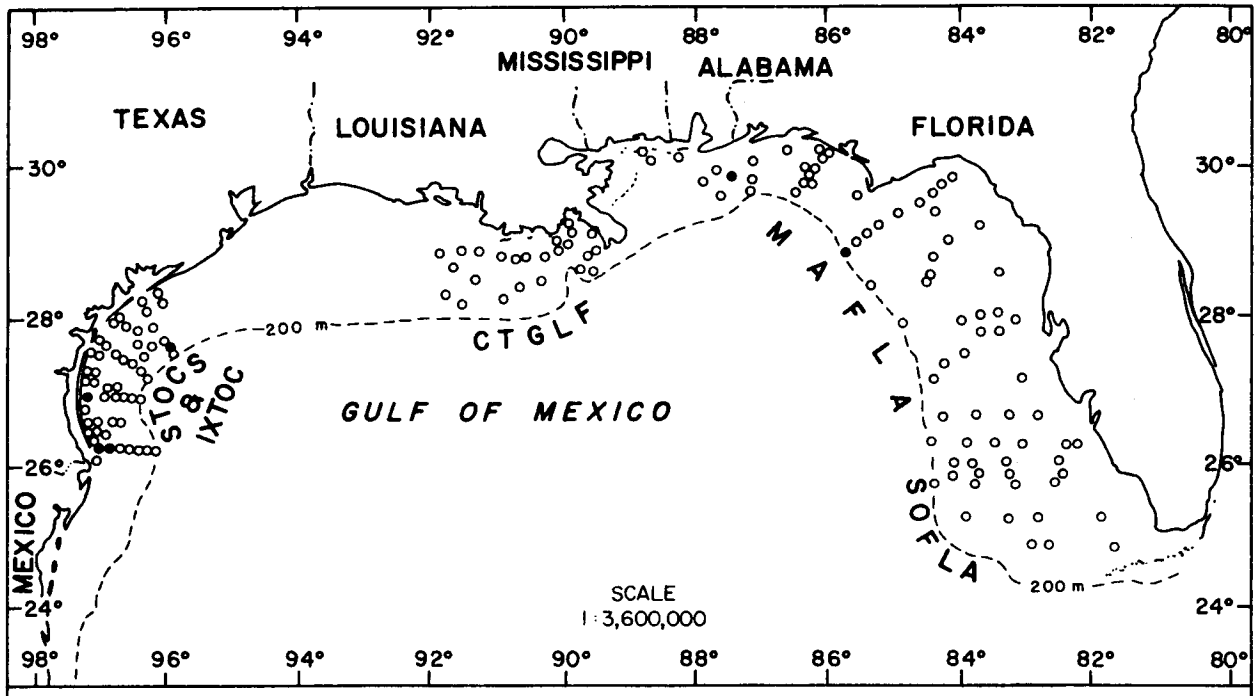

Figure 22-5. Distribution of Eupanthalis sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

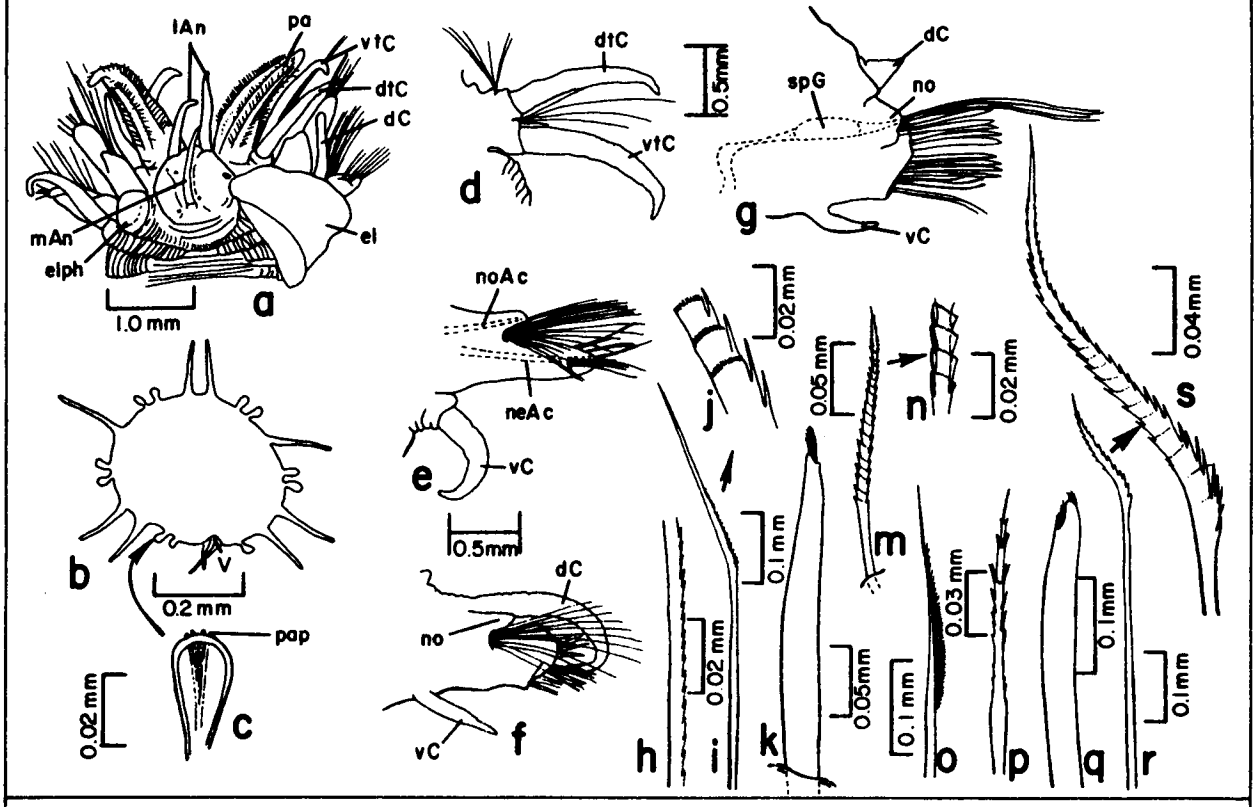

Figure 22-6. Eupanthalis sp. A: a, anterior end; b, cross-section from middle of palp; c, small papilla from same; d, tentacular parapodium, inner view; e, second parapodium, anterior view; f, third parapodium, anterior view; g, middle parapodium, anterior view; h, portion of notoseta from tentacular segment; i, j, neuroseta from segment 2; k, neuropodial spine from segment 3; m, n, lower neuroseta from same; o, pseudopenicillate neuroseta, lateral view, from middle segment; p, spiked neuroseta from same; q, spine from same; r, s, lower neuroseta from same.

Eupanthalis sp. A
Figures 22-5, 6a-s

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 16C-5/74 (1 spec.), 2427-9/77 (1 spec., USNM 55798); STOCS 6/I-3 5/76 (1 spec., USNM 86864), 4/III-5 F/76 (1 spec., USNM 86859), 1/IV-5 W/76 (1 spec., USNM 86862), 4/IV-1 F/76 (1 spec., USNM 86860), 4/IV-5 F/76 (1 spec., USNM 86861); IXTOC S53-1 12/80 (1 spec., USNM 86863).
DESCRIPTION:
Length, 83+ mm; width, to 4.5 mm. Largest specimen incomplete with about 126 segments. Prostomium (Figure 22-6a) with about four eyespots, sometimes faded and scattered. Lateral antennae long, filiform, attached to anterior margin of prostomium. Median antenna equal in length to lateral antennae, emerging posteriorly on prostomium. Palps short, thick, with regularly arranged rows of long filiform papillae alternating with rows of short papillae having 3-4 minute distal papillae (Figure 22-6b,c). First pair of elytra overlapping prostomium, subsequent elytra smaller than first pair, not overlapping middorsally. Elytra rounded to oval in outline, without ornamentation. Tentaculophores of tentacular segment with two acicula and two bundles of notosetae (Figure 22-6d). Parapodia of segment 2 (Figure 22-6e) with small notopodia, larger neuropodia and long ventral cirri. Parapodia of segment 3 (Figure 22-6f) with long filiform dorsal cirri, small notopodia and larger neuropodia; ventral cirri slightly shorter than those of segment 2. Subsequent segments (Figure 22-6g) with flattened notopodia on anterodorsal side of neuropodia; neuropodia broad, ventral cirri shorter than those of segments 1-3. Dorsal cirri gradually becoming shorter and conical. Notosetae simple, with serrate margins (Figure 22-6h), tapering to fine tips; long and more numerous on anterior segments, gradually becoming shorter and fewer in number posteriorly. Additional thread-like notosetae emerging from notopodial spinning glands beginning on segment 9 (Figure 22-6g). Neurosetae of segment 2 geniculate (Figure 22-6i), with spinous margins and dentate cusps (Figure 22-6j). Neurosetae of segments 3-8 including upper group of geniculate setae, middle group of 4-5 distally hirsute spines (Figure 22-6k), and lower group of geniculate, spirally serrate setae (Figure 22-6m,n). Beginning on segment 9, neurosetae including upper group of pseudopenicillate (Figure 22-6o) and spiked setae (Figure 22-6p), middle group of 6-10 spines bearing large distal tooth flanked by distal hairs (Figure 22-6q), and lower group of geniculate, plumose setae (Figure 22-6r,s). Pygidium not observed.
REMARKS: Eupanthalis sp. A is similar to E. perlae Fauchald, 1977b, but differs primarily in the distribution of papillae along the palps. In Eupanthalis sp. A the two kinds of papillae are regularly arranged (Figure 22-6b); in E. perlae, the papillae are of a single kind and are arranged irregularly. One specimen of Eupanthalis sp. A possessed palps that were about twice as long as those figured (Figure 22-6a), but the arrangement of papillae (as well as other characters) were consistent with individuals having shorter palps. Among smaller specimens the tips of some neuropodial spines have long aristae in addition to the fine hairs. Pettibone (pers. comm.), plans to resurrect the genus Euarche Ehlers, 1887, which will include both Eupanthalis sp. A and E. perlae.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida, Alabama, and Texas (Figure 22-5); 15-175 m; sands, silts, clays.

CHAPTER 23

Joan M. Uebelacker

FAMILY PHOLOIDIDAE Fauchald, 1977a

INTRODUCTION

Members of the Pholoididae are small, less than 10 mm in length, with oval bodies bearing dorsal elytra. The elytra are thickened, with concentric rings and a marginal fringe of numerous long papillae (Figure 23-2b); they are often encrusted with minute sand grains. Elytra occur on segments 2, 4, 5, 7 and all subsequent odd-numbered segments to the end of the body.

The prostomium has a single median antenna, two pairs of eyes (Figures 23-2a), and a pair of palps. Lateral antennae are absent. The tentacular parapodia are directed forward; each has a dorsal tentacular cirrus and notosetae. Subsequent parapodia are biramous with ventral cirri. Dorsal cirri and branchiae are absent. Notosetae are simple and spinous; neurosetae are composite and falcate. The pygidium is small and bears two anal cirri. Two pairs of jaws are present in the pharynx.

The pholoidids are a small family of scale worms known for a single genus, Pholoides, and four species (Fauchald, 1977a:68). The group was formerly included in the Aphroditidae, Sigalionidae and Polyodontidae by different authors. Hartman and Fauchald (1971:28) raised the aphroditid subfamily Peisidicinae Darboux (1899) to the family Peisidicidae, to include the single genus Peisidice Johnson, 1897. Fauchald (1977a) synonymized Peisidice with the older Pholoides Pruvot, 1895, replacing Peisidicidae with the new family name Pholoididae.

The Pholoididae are most similar to the scale worm family Sigalionidae, particularly the genus Pholoe. They differ from the sigalionids in having elytra on alternate segments rather than every segment posteriorly, in having one rather than two pairs of tentacular cirri, and (except Pholoe), in lacking branchiae and ctenidia. Pettibone (pers. comm.) feels that Pholoe has more characters in common with Pholoides than with the Sigalionidae, and in 1982 included both Pholoe and Pholoides in the family Pholoidae Kinberg, 1858. This arrangement is not followed herein (see comments under the genus Pholoe in Chapter 25).

A single species of Pholoides is known from the Gulf of Mexico outer continental shelf, and is newly reported from this region.

PRINCIPAL DIAGNOSTIC CHARACTERS

Most morphological characters seem to vary little among members of the family. Size (body length, number of segments, number of pairs of elytra), along with degree of serration of the neurosetal blades, have been used to distinguish species. However, even these characters apparently differ minimally between some species (see Hartmann-Schröder, 1979a:71). A review of the family would elucidate the taxonomic significance of these characters and enable reassessment of species.

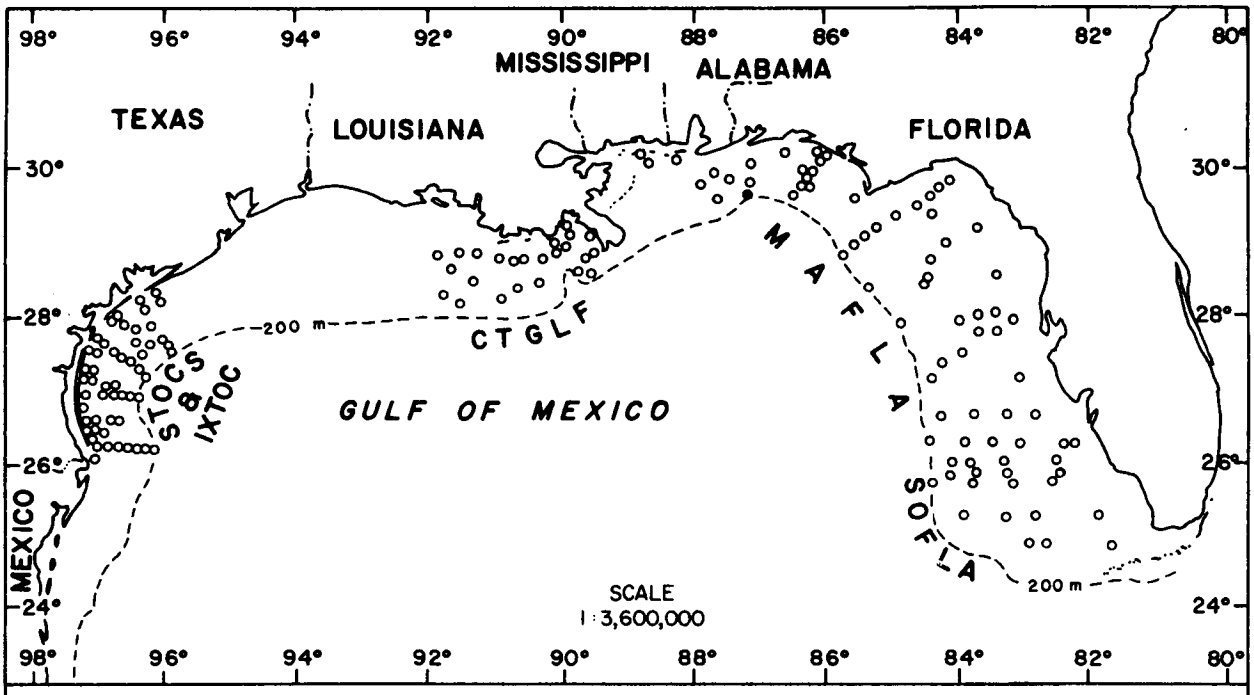

Figure 23-1. Distribution of Pholoides bermudensis on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

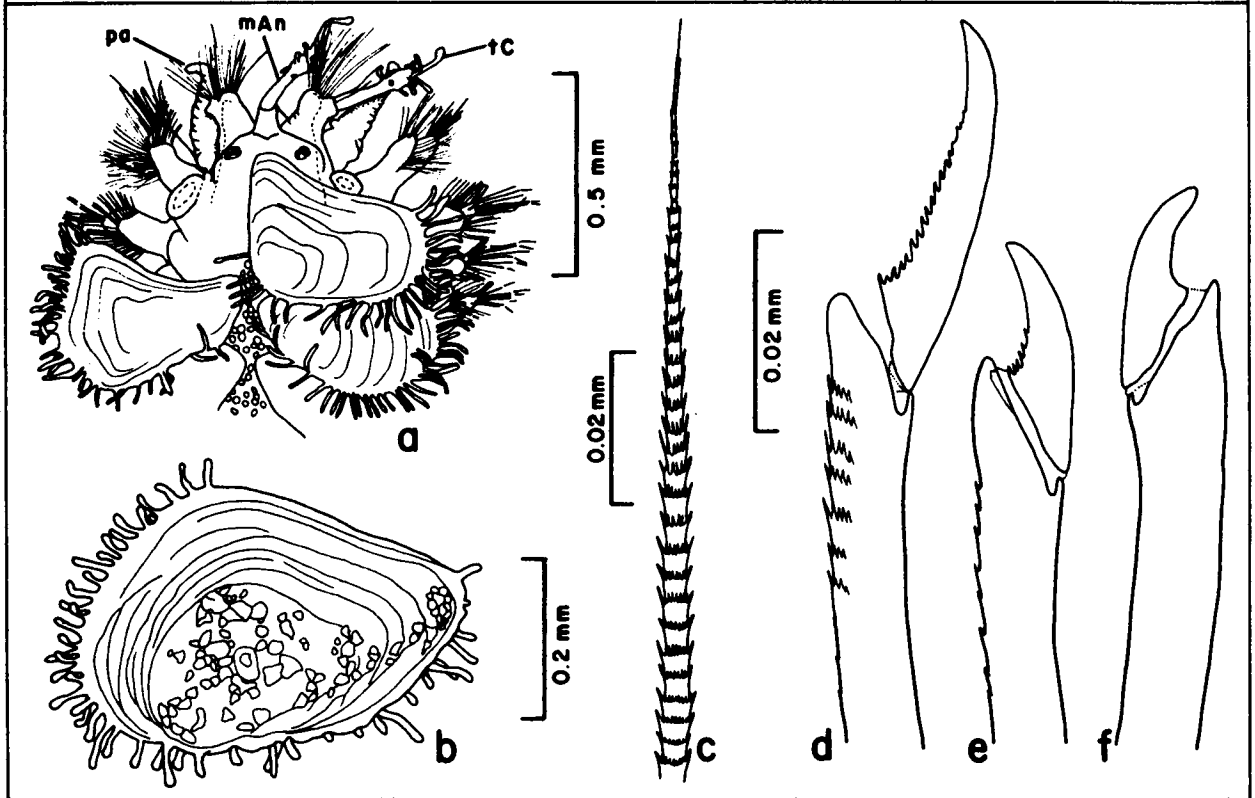

Figure 23-2. Pholoides bermudensis: a, anterior end (right 1st and left 1st and 2nd elytra removed); b, posterior left elytron; c, notoseta; d, upper neuroseta from segment 5; e, lower neuroseta from midbody region; f, same, from segment 18.

BIOLOGICAL NOTES

Pholoidids inhabit stony and muddy sediments from littoral to bathyal depths (up to 1153 m). The elytra encase the body dorsally and laterally; adherent sand grains may provide some additional protection.

Members of the family are probably carnivorous. Their reproductive biology is unknown.

Genus **Pholoides** Pruvot, 1895

TYPE SPECIES: Pholoides dorsipapillata Pruvot, 1895.
REFERENCES:
Johnson, 1897:184 (as Peisidice).
Hartman and Fauchald, 1971:29 (as Peisidice).
Fauchald, 1977a:66.
DIAGNOSIS: Body short, with fewer than 40 segments. Tentacular cirri resembling median antenna. Tentacular segment with simple, spinous setae. Middorsum exposed between elytra, often papillose. Pharynx eversible, muscular, armed.

Pholoides bermudensis (Hartman and Fauchald, 1971)
Figures 23-1, 2a-f

Peisidice bermudensis Hartman and Fauchald, 1971:30, pl. 2, figs. a-e.
Peisidice bermudensis--Hartmann-Schröder, 1979a:71, figs. 15, 16.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2645E-7/76 (1 spec.), 2645H-7/76 (1 spec.), 2645I-11/77 (1 spec.), 2645G-2/78 (1 spec.), 2645-2/78 (6 spec., USNM 56152).
DESCRIPTION:
Length, to 3.32 mm (previously reported to 4 mm); width, to 1.04 mm (previously reported to 1.4 mm). Body small; complete specimens with up to 33 segments. Prostomium with two pairs of dark, lentigerous, coalescent eyes (Figure 23-2a). Style of median antenna cylindrical, with subdistal portion expanded and papillose. Palps thick, tapered, appearing wrinkled when retracted. Single pair of tentacular cirri, similar to median antenna. Elytra thick with concentric rings and minute adherent sand grains, heavily fringed except along anterior margins (Figure 23-2b), without pigmentation; numbering 10-15 pairs, continuing to posterior end. Marginal papillae digitiform, variable in length, sometimes distally inflated or forked. Middorsum papillose. Ventrum minutely papillose. Notopodia rounded, neuropodia larger with long distal papillae. Ventral cirri subulate, papillose, long on segment 2, decreasing in size thereafter. Notosetae numerous, pointed, finely spinous on segment 1, thereafter with rows of coarse spines (Figure 23-2c). Neurosetae composite, falcate, unidentate; blades and shafts serrate and blades relatively long anteriorly (Figure 23-2d). Neurosetae of midbody and posterior regions including 1-2 longer-bladed upper falcigers and numerous lower falcigers with short, hooked, smooth or basally serrate blades (Figure 23-2e,f). Anal cirri long, subulate, papillose. Pharynx with two pairs of curved jaws and about 20 triangular marginal papillae.

REMARKS: Hartman and Fauchald (1971:31) originally described P. bermudensis as having neurosetae with smooth blades and shafts. However, their figures (pl. 2, fig. d,e) show a smooth, long-bladed neuroseta and a serrate, short-bladed neuroseta. Hartmann-Schröder (1979a) later illustrated the neurosetae of specimens she assigned to P. bermudensis. Her illustrations match the appearance of the neurosetae of Gulf of Mexico BLM-OCS specimens. This species differs from the similar P. dorsipapillata (Marenzeller, 1893) in being smaller, with fewer segments and fewer pairs of elytra. P. bermudenis is newly reported from the Gulf.

PREVIOUSLY REPORTED HABITAT: 229-1153 m; muddy sediments.

GULF OF MEXICO BLM-OCS OCCURRENCE: One station off Pensacola, Florida (Figure 23-1); 107 m; coarse sand.

DISTRIBUTION: Mid-Atlantic between Bermuda, Portugal and Canary Islands; Gulf of Mexico.

CHAPTER 24

Joan M. Uebelacker

FAMILY EULEPETHIDAE Chamberlin, 1919b

INTRODUCTION

Eulepethids are fairly large scale worms, ranging in length up to 75 mm, although most species measure about 10-30 mm. Specimens are normally quite robust, and usually do not fragment easily. Unlike other scale worms, such as some of the polynoids, eulepethids have elytra which are firmly attached and seldom lost during handling and preservation.

The prostomium is small and not visible unless the first pair of elytra and dorsal portion of segment 2 are pulled aside or removed. It bears three small, conical to globular antennae; a pair of long, tapered palps; and sometimes minute eyespots. Nuchal organs are present as a pair of small, clavate lobes lateral to the prostomium (Figure 24-2a). The eversible pharynx bears a circle of distal papillae (Figure 24-10a) and two pairs of plate-like jaws. The tentacular segment (first setiger) is small, lateral to the prostomium and anteriorly directed, and bears two bundles of capillary setae along with dorsal and ventral tentacular cirri (Figure 24-2a). The second segment bears the first pair of elytra, fully developed parapodia, and large ventral (buccal) cirri. Small, subulate dorsal cirri are present on segments 3 and 6. The third segment is not visible middorsally; its dorsal cirri are wedged between the large elytrophores of segments 2 and 4. All segments are setigerous with biramous parapodia. The pygidium has a dorsal anus, a long filiform cirrus on the right side, and a rudimentary bulbous cirrus on the left side.

The elytra cover the dorsum except for some posterior segments, and increase in length up to the twelfth pair. The lateral borders are usually notched or fimbriated. Elytra arise on dorsal elytrophores of segments 2, 4, 5, 7, 9, 11, 13, 15, 17, 19, 21, and 24. Nine pairs of branchiae (Figure 24-2e) arise on modified dorsal tubercles on segments 8, 10, 12, 14, 16, 18, 20, 22, 23; additional branchiae are found on 1-4 following segments, depending upon the species, starting on segment 25. The postbranchial segments are equipped with either dorsal lamellae (Figure 24-10d) in Pareulepis and Grubeulepis, or small elytra (Figure 24-2d) in Eulepethus, Mexieulepis and Japoeulepis, continuing to the posterior end.

Setae are numerous and entirely simple. The notopodium is supported by a single aciculum which usually has a hooked tip. Notosetae include bent spines with spoon-shaped or pointed tips (Figure 24-2g,h) starting on segment 3, and a posterolaterally projecting bundle of smooth or spinous (Figure 24-4g) capillary setae. The large neuropodium is paddle-shaped and is supported by a single aciculum having large distal plates (Figure 24-2e). Neurosetae include pectinate setae (Figure 24-2n), spines (Figure 24-2k), bilimbate setae (Figure 24-2m), and capillary setae; stout acicular neurosetae (Figure 24-2i) are sometimes present.

The Eulepethidae, placed by Fauchald (1977a:68) and Pettibone (1982:15) in the order Phyllodocida and superfamily Aphroditacea, appear

most closely related to the Aphroditidae (Pettibone, 1969c:4). A detailed analysis and revision of the family, covering all species known at the time, was presented by Pettibone (1969c). Further revision and addition of new species are the objectives of ongoing work by Pettibone.

The family comprises five genera, including the recent addition of Japoeulepis Imajima, 1974. About 13 species are known. Two genera and five species have been found in northern Gulf of Mexico BLM-OCS collections. Of these, one species is a questionable assignment and one is presumably new to science.

PRINCIPAL DIAGNOSTIC CHARACTERS

Eulepethid genera are separated mainly by characteristics of the elytra and posterior dorsal structures (elytra or lamellae). The branchiae and large twelfth pair of elytra are followed by dorsal lamellae (Figure 24-10d) in Grubeulepis and Pareulepis, and by smaller elytra (Figure 24-2d) in Eulepethus, Mexieulepis and Japoeulepis. The anterior 12 pairs of elytra have a single lateral notch in Pareulepis and Eulepethus, and multiple lateral lamelliform processes (Figure 24-4b,c) in Grubeulepis, Mexieulepis and Japoeulepis. Japoeulepis is distinguished from Mexieulepis in having the posterior small elytra with entire rather than notched or fimbriated margins.

Specific characters are based mainly on elytral and setal distinctions. Elytral characters of importance include the presence or absence of marginal papillae on the first pair of elytra; and the number, shape and articulation of the lateral processes on the anterior 12 pairs of elytra. Diagnostic setal characters include shape of the tips and serrations on the notopodial and neuropodial spines, orientation and relative thickness of the upper posterior neurosetae, and the presence of acicular neurosetae. An additional character distinguishing the new species of Grubeulepis reported herein is the presence of large lamellae arising from the ventrolateral edges of the middle segments (Figure 24-4d). The number of pairs of branchiae, used by Pettibone (1969c) as a key specific character, appears subject to intraspecific variation.

Juvenile eulepethids exhibit a number of variations which make them difficult to identify. The body is obviously much smaller, with a reduced number of segments. Segments bearing the posterior branchiae, lamellae or small elytra, and sometimes even the last few pairs of anterior elytra, are often undeveloped. The twelfth pair of elytra may be much smaller with fewer lateral processes than in the adult. The lateral processes of the elytra may be biarticulate in juveniles but entire in adults. Acicular neurosetae may be present on many setigers of juveniles. In Grubeulepis, acicular setae appear to be gradually lost as the worm matures until they are represented by at most a single acicular seta per neuropodium of one or a few anterior segments. The upper neuropodial spines may change in appearance, from having distinct, knob-like serrations in juveniles, to having virtually smooth margins in adults. Most juveniles encountered in this study were not assigned to species unless their affinity seemed certain (e.g., due to the presence of ventral lamellae in Grubeulepis sp. A).

All illustrations herein of the anterior end and elytra are presented from a dorsal view.

BIOLOGICAL NOTES

Little is known about the biology of eulepethids. They seem to be burrowers in sand, silt, mud and among shells and coral. Pettibone (1969c:4) indicated that one species was found commensal with a tube-dwelling polyodontid scale worm. Fauchald and Jumars (1979:262) classified the eulepethids as motile, jawed carnivores. Reproduction has not been studied.

SPECIES OF EULEPETHIDAE RECORDED FROM GULF OF MEXICO BLM-OCS PROGRAMS

Key to the Genera of Eulepethidae from the Gulf of Mexico BLM-OCS Programs

1a. Twelve pairs of elytra followed by smaller elytra (Figure 24-2d) . . . . . **Mexieulepis**, p. 24-3

1b. Twelve pairs of elytra followed by dorsal lamellae (Figure 24-10d). . . . . **Grubeulepis**, p. 24-5

Genus **Mexieulepis** Rioja, 1961

TYPE SPECIES: *Mexieulepis elongatus* Rioja, 1961 (=*M. weberi* (Horst, 1922)).
REFERENCES:
Pettibone, 1969c:12.
Fauchald, 1977a:68.
DIAGNOSIS: Adults with 37-62 segments. Numerous pairs of elytra; anterior 12 pairs larger, followed by smaller elytra posteriorly. Elytra with lateral processes. Dorsal cirri on segments 3 and 6. Branchiae numbering 11-12 pairs.

Mexieulepis weberi (Horst, 1922)
Figures 24-1, 2a-n

Eulepis weberi Horst, 1922:199, fig. 2.
Mexieulepis weberi--Pettibone, 1969c:18, figs. 11-14.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2529F-6/75 (1 spec.), 2530-7/76 (1 spec., USNM 55801).
Supplementary Material:
Georgia--Sapelo Beach, June 1957, low intertidal, muddy sand, Teal coll., M. H. Pettibone ID. (1 spec., USNM 32359).

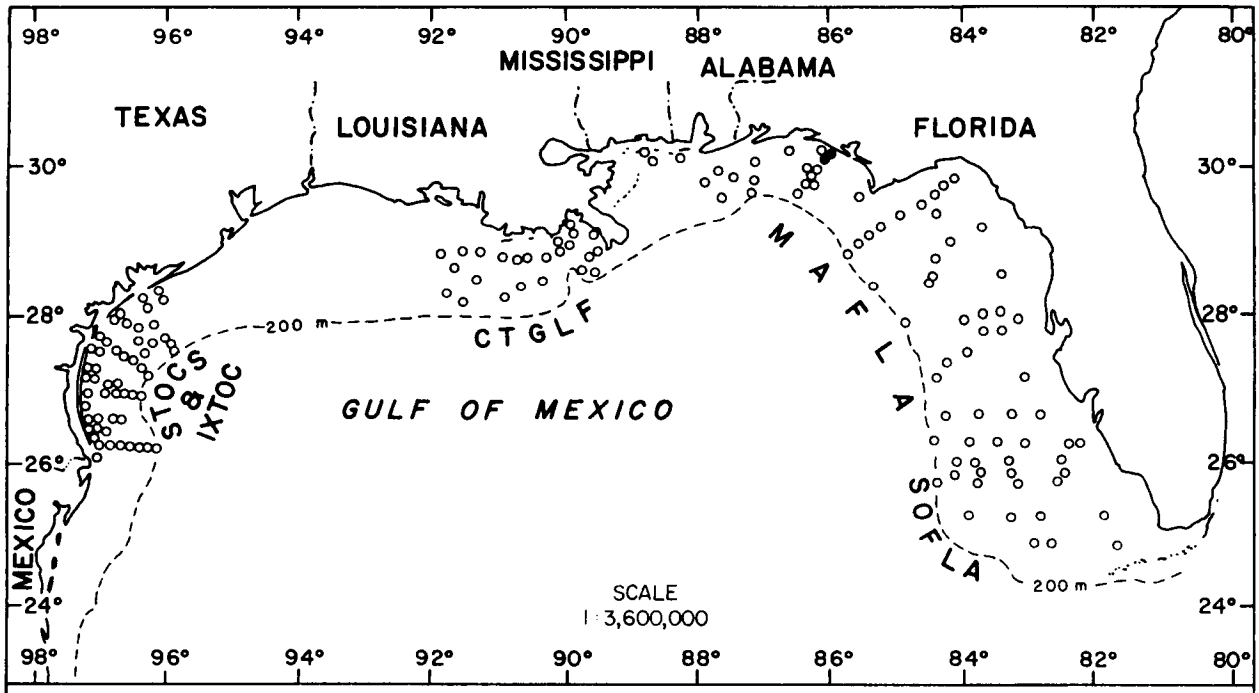

Figure 24-1. Distribution of Mexieulepis weberi on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

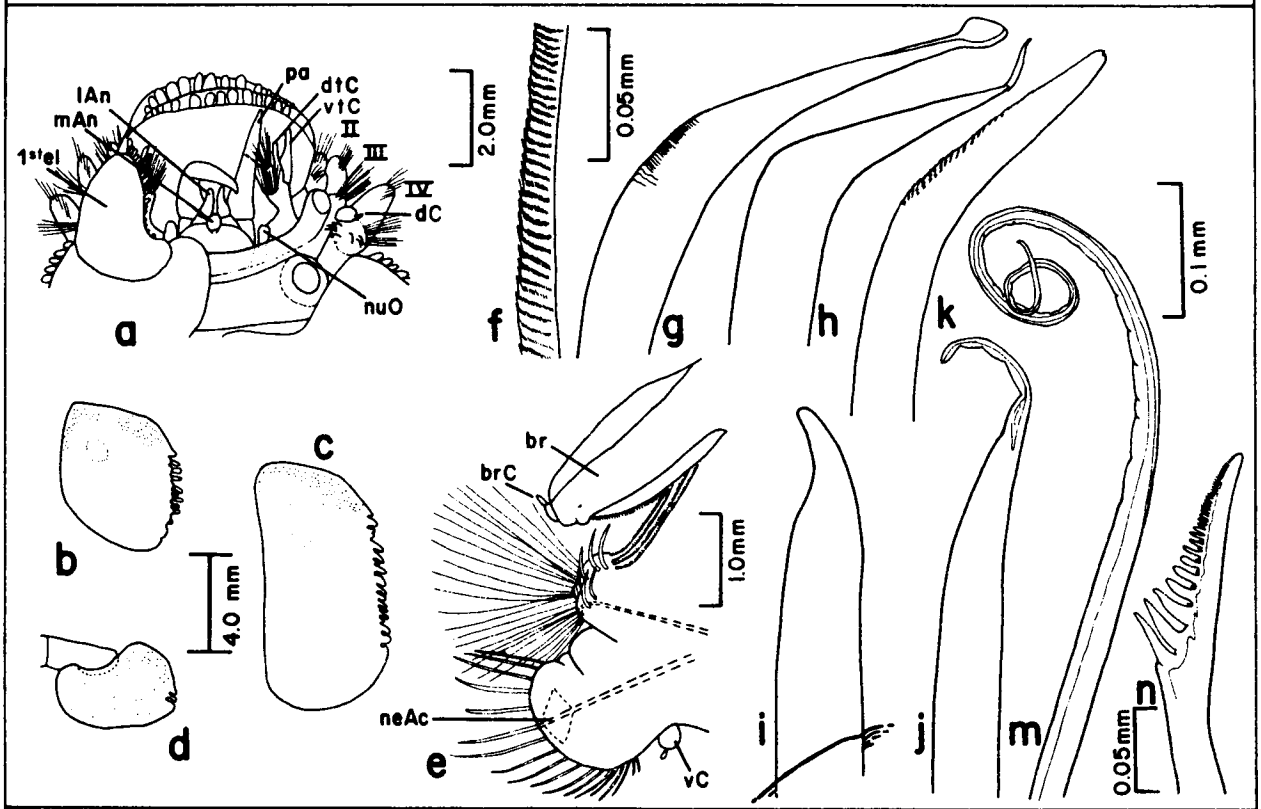

Figure 24-2. Mexieulepis weberi: a, anterior end, 1st two right elytra removed; b, right 8th elytron; c, right 12th elytron; d, right posterior elytron; e, branchial parapodium from midbody region (anterior view); f, portion of spinous notoseta from segment 2, g, spoon-tipped notopodial spine from segment 5; h, pointed notopodial spine from midbody region; i, acicular neuroseta from segment 5; j, limbate-tipped neuropodial spine from midbody region; k, upper neuropodial spine from posterior region; m, lower bilimbate neuroseta from midbody region; n, pectinate neuroseta from midbody region (Figures a-e from Pettibone 1969c, figs. 11e, b, c, d, 13b).

DESCRIPTION:
Length, to 48 mm (previously reported to 75 mm); width, to 10 mm (previously reported to 12 mm, including setae). Largest complete specimen with 52 segments. Prostomium rounded anteriorly, brownish in color, with short globular median antenna inserted dorsal to pair of longer, conical lateral antennae (Figure 24-2a). Elytra numbering 23-27 pairs, first pair with numerous papillae along anterior and lateral margins; following 11 pairs with up to 19 fairly short, lamelliform lateral processes (Figure 24-2b,c); posterior elytra small, with few lateral processes or smooth (Figure 24-2d). Branchiae (Figure 24-2e) numbering 12 pairs. Notoacicula with hooked tips. Segment 2 with several stout, spinous, capillary notosetae (Figure 24-2f). Notopodial spines strongly bent, with spoon-shaped (Figure 24-2g) or pointed tips (Figure 24-2h); smooth or with faint striations along bend; present from segment 3. Notopodia with posterior bundle of numerous long, smooth or spinous capillary setae. Acicular neurosetae (Figure 24-2i) starting on setiger 2. Upper neuropodial spines with short limbate tips anteriorly (Figure 24-2j); blunt-tipped, bent downward and serrate along bend posteriorly (Figure 24-2k). Lower neurosetae bilimbate, tips often curled (Figure 24-2m). Uppermost 1-2 neurosetae pectinate (Figure 24-2n). Lowermost neurosetae few, slender, capillary. Anterior ventral cirri subulate, becoming globular with short slender tips after segment 6. Pygidium with long, filiform, papillose cirrus on right side.
REMARKS: These records represent a range extension of M. weberi to the northeastern Gulf of Mexico.
PREVIOUSLY REPORTED HABITAT: Low intertidal, muddy sand.
GULF OF MEXICO BLM-OCS OCCURRENCE: Two stations off Panama City, Florida (Figure 24-1); 38-41 m; coarse to medium sand.
DISTRIBUTION: West Indies, Gulf of Mexico, Georgia.

Genus **Grubeulepis** Pettibone, 1969

TYPE SPECIES: Eulepis fimbriata Treadwell, 1901.
REFERENCES:
Pettibone, 1969c:22.
Fauchald, 1977a:68.
DIAGNOSIS: Adults with 32-40 segments. Twelve pairs of elytra followed by small posterior lamellae. Elytra with lateral processes. Dorsal cirri on segments 3 and 6. Branchiae numbering 10-13 pairs.

