

Additions to the Family
Eulepethidae Chamberlin
(Polychaeta: Aphroditacea)

MARIAN H. PETTIBONE

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SMITHSONIAN CONTRIBUTIONS TO ZOOLOGY • NUMBER 441

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SMITHSONIAN INSTITUTION PRESS

City of Washington

1986

ABSTRACT

Pettibone, Marian H. Additions to the Family Eulepethidae Chamberlin (Polychaeta: Aphroditacea). *Smithsonian Contributions to Zoology*, number 441, 51 pages, 42 figures, 1986.—The previous revisionary study of the family Eulepethidae by Pettibone (1969) is supplemented, based on additional available material, including young stages. Two new genera, five new species, and two new combinations are added to the family.

OFFICIAL PUBLICATION DATE is handstamped in a limited number of initial copies and is recorded in the Institution's annual report, *Smithsonian Year*. SERIES COVER DESIGN: The coral *Montastrea cavernosa* (Linnaeus).

Library of Congress Cataloging in Publication Data

Pettibone, Marian H.

Additions to the family Eulepethidae Chamberlin (Polychaeta: Aphroditacea).

(Smithsonian contributions to zoology ; no. 441)

Bibliography: p.

Supt. of Docs. no.: SI 1.27:441

1. Eulepethidae—Classification. 2. Annelida—Classification. I. Title. II. Series.

QL1.S54 no. 441 [QL391.A6] 591 s [595.1'47] 86-600055

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Additions to the Family Eulepethidae Chamberlin (Polychaeta: Aphroditacea)

Marian H. Pettibone

Introduction

Based on additional available material from various sources, the present paper supplements my previous revisionary study on the family Eulepethidae, a member of the superfamily Aphroditacea (Pettibone, 1969). The collection of some younger stages showed differences from the adults such that they did not fit into the keys provided for the separation of the species.

Four genera, 11 species, and one questionable eulepethid were covered by Pettibone (1969) in this relatively small family of scale worms. Ushakov (1972) extended the range and included additional figures for the type genus and species of the family, *Eulepethus hamifer* (Grube). Imajima (1974) added a new genus and species from Japan, *Japoeulepis amioi*; it is referred herein to *Mexieulepis* Rioja and *M. amioi* (Imajima), new combination. Two new genera are added. The new genus *Proeulepethus* includes a new species from the Virgin Islands, *P. clarki*, and *P. challengeriae* (McIntosh, 1885), new combination; the eulepethid that was considered to be a questionable genus and species by Pettibone (1969:43). The new genus *Lamelleulepethus*, with two new

species from Uruguay (*L. orensanzi*) and Bimini (*L. biminiensis*), introduces a new character in the family: the presence of large ventral lamellae on the middle region of the body, recalling the ventral lamellae in some members of the Polynoidae, such as *Gastrolepidia* and *Paralepidonotus*. Two new species of *Grubeulepis* Pettibone are added, making a total of nine species in the genus.

Numerous specimens of eulepethids from the Gulf of Mexico were available for study through Barry A. Vittor and Associates, Inc. (BVA), collected by the Southwest Florida Ecosystem Study (SOFLA), by the Mississippi-Alabama-Florida Outer Continental Shelf Study (MAFLA), and by the IXTOC Oil Spill Assessment Study (IXTOC). These collections were covered in the publication on the family Eulepethidae by Joan M. Uebelacker (1984), with some preliminary identifications. Additional specimens from Barry A. Vittor and Associates were collected in the Gulf of Mexico by the Army Corp of Engineers (COE) in March 1981, and by the Environmental Protection Agency (EPA) in November 1983. In addition, specimens were collected by Nancy Rabalais of the University of Texas.

Specimens from Puerto Rico were collected during the Baseline Oceanographic Study near the Ocean Outfall Pipeline in 1974, through B.

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Mayo, by Debbie Arneson of the University of Puerto Rico at Mayaguez, and by Interstate Electronics Corporation (IEC) and Science Application, Inc. (SAI) through Barry A. Vittor and Associates (BVA). Specimens from waters off North Carolina were collected by M. Cerame-Vivas, Roland Wigley, Gary R. Gaston, and Donald W. Weston; from Uruguay by José Orensanz; and from the Adriatic by Werner Katzmann. Meredith L. Jones was responsible for collections from Key West, Florida; Belize; Venezuela; Bimini, the Bahamas; and Panama.

Except for the ones retained by Barry A. Vittor and Associates (BVA) in Mobile, Alabama, all specimens are deposited in the Smithsonian Institution (USNM).

ABBREVIATIONS USED IN THE FIGURES.

| | |
|------|---------------------------|
| br | branchia |
| buC | buccal cirrus |
| dC | dorsal cirrus |
| dTc | dorsal tentacular cirrus |
| elph | elytrophore |
| lAn | lateral antenna |
| mAn | median antenna |
| mLo | medial lobe |
| nuO | nuchal organ |
| pa | palp |
| pLa | posterior dorsal lamella |
| vC | ventral cirrus |
| vLa | ventral lamella |
| vLo | ventral lobe |
| vTc | ventral tentacular cirrus |

ACKNOWLEDGMENTS.—I am grateful to the numerous collectors mentioned above for the material on which this study is based. The manuscript benefited from the suggestions of Joan M. Uebelacker and Kristian Fauchald.

Family EULEPETHIDAE Chamberlin, 1919

EULEPIDINAE Darboux, 1900.

PAREULEPIDAE Hartman, 1939.

TYPE GENUS.—*Eulepis* Grube, 1875, preoccupied; = *Eulepethus* Chamberlin, 1919.

The head ends of the eulepethids are withdrawn and wedged between the anterior few segments of the body. They are composed of a

small globular prostomium with three small antennae and a pair of long smooth palps, a modified first or tentacular segment with tentaculophores lateral to the prostomium, each bearing two bundles of setae, and dorsal and ventral tentacular cirri, along with a pair of club-shaped nuchal organs (Figures 16A,B, 33E,F, 36F,G). The second and third segments contribute to the lateral and posterior lips of the ventral mouth, with elongate buccal cirri on segment 2 (Figure 33E,G; Pettibone, 1969, fig. 6b). When extended, the distal end of the strong muscular pharynx is encircled with soft papillae (up to 17 pairs; Figure 36F) and two pairs of plate-like jaws (similar to those found in the Aphroditidae; Pettibone, 1969, fig. 11e,f).

All genera have 12 pairs of elytra, firmly attached on stout elytrophores, on segments 2, 4, 5, 7, continuing on alternate segments to 21 and 24. The elytra increase in length posteriorly, the 12th pair being extremely elongated and subrectangular (Figures 7A–F, 33A–D). Two pairs of small subulate dorsal cirri are attached posterior to the notopodia on segments 3 (wedged between the large elytrophores of segments 2 and 4) and 6 (Figures 16A,F, 36F, 37C,F). Large branchiae (modified dorsal tubercles) are found on segments 6, 8, alternate segments to 22, 23, 25–28 (Figures 25B, 28B). In the posterior region of the more elongated genera (up to 70 segments, including *Eulepethus* and *Mexieulepis*), additional small elytra are attached along their anterior borders to the elytrophores; they occur on all the postbranchial segments (Pettibone, 1969, figs. 3d, 11b–d). In the posterior region of the shorter-bodied genera (up to 40 segments, including *Pareulepis*, *Grubeulepis*, *Proeulepethus*, and *Lamelleulepethus*), beginning on the postbranchial segments and continuing posteriorly, the elongate dorsal tubercles are provided with flattened, oval to conical dorsal lamellae (Figures 10A,B, 28E). A unique feature in the family is found in the new genus *Lamelleulepethus*, where large ventral lamellae occur on the ventrolateral sides of the middle segments of the body (Figures 7G, 9A,B, 12B,C). Otherwise, it agrees with *Grubeulepis*.

The elytral surfaces are smooth, except some-

times for scattered microtubercles. The first elytra may have papillae on the anterior border or lack them. The lateral borders of the elytra may be entire (*Proeulepethus*, Figure 16H), notched (*Eulepethus*, *Pareulepis*, Pettibone, 1969, figs. 3a-c, 4g-i), or fimbriated (*Mexieulepis*, *Grubeulepis*, *Lamelleulepethus*, Figures 7B-F, 36B-E). The lateral processes of the fimbriated elytra may be entire (Figure 36B-E), articulated or with terminal buds (Figure 7B-F). At least in some species, there appear to be some changes in the lateral processes during development from the juvenile to the adult, with the terminal buds or articulations present in the juveniles (Figure 39B-G) and absent or nearly absent in the adults (Figure 36B-E). Additional observations will be needed to determine the variability of this character in the different species. The juveniles not only have fewer total segments than the adults but the elytra gradually increase in length posteriorly during development, as indicated by the shorter

lengths of the posterior elytra in the juveniles (Figure 39A-G) in comparison to the adults (Figure 36A-E).

The characteristic biramous parapodia of the eulepethids have smaller notopodia, supported by a hooked-tipped notoaciculum, with capillary and stout hooked notosetae; the larger neuropodia, supported by a neuroaciculum with a distal hammer-shaped plate, have upper pectinate setae and limbate and non-limbate capillaries (Figure 18A-E). Additional smooth acicular neurosetae may be present in some segments, particularly in segment 3 (Figure 33H,K). The acicular neurosetae may be more numerous in juveniles, where they are often denticled and not smooth, as in the adults (Figure 3D,G). The setae of the posterior lamelligerous parapodia are usually somewhat modified (Figure 13A-D). The anterior few ventral cirri are short and tapered (Figure 33H); those following are globular, with filamentous tips (Figure 34D,E).

Key to the Genera of Eulepethidae

1. Elytra more than 12 pairs, anterior 12 pairs increasing in length progressively, followed by smaller pairs of elytra continuing to posterior end [Pettibone, 1969, figs. 3a-d, 11a-d; Imajima, 1974, fig. 1a-f] 2
 - Elytra 12 pairs, increasing in length progressively, followed by smaller foliaceous lamellae [Figures 7A,F, 10A,B, 27A,F, 28E] 3
2. Anterior 12 pairs of elytra with lateral borders notched; posterior small elytra with entire margins [Pettibone, 1969, fig. 3a-d]
 - *Eulepethus* Chamberlin
 - Anterior 12 pairs of elytra with lateral borders fimbriated; posterior small elytra with margins fimbriated or entire [Pettibone, 1969, fig. 11a-d; Imajima, 1974, fig. a-f] *Mexieulepis* Rioja (= *Japoulepis* Imajima)
3. Large ventral lamellae on bases of neuropodia of segments 7 to 26-28 [Figures 9A,B, 12B,C, 14A] *Lamelleulepethus*, new genus
 - Without ventral lamellae on bases of neuropodia 4
4. Elytra with lateral borders entire [Figure 16H]
 - *Proeulepethus*, new genus
 - Elytra with lateral borders notched [Pettibone, 1969, figs. 4g-i, 9c,d] *Pareulepis* Darboux
 - Elytra with lateral borders fimbriated [Figure 27A-F] *Grubeulepis* Pettibone

Genus *Eulepethus* Chamberlin, 1919

Eulepethus Chamberlin, 1919. [New name for *Eulepis* Grube, preoccupied. Gender: masculine.]

Eulepis Grube, 1875. [Type-species: *E. hamifera* Grube, 1875, by monotypy. Gender: feminine. Preoccupied by *Eulepis* Billberg, 1820 (Lepidoptera).]

DIAGNOSIS.—Body elongate, segments about 60 (up to 70). Elytra numerous pairs; first 12 pairs larger, with lateral notch, on segments 2, 4, 5, 7, alternate segments to 21, 24; smaller elytra with margins entire, on all segments beginning with segment 28. Dorsal cirri on segments 3 and 6. Branchiae 12 pairs, on segments 8, 10, alternate segments to 22, 23, 25, 26, 27.

The genus is represented by a single species.

***Eulepethus hamifer* (Grube, 1875)**

Eulepis hamifer Grube, 1875:71.

Eulepethus hamifer.—Pettibone, 1969:5–8, figs. 1–3 [synonymy].—Uschakov, 1972:329–333, pl. 1A–L.

REMARKS.—Based on additional material in the Academy of Sciences of the USSR, Uschakov (1972) extended the known range of the species from the Philippine Islands, Indochina (Annam), in 80 meters, to include Tonkin Gulf, East China Sea, and Malacca Gulf, in 10–60 meters. Uschakov included a full description and figures of

a specimen from the Tonkin Gulf. He reported large eggs present in the cavities of the elytraphores in two specimens from the Tonkin Gulf. Uschakov referred to the small posterior elytra from segment from 28 on as pseudelytra.

Genus *Mexieulepis* Rioja, 1961

Mexieulepis Rioja, 1961. [Type-species: *M. elongatus* Rioja, 1961, by original designation and monotypy. Gender: feminine. = *M. weberi* (Horst, 1922).—Pettibone, 1969:12.

Japoeulepis Imajima, 1974. [Type-species: *J. amioi* Imajima, by original designation and monotypy. Gender: feminine.]

DIAGNOSIS.—Body elongate, segments about 50 (37–62). Elytra numerous pairs; first 12 pairs larger, on segments 2, 4, 5, 7, alternate segments to 21, 24, with lateral margins fimbriated; smaller elytra on all segments beginning on segment 27 or 28, with lateral margins fimbriated or entire. Dorsal cirri on segments 3 and 6. Branchiae 11–12 pairs, on segments 8, 10, alternate segments to 22, 23, 25, 26 (27).

Japoeulepis was separated from *Mexieulepis* based on a slightly different type of fimbriated margins on the anterior 12 pairs of larger elytra and having only smooth margins on the small posterior elytra, instead of fimbriated or slightly notched.

Key to the Species of *Mexieulepis* Rioja

- Larger anterior fimbriated elytra with numerous, small lateral processes; posterior smaller elytra with lateral margins fimbriated or slightly notched [Pettibone, 1969, fig. 11a–d]. With acicular neurosetae beginning on segment 3 [Pettibone, 1969, figs. 11k, 12a,b,f]. Posterior parapodia with upper group of neurosetae stout, acicular, and bent downward [Pettibone, 1969, fig. 14a,c] *M. weberi* (Horst)
- Larger anterior fimbriated elytra with few, wide lateral processes; posterior smaller elytra with lateral margins entire [Imajima, 1974, fig. 1c–f]. Without acicular neurosetae. Posterior parapodia without stout acicular neurosetae *M. amioi* (Imajima)

***Mexieulepis amioi* (Imajima, 1974), new combination**

Japoeulepis amioi Imajima, 1974:58, fig. 1a-v.

REMARKS.—In the description of *M. amioi* from Japan, Imajima incorrectly reported both dorsal cirri and small branchiae on segment 6 (it could not have both); it should be corrected to dorsal cirri on segments 3 and 6 and branchiae 12 pairs, instead of 13, beginning on segment 8, not 6.

***Mexieulepis weberi* (Horst, 1922)**

FIGURES 1-6

Eulepis weberi Horst, 1922:199, fig. 2.

Mexieulepis weberi.—Pettibone, 1969:18, figs. 11-14 [synonymy].—Uebelacker, 1984:24-3, figs. 24-1, 2a-n.

Pareulepis fimbriata.—Rullier, 1974:21 [not Treadwell, 1901].

MATERIAL EXAMINED.—*North Atlantic off North Carolina*: 14 miles E of Cape Lookout, 20 m, Jun, Aug 1977, D.W. Weston, 4 juveniles (USNM 67487). 33°49'N, 78°23'W, Aug 1977, G.R. Gaston, juvenile (USNM 56536). 33°50'N, 78°24'W, 11 m, R/V *Pierce* sta 1A, 9 Feb 1977, juvenile (USNM 60399).

Off South Carolina: 32°57'N, 79°17'W, 12 m, R/V *Pierce* sta 2A, 12 Feb 1977, 1 specimen (USNM 60928).

Off Georgia: 31°25'N, 81°06'W, 11 m, Sep 1970, A.S. Leiper, juvenile (USNM 67064). 30°59'N, 80°08'W, R/V *Pierce* sta 5G, 46 m, 1 May 1977, juvenile (USNM 60400). 31°01'N, 80°17'W, 40 m R/V *Pierce* sta 5F, 30 Aug 1977, 1 specimen (USNM 61097); 24 Nov 1977, juve-

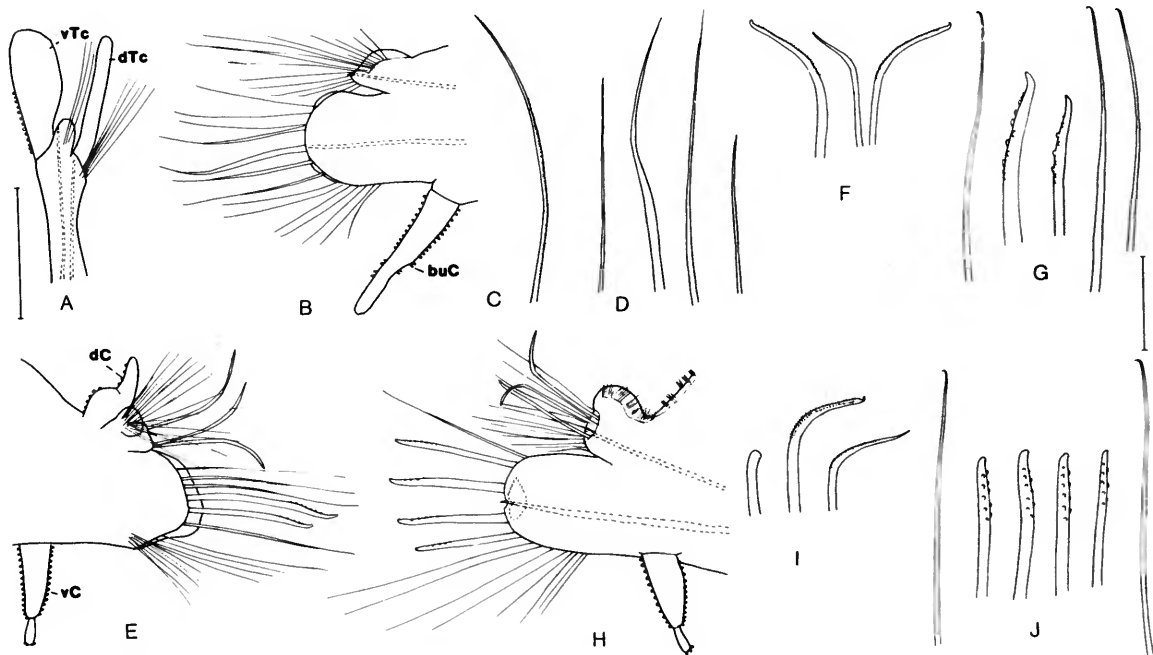


FIGURE 1.—*Mexieulepis weberi*, juvenile of 22 segments from waters off Georgia (USNM 67064): A, right tentacular parapodium, inner view, acicula dotted; B, right elytrigerous parapodium of segment 2, anterior view, acicula dotted; C, stout capillary notoseta from same; D, upper, 2 middle, and lower neurosetae from same; E, right cirriferous parapodium of segment 3, posterior view; F, notopodial hooks from same; G, upper, middle and lower neurosetae from same; H, right elytrigerous parapodium of segment 4, anterior view, acicula dotted; I, notopodial hooks from same; J, upper, middle, and lower neurosetae from same. (Scales = 0.2 mm for A,B,E,H; 0.1 mm for C,D,F,G,I,J.)

nile (USNM 60401). 31°03'N, 80°26'W, 34 m, R/V *Pierce* sta 5E, 24 Nov 1977, juvenile (USNM 60398).

Off Florida: Fleming Key, Key West, 24 May 1967, M.L. Jones, 1 specimen (USNM 67063). 30°23'N, 80°36'W, 35 m, R/V *Pierce* sta 6D, 1 Mar 1977, 1 specimen (USNM 61388); 1 Sep 1977, juvenile (USNM 59315).

Gulf of Mexico: 29°51'N, 86°06'W, 41 m,

medium sand, MAFLA sta 2530, Jul 1976, 1 specimen (USNM 55801).

Belize, Carrie Bow Cay: S of island, 50–75 m, coral rubble and sand, 13 May 1977, M.L. Jones, 1 specimen (USNM 67067).

Panama (Atlantic), Punto de Roto: Fort Sherman, *Thalassia* substrate, sta 100, 25 Apr 1972, M.L. Jones, 1 specimen (USNM 67065).

Venezuela, Turpialito: 20 km E of central Cu-

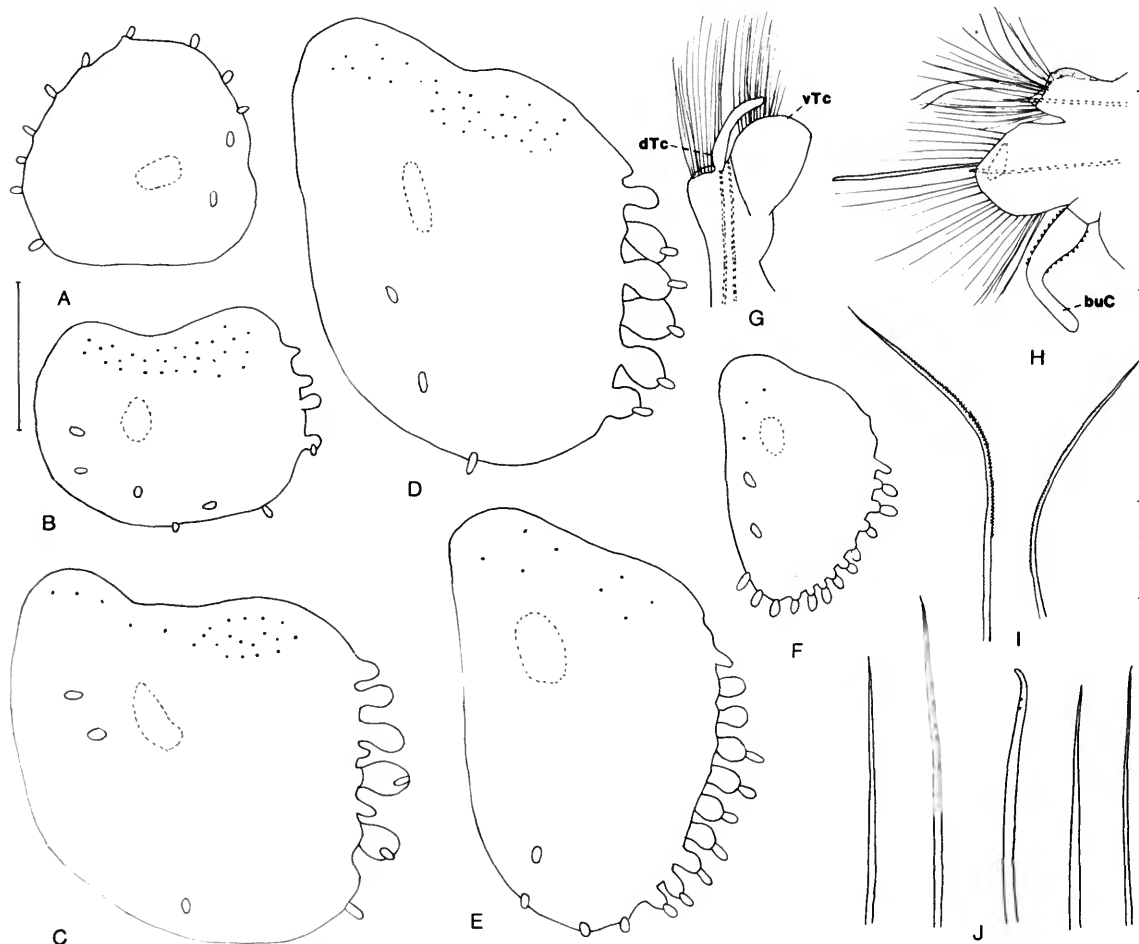


FIGURE 2.—*Mexieulepis weberi*, juvenile of 28 segments from waters off Georgia (USNM 60398): A, right 1st elytron; B, right 2nd elytron; C, right 3rd elytron; D, right 7th elytron; E, right 11th elytron; F, right 12th elytron; G, right tentacular parapodium, outer view, acicula dotted; H, right elytrigerous parapodium of segment 2, anterior view, acicula dotted; I, stout capillary notosetae from same; J, upper, middle, and lower neurosetae from same. (Scales = 0.5 mm for A–F; 0.1 mm for I, J.)

maná, mud bottom, 16 Jan 1978, M.L. Jones, advanced juvenile (USNM 67068).

Puerto Rico, Barceloneta: 18°29'N, 66°33'W, 27 m, 8 Nov 1974, G. Mayo, 2 juveniles (USNM 67066).

The additional seven adult specimens examined agree with the previous descriptions of the species. The collection of some juveniles that are referred to this species show some characters that differ from the adults and thus do not fit into the keys based on the adults. The basis for refer-

ring the small juveniles from waters off North Carolina, Georgia, Florida, Venezuela, and Puerto Rico to *Mexieulepis weberi* and separating them from juveniles of *Grubeulepis* spp. is the presence of acicular neurosetae in most of the parapodia, as they are in the adults of this species. They were found in the same general areas as the adults. Some 13 juveniles, with 17 to 28 segments, and one more advanced juvenile, with 35 segments, were collected, compared to the adults with 44 to 52 segments, 24–48 mm long,

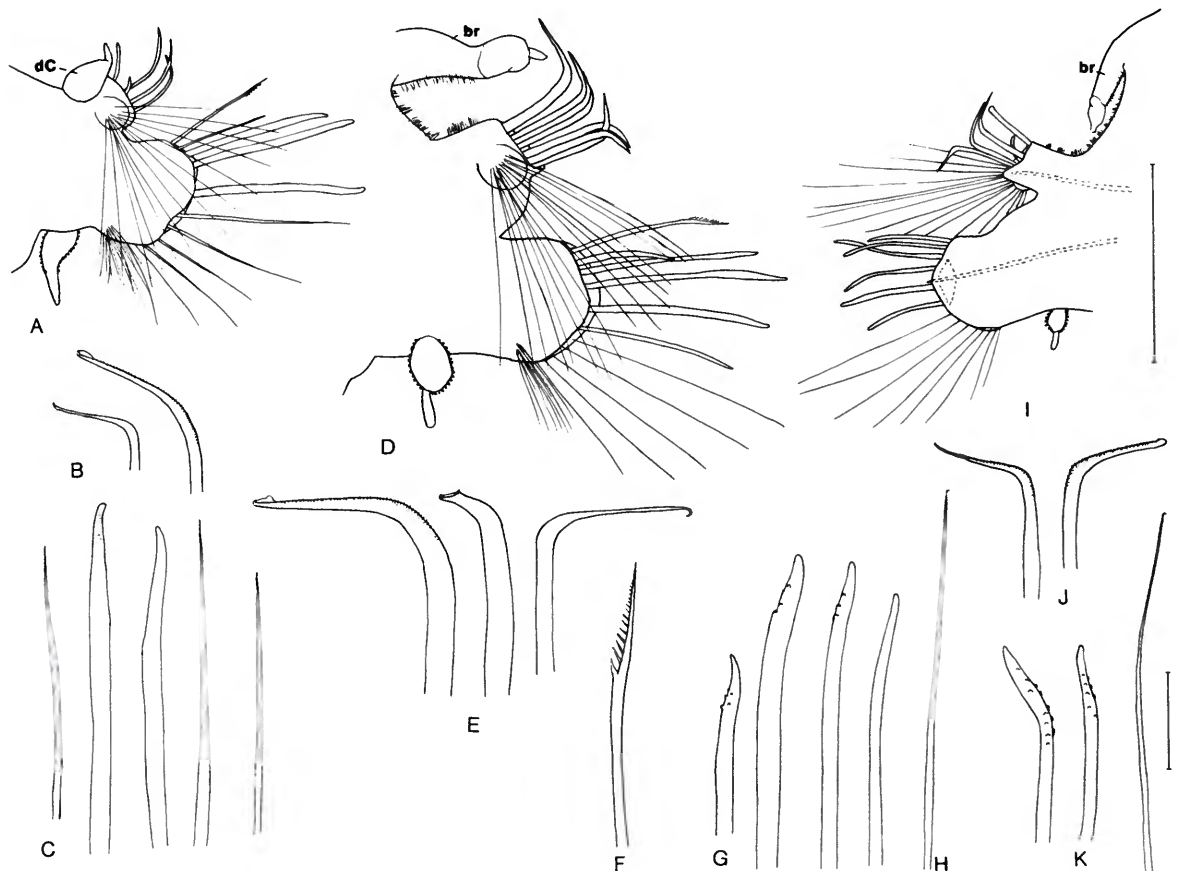


FIGURE 3.—*Mexieulepis weberi*, juvenile of 28 segments from waters off Georgia (USNM 60398): A, right cirriferous parapodium of segment 3, posterior view; B, notopodial hooks from same; C, upper, middle, and lower neurosetae from same; D, right middle branchial parapodium, posterior view; E, notopodial hooks from same; F, pectinate neuroseta from same; G, acicular neurosetae from same; H, lower capillary neuroseta from same; I, right posterior branchial parapodium (segment 23), anterior view, acicula dotted; J, notopodial hooks from same; K, middle and lower neurosetae from same. (Scales = 0.5 mm for A,D,I; 0.1 mm for B,C,E-H,J,K.)

and 8–10 mm wide.

DESCRIPTION OF JUVENILES.—Juveniles with 17–23 segments 2.5–4 mm long, 1–2.5 mm wide; juveniles with 25–28 segments 4–7 mm long, 2–3.5 mm wide; more advanced juvenile with 35 segments 13 mm long and 3 mm wide.

Anterior 12 pairs of elytra increasing in size toward middle of body, then decreasing somewhat, with 12th elytra not extra large, as in adults (Figures 2A–F, 4A–D, 6A–E). First pair of elytra with papillae on anterior border and few on surface (Figures 2A, 4A, 6A). Lateral fimbriation of following elytra differing from adults (Pettibone, 1969, fig. 11a–c) by different shapes of lateral processes: bulbous, with terminal buds (Figure 2B–F); digitiform or filiform with termi-

nal buds or with 2–3 articles (Figures 4B–D, 6B–E); additional buds or papillae on posterior borders and scattered on surface; scattered microtubercles on anterior part of elytra present or absent. Posterior small elytra not developed on juveniles of less than 27 segments. On advanced juvenile of 35 segments, posterior elytra with more numerous lateral processes (Figure 6F), compared to adult (Pettibone, 1969, fig. 11d).

Tentaculophores of tentacular segment with filiform dorsal tentacular cirrus and large oval ventral tentacular cirrus (Figures 1A, 2G), thus differing from adult (Pettibone, 1969, fig. 11e,g). Parapodia of buccal segment 2 similar to adult; some capillary notosetae thicker, spinous; middle neuroseta thicker, ending in blunt or

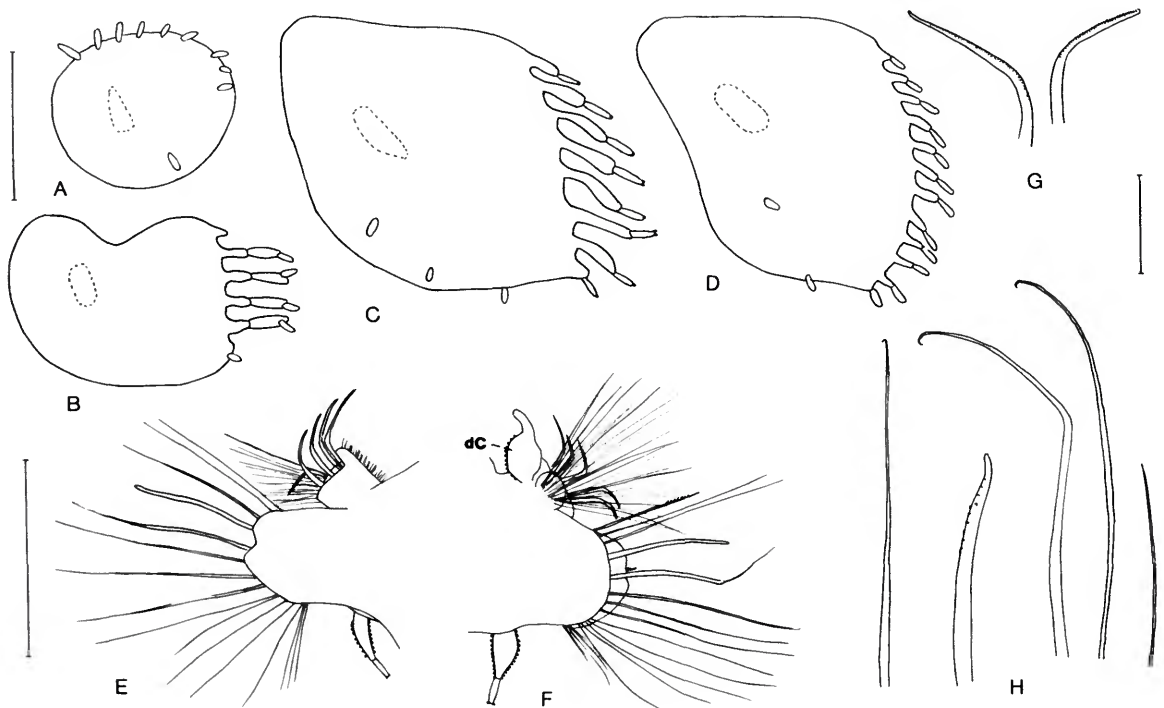


FIGURE 4.—*Mexieulepis weberi*, juvenile of 27 segments from waters off North Carolina (USNM 67487): A, right 1st elytron; B, right 3rd elytron; C, right middle elytron; D, right 11th elytron; E, right elytrigerous parapodium of segment 5, anterior view; F, right cirriferous parapodium of segment 6, posterior view; G, notopodial hooks from same; H, upper, middle, and lower neurosetae from same. (Scales = 0.5 mm for A–D; 0.5 mm for E,F; 0.1 mm for G,H.)

tapered slender tips (Figures 1B–D, 2H–J). Parapodia of segment 3 with dorsal cirrus on posterior side of notopodium, bundle of capillary notosetae and stout notopodial hooks with tips tapered or spatulate, smooth or spinous along bend; neuropodium with upper limbate capillaries, 2–3 middle denticled, slightly roughened or smooth acicular setae and lower limbate and non-limbate capillaries (Figures 1E–G, 3A–C).

Biramous parapodia similar in shape and composition to adults (Figures 1H–J, 3D–K, 4E–H, 5A–D). Notopodial hooks mostly spinous along bend and distal part, instead of smooth as in adults (Figures 1I, 3B,E,J; 4G, 5C). Middle acicular neurosetae 1–5 in number, slightly hooked, mostly denticled (Figures 1G,J, 3G, 4H, 5D), in

contrast to smooth acicular neurosetae in adults (Pettibone, 1969, figs. 11k, 12f, 13e). Posterior parapodia of more advanced juveniles showing same modification as in adults: stouter upper group of acicular neurosetae bent downward but tubercled (Figures 5E,G, 6G,H,J) and not smooth as in adults (Pettibone, 1969, fig. 14a,c).

REMARKS.—The specimen recorded as *Pareulepis fimbriata* (Treadwell) by Rullier (1974:21) and collected in sponges in the Bay of Batabano, Cuba, should be referred to *Mexieulepis weberi*. The first 12 pairs of elytra, bordered by digitations, were inserted on the usual segments, then followed by 10 smaller elytra piled up on one another. This agrees with *Mexieulepis weberi*.

DISTRIBUTION.—Off North Carolina to Flor-

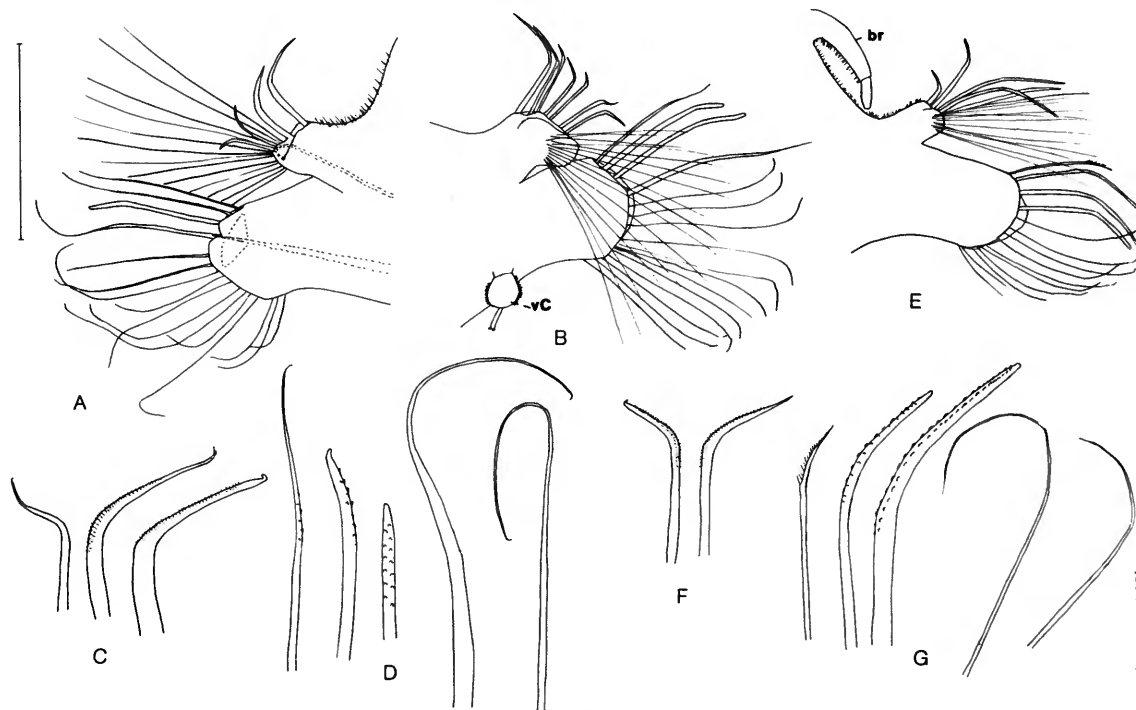


FIGURE 5.—*Mexieulepis weberi*, juvenile of 27 segments from waters off North Carolina (USNM 67487): A, right middle elytrigerous parapodium, anterior view, acicula dotted; B, right middle branchial parapodium, posterior view; C, notopodial hooks from same; D, upper, middle, and lower neurosetae from same; E, posterior branchial parapodium, posterior view; F, notopodial hooks from same; G, upper, middle, and lower neurosetae from same. (Scales = 0.5 mm for A,B,E; 0.1 mm for C,D,F,G.)

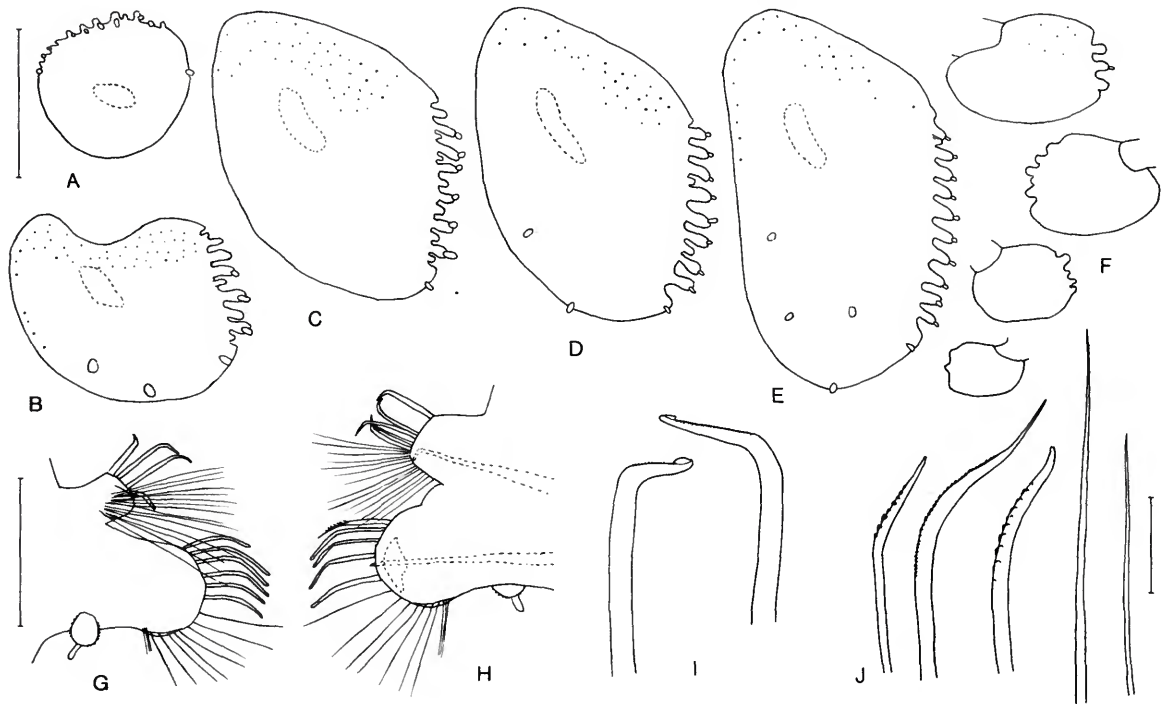


FIGURE 6.—*Mexieulepis weberi*, advanced juvenile of 35 segments from Venezuela (USNM 67068): A, right 1st elytron; B, right 2nd elytron; C, right 6th elytron; D, right 10th elytron; E, right 12th elytron; F, four elytra of posterior segments; G, right posterior parapodium, posterior view; H, same, anterior view, acicula dotted; I, hooked notosetae from same; J, upper, middle, and lower neurosetae from same. (Scales = 1.0 mm for A-F; 0.5 mm for G,H; 0.1 mm for I,J.)

ida, Gulf of Mexico, Belize, Panama, Venezuela, West Indies (Curaçao, Puerto Rico, Cuba), in low intertidal to 46 meters.

Lamelleulepethus, new genus

TYPE-SPECIES.—*Lamelleulepethus orensanzi*, new species. Gender: masculine.

DIAGNOSIS.—Segments about 35. Elytra 12 pairs, on segments 2, 4, 5, 7, alternate segments to 21, 24; elytra with lateral borders fimbriated. Dorsal cirri on segments 3 and 6. Branchiae 12–13 pairs, on segments 8, 10, alternate segments to 22, 23, 25, 26, 27, (28). Posterior dorsal lamellae beginning on segment 28 or 29, continuing posteriorly. Large ventral lamellae on ven-

trolateral sides of body, beginning on segments 7–8 and continuing to segments 26–28.

ETYMOLOGY.—From the Latin *Lamella* (plate) plus the generic epithet *Eulepethus*, referring to the presence of the characteristic ventral lamellae on the eulepethid polychaete.

Lamelleulepethus agrees with *Grubeulepis* Pettibone in all respects, except for the addition of the unique large ventral lamellae on the middle region of the body. Although differing in shape and arrangement, they are like the ventral lamellae in *Gastrolepidia* Schmarda and *Paralepidonotus* Horst in the Polynoidae because they all have similar attachment on the ventrolateral sides of the bases of the neuropodia.

COMPOSITION.—*Lamelleulepethus* includes two new species: *L. orensanzi* and *L. biminiensis*.

Key to the Species of *Lamelleulepethus*

- Microtubercles on all elytra except first pair; lateral processes of middle and posterior elytra entire, not articulated, without terminal bud [Figure 11D–F]. Single acicular neuroseta in parapodium 3 only [Figure 11J,L] *L. biminiensis*, new species
- Microtubercles on anterior few elytra only (not first pair); lateral processes of middle and posterior elytra with terminal bud [Figure 7D–F]. Single acicular neuroseta in parapodia 3–5 [Figure 8E,G–I] *L. orensanzi*, new species

***Lamelleulepethus orensanzi*, new species**

FIGURES 7–10

MATERIAL EXAMINED.—*Uruguay*: Darsena, Punta La Paloma, 0–8 m, shelly sand, Cache,

collector, 31 Jan 1974, holotype (USNM 67473).

DESCRIPTION.—Length of holotype 12 mm, width with setae 5 mm, segments 35. Elytra 12 pairs, delicate, transparent, fimbriated, becoming more elongate posteriorly; first pair oval,

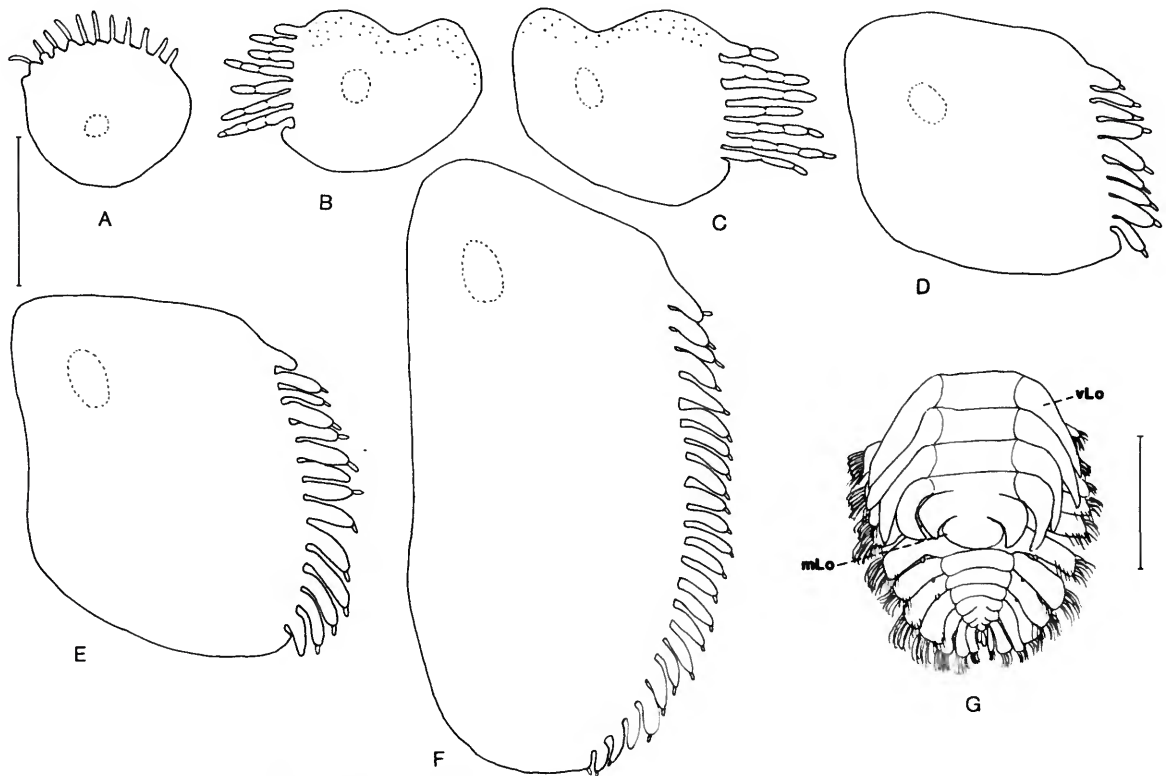


FIGURE 7.—*Lamelleulepethus orensanzi*, holotype (USNM 67473): A, left 1st elytron; B, left 2nd elytron; C, right 3rd elytron; D, right 7th elytron; E, right 11th elytron; F, right 12th elytron; G, ventral view of posterior end, including segments 24–35, ventral lamellae on segments 24–28 and central rounded plate on segment 29. (Scales = 1.0 mm for A–F; 2.0 mm for G.)

with about 11 papillae on anterior border (Figure 7A); following few elytra reniform, with microtubercles on anterior part, with 6–7 lateral digitiform processes, having 2–5 joints (Figure 7B,C); middle and posterior elytra squarish to rectangular, without microtubercles, with lateral digitiform processes increasing in number: 9 on 7th elytron, 14 on 11th, 22 on 12th, nearly all processes with terminal bud (Figure 7D–F). Two pairs of dorsal cirri short, subulate, on posterior sides of notopodia of segments 3 and 6 (Figure 8E,J). Branchiae 12 pairs, beginning on segment 8 and ending on segment 27, large, inflated, with distal papilla (Figure 9A). Posterior dorsal lamellae subconical, beginning on segment 28 and continuing posteriorly (Figure 10A,B).

Prostomium withdrawn in segment 2 and mostly hidden by large elythrophones, rounded anteriorly, with short conical median antenna attached anteriorly, tapered lateral antennae attached ventrally, longer than median antenna, and thick, smooth tapered palps (Figure 8A); no eyes visible; lateral nuchal organs not observed. Tentaculophores of segment 1 directed anteriorly, lateral to prostomium, each with 2 acicula, pair of similar dorsal and ventral tentacular cirri, and 2 bundles of smooth and spinous capillary setae (Figure 8B). Elytrigerous parapodium of segment 2 with small rounded notopodium and bundle of slender spinous capillary notosetae; neuropodium similar to following parapodia; neurosetae composed of single upper pectinate,

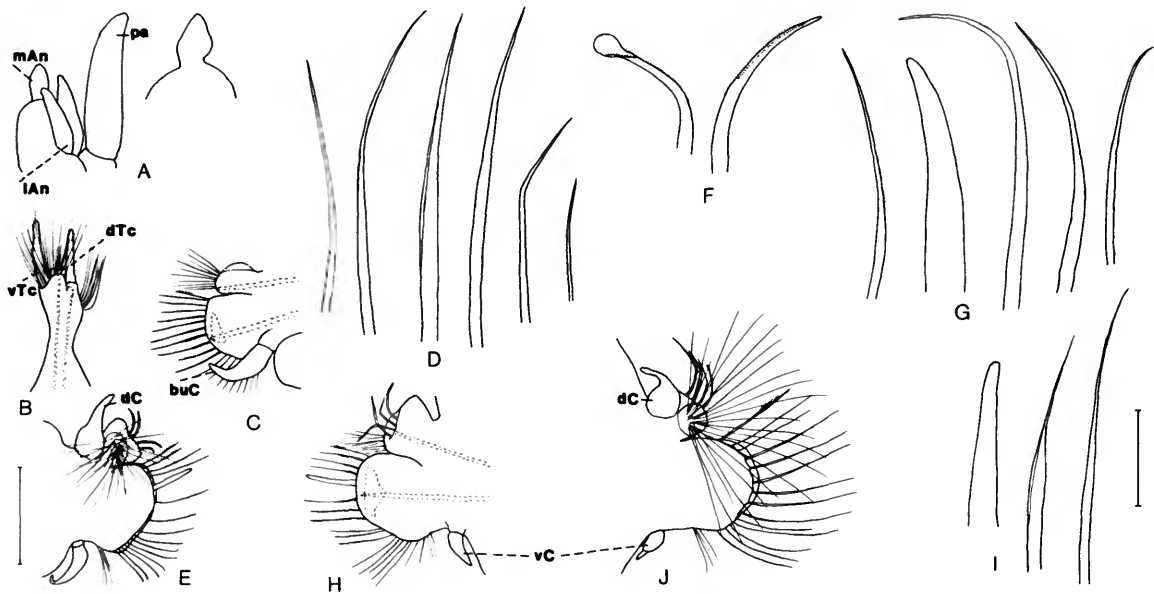


FIGURE 8.—*Lamelleulepethus orensanzi*, holotype (USNM 67473): A, dorsal and lateral views of prostomium with median and lateral antennae and left palp removed from body (not to scale); B, right tentacular parapodium, inner view, acicula dotted; C, right parapodium of segment 2, anterior view, acicula dotted; D, upper, middle, and lower neurosetae from same; E, right cirriferous parapodium of segment 3, posterior view; F, notopodial hooks from same; G, upper, middle, and lower neurosetae from same; H, right parapodium of segment 4, anterior view, acicula dotted; I, middle and lower neurosetae from same; J, right cirriferous parapodium of segment 6, posterior view. (Scales = 0.5 mm for B,C,E,H,J; 0.1 mm for D,F,G,I.)

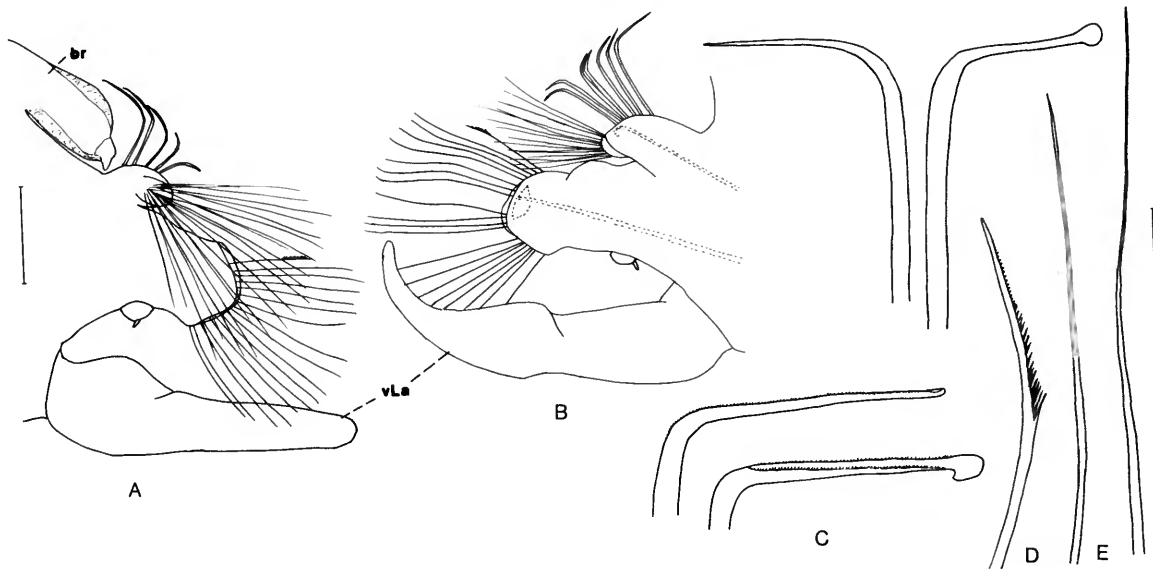


FIGURE 9.—*Lamelleulepethus orensanzi*, holotype (USNM 67473): A, right middle branchial parapodium, posterior view, ventral lamella included; B, right middle elytrigerous parapodium, anterior view, acicula dotted, ventral lamella included; C, notopodial hooks from same; D, pectinate neuroseta from same; E, upper and middle neurosetae from same. (Scales = 0.5 mm for A,B; 0.1 mm for C-E.)