Key to the Gulf of Mexico BLM-OCS Species of Grubeulepis

1a. Ventral lamellae present (Figure 24-4d). . . . . **Grubeulepis sp. A**, p. 24-7
1b. Ventral lamellae absent 2

2a. First pair of elytra without papillae along anterior or lateral margins (Figure 24-6a). . . . **Grubeulepis cf. ecuadorensis**, p. 24-9
2b. First pair of elytra with papillae along anterior or lateral margins (Figures 24-8a, 10a). 3

3a. Twelfth elytra with up to eight low, wide lateral processes (Figure 24-8c). . . . . **Grubeulepis augeneri**, p. 24-11

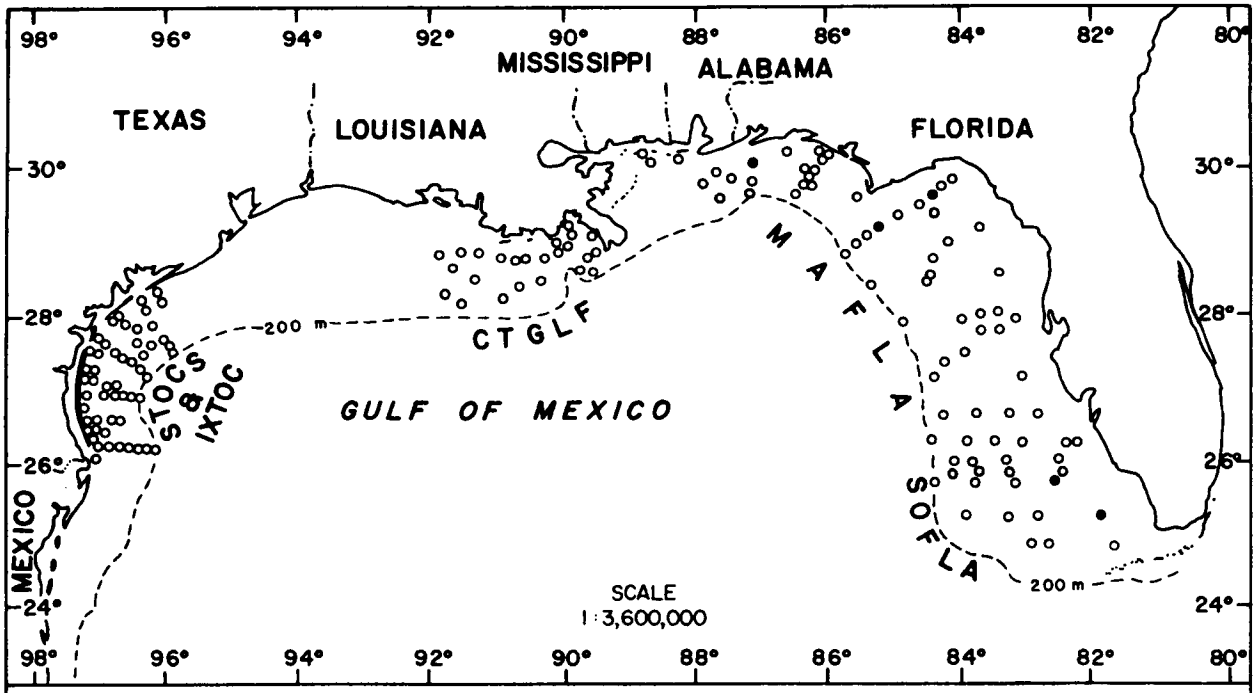

Figure 24-3. Distribution of Grubeulepis sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

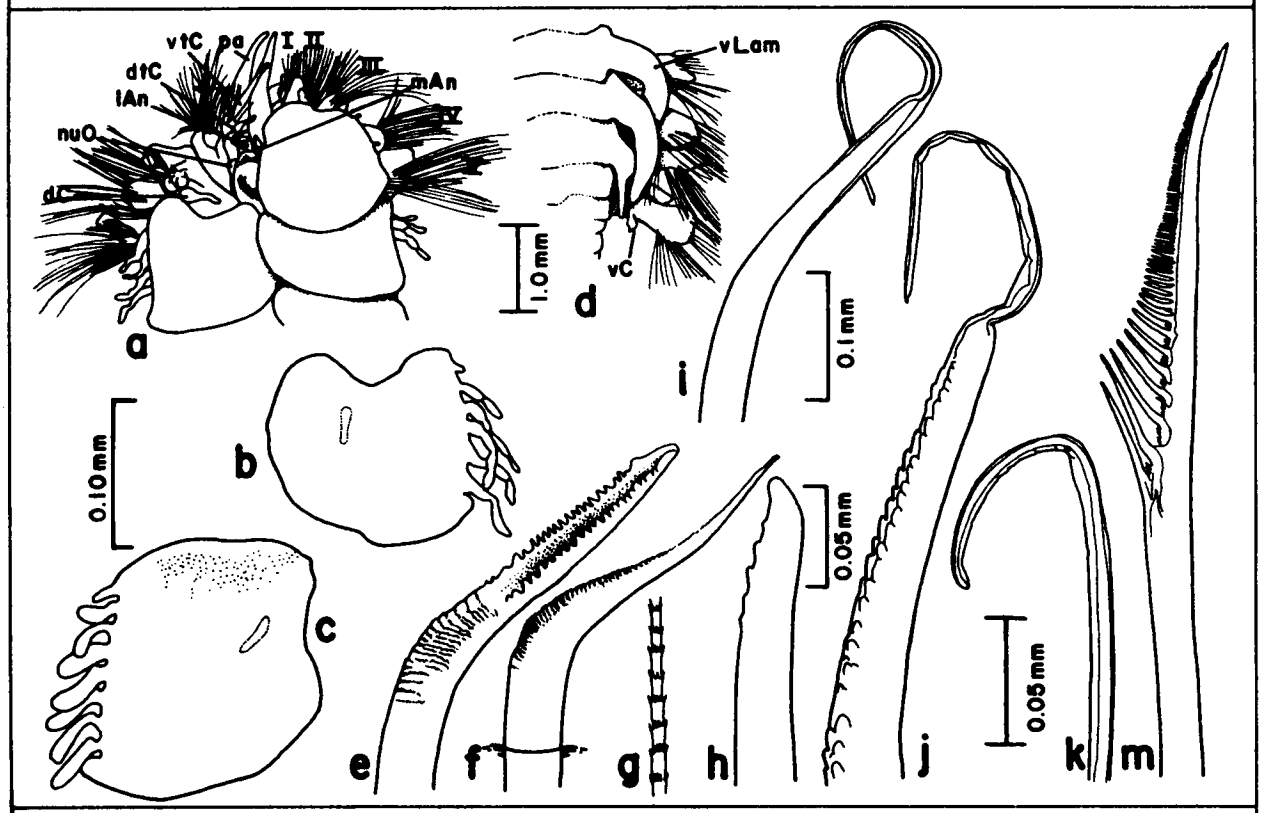

Figure 24-4. Grubeulepis sp. A: a, anterior end, first left elytron removed; b, right 2nd elytron; c, left middle elytron; d, ventrum, left side, from posterior region; e, spatulate notopodial spine from posterior region; f, pointed notopodial spine from posterior region; g, portion of spinous notopodial capillary seta from posterior region; h, acicular neuroseta from anterior region of juvenile; i, upper neuropodial spine from posterior region; j, same, from juvenile; k, lower bilimbate neuroseta from posterior region; m, pectinate neuroseta from anterior region.

3b. Twelfth elytra with 16-21 long, lamelliform lateral processes . . . . . **Grubeulepis mexicana, p. 24-13**

Grubeulepis sp. A
Figures 24-3, 4a-m

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 20E-4/81 (1 spec., USNM 74462); MAFLA 2421A-11/77 (1 spec.), 2424A-2/78 (1 juv.), 2856C-9/77 (1 spec.), 2960D-8/77 (1 spec.), 2960C-11/77 (1 spec.).
DESCRIPTION:
Length, to 15.3 mm; width, to 3.7 mm. Largest complete specimen with 36 segments. Prostomium rounded, yellowish or brownish in color; with small, globular median antenna inserted just dorsal to small, conical lateral antennae (Figure 24-4a). Eyespots not observed. First pair of elytra rounded, with few short papillae along anterior and lateral margins; following anterior elytra with long, bi- or triarticulate lateral processes (Figure 24-4b). Middle and posterior elytra with lamelliform lateral processes (Figure 24-4c), numbering 15-22 on twelfth elytra, sometimes biarticulate with small terminal article. Branchiae numbering 13 pairs, followed by 4-7 pairs of posterior lamellae beginning on segment 29. Ventral lamellae (Figure 24-4d) from segments 7-9 to 23-28, small anteriorly, becoming large medially and posteriorly, usually ending abruptly. Notoacicula with hooked tips. Notopodial spines starting on segment 3, strongly bent; upper ones with spatulate tips bordered by coarse serrations, finely serrate along bend (Figure 24-4e); lower ones with pointed tips, minutely serrate along bend (Figure 24-4f). Notopodia with posterior bundle of numerous long, smooth or coarsely spinous (Figure 24-4g) capillary setae. Acicular neurosetae smooth, present on segment 3 of adults; knobbed (Figure 24-4h) and present on most segments of juveniles. Neuropodial spines with long, abruptly slender, bilimbate tips, bent downward on posterior segments, smooth in adults (Figure 24-4i), coarsely serrate in juveniles (Figure 24-4j). Lower neurosetae slender, bilimbate, tips often hooked or curled (Figure 24-4k). Uppermost 1-2 neurosetae pectinate (Figure 24-4m). Lowermost neurosetae few, slender, capillary. Anterior ventral cirri subulate, becoming globular with short slender tips after first few segments. Pygidium with long, filiform cirrus on right side, and short, bulbous cirrus on left side.
REMARKS: Grubeulepis sp. A differs from all known species of the genus in having pronounced ventral lamellae. It otherwise resembles Grubeulepis geayi (Fauvel, 1918), except in having articulate lateral processes on the anterior elytra.
GULF OF MEXICO BLM-OCS OCCURRENCE: Scattered occurrences in northeastern Gulf (Figure 24-3); shallow water, 19-30 m; coarse to fine sand, silty fine sand.

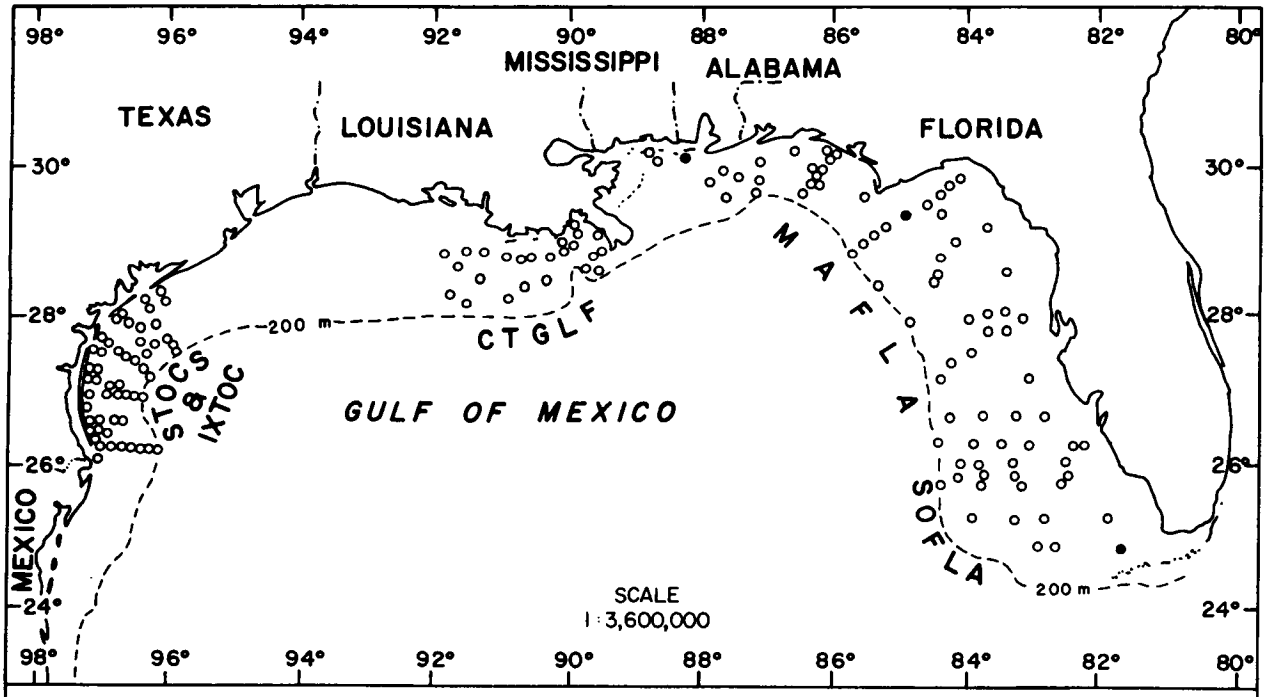

Figure 24-5. Distribution of Grubeulepis cf. ecuadorensis on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

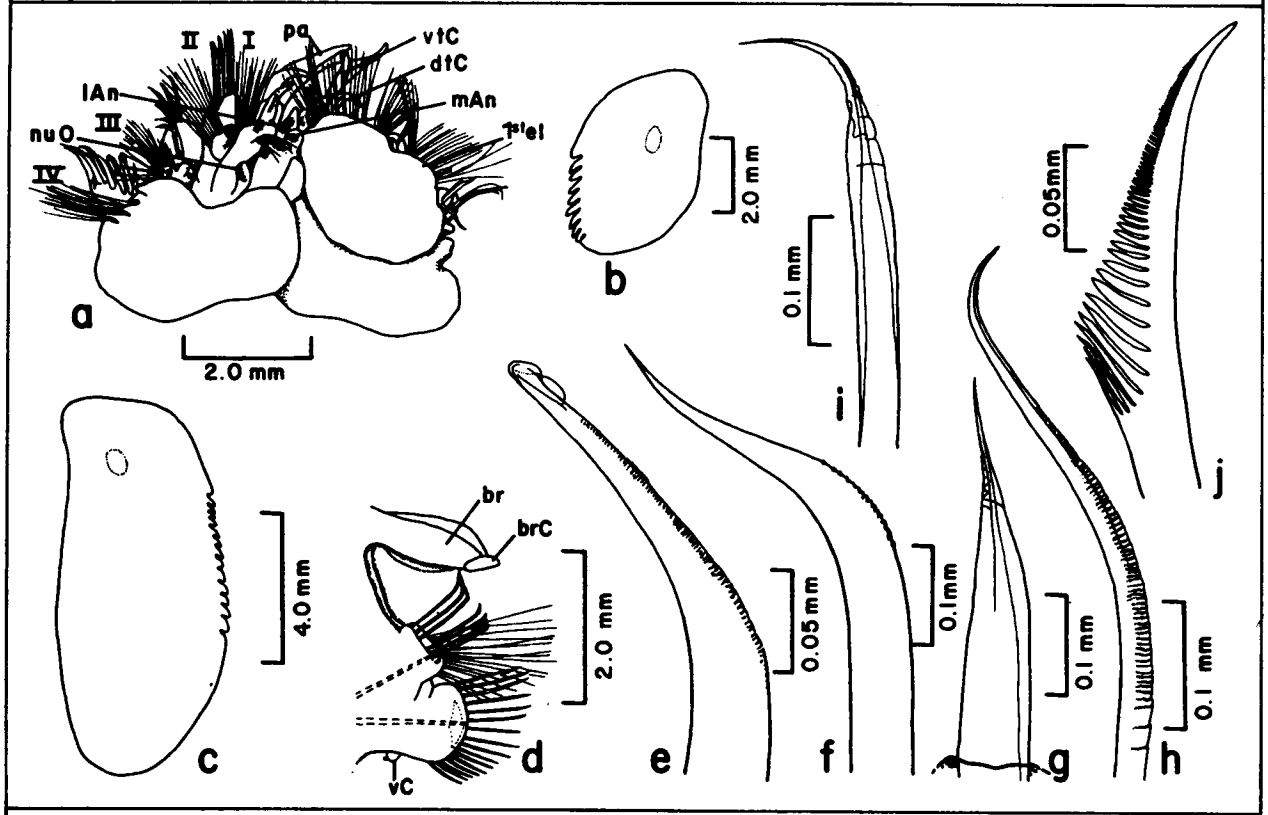

Figure 24-6. Grubeulepis cf. ecuadorensis: a, anterior end, first left elytron removed; b, left 7th elytron; c, right 12th elytron; d, middle branchial parapodium (anterior view); e, spoon-tipped notopodial spine from anterior region; f, pointed notopodial spine from posterior region; g, upper neuropodial spine from anterior region; h, same, from posterior region; i, lower bilimbate neuroseta from anterior region; j, pectinate neuroseta from posterior region (Figures b-d from Pettibone 1969c, figs. 23h, i, 22a).

Grubeulepis cf. ecuadorensis Pettibone, 1969
Figures 24-5, 6a-j

Grubeulepis ecuadorensis Pettibone, 1969c:30, figs. 21-23.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 25D-11/80 (1 spec., USNM 74463); MAFLA 8E-5/74 (1 spec.), 2423F-11/77 (1 spec.), 2639A-8/77 (1 spec.).
Supplementary Material:
Gulf of Mexico--Alabama, COE Sta. 476-3, 30°03.20'N, 88°14.40'W, 21.0 m, sand, Mar. 1981 (1 spec.).
DESCRIPTION:
Length, to 29.2 mm (previously reported to 35 mm); width, to 7.7 mm (previously reported to 8 mm, including setae). Body large, robust; complete specimens with up to 40 segments. Prostomium with brownish pigment patches; median antenna small, globular, inserted posterodorsal to pair of clavate lateral antennae (Figure 24-6a); two pairs of minute, black, lateral eyespots present. First pair of elytra smooth, without marginal papillae; following elytra with lamelliform lateral processes (Figure 24-6b) increasing in number posteriorly; twelfth pair with 11-24 lateral processes (Figure 24-6c). Branchiae (Figure 24-6d) numbering 12-13 pairs, last pair often transitional, followed by 10-12 pairs of posterior lamellae beginning on segments 28-29. Notoacicula with hooked tips. Notopodial spines starting on segment 3, strongly bent, tips spoon-shaped (Figure 24-6e) or pointed (Figure 24-6f), finely serrate to nearly smooth along bend. Notopodia with posterior bundle of numerous long, smooth or lightly spinous capillary setae. Segment 3 with single acicular seta on each neuropodium. Anterior upper neuropodial spines stout with short, bilimbate tips (Figure 24-6g); posterior neuropodial spines curved downward, with rows of transverse serrations along bend, and narrow, limbate tips (Figure 24-6h). Lower neuropodial spines of anterior and posterior regions, and all neuropodial spines of midbody bilimbate with tips often wrinkled or curled (Figure 24-6i). Uppermost 1-2 neurosetae pectinate (Figure 24-6j). Lowermost neurosetae few, capillary, smooth or lightly serrate. Anterior ventral cirri subulate, becoming globular with short slender tips after segment 4. Pygidium with long, filiform cirrus on right side; left side not observed.
REMARKS: Gulf of Mexico BLM-OCS specimens differ from the original description of G. ecuadorensis in having up to 24 lateral processes on posterior elytra, rather than 13; variation in the number of pairs of branchiae; acicular neurosetae on segment 3 only rather than on segments 3-8; and notopodial spines faintly to distinctly serrate along the bend. Since the original description was based on a single specimen, these character discrepancies may simply reflect intraspecific variation.
PREVIOUSLY REPORTED HABITAT: 36.5 m, muck.
GULF OF MEXICO BLM-OCS OCCURRENCE: Three widespread occurrences in northeastern Gulf (Figure 24-5); shallow water, 19-32 m; silty fine sand, sandy silt, silty clay.
DISTRIBUTION: Off Ecuador, ?Gulf of Mexico.

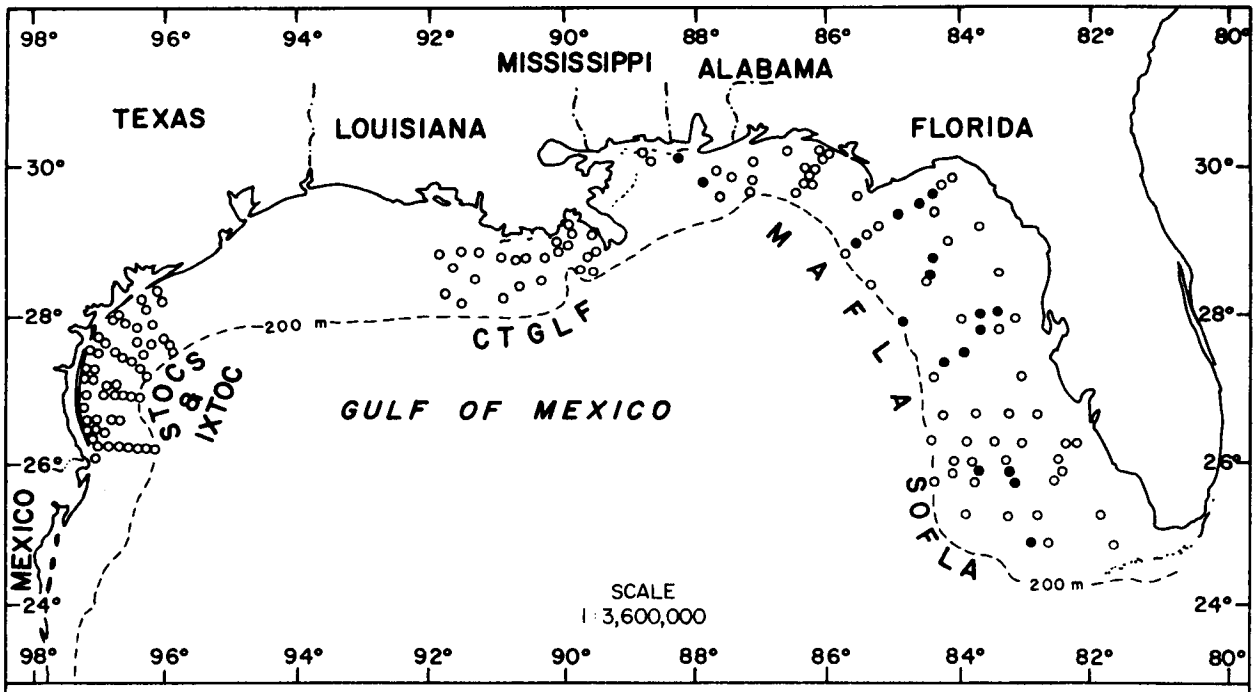

Figure 24-7. Distribution of Grubeulepis augeneri on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

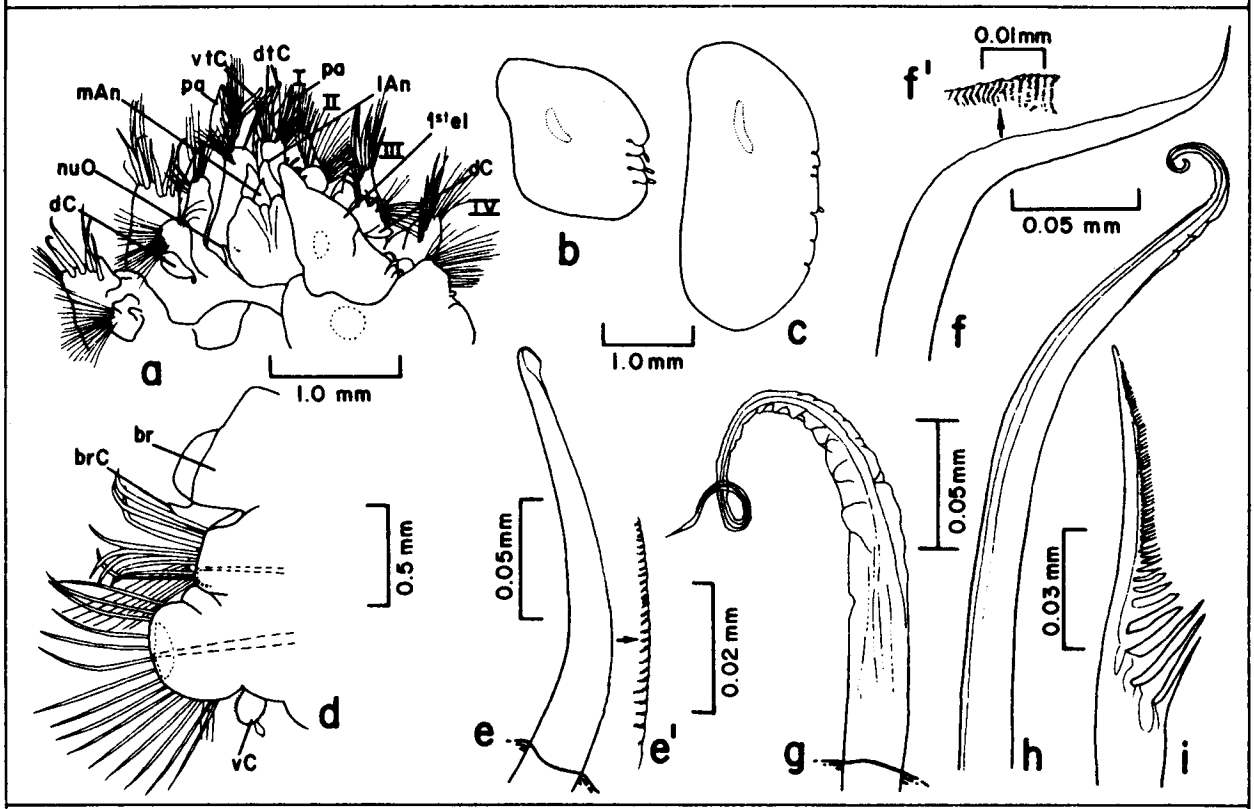

Figure 24-8. Grubeulepis augeneri: a, anterior end, first two left elytra removed; b, right 5th elytron; c, right 12th elytron; d, middle branchial parapodium (anterior view); e, spoon-tipped notopodial spine from anterior region; e', enlargement of portion of e, showing serrations; f, pointed notopodial spine from posterior region; f' enlargement of portion of f, showing serrations; g, middle bilimbate neuroseta from anterior region; h, upper bilimbate neuroseta from posterior region; i, pectinate neuroseta from posterior region (Figures b-d from Pettibone 1969c, fig. 31i, k, a).

Grubeulepis augeneri Pettibone, 1969
Figures 24-7, 8a-i

Grubeulepis augeneri Pettibone, 1969c:38, figs. 30, 31.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 16D-11/80 (2 spec., USNM 74464), 16B-7/81 (2 spec., USNM 74465), 18D-4/81 (1 spec., USNM 74466), 28C-8/81 (2 spec., USNM 74467); MAFLA 2208B-7/76 (1 spec.), 2208D-7/76 (1 spec.), 2208E-7/76 (1 spec.), 2208G-7/76 (1 spec.), 2208J-7/76 (1 spec.), 2208J-8/77 (1 spec.), 2209B-7/76 (1 spec.), 2209C-7/76 (1 spec.), 2209D-7/76 (1 spec.), 2209J-11/77 (1 spec.), 2210C-7/76 (1 spec.), 2316C-8/76 (1 spec.), 2640A-2/78 (2 spec.), 2959C-8/77 (1 spec.), 2959D-8/77 (1 juv.), 2959G-8/77 (1 juv.), 2959I-8/77 (2 spec.), 2959G-11/77 (1 spec.).
DESCRIPTION:
Length, to 20.7 mm (previously reported to 17 mm); width, to 3.6 mm (previously reported to 4 mm, including setae). Largest complete specimen with 36 segments. Prostomium with short, clavate median antenna inserted anterodorsally; pair of longer, clavate lateral antennae inserted behind median antenna; and two pairs of eyes near lateral borders (Figure 24-8a). First pair of elytra rounded, each with 7-16 papillae along anterior and lateral margins; following anterior elytra with 1-4 short lamelliform lateral processes, often biarticulate (Figure 24-8b); posterior elytra with up to eight low, wide lateral processes, rarely biarticulate (Figure 24-8c). Branchiae numbering 12-13 pairs (14 pairs on one specimen), followed by 4-8 pairs of posterior lamellae. Notoacicula with hooked tips (Figure 24-8d). Notopodial spines starting on segment 3, strongly bent, tips spoon-shaped (Figure 24-8e) or pointed (Figure 24-8f), with minute serrations along bend (Figure 24-8e',f'). Notopodia with posterior bundle of numerous long, smooth or spinous capillary setae. Acicular neurosetae, if present, on segment 3 in young specimens. Neuropodial spines with bilimbate tips, often wrinkled or curled distally (Figure 24-8g); lower neurosetae more slender. Posterior parapodia with upper neurosetae curved downward (Figure 24-8h), sometimes faintly serrate along bend. Uppermost 1-2 neurosetae pectinate (Figure 24-8i). Lowermost neurosetae few, smooth, capillary. Anterior ventral cirri subulate, becoming globular with short slender tips after first few segments. Pygidium with long, filiform, papillose cirrus on right side, and rudimentary cirrus on left side.
REMARKS: Pettibone (1969c:43) described G. augeneri as having smooth notopodial spines, and lacking acicular neurosetae. Upon close examination under high magnification, the notopodial spines of Gulf of Mexico BLM-OCS specimens were observed to be minutely serrate. Acicular neurosetae, although absent from most of the larger specimens, were commonly found on segment 3 of small specimens, and also on segment 4 of one specimen. G. augeneri is newly reported from the Gulf of Mexico.
PREVIOUSLY REPORTED HABITAT: 34 m, fine muddy sand.
GULF OF MEXICO BLM-OCS OCCURRENCE: Common in northeastern Gulf (Figure 24-7); intermediate depths, 19-87 m, with one unverified record from 189 m; coarse to fine sand, silty fine to very fine sand, clayey and sandy silt.
DISTRIBUTION: Adriatic, central-east Atlantic, West Africa, Gulf of Mexico.

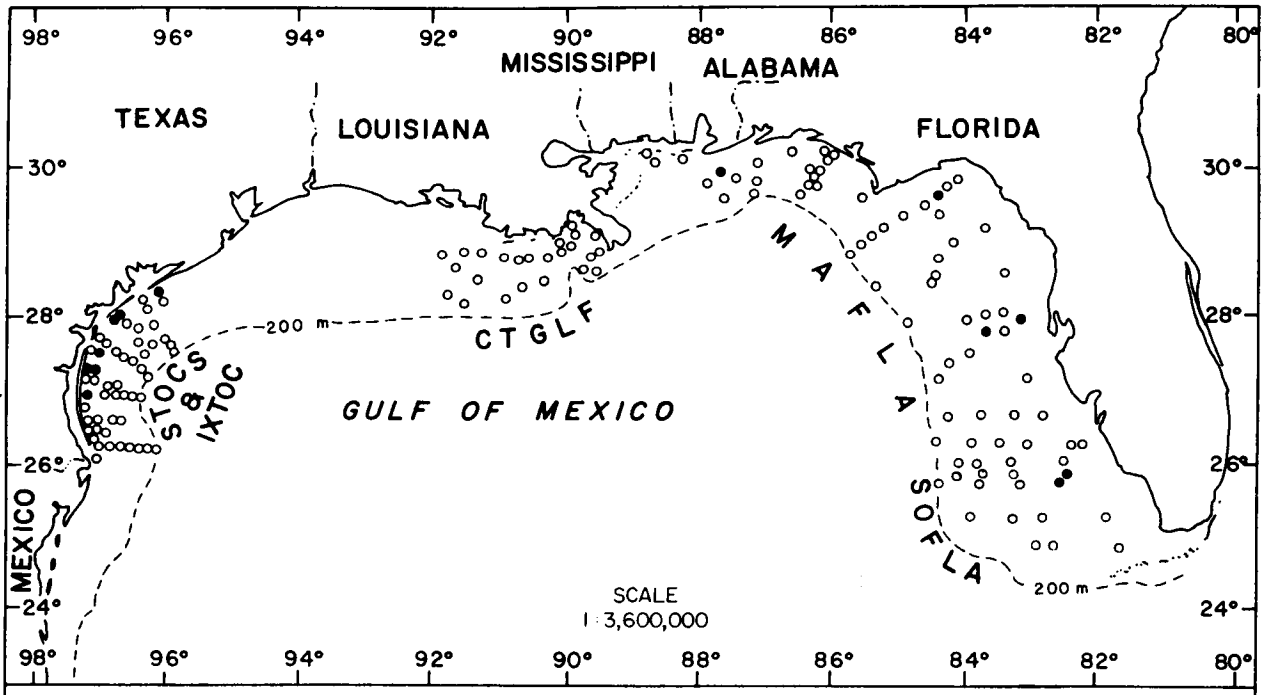

Figure 24-9. Distribution of Grubeulepis mexicana on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

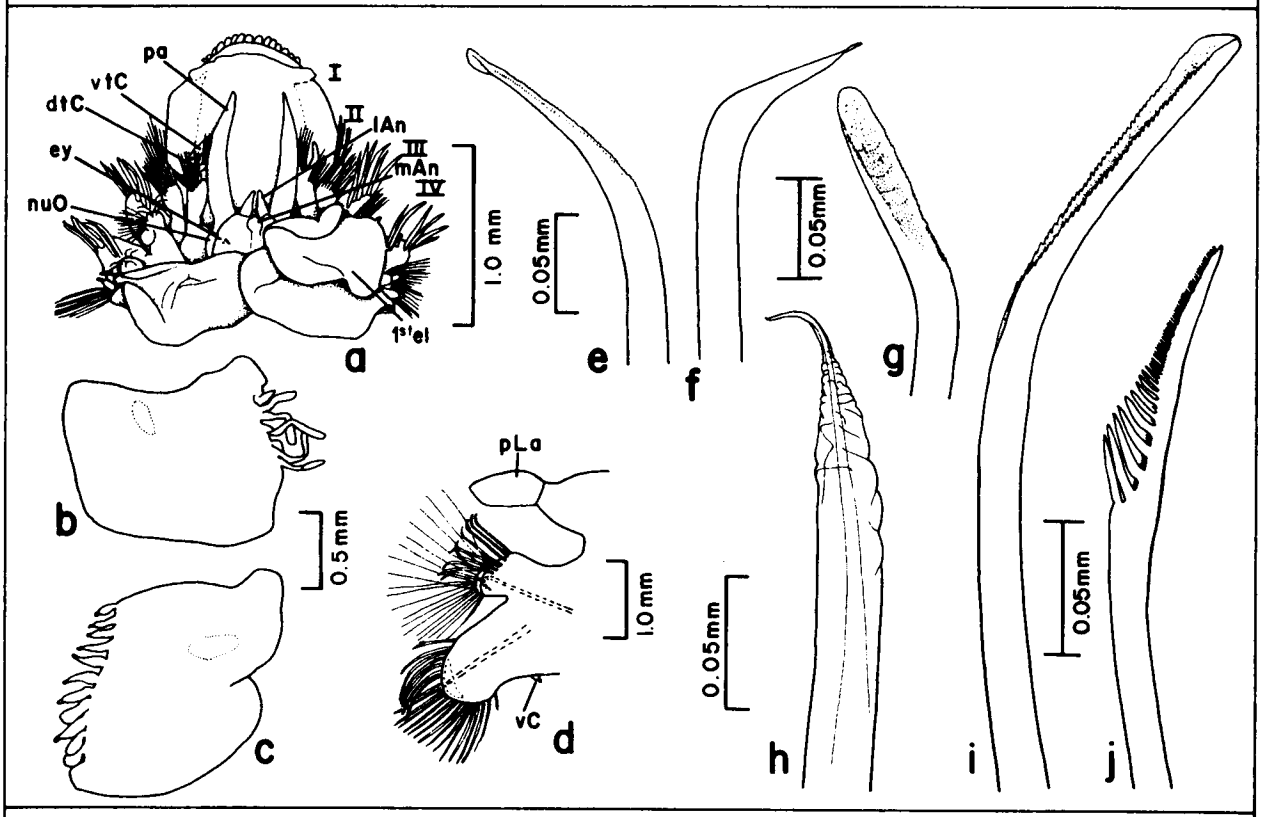

Figure 24-10. Grubeulepis mexicana: a, anterior end, pharynx extended, first left elytron removed; b, right 3rd elytron; c, left middle elytron; d, posterior lamelligerous parapodium (anterior view); e, spoon-tipped notopodial spine from anterior region; f, pointed notopodial spine from midbody region; g, spatulate notopodial spine from posterior region; h, upper bilimbate neuroseta from anterior region; i, spatulate neuropodial spine from posterior region; j, pectinate neuroseta from posterior region (Figure d from Pettibone 1969c, fig. 27a).

Grubeulepis mexicana (Berkeley and Berkeley, 1939)
Figures 24-9, 10a-j

Eulepethus mexicanus Berkeley and Berkeley, 1939:328, figs. 4-7.
Grubeulepis mexicana--Pettibone, 1969c:30, figs. 24-27.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 14F-11/80 (1 spec., USNM 74468); MAFLA 8C-5/74 (1 spec.), 2207E-8/77 (1 spec.), 2207H-8/77 (1 spec.), 2209C-7/76 (1 spec.), 2421E-7/76 (1 spec.), 2641B-6/75 (2 spec.), 2641H-6/75 (1 spec.), 2641-6/75 (1 spec., USNM 55800), 2960K-8/77 (1 spec.); IXTOC S50-11/79 (1 spec., USNM 74469).
Supplementary Material:
Mexico--Gulf of California, Bahia de los Angeles, Sta. #45, 30 m, Apr. 1962, silty fine sand, Barnard & Grady colls., M. H. Pettibone ID. (3 spec., USNM 39283); Grande Bay, 11 m, Apr. 1937, fine sand, W. Williams coll. (USNM 32893, holotype).
DESCRIPTION:
Length, to 15.5 mm (previously reported to 33 mm); width, to 3.4 mm (previously reported to 9 mm including setae). Largest complete specimen with 35 segments. Prostomium rounded to peaked anteriorly, sometimes with brownish pigment patches; median antenna globular, inserted dorsally; lateral antennae conical, inserted anteriorly below median antenna; eyespots sometimes present (Figure 24-10a). First pair of elytra rounded with few short papillae along anterior and lateral margins; following anterior elytra with long, entire or biarticulate lateral processes (Figure 24-10b). Middle and posterior elytra with biarticulate or entire lamelliform lateral processes (Figure 24-10c), numbering 16-21 on twelfth elytra. Branchiae numbering 11-12 pairs, followed by 3-7 pairs of posterior lamellae starting on segments 27-28 (Figure 24-10d). Notoacicula with hooked tips. Notopodial spines starting on segment 3, strongly bent, with spoon-shaped (Figure 24-10e) or pointed tips (Figure 24-10f) on anterior parapodia, more broadly spatulate on posterior parapodia (Figure 24-10g); smooth or lightly serrate near tips. Notopodia with posterior bundle of numerous long, smooth or spinous capillary setae. Acicular neurosetae present on segment 3. Anterior upper neuropodial spines with short, often wrinkled, bilimbate tips (Figure 24-10h); posterior upper neuropodial spines bent downward, tips pointed or coarsely serrate and spatulate (Figure 24-10i). Lower neurosetae more slender, bilimbate. Uppermost 1-2 neurosetae pectinate (Figure 24-10j). Lowermost neurosetae few, slender, capillary. Anterior ventral cirri subulate, becoming globular with short slender tips after first 3-6 segments. Pygidium with long, filiform cirrus on right side and bulbous cirrus on left side.
REMARKS: Smaller individuals of G. mexicana, including some Gulf of Mexico BLM-OCS specimens, have posterior elytra with biarticulate lateral processes, and upper posterior neuropodial spines which are distally spatulate rather than pointed.
PREVIOUSLY REPORTED HABITAT: Intertidal to 30 m; fine sand, silty very fine sand, shells, mud, silt.
GULF OF MEXICO BLM-OCS OCCURRENCE: Scattered occurrences throughout eastern and western Gulf (Figure 24-9); shallow water, 4.5-40 m; fine to very fine sand, silty fine sand, clayey sandy silt, silty clay.
DISTRIBUTION: Southern California to Guatemala, Gulf of Mexico.