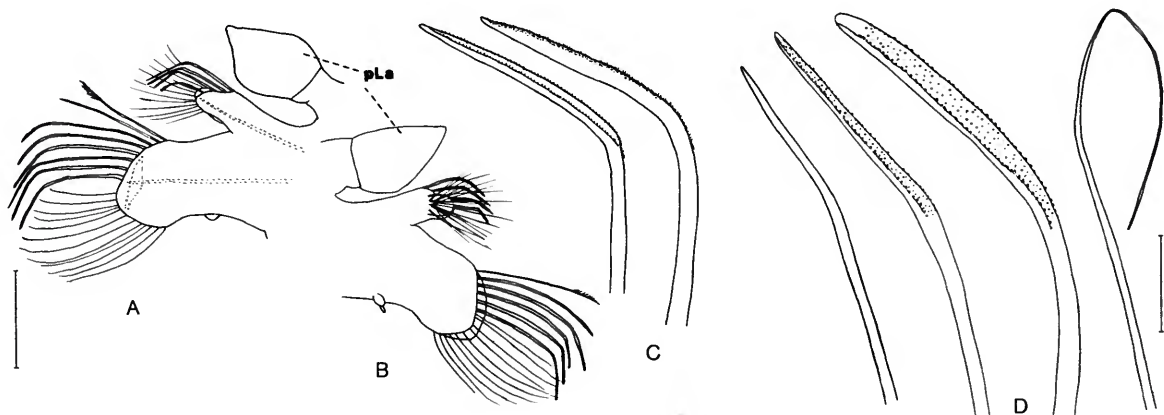


FIGURE 10.—*Lamelleulepethus orensanzi*, holotype (USNM 67473): A, right posterior lamelli-gerous parapodium, anterior view, acicula dotted; B, same, posterior view; C, notopodial hooks from same; D, upper and lower neurosetae from same. (Scales = 0.5 mm for A,B; 0.1 mm for C,D.)

non-limbate capillaries, with middle ones stouter; ventral buccal cirrus longer and thicker than following ventral cirri (Figure 8C,D). Notopodium of cirriferous segment 3 with bundle of capillary notosetae emerging from posterior lobe and 4 notopodial hooks with tips tapered or spatulate, finely spinous along bend; neuropodia with 2 upper pectinate setae, upper and lower limbate capillaries and single middle smooth acicular spine: ventral cirrus short, tapered (Figure 8E-G). Parapodia of segments 4 and 5 similar, each with single acicular neuroseta (Figure 8H,I).

Biramous parapodia supported by acicula, notoaciculum with hooked tip, neuroaciculum with distal hammer-shaped plate on anterior side (Figure 9B). Notopodium short, cylindrical, with bundle of slender, capillary, smooth and finely spinous notosetae emerging from posterior rounded lobe; dorsally with stout geniculate notopodial hooks with tips tapered or wide spatulate, smooth or spinous along bend and distal part (Figure 9A-C). Neuropodium thick, rounded, paddle-shaped, with fan-shaped bundle of neurosetae, upper one pectinate (Figure 9D) and numerous slender limbate capillaries (Figure 9E), upper and middle ones slightly stouter; ventral cirri from segment 6 on small, ovoid, with small cylindrical tip (Figures 8J, 9A,B). Large ventral lamellae 22 pairs, attached by wide base on ventral side of bases of neuropodia, medial to ventral cirri, beginning on segment 7 (small), becoming larger, extending about to tips of neurosetae, and continuing to segment 28, with small rounded medial lobe on segment 29 (Figures 7C, 9A,B).

Parapodia of posterior lamelligerous segments (28-35) differing somewhat from more anterior parapodia: notopodial hooks all curved downward, with blunt tips and wider spinous regions (Figure 10A-C); supraacicular group of neurosetae (about 6) stouter than lower ones, curved downward, with blunt tips and wide spinous regions (Figure 10A,B,D).

Pygidium small, rounded, with short anal cirrus and short oval lobe (Figure 7C). Pharynx not examined.

ETYMOLOGY.—The species is named for Dr. José Orensanz, who placed the specimen at my disposal and who noted the greatly expanded ventral lamellae, the characteristic feature of the new genus *Lamelleulepethus*.

Lamelleulepethus biminiensis, new species

FIGURES 11-15

Grubeulepis sp. A.—Uebelacker, 1984:24-7, figs. 24-3, 4a-m.

MATERIAL EXAMINED.—*North Atlantic*: Between South and East Bimini, sand and *Thalassia*, M.L. Jones, 20 Aug 1962, holotype (USNM 67470).

Off Georgia: 31°01'N, 80°17'W, 40 m, R/V *Pierce* sta 5F, 30 Aug 1977, 2 paratypes (USNM 61751-2).

Gulf of Mexico: SOFLA sta 20E, 5 Apr 1981, 25°17'N, 82°09'W, 22 m, coarse sand, 1 specimen (USNM 74462). MAFLA sta 2421A, Nov 1977, 29°37'N, 84°17'W, 19 m, silty fine sand, juvenile (USNM 97612); sta 2424A, Feb 1978, 29°13'N, 85°00'W, 27 m, medium sand, juvenile (USNM 97613); sta 2856C, Sep 1977, 29°54'N, 87°24'W, 30 m, fine sand, 1 specimen (BVA); sta 2960C, D, Nov, Aug 1977, 25°40'N, 82°20'W, 27 m, fine sand, 1 specimen (USNM 97610), advanced juvenile (USNM 97611).

DESCRIPTION.—Length of holotype from Bimini 16 mm, width with setae 5 mm, segments 35. Length of 2 paratypes from waters off Georgia 18 and 16 mm, width 5 mm, segments 35. Length of 2 adults from Gulf of Mexico 18 and 15 mm, width 6 and 4 mm, segments 36 and 34 (USNM 74462, 97610); 2 advanced juveniles 11 mm long, 3-3.5 mm wide, segments 32-33 (USNM 97611-2); smallest juvenile 6 mm long, 2.5 mm wide, segments 26 (USNM 97612).

Elytra 12 pairs, delicate, transparent, fimbriated, becoming more elongate posteriorly; first pair oval, with 9-11 papillae on anterior border (Figures 11A, 15A); following few elytra reniform, with microtubercles on anterior part

and 5–6 lateral digitiform processes, 2–4 jointed (Figures 11B,C, 15B,C); middle and posterior elytra squarish to rectangular, also with microtubercles, with entire lateral processes increasing in number: 7 on 6th and 7th elytra, 10 on 11th, 18–22 on 12th (Figure 11D–F). Advanced juveniles with fewer lateral processes (about 15) on 12th elytra and mostly with terminal buds (Figure 15E). Two pairs of dorsal cirri short, subulate, on posterior sides of notopodia of segments 3 and 6 (Figures 11J, 12A). Branchiae 12–13 pairs, beginning on segment 8 and continuing to segment 27 (holotype) or 28 (paratype), large, inflated, with distal papilla (Figure 12C). Dorsal posterior lamellae conical, beginning on segment 28 (small, holotype) or 29 (paratype) and continuing posteriorly (Figures 13A,B, 14D).

Prostomium withdrawn and attached middorsally to enlarged elyptrophores of segment 2, rounded anteriorly, with short conical median antenna attached anteriorly and similar lateral antennae attached ventrally, with thick tapered smooth palps (Figure 11G); 4 pairs of small eyes on posterior half (holotype); nuchal organs lateral to prostomium, usually hidden from view. Tentaculophores of segment 1 directed anteriorly, lateral to prostomium, each with 2 acicula, pair of similar dorsal and ventral tentacular cirri, and 2 bundles of smooth and spinous capillary setae (Figure 11H). Elytrigerous parapodium of segment 2 (Figure 11I) with small rounded notopodium and bundle of spinous capillary notosetae; neuropodium similar to following parapodia; neurosetae non-limbate and limbate capillar-

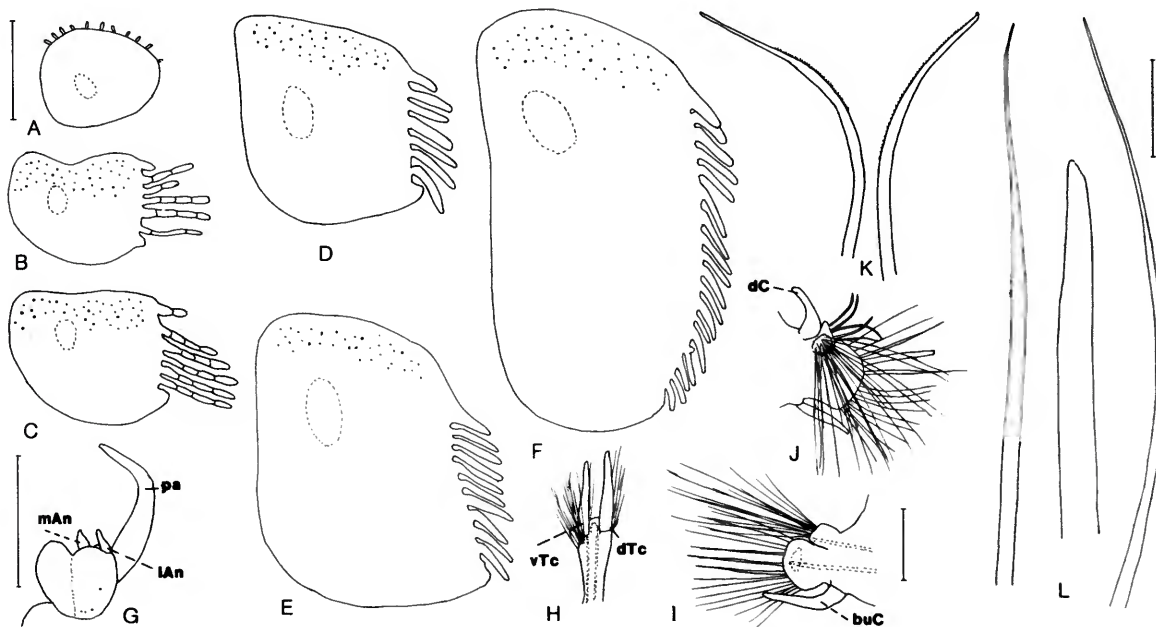


FIGURE 11.—*Lamelleulepethus biminiensis*, holotype (USNM 67470): A, left 1st elytron; B, right 2nd elytron; C, right 3rd elytron; D, right 7th elytron; E, right 11th elytron; F, right 12th elytron; G, lateral view of right side of prostomium; H, right tentacular parapodium, inner view, acicula dotted; I, right parapodium of segment 2, anterior view, acicula dotted; J, right cirriferous parapodium of segment 3, posterior view; K, notopodial hooks from same; L, upper, middle, and lower neurosetae from same. (Scales = 1.0 mm for A–F; 1.0 mm for G; 0.5 mm for H–J; 0.1 mm for K,L.)

ies, with middle ones stouter; ventral buccal cirrus longer than following ventral cirri. Notopodia of cirriferous segment 3 with bundle of long capillary notosetae emerging from posterior rounded lobe and notopodial hooks with tips tapered or slightly hooked, finely spinous along

bend; neuropodium with single upper pectinate seta, slender limbate capillaries, some middle ones thicker, and single middle smooth acicular neuroseta; ventral cirrus short, tapered (Figure 11J-L). Acicular neurosetae absent on following parapodia.

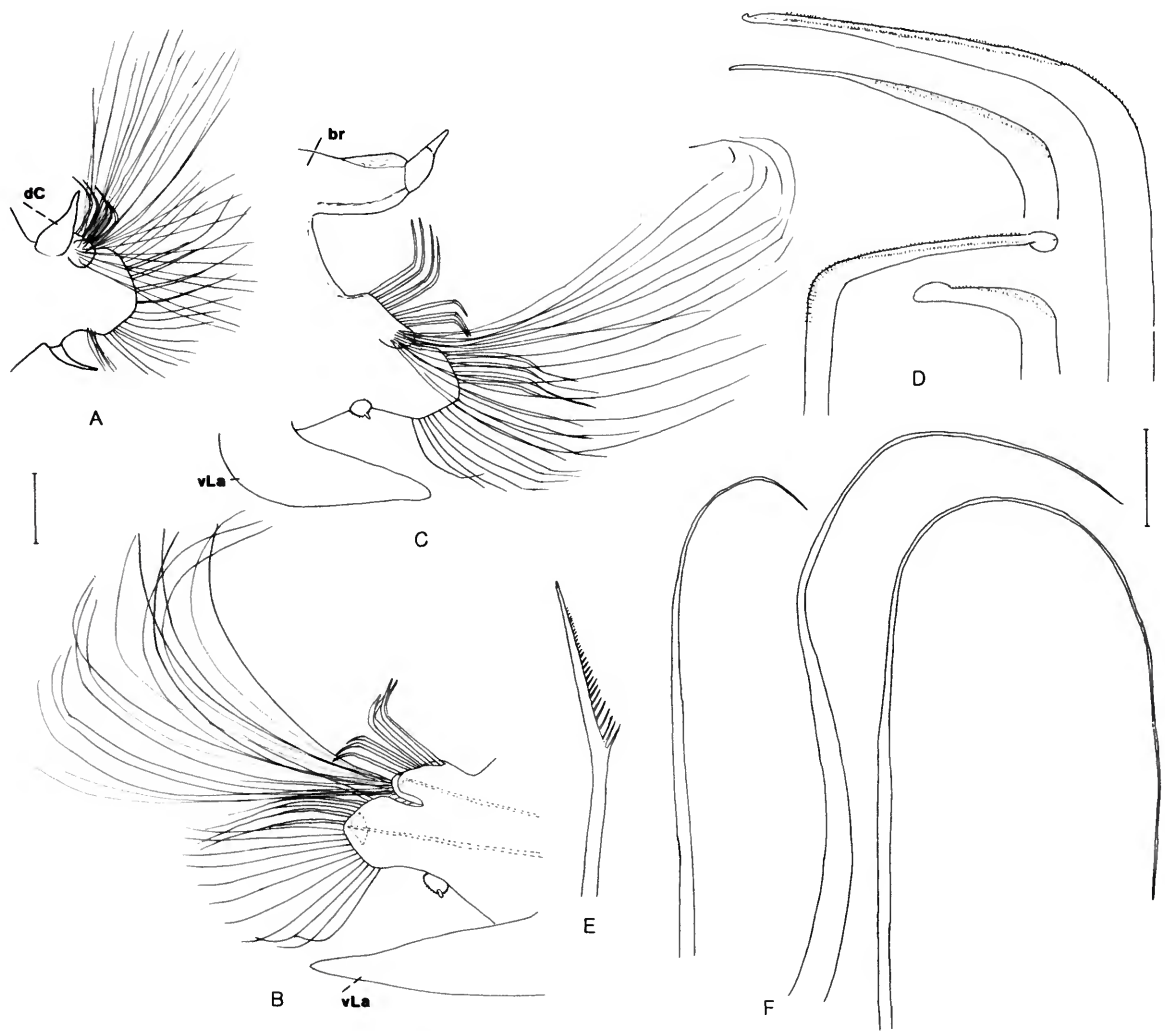


FIGURE 12.—*Lamelleulepethus biminiensis*, holotype (USNM 67470): A, right cirriferous parapodium of segment 6, posterior view; B, right middle elytriferous parapodium, anterior view, acicula dotted, ventral lamella included; C, right middle branchial parapodium, posterior view, ventral lamella included; D, notopodial hooks from same; E, pectinate neuroseta from same; F, upper, middle, and lower neurosetae from same. (Scales = 0.5 mm for A-C; 0.1 mm for D-F.)

Biramous parapodia supported by acicula, notoaciculum with hooked tip, neuroaciculum with distal hammer-shaped plate on anterior side (Figures 12B, 14A). Notopodium short, cylindrical, with bundle of numerous capillary notosetae emerging from posterior rounded lobe and extending far beyond neurosetae; dorsally with stout geniculate notopodial hooks with tips tapered or wide spatulate, spinous along bend and distal part (Figures 12B,C,D; 14A,B). Neuropodium thick, rounded, paddle-shaped, with fan-shaped bundle of neurosetae, upper one pectinate (Figure 12E), 4 upper stout limbate neurosetae abruptly narrowed and bent downward, with long slender tips; lower ones slender capillaries (Figures 12B,C,F, 14A,C). Most middle segments of young 26-segment juvenile with 3–4 middle stout acicular neurosetae, smooth, spinous or irregularly roughened, with tips slightly curved (Figure 15F,G; Uebelacker, 1984, fig. 24-4h). Ventral cirri from segment 7 on small, ovoid, papillate, with small cylindrical tips (Figures

12B,C, 13A,B, 14A,D). Ventral lamellae beginning on segments 7–9 as small projecting ridge, forming large flattened digitiform projections from segments 9–10, and continuing to segments 26–28 (Figures 12B,C, 14A).

Parapodia of posterior lamelligerous segments differing somewhat from more anterior parapodia: notopodial hooks all curved downward, with blunt tips and wider spinous regions (Figures 13A–C, 14D,E; Uebelacker, 1984, fig. 24-4e,f); supraacicular group of stout neurosetae (up to 8) curved downward, with tips blunt or with long whip-like capillary tips (Figures 13A,B,D, 14D,F; Uebelacker, 1984, fig. 24-4i). In posterior parapodia of juveniles, upper group of stout neurosetae denticulate, instead of smooth (Figure 15H,I; Uebelacker, 1984, fig. 24-4j).

Pygidium small, with single long papillate anal cirrus on right side and small lobe on left side. Pharynx not examined.

ETYMOLOGY.—The species is named for the place of collection of the holotype, Bimini Island.

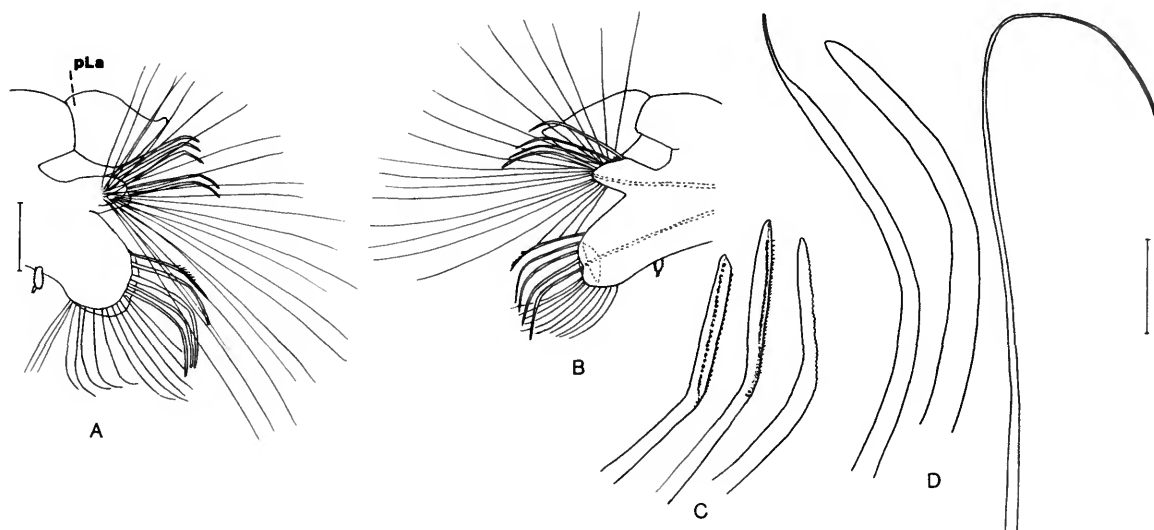


FIGURE 13.—*Lamelleulepethus biminiensis*, holotype (USNM 67470): A, right posterior parapodium, posterior view; B, same, anterior view, acicula dotted; C, notopodial hooks from same; D, upper and lower neurosetae from same. (Scales = 0.5 mm for A,B; 0.1 mm for C,D.)

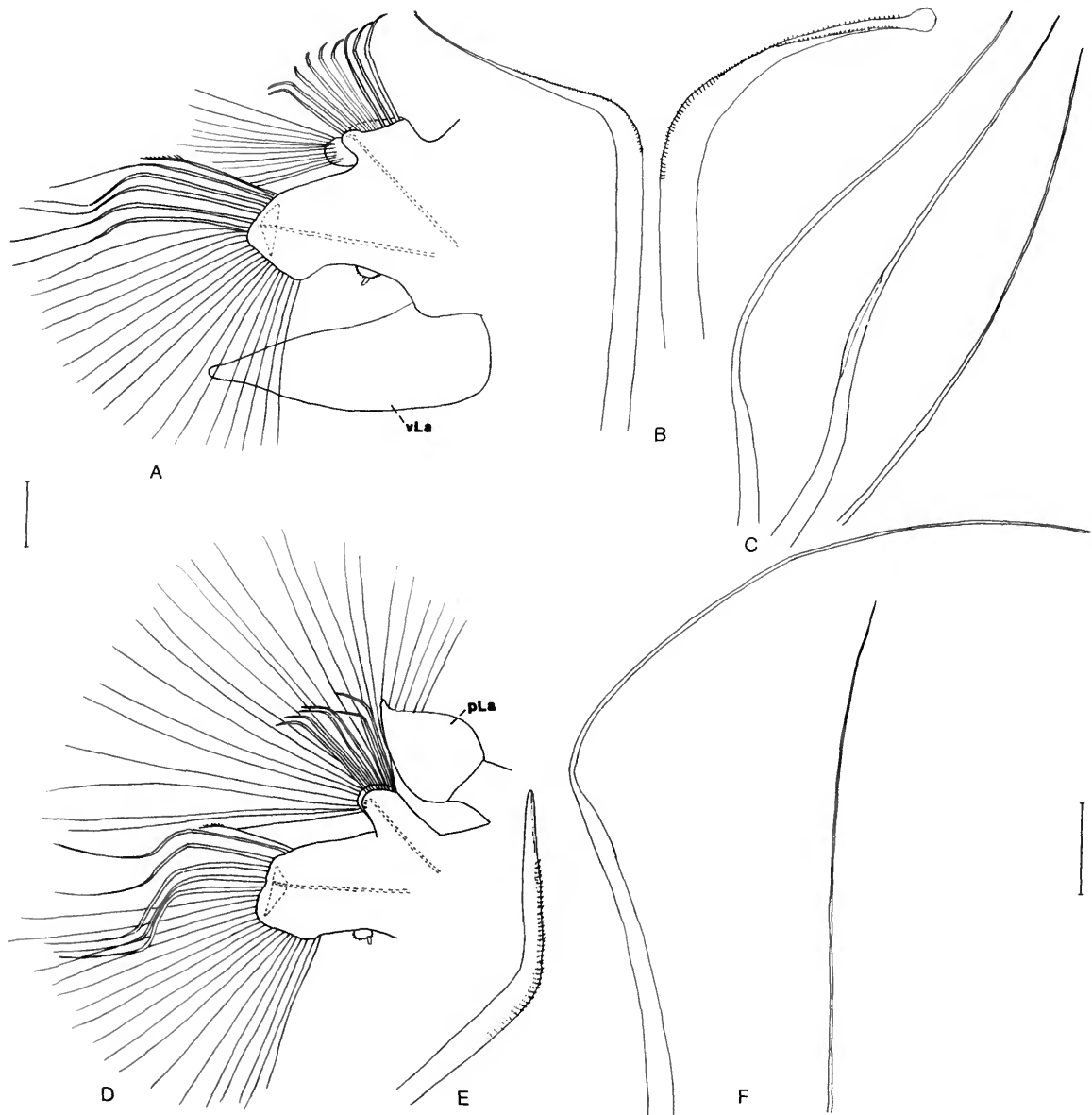


FIGURE 14.—*Lamelleulepethus biminiensis*, paratype from waters off Georgia (USNM 61752): A, right middle elytrigerous parapodium, anterior view, acicula dotted, ventral lamella included; B, notopodial hooks from same; C, upper and lower neurosetae from same; D, right posterior parapodium, anterior view, acicula dotted; E, notopodial hook from same; F, upper and lower neurosetae from same. (Scales = 0.5 mm for A,D; 0.1 mm for B,C,E,F.)