CHAPTER 25

Paul S. Wolf

FAMILY SIGALIONIDAE Malmgren, 1867

INTRODUCTION

The Sigalionidae, a family of scale worms, comprise a diverse group of species. Most are rather large with numerous segments (up to 300). They are quadrangular in cross-section with narrow bodies that taper gently posteriorly. Members of some genera such as Pholoe are quite small (usually less than 20 mm), with oval-shaped bodies. The prostomium and tentacular segment are fused. The prostomium bears 1-3 antennae, a pair of long tapering palps and 0-2 pairs of eyes. The tentaculophores of the tentacular segment are fused anteriorly to the prostomium above the palps. The lateral antennae, if present, may appear to arise dorsally on the tentaculophores. In addition, each tentaculophore bears a pair of tentacular cirri, 1-2 acicula, and two bundles of notosetae. Segments 1-4 or 5 are usually different in shape and setal composition from the following segments. Elytra are attached to elytrophores on segments 2, 4, 5, 7, continuing on alternate segments to 25 or 27, then on every segment. The morphology of the elytra is quite variable within a given genus and may be variable within a particular species, such as Psammolyce ctenidophora Day, 1973, or it may be quite consistent within a species such as in Sthenelais sp. A herein. Parapodia normally are biramous with well-developed noto- and neuropodia. Ctenidia are located above the notopodia and may be found ventrally or intersegmentally as well. Branchiae, when present, are attached to the elytrophores and dorsal tubercles. Notosetae, located in fan-shaped bundles, are always simple and smooth to spinous. Neurosetae are generally composite falcigers or spinigers. A few simple setae may be present superiorly. The pharynx is muscular, bears two pairs of chitinous jaws, and is distally surrounded by papillae.

The sigalionids have undergone a series of partial revisions by Pettibone (1969d, 1970b-d, 1971b,c). In addition, Fauchald (1977a) provided a comprehensive key to the genera. Pettibone (1982) recognized 20 genera (excluding Pholoe) and about 160 species in the Sigalionidae. Ten genera, including Pholoe, and Genus A, which is new to science, are found in Gulf of Mexico BLM-OCS material. These comprise 17 species, of which nine are new to science and three are tentatively assigned to described species.

PRINCIPAL DIAGNOSTIC CHARACTERS

In general, the placement and number of head appendages, setal morphology, and presence of a dorsal cirrus or tubercle on segment 3 are used as generic characters. Sigalionids may have one, two or three antennae with the median antenna always located on the prostomium and the lateral pair emerging from the tentacular segment. Some genera, such as Thalenessa and Sigalion, have the lateral antennae attached to the anterior margin of the prostomium. Pholoe lacks lateral antennae completely. The median antenna may arise from a ceratophore. If a

ceratophore is present, it may be flanked by a pair of membranous lobes called auricles or ctenidia.

Setal morphology is quite diverse within the family and indeed within a single parapodium. Generally the setae of the tentacular segment and the notosetae of subsequent parapodia are similar. Their structure is very fine, smooth to spinous, with minute entire or bifid tips. Neurosetae, however, can differ greatly. Those of segments 2-3 differ from each other as well as from the neurosetae of the following segments. Generally, only one or two kinds of relatively long-bladed composite setae are found on segment 2, with a third and sometimes fourth kind appearing on segment 3. Neurosetae of subsequent segments are compound except for occasional simple, spinous, superior setae. Whether the compound setae are spinigers or falcigers or both is diagnostic generically. The detailed morphology and presence of certain setal forms can be specific.

Segment 3 may have a small dorsal tubercle or a long dorsal cirrus, or may be completely smooth. This is an important generic character, and is the main character in separating such genera as Sthenolepis and Ehlersileanira.

Shape and ornamentation of the elytra can vary greatly within genera but may be of specific importance. Both anterior and posterior elytra must be examined for such details as shape, kinds of surface papillae or toothed structures (microtubercles), presence of any lateral incisions, and marginal ornamentation, if any.

Parapodial shape and detailed morphology are also useful specific characters. The length, placement, and abundance of parapodial stylodes and papillae are specific. In some cases, one must examine the posterior neuropodial bracts of middle to posterior parapodia. These bracts may be bilobed or truncate, smooth or papillose, and with or without stylodes. In this chapter, most parapodial illustrations are presented from a posterior view. Elytra are drawn from a dorsal view.

BIOLOGICAL NOTES

Members of the Sigalionidae are thought to be carnivorous, feeding on small invertebrates; however, little work has been done on the family (Fauchald and Jumars, 1979:246).

Generally, sigalionids are burrowers, living in sands or mud. A few species, such as the members of Sthenelanella, inhabit tubes. Species of Sthenelanella have spinning glands in middle and posterior notopodia. These glands, as in polyodontids (Chapter 22), produce numerous tough fibers, which are incorporated into the tube. Members of the genus Psammolyce attach sand grains to the middorsum and dorsal surfaces of the elytra, producing an effective camouflage and protective covering.

Most sigalionids produce planktonic larvae, although some such as Pholoe swedmarki possibly brood their young within a few posterior elytra (Laubier, 1975:675). Genus A broods its developing young underneath a few posterior elytra.

SPECIES OF SIGALIONIDAE RECORDED FROM GULF OF MEXICO BLM-OCS PROGRAMS

Key to the Genera of Sigalionidae from the Gulf of Mexico BLM-OCS Programs

1a. Branchiae absent; tentacular segment asetigerous (Figure 25-2a). 2

1b. Branchiae present (Figure 25-10e); tentacular segment setigerous 3

2a. Median antenna present; lateral antennae absent (Figure 25-6a) . . . . . **.Pholoe**, p. 25-4

2b. Median and lateral antennae present (Figure 25-8b) . . . . . **.Genus A**, p. 25-10

3a. Lateral antennae present; median antenna absent (Figure 25-10a). . . . . **Sigalion**, p. 25-12

3b. Median and lateral antennae present (Figures 25-12a, 18a) . . . 4

4a. Median antenna without auricles (Figures 25-12a, 18a) 5

4b. Median antenna with auricles (Figure 25-28a). 6

5a. Elytra without adherent sand grains; median antenna without ceratophore (Figure 25-12a). . . . . **.Thalenessa**, p. 25-13

5b. Elytra with adherent sand grains (Figures 25-16b, 18b); median antenna with ceratophore (Figures 25-16a, 18a). . . . . **Psammolyce**, p. 25-19

6a. Median antenna with small auricles (Figure 25-20a); parapodial stylodes absent; middle and posterior notopodia with spinning glands (Figures 25-20i) . . . . . **.Sthenelanella**, p. 25-23

6b. Median antenna with large auricles (Figure 25-28a); parapodial stylodes present (Figures 25-22g, 28i); notopodial spinning glands absent. 7

7a. Parapodial stylodes short, papillose (Figure 25-22g). . . . . .**Fimbriosthenelais**, p. 25-24

7b. Parapodial stylodes long or short, not papillose (Figures 25-28i, 30e). 8

8a. Compound neuropodial falcigers present (Figure 25-28n,q) . . . . . **Sthenelais**, p. 25-30

8b. Compound neuropodial falcigers absent; all neurosetae as compound spinigers (Figures 25-30g, 32n) 9

9a. Dorsal tubercles present on segment 3 (Figure 25-30a). . . . . .**Sthenolepis**, p. 25-34

9b. Dorsal tubercles absent on segment 3. . . **Ehlersileanira**, p. 25-38

Genus **Pholoe** Johnston, 1839

TYPE SPECIES: Aphrodita minuta Fabricius, 1780.
REFERENCES:
Day, 1967:99.
Fauchald, 1977a:70.
DIAGNOSIS: Single median antenna. Two pairs of tentacular cirri. Tentacular segment achaetous. Middorsum may or may not be exposed. Ventrum smooth or papillose. Notosetae simple, spinous; superior setae arranged in a horseshoe-shaped array opening down; inferior setae forming a straight line at or near the opening (see Figure 25-4d). Neurosetae as compound unidentate falcigers arranged in J-shape and widely spaced (see Figure 25-4h).
REMARKS: Pettibone (1982:14) placed Pholoe with Pholoides in the family Pholoidae. Until systematic discussions are produced concerning the placement of Pholoe, I feel it best to leave Pholoe within the Sigalionidae. In addition, Genus A (described herein), which is Pholoe-like except for the presence of three antennae, narrows the gap between the Pholoidae and the Sigalionidae.

Key to the Gulf of Mexico BLM-OCS Species of Pholoe

1a. Tentaculophores of tentacular segment each with a papilla on either side of median antenna (Figure 25-2a); elytra with large, conical marginal papillae (Figure 25-2b). . .**Pholoe sp. A**, p. 25-7

1b. Tentaculophores of tentacular segment without a papilla on either side of median antenna (Figure 25-6a); elytra without large conical papillae. 2

2a. Prostomium with large eyes (Figure 25-4a); neuropodia with numerous stylodes (Figure 25-4c). . . . . **Pholoe sp. B**, p. 25-7

2b. Prostomium without eyes (Figure 25-6a); neuropodia with few stylodes (Figure 25-6d). . . . . **Pholoe sp. C**, p. 25-10

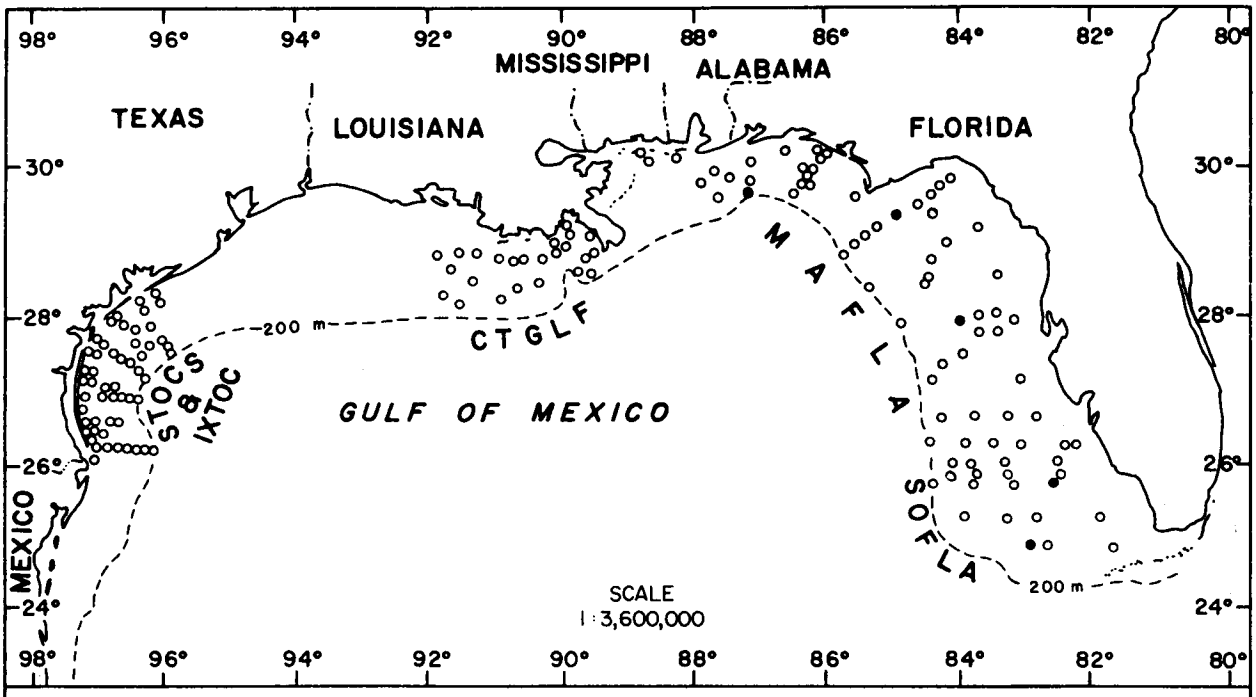

Figure 25-1. Distribution of Pholoe sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

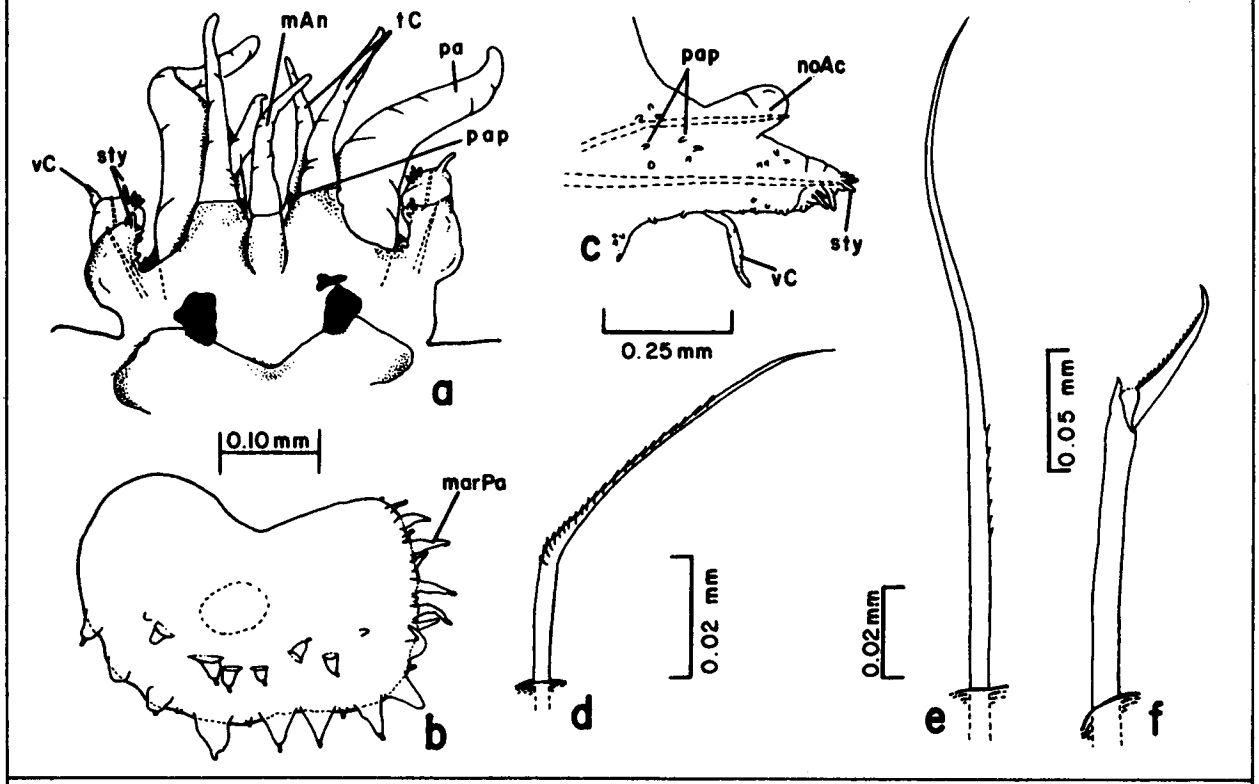

Figure 25-2. Pholoe sp. A: a, anterior end; b, second right elytron; c, middle parapodium (posterior view, setae omitted); d, superior notoseta; e, inferior notoseta; f, neuroseta.

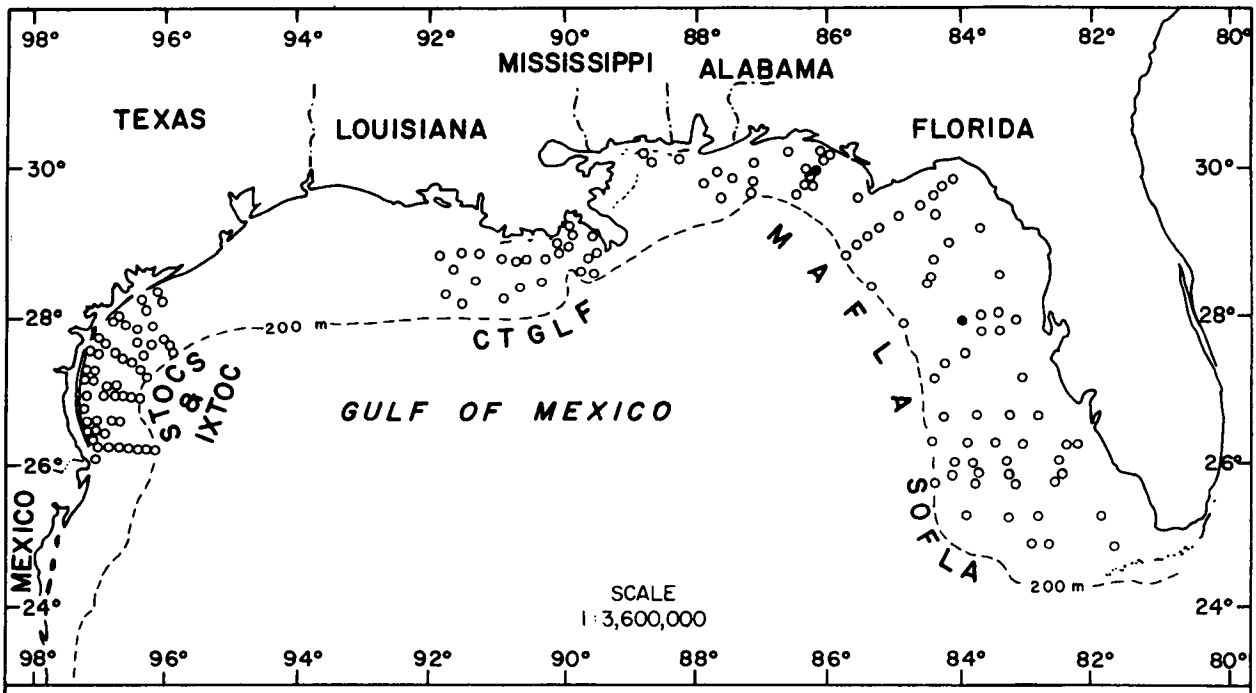

Figure 25-3. Distribution of Pholoe sp. B on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

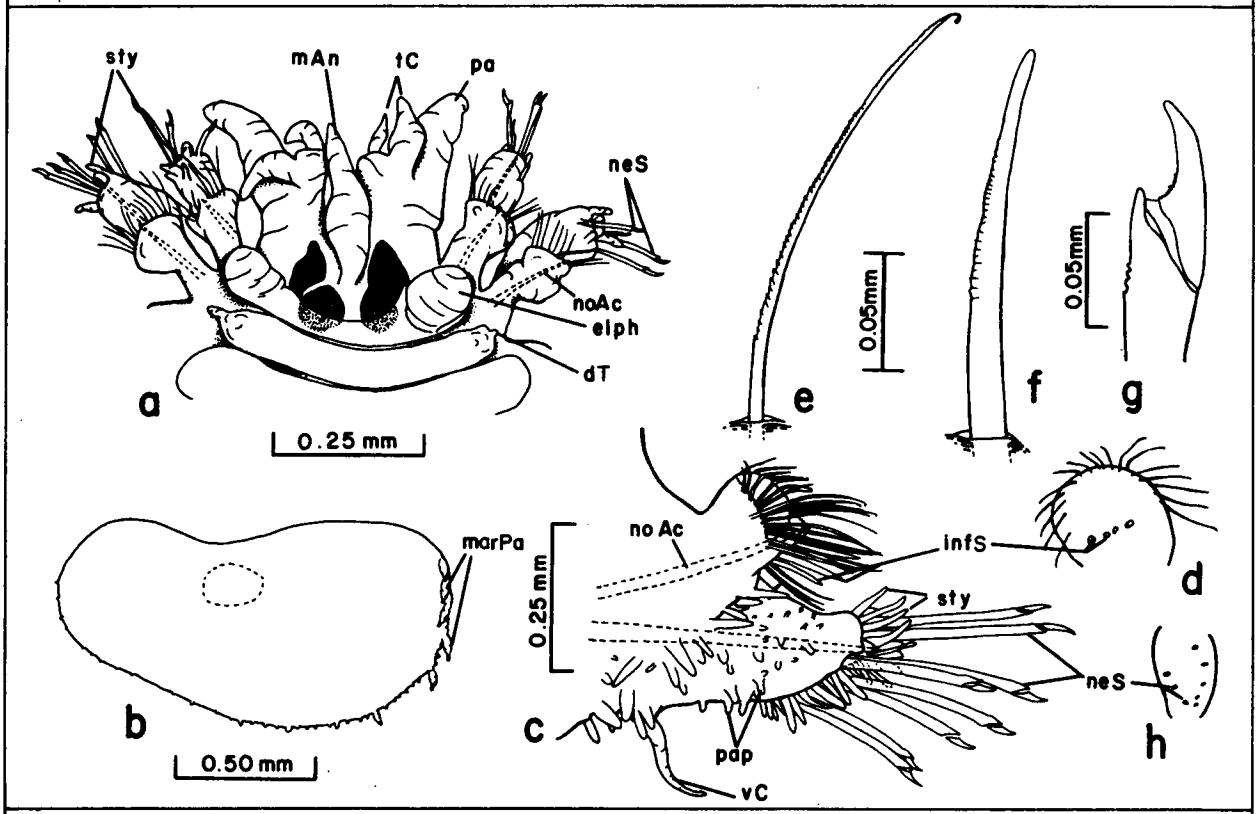

Figure 25-4. Pholoe sp. B: a, anterior end; b, middle right elytron; c, middle parapodium (posterior view); d, notopodium, schematic (edge-on view); e, superior notoseta; f, inferior notoseta; g, neuroseta; h, neuropodium, schematic (edge-on view).

Pholoe sp. A
Figures 25-1, 2a-f

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 28-11/80 (1 spec., USNM 86011); MAFLA 2211F-8/77 (1 spec.), 2211K-8/77 (1 spec.), 2423C-7/76 (2 spec., USNM 86004), 2423J-7/76 (1 spec.), 2645I-11/77 (10 spec.), 2960G-9/77 (2 spec.), 2960H-9/77 (1 spec.-gravid), 2960I-9/77 (1 spec.).
DESCRIPTION:
Length, 6.0+ mm; width, to 1.0 mm. Largest specimen incomplete with about 31 segments. Prostomium (Figure 25-2a) with two pairs of large coalesced eyespots. Dorsal and ventral tentacular cirri similar in length. Tentaculophores of tentacular segment with small papilla on either side of median antenna. Conical, papillose facial tubercle present. Elytra thick, slightly excavate anteriorly (Figure 25-2b). Elytral papillae digitiform on lateral margin, conical and biarticulate on posterior margin, with additional inner row of conical papillae on larger specimens. Elytra overlapping middorsally. Dorsum smooth. Ventrum with large papillae on tentacular segment, smooth thereafter except for few papillae on bases of parapodia (Figure 25-2c). Parapodia sparsely papillose. Notopodia without stylodes, except on segment 2 (Figure 25-2a). Neuropodia with group of relatively short stylodes distally, sparsely papillose ventrally (Figure 25-2c). Superior notosetae distinctly serrate (Figure 25-2d). Inferior notosetae wider, minutely serrate, tapering to fine tips (Figure 25-2e). Neurosetae with relatively long blades, distinctly toothed (Figure 25-2f). Pygidium not observed.
REMARKS: Pholoe sp. A differs from other species of the genus in having large, conical, marginal papillae on the elytra. Smaller individuals have thinner elytra and lack the inner row of papillae.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida (Figure 25-1); 19-106 m; coarse to fine sand, silty fine sand.

Pholoe sp. B
Figures 25-3, 4a-h

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2211K-2/78 (1 spec., USNM 86899), 2531D-8/77 (1 spec., USNM 86900).
DESCRIPTION:
Length, to 21.0 mm; width, to 2.0 mm. Largest specimen complete with about 88 setigers. Prostomium (Figure 25-4a) with two pairs of large coalesced eyespots. Median antenna, tentacular cirri, and palps relatively short and stout. Facial tubercle large, distally papillose. Elytra opaque, with excavate anterior margins (Figure 25-4b); large biarticulate and smaller entire papillae present on lateral and posterior margins. Elytra overlapping middorsally. Dorsum smooth. Ventrum densely papillose; papillae largest on segments 2 and 3. Notopodia without stylodes or papillae; neuropodia with numerous stylodes and papillae (Figure 25-4c). Notosetae arranged in typical Pholoe fashion (Figure 25-4d); superior setae serrate along one margin (Figure 25-4e); inferior setae wider, with blunt tips (Figure 25-4f). Neurosetae with

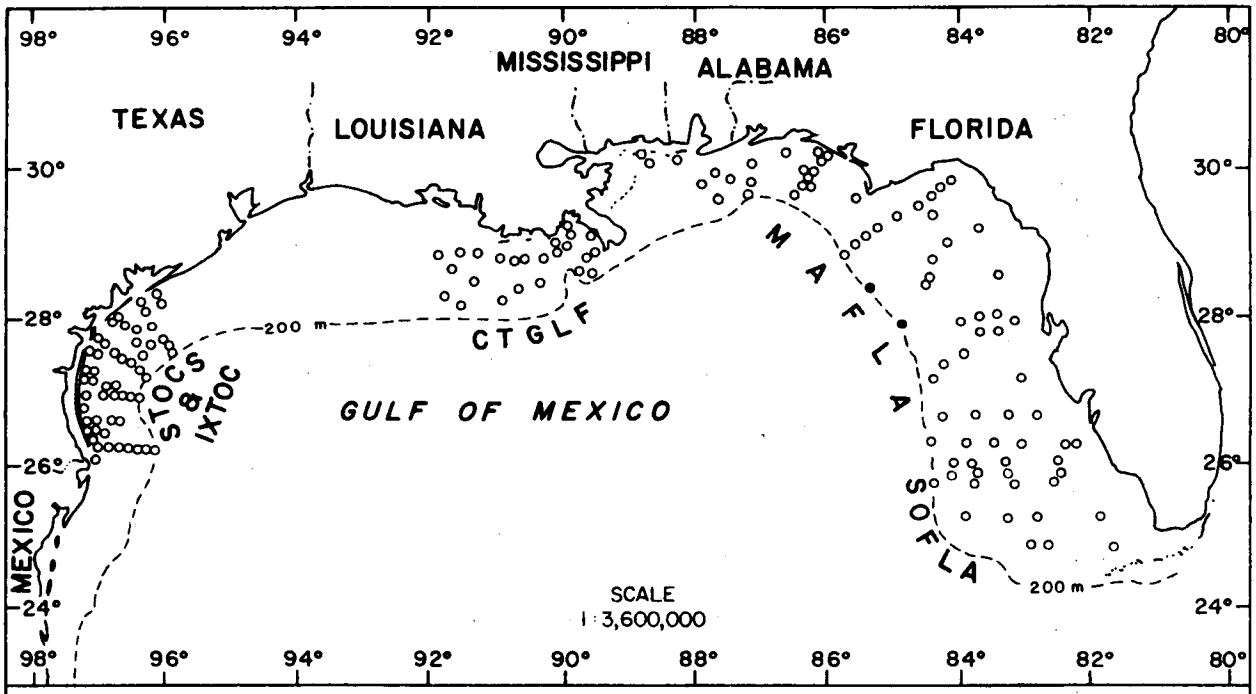

Figure 25-5. Distribution of Pholoe sp. C on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

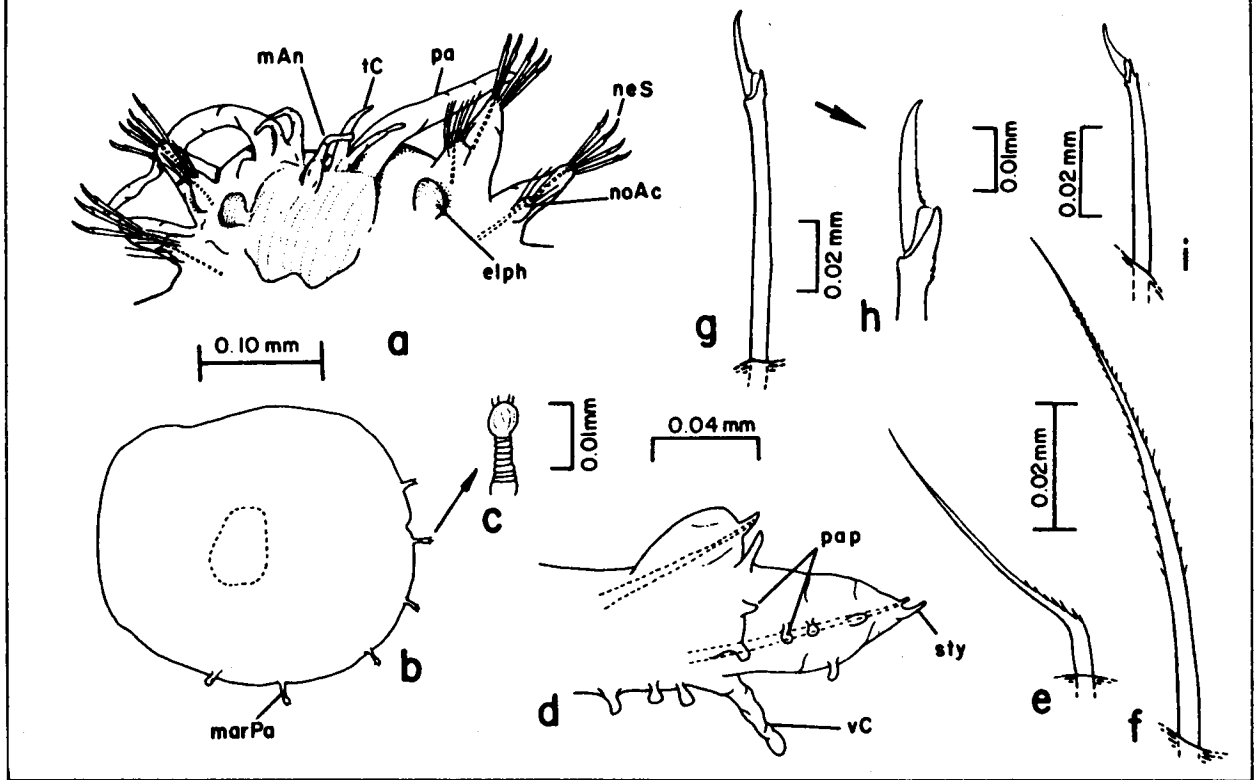

Figure 25-6. Pholoe sp. C: a, anterior end; b, middle right elytron; c, marginal papilla; d, middle parapodium (posterior view, setae omitted); e, superior notoseta; f, inferior notoseta; g, h, superior neurosetae; i, inferior neuroseta.

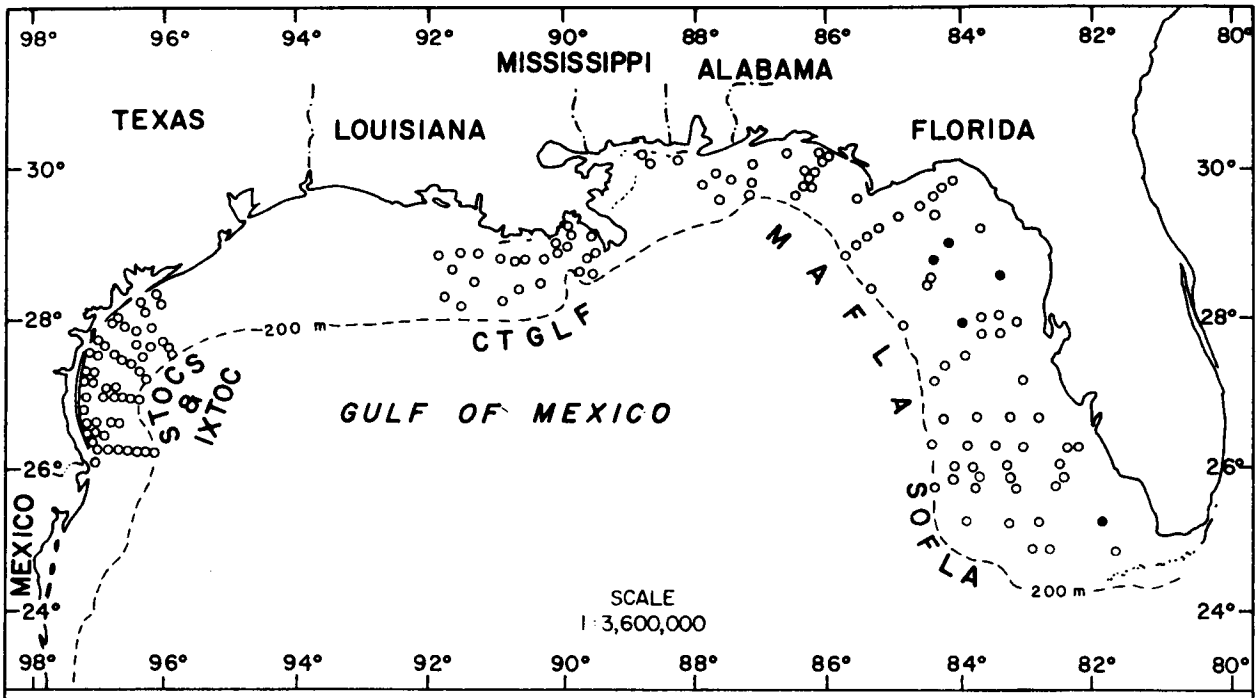

Figure 25-7. Distribution of Sigalionid Genus A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

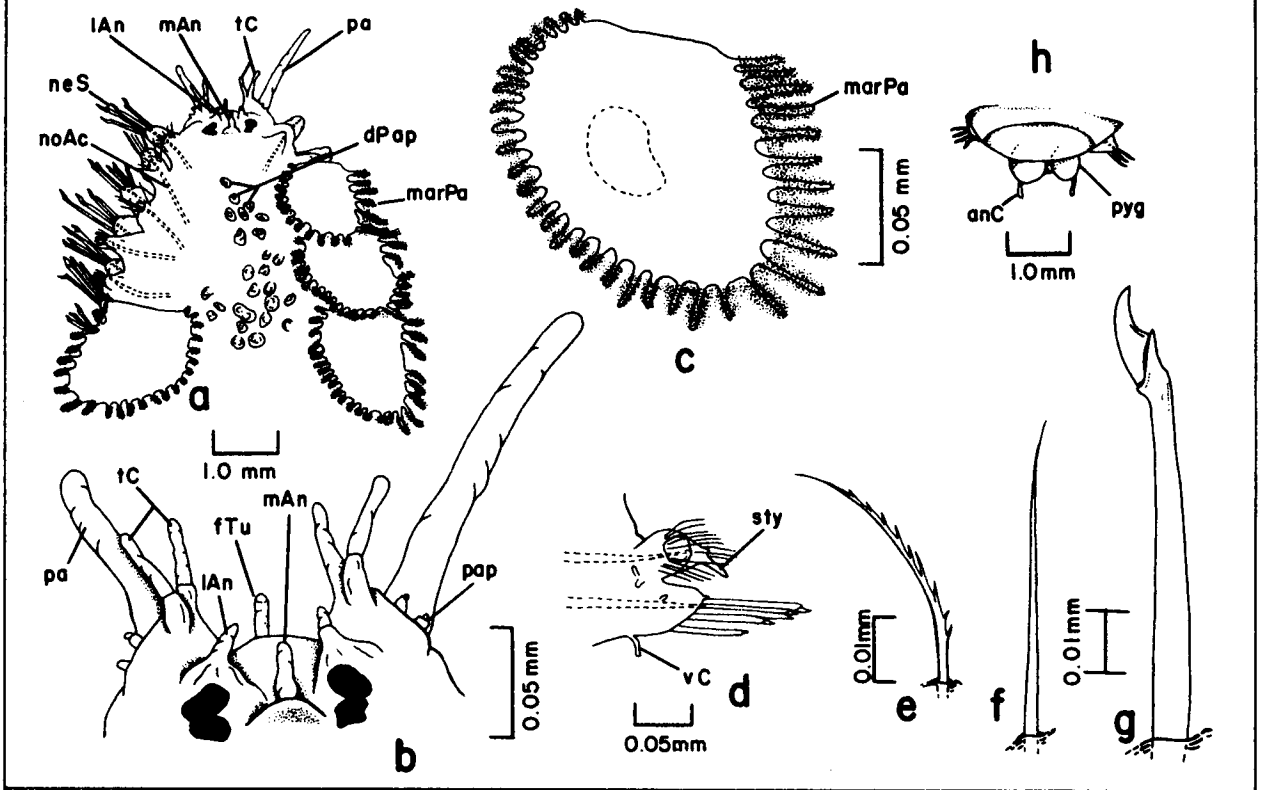

Figure 25-8. Genus A: a, anterior end; b, head; c, middle right elytron; d, middle parapodium (posterior view); e, superior notoseta; f, inferior notoseta; g, neuroseta; h, posterior end (dorsal view).

slightly spinous to smooth blades (Figure 25-4g) all similar in length; widely spaced in J-shaped arrangement (Figure 25-4h). Anus terminal, surrounded by numerous papillae and two long anal cirri.
REMARKS: Pholoe sp. B differs from other species of the genus in having inferior notosetae with blunt tips, and short, stout head appendages.
GULF OF MEXICO BLM-OCS OCCURRENCE: Two records off Florida (Figure 25-3); 43-45 m; coarse sand.

Pholoe sp. C
Figures 25-5, 6a-i

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2212F-7/76 (2 spec.), 2212H-7/76 (1 spec., USNM 86902), 2212C-2/78 (1 spec., USNM 86901), 2313G-11/77 (1 spec., USNM 86005).
DESCRIPTION:
Length, to 1.50 mm; width, to 0.50 mm. Largest specimen complete with 22 segments. Prostomium (Figure 25-6a) without eyespots. Dorsal and ventral tentacular cirri similar in size and shape. Facial tubercle broadly conical, smooth. Elytra thin, generally circular in outline with only slight anterior excavation (Figure 25-6b); marginal papillae few, annulated, knobbed distally, with terminal fimbriae (Figure 25-6c). Elytra overlapping middorsally. Dorsum and ventrum smooth. Notopodia without stylodes (Figure 25-6d); neuropodia with 2-3 distal stylodes and few knobbed papillae. Superior notosetae distinctly serrate (Figure 25-6e). Inferior notosetae minutely spinous, tapering to fine tips (Figure 25-6f). Superior neurosetae with long blades, basally serrate (Figure 25-6g,h). Inferior neurosetae falcigerous with smooth blades (Figure 25-6i). Pygidium damaged on complete specimen examined.
REMARKS: Pholoe sp. C resembles P. anoculata Hartman, 1965, and P. minuta caeca Ushakov, 1950, in lacking eyes. It differs from P. anoculata in having knobbed and annulated elytral papillae instead of smooth, digitiform papillae. Pholoe sp. C differs from P. minuta caeca in having much smaller elytral papillae.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida (Figure 25-5); deep water, 177-189 m; silty very fine sand, clayey sandy silt.

Genus A
Figures 25-7, 8a-h

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 20D-7/81 (2 spec., USNM 86013); MAFLA 2211F-7/76 (1 spec., with embryos), 2316I-11/77 (1 spec.), 2317A-8/77 (1 spec., USNM 86008), 2852B-7/76 (1 spec., USNM 86906; 5 spec., 1 with embryos).
DESCRIPTION:
Length, to 1.2 mm; width, to 0.64 mm. Body small, oval; complete specimens with up to 15 segments. Prostomium with two pairs of large eyespots (Figure 25-8a,b). Median antenna short, arising between posterior pair of eyespots; ceratophore absent. Lateral antennae present on anterior margin of prostomium. Dorsal and ventral tentacular cirri similar in length. Facial tubercle digitiform. Elytra oval, not overlapping middorsally (Figure 25-8a); with filiform marginal papillae

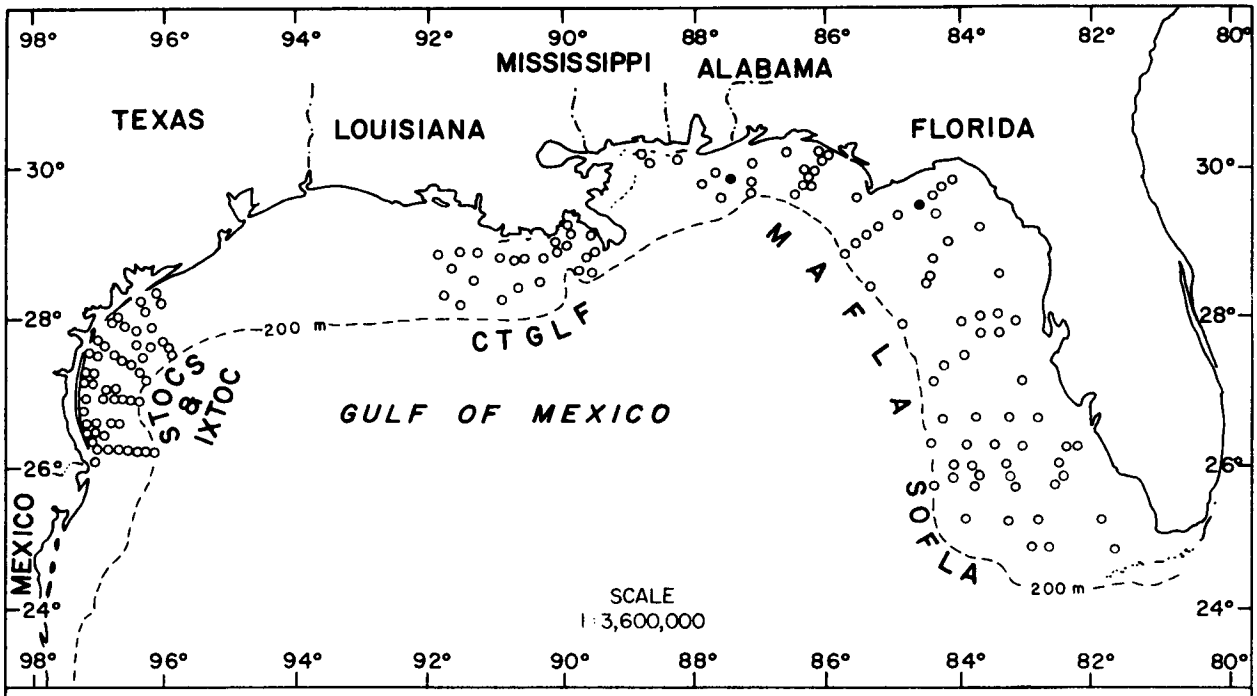

Figure 25-9. Distribution of Sigalion sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

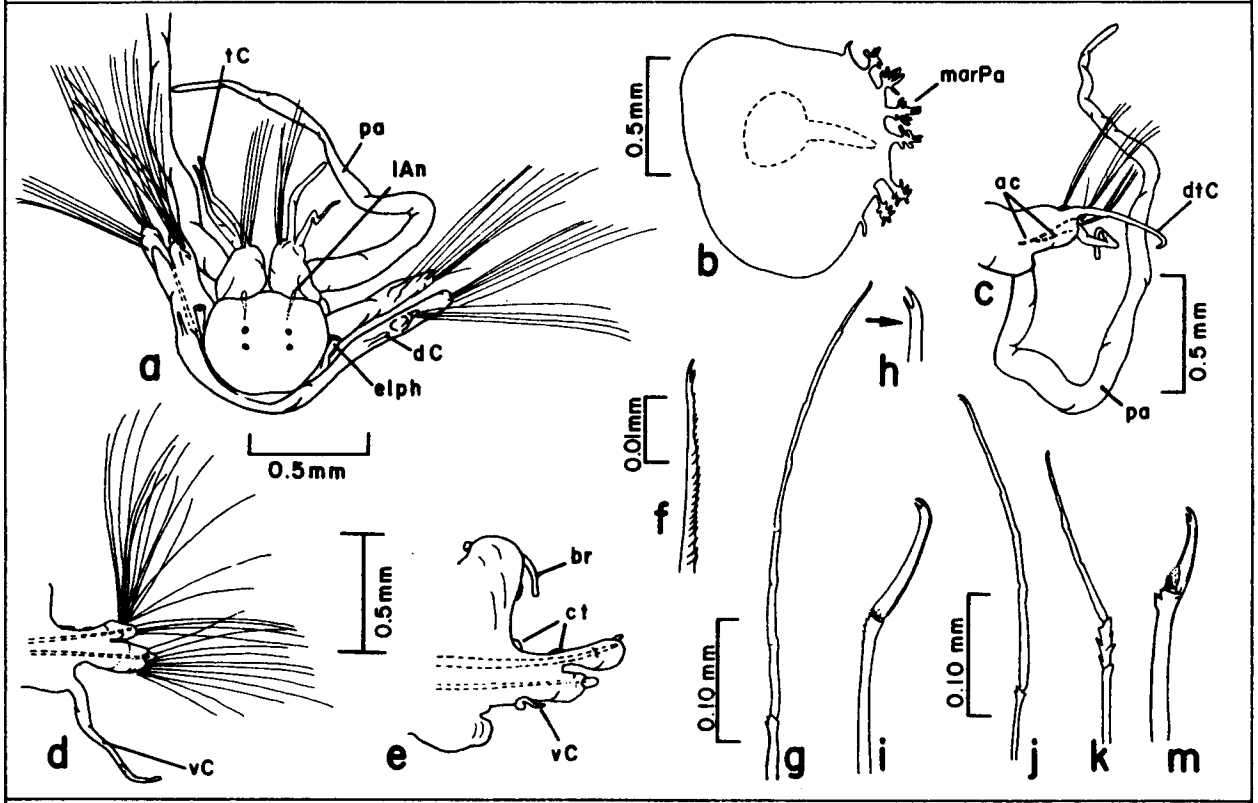

Figure 25-10. Sigalion sp. A: a, anterior end; b, middle right elytron; c, tentacular segment (outer view); d, second parapodium (posterior view); e, middle parapodium (posterior view, setae omitted); f, tip of seta from tentacular segment; g, neuroseta from segment 2; h, tip of same; i, medial neuroseta from segment 3; j, inferior neuroseta from same; k, superior neuroseta from middle segment; m, medial neuroseta from same.

covered with mucus and silt (Figure 25-8c). Middorsum papillose. Ventrum smooth. Parapodia (Figure 25-8d) Pholoe-like; notopodia with one digitiform distal extension (stylode); neuropodia with two stylodes, and few small papillae on posterior side. Superior notosetae spinous along one margin (Figure 25-8e), strongly curved dorsally but not geniculate. Inferior notosetae (Figure 25-8f) smooth, evenly tapered, one per notopodium. Compound neurosetae with smooth, unidentate blades (Figure 25-8g). Pygidium bilobed with one pair of anal cirri (Figure 25-8h).
REMARKS: Genus A closely resembles Pholoe, differing only in possessing three antennae instead of a single median antenna. One specimen assigned to Genus A was observed to have four embryos developing under two pairs of posterior elytra. Additionally, one specimen possessed less developed embryos still within the body wall. Apparently embryos develop internally, then are released to continue development under the elytra. This is similar to the development of Pholoe swedmarki, except that in the latter young appear to develop within the elytra instead of under them (Laubier, 1975:675).
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida (Figure 25-7); 22-43 m; coarse to medium sand, silty fine to very fine sand.

Genus **Sigalion** Audouin and Milne Edwards, 1832

TYPE SPECIES: Sigalion mathildae Audouin and Milne Edwards, 1832.
REFERENCES:
Day, 1967:101.
Fauchald, 1977a:70.
DIAGNOSIS: Two antennae located on anterior margin of prostomium; median antenna absent. Tentacular segment with two acicula and simple setae only. Subsequent segments with simple notosetae and compound falcigerous neurosetae of several kinds, including pluriarticulate and simple-bladed forms.

Sigalion sp. A
Figures 25-9, 10a-m

Sigalion arenicola--Day, 1973:10 [not Verrill, 1879].

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2422H-7/76 (1 spec., USNM 86905), 2642G-6/75 (1 spec., USNM 86007).
Supplementary Material:
North Carolina--Beaufort, J. H. Day ID., as Sigalion arenicola Verrill, 1879 (2 spec., USNM 50993).
DESCRIPTION:
Length, to 17.0 mm; width, to 3.0 mm. Largest specimen complete with about 73 segments. Prostomium with eyespots (Figure 25-10a) and one pair of antennae on anterior margin; median antenna absent. Facial tubercle present. Elytra all similar, oval, overlapping middorsally, lateral margins with palmate papillae (Figure 25-10b). Tentaculophores of tentacular segment with two acicula and two bundles of notosetae (Figure 25-10c). Segment 2 (Figure 25-10d) with well-developed noto- and neuropodia, and long ventral cirri. Subsequent parapodia (Figure

25-10e) with large notopodia extending beyond neuropodia. Notopodia with small stylode on anterior face. Ventral cirri smaller than those of segment 2. Ctenidia present above notopodia (Figure 25-10e). Notosetae similar throughout, curving slightly over dorsum, simple, spinous, with bifid tips (Figure 25-10f). Neurosetae of segment 2 as compound, pluriarticulate falcigers, with bifid tips (Figure 25-10g,h). Neurosetae of segment 3 including superior, compound, pluriarticulate, bifid falcigers; medial, compound, bidentate falcigers with simple, nonarticulate blades (Figure 25-10i); and more slender, inferior, pluriarticulate, bidentate falcigers (Figure 25-10j). Subsequent segments with additional, superior, pluriarticulate, bidentate falcigers having distally spinous shafts (Figure 25-10k); and some shorter, simple-bladed, bidentate falcigers having shafts with prominent spines (Figure 25-10m). Pygidium simple with two anal cirri, one twice as long as the other.
REMARKS: Sigalion sp. A closely resembles S. arenicola Verrill, 1879, but differs from the latter in being much smaller (17.0 mm as compared to 300 mm (Pettibone, 1963)), and in lacking simple spinous neurosetae. Since all specimens examined herein, including those identified by Day (USNM 50993), are small and lack gametes, they could be juveniles of S. arenicola. Until more material can be examined, it seems best not to record S. arenicola from the Gulf of Mexico BLM-OCS material.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off northwestern Florida (Figure 25-9); 24-36 m; medium to medium-fine sand.

Genus **Thalenessa** Baird, 1868

TYPE SPECIES: Sigalion edwardsi Kinberg, 1855.
REFERENCES:
Day, 1967:107.
Fauchald, 1977a:70.
DIAGNOSIS: Three small antennae; lateral antennae attached to anterior margin of prostomium or base of tentaculophores of tentacular segment; median antenna without ceratophore or auricles. Tentaculophores of tentacular segment with one or two acicula, and simple notosetae only. Subsequent segments biramous, with simple notosetae and compound falcigerous neurosetae of several kinds, including pluriarticulate and simple-bladed forms.

Key to the Gulf of Mexico BLM-OCS Species of Thalenessa

1a. Median antenna arising anterior to eyespots (Figure 25-12a); neurosetae of middle and posterior segments including forms with distally hooked shaft heads (Figure 25-12n). . . . . **Thalenessa sp. A**, p. 25-15

1b. Median antenna arising posterior to eyespots (Figure 25-14a); neurosetae of middle and posterior segments with shaft heads not distally hooked (Figure 25-14m). . . . . **Thalenessa cf. spinosa**, p. 25-17

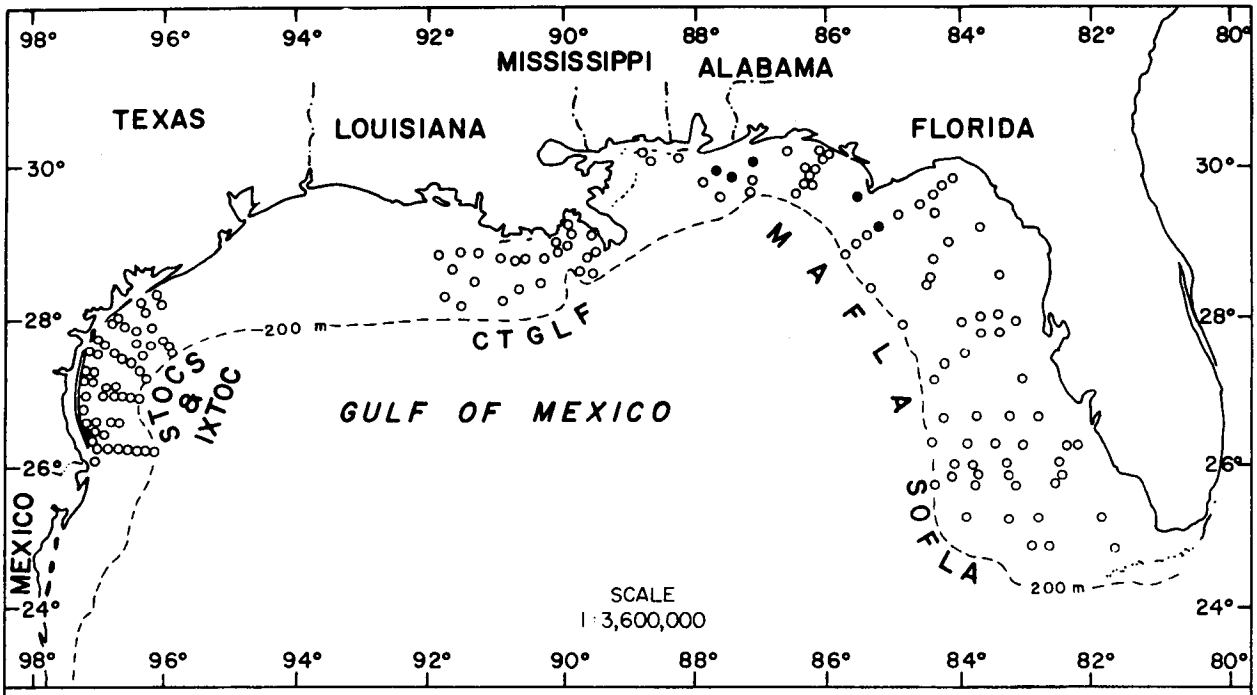

Figure 25-11. Distribution of Thalenessa sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

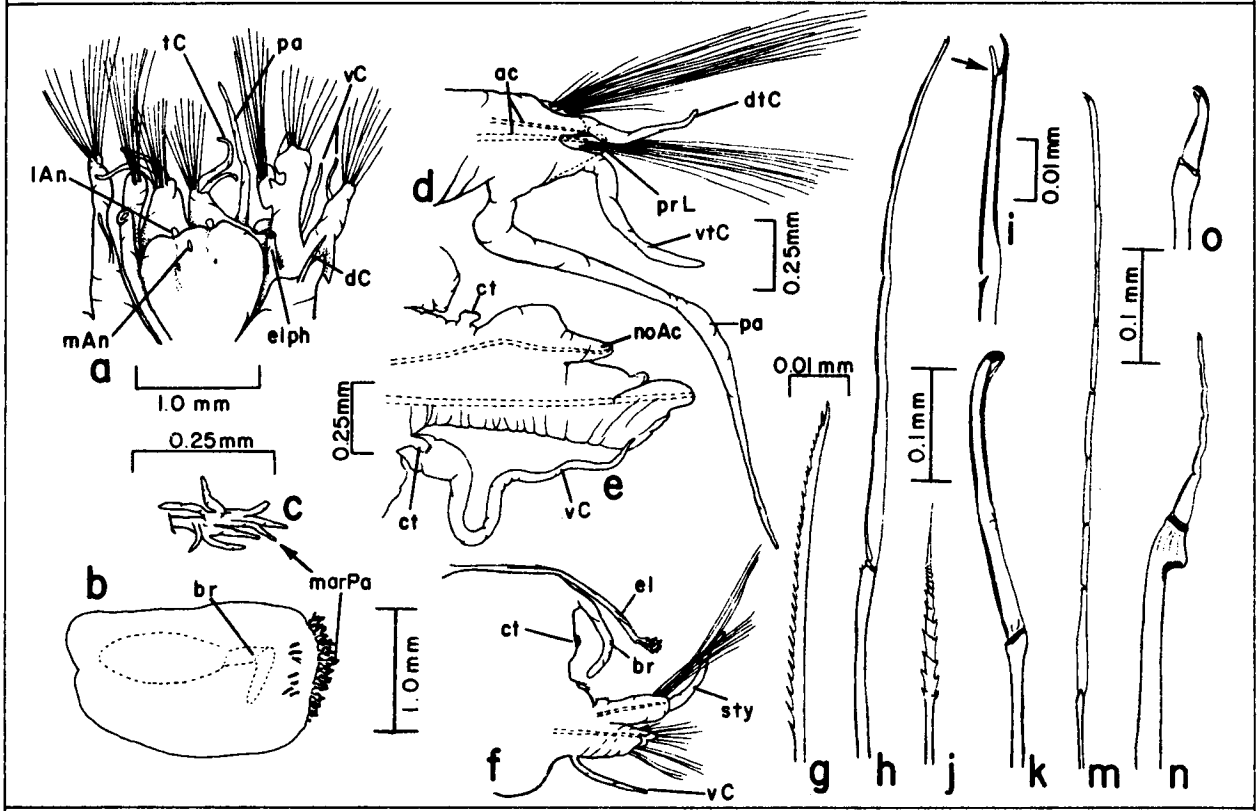

Figure 25-12. Thalenessa sp. A: a, anterior end; b, middle right elytron; c, marginal papilla (enlarged); d, tentacular parapodium and palp (outer view); e, second parapodium (posterior view, setae omitted); f, middle parapodium (posterior view); g, tip of notoseta from tentacular parapodium; h, neuroseta from segment 2; i, tip of same; j, simple neuroseta from segment 3; k, medial neuroseta from same; m, inferior neuroseta from same; n, superior neuroseta from middle segment; o, medial neuroseta from same.

Thalenessa sp. A
Figures 25-11, 12a-o

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 14B-7/81 (2 spec., USNM 86020); MAFLA 13C-5/74 (1 spec.-gravid), 13E-5/74 (1 spec.), 16G-5/74 (1 spec.), 2424B-6/76 (1 spec.), 2854J-8/77 (1 spec.), 2856J-2/78 (1 spec.); IXTOC S43-6 12/80 (1 spec., USNM 86002).
DESCRIPTION:
Length, 155+ mm; width, to 3.0 mm. Largest specimen incomplete with about 300 segments. Prostomium with four small, coalesced, subdermal eyespots (Figure 25-12a). Lateral antennae small, globular, on anterior margin of prostomium. Median antenna small, globular, located anterior to eyes, pigmented at base. Facial tubercle present. Elytra all similar, oval, lateral margins with palmate papillae, second row of digitiform papillae also present (Figure 25-12b,c). Elytra overlapping middorsally. Tentaculophores of tentacular segment each with two acicula and two bundles of notosetae (Figure 25-12d); with two presetal lobes; ventral tentacular cirri slightly longer than dorsal ones. Second parapodia (Figure 25-12e) with well-developed neuropodial presetal lobe, small postsetal lobe, and long ventral cirri. Third parapodia with dorsal cirri (Figure 25-12a) and small setigerous notopodia. Subsequent parapodia (Figure 25-12f) each with long setigerous notopodium bearing long terminal stylode. Neuropodia without stylodes, with small digitiform postsetal lobe. Ctenidia present above notopodia. Notosetae finely serrate, with bifid tips (Figure 25-12g). Neurosetae of segment 2 as pluriarticulate compound falcigers of varying lengths having bifid tips and minutely spinous shafts (Figure 25-12h,i). Neurosetae of segment 3 including superior spinous simple setae (Figure 25-12j); long, slender, compound falcigers with pluriarticulate blades and bifid tips; stouter compound falcigers with biarticulate blades and bidentate tips (Figure 25-12k); and inferior slender falcigers with pluriarticulate blades and bifid tips (Figure 25-12m). Neurosetae of subsequent segments including additional supra-acicular falcigers having distally hooked shaft-heads beginning on middle parapodia (Figure 25-12n), and subacicular bidentate falcigers with nonarticulate blades (Figure 25-12o). Pygidium not observed.
REMARKS: Thalenessa sp. A is similar to T. lewisii (Berkeley and Berkeley, 1939). Previous descriptions of T. lewisii do not mention bifid-tipped notosetae; however, the bifid condition is distinct only under oil immersion and could easily have been overlooked. Neither are the number of acicula in the tentacular segment discussed. According to Dr. Pettibone (pers. comm.), the type material of T. lewisii lacks the distally hooked shaft-heads of the supra-acicular falcigers. These falcigers are, however, figured by Nonato and Luna (1970) for specimens they identified as T. lewisii. That record is thus doubtful, and therefore specimens from Gulf of Mexico BLM-OCS material are identified as Thalenessa sp. A. Smaller (younger?) specimens do not have the falcigers with modified shaft heads (Figure 25-12n). In addition, younger specimens have simple-bladed (nonarticulate) falcigers with slightly dentate margins.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida, Alabama and Texas (Figure 25-11); 4.5-42 m; medium to fine sand.

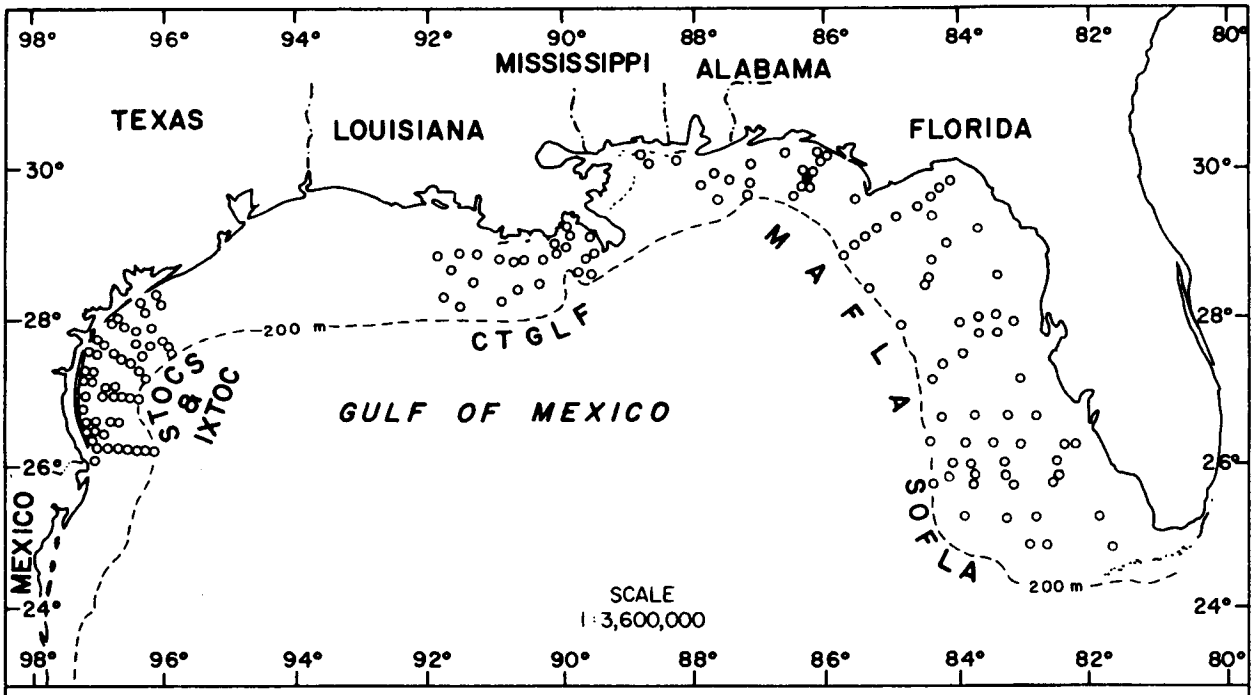

Figure 25-13. Distribution of Thalenessa cf. spinosa on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

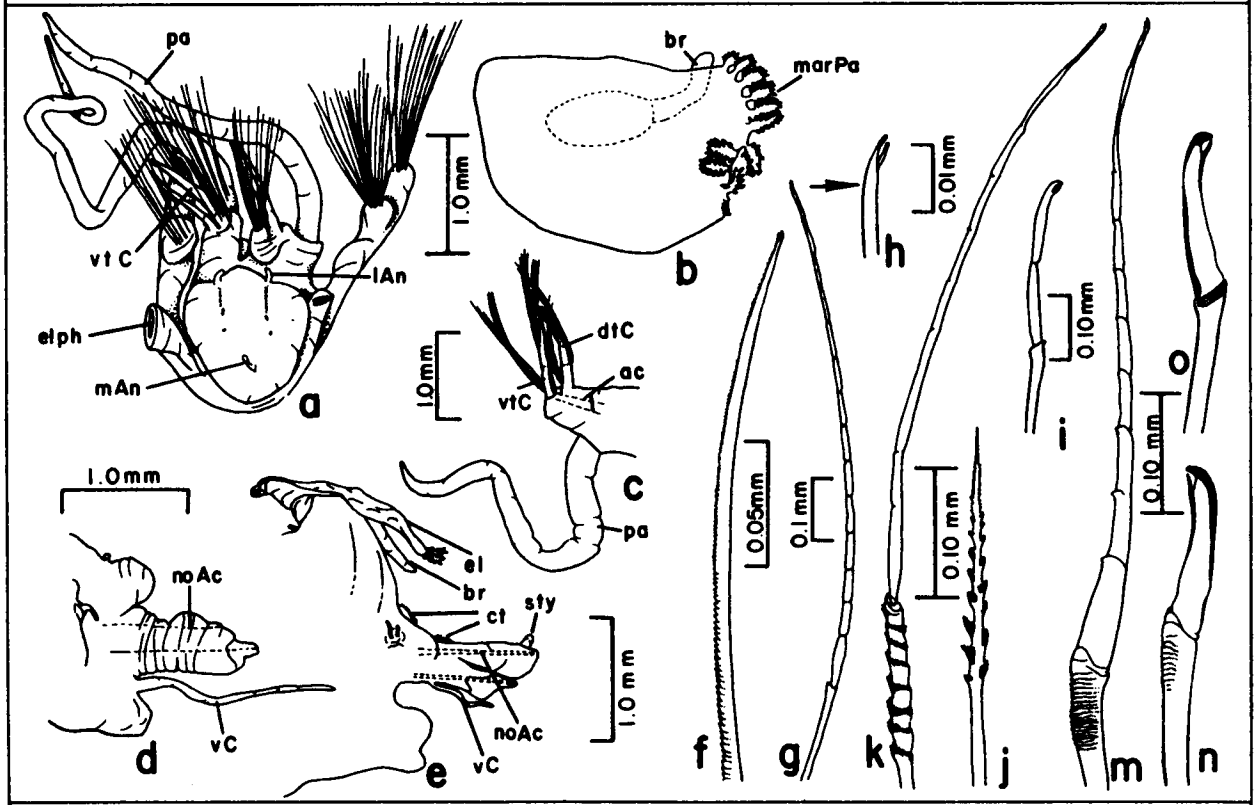

Figure 25-14. Thalenessa cf. spinosa: a, anterior end; b, middle right elytron; c, tentacular parapodium and palp (outer view); d, second parapodium (posterior view, setae omitted); e, posterior parapodium (posterior view, setae omitted); f, notoseta from segment 2; g, neuroseta from segment 2; h, tip of same; i, medial neuroseta from segment 3; j, simple neuroseta from posterior segment; k, superior neuroseta from same (with spinous shaft); m, same (with ridged shaft); n, medial simple-bladed falciger from same (with ridged shaft); o, same (with smooth shaft).

Thalenessa cf. spinosa (Hartman, 1939)
Figures 25-13, 14a-o

Eusigalion spinosum Hartman, 1939a:57, pls. 11, 12, figs. 134-140, 146, 147.
Thalenessa spinosa--Hartman, 1968:177, figs. 1-5.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2533B-6/75 (1 spec.).
DESCRIPTION:
Length, 80+ mm (previously reported to over 100 mm); width, to 5.0 mm. Single specimen fragmented with about 115 segments. Prostomium with four small eyespots, posterior pair smaller (Figure 25-14a). Lateral antennae small, globular, on anterior margin of prostomium. Median antenna small, globular, located posteriorly on prostomium. Facial tubercle present. Lateral margins of elytra oval with bipinnate papillae (Figure 25-14b). Elytra overlapping middorsally. Tentaculophores of tentacular segment each with two acicula (Figure 25-14c), two bundles of notosetae, and two presetal lobes; ventral tentacular cirri slightly longer than dorsal ones. Second parapodia each with prominent neuropodial presetal lobe (Figure 25-14d) and long ventral cirrus; notopodia poorly developed. Subsequent parapodia (Figure 25-14e) with well-developed notopodia bearing short stylode and small presetal lobe; neuropodia with pointed presetal lobe, without stylodes, with small postsetal lobe. Ctenidia present above notopodia; pair of papillae present on posterior surface of parapodia (Figure 25-14e). Notosetae curving slightly over dorsum, with serrate distal margin and bifid tips (Figure 25-14f), plumose basally. Neurosetae of segment 2 as pluriarticulate falcigers with bifid tips (Figure 25-14g,h). Neurosetae of segment 3 including superior falcigers as on segment 2; medial stout falcigers with few to many articles and hooked, bidentate tips (Figure 25-14i); and inferior pluriarticulate falcigers with hooked, bidentate blades, more slender than middle ones. Neurosetae of subsequent parapodia of six kinds in two groups. Supra-acicular group including superior, spinous, simple setae (Figure 25-14j); spinous-shafted pluriarticulate falcigers (Figure 25-14k); pluriarticulate falcigers having ridged shafts (Figure 25-14m); and simple falcigers having ridged shafts (Figure 25-14n). Subacicular neurosetae including stout, smooth-shafted, nonarticulate falcigers (Figure 25-14o); and inferior bundle of slender pluriarticulate falcigers having smooth to minutely spinous shafts. Pygidium not observed.
REMARKS: The single MAFLA specimen differs from Hartman's descriptions of T. spinosa in having spinous-shafted falcigers among the neurosetae (Figure 25-14k). All other characters that can be compared with Hartman's (1939a) description match quite well.
PREVIOUSLY REPORTED HABITAT: 18-119 m, silt.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off northwestern Florida (Figure 25-13); 67 m; coarse sand.
DISTRIBUTION: Central and southern California, Galapagos Islands; ?Gulf of Mexico.

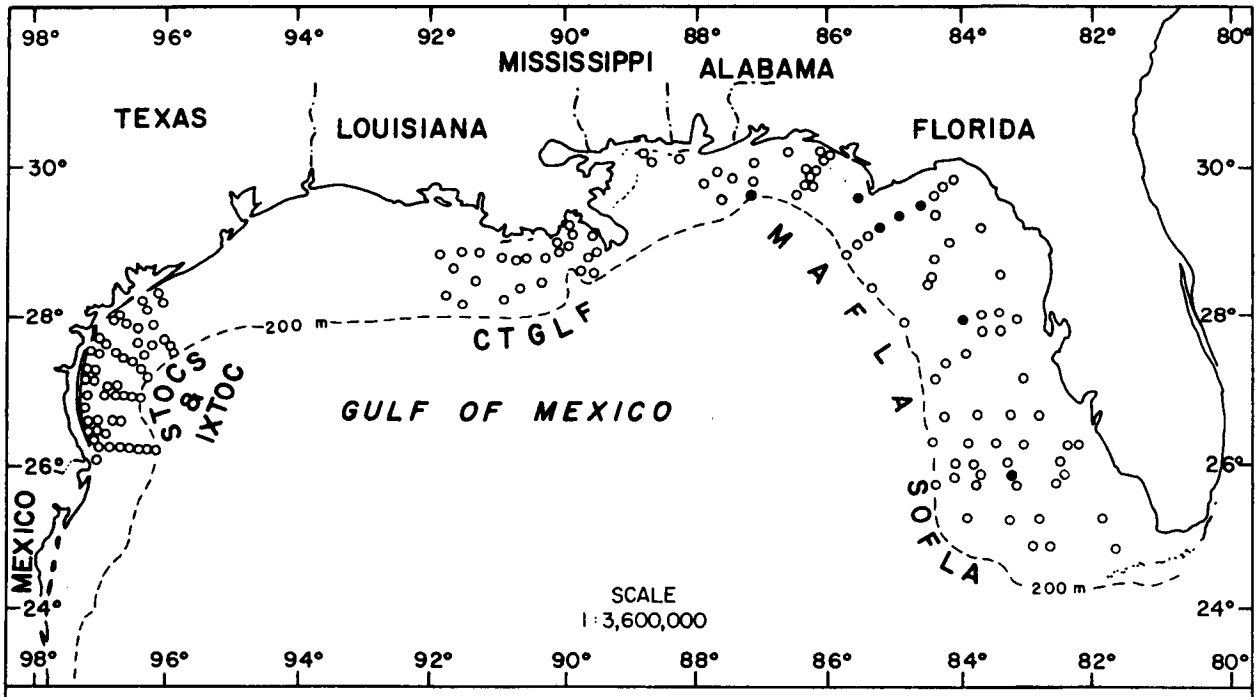

Figure 25-15. Distribution of Psammolyce ctenidophora on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

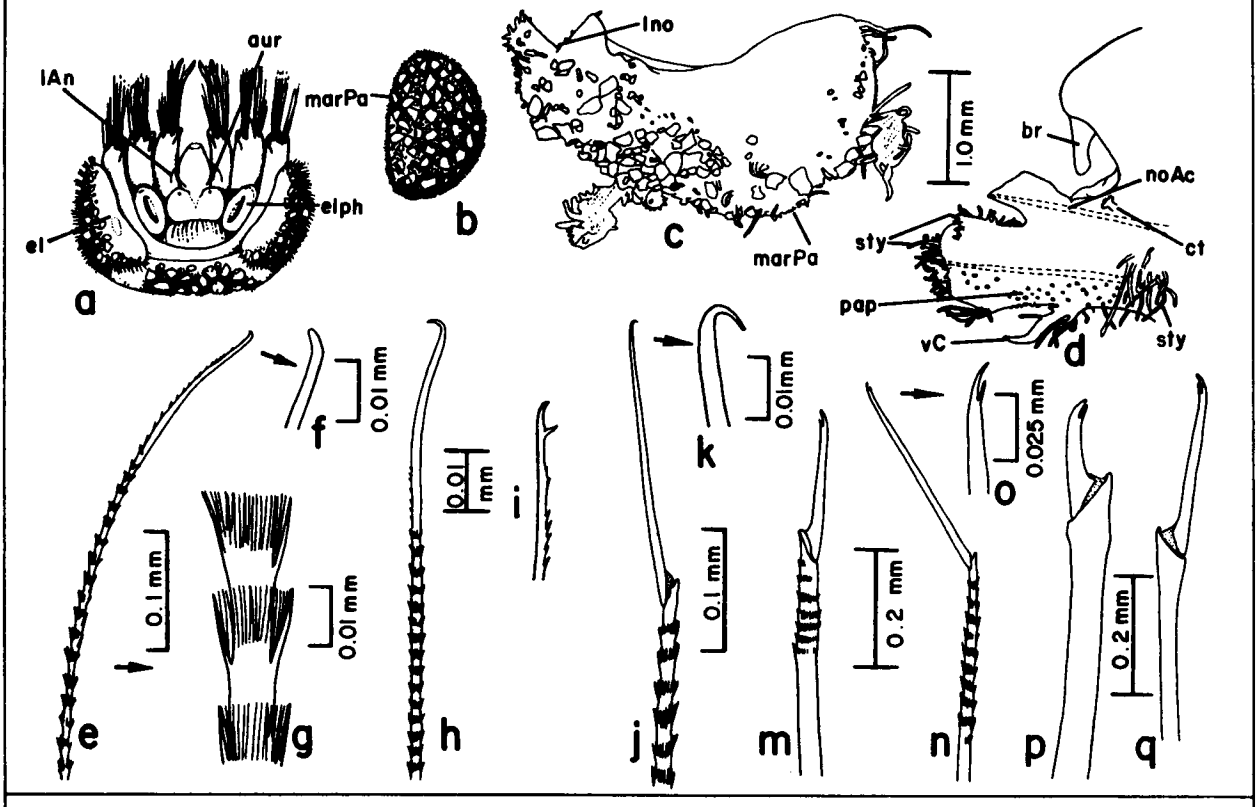

Figure 25-16. Psammolyce ctenidophora: a, anterior end; b, first elytron; c, second right elytron; d, middle parapodium (posterior view, setae omitted); e, superior seta from tentacular segment; f, tip of same; g, basal portion of same; h, inferior seta from same; i, tip of notoseta from middle segment; j, neuroseta from segment 2; k, tip of same; m, superior neuroseta from segment 3; n, inferior neuroseta from same; o, tip of same; p, medial neuroseta from middle segment; q, inferior neuroseta from same (Figures a, b, from Day 1973, fig. 1m, n).