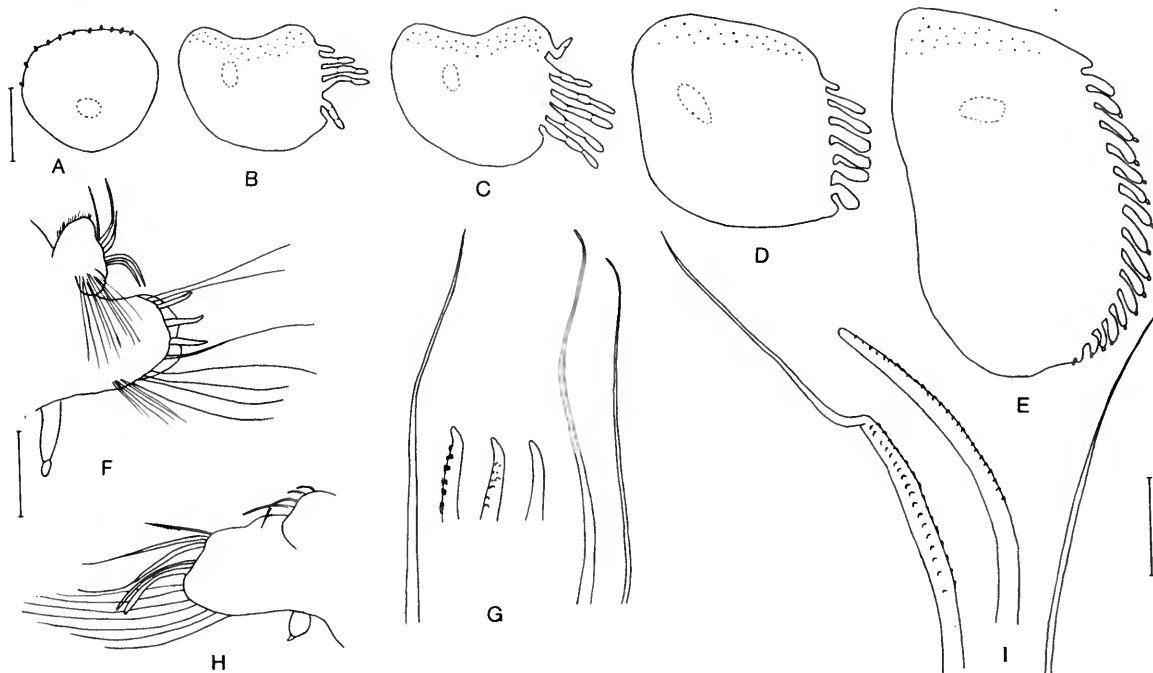


FIGURE 15.—*Lamelleulepethus biminiensis* (A–E, advanced juvenile of 33 segments from Gulf of Mexico (USNM 97613); F–I, juvenile of 26 segments from same (USNM 97612)): A, right 1st elytron; B, right 2nd elytron; C, right 3rd elytron; D, right 6th elytron; E, right 12th elytron; F, right elytrigerous parapodium of segment 5, posterior view, elytriphore and ventral lamella not shown; G, upper, middle, and lower neurosetae from same; H, right branchial parapodium of segment 25, anterior view, branchia not shown; I, upper and lower neurosetae from same. (Scales = 0.5 mm for A–E; 0.2 mm for F,H; 0.1 mm for G,I.)

Proeulepethus, new genus

TYPE-SPECIES.—*Proeulepethus clarki*, new species. Gender: masculine.

DIAGNOSIS.—Body short, segments up to 39. Elytra 12 pairs, on segments 2, 4, 5, 7, alternate segments to 21, 24; elytra with lateral borders entire, not notched or fimbriated. Dorsal cirri on segments 3 and 6. Branchiae 10–11 pairs, on segments 8, 10, alternate segments to 22, 23, 25, (26). Posterior dorsal lamellae beginning on segments 26–27, continuing posteriorly. Posterior upper neurosetae not enlarged and curved downward.

ETYMOLOGY.—From the Latin *pro* (before) plus the generic epithet *Eulepethus*, indicating its relationship to the eulepethid polychaetes.

Proeulepethus differs from the other genera of Eulepethidae in having elytra with entire borders, not notched or fimbriated.

COMPOSITION.—*Proeulepethus* includes *P. clarki*, new species, and *P. challengeriae* (McIntosh, 1885), new combination (species doubtful).

Proeulepethus challengeriae (McIntosh, 1885), new combination

Eulepis challengeriae McIntosh, 1885:134, pl. 20: fig. 1, pl. 23: fig. 1, pl. 24: fig. 1, pl. 14A: figs. 7, 8.—Pettibone, 1969:43.

REMARKS.—The original description was based on an anterior fragment from waters off Sombrero and St. Thomas, West Indies, in 713–

823 meters. After examination of the defective holotype in the British Museum (BMNH 1885.12.1.106), Pettibone (1969:43) referred it to a questionable genus and species of Eulepethidae. McIntosh stated that the elytra were entire, lacking a distinct notch as in *Pareulepis* (= *Eule-*

pis). This agrees with the diagnosis of *Proeulepethus*. Based on the incomplete original description and defective holotype, the species cannot be completely described. For this reason, this first-named species has not been selected as the type-species for the new genus *Proeulepethus*.

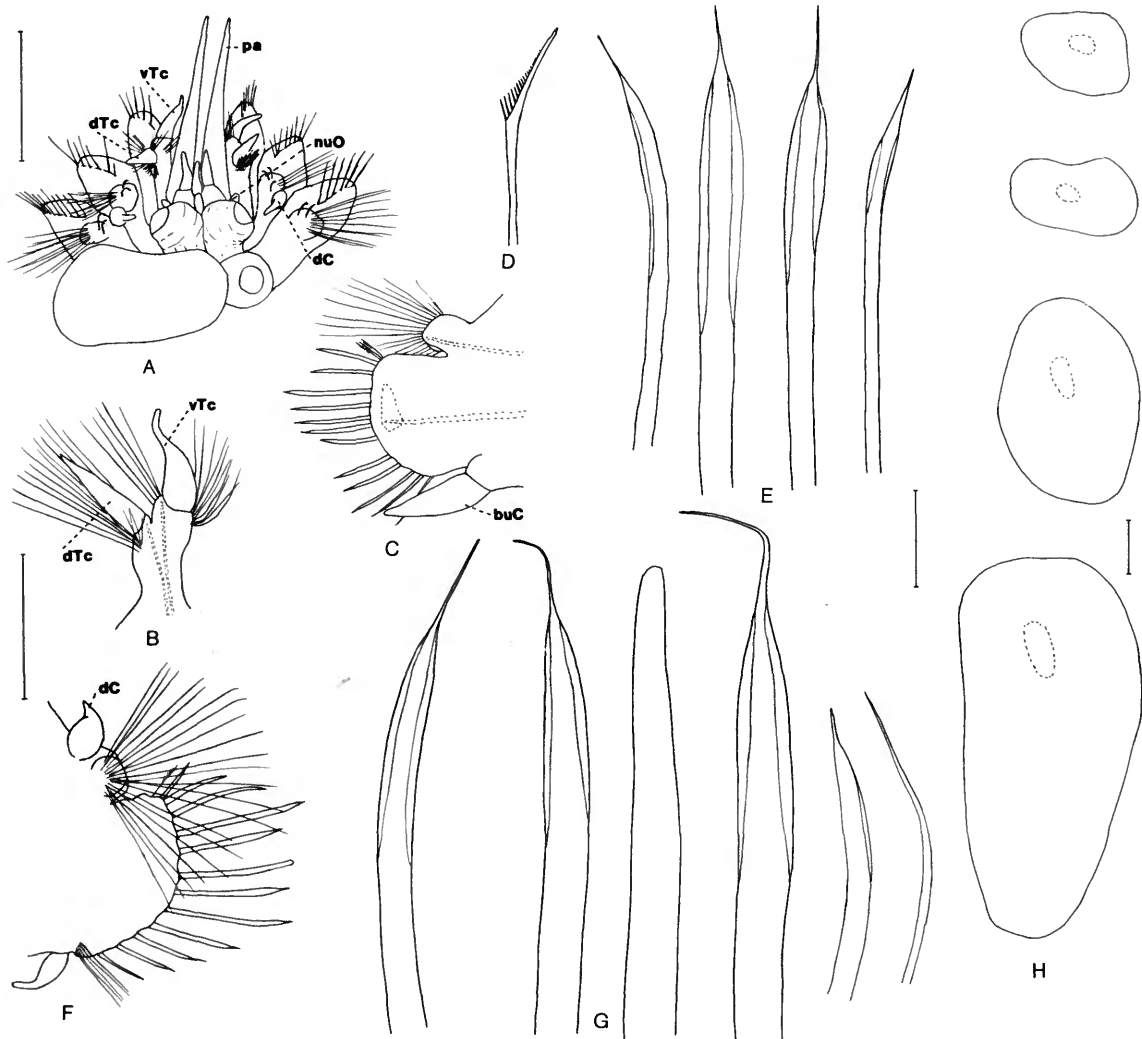


FIGURE 16.—*Proeulepethus clarki*, holotype (USNM 67474): A, dorsal view of anterior end, elytra of segment 2 and right elytron of segment 4 removed; B, right tentaculophore, outer view, acicula dotted; C, right elytrigerous parapodium of segment 2, anterior view, acicula dotted; D, pectinate neuroseta from same; E, upper, middle, and lower neurosetae from same; F, right cirriferous parapodium of segment 3, posterior view; G, upper, middle, and lower neurosetae from same; H, right 1st, 2nd, 6th and 12th elytra. (Scales = 2.0 mm for A; 1.0 mm for B,C,F; 0.1 mm for D,E,G; 1.0 mm for H.)

Proeulepethus clarki, new species

FIGURES 16–19

MATERIAL EXAMINED.—*Caribbean Sea, Virgin Islands:* R/V *Advance* sta 4, 20 Sep 1970, James Clark, holotype (USNM 67474).

Puerto Rico: San Juan Harbor, 18°30'N, 66°07'–09'W. IEC sta 724 006-009, Jan 1980, 260 m, clay, paratype (USNM 97595); sta 724 001-007, Jun 1980, 257 m, silt, juvenile paratype (USNM 97596); sta 731 004-008, Jun 1980, 288 m, silt, paratype (USNM 97597). Puerto Rico, Mar 1984, SAI sta P83, Ponce, 17°52'N, 66°36'W, 411 m, silty clay, paratype (USNM 97598); sta P12-1, 17°51'N, 66°35'W, 411 m, sandy mud, paratype (USNM 97599); sta SJ6-2, San Juan, 18°30'N, 66°07'W, 274 m, silty clay, paratype (BVA).

DESCRIPTION.—Length of holotype 34 mm, width including setae 8 mm, segments 39, last few small; length of adult paratypes from Puerto Rico 15–23 mm, width 4–6 mm, segments 33–38. Elytra 12 pairs, becoming more elongate

posteriorly, opaque, oval, reniform to elongate-oval with borders entire, without microtubercles (Figures 16H, 19F). Two pairs of dorsal cirri short, conical, on posterior sides of notopodia of segments 3 and 6 (Figures 16A,F, 19F). Branchiae 10–11 pairs, beginning on segment 8 and ending on segments 25–26, large, inflated, with distal papilla (Figure 18B). Posterior dorsal lamellae conical, beginning on segments 26–27, continuing posteriorly (Figure 19B).

Prostomium withdrawn in anterior segments, nearly hidden by large elytriphores of segment 2 and attached middorsally; antennae short, subulate, middle one attached anterodorsally, lateral pair attached anteriorly; ventral palps long, tapered; no eyes visible; with pair of rod-like lateral nuchal organs (Figures 16A, 19F). Tentaculophores of segment 1 directed anteriorly, lateral to prostomium, each with 2 acicula, pair of similar dorsal and ventral tentacular cirri, and 2 bundles of smooth and spinous capillary setae (Figure 16A,B). Elytrigerous parapodium of segment 2 with small rounded notopodium and bundle of capillary notosetae; neuropodium sim-

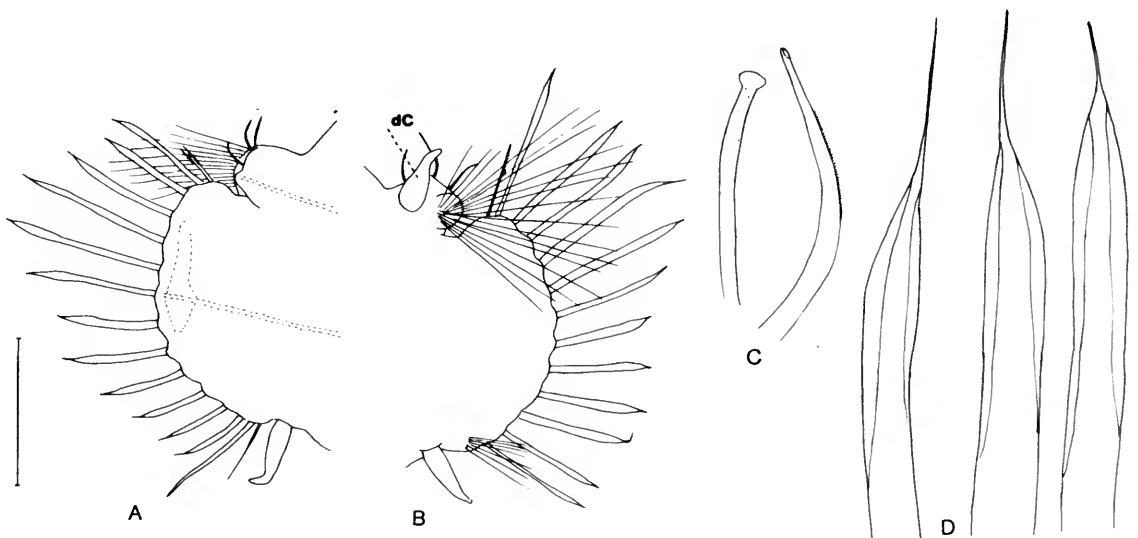


FIGURE 17.—*Proeulepethus clarki*, holotype (USNM 67474): A, right elytrigerous parapodium of segment 5, anterior view, acicula dotted; B, right cirriferous parapodium of segment 6, posterior view; C, notopodial hooks from same; D, upper, middle, and lower neurosetae from same. (Scales = 1.0 mm for A,B; 0.1 mm for C,D.)

ilar to following parapodia; neurosetae composed of 3 upper pectinate setae and wide bilimbate capillaries with short slender tips, middle ones stouter; ventral buccal cirrus longer and thicker than following ventral cirri (Figure 16C-E). Notopodium of cirriferous segment 3 with bundle of capillary notosetae emerging from rounded posterior lobe and 1-2 short acicular hooks; neuropodium with upper pectinate seta, wide bilimbate capillaries, single middle smooth acicular seta and lower group of slender non-limbate capillaries; ventral cirrus short, tapered (Figure 16A,F,G). Neuropodial acicular spines absent on following parapodia. Ventral cirri short, tapered through segment 7 (Figures 16F, 17A,B).

Biramous parapodia supported by acicula, notoaciculum with hooked tip, neuroaciculum with distal hammer-shaped plate on anterior side (Fig-

ures 18A, 19A). Notopodium short, wide, with bundle of long capillary notosetae emerging from posterior rounded lobe and extending beyond neurosetae; dorsally with stout geniculate notopodial hooks with tips tapered or blunt, smooth or finely spinous along bend (Figure 18A-C). Neuropodium thick, rounded, paddle-shaped, with fan-shaped bundle of neurosetae, upper one pectinate (Figure 18D) and numerous limbate capillaries, middle ones slightly stouter, lower ones slender, non-limbate; ventral cirri small, ovoid, with small rounded tips (Figure 18A,B,E).

Parapodia of posterior lamelliferous segments similar to more anterior segments, upper neurosetae not stouter and bent downward (Figure 19A-E). Few posterior segments small, tapered. Pygidium small, rounded, with pair of papillated

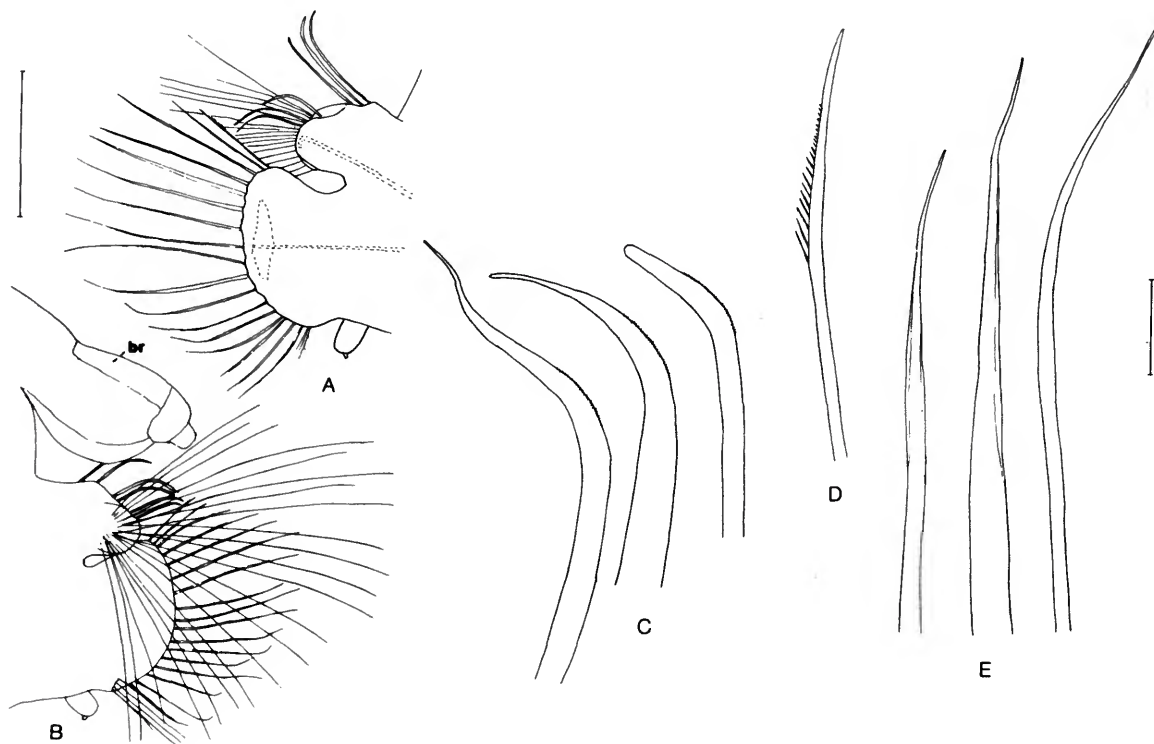


FIGURE 18.—*Proeulepethus clarki*, holotype (USNM 67474): A, right middle elytrigerous parapodium, anterior view, acicula dotted; B, right middle branchial parapodium, posterior view; C, notopodial hooks from same; D, pectinate neuroseta from same; E, upper, middle, and lower neurosetae from same. (Scales = 1.0 mm for A,B; 0.1 mm for C-E.)

anal cirri, one longer. Strong muscular pharynx with 18 pairs of papillae around opening, larger in middle part, becoming smaller laterally; papillae wider basally, with slender curved tip (Figure 19F); 2 pairs of inner jaw plates.

Minute paratype from Puerto Rico (USNM 97590) with 17 segments, last one incomplete,

plus bulbous growing zone, 2 mm long, 1.3 wide; elytra and setae similar to adults; with single long papillate anal cirrus about half length of body.

DISTRIBUTION.—Caribbean Sea (Puerto Rico, Virgin Islands), in 257–414 meters.

ETYMOLOGY.—The species is named for the collector of the holotype, James Clark.

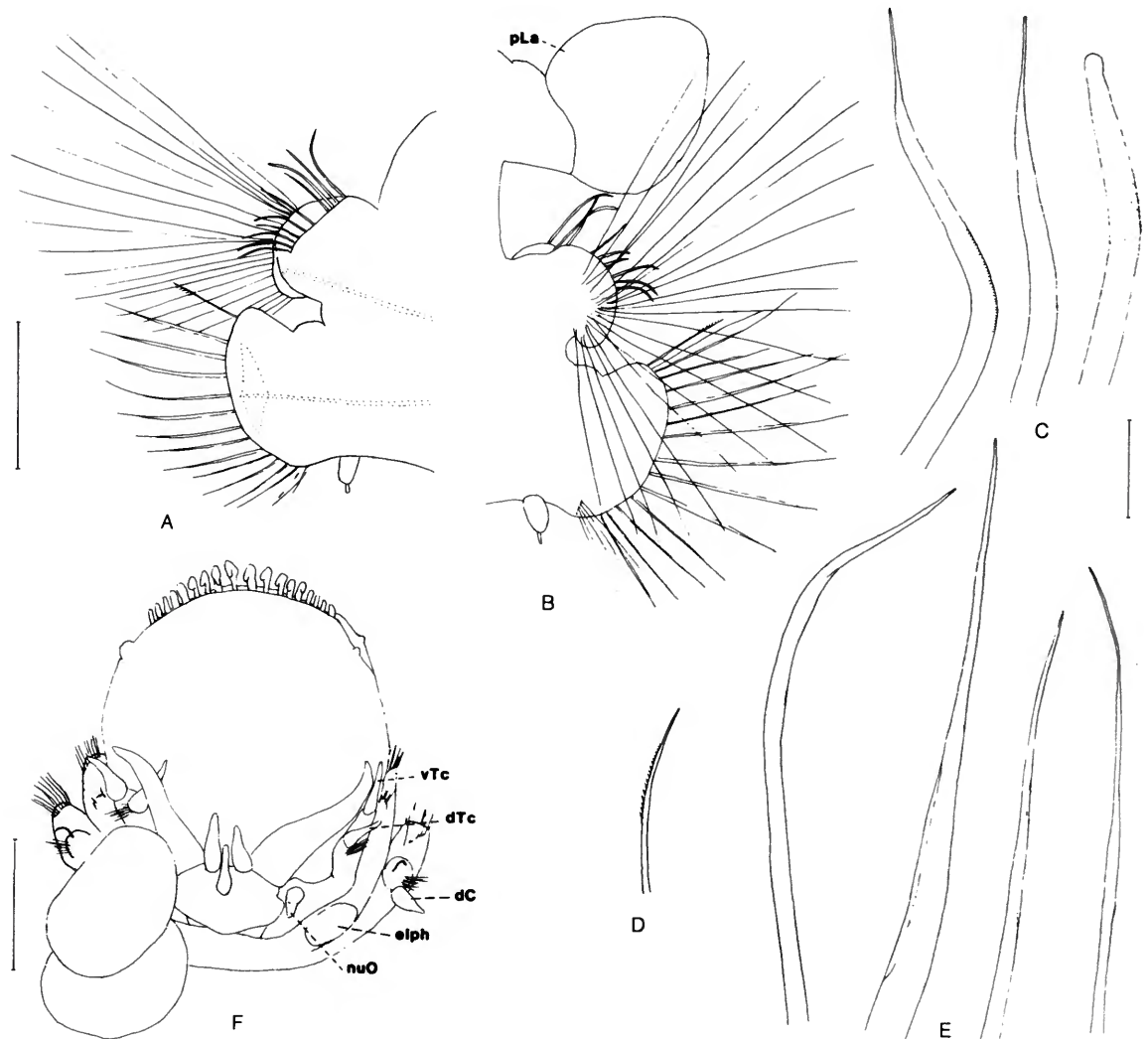


FIGURE 19.—*Proeulepethus clarki* (A–E, holotype (USNM 67474); F, paratype (USNM 97599)): A, right posterior lamelligerous parapodium, anterior view, acicula dotted; B, same, posterior view, posterior dorsal lamella included; C, notopodial hooks from same; D, pectinate neuroseta from same; E, upper, middle, and lower neurosetae from same; F, dorsal view of anterior end with pharynx fully extended, right elytra of segments 2 and 4 removed. (Scales = 1.0 mm for A, B; 0.1 mm for C–E; 1.0 mm for F.)

Genus *Pareulepis* Darboux, 1900

TYPE-SPECIES.—*Eulepis wyvillei* McIntosh, 1885, by original designation. Gender: feminine.

DIAGNOSIS.—Body short, segments about 37. Elytra 12 pairs, on segments 2, 4, 5, 7, alternate

segments to 21, 24; elytra with lateral borders notched. Dorsal cirri on segments 3 and 6. Branchiae 12 pairs, on segments 8, 10, alternate segments to 22, 23, 25, 26, 27. Posterior dorsal lamellae beginning on segment 28 and continuing posteriorly.

Key to the Species of *Pareulepis* Darboux

- First elytra with border entire, with fringe of papillae on anterior border; two pairs of small eyes on posterior part of prostomium; posterior parapodia with upper neurosetae stouter and darker than lower neurosetae, with tips curved downward and finely spinous along bend *P. malayana* (Horst)
- First elytra with anterior notch, without papillae; eyes lacking; posterior parapodia with upper and lower neurosetae similar *P. wyvillei* (McIntosh)

***Pareulepis wyvillei* (McIntosh, 1885)**

Eulepis wyvillei McIntosh, 1885:131, pl. 19: fig. 11, pl. 20: figs. 2, 3, pl. 24: figs. 2, 3, pl. 25: fig. 11, pl. 14A: figs. 4–6, pl. 32A: fig. 7.

Pareulepis wyvillei.—Pettibone, 1969:9, figs. 4, 5 [synonymy].

NEW RECORD.—West Indies, from encrusting material chipped from rocks, W. Hartman, 1972, 1 specimen (USNM 49234).

DISTRIBUTION.—North Atlantic off Bermuda and Caribbean region, in 7 to 796 meters.

***Pareulepis malayana* (Horst, 1913)**

Eulepis malayana Horst, 1913:164, fig. 2.

Pareulepis malayana.—Gallardo, 1967:54, pl. 8: figs. 1–5.—Pettibone, 1969:12, figs. 6–10.—Amoureux, 1977:1095.—Buzhinskaja, 1982:34, fig. 5A–D.

Pareulepis wyvillei.—Amoureux, Rullier, and Fishelson, 1978:70, fig. 3A,B [not *P. wyvillei* (McIntosh, 1885)].

REMARKS.—Gallardo (1968) extended the range of the species from the Malay Archipelago to Nha Trang, Vietnam, in 22–24 meters,

Amoureux (1977) to Madagascar in 56 meters, and Buzhinskaja (1982) to the South China Sea in 48–50 meters. The species reported as *P. wyvillei* by Amoureux, Rullier, and Fishelson (1978) from the Gulf of Elat in 400–500 meters appears to be closer to *P. malayana*. Gallardo (1968) referred to the branchiae as dorsal cirri.

DISTRIBUTION.—Malay Archipelago, Vietnam, South China Sea, Madagascar, Gulf of Elat, in 22 to 500 meters.

Genus *Grubeulepis* Pettibone, 1969

TYPE-SPECIES.—*Eulepis fimbriata* Treadwell, by original designation. Gender: feminine.

DIAGNOSIS.—Body short, up to 40 segments. Elytra 12 pairs, on segments 2, 4, 5, 7, alternate segments to 21, 24; elytra with lateral borders fimbriated. Dorsal cirri on segments 3 and 6. Branchiae 10–13 pairs, on segments 8, 10, alternate segments to 22, 23, 25, (26, 27, 28). Posterior dorsal lamellae beginning on segments 26–29, continuing posteriorly.