Genus **Psammolyce** Kinberg, 1855

TYPE SPECIES: Psammolyce flava Kinberg, 1855.
REFERENCES:
Day, 1967:105.
Fauchald, 1977a:70.
DIAGNOSIS: Three antennae. Segment 3 with dorsal cirri. Tentacular segment with simple notosetae; subsequent segments with simple notosetae and compound falcigerous neurosetae. Elytra and dorsum sand-encrusted; ventrum papillose.

Key to the Gulf of Mexico BLM-OCS Species of Psammolyce

1a. Blades of compound neurosetae falcigerous, bidentate (Figure 25-16o,p); some notosetae of middle segments with bidentate tips (Figure 25-16i). . . . . **Psammolyce ctenidophora**, p. 25-19

1b. Blades of compound neurosetae cleft or split distally (Figure 25-18k-n); all notosetae of middle setigers with entire tips. . . . . **Psammolyce flava**, p. 25-21

Psammolyce ctenidophora Day, 1973
Figures 25-15, 16a-q

Psammolyce ctenidophora Day, 1973:11, fig. 1m-t.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 16C-11/80 (3 spec., USNM 86012); MAFLA 2211D-8/77 (1 spec.), 2211E-8/77 (2 spec.), 2211F-8/77 (1 spec.), 2422D-7/76 (1 spec.), 2423I-2/78 (1 spec.), 2424C-7/76 (1 spec.), 2645H-6/75 (1 spec.), 2645H-11/77 (1 spec.), 2854K-8/77 (1 spec.).
Supplementary Material:
North Carolina--Beaufort (USNM 43117, holotype).
DESCRIPTION:
Length, 52+ mm (previously reported to 25 mm for incomplete specimen); width, to 8.0 mm. Largest specimen incomplete with about 75 segments. Prostomium with four eyes, anterior pair larger, hidden under ceratophore of median antenna (Figure 25-16a). Median antenna with large ceratophore. Lateral antennae inconspicuous. Dorsal and ventral tentacular cirri long, similar in length. Facial tubercle present. First pair of elytra oval, without incision (Figure 25-16b). Subsequent elytra variable, with or without lateral notch (Figure 25-16c), with or without protuberances on posterior margin; marginal papillae of various lengths. Elytra not overlapping middorsally. Middorsum papillose with adherent sand grains (Figure 25-16a). Ventrum with long, segmentally arranged papillae as well as small tubercles. Neuropodia (Figure 25-16d) with numerous long stylodes beginning on segment 3. Tentacular segment with spinous notosetae, superior ones broader with tips not as curved as more slender inferior ones (Figure 25-16e-h). Notosetae of subsequent segments spinous, with curved unidentate and bidentate tips (Figure 25-16i). Compound neurosetae of segment 2 with blades long, tips strongly curved, unidentate; shafts with spinous rows (Figure 25-16j,k). Neurosetae of segment 3 falcigerous, bidentate; shafts with

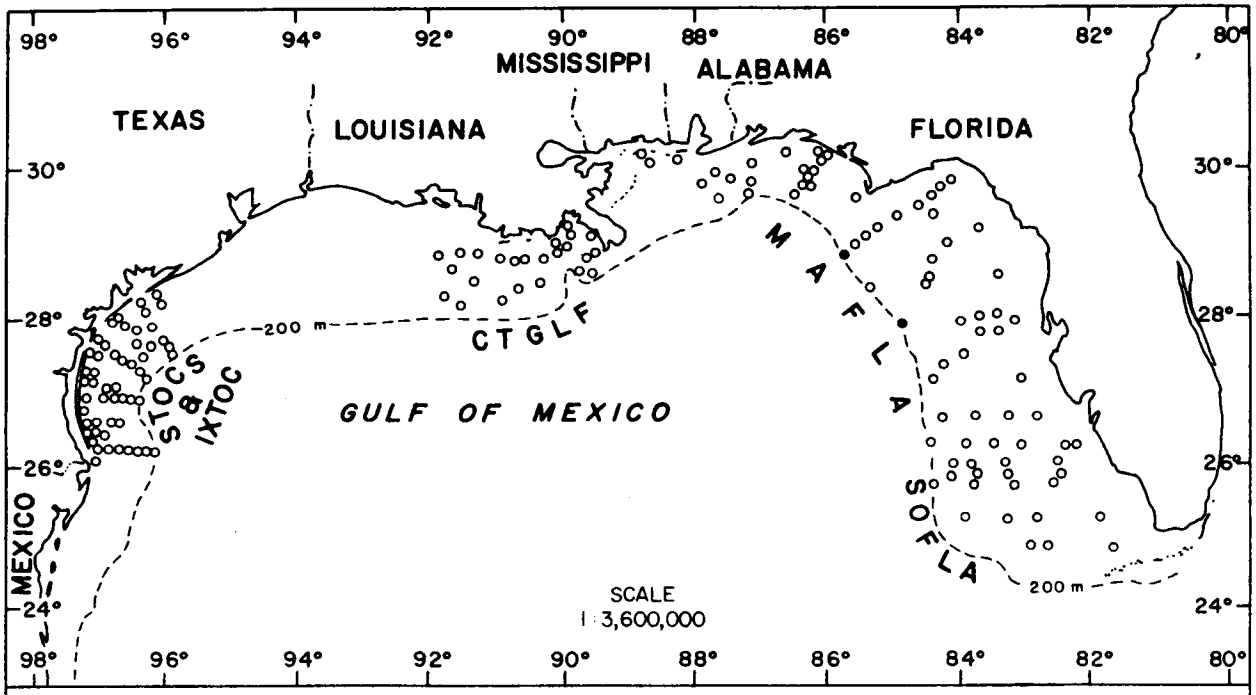

Figure 25-17. Distribution of Psammolyce flava on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

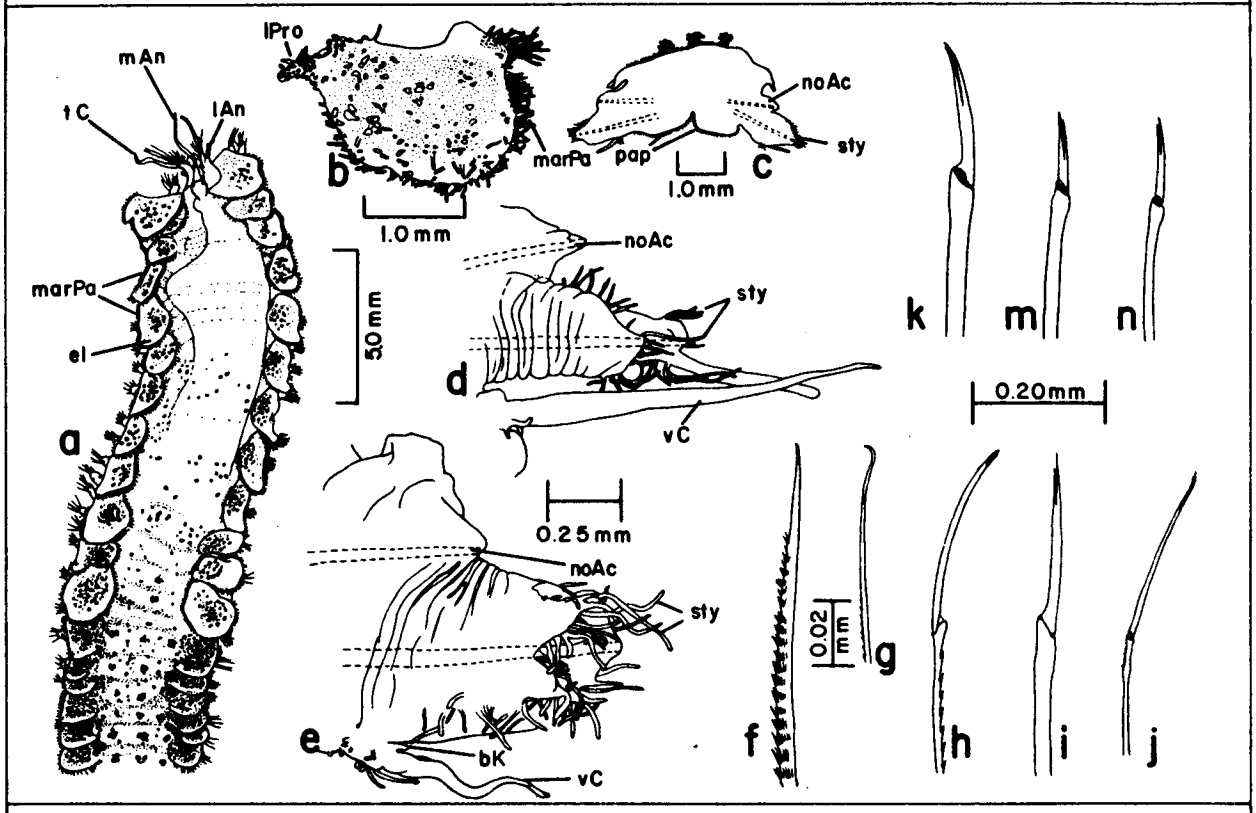

Figure 25-18. Psammolyce flava: a, anterior end; b, posterior right elytron (some sand grains removed); c, cross-section of posterior segment (posterior view, setae omitted); d, second parapodium (posterior view, setae omitted); e, middle parapodium (posterior view, setae omitted); f, superior notoseta from segment 1; g, inferior notoseta from same; h, neuroseta from segment 2; i, superior neuroseta from segment 3; j, inferior neuroseta from same; k, medial neuroseta from posterior segment (long-bladed); m, same (short-bladed); n, inferior neuroseta from same.

spinous rows distally; superior ones with shorter blades and fewer spinous rows (Figure 25-16m) than inferior ones (Figure 25-16n,o). Neurosetae of subsequent segments with bidentate blades and smooth shafts (Figure 25-16p,q). Pygidium not observed.
REMARKS: The original account of Psammolyce ctenidophora by Day (1973), does not describe the detailed morphology or arrangement of the notosetae. The setal figures presented herein are not taken from the holotype (USNM 43117) but are identical to those found on Day's specimen. The holotype also possesses bidentate falcigers as shown in Figure 25-16p, as well as unidentate falcigers (see Day 1973, fig. 1q,r). These may represent bidentate falcigers which have lost the secondary tooth due to wear. The structures located on the base of the ceratophore of the median antenna which were called auricles by Day (1973), are lacking in some individuals. In the holotype these structures are quite small and appear as sac-like inflations of the ceratophore, not as thin membranous flaps as in Sthenelais, for example. The presence of these sac-like structures is probably an artifact of contraction or fixation.
PREVIOUSLY REPORTED HABITAT: 20 m, rock and sand.
GULF OF MEXICO BLM-OCS OCCURRENCE: Several records off Florida (Figure 25-15); 19-106 m, coarse to fine sand, silty fine sand.
DISTRIBUTION: North Carolina, Gulf of Mexico.

Psammolyce flava Kinberg, 1855
Figures 25-17, 18a-n

Eupholoe acuminata Treadwell, 1934:3, pl. 1, figs. 7-8.
Psammolyce flava--Hartman, 1942a:108, fig. 8h; 1942c:90, pl. 9, figs. 21-23.
Psammolyce flava--Nonato and Luna, 1970:71, pl. 5, figs. 65-67.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2212C-2/78 (1 spec.), 2212F-2/78 (1 spec., USNM 86006), 2427H-9/77 (1 spec.), 2427I-2/78 (1 spec.-gravid).
Supplementary Material:
Puerto Rico--holotype of Eupholoe acuminata Treadwell (USNM 20032).
DESCRIPTION:
Length, 122+ mm; width, to 8.0 mm. Largest specimen incomplete and fragmented with about 150 total segments. Prostomium with four faint eyespots. Median antenna long, with large ceratophore (Figure 25-18a). Lateral antennae inconspicuous. Facial tubercle present. Anterior elytra oval with marginal papillae; long papillae and microtubercles present on dorsal surface. Posterior elytra (Figure 25-18b) slightly excavate anteriorly, with numerous marginal papillae as well as a lateral process on medial anterior margin and few papillae on dorsal surface. Elytra not overlapping middorsally. Dorsum smooth anteriorly with relatively few adherent sand particles. From about setiger 24, dorsum covered with sand grains and silt particles with clumps of sand grains, attached to three groups of clavate papillae, arranged in transverse row on each segment (Figure 25-18a,c). Ventrum densely papillose; all papillae relatively short, similar in size and shape. Parapodia of segment 2 each with long cirrus on neuropodial lobe (Figure 25-18d). Subsequent parapodia (Figure 25-18e) with numerous stylodes, and shorter ventral cirri. Tentacular segment with plumose notosetae; superior ones

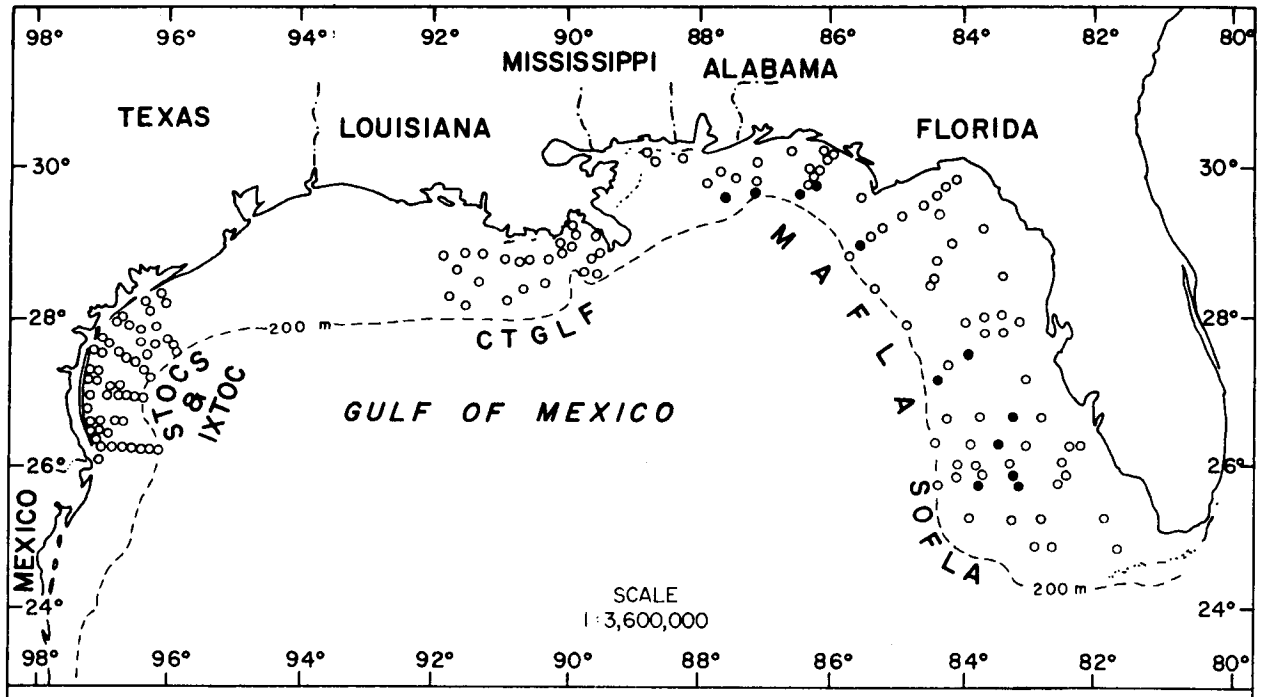

Figure 25-19. Distribution of Sthenelanella sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

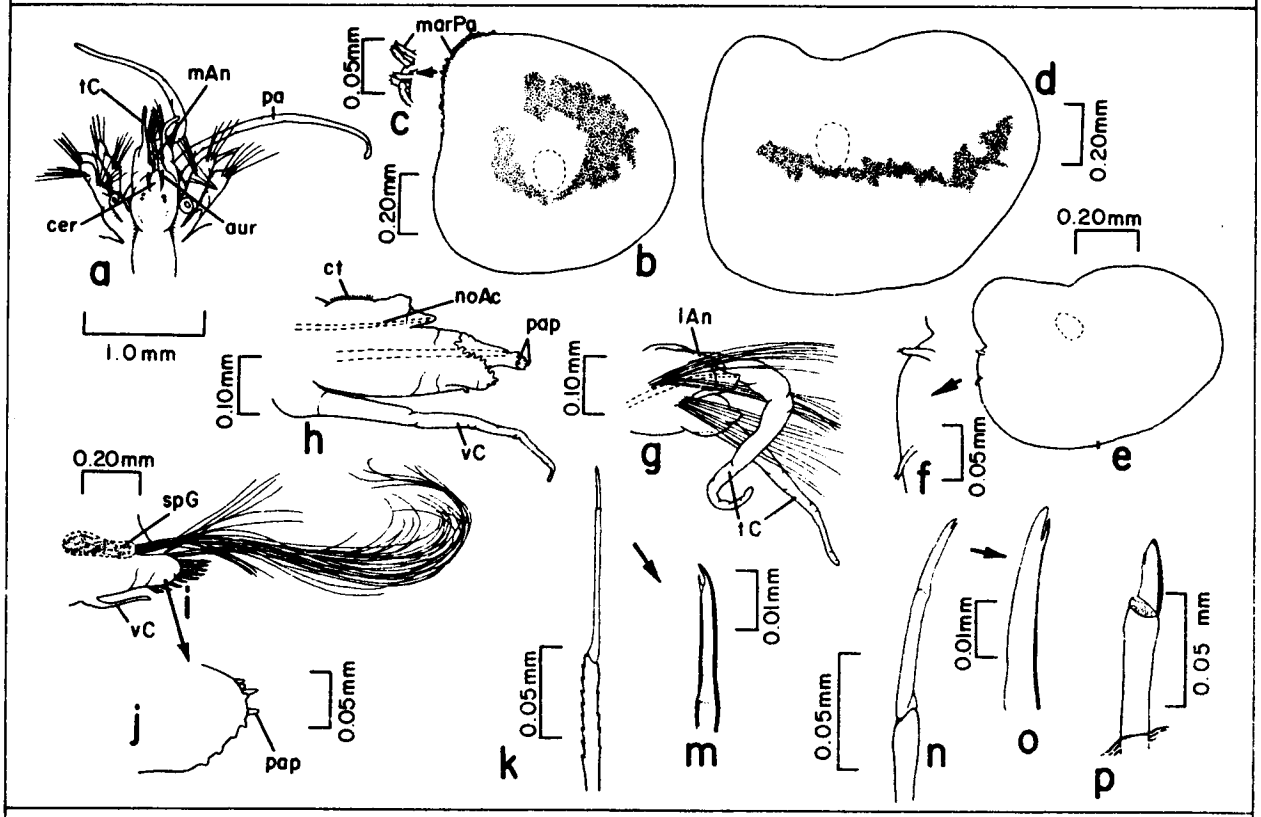

Figure 25-20. Sthenelanella sp. A: a, anterior end; b, first left elytron; c, marginal papillae from same; d, third right elytron; e, posterior left elytron; f, lateral margin from same; g, tentacular parapodium (inner view); h, second parapodium (posterior view, setae omitted); i, posterior parapodium (posterior view); j, posterior neuropodial bract from same; k, superior neuroseta from segment 2; m, tip of same; n, inferior neuroseta from same; o, tip of same; p, neuroseta from posterior segment.

broad with straight tips (Figure 25-18f); inferior ones finer with strongly curved tips (Figure 25-18g). Notosetae of subsequent segments extremely long, tapering to fine tips. Compound neurosetae of segment 2 with cleft blades and spinous shafts (Figure 25-18h). Compound neurosetae of segment 3 including superior ones bearing blades with cleft tips and smooth shafts (Figure 25-18i); and inferior slender ones with minutely bidentate blades and spinous shafts (Figure 25-18j). Neurosetae of subsequent segments similar, with smooth shafts; medial neurosetae (Figure 25-18k,m) with long and short blades; superior and inferior neurosetae slightly finer (Figure 25-18n). Pygidium not observed.
REMARKS: Although previous accounts of Psammolyce flava and Eupholoe acuminata did not describe the setae in as much detail as herein, Gulf of Mexico BLM-OCS specimens matched the holotype of E. acuminata exactly. The holotype of P. flava was not examined, but due to synonymy (see above), P. flava is herein newly recorded from the Gulf of Mexico.
PREVIOUSLY REPORTED HABITAT: 274-476 m.
GULF OF MEXICO BLM-OCS OCCURRENCE: Two records off Florida (Figure 25-17); 175-189 m; silty very fine sand, clayey sandy silt.
DISTRIBUTION: Gulf of Mexico, Cuba, Puerto Rico, Brazil.

Genus Sthenelanella Moore, 1910

TYPE SPECIES: Sthenelanella uniformis Moore, 1910.
REFERENCES:
Pettibone, 1969d:429.
Thomassin, 1972:255.
DIAGNOSIS: Three antennae; median antenna with ceratophore and small auricles, lateral antennae fused to tentacular segment. Tentacular parapodium with one aciculum. Parapodial stylodes absent. Notosetae finely spinous; felt-like notosetae produced by spinning glands in middle and posterior segments. Compound neurosetae long, with blades articulate, minutely bifid or unidentate on anterior segments, short and unidentate to weakly bidentate on middle and posterior segments.

Sthenelanella sp. A
Figures 25-19, 20a-p

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 4B-4/81 (1 spec., USNM 86015), 16C-7/81 (1 spec., USNM 86014); MAFLA 17G-5/74 (1 spec.), 2426C-2/78 (1 spec.), 2643A-11/77 (2 spec.), 2645D-11/77 (1 spec.), 2645G-11/77 (2 spec.), 2645I-6/75 (1 male), 2645J-7/76 (1 spec.), 2958K-11/77 (1 spec., USNM 86904), 2959J-8/77 (1 spec.).
DESCRIPTION:
Length, 17.0+ mm; width, to 2.0 mm. Largest specimen incomplete with 37 segments. Prostomium (Figure 25-20a) with four eyes, ocular area not raised. Median antenna with small ceratophore and small pair of auricles. Facial tubercle absent. First pair of elytra (Figure 25-20b) rounded, pigmented, with marginal papillae (Figure 25-20c). Subsequent anterior elytra (Figure 25-20d) reniform, with smooth margins and brown pigmented band. Posterior elytra (Figure 25-20e) with small lateral incision and 2-3 papillae (Figure 25-20f), without pigmentation.

Ventrum smooth. Tentacular parapodia (Figure 25-20g) each with one aciculum, small lateral antenna, dorsal and ventral tentacular cirri similar in size and shape. Parapodia of segment 2 (Figure 25-20h) each with small notopodium; neuropodium large with papillae on extended neuropodial tip and posterior neuropodial bract; ventral buccal cirri longer than following ventral cirri. Segment 3 similar to segment 2 except for slightly larger notopodia. Middle and posterior segments (Figure 25-20i) with small notopodia; neuropodia with rounded neuropodial bract bearing few papillae (Figure 25-20j). Notosetae of tentacular segment and subsequent segments fine, spinous, tapering to fine tips; additional felt-like notosetae formed from spinning glands (Figure 25-20i) present in middle and posterior segments. Neurosetae of segments 2-4 including pseudoarticulate compound falcigers with bidentate blades and smooth to spinous shafts (Figure 25-20k-o), and some with blunt unidentate tips. Beginning on segment 5, compound neurosetae short-bladed with blunt tips and smooth to spinous shafts (Figure 25-20p); faint hint of secondary tooth visible on some blades. Pygidium not observed.

REMARKS: Sthenelanella sp. A is similar to S. ehlersi (Horst, 1916), but differs from the latter in having bifid neurosetae on segments 2-5; also, the elytra of S. ehlersi are more distinctly incised. Sthenelanella sp. A is also similar to S. corallicola Thomassin, 1972, but differs from the latter in having pigmented anterior elytra and incised posterior elytra. Also, the extended neuropodial lobe of segment 2 is more heavily papillose in the former than in the latter.

GULF OF MEXICO BLM-OCS OCCURRENCE: Several records off Florida and Alabama (Figure 25-19); 50-189 m; coarse to fine sand, silty very fine sand.

Genus **Fimbriosthenelais** Pettibone, 1971

TYPE SPECIES: Sthenelais longipinnis Grube, 1870.

REFERENCE:

Pettibone, 1971b:25.

DIAGNOSIS: Three antennae, lateral pair emerging from tentacular segment; ceratophore of median antenna with conspicuous auricles. Tentacular parapodium with one aciculum. Parapodial stylodes with papillae. Notosetae fine, simple, spinous. Neurosetae including simple spinous forms, compound pluriarticulate falcigers, and simple-bladed falcigers.

Key to the Gulf of Mexico BLM-OCS Species of Fimbriosthenelais

1a. Neuropodial posterior bracts bilobed (Figure 25-24g); ventrum smooth. 2

1b. Neuropodial posterior bracts truncate, not bilobed (Figure 25-22f); ventrum papillose (Figure 25-22f). . . . . **Fimbriosthenelais hobbsi**, p. 25-26

2a. Some microtubercles of anterior elytra long, papillar (Figure 25-24b); ventral cirri with basal and medial knobs (Figure 25-24h). . . . . **Fimbriosthenelais sp. A**, p. 25-28

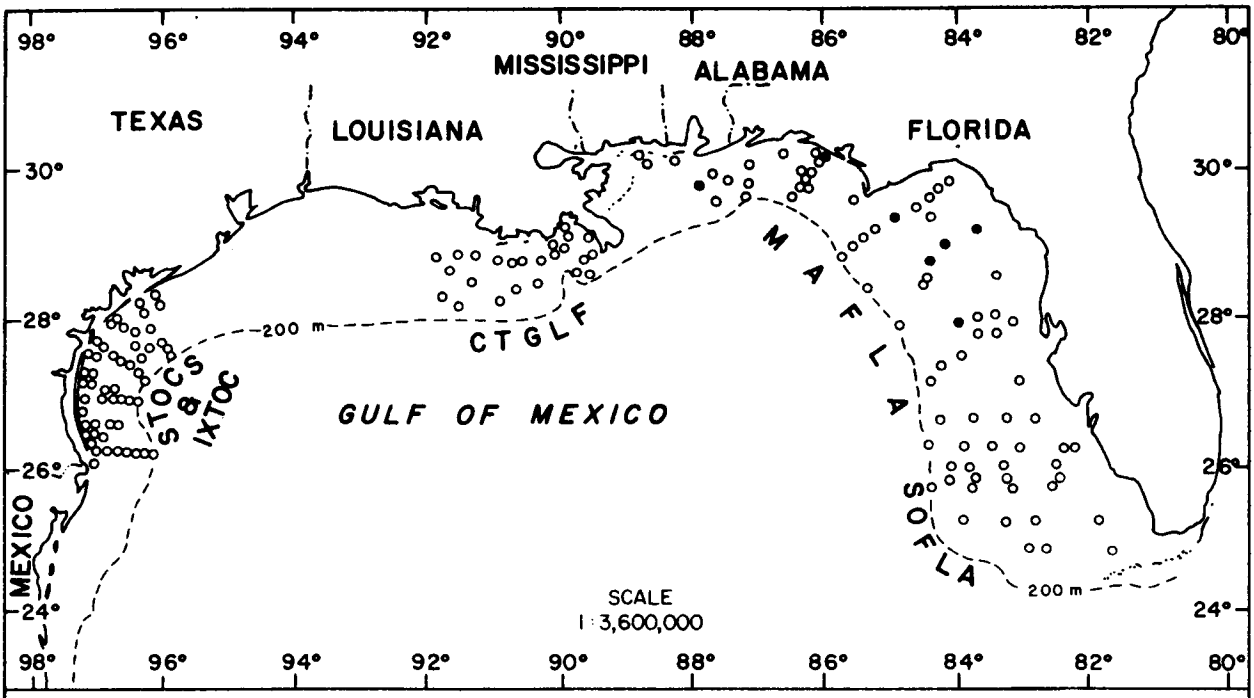

Figure 25-21. Distribution of Fimbriosthenelais hobbsi on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

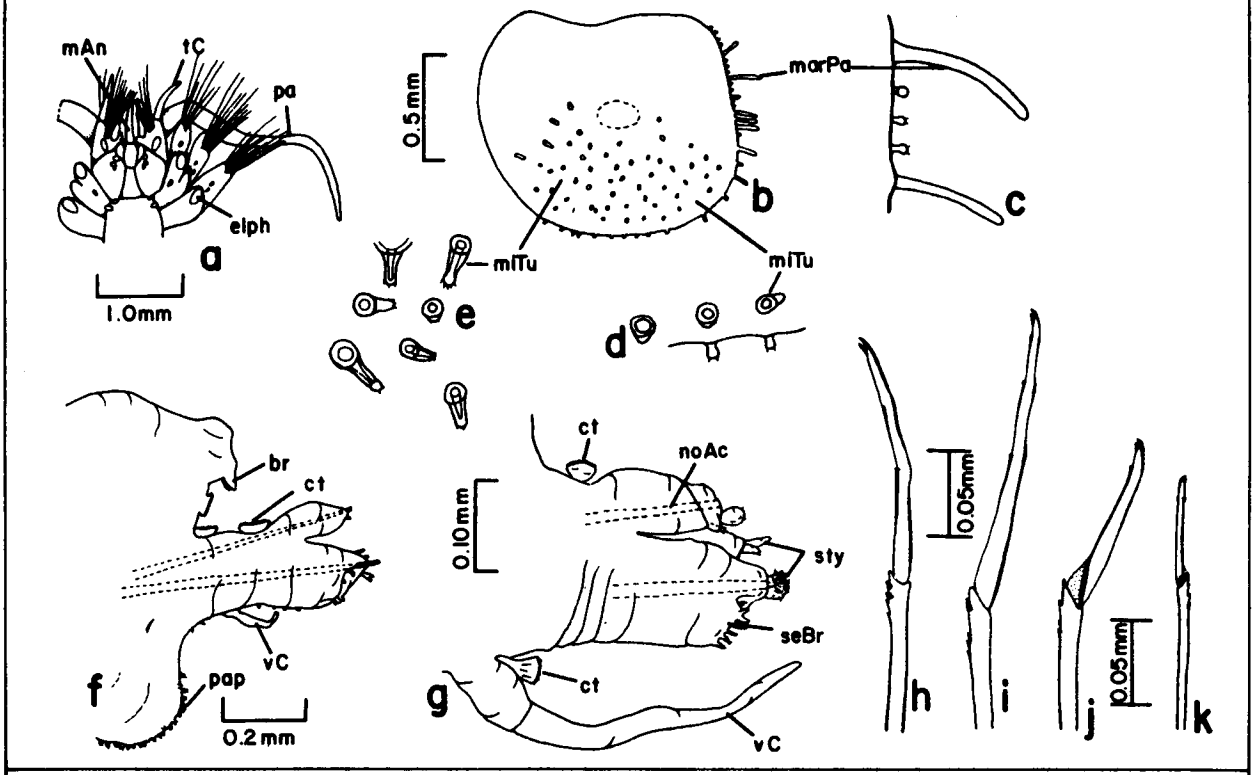

Figure 25-22. Fimbriosthenelais hobbsi: a, anterior end; b, anterior right elytron; c, outer marginal papillae from same; d, posterior margin and microtubercles from same; e, microtubercles from same; f, middle parapodium (posterior view, setae omitted); g, second parapodium (anterior view, setae omitted); h, superior neuroseta from segment 2; i, same, from middle segment; j, medial neuroseta from same; k, inferior neuroseta from same (Figures a-e from Pettibone 1971b, figs. 24 a, k).

2b. All microtubercles of anterior elytra short, mound-like (Figure 25-26c); ventral cirri with basal knob only (Figure 25-26i) . . . . . .**Fimbriosthenelais minor**, p. 25-30

Fimbriosthenelais hobbsi Pettibone, 1971
Figures 25-21, 22a-k

Fimbriosthenelais hobbsi Pettibone, 1971b:37, fig. 24a-k.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2211F-7/76 (2 spec.), 2211D-8/77 (1 spec.-gravid), 2316F-8/76 (1 spec.), 2317A-8/76 (3 spec.), 2318F-11/77 (1 spec.), 2423I-2/78 (3 spec.), 2529F-7/76 (1 spec., USNM 86003), 2640J-2/78 (1 spec.).
Supplementary Material:
Caribbean--Siguanea Bay, Isle of Pines, 4-8 m, Apr. 1937 (USNM 43553, holotype).
DESCRIPTION:
Length, to 20 mm (previously reported to 10 mm for incomplete specimen with 31 segments); width, to 2.0 mm. Largest specimen complete with 73 segments. Prostomium (Figure 25-22a) rounded, with four eyes. Elytra all similar (Figure 25-22b), with outer lateral margins having long, digitiform papillae separated by small, globular papillae (Figure 25-22c); globular papillae also present on posterior margins (Figure 25-22d). Microtubercles chitinized basally, with tubular papillae (Figure 25-22e). Elytra overlapping middorsally. Ventrum thickly papillose (Figure 25-22f). Tentacular parapodia each with single aciculum and two bundles of setae, with dorsal ctenidia. Segment 2 (Figure 25-22g) with well-developed notopodia; neuropodia with a pair of large papillose stylodes on projecting acicular lobe. Subsequent segments similar (Figure 25-22f), with well-developed parapodia and shorter ventral cirri; posterior neuropodial bracts truncate, not bilobed. Ventral cirri without basal knobs. All notosetae fine, spinous, tapering to fine tips. Neurosetae of segment 2 with pluriarticulate, bidentate, falcigerous blades, and spinous shafts (Figure 25-22h); inferior falcigers slightly finer and smaller than superior ones. Subsequent compound neurosetae all similar; superior falcigers with 3-4 articles (Figure 25-22i); medial falcigers with two articles (Figure 25-22j); inferior falcigers smaller with two articles (Figure 25-22k). Simple neurosetae absent. Pygidium terminal; cirri not observed.
REMARKS: Gulf of Mexico BLM-OCS specimens matched the original description of F. hobbsi quite well. It should be noted that superior simple setae were not observed on the only entire specimen. For F. hobbsi, the absence of the simple setae may be characterizing (see Pettibone, 1971b:26 for discussion).
PREVIOUSLY REPORTED HABITAT: 4-8 m.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida and Alabama (Figure 25-21); 19-43 m; coarse to medium sand, silty fine to very fine sand.
DISTRIBUTION: Gulf of Mexico, Caribbean.

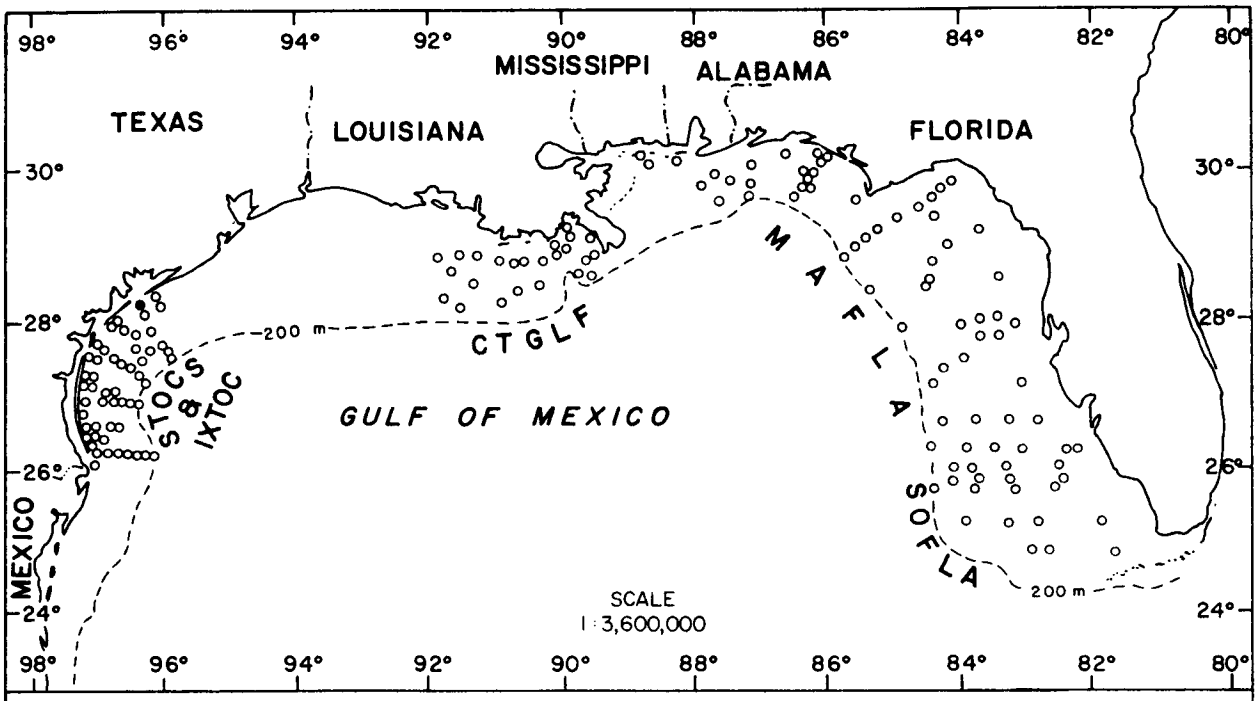

Figure 25-23. Distribution of Fimbriosthenelais sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

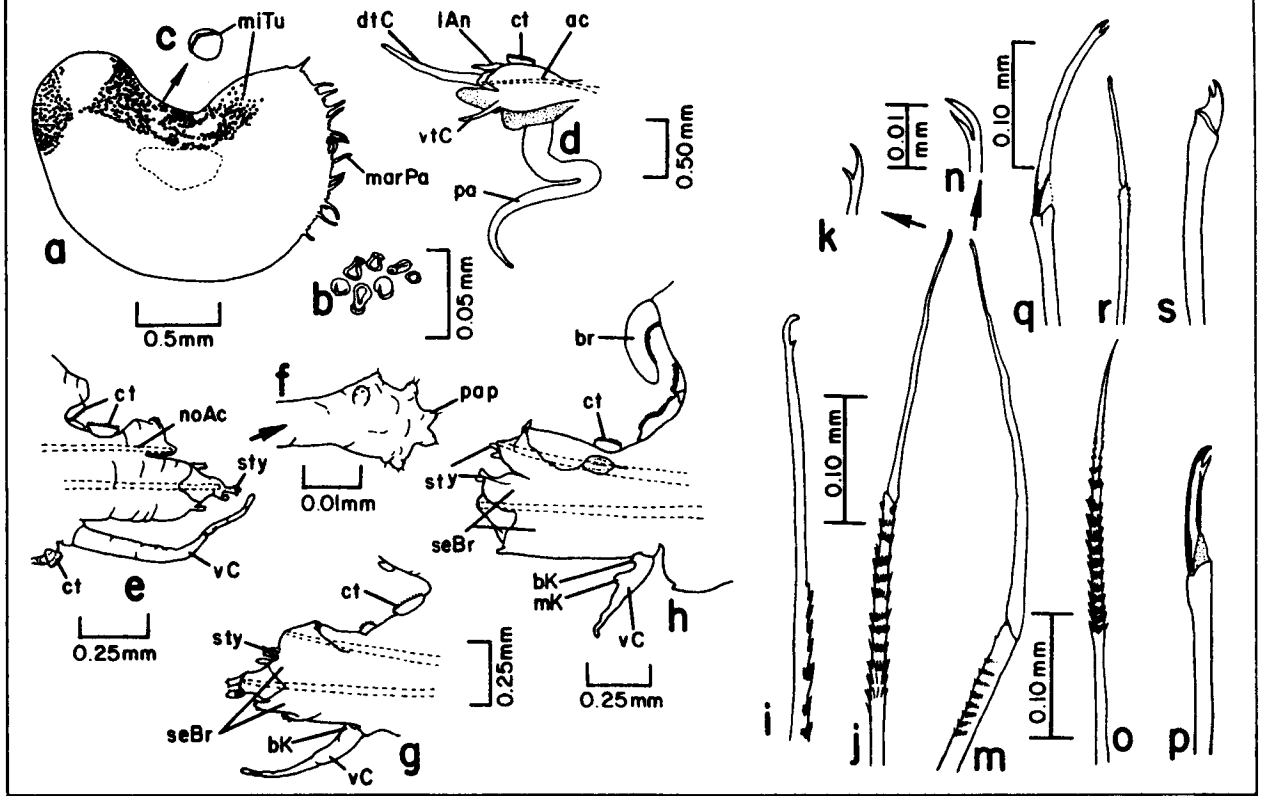

Figure 25-24. Fimbriosthenelais sp. A: a, middle right elytron; b, microtubercles from anterior elytron; c, microtubercle from middle elytron; d, tentacular parapodium (inner view, setae omitted); e, second parapodium (posterior view, setae omitted); f, stylode from same; g, third parapodium (posterior view, setae omitted); h, middle parapodium (posterior view, setae omitted); i, simple notoseta from tentacular segment; j, superior seta from segment 2 (with spinous shaft); k, tip of same; m, superior neuroseta from same (with ridged shaft); n, tip of same; o, simple neuroseta from segment 3; p, nonarticulate falciger from segment 3; q, pseudoarticulate falciger from same; r, inferior falciger from same, s, neuroseta from middle segment.

Fimbriosthenelais sp. A
Figures 25-23, 24a-s

Sthenelais articulata--Hartman, 1951a:20 [in part; not Kinberg, 1855].

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
STOCS 4/I-3 S/76 (3 spec., USNM 86022), 4/I-6 S/76 (2 spec., USNM 86908), 4/IV-5 F/76 (1 spec.).
Supplementary Material:
Gulf of Mexico--Texas, as Sthenelais? (1 spec., AHF 5779); Louisiana, June 1942, O. Hartman ID., as Sthenelais leidyi (1 spec., AHF 4939; 1 spec., AHF 2742).
DESCRIPTION:
Length, to 55 mm; width, to 4.0 mm. Largest specimen complete with 146 segments. Prostomium with four eyes; median antenna with large conspicuous auricles. All elytra similar in shape, with lateral marginal papillae (Figure 25-24a). Microtubercles of anterior elytra papillar, or with chitinous tooth (Figure 25-24b). Microtubercles of middle and posterior elytra with chitinous tooth (Figure 25-24c). Elytra overlapping middorsally. Ventrum smooth. Tentacular parapodia each with single aciculum (Figure 25-24d) and dorsal ctenidia; ventral tentacular cirri much smaller than dorsal ones. Segment 2 (Figure 25-24e) with small notopodia and well-developed neuropodia; stylodes club-shaped, papillose (Figure 25-24f). Segment 3 with well-developed noto- and neuropodia (Figure 25-24g); stylodes more numerous; ventral cirri with basal knob. Subsequent parapodia with bilobed neuropodial posterior bracts (Figure 25-24h), few stylodes, and ventral cirri having basal and medial knobs. All notosetae spinous with bifid tips (Figure 25-24i). Compound neurosetae of segment 2 pluriarticulate, bifid, falcigerous, with more or less spinous shafts (Figure 25-24j-n). Neurosetae of segment 3 including superior, spinous, simple setae (Figure 25-24o); medial group of nonarticulate and pluriarticulate compound setae (Figure 25-24p,q); and inferior simple and pseudoarticulate falcigers with minutely spinous shafts (Figure 25-24r). Neurosetae of subsequent segments similar, with additional short, simple-bladed compound falcigers (Figure 25-24s). Pygidium terminal with a pair of similar-sized anal cirri.
REMARKS: Fimbriosthenelais sp. A differs from other species of the genus in having a medial knob on the ventral cirri, along with the combination of bilobed neuropodial posterior bracts (as in F. minor) and the distinctive microtubercles of the anterior elytra (as in F. hobbsi). Specimens identified by Hartman (see "Supplementary Material" above) as Sthenelais leidyi Quatrefages, 1865, including some specimens she later referred to Sthenelais articulata Kinberg, 1855 (Hartman, 1951a:20) are identical with Fimbriosthenelais sp. A. Another specimen from Florida (AHF 1539), also identified as S. leidyi by Hartman and included as S. articulata in Hartman (1951a), represents an undescribed species of Fimbriosthenelais.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Texas (Figure 25-23); 10-15 m; sand, clayey sand.

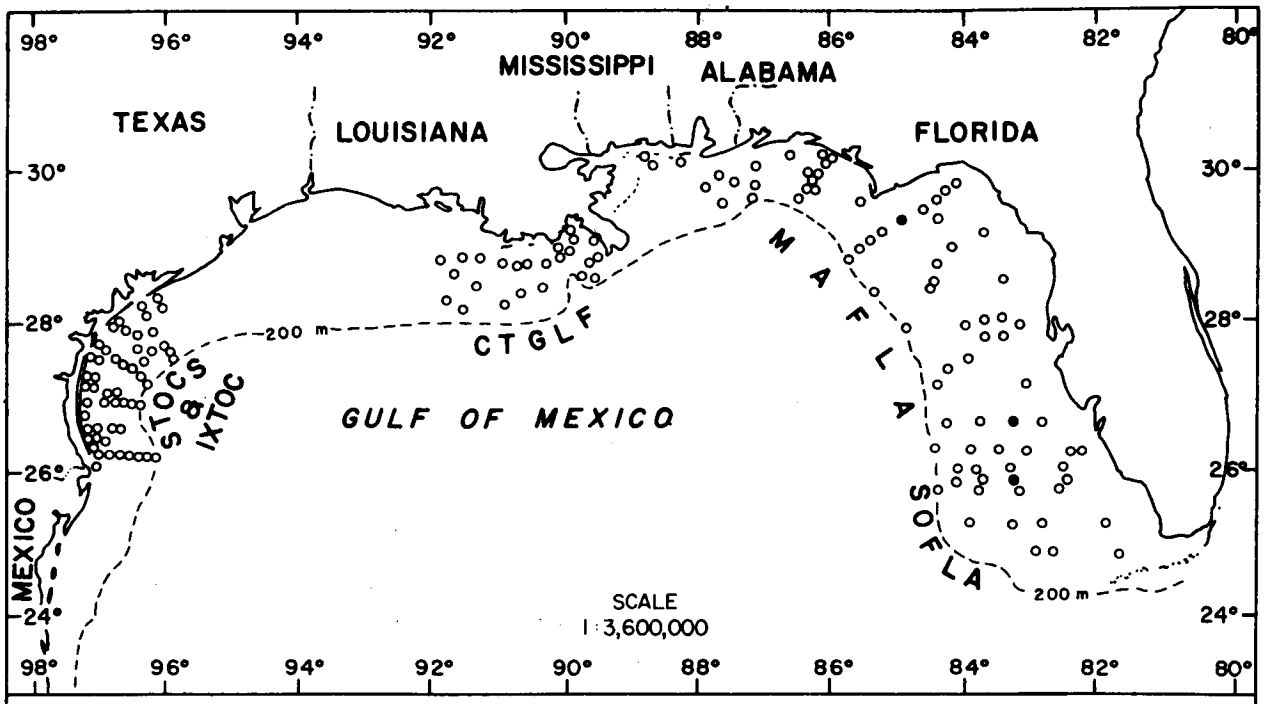

Figure 25-25. Distribution of Fimbriosthenelais minor on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

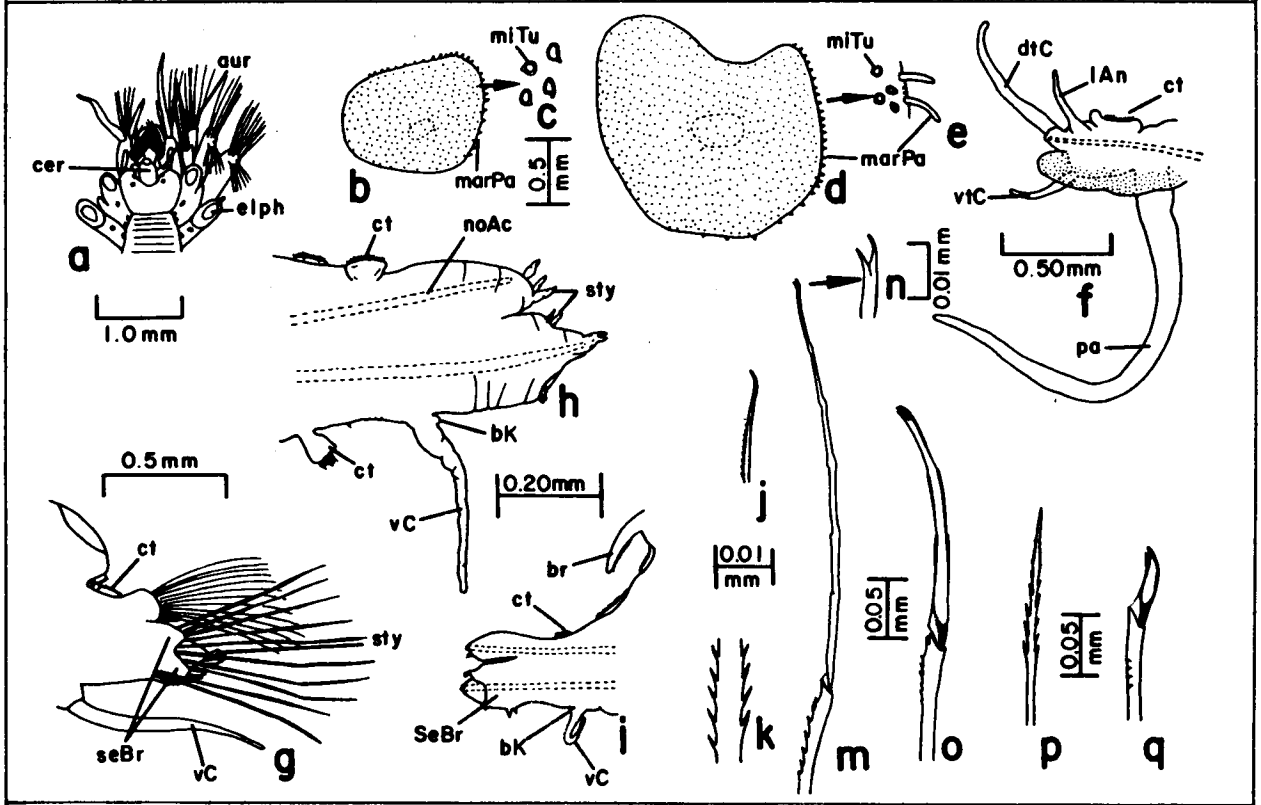

Figure 25-26. Fimbriosthenelais minor: a, anterior end; b, first elytron; c, microtubercles from same; d, anterior elytron; e, margin and microtubercles from same; f, tentacular segment (inner view, setae omitted); g, second parapodium (posterior view); h, third parapodium (anterior view, setae omitted); i, middle parapodium (posterior view, setae omitted); j, tip of notoseta from tentacular segment; k, basal portion of same; m, superior seta from segment 2; n, tip of same; o, medial neuroseta from same; p, simple neuroseta from middle segment; q, compound falcigerous neuroseta from same (Figures a-e, g from Pettibone 1971b, figs. 23a, k, l, b).

Fimbriosthenelais minor (Pruvot and Racovitza, 1895)
Figures 25-25, 26a-q

Sthenelais minor--Fauvel, 1923:112, fig. 41m-q.
Fimbriosthenelais minor--Pettibone, 1971b:35, fig. 23a-m.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 4B-4/81 (1 spec., USNM 86009), 16C-7/81 (1 spec., USNM 86010); MAFLA 2423B-7/76 (3 spec.), 2423E-7/76 (1 spec.), 2423G-7/76 (1 spec.).
DESCRIPTION:
Length, 45.0+ mm (previously reported to 45 mm); width, to 3.0 mm (previously reported to 4.0 mm). Largest specimen incomplete with more than 75 segments. Prostomium (Figure 25-26a) typical of genus. All elytra similar (Figure 25-26b,d), with small digitiform papillae along outer lateral margins; microtubercles (Figure 25-26c,e) with chitinized tooth atop a small mound. Elytra overlapping middorsally. Ventrum smooth. Tentacular parapodia each with single aciculum and dorsal ctenidia (Figure 25-26f). Segment 2 (Figure 25-26g) with small notopodia devoid of stylodes; ventral cirri elongate. Segment 3 (Figure 25-26h) with more prominent notopodia having stylodes; ventral cirri slightly shorter, with basal knob. Subsequent parapodia (Figure 25-26i) with bilobed neuropodial posterior bracts. All notosetae fine, with curved tips, spinous along most of length (Figure 25-26j,k). Compound neurosetae of segment 2 including upper ones with pluriarticulate, falcigerous blades having bifid tips, and spinous shafts (Figure 25-26m,n); and medial stout setae, with falcigerous blades having 2-3 articles and bidentate tips, and spinous shafts (Figure 25-26o). Neurosetae of subsequent segments including superior, spinous, simple ones (Figure 25-26p); compound pluriarticulate falcigers; compound simple-bladed falcigers (Figure 25-26q); and inferior, more slender, pluriarticulate compound falcigers. Pygidium missing.
REMARKS: Gulf of Mexico BLM-OCS specimens of Fimbriosthenelais minor appear to differ slightly from figures by Pettibone (1971b) in details of the parapodia. Specimens examined herein have fewer parapodial stylodes. Type material of F. minor was not examined; however, the small differences noted are not considered sufficient to indicate a new species.
PREVIOUSLY REPORTED HABITAT: Coastal to deep waters; silt.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida (Figure 25-25); 19-56 m; medium to fine sand, silty fine sand.
DISTRIBUTION: English Channel, France, Mediterranean; Gulf of Mexico.

Genus Sthenelais Kinberg, 1855

TYPE SPECIES: Sthenelais helenae Kinberg, 1855.
REFERENCES:
Pettibone, 1971b:3.
Day, 1967:108.
Fauchald, 1977a:70.
DIAGNOSIS: Three antennae, lateral pair fused to tentacular segment. Median antenna with conspicuous auricles. Tentacular segment with one or two acicula. Parapodial stylodes without papillae. Notosetae fine, simple, spinous. Neurosetae including simple spinous ones, compound

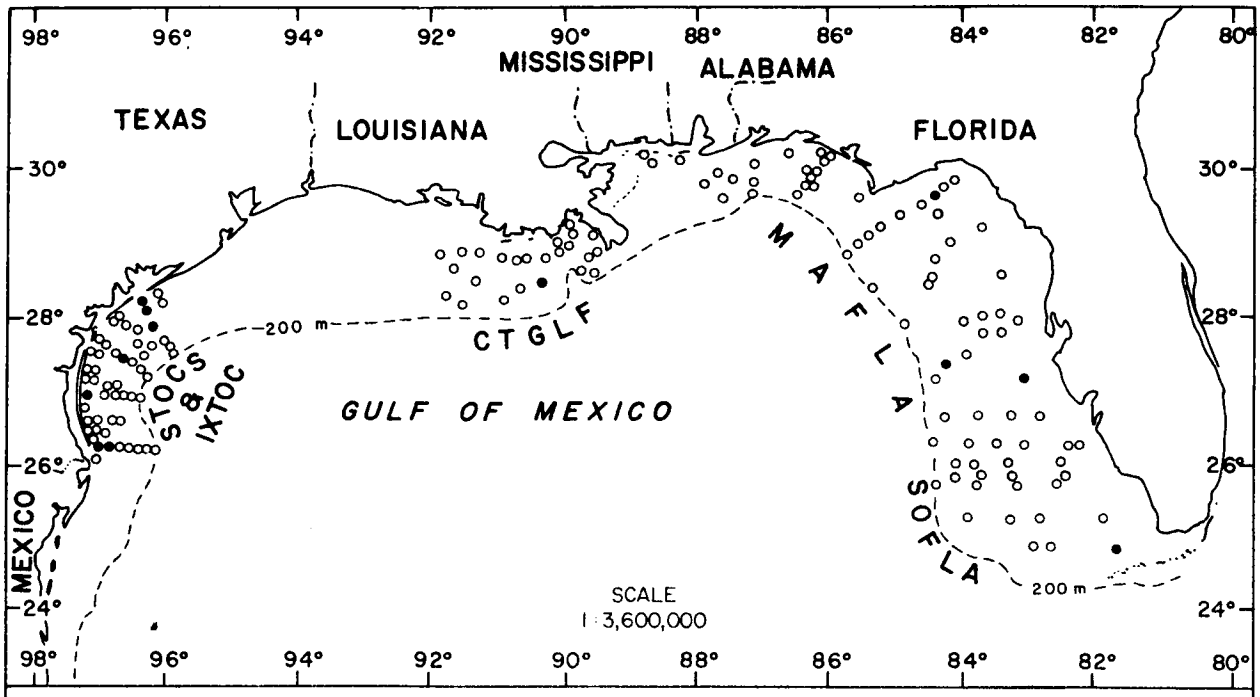

Figure 25-27. Distribution of Sthenelais sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

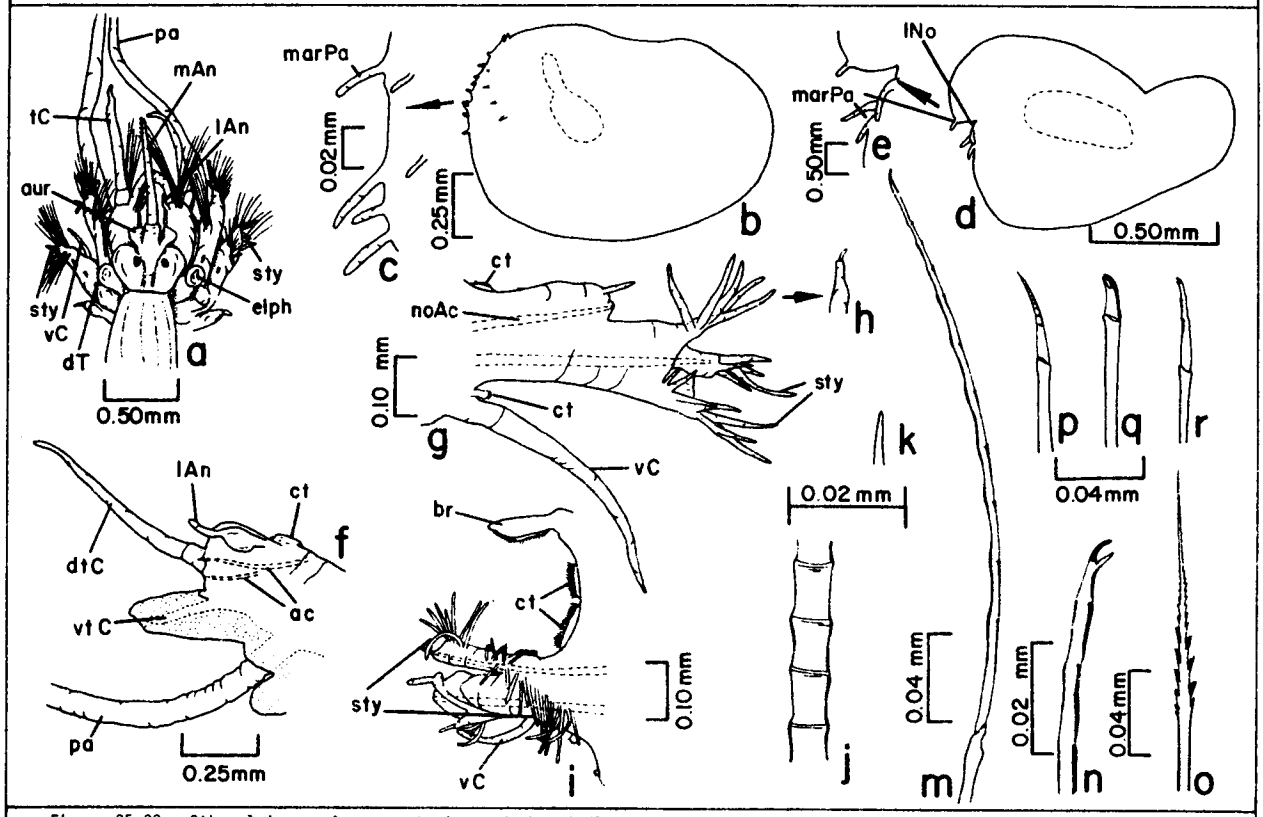

Figure 25-28. Sthenelais sp. A: a, anterior end; b, middle left elytron; c, margin from same; d, posterior left elytron; e, margin from same; f, tentacular segment (inner view, setae omitted); g, second parapodium (posterior view, setae omitted); h, stylode from same; i, middle segment (posterior view, setae omitted); j, basal portion of notosetae from tentacular segment; k, tip of same; m, unidentate pluriarticulate neuroseta from segment 2; n, tip of subacicular falciger from segment 3; o, simple neuroseta from middle segment; p, canaliculate spinigerous neuroseta from same; q, medial falcigerous neuroseta from same; r, inferior neuroseta from same.

pluriarticulate and simple-bladed bidentate falcigers; some species with compound falcigers having tapered, canaliculate blades.
REMARKS: The above diagnosis has been modified to include species possessing two acicula in the tentacular segment and compound falcigers with tapered, canaliculate blades. Both above characters are described herein for Sthenelais sp. A. Pettibone (pers. comm.) is revising the genus Sthenelais; thus, at present, the generic placement of Sthenelais sp. A is uncertain.

Sthenelais sp. A
Figures 25-27, 28a-r

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 25A-4/81 (2 spec., USNM 86017), 25D-4/81 (1 spec., USNM 86018); MAFLA 2421D-7/76 (1 spec.), 2747H-2/78 (1 spec.), 2851E-7/76 (1 spec.); CTGLF 03-5/78 (1 spec.); STOCS 1/I-5 F/77 (1 spec., USNM 86030), 2/I-3 (1 spec., USNM 86023), 4/I-5 F/77 (1 spec., USNM 86031), 2/II-2 4/76 (1 spec., USNM 86024), 2/II-4 4/76 (1 spec., USNM 86025), 4/III-1 Sp/76 (1 spec., USNM 86026), 4/III-4 W/76 (4 spec., USNM 86029), 1/IV-5 W/76 (1 spec., USNM 86028), 4/IV-1 F/76 (1 spec., USNM 86027); IXTOC S53-3 11/79 (1 spec., USNM 86001).
Supplementary Material:
North Carolina--Beaufort, 34°20'N, 75°57'W, 80 m, Apr. 1965, J. H. Day ID., as Sthenelais limicola (6 spec., USNM 50995).
Gulf of Mexico--Louisiana, LOOP Sta. 422-1, 29°06'16"N, 90°06'47"W, 10 m, clayey silt, Spr. 1982, P. Wolf ID. (6 spec.).
DESCRIPTION:
Length, to 38.0 mm; width, to 3.0 mm. Largest specimen incomplete with about 75 segments. Prostomium rounded anteriorly, with four eyes and median antenna (Figure 25-28a). Anterior and middle elytra (Figure 25-28b) oval, with few marginal papillae (Figure 25-28c). Posterior elytra (Figure 25-28d) excavate anteriorly, incised laterally with few papillae in incision (Figure 25-28e). Surface of elytra smooth. Ventrum smooth. Tentacular parapodia (Figure 25-28f) each with two acicula; lateral antennae relatively small. Second parapodia (Figure 25-28g) with small notopodia and well-developed neuropodia having three well-defined groups of stylodes. Some stylodes biarticulate with fimbriae at tips (Figure 25-28h). Third parapodia similar, with notopodia well-developed, having more stylodes. Middle and posterior parapodia (Figure 25-28i) with numerous long stylodes in distinct groups especially on posterior surface where stylodes are arranged in an oblique row. Notosetae of tentacular and anterior segments simple, slender, appearing somewhat annulated (Figure 25-28j), with tapered tips (Figure 25-28k). Notosetae of subsequent parapodia including annulated ones and spinous ones. Neurosetae of segment 2 (Figure 25-28m) compound, pluriarticulate, unidentate. Neurosetae of segment 3 with additional, long, pluriarticulate, bidentate falcigers (Figure 25-28n). Subsequent neurosetae including superior, spinous, simple ones (Figure 25-28o); compound, long- to short-bladed, canaliculate spinigers (Figure 25-28p); compound, nonarticulate, bidentate falcigers (Figure 25-28q); and compound bidentate falcigers with few to many articles (Figure 25-28r). Pygidium missing.
REMARKS: Sthenelais sp. A is similar to S. limicola (Ehlers, 1864), from which it differs in having two acicula in the tentacular segment,

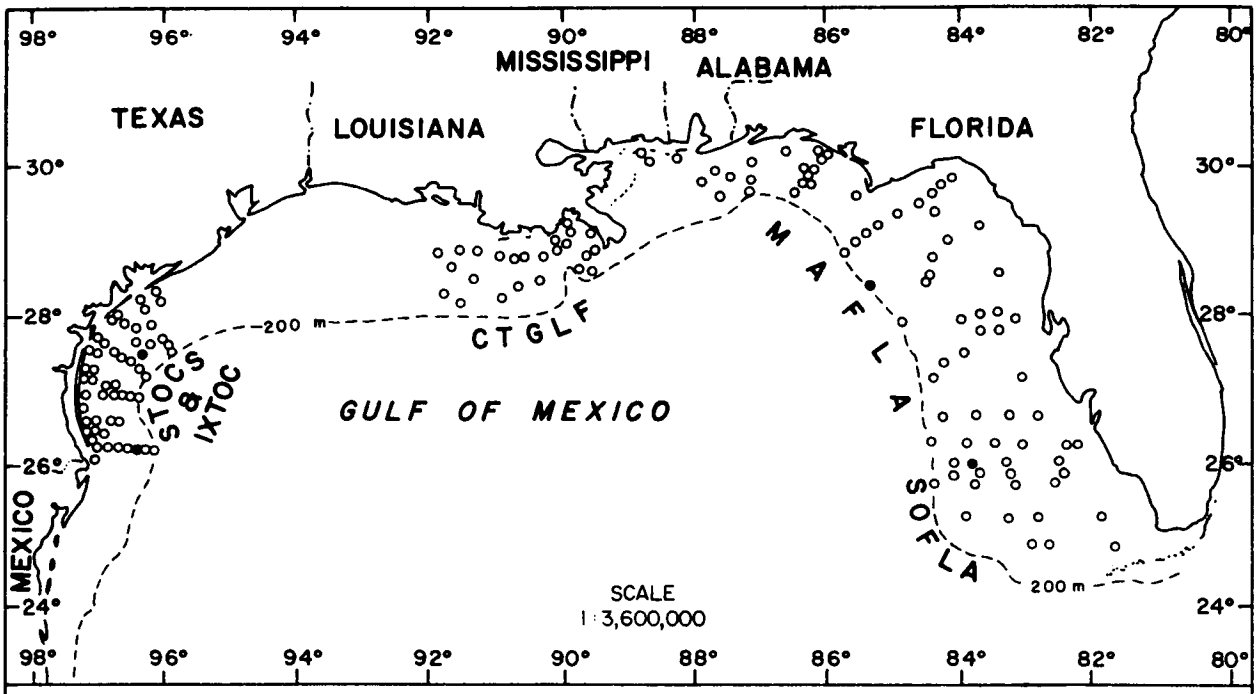

Figure 25-29. Distribution of Sthenolepis sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

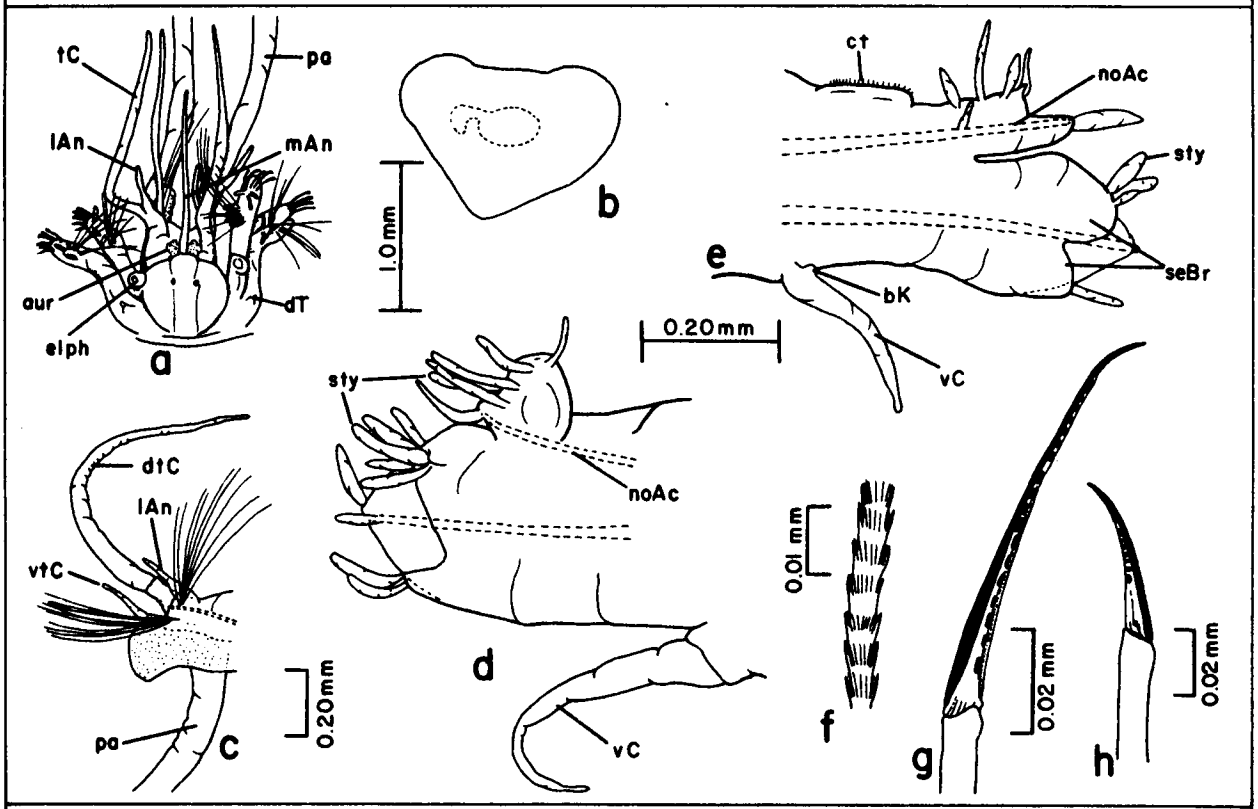

Figure 25-30. Sthenolepis sp. A: a, anterior end; b, middle left elytron; c, tentacular segment (inner view); d, second parapodium (posterior view, setae omitted); e, middle parapodium (posterior view, setae omitted); f, basal portion of notoseta from tentacular segment; g, neuroseta from segment 2; h, neuroseta from middle segment.

marginal papillae on the middle elytra, and papillae in the lateral incisions of posterior elytra. From size series studied, it is apparent that as individuals of Sthenelais sp. A mature, they gradually lose their falcigers, with larger worms possessing only one or two or even no falcigers at all throughout the entire body. Thus, in the middle and posterior neuropodia, only canaliculate compound spinigers may be present, as in species of Sthenolepis. Consistent characters in any case are the arrangement of stylodes on the parapodia and the shape of the elytra.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida, Louisiana, and Texas (Figure 25-27); 10-74 m; medium-fine to fine sand, silty and clayey sand, sandy and silty clay.

Genus Sthenolepis Willey, 1905

TYPE SPECIES: Leanira japonica McIntosh, 1885.
REFERENCE:
Fauchald, 1977a:70.
DIAGNOSIS: Three antennae; median antenna with auricles, lateral antennae emerging from tentacular segment. Dorsal tubercle present on segment 3. Parapodial stylodes smooth. Notosetae simple, spinous or smooth. Neurosetae compound, with spinigerous blades, sometimes canaliculate additional simple spinous neurosetae present or absent.

Key to the Gulf of Mexico BLM-OCS Species of Sthenolepis

1a. Elytra without marginal papillae (Figure 25-30b); compound neurosetae with canaliculate blades (Figure 25-30g,h) . . . . . .Sthenolepis sp. A, p. 25-34

1b. Elytra with marginal papillae (Figure 25-32a,d); compound neurosetae with smooth blades (Figure 32n,o). . . . . Sthenolepis cf. grubei, p. 25-36

Sthenolepis sp. A
Figures 25-29, 30a-h

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 12A-11/80 (1 spec., USNM 86019); MAFLA 2313H-11/77 (1 spec.); STOCS 6/IV-1 W/77 (1 spec., USNM 86033), SB3-5 12/76 (4 spec., USNM 86032).
DESCRIPTION:
Length, 35+ mm; width, to 3.0 mm. Largest specimen incomplete with 49 segments. Prostomium rounded anteriorly, with four eyes and long median antenna (Figure 25-30a); lateral antennae short, emerging from tentacular segment. Facial tubercle absent. Anterior elytra small, oval; middle elytra (Figure 25-30b) triangular; posterior elytra missing. Elytra without tubercles, marginal papillae or incisions. Ventrum smooth. Tentacular parapodia (Figure 25-30c) each with one aciculum, dorsal tentacular cirri much longer than ventral ones. Segment 2 (Figure 25-30d) with mound-like notopodia bearing several stylodes. Segment 3 with well-developed notopodia and small dorsal tubercles. Subsequent

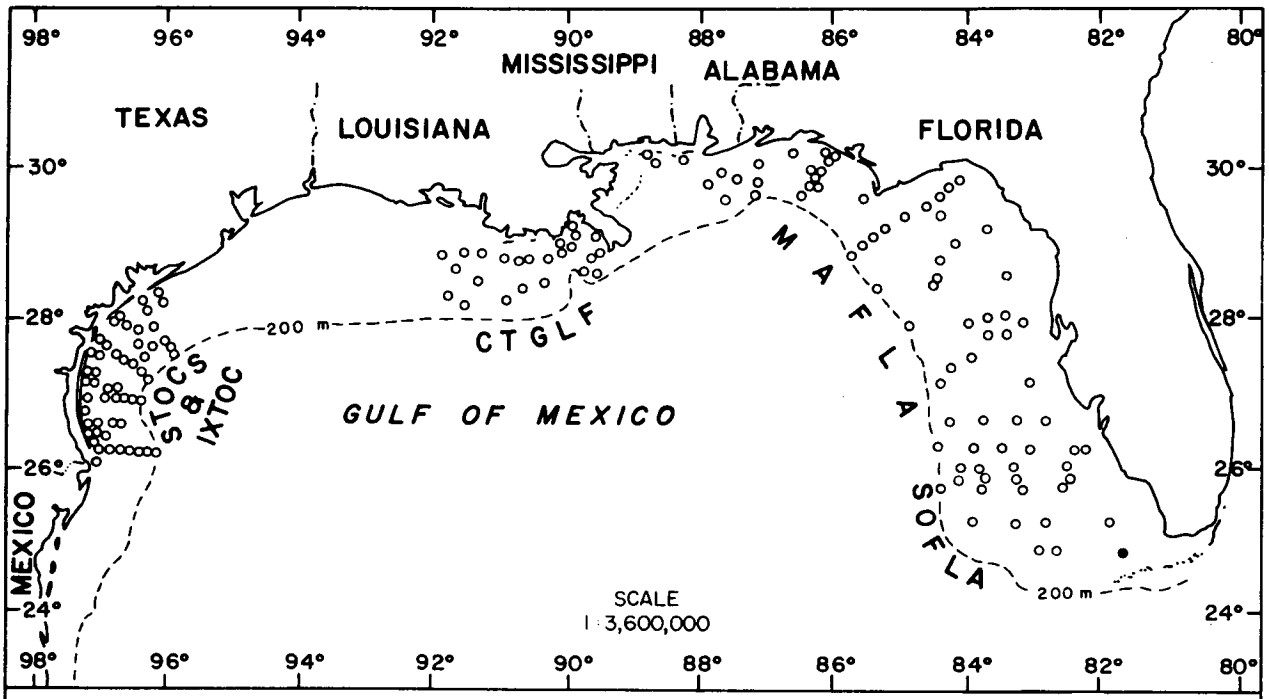

Figure 25-31. Distribution of Sthenolepis cf. grubei on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

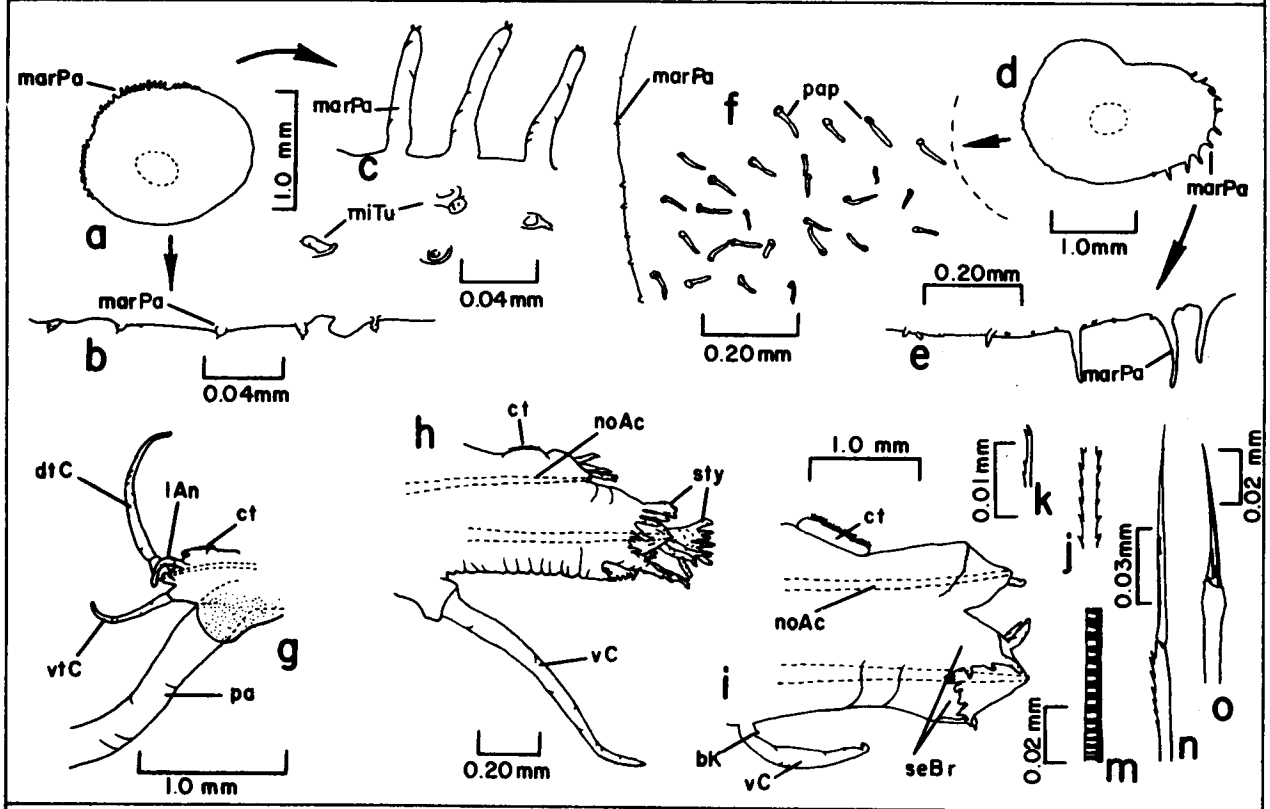

Figure 25-32. Sthenolepis cf. grubei: a, anterior left elytron; b, posterior margin of same; c, anterior margin and microtubercles of same; d, middle right elytron; e, posterior margin of same; f, inner margin and papillae of same; g, tentacular segment (inner view); h, second parapodium (posterior view); i, middle parapodium (posterior view); j, basal portion of notoseta from tentacular segment; k, tip of same; m, basal portion of annulated simple notoseta from middle segment; n, superior neuroseta from middle segment; o, medial neuroseta from same.

noto- and neuropodia (Figure 25-30e) with few stylodes; posterior neuropodial bracts bilobed; ventral cirri with small basal knob. All notosetae simple, smooth or spinous (Figure 25-30f), tapering to fine unidentate tips. Compound neurosetae canaliculate, spinigerous, with blades of various lengths (Figure 25-30g,h); spinous simple neurosetae not observed. Pygidium not observed.
REMARKS: Gulf of Mexico BLM-OCS specimens of Sthenolepis sp. A are similar to S. japonica (McIntosh, 1885), and S. yhleni (Malmgren, 1867). They differ from S. japonica in lacking simple spinous neurosetae and in the arrangement of the parapodial stylodes, and from S. yhleni in having a dorsal tubercle on setiger 3. Sthenolepis sp. A differs from other species of the genus in the combination of the above characters as well as in having elytra with smooth margins.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida and Texas (Figure 25-29); 65-177 m; fine sand, clayey sand, clayey sandy silt.