Key to the Adults of *Grubeulepis* Pettibone

1. First elytra with series of 7 or more papillae on anterior border; following few elytra with lateral processes articulate or with terminal buds [Figures 20A–C, 27A–C; Pettibone, 1969, fig. 27e,f]. Posterior lamelligerous parapodia with upper neurosetae stouter than lower ones, curved downward, spinous along bend [Figures 21E,G, 28E,G; Pettibone, 1969, fig. 27a,c] 2
 First elytra without series of 7 or more papillae on anterior border [Figure 33A; Pettibone, 1969, fig. 23e]; following elytra with entire digitiform lateral processes [Figure 33B–D; Pettibone, 1969, figs. 17d–f, 20d–f, 23f–i] 3
2. Twelfth elytra with up to 6 low wide lateral processes, without terminal buds [Figure 20E]. Without acicular neuroseta in cirriferous parapodia of segment 3 [Figure 20G,I]. Upper neurosetae of posterior segments finely spinous along bend, with slender tapered tips [Figure 21E,G] *G. augeneri* Pettibone [Figures 20, 21]
 Twelfth elytra with up to 19–25 entire digitiform lateral processes, without terminal buds [Figure 27F; Pettibone, 1969, fig. 27h]. With acicular neuroseta in cirriferous parapodia of segment 3 [Figure 27I,K; Pettibone, 1969, fig. 25e,i]. Upper neurosetae of posterior segments with prominent denticles along bend and blunt tips [Figure 28G; Pettibone, 1969, fig. 27c] *G. mexicana* (Berkeley and Berkeley) [Figures 27, 28; Pettibone, 1969, figs. 24–27]
3. Without acicular neurosetae in some anterior segments. Upper neurosetae of posterior lamelligerous parapodia similar to lower ones, not stouter or curved downward, not spinous [Pettibone, 1969, fig. 17a,c] *G. fimbriata* (Treadwell) [Pettibone, 1969, figs. 15–17; Nonata and Luna, 1970, pl. 2: figs. 15–25]
 With acicular neurosetae in some anterior segments [Pettibone, 1969, fig. 18b,d]. Upper neurosetae of posterior lamelligerous parapodia stouter than lower ones, curved downward [Figure 35B,D,E; Pettibone, 1969, figs. 20a–c, 23a–d] 4
4. Neurosetae of anterior segments limbate, with long tapering tips [Pettibone, 1969, fig. 18b,c,e]. With few acicular neurosetae in segments 3 and 4 [Pettibone, 1969, fig. 18b,d]. Upper stouter neurosetae of posterior segments tapering abruptly to fine tips, not spinous [Pettibone, 1969, fig. 20a,b] *G. geayi* (Fauvel) [Pettibone, 1969, figs. 18–20]
 Neurosetae of anterior parapodia widely limbate, with short tapering tips [Figures 33K, 37B; Pettibone, 1969, fig. 21e,f,h]. Upper stouter neurosetae of posterior segments finely spinous along bend, with tapered tips [Figure 35D; Pettibone, 1969, fig. 23a,c] 5
5. With acicular neuroseta in segment 3 only [Figure 33H,K] *G. westoni*, new species [Figures 33–38]

With acicular neurosetae in segments 3–8 [Pettibone, 1969, fig. 21e,g]
 *G. ecuadorensis* Pettibone
 [Pettibone, 1969, figs. 21–23]

Key to the Advanced Juveniles of *Grubeulepis*

1. First elytra with 13–18 or more papillae on anterior border; following few elytra with few short lateral processes with terminal buds [Figures 22A,B, 23A–C; Pettibone, 1969, figs. 30e,f, 31f–h]. Upper neurosetae of posterior lamelligerous parapodia stouter than lower ones, bent downward, spinous along bend, with slender tapered tips [Figures 22K,M, 25F,G,I; Pettibone, 1969, fig. 31b,d] 2
 First elytra with 7–8 papillae on anterior border; following few elytra with lateral processes elongate, articulate [Figures 29A–C, 41A–C; Pettibone, 1969, fig. 29e; Jones, 1962, figs. 8, 9]. Upper neurosetae of posterior lamelligerous parapodia stouter than lower ones, bent downward [Figures 30G,I,J, 42E,G,H] 3
2. Middle and posterior elytra with 3–5 short wide lateral processes, without buds [Figure 22C,D] (Gulf of Mexico) or with buds [Pettibone, 1969, fig. 31i–k] (West Africa). Without acicular neuroseta in segment 3 (West Africa) or with acicular neuroseta [Figure 22E,G] (Gulf of Mexico) *G. augeneri* Pettibone
 [Figure 22A–M; Pettibone, 1969, figs. 30a–h, 31a–k]
 Middle and posterior elytra with 5–6 lateral processes, with terminal buds and additional papillae on posterior border [Figure 23D–F]. With acicular neuroseta in segment 3 [Figure 24E,G]
 *G. katzmanni*, new species
 [Figures 23–25]
3. Without acicular neuroseta in segment 3 4
 With acicular neuroseta in segment 3 [Figures 27i,k, 41G,I]. Upper stouter neurosetae of posterior segments spinous along bend, with tips spatulate [Figures 30G,I, 42E,G] 5
4. Lateral processes of middle elytra with buds; 12th elytra with up to 12 lateral processes, half of them with buds [Pettibone, 1969, fig. 29f–h]. Upper stouter neurosetae of posterior segments not spinous along bend, with tips limbate, spatulate [Pettibone, 1969, fig. 29a,c]
 *G. tebblei* Pettibone
 [Pettibone, 1969, figs. 28, 29]
 Lateral processes of middle elytra without buds; 12th elytra with up to 10 lateral processes, 2 with buds [Jones, 1962, figs. 10, 11]. Upper stout neurosetae of posterior segments spinous along bend, with tips blunt, spatulate [Jones, 1962, fig. 25] *G. sulcatisetis* (Jones)
 [Jones, 1962, figs. 1–27]
5. Middle elytra with 8–10 lateral processes, entire or with some terminal buds; posterior elytra with 15–20 lateral processes, mostly with termi-

- nal buds [Figures 29D-F, 30B,C, 31C-E]
 *G. mexicana* (Berkeley and Berkeley)
 [Figures 29-31]
 Middle elytra with entire lateral processes; posterior elytra with 11 lateral
 processes, one with bud [Figure 41D,E] *G. westoni*, new species
 [Figures 41, 42]

***Grubeulepis fimbriata* (Treadwell, 1901)**

Eulepis fimbriata Treadwell, 1901:190, figs. 23, 24.
Grubeulepis fimbriata.—Pettibone, 1969:23, figs. 15-17
 [synonymy].—Nonato and Luna, 1970:74.—Rullier and
 Amoureux, 1979:155.
Pareulepis fimbriata.—Nonato and Luna, 1969:75, pl. 2: figs.
 15-25.

REMARKS.—Nonato and Luna (1969, 1970)
 and Rullier and Amoureux (1979) extended the
 distribution of the species from the West Indies
 and Atlantic side of Panama to northeastern
 Brazil, intertidal to 33 meters.

***Grubeulepis geayi* (Fauvel, 1918)**

Eulepis geayi Fauvel, 1918:503, fig. 1a-h.
Grubeulepis geayi.—Pettibone, 1969:27, figs. 18-20 [synon-
 ymy].

DISTRIBUTION.—Indo-west Pacific, Red Sea,
 southwestern Pacific. Intertidal.

***Grubeulepis tebblei* Pettibone, 1969**

Grubeulepis tebblei Pettibone, 1969:38, figs. 28, 29 [synon-
 ymy].

REMARKS.—The small size of the types from
 the Gold Coast, West Africa (13-17 mm × 4
 mm, with 33 segments), and the lateral processes
 of the fimbriated elytra with terminal buds indi-
 cate that they may be considered to be advanced
 juveniles, rather than adults.

***Grubeulepis ecuadorensis* Pettibone, 1969**

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

REMARKS.—A single adult of 40 segments was
 described from Cape San Francisco, Ecuador, in
 36.6 meters.

***Grubeulepis sulcatisetis* (Jones, 1962)**

Pareulepis sulcatisetis Jones, 1962:174, figs. 1-27.
Grubeulepis sulcatisetis.—Pettibone, 1969:37.

REMARKS.—The small size of the type speci-
 mens from Jamaica, West Indies (9.5-10 × 2.5
 mm, with 32 segments), and the elytra with arti-
 cled lateral processes indicate that they may be
 considered to be advanced juveniles, rather than
 adults.

***Grubeulepis augeneri* Pettibone, 1969**

FIGURES 20-22

Grubeulepis augeneri Pettibone, 1969:38, figs. 30, 31 [synon-
 ymy].—Uebelacker, 1984:24-11, figs. 24-7, 8a-i.

MATERIAL EXAMINED.—*Gulf of Mex-
 ico*: MAFLA sta 2208B, E, Jul 1976, 27°56'N,
 83°27'W, 30 m, clayey sandy silt, adult and
 juvenile (USNM 98355); sta 2209, Jul 1976,
 27°52'N, 83°33'W, 34 m, clayey sandy silt,
 adult (USNM 98356); sta 2959, Aug, Nov 1977,
 25°40'N, 83°05'W, 60 m, silty fine sand, juve-
 nile and advanced juvenile (USNM 98357). SO-
 FLA sta 16B, D, Nov 1980, Jul 1981, 25°45'N,
 83°11'W, 54 m, fine sand, 2 adults, 2 advanced
 juveniles (USNM 74464-5); sta 18D, Apr 1981,
 25°45'N, 83°42'W, 87 m, medium sand, ad-
 vanced juvenile (USNM 74466); sta 28C, Aug
 1981, 24°47'N, 83°13'W, 58 m, fine sand, adult
 and advanced juvenile (USNM 74467).

DESCRIPTION OF ADULT SPECIMENS FROM GULF
 OF MEXICO.—Length of 4 adult specimens 14-
 18 mm, width 3-4 mm, segments 35-36. Elytra
 12 pairs, increasing in length posteriorly (Figure
 20A-E); 1st elytra with papillae on anterior border
 (Figure 20A); following few elytra with 1-3 lat-

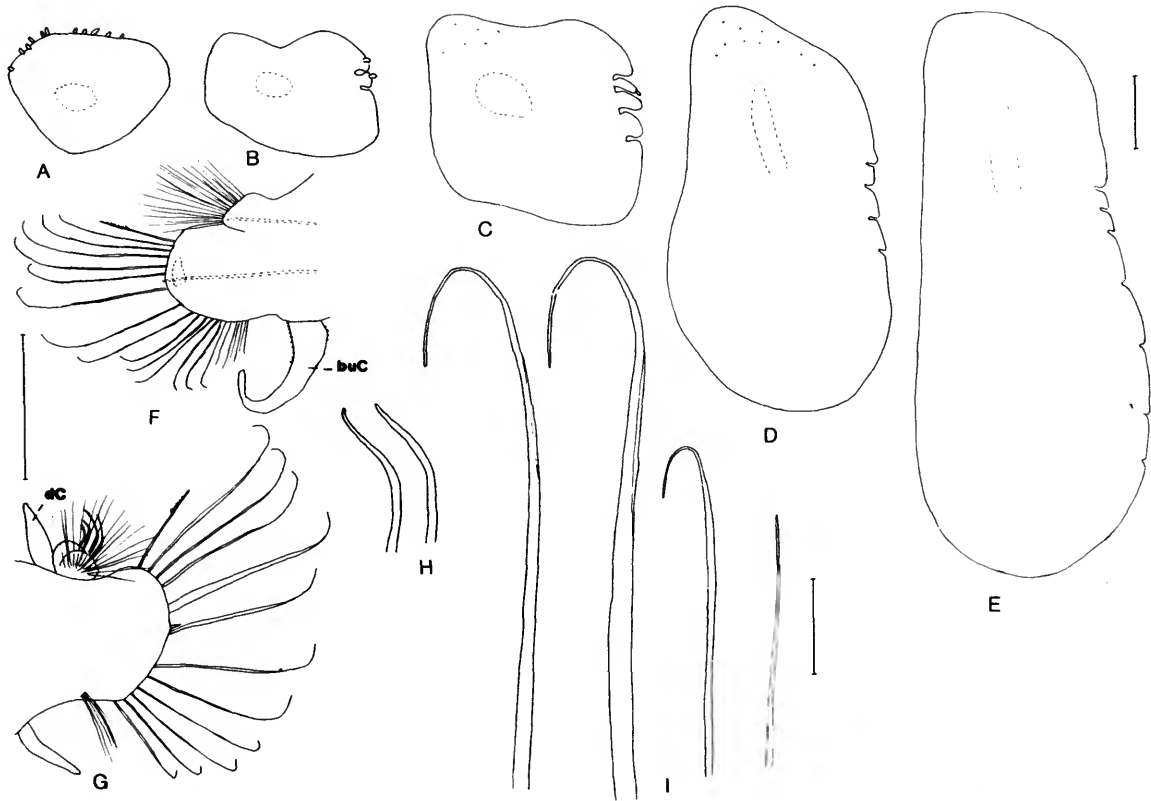


FIGURE 20.—*Grubeulepis augeneri*, adult from Gulf of Mexico (USNM 74464): A, right 1st elytron; B, right 2nd elytron; C, right 4th elytron; D, right 11th elytron; E, right 12th elytron; F, right elytrigerous parapodium of segment 2, anterior view, acicula dotted; G, right cirriferous parapodium of segment 3, posterior view; H, notopodial hooks from same; I, upper, middle, and lower neurosetae from same. (Scales = 0.5 mm for A-E; 0.5 mm for F,G; 0.1 mm for H,I.)

eral processes, some with terminal buds (Figure 20B,C); posterior elytra with up to 6 wide lateral processes, without terminal buds (Figure 20D,E).

Elytrigerous parapodium of segment 2 with capillary notosetae; neuropodium with upper pectinate seta, limbate capillary and lower non-limbate capillary setae, and long buccal cirrus (Figure 20F). Cirriferous parapodium of segment 3 with stout notopodial hooks in addition to posterior bundle of capillary setae; bilimbate capillary neurosetae with long tapering tips, middle ones somewhat stouter, without acicular neu-

roseta (Figure 20G-I).

Notopodia of middle biramous parapodia with posterior bundle of long capillary notosetae and long, stout, smooth notopodial hooks, with tips tapered, truncate, or flattened, spatulate; neuropodia with fan-shaped bundle of neurosetae: upper one pectinate, limbate capillaries with middle ones slightly stouter, and lower group of short capillaries (Figure 21A-D). Posterior lameligerous parapodia differing in having upper group of neurosetae stouter than lower group, bent downward, and finely spinous along bend,

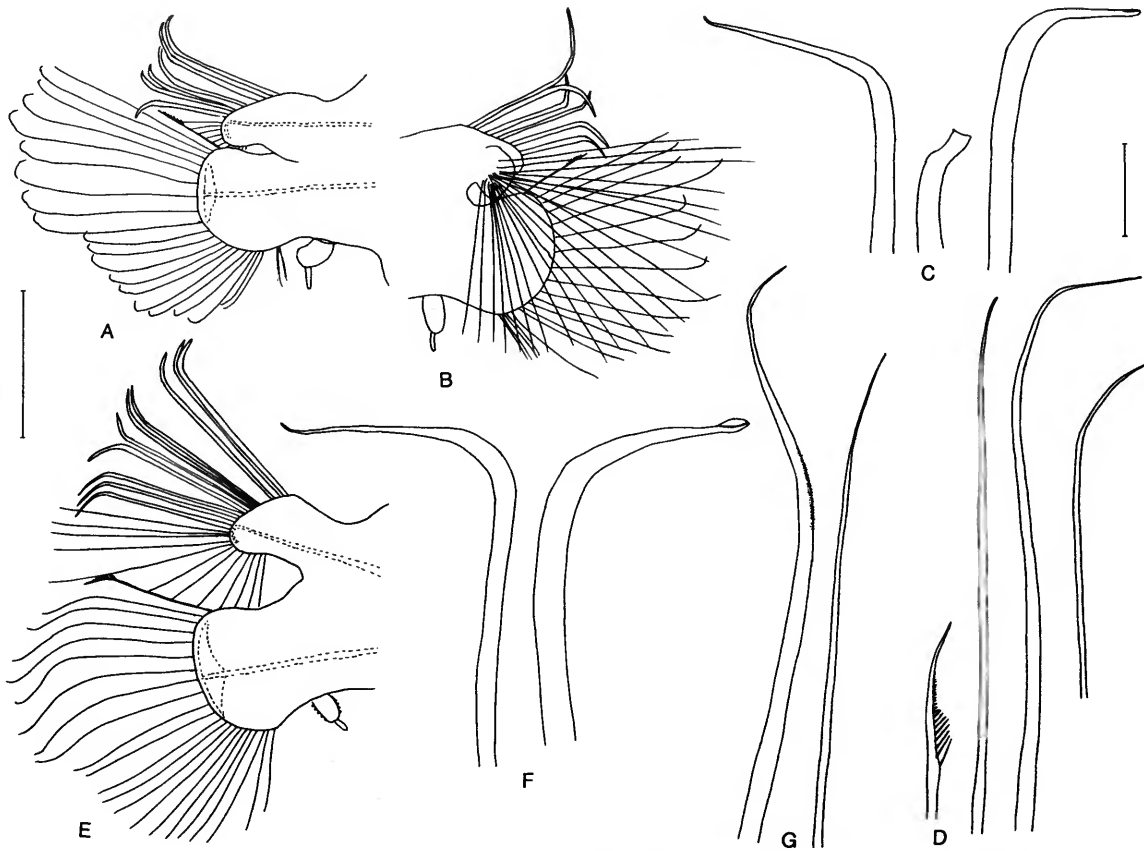


FIGURE 21.—*Grubeulepis augeneri*, adult from Gulf of Mexico (USNM 74464): A, right middle parapodium, anterior view, acicula dotted; B, same, posterior view; C, notopodial hooks from same; D, upper, middle, and lower neurosetae from same; E, right posterior parapodium, anterior view, acicula dotted; F, notopodial hooks from same; G, upper and lower neurosetae from same. (Scales = 0.5 mm for A,B,E; 0.1 mm for D,F,G.)

with curled slender tips (Figure 21E–G).

DESCRIPTION OF JUVENILES FROM GULF OF MEXICO.—Length of five advanced juveniles 8.5–12 mm, width 2–3 mm, segments 31–34. Elytra 12 pairs, increasing in length posteriorly but not as much in comparison to adults (Figure 22A,D); 1st elytra with papillae on anterior border (Figure 22A); following few elytra with 1–3 lateral processes, some with terminal buds (Figure 22B); posterior elytra with up to 5 wide lateral processes, without terminal buds (Figure 22C,D),

thus differing from adults only in size. Cirriferous parapodia of segment 3 differing from adults by presence of stout acicular neuroseta in middle of bundle (Figure 22F,G). Middle elytrigerous and branchial parapodia similar to adults (Figure 22H–J). Posterior lamelligerous parapodia similar to adults, with upper neurosetae stouter than lower ones, bent downward and spinous along bend, with curled slender tips (Figure 22K,L). Small juvenile (USNM 98357) 5 mm long, 2 mm wide, with about 26 segments (posterior end

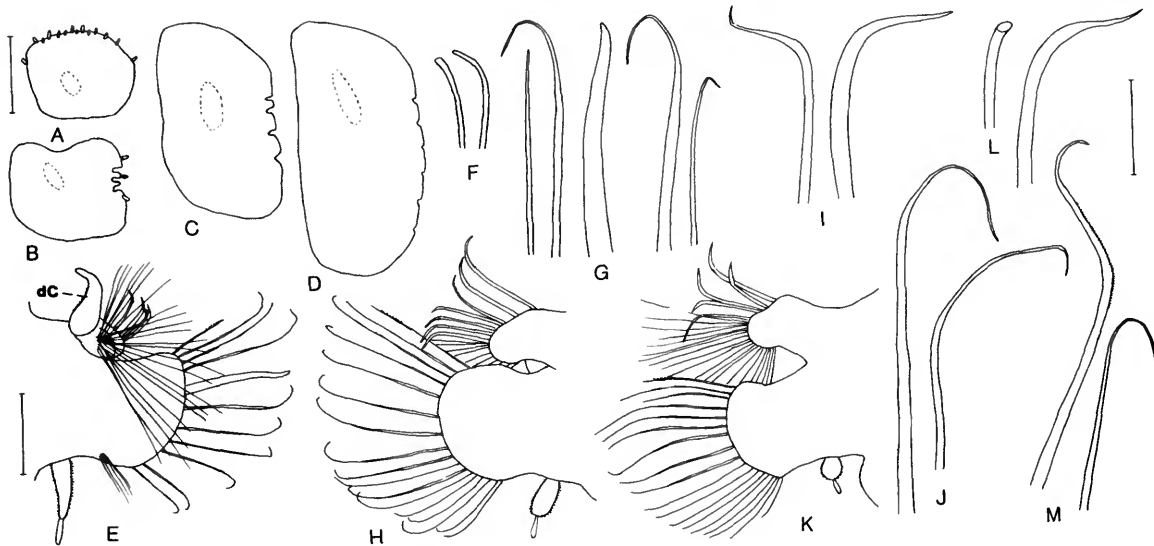


FIGURE 22.—*Grubeulepis augeneri*, advanced juvenile with 31 segments from Gulf of Mexico (USNM 74464): A, right 1st elytron; B, right 3rd elytron; C, right 6th elytron; D, right 12th elytron; E, right cirriferous parapodium of segment 3, posterior view; F, notopodial hooks from same; G, upper, middle, and lower neurosetae from same; H, right middle parapodium, anterior view; I, notopodial hooks from same; J, middle and lower neurosetae from same; K, right posterior parapodium, anterior view; L, notopodial hooks from same; M, upper and lower neurosetae from same. (Scales = 0.5 mm for A–D; 0.2 mm for E, H, K; 0.1 mm for F, G, I, J, L, M.)

damaged). Acicular neuroseta present in parapodia of segments 3, 4, and 5.

REMARKS.—Some eulepethids from the Gulf of Mexico, in 19–87 meters, were referred to *G. augeneri* by Uebelacker (1984). She noted the presence of acicular neurosetae in segment 3 and sometimes also in segment 4 of young specimens. The original description of *G. augeneri* was based on three specimens from West Africa (French Congo, Togo) and the Adriatic, measuring 11–17 mm in length, 3.5–4 mm in width, with 33–35 segments, thus they could be designated as advanced juveniles. The elytra agree with the specimens from the Gulf of Mexico in having relatively few (up to 8) wide lateral processes but here most of the elytra have terminal buds (Pettibone, 1969, figs. 30f–h, 31g–k). Also acicular neurosetae were not observed on the type specimens.

DISTRIBUTION.—West Africa, Adriatic, in 34 meters; Gulf of Mexico, in 19–87 meters.

Grubeulepis katzmanni, new species

FIGURES 23–26

MATERIAL EXAMINED.—Middle Adriatic near Zlorin Island, Yugoslavia, 20–60 m, 1972, W. Katzmann, holotype, juvenile (USNM 67471), 3 juvenile paratypes (USNM 67472).

MEASUREMENTS.—Holotype 9 mm long, 2 mm wide with setae, segments 31, last one small. Largest paratype 6 × 2 mm, with 29 segments; 2 smaller paratypes 3–4 × 1–1.5 mm, with 18 and 20 segments. Two larger ones considered to be advanced juveniles; 2 small juveniles described separately.

DESCRIPTION OF ADVANCED JUVENILES.—

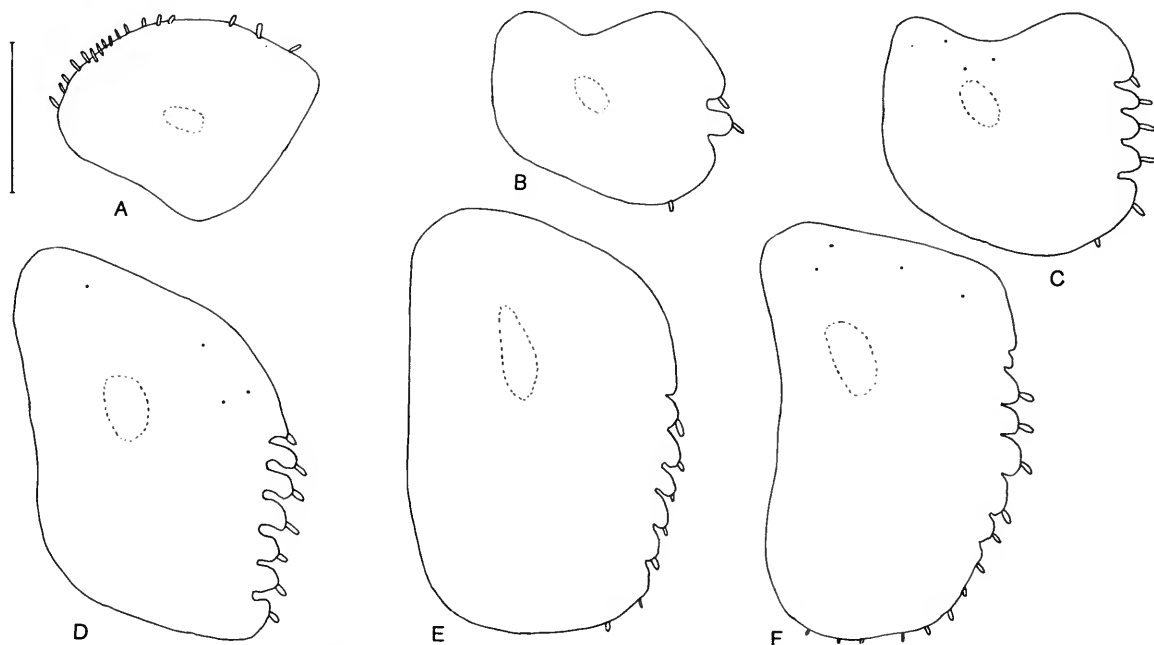


FIGURE 23.—*Grubeulepis katzmanni*, holotype (advanced juvenile of 31 segments, 9 mm long, USNM 67471): A, right 1st elytron; B, right 2nd elytron; C, right 3rd elytron; D, right 7th elytron; E, right 11th elytron; F, right 12th elytron. (Scale = 0.5 mm for A–F.)

Twelve pairs of elytra on usual segments; first pair rounded with numerous papillae (up to 17) on anterior border; fimbriated lateral borders of following elytra with 1–6 wide oval processes, all with terminal buds, with additional papillae on posterior borders and few scattered microtubercles on some of elytra (Figure 23A–F). Two pairs of dorsal cirri short, subulate, on posterior sides of notopodia of segments 3 and 6 (Figures 24E, 25A). Branchiae 11 pairs, on segments 8, 10, alternate segments to 22, 23, 25, 26; large, inflated, with distal papilla (Figure 25B). Posterior dorsal lamellae conical, beginning on segment 27 and continuing posteriorly (Figure 25F).

Prostomium rounded, with small bulbous median antenna, larger subulate lateral antennae and long tapered palps; 3 pairs of scattered pigment on posterolateral sides (Figure 24A). Tentaculophores lateral to prostomium, each with 2

acicula, 2 bundles of capillary setae and pair of dorsal and ventral tentacular cirri, ventral one larger and longer than dorsal one (Figure 24B). Parapodia of elytrigerous segment 2 with small conical notopodium and bundle of finely spinous capillary notosetae; neuropodium with upper pectinate seta and slender tapering limbate and non-limbate capillaries; buccal cirrus longer than following ventral cirri (Figure 24C,D). Notopodium of cirriferous segment 3 with bundle of capillary notosetae on posterior side and stout notopodial hooks with tips tapering and blunt, spinous along bend; neuropodium with upper pectinate seta, single middle smooth acicular seta, limbate and non-limbate capillaries (Figure 24E–G).

Biramous parapodia supported by acicula; notoaciculum with hooked tip, neuroaciculum with distal hammer-shaped plate on anterior side (Fig-

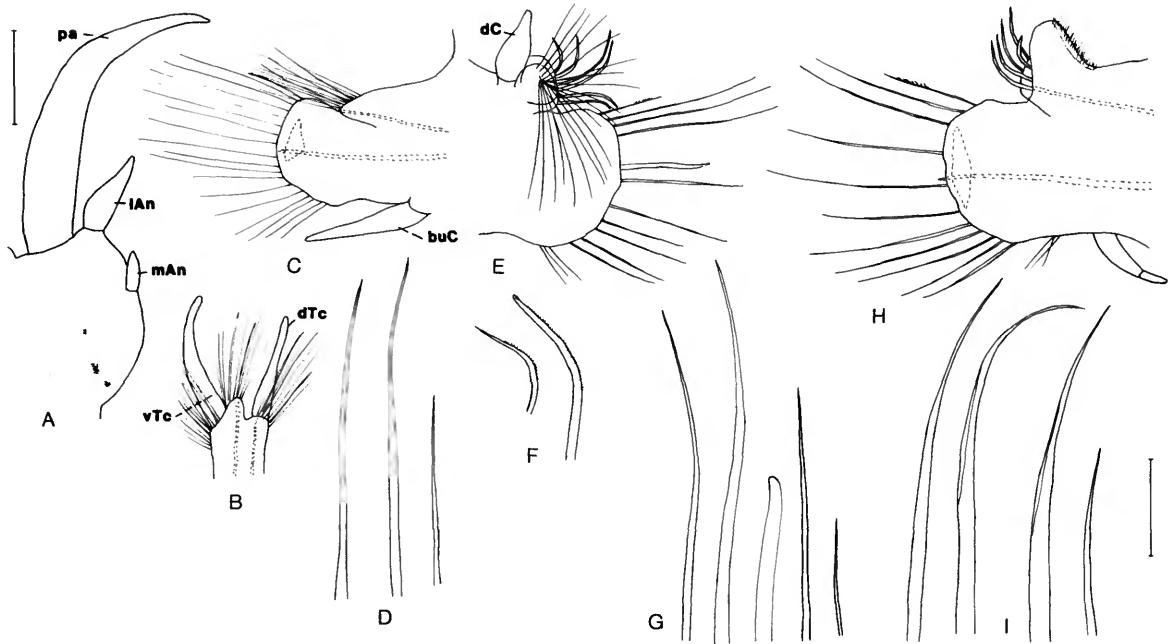


FIGURE 24.—*Grubeulepis katzmanni*, holotype (advanced juvenile, USNM 67471): A, lateral view left side of prostomium showing median antenna, right lateral antenna and palp; B, right tentaculophore, inner view, acicula dotted; C, right parapodium of segment 2, anterior view, acicula dotted; D, upper, middle, and lower neurosetae from same; E, right cirriferous parapodium of segment 3, posterior view, ventral cirrus broken off; F, notopodial hooks from same; G, upper, middle, and lower neurosetae from same; H, right elytriferous parapodium of segment 4, anterior view, acicula dotted; I, upper, middle and lower neurosetae from same. (Scales = 0.2 mm for A–C, E, H; 0.1 mm for D, F, G, I.)

ures 24H, 25c). Smaller notopodium truncate; rounded lobe on posterior side with spreading bundle of long capillary notosetae; projecting stout amber-colored notopodial hooks with tips tapering or flattened spatulate, finely spinous or smooth along bend (Figure 25A–D); neuropodium with fan-shaped bundle of neurosetae: 1–2 upper pectinate setae, middle limbate capillaries with tapering tips, and lower slender capillaries; ventral cirrus short, bulbous, with terminal bud or filament (Figure 25A–C, E).

Posterior lamelligerous parapodia with upper neurosetae stouter than lower ones, curved downward, spinous along bend, tapering to cap-

illary tips (unless broken); notopodial hooks appearing smooth (Figure 25F–I).

DESCRIPTION OF JUVENILE OF 18 SEGMENTS AND 9 PAIRS OF ELYTRA.—First pair of elytra with papillae on anterior border and some on surface (Figure 26A). Following elytra with lateral borders somewhat wavy and up to 7 filiform processes, with some additional processes or papillae on posterior borders (Figure 26B, C).

Prostomium with bulbous median antenna; lateral antennae bulbous with terminal buds; palps long, tapering; 2 pairs of eyes near posterior border (Figure 26D). Tentaculophores lateral to prostomium, each with 2 bundles of long capil-

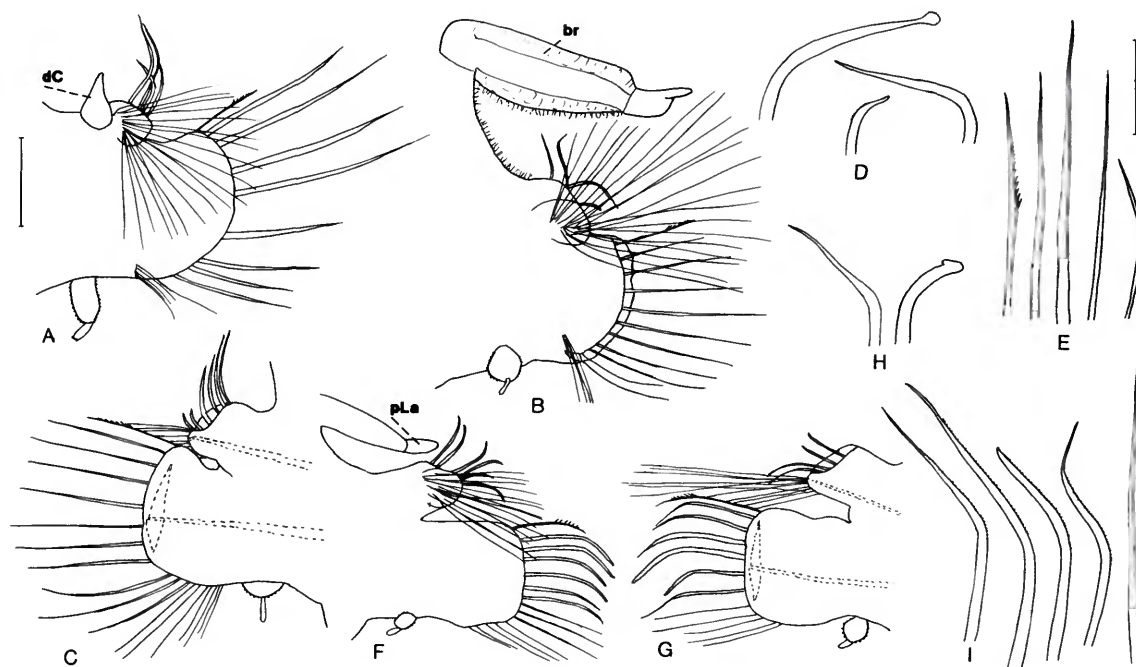


FIGURE 25.—*Grubeulepis katzmanni*, holotype (advanced juvenile, USNM 67471): A, right cirriferous parapodium of segment 6, posterior view; B, right branchial parapodium of segment 14, posterior view; C, right elytriferous parapodium of segment 15, anterior view, acicula dotted; D, notopodial hooks from same; E, upper, middle, and lower neurosetae from same; F, posterior lamelligerous parapodium from segments 25–30, posterior view, acicula dotted; G, same, anterior view, acicula dotted; H, notopodial hooks from same; I, upper and lower neurosetae from same. (Scales = 0.2 mm for A–C,F,G; 0.1 mm for D,E,H,I.)

lary setae; dorsal tentacular cirri subulate; ventral tentacular cirri greatly inflated basally, with short tapering tips (Figure 26D). Buccal cirri of segment 2 large, inflated basally (Figure 26D).

Biramous parapodia similar in shape to advanced juveniles; long projecting notopodial hooks spinous along bend, ending in tapering capillary or blunt tips; fan-shaped bundles of neurosetae from segment 3 on consisting of upper and lower limbate capillaries, lower non-limbate capillaries, and middle stout acicular neurosetae; acicular setae increasing in number on successive parapodia: from 1 on segment 3, to 5 on segment 17, 3 on segment 18; acicular setae

smooth on segment 3, tubercled on following neuropodia; ventral cirri bulbous, with terminal filiform tips (Figure 26E,F).

ETYMOLOGY.—The species is named for Dr. Werner Katzmann, the collector of the specimens, in recognition of his contributions to our knowledge of the Adriatic polychaetes.

REMARKS.—Adult specimens need to be collected in the Adriatic in order to complete the description of the species. It is possible that *G. katzmanni* may prove to be still younger specimens of *G. augeneri*. The denticled acicular neurosetae found in the small juveniles of *G. katzmanni* are similar to those described by Intes and

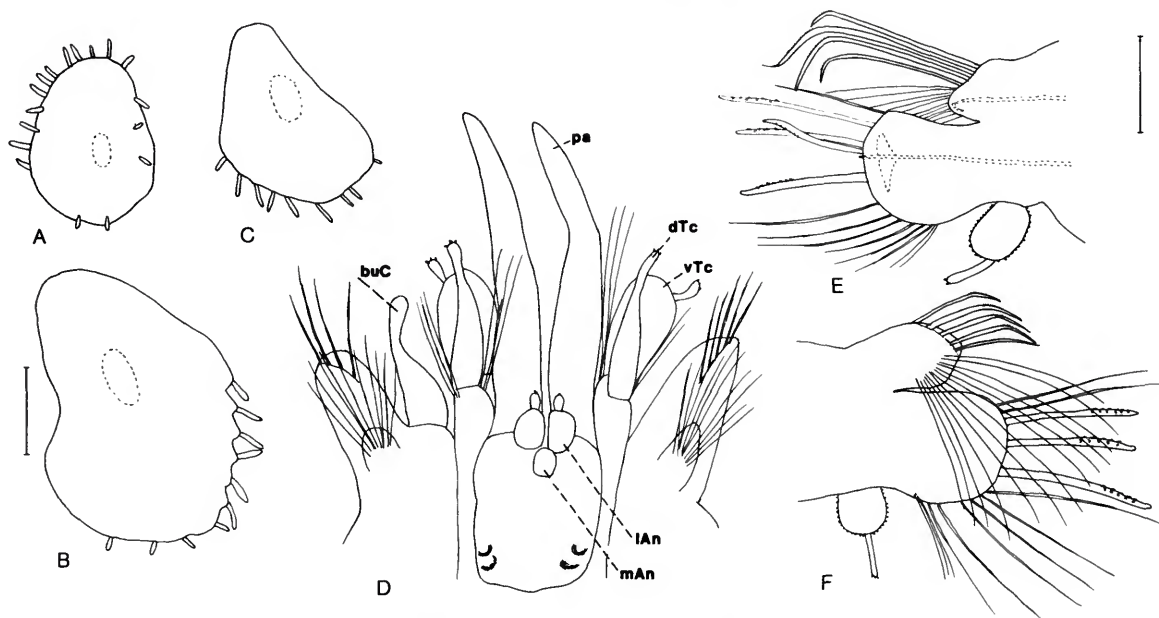


FIGURE 26.—*Grubeulepis katzmanni*, paratype (juvenile of 18 segments, 3 mm long, USNM 67472): A, left 1st elytron; B, right middle elytron; C, left 9th (last) elytron; D, dorsal view of anterior end; E, middle parapodium, anterior view, acicula dotted; F, same, posterior view. (Scales = 0.2 mm for A–C; 0.1 mm for D–F.)

Le Loeuff (1975:282, fig. 4, l–o) on a posterior fragment of about 20 segments and designated as *Grubeulepis* sp. D.

***Grubeulepis mexicana* (Berkeley and Berkeley, 1939)**

FIGURES 27–32

Eulepethus mexicana Berkeley and Berkeley, 1939:328, figs. 4–7.

Grubeulepis mexicana.—Pettibone, 1969:30, figs. 24–27 [synonymy].—Uebelacker, 1984:24, figs. 24-9, 10a-j.

MATERIAL EXAMINED.—*Gulf of California*: 24°16'N, 110°22'W, 37 m, *Albatross* sta 2822, 30 Apr 1888, 1 specimen (USNM 67475). · *Panama, Pacific* (M.L. Jones et al.): Naos Island, Canal Zone, 08°55'N, 79°32'W, muddy sand, sta 19, 23 Apr 1971, 1 specimen (USNM 67476). Fort Amador, Canal Zone, Pilot House

Beach, fine sand, sta 27, 27 Apr 1971, 1 specimen (USNM 67477). Mud flats below Thatcher Bridge, Canal Zone, 08°56'N, 79°34'W, sta 47, 29 Apr 1971, 1 specimen (USNM 67478). Between Naos and Pilot Pier, sandy mud, sta 79, 18 Mar 1972, 3 specimens (USNM 67479); same, muddy sand, shell fragment and plant debris, sta 83, 12 Apr 1972, 4 specimens, including juvenile (USNM 67480). Venado Beach, muddy sand, sta 111, 5 Nov 1972, advanced juvenile (USNM 67481); same, sand spit, sta 132, 4 Apr 1973, 1 specimen (USNM 67482). Farfan Beach, slope of Canal Channel, sta 134, 6 Apr 1973, 1 specimen (USNM 67483).

Gulf of Mexico: Sarasota Bay, Florida, 2–3 m, fine sand and shell, 16 Apr 1944, M.W. Williams, advanced juvenile (USNM 43628). SOFLA sta 8C, May 1974, 26°16'N, 83°12'W, 48 m, fine sand, 1 specimen (BVA); sta 14F, Nov 1980,

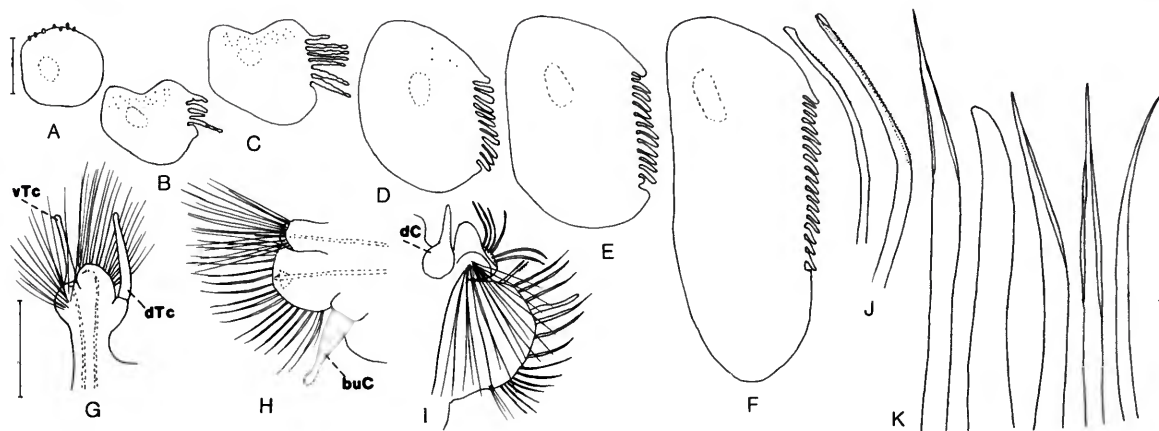


FIGURE 27.—*Grubeulepis mexicana* (Venezuela, USNM 97866): A, right 1st elytron; B, right 2nd elytron; C, right 3rd elytron; D, right 7th elytron; E, right 11th elytron; F, right 12th elytron; G, right tentaculophore, inner view, acicula dotted; H, elytrigerous parapodium of segment 2, anterior view, acicula dotted; I, right cirriferous parapodium of segment 3, posterior view; J, notopodial hooks from same; K, upper, middle, and lower neurosetae from same. (Scales = 1.0 mm for A-F; 0.5 mm for G-I; 0.1 mm for J,K.)

25°46'N, 82°23'W, 26 m, fine sand, 1 specimen (USNM 74468). MAFLA sta 2207H, Aug 1977, 27°57'N, 83°09'W, 19 m, fine sand, 1 specimen (USNM 97600); sta 2209C, July 1976, 27°52'N, 83°33'W, 34 m, clayey, sandy silt, advanced juvenile (USNM 97601); sta 2421E, July 1976, 29°37'N, 84°17'W, 19 m, silty fine sand, advanced juvenile (USNM 97602); sta 2641, 2641B, H, Jun 1975, 29°45'N, 87°46'W, 37 m, fine sand, 4 advanced juveniles (USNM 55800, 97603); sta 2960K, Aug 1977, 25°40'N, 82°20'W, 27 m, fine sand, 1 specimen (BVA). IXTOC sta S-50, Nov 1979, 26°58'N, 97°20'W, 15 m, sand, advanced juvenile (USNM 74469). Off Matagorda, Texas, EPA sta 9-2, Nov 1983, 28°21'N, 96°23'W, 10 m, muddy sand, advanced juvenile (USNM 97606). Mississippi Sound, COE sta 475-4, 2 Nov 1980, 30°02'N, 88°18'W, 20 m, juvenile (USNM 75451). Tuscaloosa Trend, Chevron sta 149, spring 1970, 29°38'N, 88°51'W, 10 m, muddy sand, 2 specimens (USNM 97604); sta 158, 29°27'N, 88°44'W, 24 m, muddy sand, 1 specimen

(USNM 97605).

Venezuela (M.L. Jones): Chargato, Cubagua Island, sta M-9, 1.5 m depth to shore, 16 Feb 1977, advanced juvenile (USNM 97863). Cumaná beach W of airport, sta C-78-5, 18 Jan 1978, 2 specimens (USNM 97866). Isla Margarita, outer side of tip of peninsula, sta 78-1-2, 1 m depth to shore, 13 Jan 1978, advanced juvenile (USNM 97864). South side of peninsula E of Pampatar, sta 78-3, sand, 14 Jan 1978, advanced juvenile (USNM 97865).

MEASUREMENTS.—Two adults from Venezuela 19–26 mm long, 4–6 mm wide, with 39 segments; 3 advanced juveniles 8–12 mm long, 2.5–3 mm wide, with 31–34 segments. Adults from Gulf of Mexico 12–31 mm long, 3.5–5 mm wide, with 35–40 segments; advanced juveniles 8–10 mm long, 2–3 mm wide, with 31–33 segments; small juvenile 5.2 mm long, 2 mm wide, with 26 segments. Adults from Pacific side of Panama 11–18 mm long, 4–6 mm wide, with 32–37 segments; advanced juvenile 6 mm long, 2.5 mm wide, with 31 segments; small juvenile 4

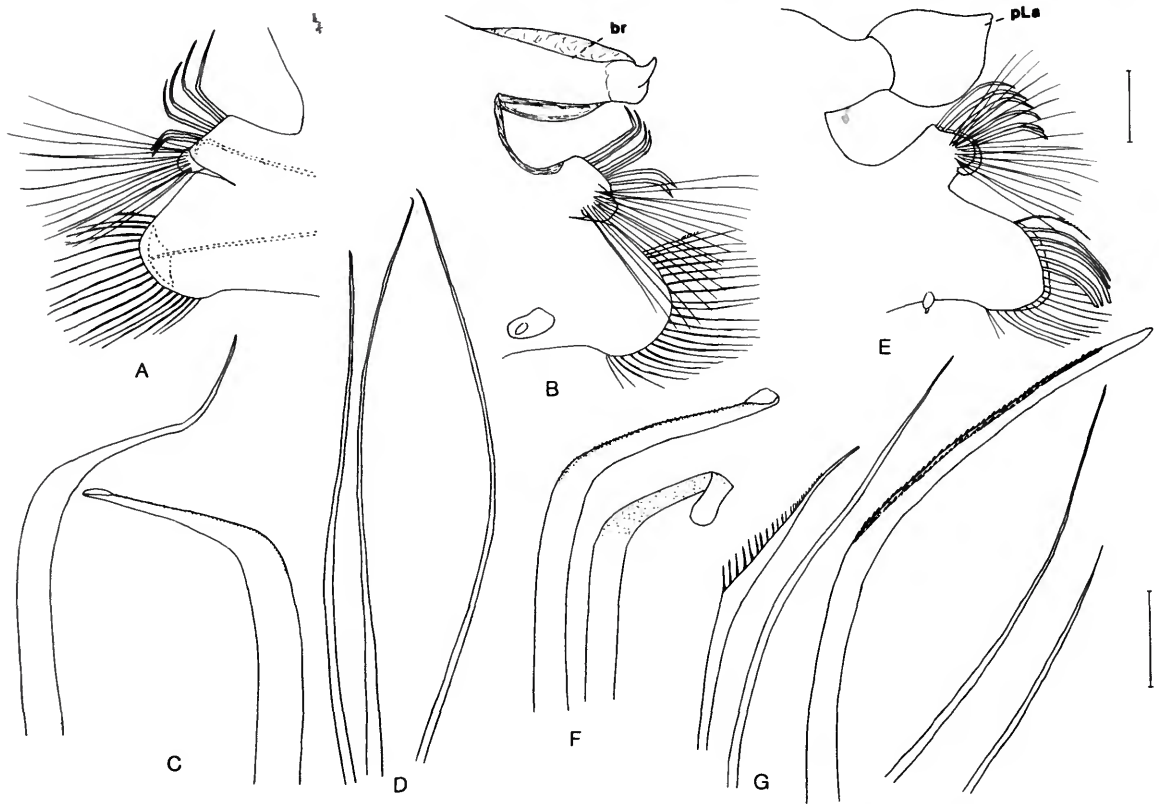


FIGURE 28.—*Grubeulepis mexicana* (Venezuela, USNM 97866): A, right elytrigerous parapodium of segment 15, anterior view, acicula dotted; B, right branchial parapodium of segment 16, posterior view; C, notopodial hooks from same; D, upper, middle, and lower neurosetae from same; E, posterior lamelligerous parapodium, posterior view; F, notopodial hooks from same; G, upper and lower neurosetae from same. (Scales = 0.5 mm for A,B,E; 0.1 mm for D,F,G.)

mm long, 1.5 mm wide, with 23 segments.

DESCRIPTION OF ADULTS FROM VENEZUELA.—Twelve pairs of elytra increasing posteriorly in length as well as number of lateral processes (Figure 27A–F). First pair of elytra round, with fringe of minute papillae on anterior border (Figure 27A); lateral processes of 2nd to 5th elytra long, slender, articulated, with microtubercles on anterior part (Figure 27B,C); following elytra with microtubercles few or lacking, with lateral processes entire, increasing in number to 10 on 7th elytra, to 13 on 11th, and to 17–19 on 12th (Figure 27D–F; up to 25 entire pro-

cesses—in Pettibone, 1969). Two pairs of short subulate dorsal cirri on posterior sides of notopodia of segments 3 and 6 (Figure 27i). Branchiae 12 pairs, on segments 25–27 following last pair of elytra, inflated, with distal papilla (Figure 28B). Posterior dorsal lamellae conical, beginning on segment 28 and continuing posteriorly (Figure 28E). (Branchiae 11–12 pairs, with posterior lamellae beginning segments 27–28—in Pettibone, 1969, and Uebelacker, 1984.)

Tentaculophores lateral to prostomium, each with 2 acicula, 2 tufts of capillary setae, and similar dorsal and ventral tentacular cirri (Figure

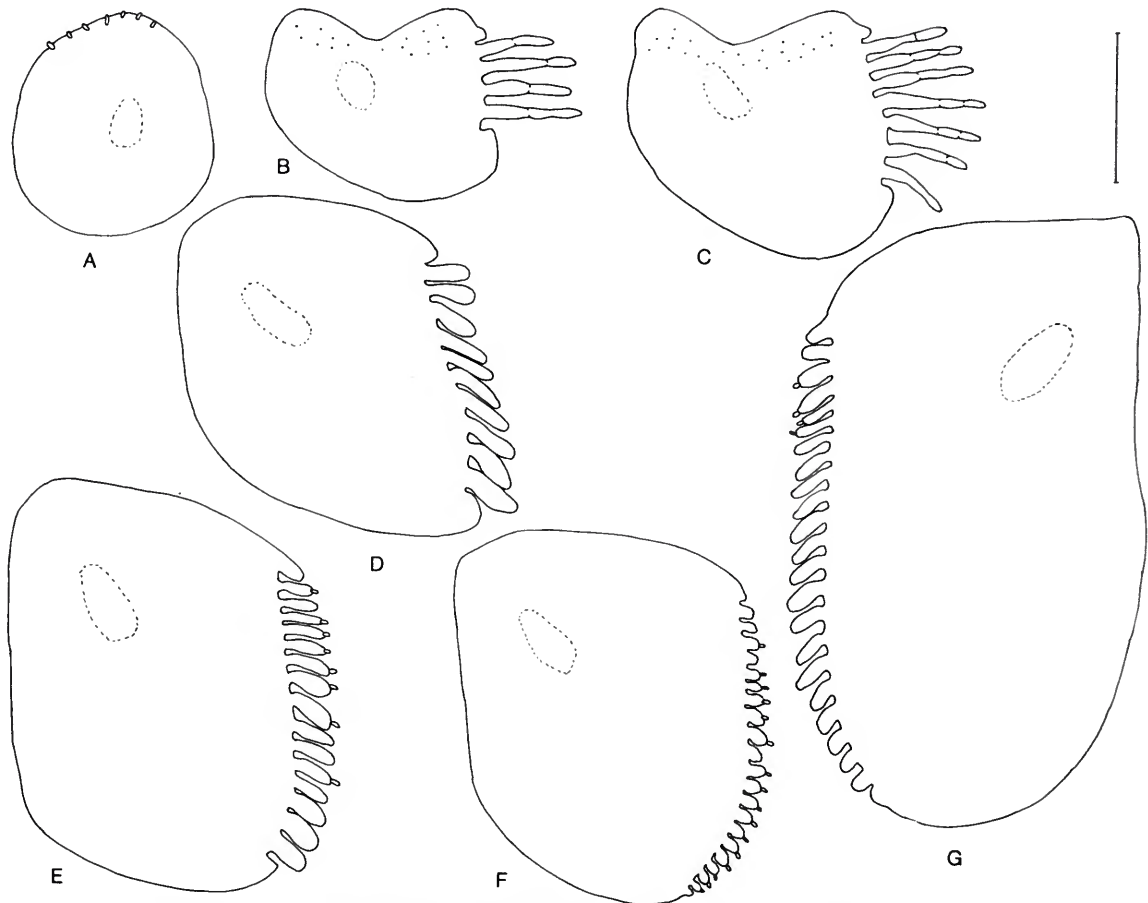


FIGURE 29.—*Grubeulepis mexicana* (Isla Margarita, Venezuela) (A–F, advanced juvenile of 31 segments, 8 mm long (USNM 97863); G, advanced juvenile of 34 segments, 10 mm long (USNM 97864)); A, right 1st elytron; B, right 2nd elytron; C, right 3rd elytron; D, right 7th elytron; E, right 11th elytron; F, right 12th elytron; G, left 12th elytron from larger advanced juvenile. (Scale = 0.5 mm for A–G.)