Sthenolepis cf. grubei (Treadwell, 1901)
Figures 25-31, 32a-o

Sthenelais grubei Treadwell, 1901:187, figs. 10-13.
Eupholoe grubei--Treadwell, 1939b:197, fig. 26a,b.
Leanira grubei--Hartman, 1942a:106.
Sthenolepis grubei--Nonato and Luna, 1970:73, pl. 4, figs. 37-45.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 25D-4/81 (1 spec.-gravid, USNM 86016).
DESCRIPTION:
Length, 27.0+ mm (previously reported to 30 mm); width, to 5.0 mm. Only specimen incomplete with 44 segments. Prostomium with four eyes and long median antenna; facial tubercle absent. Anterior elytra (Figure 25-32a) small, oval, with short marginal papillae on anterior and lateral borders, minute papillae on posterior border (Figure 25-32b), and papillar microtubercles (Figure 25-32c). Middle elytra (Figure 25-32d) anteriorly excavate, with long marginal papillae (Figure 25-32e); inner surface with digitiform papillae (Figure 25-32f). Posterior elytra missing. Ventrum smooth. Tentacular parapodia (Figure 25-32g) each with one aciculum; lateral antennae relatively long, digitiform; dorsal tentacular cirri about twice length of ventral ones. Segment 2 (Figure 25-32h) with small notopodia bearing a group of stylodes; neuropodia with numerous stylodes, some bifurcate. Segment 3 similar to segment 2; with dorsal tubercle. Subsequent parapodia (Figure 25-32i) with well-developed notopodia having few stylodes; neuropodia with bilobed posterior bract bearing stylodes along margin; ventral cirri with small basal knob. Notosetae of first two segments spinous, with minutely bifid tips (Figure 25-32j,k). Subsequent notosetae of two kinds, spinous and annulate (Figure 25-32m), both tapering to fine, entire tips. Neurosetae including simple spinous ones beginning on segment 3; and several compound spinigers with long to short blades, and smooth to spinous shafts (Figure 25-32n,o). Pygidium not observed.
REMARKS: Sthenolepis cf. grubei could not be identified with certainty because previous descriptions of elytra, stylode arrangement, and the shape of the posterior neuropodial bracts are rather vague and incomplete. Indeed, Leanira fimbriarum Hartman, 1939a, a junior synonym of

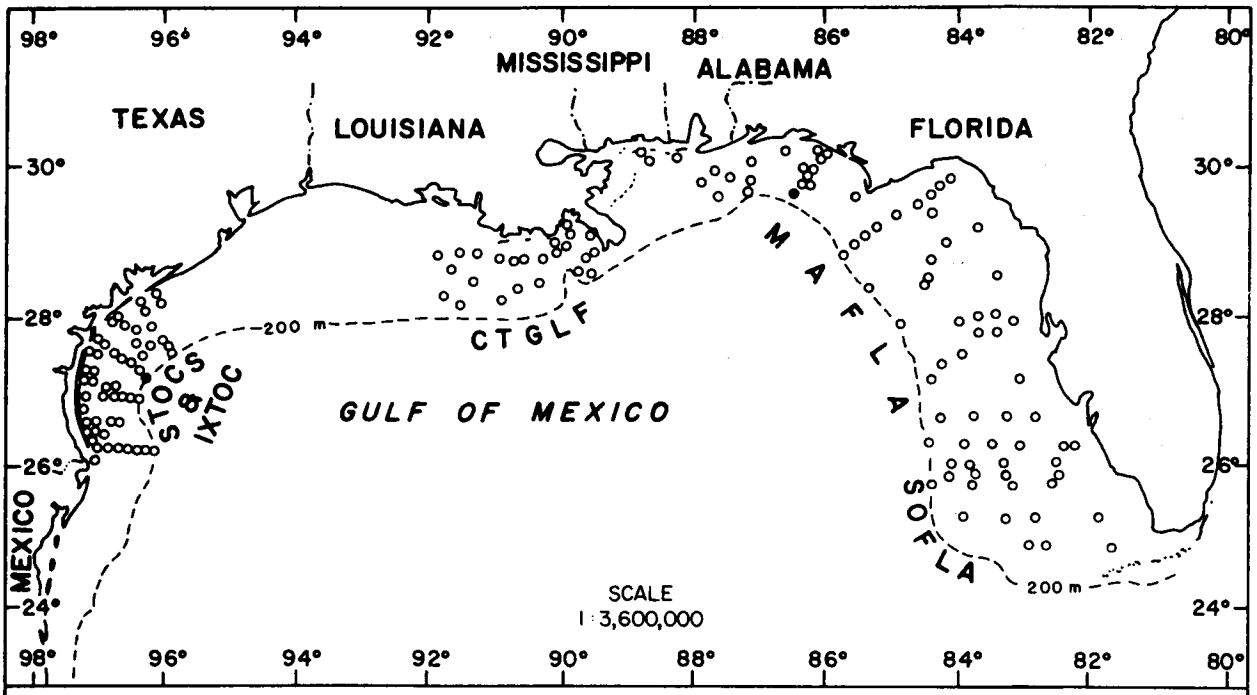

Figure 25-33. Distribution of Ehlersileanira incisa on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

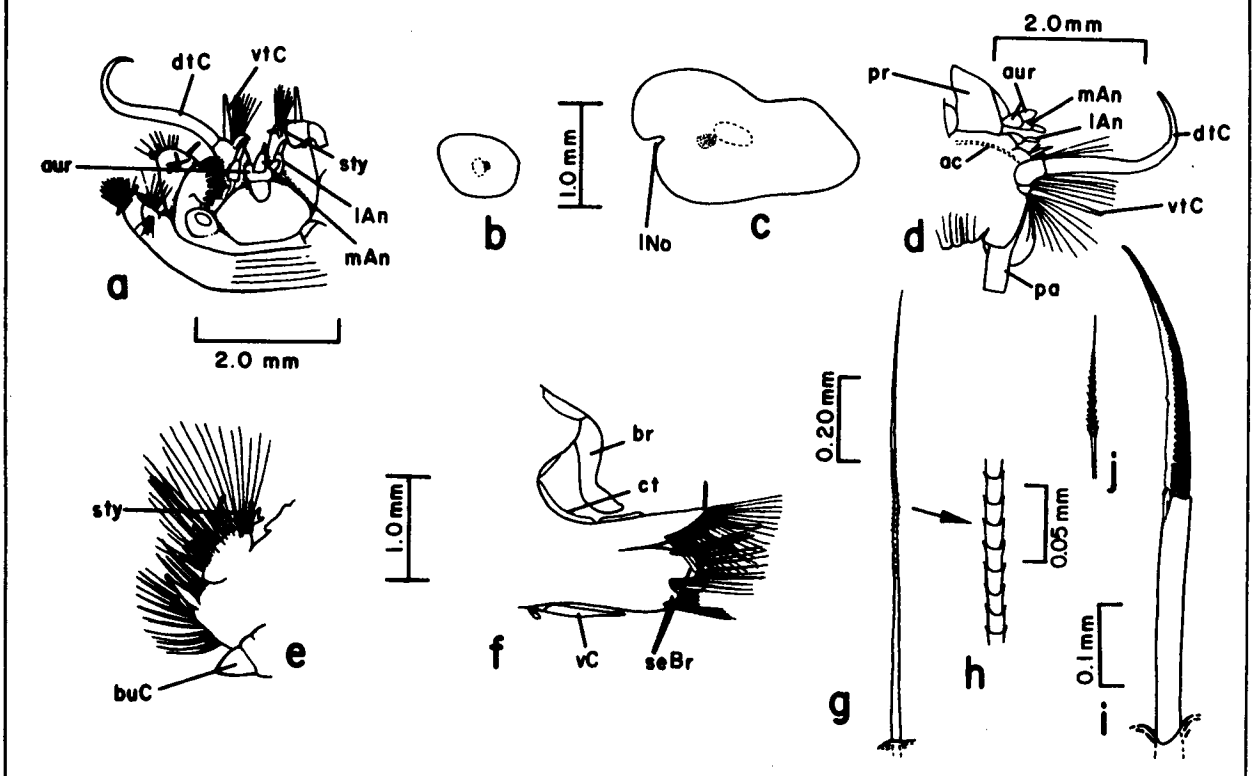

Figure 25-34. Ehlersileanira incisa: a, anterior end; b, second right elytron; c, middle left elytron; d, tentacular segment and prostomium (outer view); e, second parapodium (anterior view); f, middle parapodium (posterior view); g, notoseta from tentacular segment; h, basal portion of same; i, neuroseta from middle segment; j, simple neuroseta from same (Figures a-f, j from Pettibone 1970c, figs. 10a, 11g, i; 10c, e; 11f, d).

S. grubei (according to Nonato and Luna, 1970), appears to differ considerably in the above characters. Type material should be compared before that synonymy can be confirmed and before S. grubei can be confirmed for the Gulf of Mexico.
PREVIOUSLY REPORTED HABITAT: 22-33 m.
GULF OF MEXICO BLM-OCS OCCURRENCE: Single record off southern Florida (Figure 25-31); 24 m; silty clay.
DISTRIBUTION: Puerto Rico, Brazil; doubtful records off California, Panama, Equador; ?Gulf of Mexico.

Genus **Ehlersileanira** Pettibone, 1970

TYPE SPECIES: Sthenelais incisa Grube, 1877.
REFERENCES:
Pettibone, 1970c:19.
Fauchald, 1977a:70.
DIAGNOSIS: Three antennae; median antenna with lateral auricles; lateral antennae emerging from tentacular segment. Segment 3 without dorsal cirri or tubercles. Notosetae simple, spinous or serrate. Neuropodia with composite spinigers and some spinous simple setae; falcigers absent.

Ehlersileanira incisa (Grube, 1877)
Figures 25-33, 34a-j

Ehlersileanira incisa--Pettibone, 1970c:19, figs. 10a-g, 11a-i, 12a-l.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2536-11/77 (1 spec.); STOCS 3/II-4 4/76 (1 spec., USNM 86021).
DESCRIPTION:
Length, 95+ mm (previously reported to over 330 mm); width, to 6.0 mm (previously reported to 12.0 mm). Largest specimen incomplete with about 100 segments. Prostomium rounded anteriorly, without eyespots; median antenna short, biarticulate, with conspicuous lateral auricles (Figure 25-34a). Facial tubercle present. Elytra with smooth margins, without surface microtubercles or papillae. First two pairs of elytra rounded (Figure 25-34b), subsequent elytra becoming larger and irregularly quadrangular in shape, excavate anteriorly, with lateral notch (Figure 25-34c). Ventrum smooth. Parapodia of tentacular segment (Figure 25-34d) each with one aciculum and few stylodes; dorsal tentacular cirri much larger than ventral ones. Segment 2 (Figure 25-34e) with well-developed notopodia, numerous stylodes, and conical buccal cirri. Segment 3 similar to segment 2 except ventral cirri slightly smaller. Following parapodia (Figure 25-34f) with well-developed notopodia; stylodes present on both noto- and neuropodia. All notosetae spinous, tapering to filiform tips (Figure 25-34g,h). Neurosetae including compound, spinigerous setae with canaliculate blades (Figure 25-34i); and simple, spinous, superior setae (Figure 25-34j). Pygidium unknown.
REMARKS: The specimens from Gulf of Mexico BLM-OCS voucher material agree well with the description by Pettibone (1970c). One specimen has two median antennae, an anomalous variation.
PREVIOUSLY REPORTED HABITAT: Mud substrata, 15-930 m.

GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida and Texas (Figure 25-33); 131-189 m; clayey silt, silty clay.
DISTRIBUTION: North and South Atlantic: West Africa, South and Central America, Gulf of Mexico, Florida, West Indies; Malay Archipelago; Philippine Islands; Japan.

CHAPTER 26

Jerry M. Gathof

FAMILY CHRYSOPETALIDAE Ehlers, 1864

INTRODUCTION

Chrysopetalids are small (usually less than 50 mm), errant polychaetes with long bodies tapering slightly at both ends. Members of the family are characterized by the golden-brown, flattened setae or paleae which typically cover the dorsum, giving the whole worm a metallic appearance (Figure 26-6a). The small prostomium, sometimes retracted into the first three setigers, usually possesses two pair of eyes, and a median and two lateral antennae. Parapodia are well-developed. The larger notopodia have paleae that often extend over or meet at the dorsal midline. The paleae vary in shape from flattened or spatulate to round or awl-shaped and may be symmetrical or asymmetrical. Neurosetae include falcigerous or spinigerous compound setae. The pygidium is nondescript, often terminating in two anal cirri.

First erected by Ehlers in 1864, the family Chrysopetalidae has undergone recent revisions by Day (1967) and Orensanz (1972), who included it in the family Palmyridae. Most authors, however, prefer to maintain the separate family designation of Chrysopetalidae as used herein. Four genera and 24 species of chrysopetalids were recognized by Fauchald (1977a). Of these, two genera and three species have been identified from the Gulf of Mexico BLM-OCS material. A fourth species may be new to science.

PRINCIPAL DIAGNOSTIC CHARACTERS

The principal diagnostic characters used in the identification of chrysopetalids are position of the prostomium, shape and arrangement of the tentacular cirri, shape and ornamentation of the notosetae, and morphology of the neurosetae.

Prostomium.

The prostomium is usually small and rectangular. In some species, the prostomium is retractile and may not be visible depending on the state of contraction into the first three setigers. In most species, the prostomium is covered to a variable degree by the paleae of setigers 1 and 2, requiring their removal to properly observe this structure. Two pairs of eyes are located anteriorly on the prostomium, usually in a rectangular arrangement. A median antenna and two lateral antennae are attached at the anterior margin of the prostomium, in front of the eyes and superior to the ventral palps (Figure 26-2a).

Notosetae.

The notosetae range from cylindrical or awl-shaped setae arranged in tufts on the notopodium (i.e., Dysponetus) to broadly flattened, spatulate paleae (Figures 26-2b; 4b,c) in the genera Bhawania, Chrysopetalum and Paleanotus. In the latter, the paleae are arranged in dorsal,

transverse rows, overlapping one another posteriorly. This may provide a protective or cryptic covering over the worm.

Each palea may be provided with five or six to as many as 24 longitudinal striae on its dorsal surface with many horizontal lines as well. In some species the longitudinal striae may be enhanced by regular to irregular beading (Figure 26-4b), while in others the longitudinal striae do not extend to the distal end of the paleae, leaving a clear hyaline area near the tip (Figure 26-8c). The genera Paleanotus and Chrysopetalum have, in addition to the dorsal paleae, a group of 4-6 narrow paleae located near the dorsal cirrus and directed laterally (Figure 26-6c).

Neurosetae.

The neurosetae include compound falcigers (Figure 26-8f,g) and occasionally compound spinigers (Figure 26-8e) as well. The degree of dentition on the cutting edge of the distal blade in both forms of setae may be diagnostic in some species. Spinigers, if present, are few in number (1-3) and usually restricted to the superior position of the neuropodial fascicle.

BIOLOGICAL NOTES

Chrysopetalids are typically epibenthic, found in crevices of rocks, shells and reefs or on sandy bottoms. There are few reports of their occurrence in silty sand. Possible commensalism with scale worms and chaetopterids have also been reported (Gibbs, 1971).

Little is known about the feeding strategies within this family. Fauchald and Jumars (1979) cited chrysopetalids as being motile carnivores. Little work has been reported on the reproductive strategies of this family.

SPECIES OF CHRYSOPETALIDAE RECORDED FROM GULF OF MEXICO BLM-OCS PROGRAMS

Key to the Genera of Chrysopetalidae from the Gulf of Mexico BLM-OCS Programs

1a. Paleae concave (Figure 26-2b), strongly curved; caruncle present (Figure 26-2a). . . . . Chrysopetalum, p. 26-4

1b. Paleae convex (Figures 26-4b, 6b, 8c); caruncle usually absent (Figure 26-6a). . . . . .Paleanotus, p. 26-4

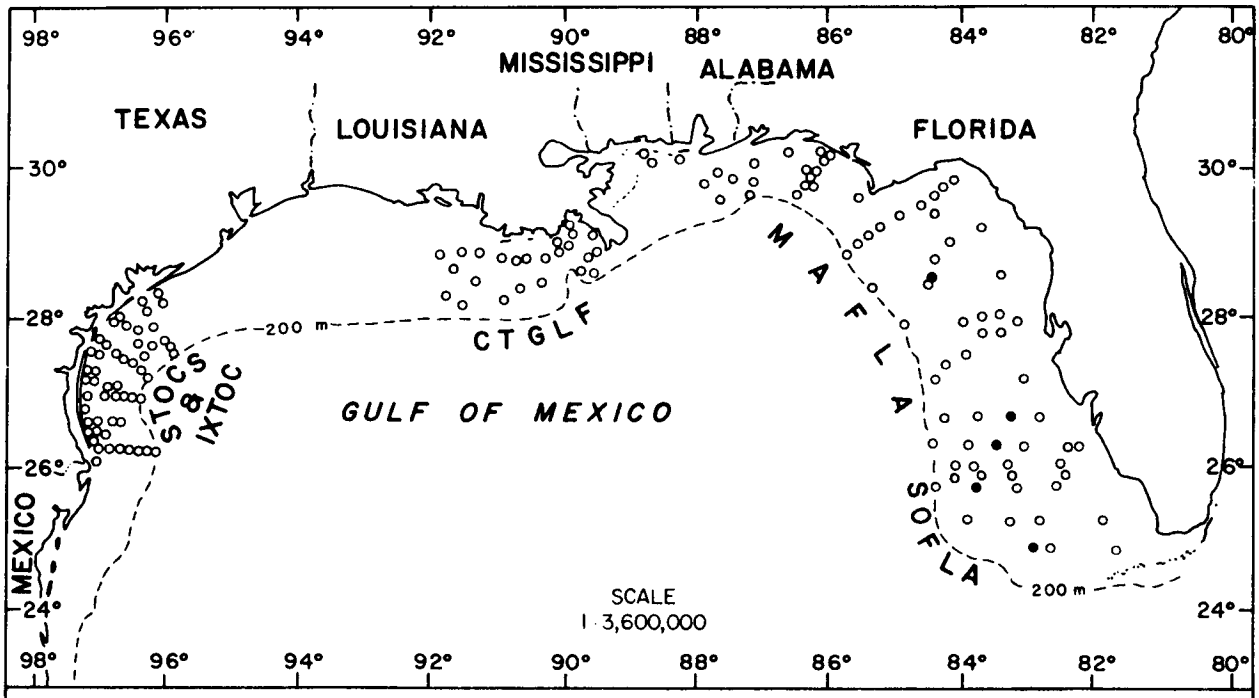

Figure 26-1. Distribution of Chrysopetalum occidentale on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

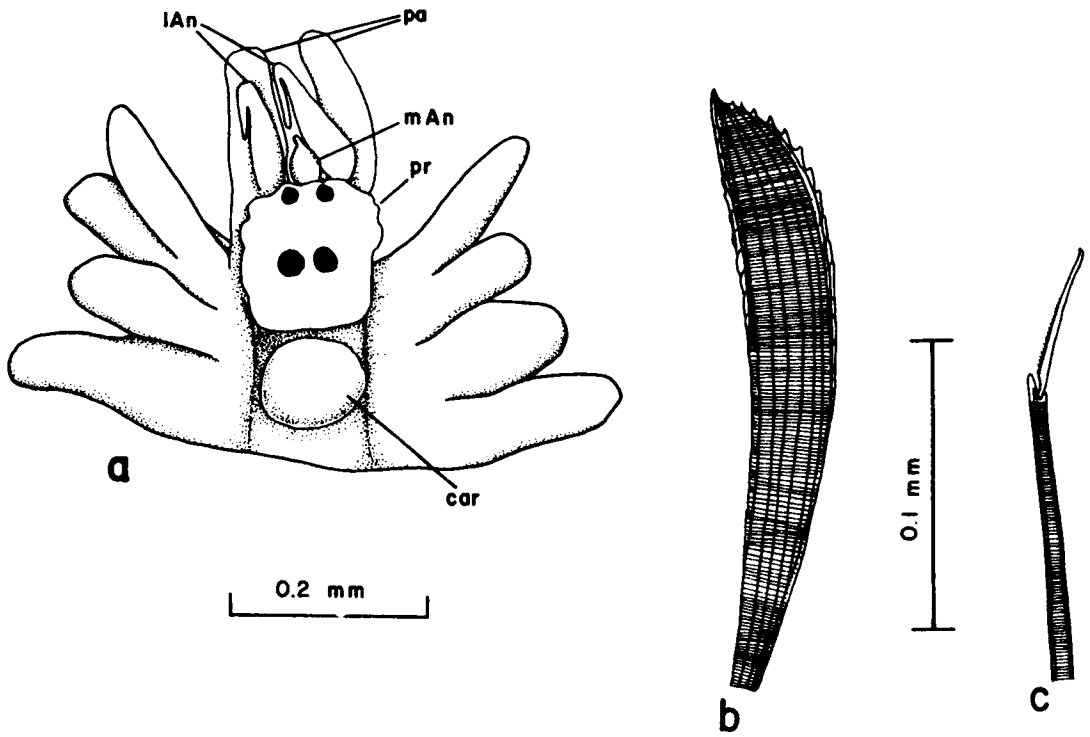

Figure 26-2. Chrysopetalum occidentale: a, anterior end, dorsal view (paleae and setae removed); b, dorsal palea; c, neuropodial falciger.

Genus **Chrysopetalum** Ehlers, 1864

TYPE SPECIES: Palmyra debilis Grube, 1855.
REFERENCES:
Ushakov, 1955:166.
Fauchald, 1977a:72.
DIAGNOSIS: Body long, tapering slightly at both ends. Paleae covering dorsum, sometimes overlapping. Prostomium small, caruncle present. Two pairs of eyes, usually in rectangular arrangement. Paleae usually strongly asymmetrical, laterally dentate, with few longitudinal striae. Neurosetae as heterogomph falcigers. Two anal cirri.

Chrysopetalum occidentale Johnson, 1897
Figures 26-1, 2a-c

Chrysopetalum occidentale Johnson, 1897:161, pl. 5, figs. 15, 16; pl. 6, figs. 17-19.
Chrysopetalum occidentale--Hartman, 1968:185, figs. 1-5.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 4A-7/81 (4 spec., USNM 90632), 28C-8/81 (2 spec., USNM 90633); MAFLA 2104J-2/78 (1 spec.), 2315A-8/76 (1 spec.), 2958E-11/77 (1 spec., USNM 75181).
DESCRIPTION:
Length, 2+ mm (previously reported to 18 mm); width, to 1 mm (previously reported to less than 1 mm). Body small, slender; largest specimen incomplete with 13 setigers. Paleae not overlapping middorsally. Prostomium longer than wide; posterior pair of eyes large. Caruncle as a rounded lobe behind prostomium (Figure 26-2a). Median antenna short, basally swollen. Lateral antennae longer than palps, approximately four times length of median antenna. Dorsal paleae concave (Figure 26-2b), strongly asymmetrical, laterally dentate with 7-8 longitudinal striae extending to tips, and many horizontal lines. Lateral paleae similar to dorsal paleae but narrower. Neurosetae (Figure 26-2c) all finely dentate falcigers, blades variable in length.
PREVIOUSLY REPORTED HABITAT: Among rock crevices, 3 m.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off west coast of Florida (Figure 26-1); 38-120 m; fine to coarse sand, silty fine sand.
DISTRIBUTION: California, western Mexico, Red Sea, Indian Ocean, Tahiti, Gulf of Mexico.

Genus **Paleanotus** Schmarda, 1861

TYPE SPECIES: Paleanotus chrysolepis Schmarda, 1861.
REFERENCES:
Day, 1967:116.
Fauchald, 1977a:72.
DIAGNOSIS: Body long, tapering at both ends. Paleae covering dorsum, sometimes overlapping. Prostomium small, may be retracted into first three setigers; caruncle present or absent. Two pairs of eyes. Segments 2 and 3 projecting anteriorly around prostomium; neurosetae absent on segment 1, present on segments 2 and 3; dorsal and ventral cirri

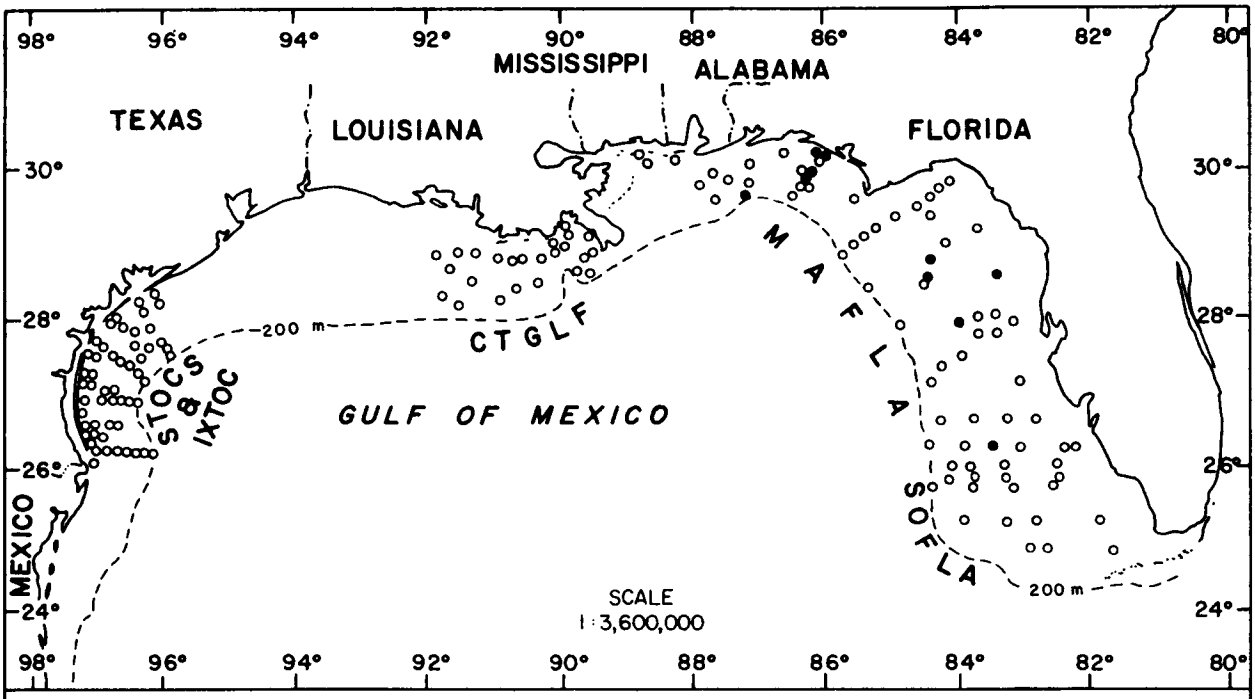

Figure 26-3. Distribution of Paleanotus chrysolepis on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

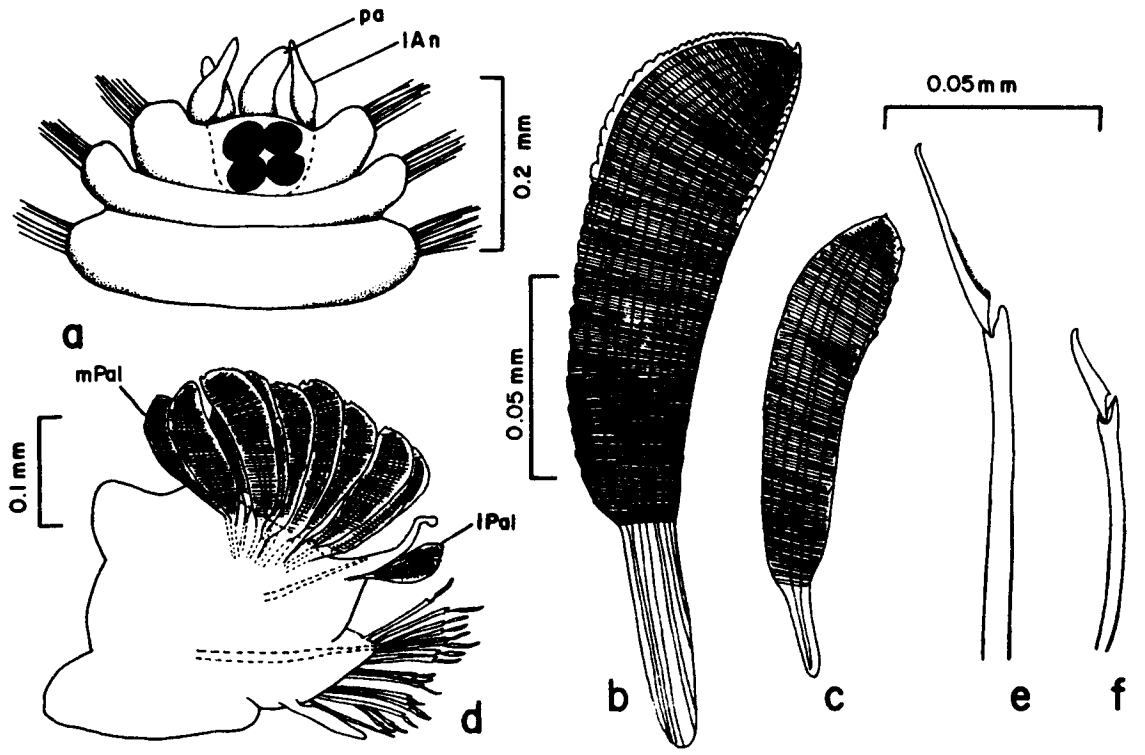

Figure 26-4. Paleanotus chrysolepis: a, anterior end, dorsal view (paleae removed); b, large dorsal palea; c, medial palea; d, parapodial cross-section showing laterally curved medial paleae; e, long-bladed superior falciger; f, short-bladed inferior falciger.

elongated to form tentacular cirri. Paleae symmetrical with numerous longitudinal striae. Neurosetae as composite spinigers and falcigers. Two anal cirri.

Key to the Gulf of Mexico BLM-OCS Species of Paleanotus

1a. Paleae asymmetrical, with apical notch (Figure 26-4b) . . . . . **.Paleanotus chrysolepis**, p. 26-6

1b. Paleae symmetrical, without apical notch. 2

2a. Longitudinal striae extending to tips of paleae (Figure 26-6b); paleae meeting middorsally to form ridge . . . . . **.Paleanotus sp. A**, p. 26-9

2b. Longitudinal striae not extending to tips of paleae, leaving a clear hyaline area near tip (Figure 26-8c); paleae not forming middorsal ridge. . . . . **.Paleanotus heteroseta**, p. 26-9

Paleanotus chrysolepis Schmarda, 1861
Figures 26-3, 4a-f

Paleanotus chrysolepis--Day, 1967:116, fig. 2.1.1,m.
Paleanotus cf. chrysolepis--Ben-Eliahu, 1976:159.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
MAFLA 2315A-11/77 (1 spec., USNM 75182), 2316C-11/77 (15 spec.).
DESCRIPTION:
Length, 4.0+ mm (previously reported to 15 mm); width, to 1.0 mm. Body small, slender; largest specimen incomplete with 35 setigers. Paleae meeting dorsally but not overlapping. Prostomium small, concealed beneath paleae and integument of setiger 1. Eyes large, all equal in size (Figure 26-4a). Palps large, equal in length to dorsal cirri of setiger 1. Dorsal paleae large with 15-17 longitudinal striae, curved toward dorsal midline, with distal tip skewed forming an apical notch (Figure 26-4b); convex dorsally with dentition strong along lateral margin, weaker along medial margin. Two to four medial paleae having 6-8 longitudinal striae, without notched tips (Figure 26-4c). Dorsal paleae curved toward midline against laterally curved medial paleae (Figure 26-4d). Lateral paleae similar to medial paleae, numbering 2-4 per fascicle. Neurosetae all falcigers, superior ones with long blades (Figure 26-4e), inferior ones with short blades (Figure 26-4f).
PREVIOUSLY REPORTED HABITAT: Intertidal and shallow water on rocks at low tide.
GULF OF MEXICO BLM-OCS OCCURRENCE: Scattered occurrences in northeastern Gulf (Figure 26-3); 22-106 m, predominately coarse sand, also silty fine sand.
DISTRIBUTION: Gulf of Elat, Red Sea, Pacific, Chile, California, Alaska, South Africa and Gulf of Mexico.

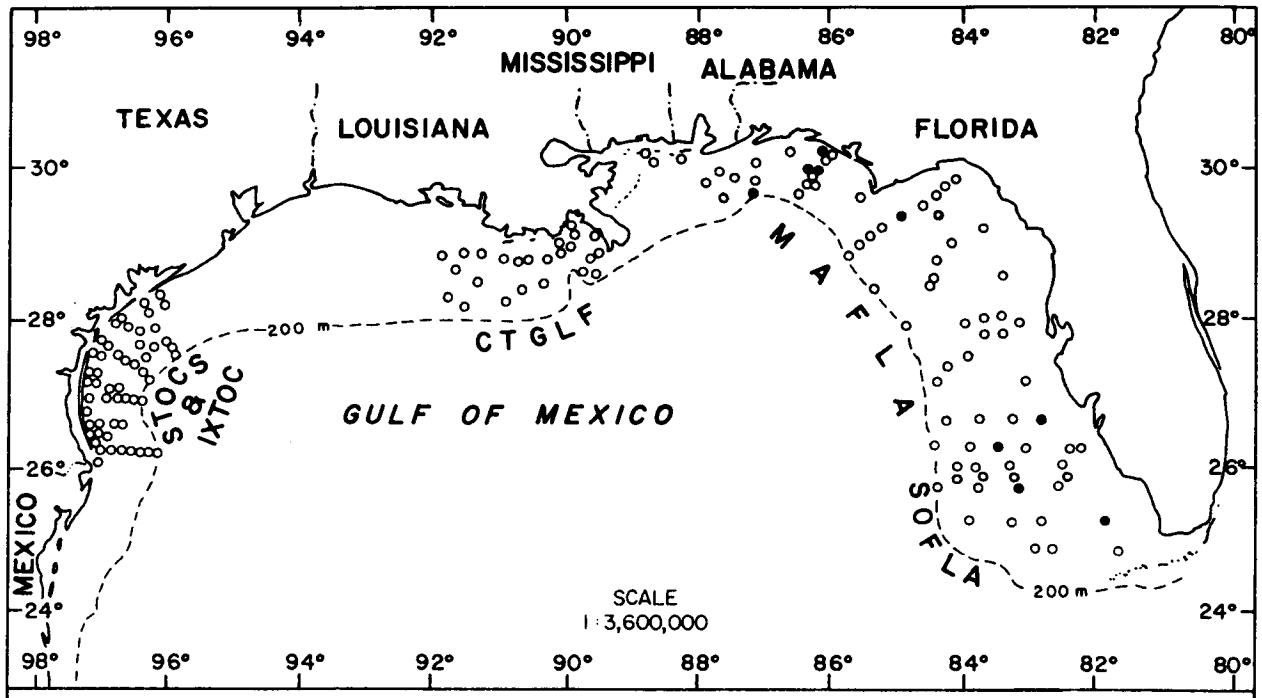

Figure 26-5. Distribution of Paleanotus sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

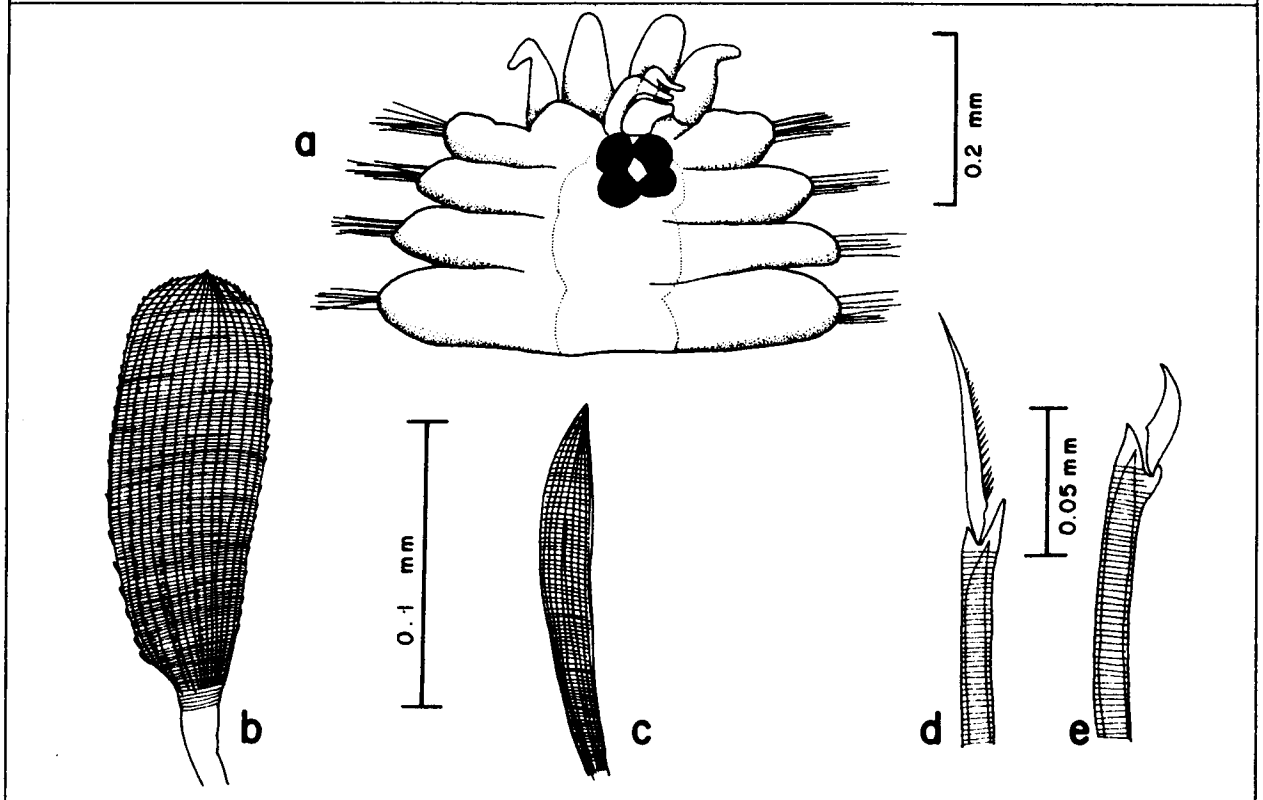

Figure 26-6. Paleanotus sp. A: a, anterior end, dorsal view (paleae removed); b, dorsal palea; c, lateral palea; d, superior neuropodial spiniger; e, inferior neuropodial falciger.

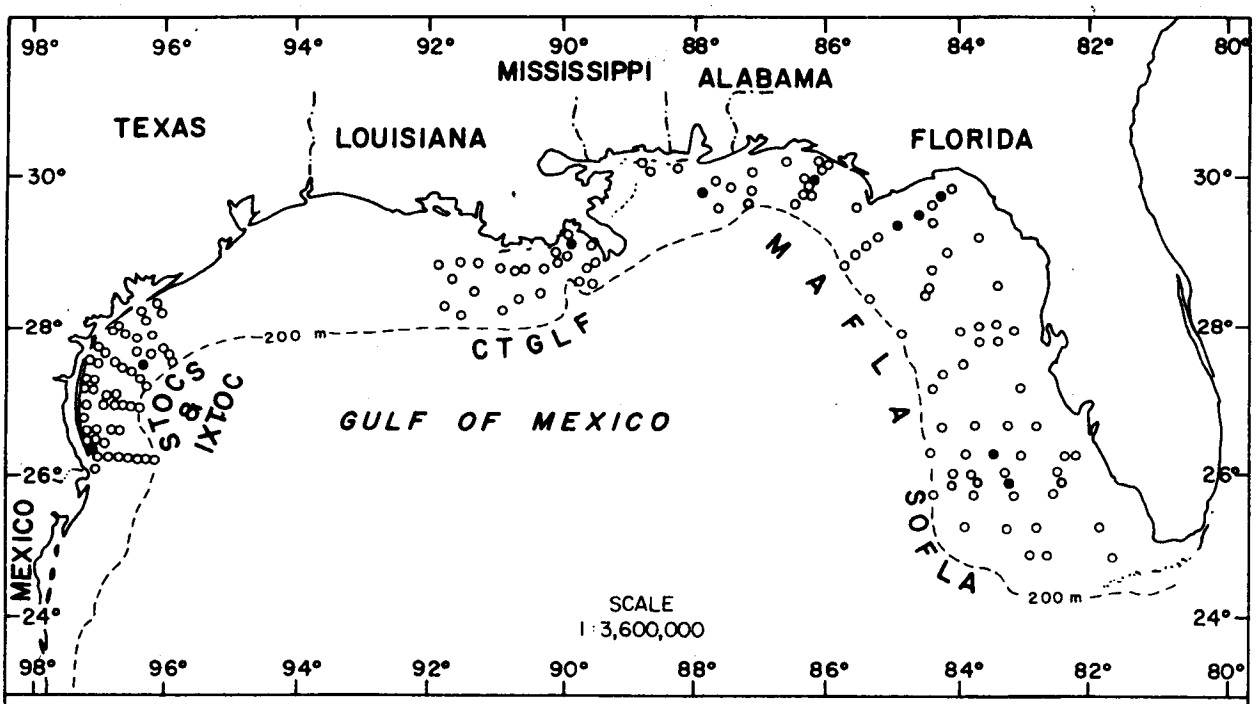

Figure 26-7. Distribution of Paleanotus heteroseta on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

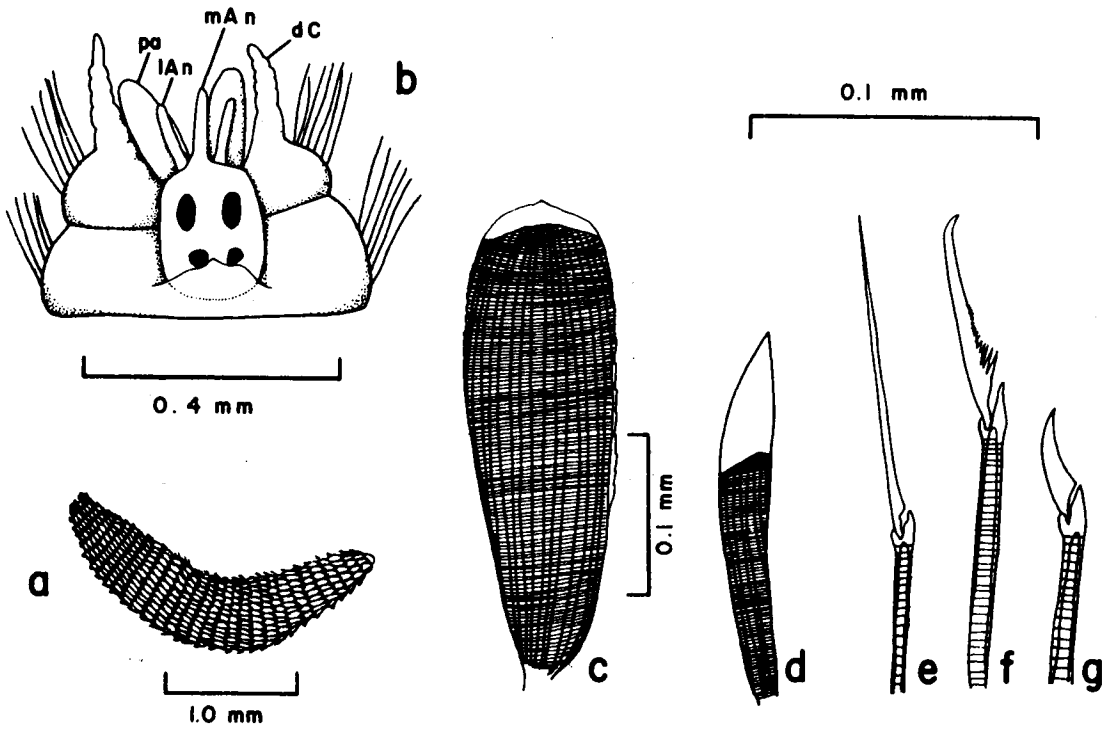

Figure 26-8. Paleanotus heteroseta: a, dorsal view of entire worm; b, anterior end, dorsal view (paleae removed); c, dorsal palea; d, lateral palea; e, superior neuropodial spiniger; f, superior neuropodial falciger; g, inferior neuropodial falciger.

Paleanotus sp. A
Figures 26-5, 6a-e

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 2-11/80 (6 spec., USNM 90634), 20-11/80 (5 spec., USNM 90635); MAFLA 2423G-7/76 (1 spec.), 2528E-2/78 (1 spec.), 2645J-2/78 (1 spec.), 2959K-11/78 (2 spec., USNM 75184).
DESCRIPTION:
Length, 4.5+ mm; width, to 1.0 mm. Body small, slender; largest specimen incomplete with 40 setigers. Paleae meeting dorsally, forming middorsal ridge, not overlapping. Prostomium small, rectangular, concealed beneath paleae of setiger 1. Eyes large, close together, all equal in size (Figure 26-6a). Palps large, equal in length to dorsal cirri of setiger 1. Dorsal paleae large, symmetrical, with 14-16 longitudinal striae (3-4 strongly beaded) and many horizontal lines extending to tips (Figure 26-6b); dentition strong along both margins. Lateral paleae similar to dorsal paleae but slightly asymmetrical, numbering 4-5 per fascicle (Figure 26-6c). Neuropodia with 2-3 superior spinigers having basally dentate blades (Figure 26-6d), and 20-25 inferior falcigers having short, smooth blades (Figure 26-6e).
REMARKS: Paleanotus sp. A differs from previously described species of the genus in having numerous longitudinal ribs extending to the tips of the paleae, along with 3-4 strongly beaded striae. This species superficially resembles Bhawania reyssi Katzmann et al., 1974, but differs from the latter in lacking serrated, long-bladed inferior falcigers.
GULF OF MEXICO BLM-OCS OCCURRENCE: Scattered occurrences in northeastern Gulf (Figure 26-5); 19-106 m; coarse to medium sand, silty fine to very fine sand.

Paleanotus heteroseta Hartman, 1945
Figures 26-7, 8a-g

Paleanotus heteroseta Hartman, 1945:12, pl. 1, figs. 1-6.
Paleanotus heteroseta--Renaud, 1956:9, fig. 5.
Paleanotus heteroseta--Gardiner, 1976:100, fig. 5f-i.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 16B-11/80 (2 spec., USNM 90636), 16C-7/81 (1 spec., USNM 90637); MAFLA 2423D-7/76 (3 spec.; 21 spec., USNM 75183), 2423F-7/76 (8 spec.), 2423G-7/76 (12 spec.); CTGLF 01-5/78 (1 spec.); STOCS SB3-8/76 (2 spec., USNM 90639); IXTOC S46-12/80 (3 spec., USNM 90638).
Supplementary Material:
North Carolina--Bogue Sound near Beaufort, intertidal shell fragments, June 1940, O. Hartman coll./ID. (AHF Poly 0091, 6 paratypes).
DESCRIPTION:
Length, to 3.6 mm (previously reported to 15 mm); width, to 0.6 mm (previously reported to 1.0 mm). Body small, slender, tapering slightly at both ends. Intersegmental pigment spots may be present laterally. Middorsum covered with overlapping paleae (Figure 26-8a). Prostomium small, longer than wide; may be withdrawn into first three setigers (Figure 26-8b). Median antenna two-thirds length of palps; lateral antennae about equal in length to median antenna. Eyes in rectangular

arrangement, anterior pair larger. Palps large, two-thirds length of dorsal cirri of setiger 1. Dorsal paleae large, symmetrical, with 18-20 longitudinal striae and many horizontal lines, faint dentition along both margins, and clear hyaline tips (Figure 26-8c). Lateral paleae asymmetrical, curved toward midline, with hyaline area near tips (Figure 26-8d). Neuropodia with 2-3 superior spinigers (Figure 26-8e), 4-5 long-bladed falcigers having long teeth basally on blades (Figure 26-8f), and about 20 falcigers having short, smooth blades (Figure 26-8g).
PREVIOUSLY REPORTED HABITAT: 20 m; on sandy and shelly bottoms and among cemented material of Petaloproctus socialis.
GULF OF MEXICO BLM-OCS OCCURRENCE: Scattered occurrences throughout northern Gulf (Figure 26-7); 14-82 m; coarse to fine-very fine sand; sandy clayey silt, silty clay.
DISTRIBUTION: North Carolina to Florida, Gulf of Mexico.

CHAPTER 27

Paul S. Wolf

FAMILY PISIONIDAE Southern, 1914

INTRODUCTION

The Pisionidae comprise a small family of polychaetes whose members are rare in occurrence and are considered well-adapted to an interstitial environment. Most species are small, measuring only 10-25 mm in length. The body is slender and thread-like with up to 100 segments. The integument is smooth, transparent, and indistinctly annulated. At first glance, the pisionids may resemble small hesionids. The most striking feature of these worms, however, is the fused head. The prostomium is reduced and surrounded by the anteriorly directed tentacular segment. The tentaculophores of the tentacular segment arise frontally, and are dorsal to a pair of long smooth palps which are sheathed basally (Figure 27-4b). Each tentaculophore bears a pair of tentacular cirri with a long, slender dorsal cirrus and a short, flask-shaped ventral cirrus. Each tentaculophore also has a stout acicular seta that projects obliquely in front of the mouth (Figure 27-2a). A single median antenna may be present. The proboscis is similar to the scale worm proboscis in being muscular, eversible, and in usually having two pairs of chitinous jaws and a ring of distal papillae. Parapodia usually have a reduced notopodium represented only by a small lobe and an internal aciculum (Figure 27-2d). The neuropodia, however, are well-developed with upper simple setae (Figures 27-2f,g; 4f) and lower compound setae (Figures 27-2h, 4g-i). All setae are absent, however, in adults of Pisionidens indica (Aiyar and Alikunhi, 1940). Dorsal and ventral cirri are usually flask-shaped and similar to each other in size except on segment 2, which has long ventral cirri (Figure 27-2b), and segment 3, which may have long dorsal cirri. In addition, a few middle segments in mature males of certain species may have copulatory organs (Figure 27-4e). On these segments the superior parts of the parapodia (i.e., the dorsal cirrus and setigerous lobes) are as in other segments, but the inferior parts include a copulatory organ bearing several lamellae, and a long ventral cirrus which may have projecting lobes. The pygidium is simple, without papillae, and has a pair of long, slender anal cirri.

Pettibone (1982:16) considered the Pisionidae as an aberrant family related to the scale worms, within the superfamily Aphroditacea. Like the scale worms, pisionids have an eversible proboscis armed with two pairs of jaws, an anteriorly directed tentacular segment bearing two pairs of tentacular cirri, and a pair of well-developed palps. The pisionids differ from scale worms in lacking elytra and in having a much-reduced prostomium. The pisionids have also developed a complex reproductive system including copulation during reproduction, which is considered by Laubier (1967b) to be a possible adaptation to an interstitial environment (see also Schroeder and Hermans, 1975:28). Indeed, pisionid morphology and reproductive strategy resemble that of the archiannelids, which are now considered to be polychaetes adapted to an interstitial environment (see Fauchald, 1977a:152).

The most recent revisions of the Pisionidae deal primarily with generic subdivisions (Siewing, 1953; Laubier, 1967c; Stecher, 1968;

Fauchald, 1977a). According to Fauchald (1977a:73), the Pisionidae include four genera and about 14 species. Of these only one genus and two species, one of which may be new to science, are represented in Gulf of Mexico BLM-OCS material.

PRINCIPAL DIAGNOSTIC CHARACTERS

Structures of the anterior region, especially those of the head, are used to characterize genera. A median antenna is present in Pisionella Hartman, 1939a, but absent in Pisionidens Aiyar and Alikunhi, 1943, Anoplopisione Laubier, 1967c, and Pisione Grube, 1857. Members of the genus Pisionidens have a pair of elongate dorsal tentacular cirri but lack ventral tentacular cirri. They also have laterally directed palps. Species of Pisione and Anoplopisione both have dorsal and ventral tentacular cirri as well as anteriorly directed palps. Anoplopisione, known for one species, A. minuta Laubier, 1967c, is the only pisionid that lacks chitinized jaws; all others possess two pairs that resemble those of scale worms.

The only pisionid genus with more than one species is Pisione. Specific characters within this genus include the length of the dorsal cirri on segment 3, the kinds and number of neurosetae, and the presence and distribution of copulatory organs on males. The length of the dorsal cirri on segment 3 may be about twice the length of the parapodia as in P. oerstedii Grube, 1857, or small and similar in shape to the dorsal cirri of the other segments as in P. remota and Pisione sp. A (Figures 27-2a, 4a).

Some species of Pisione possess only one simple seta per parapodium as in P. oerstedii and Pisione sp. A (Figure 27-4d) while others such as P. remota have two simple setae per parapodium (Figure 27-2d). The compound setae are generally falcigerous (Figure 27-2d) but may include spinigers as in P. galapagoensis Westheide, 1974, and Pisione sp. A (Figure 27-4g).

The number of male copulatory organs, when present, can be an important specific character. In P. remota there are 4-18 pairs of copulatory ogans, 3-6 pairs in P. galapagoensis, and only two pairs in Pisione sp. A. Each parapodium bearing a copulatory organ is usually modified. The ventral cirrus becomes long and slender (Figure 27-4e) and has stiff sensory hairs. In P. galapagoensis the ventral cirrus also has a pair of small lamellae, whereas in Pisione sp. A lamellae are absent (Figure 27-4e). In some species, the setigerous lobe of the parapodium is well-developed with a full complement of setae as in Pisione sp. A (Figure 27-4e). In other species, the setigerous lobe is less developed. For example, in P. alikunhii only a single compound seta is present, in P. complexa Alikunhi, 1947, the single compound seta is lost at an early stage, and in P. gopalai (Alikunhi, 1941) compound setae never appear and parapodial structures, except the acicula, are vestigial (Schroeder and Hermans, 1975:30).

The male copulatory organ itself differs specifically in its morphology. In Pisione sp. A for example, there is a broad, hammer-shaped, terminal lamella (Figure 27-4e), whereas in P. remota the copulatory organ terminates as a slender tip which also bears the tip of the gonoduct (Schroeder and Hermans, 1975:30).

In some species, such as P. gopalai, the parapodia bearing the female genital openings are also modified, each having only a dorsal cirrus and two acicula (Alikunhi, 1951).

BIOLOGICAL NOTES

The pisionids are small carnivorous worms, living primarily in sandy areas. They are highly motile, burrowing actively among the sand grains, as do the Archiannelida. Indeed, Pisionidens indica (Aiyar and Alikunhi, 1940) superficially resembles an archiannelid with its modified head, uniramous parapodia, loss of setae in the adult, and smooth integument. Its reproductive structures are also similar to the archiannelid Meganerilla clavata (Jouin, 1968; see Schroeder and Hermans, 1975:30).

In general, pisionids reproduce by copulation and this has led to the development of a complicated reproductive system involving male copulatory organs and female seminal receptacles (see Stecher, 1968; Schroeder and Hermans, 1975). Larvae are planktonic.

SPECIES OF PISIONIDAE RECORDED FROM GULF OF MEXICO BLM-OCS PROGRAMS

Genus Pisione Grube, 1857

TYPE SPECIES: Pisione oerstedii Grube, 1857.
REFERENCES:
Hartman, 1939a:90.
Day, 1967:133.
Fauchald, 1977a:73.
DIAGNOSIS: Palps and two pairs of tentacular cirri present. Antennae absent. Proboscis with two pairs of jaws. Peristomium with a pair of anteriorly directed acicular setae. All segments with parapodia and setae.

Key to the Gulf of Mexico BLM-OCS Species of Pisione

1a. Middle parapodia with two acicular setae (Figure 27-2d); compound spinigers absent. . . . . .Pisione remota, p. 27-3
1b. Middle parapodia with one acicular seta (Figure 27-4d); compound spinigers present (Figure 27-4g) . . . . . .Pisione sp. A, p. 27-7

Pisione remota (Southern, 1914)
Figures 27-1, 2a-j

Praegeria remota Southern, 1914:61, pls. 7, 8.
Praegeria remota--Fauvel, 1923:124, fig. 45a-g.

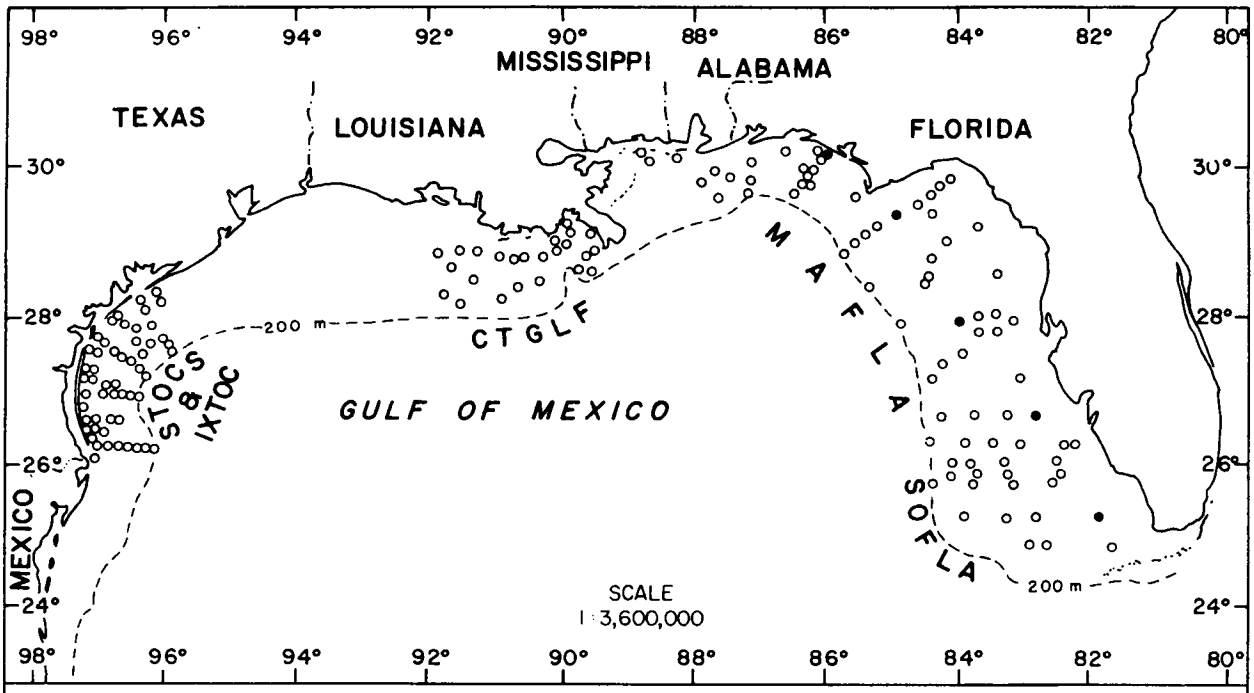

Figure 27-1. Distribution of Pisione remota on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

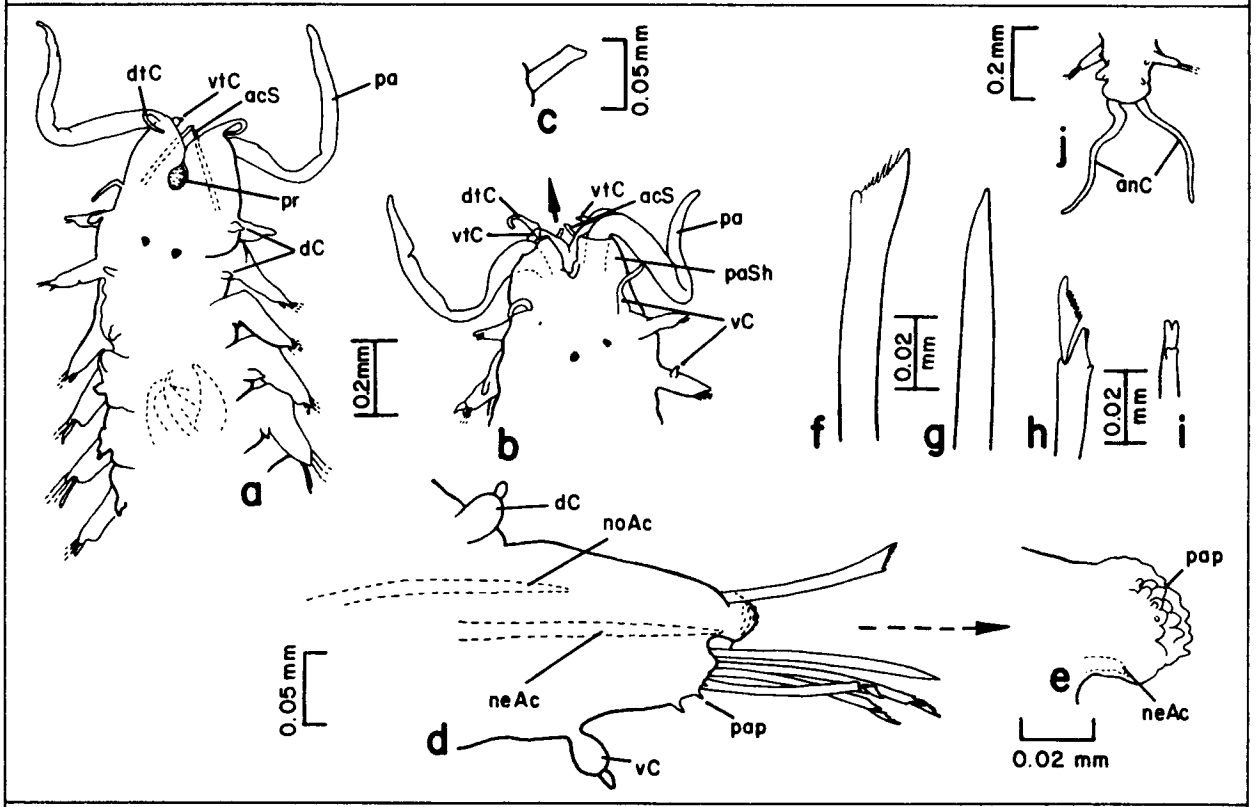

Figure 27-2. Pisione remota: a, anterior end, dorsal view; b, same, ventral view; c, peristomial acicular seta; d, middle parapodium, posterior view; e, superior neuropodial lobe from same; f, supra-acicular simple neuroseta; g, subacicular simple neuroseta; h, compound neuropodial falciger; i, shaft from same, frontal view; j, posterior end, dorsal view.

Pisione remota--Hartman, 1968:181, figs. 1-5.
Pisione remota--Hartmann-Schröder, 1971:88, fig. 29a-e.
Pisione remota--Day, 1973:14, fig. 2k-o.
Pisione remota--Gardiner, 1976:99, fig. 4t-x.

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 2-11/80 (1 spec., USNM 86836), 20E-8/81 (3 spec., USNM 86835); MAFLA 2211G-6/76 (2 spec.), 2423B-7/76 (4 spec., USNM 86837), 2423D-7/76 (1 spec.), 2423E-7/76 (1 spec.), 2423G-7/76 (1 spec.), 2423H-7/76 (2 spec.), 2423I-7/76 (9 spec., USNM 86838), 2529F-7/76 (2 spec.).
DESCRIPTION:
Length, to 7.5 mm (previously reported to 60 mm); width, to 0.6 mm. Largest specimen complete with 41 segments. Prostomium (Figure 27-2a) inconspicuous, greatly reduced and surrounded by large peristomium. Palps long, tapered, smooth, emerging below pair of tentacular cirri (Figure 27-2b). Dorsal tentacular cirri long, slender; ventral tentacular cirri minute, biarticulate (Figure 27-2a,b). Peristomial acicular setae with oblique flange (Figure 27-2a,c). Paired, subepidermal eyes present in segment 2 or 3. Two pairs of jaws visible within segments 4-5 when fully retracted (Figure 27-2a). Small biarticulate dorsal cirri present throughout from segment 2 (Figure 27-2a,d). Ventral cirri long and slender on segment 2 (Figure 27-2b), similar to dorsal cirri in size and shape from segment 3 (Figure 27-2d). Notopodia represented only by internal acicula (Figure 27-2d). Neuropodia well-developed with superior papillose lobe (Figure 27-2d,e), and inferior setigerous lobe bearing minute, slender papillae (Figure 27-2d). Each neuropodium with one supra-acicular simple seta having oblique, dentate tip (Figure 27-2f); one subacicular simple seta having smooth, pointed tip, beginning on segments 9-12 (Figure 27-2g); and three subacicular compound falcigers having dentate blades of equal length (Figure 27-2h). Shaft head of compound setae with bifid upper tine and bifid subdistal boss visible when viewed frontally (Figure 27-2i). Pygidium with pair of long anal cirri (Figure 27-2j).
REMARKS: The specimens examined herein did not possess either gametes or the copulatory organs which should be present on mature males of Pisione remota. It is possible that all the specimens from Gulf of Mexico BLM-OCS material are either females or juveniles. Indeed, Day (1973), whose specimens of P. remota represented the first record of the species on the Atlantic coast of the United States, reported his specimens as juveniles up to 15 mm long. It is also possible that all reports of P. remota from the southeastern United States represent a new species differing from P. remota in lacking copulatory organs. Until more material can be examined, the specimens herein are referred to P. remota, since all other characters match that species quite well.
PREVIOUSLY REPORTED HABITAT: Sandy substrata; 10-200 m.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida (Figure 27-1); 19-43 m; coarse to medium sand, silty fine sand.
DISTRIBUTION: Ireland, English Channel, Mediterranean, North Carolina, Gulf of Mexico, southern Califonia, Pacific coast of Mexico.

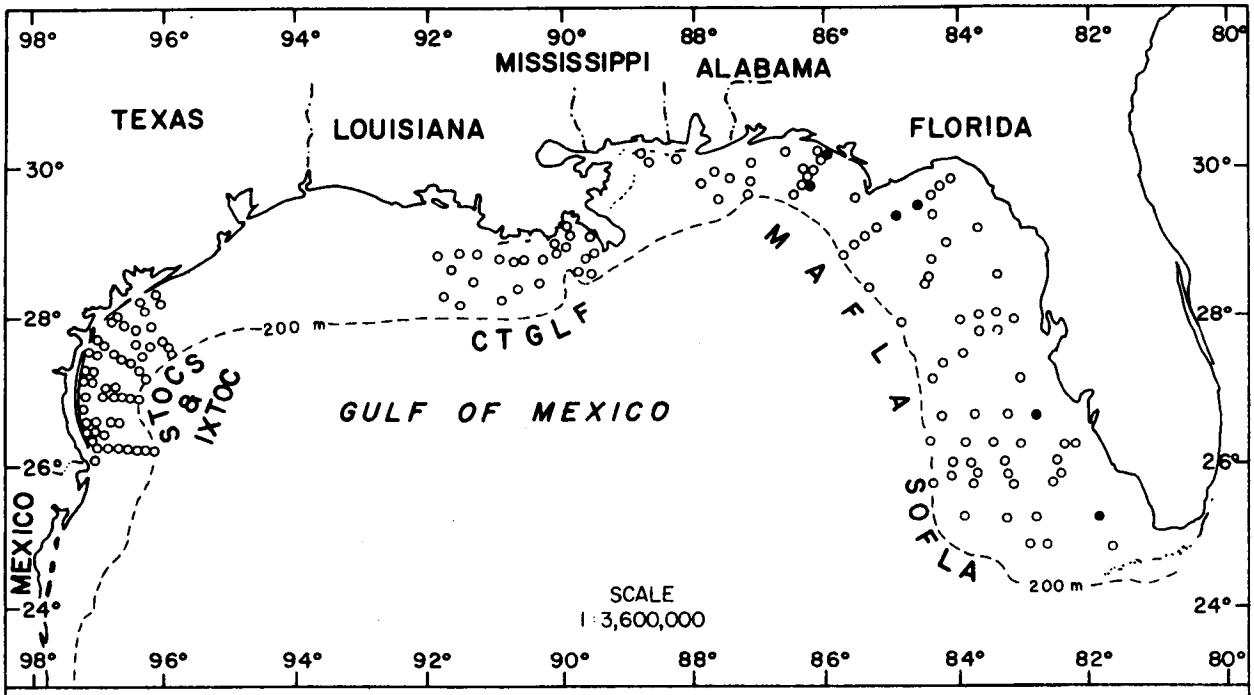

Figure 27-3. Distribution of Pisione sp. A on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs.

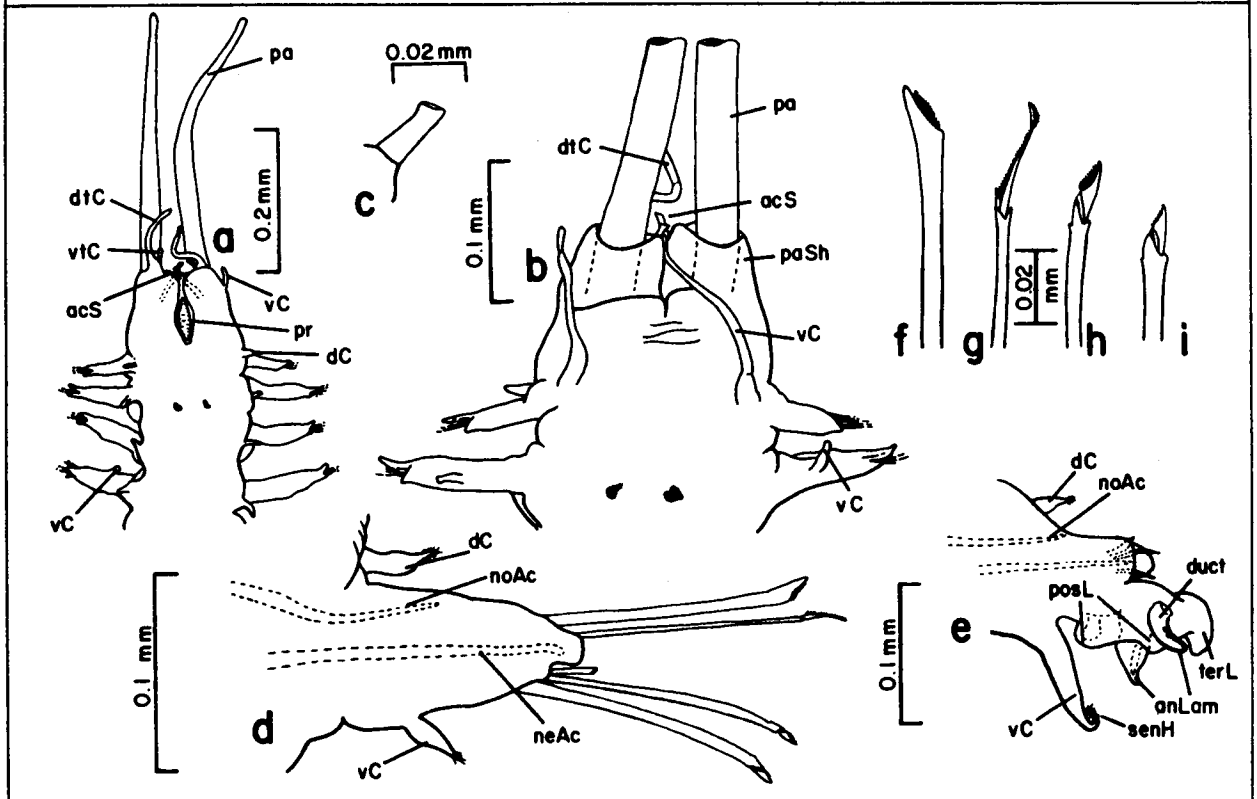

Figure 27-4. Pisione sp. A: a, anterior end, dorsal view; b, same, ventral view; c, peristomial acicular seta; d, middle parapodium, posterior view; e, 26th parapodium, posterior view; f, supra-acicular simple neuroseta; g, compound neuropodial spiniger; h, i, compound neuropodial falcigers.

Pisione sp. A
Figures 27-3, 4a-i

MATERIAL EXAMINED:
Gulf of Mexico BLM-OCS:
SOFLA 2-11/80 (6 spec., USNM 86833), 20E-8/81 (3 spec., USNM 86832); MAFLA 2422H-6/76 (1 spec.), 2423F-7/76 (1 spec., USNM 86834), 2423I-7/76 (1 spec.), 2529F-6/75 (6 spec.), 2534C-6/75 (1 spec.).
DESCRIPTION:
Length, to 8.0 mm; width, to 0.4 mm. Largest specimen complete with 52 segments. Prostomium (Figure 27-4a) long, tapered at both ends, surrounded by large peristomium. Palps long, tapered, smooth, emerging below paired tentacular cirri (Figure 27-4b). Dorsal tentacular cirri long, slender, distally biarticulate; ventral tentacular cirri minute, biarticulate (Figure 27-4a). Peristomial acicular setae enlarged distally with asymmetrically excavate margin bearing a rounded keel (Figure 27-4c). Two pairs of coalesced subepidermal eyes present in segment 2 or 3. Two pairs of jaws visible within segments 4-5 when fully retracted. Small dorsal cirri present from segment 2 (Figure 27-4a); each with slender, pointed tip bearing several minute filaments (Figure 27-4d). Ventral cirri long and slender on segment 2 (Figure 27-4b); similar to dorsal cirri in size and shape from segment 3 (Figure 27-4d). Notopodia represented only by internal acicula (Figure 27-4d,e). Neuropodia well-developed with superior long, smooth lobe (Figure 27-4d). Segments 25-26 or 26-27 of mature males with ventral copulatory organs and long ventral cirri bearing stiff sensory hairs (Figure 27-4e). Each organ with two broad posterior lamellae; two anterior lamellae; and broad, hammer-shaped, terminal lamella. Distalmost anterior lamella with slightly chitinized and curved internal channel or duct (Figure 27-4e). Each neuropodium with one supra- acicular simple seta having dentate, oblique tip (Figure 27-4f); one supra-acicular spiniger having twisted, dentate blade (Figure 27-4g); and three compound subacicular falcigers having short, dentate blades grading slightly in length (Figure 27-4h,i). Shaft-heads of compound spinigers with stout, biarticulate upper tine (Figure 27-4g). Shaft-heads of compound falcigers with bifid upper tine and bifid subdistal boss visible when viewed frontally. Pygidium with pair of long anal cirri.
REMARKS: Pisione sp. A is most similar to P. galapagoensis Westheide, 1974, differing primarily in the form of the copulatory organs. Also, Pisione sp. A has only two pairs of copulatory organs instead of 3-6 pairs as in P. galapagoensis.
GULF OF MEXICO BLM-OCS OCCURRENCE: Off Florida (Figure 27-3); 19-73 m; coarse to medium sand, silty fine sand.

The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

The Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Minerals Revenue Management** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.