27G). Small notopodium of segment 2 with capillary notosetae only; larger neuropodium with fan-shaped bundle of neurosetae: 2 upper pectinate setae, limbate capillaries, middle ones stouter, and lower slender capillaries; buccal cirrus stouter and longer than following ventral cirri (Figure 27H). Notopodium of cirriferous segment 3 with bundle of long capillary notosetae emanating from posterior side, and stout notopodial hooks, spinous along bend, with tips finely ta-

pered or flattened, spatulate; neuropodium with 2 upper pectinate setae, stout limbate setae with short capillary tips, middle stout smooth acicular seta, and lower posterior bundle of slender capillaries (Figure 27I–K). Following few parapodia similar except for absence of acicular neuroseta.

Biramous parapodia of middle segments with long capillary notosetae emerging from posterior rounded lobe of notopodium, and stout notopodial hooks from truncate distal part; hooks

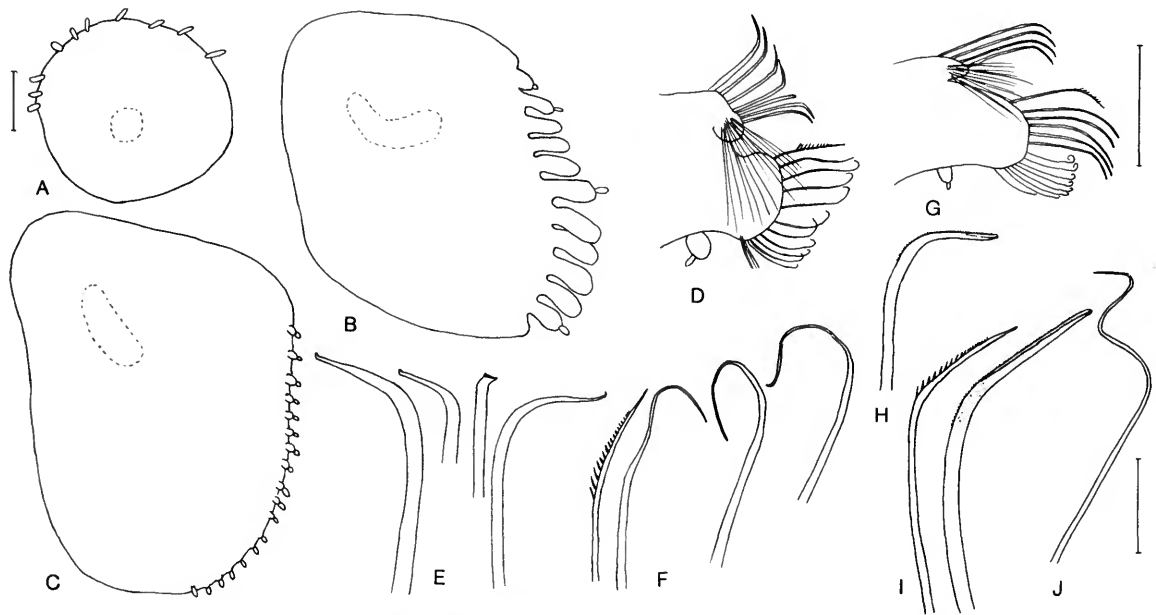


FIGURE 30.—*Grubeulepis mexicana* (Sarasota Bay, Florida), advanced juvenile of 31 segments, 8 mm long (USNM 43628): A, right 1st elytron; B, right 5th elytron; C, right 12th elytron; D, right middle parapodium, posterior view; E, notopodial hooks from same; F, upper, middle, and lower neurosetae from same; G, right posterior parapodium, posterior view; H, notopodial hook from same; I, upper neurosetae from same; J, lower neuroseta from same. (Scales = 0.2 mm for A–C; 0.5 mm for D,G; 0.1 mm for E,F,H–J.)

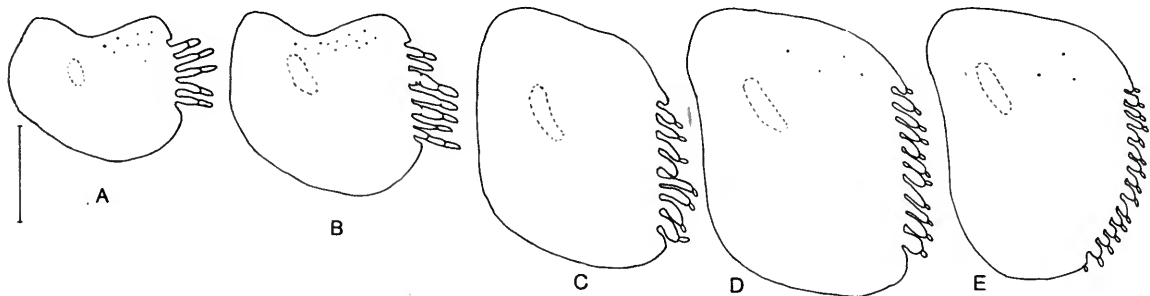


FIGURE 31.—*Grubeulepis mexicana* (Pacific Panama), advanced juvenile of 31 segments, 6 mm long (USNM 67481): A, right 2nd elytron; B, right 3rd elytron; C, right 5th elytron; D, right 11th elytron; E, right 12th elytron. (Scale = 0.5 mm for A–E.)

smooth or spinous along bend, with tips slender, tapering or flattened, spatulate; fan-shaped bundle of neurosetae consisting of 2 upper pectinate setae, slender limbate setae with long capillary tips, middle ones only slightly thicker, and lower

non-limbate capillaries; ventral cirri bulbous with terminal bud (Figure 28A–D).

Parapodia of posterior lamelligerous segments with stout notopodial hooks all bent downward, spinous along bend, and with wide spatulate tips;

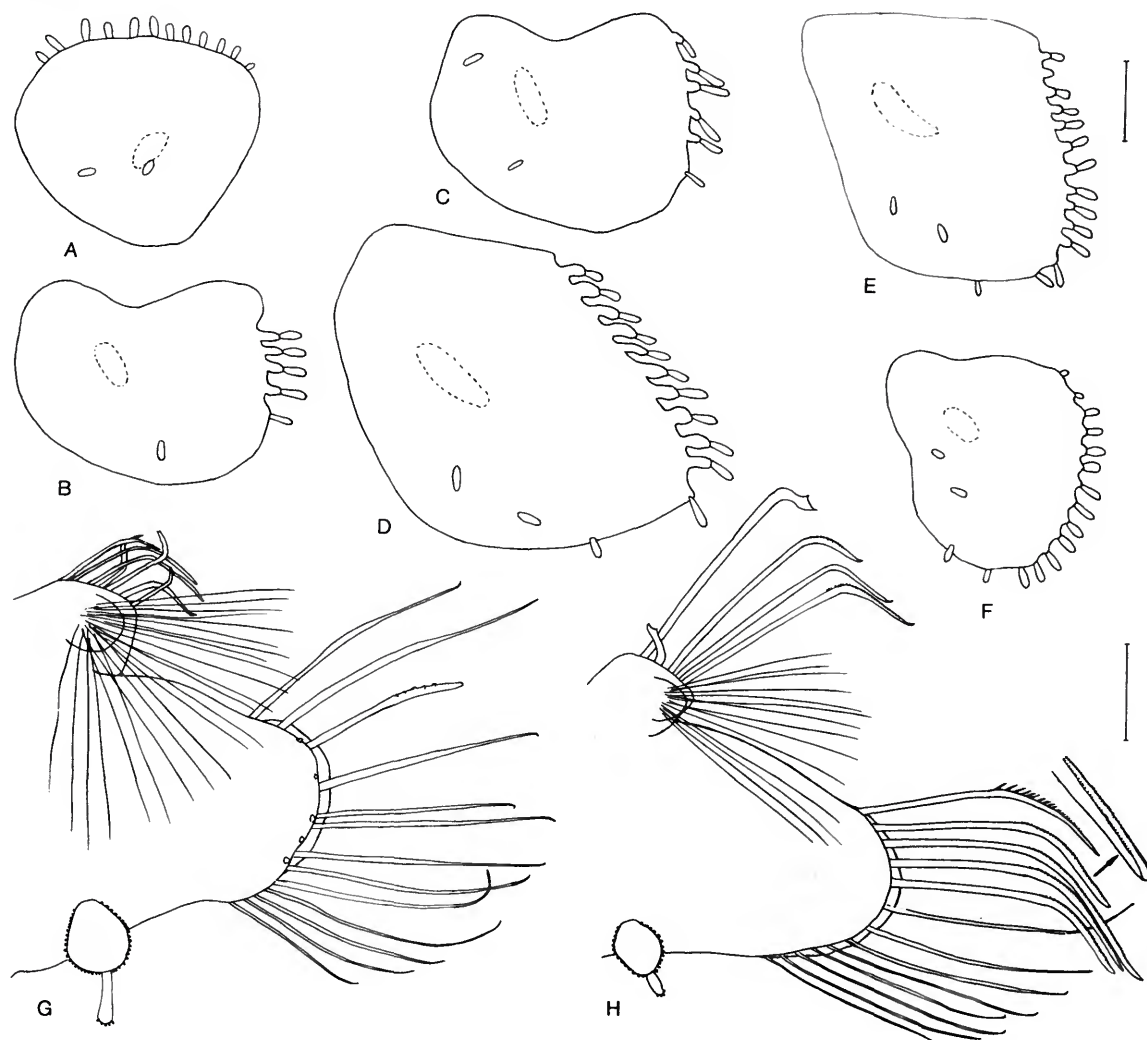


FIGURE 32.—*Grubeulepis mexicana* (Pacific Panama), juvenile of 23 segments, 4 mm long (USNM 67480): A, right 1st elytron; B, right 2nd elytron; C, right 3rd elytron; D, right 5th elytron; E, right 10th elytron; F, right 11th elytron; G, right middle (9th) parapodium, posterior view; H, right posterior (20th) parapodium, posterior view, showing enlargement of neuroseta. (Scales = 0.2 mm for A-F; 0.1 mm for G,H.)

neurosetae consisting of upper pectinate seta, limbate capillary seta, 6 stout acicular hooks bent downward, with prominent spinous regions along bend, about 20 lower limbate setae with long capillary tips and few slender non-limbate capillaries (Figure 28E-G).

DESCRIPTION OF ADVANCED JUVENILES FROM

VENEZUELA, SARASOTA BAY, AND PANAMA.—On advanced juveniles with 31 segments, elytra increasing in length toward middle of body, then decreasing somewhat, with 12th elytra not extra long, as in adults (Figures 29A-F, 30A-C, 31A-E). Anterior few pairs of elytra similar to adult, with papillae on anterior border of 1st elytra,

few following elytra with lateral processes slender and articulated, with microtubercles on anterior part (Figures 29A-C, 31A,B). Middle elytra with lateral processes entire, as in adults, or some biarticulate with terminal buds (Figures 29D, 30B, 31C). Posterior elytra with most of lateral processes biarticulate, with terminal buds (Figures 29E,F, 30C, 31C-E). On advanced juvenile of 34 segments, 12th elytra extra long, as in adult, but with few of lateral processes having terminal buds, instead of entire (Figure 29G).

Stout acicular neuroseta on segment 3 and limbate capillary neurosetae abruptly tapered, as in adult. Middle parapodia similar to adult; notopodial hooks smooth; neurosetae fewer in number (Figure 30D-F). Posterior parapodia similar to adult; notopodial hooks bent downward, spinous along bend, with blunt tips; upper group of neurosetae stouter than lower ones, bent downward, spinous along bend, with blunt tips (Figure 30G-J).

DESCRIPTION OF JUVENILE OF 23 SEGMENTS FROM PANAMA.—Elytra 11 pairs, becoming larger toward middle of body, then smaller (Figure 32A-F). First pair of elytra with papillae on anterior border and few on surface (Figure 32A); lateral borders of following elytra fimbriated, with biarticulate processes and few papillae on surface and posterior border, without microtubercles (Figure 32B-F).

Ventral tentacular cirri large and bulbous. Acicular neuroseta on segment 3. Also some middle parapodia (9, 10) with single denticulate acicular neuroseta; ventral cirrus with minute papillae on bulbous basal part and distal tip (Figure 32G). Posterior parapodium (segment 20) with projecting notopodial hooks bent downward, smooth and spinous along bend; neuropodium with upper pectinate seta, 4 stout acicular neurosetae bent downward, spinous along bend, with spatulate tips; lower neurosetae slender (Figure 32H).

DISTRIBUTION.—Southern California, Gulf of California, Mexico (Isle Grand Bay), Guatemala, Panama (Pacific), intertidal to 37 meters; Gulf of

Mexico, 10–48 meters; Venezuela, intertidal to 1.5 meters.

Grubeulepis westoni, new species

FIGURES 33–42

Grubeulepis cf. *ecuadorensis*.—Uebelacker, 1984:24-9, figs. 24-5, 6a-j [not *G. ecuadorensis* Pettibone, 1959].

MATERIAL EXAMINED.—*North Carolina*: Cape Hatteras, *Eastward* sta 283-286, Jun 1977, 30 m, D.W. Weston, holotype (USNM 97588), 2 paratypes (USNM 97589), 4 juvenile paratypes (USNM 97590). Diamond Shoals, Cape Hatteras, R/V *Explorer*, 24 Jul 1963, 37 m, M. Cerame-Vivas, 10 paratypes (USNM 97591). NE of Cape Hatteras, 35°20'N, 74°59'W, 70 m, gray silty mud, R/V *Gosnold* sta 1869, 27 Jun 1964, R. Wigley, 2 paratypes (USNM 97592).

Gulf of Mexico: Off Rio Grande, Texas, 26°10'N, 97°08'W, 15 m, spring 1976, sta 4, N. Rabalais, 1 specimen (USNM 97593); 26°10'N, 96°31'W, 65 m, sta 6, 2 advanced juveniles (USNM 97594). SOFLA sta 8E, May 1974, 26°16'N, 83°12'W, 48 m, fine sand, 1 specimen (BVA); sta 25D, Nov 1980, 24°47'N, 82°13'W, 24 m, silt/clay, 1 specimen (USNM 74463). MAFLA sta 2423F, Nov 1977, 29°37'N, 84°17'W, 19 m, silty fine sand, 1 specimen (BVA); sta 2693A, Aug 1977, 29°53'N, 88°12'W, 32 m, sandy silt, 1 specimen (BVA). Mississippi Sound, COE sta 470, 3 Nov 1980, 30°05'N, 88°14'W, 19 m, sand, advanced juvenile (USNM 75450); sta 476-3, Mar 1981, 30°03'N, 88°14'W, 21 m, sand, 1 specimen (USNM 97608). Off Alabama, Tuscaloosa Trend, Chevron sta 158, spring 1970, 29°27'N, 88°44'W, 24 m, muddy sand, 3 specimens (BVA; USNM 97607). Off Louisiana, LOOP-offshore sta 484-6, Feb 1984, 28°51'N, 90°04'W, 34 m, mud, 1 specimen (USNM 97609).

Belize: S of Dangriga, Commerce Bight Pier, 75–80 m transect, 17 May 1977, M.L. Jones, advanced juvenile (USNM 97870).

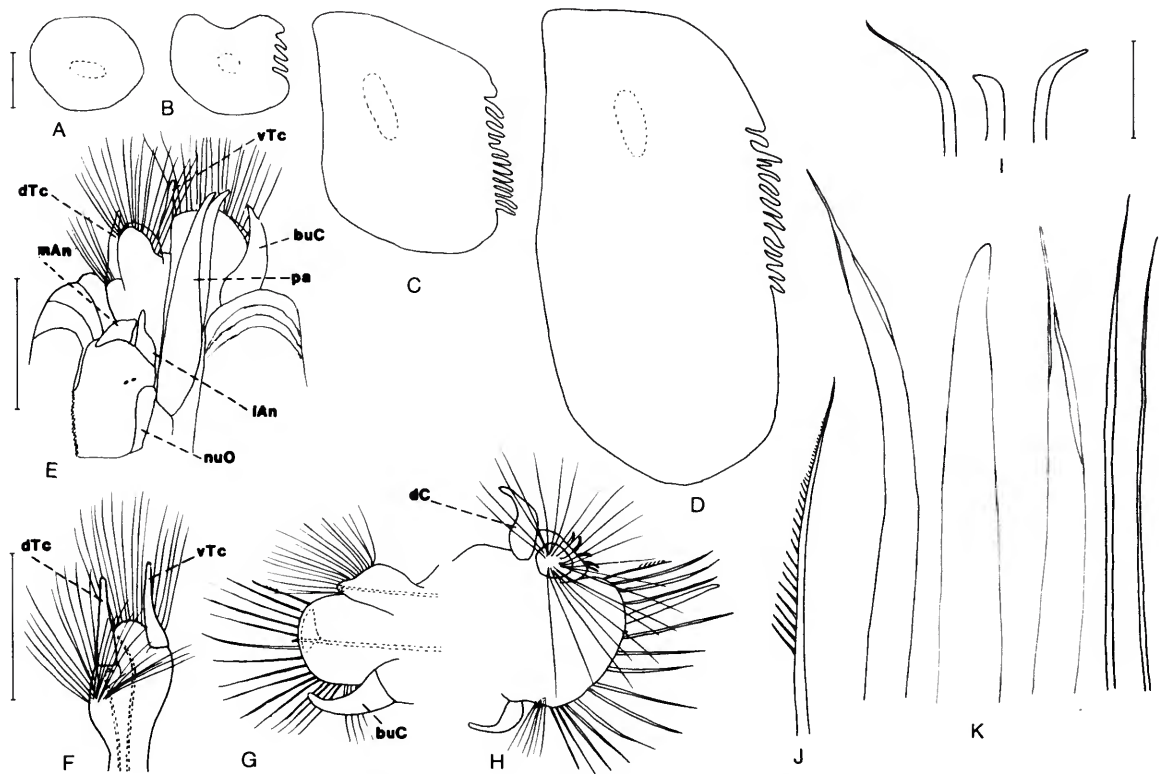


FIGURE 33.—*Grubeulepis westoni*, holotype (USNM 97588): A, right 1st elytron; B, right 2nd elytron; C, right 8th elytron; D, right 12th elytron; E, lateral view of prostomium, left tentaculophore with tentacular cirri of segment 1, parapodium of segment 2 with buccal cirrus, and lower lip (right parapodia of segments 1–3 removed); F, right tentaculophore, outer view, acicula dotted; G, right elytrigerous parapodium of segment 2, anterior view, acicula dotted; H, right cirriferous parapodium of segment 3, posterior view; I, notopodial hooks from same; J, pectinate neuroseta from same; K, upper, middle, and lower neurosetae from same. (Scales = 1.0 mm for A–D; 1.0 mm for E; 1.0 mm for F–H; 0.1 mm for I–K.)

Puerto Rico: Near Punto Palmar Altas, 183 m, sta C-10, Aug 1962, muddy sand, N.C. Hulings, D.E. Feray, adult and juvenile (USNM 81648). Leeward side of Laurel Reef, 1½ mi S of La Parguera, 18 m, 15 Nov 1975, from burrow of fish, *Lonchopithus* sp., Debbie Arneson, 1 specimen (USNM 97869). Barceloneta, 18°29'N, 66°33'W, EPA Baseline Oceanographic Study near Ocean Outfall Pipeline, 1974, B. Mayo, sta 6N-2C, 11 Sep, 30 m, muddy sand, 2 advanced juveniles (USNM 97867); sta

6H-3G, 10 Nov, 32 m, 1 specimen (USNM 97868).

MEASUREMENTS.—Holotype from North Carolina 33 mm long, 8 mm wide, with 38 segments; paratypes 30–40 × 6–8 mm, with 38–40 segments. Adult specimens from Gulf of Mexico 25–37 × 7–9 mm, with 38–40 segments; from Puerto Rico, 25–38 × 6–8 mm, with 38 segments. Advanced juvenile paratype from North Carolina 12 mm long, 3 mm wide, with 34 segments; from Gulf of Mexico, 5–15 × 2–4 mm,

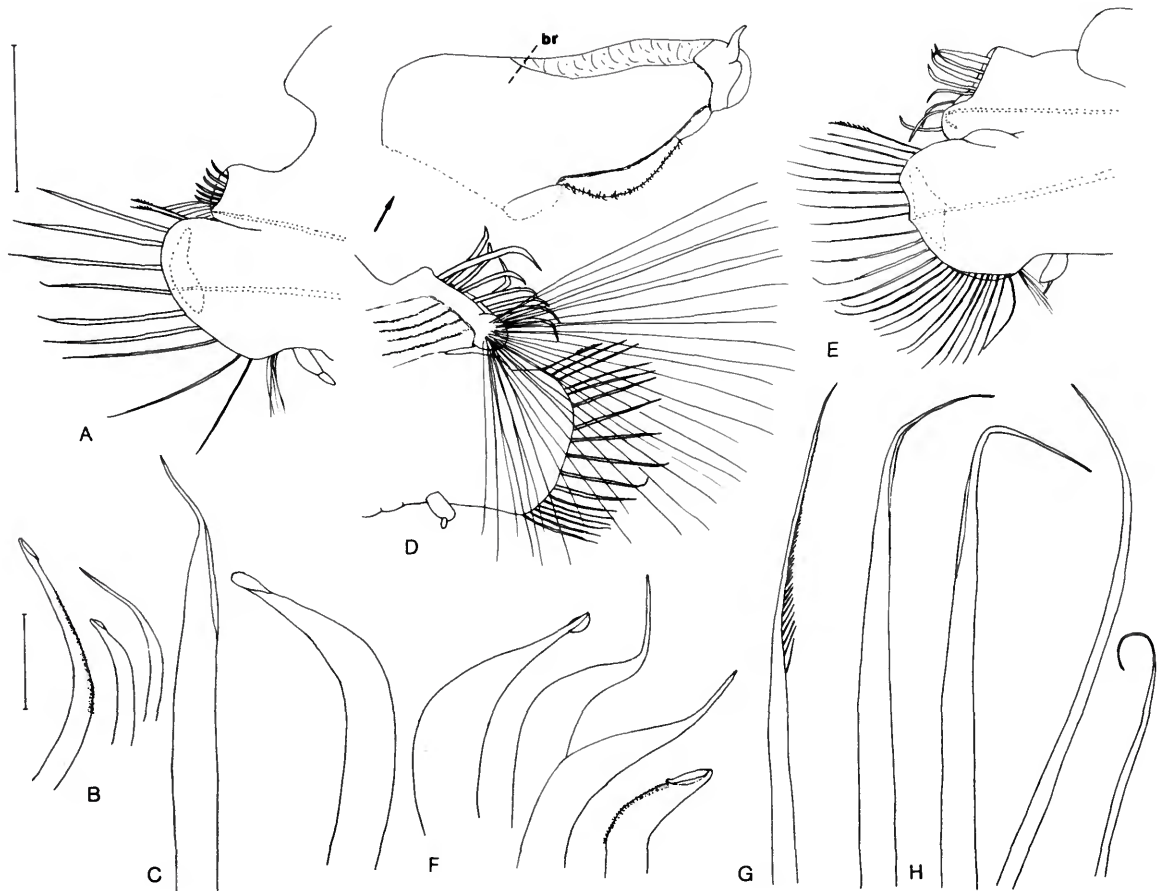


FIGURE 34.—*Grubeulepis westoni*, holotype (USNM 97588): A, right elytrigerous parapodium of segment 4, anterior view, acicula dotted; B, notopodial hooks from same; C, middle neuroseta from same; D, right middle branchial parapodium, posterior view, branchia shown separated (arrow); E, right middle elytrigerous parapodium, anterior view, acicula dotted; F, notopodial hooks from same; G, upper pectinate neuroseta from same; H, middle and lower neurosetae from same. (Scales = 1.0 mm for A,D,E; 0.1 mm for B,C,F-H.)

with 32–35 segments; from Puerto Rico, 6–8.5 × 2–2.5 mm, with 30–32 segments; from Belize, 14 × 4 mm, with 34 segments. Smallest juvenile paratypes from North Carolina 4 mm long, 1.5–2 mm wide, with 23 segments, last one small and incomplete.

DESCRIPTION OF ADULTS.—Twelve pairs of elytra on usual segments, becoming more elongate posteriorly (Figures 33A–D, 36A–E). First pair oval, without papillae (Figures 33A, 36A),

following ones with lateral borders fimbriated, with entire digitiform lateral processes, increasing in number from 3–4 on 2nd elytra to 13–20 on 12th elytra, without microtubercles (Figures 33B–D, 36B–E). Two pairs of dorsal cirri short, subulate, on posterior sides of notopodia of segments 3 and 6 (Figures 33H, 37C,F). Branchiae 12–13 pairs, on segments 8, 10, alternate segments to 22, 23, 25, 26, 27 (28), large inflated, with distal papilla (Figures 34D, 38B). Posterior

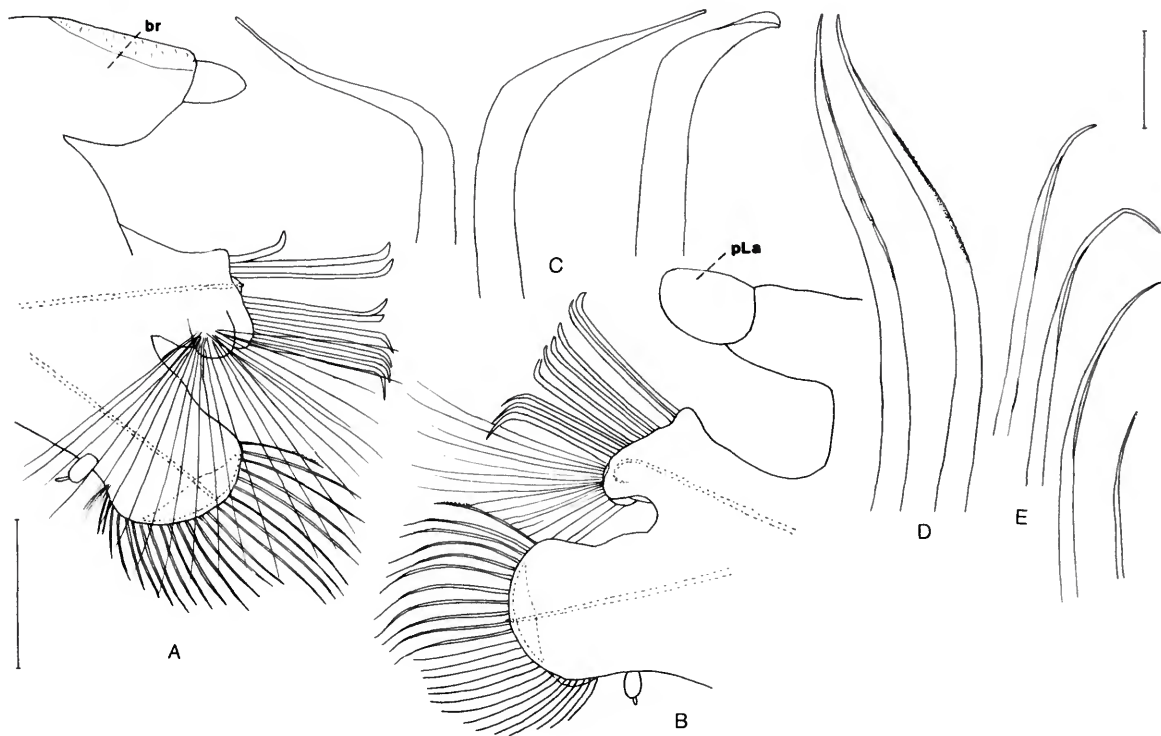


FIGURE 35.—*Grubeulepis westoni*, holotype (USNM 97588): A, last right branchial parapodium (segment 28), posterior view; B, first right lamelligerous parapodium (segment 29), anterior view, acicula dotted; C, notopodial hooks from same; D, upper neurosetae from same; E, lower neurosetae from same. (Scales = 1.0 mm for A,B; 0.1 mm for C–E.)

dorsal lamellae up to 10 pairs, conical, beginning on segment 28 or 29, continuing posteriorly (Figures 35B, 38E).

Prostomium withdrawn in anterior 3 segments, posterior middorsal half attached to segment 2, rounded anteriorly, with short globular median antenna attached terminally, short subulate lateral antennae attached anteroventrally, and longer, thicker tapered palps attached ventrally; 2–3 pairs of small eyes and club-shaped nuchal organs on lateral side (Figures 33E, 36F). Tentaculophores of 1st segment directed anteriorly, lateral to prostomium, each with 2 acicula, pair of similar dorsal and ventral tentacular cirri and 2 tufts of smooth and spinous capillary setae (Figures 33F, 36F,G). Elytrigerous parapodia of

segment 2 extended anteriorly, notopodia small, conical, with bundle of finely spinous and smooth capillary notosetae; neuropodia similar to following parapodia; neurosetae composed of 2 upper pectinate setae, limbate capillaries, few middle ones somewhat stouter, and lower slender, finely spinous capillaries; buccal cirri longer and thicker than following ventral cirri (Figures 33G, 37A,B). Cirriferous segment 3 not distinct dorsally; parapodia wedged between parapodia and elytriphores of segments 2 and 4 (Figure 36F); notopodium small, truncate with bundle of capillary notosetae emerging from posterior rounded lobe and stout hooked notosetae with tips tapered or blunt, spatulate, smooth or finely spinous along bend (Figures 33H,I, 37C,D); large rounded neu-

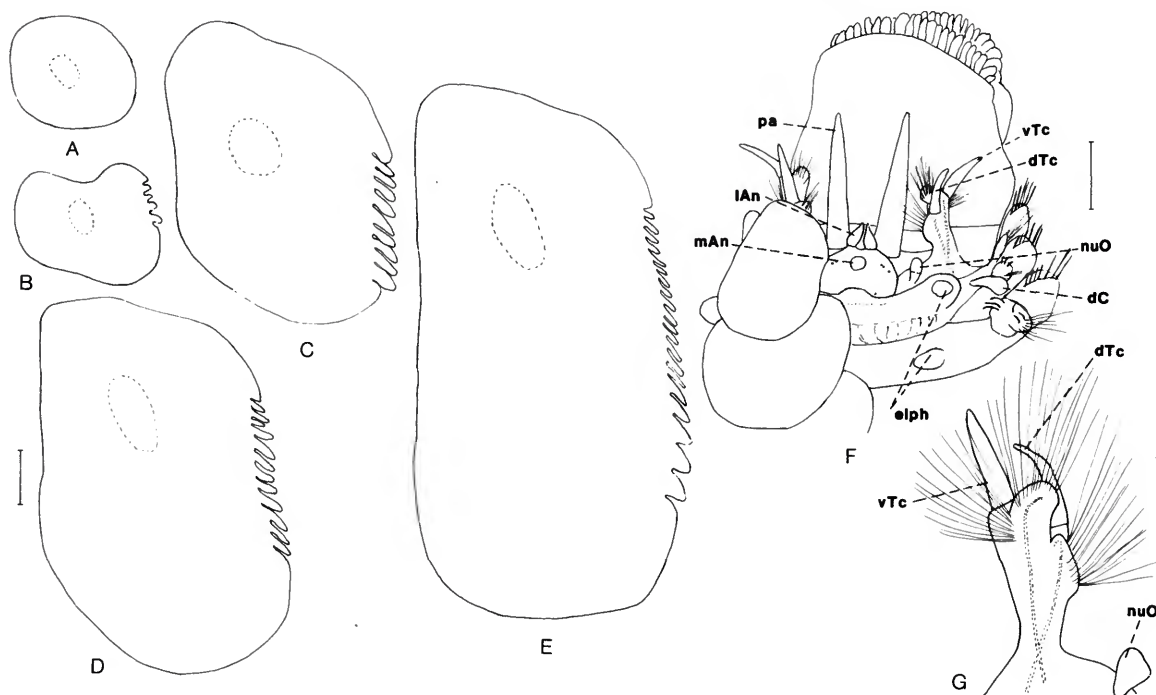


FIGURE 36.—*Grubeulepis westoni*, adult from Puerto Rico (USNM 97869): A, right 1st elytron; B, right 2nd elytron; C, right 7th elytron; D, right 11th elytron; E, right 12th elytron; F, dorsal view of anterior end, pharynx extended, right elytra of segments 2 and 4 removed; G, right tentaculophore and nuchal organ, inner view, acicula dotted. (Scales = 0.1 mm for A–E; 1.0 mm for F; 0.5 mm for G.)

ropodium with 1–2 upper pectinate setae, stout limbate setae with short tapered tips, single middle stout acicular seta, and lower group of finely spinous capillaries lateral to short, tapered ventral cirrus (Figures 33H,J,K, 37C,E). Elytrigerous parapodium of segment 4 similar to 3 except for absence of acicular neuroseta (Figure 34A–C).

Biramous parapodia supported by acicula: notoaciculum with hooked tip, neuroaciculum with distal hammer-shaped plate on anterior side (Figures 34E, 38A). Notopodium truncate, with rounded lobe on posterior side with spreading bundle of long capillary notosetae; upper truncate part with projecting stout amber-colored hooked notosetae, with tips tapering or flattened spatulate, mostly smooth along bend but some finely spinous or roughened (Figures 34D–F,

38A–C); neuropodium flattened, paddle-like, with fan-shaped bundle of neurosetae: 1–2 upper pectinate setae, stout middle limbate capillaries with rather short tapering tips, and lower slender capillaries; ventral cirrus short, bulbous, with terminal bud or filament (Figures 34D,E,G,H, 38A,B,D).

Parapodia of posterior segments differing somewhat from more anterior parapodia. Last branchial parapodium sometimes transitional, with less-developed branchia (Figure 35A). Following parapodia with conical posterior dorsal lamellae from segment 28 or 29 on (Figures 35B, 38E); notopodial hooks strongly roughened and spinous (Figure 38F); upper neurosetae much stouter than lower ones, bent downward, with shorter tapered tips and somewhat roughened or

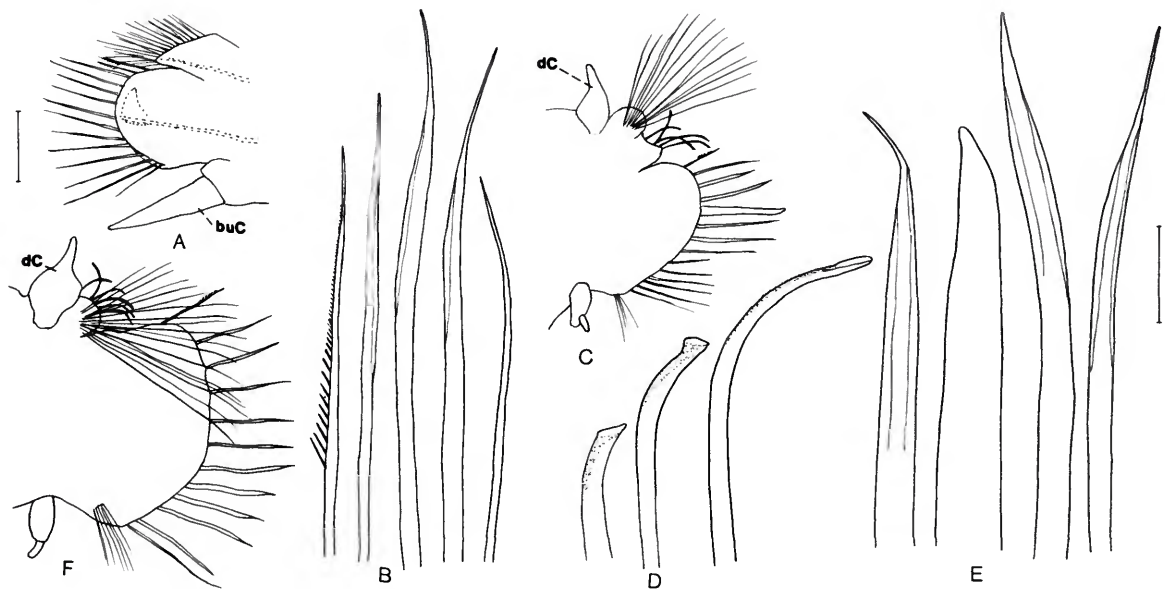


FIGURE 37.—*Grubeulepis westoni*, adult from Puerto Rico (USNM 97869): A, right elytrigerous parapodium of segment 2, anterior view; B, upper, middle, and lower neurosetae from same; C, right cirriferous parapodium of segment 3, posterior view; D, notopodial hooks from same; E, upper, middle, and lower neurosetae from same; F, right cirriferous parapodium of segment 6, posterior view. (Scales = 0.5 mm for A,C,F; 0.1 mm for B,D,E.)

spinous along bend (Figures 35B,D,E, 38E,G,H).

Pygidium small, round, with long papillate anal cirrus on right side and short stub on left side. Pharynx fully extended on specimen from Puerto Rico, with prostomium and anterior parapodia fully exposed (Figure 36F). Distal border of pharynx with circle of about 17 pairs of leaf-like papillae.

DESCRIPTION OF JUVENILES.—Smallest juvenile paratypes from North Carolina 4 mm long, 2 mm wide, with 23 segments, last 2 small and incompletely developed. Long papillate anal cirrus on right side more than half length of body, with small biarticulate cirrus on left side. Elytra 11 pairs, becoming larger toward 7th to 9th elytra, then smaller toward 11th elytra on segment 21, followed by 2 small incomplete parapodia (Figure 39A–G). First elytron with papillae on anterior border and few on surface (Figure 39A). Following elytra with lateral borders fim-

briated, processes biarticulate and some with additional terminal bud; 3 processes on elytra 2, increasing to 13 on elytra 10 and decreasing to 10 on last elytra 11, with 1–2 papillae on posterior borders (Figure 39B–G). Dorsal cirri subulate, attached on posterior sides of notopodia of segments 3 and 6 (Figure 40C). Branchiae 7 pairs, beginning on segment 8 (Figure 40J). Posterior lamelligerous parapodia not developed on small juveniles.

Notopodia of elytrigerous segment 2 with slender capillaries; neuropodia with limbate capillaries having short tapering tips, and lower posterior bundle of fine capillaries; buccal cirri long, tapered (Figure 40A,B). Notopodia of cirriferous segment 3 with slender capillaries on posterior side and notopodial hooks, spinous along bend; neuropodia with limbate capillaries having short tapered tips and single stout acicular seta; ventral cirrus with terminal knob (Figure 40C–E).

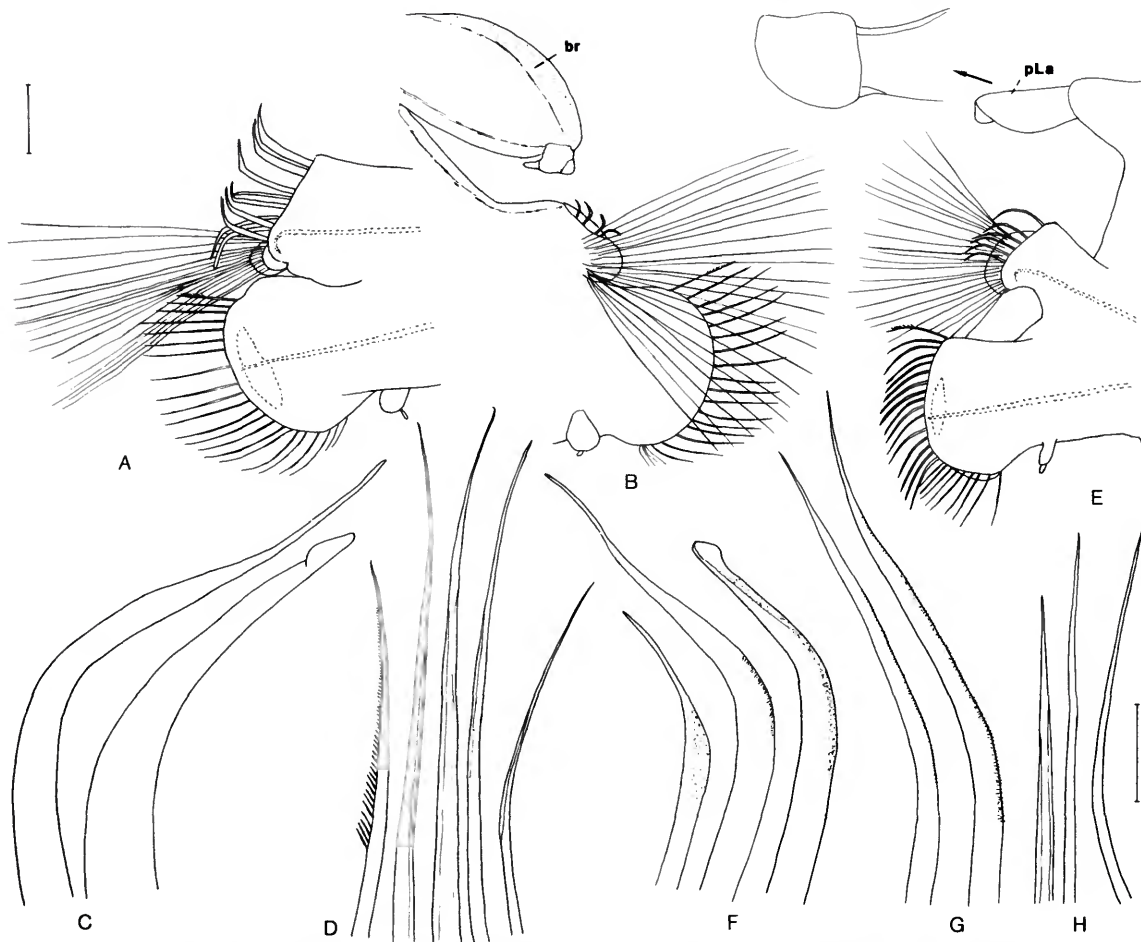


FIGURE 38.—*Grubeulepis westoni*, adult from Puerto Rico (USNM 97869): A, right middle elytrigerous parapodium, anterior view, acicula dotted; B, right middle branchial parapodium, posterior view; C, notopodial hooks from same; D, upper, middle, and lower neurosetae from same; E, right posterior lamelligerous parapodium, anterior view, acicula dotted; F, notopodial hooks from same; G, upper neurosetae from same; H, lower neurosetae from same. (Scales = 0.5 mm for A,B,E; 0.1 mm for C,D,F-H.)

Following parapodia similar, with addition of upper pectinate neuroseta and with acicular neuroseta lacking; notopodial hooks smooth or spinous along bend (Figure 40F-L). Parapodia of segment 19 somewhat modified (similar to segments with lamelligerous parapodia): notopodial hooks roughened along bend; upper neurosetae stouter than lower ones, curved downward,

roughened or slightly spinous along bend (Figure 40M-O).

Advanced juveniles with 30-34 segments, 12 pairs of elytra, and few posterior lamelligerous parapodia. First elytra with papillae on anterior border and not lacking, as in adults (Figure 41A); following few elytra with lateral processes biarticulate (Figure 41B,C); middle elytra with about

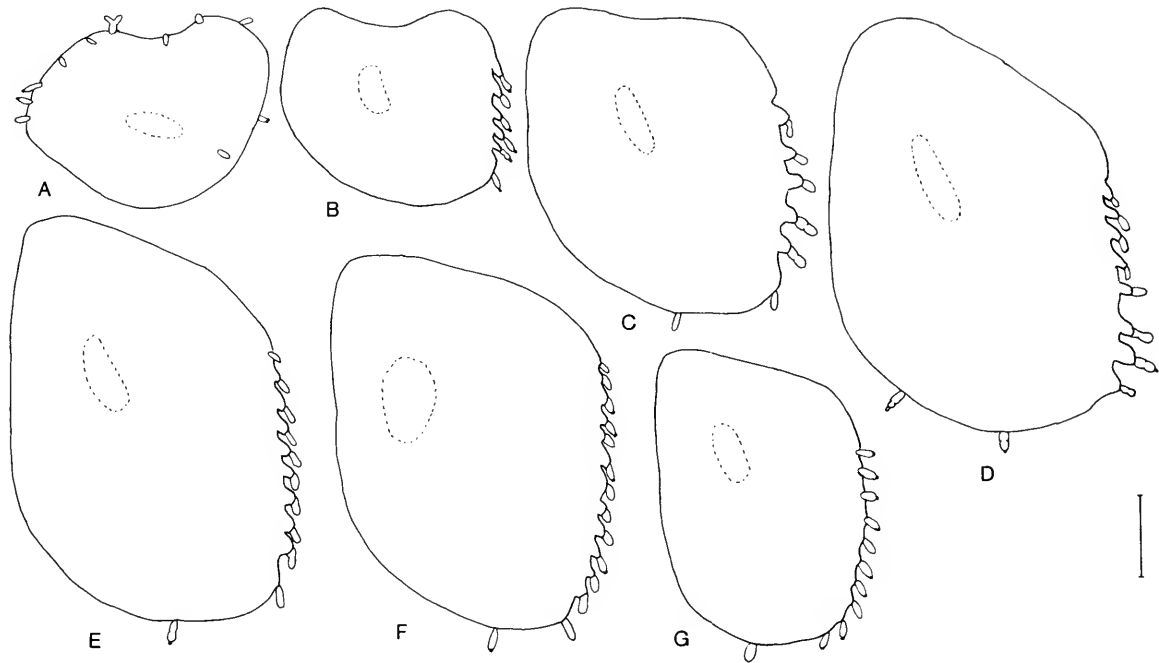


FIGURE 39.—*Grubeulepis westoni*, juvenile paratype from North Carolina (4 mm long, 23 segments, USNM 97590): A, right 1st elytron; B, right 3rd elytron; C, right 4th elytron; D, right 7th elytron; E, right 9th elytron; F, right 10th elytron, G, right 11th elytron. (Scale = 0.2 mm for A–G.)

8 entire lateral processes (Figure 41D); posterior 12th elytra not so large as in adults, with about 11 lateral processes, one with terminal bud (Figure 41E). Parapodia similar to adults (Figures 41F–I, 42A–H); most of upper stout neurosetae of posterior lamelligerous parapodia ending in blunt tips and not tapered, as in adults (Figure 42G).

DISTRIBUTION.—North Carolina, Gulf of Mexico, British Honduras, Puerto Rico, in 15–80 meters.

ETYMOLOGY.—The species is named for Donald W. Weston, who collected some of the type specimens and noted some of the differences from previously described species of eulepethids.

REMARKS.—*Grubeulepis westoni* is closest to *G. ecuadorensis* Pettibone from Ecuador. The adults agree in having the first pair of elytra without papillae; the lateral processes of the fimbriated elytra entire, not articulated; the neurosetae of the anterior segments widely limbate with short tapering tips; and the upper neurosetae of the posterior lamelligerous segments stouter than the lower ones, curved downward, with tapered tips and finely spinous along the bend. They differ in having a single acicular neuroseta only on segment 3 in *G. westoni* and single acicular seta in anterior parapodia of segments 3–8 in *G. ecuadorensis*.

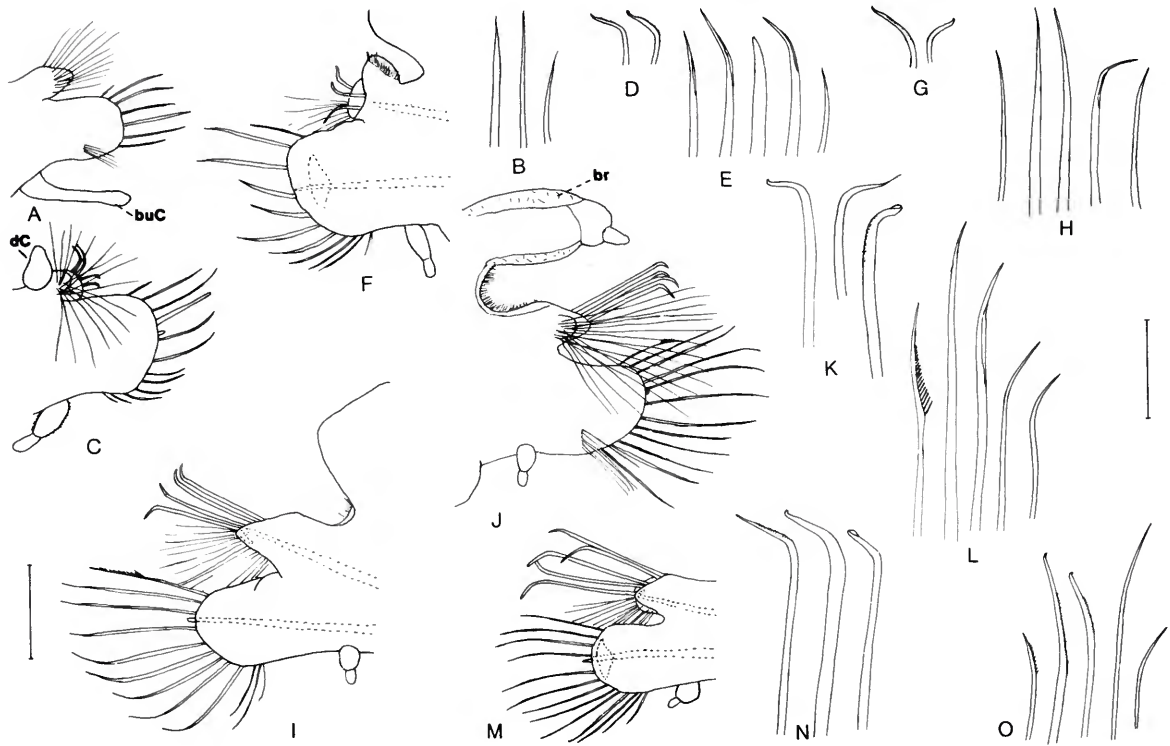


FIGURE 40.—*Grubeulepis westoni*, juvenile paratype from North Carolina (USNM 97590): A, right elytrigerous parapodium of segment 2, posterior view; B, neurosetae from same; C, right cirriferous parapodium of segment 3, posterior view; D, notopodial hooks from same; E, upper, middle, and lower neurosetae from same; F, right elytrigerous parapodium of segment 4, anterior view, acicula dotted; G, notopodial hooks from same; H, upper, middle, and lower neurosetae from same; I, right middle elytrigerous parapodium, anterior view, acicula dotted; J, right middle branchial parapodium, posterior view; K, notopodial hooks from same; L, upper, middle, and lower neurosetae from same; M, right elytrigerous parapodium of segment 19, anterior view, acicula dotted; N, notopodial hooks from same; O, upper, middle, and lower neurosetae from same. (Scales = 0.2 mm for A,C,F,I,J,M; 0.1 mm for B,D,E,G,H,K,L,N,O.)



FIGURE 42.—*Grubeulepis westoni*, advanced juvenile from Puerto Rico (USNM 97867): A, right middle parapodium, anterior view, acicula dotted; B, same, posterior view; C, notopodial hooks from same; D, upper, middle, and lower neurosetae from same; E, right posterior lamelligerous parapodium, posterior view; F, notopodial hooks from same; G, upper neurosetae from same; H, lower neuroseta from same. (Scales = 0.2 mm for A,B,E; 0.1 mm for C,D,F-H.)

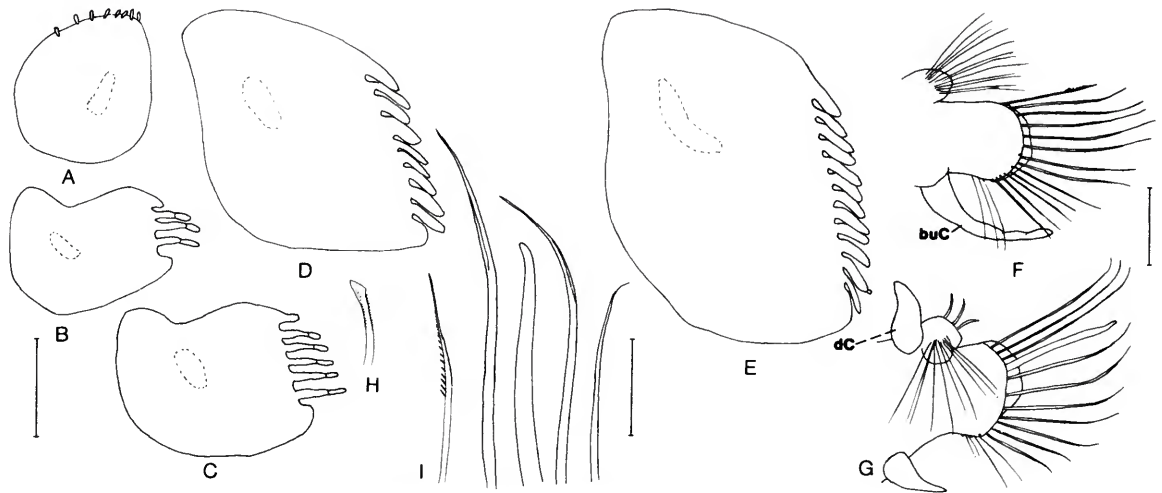
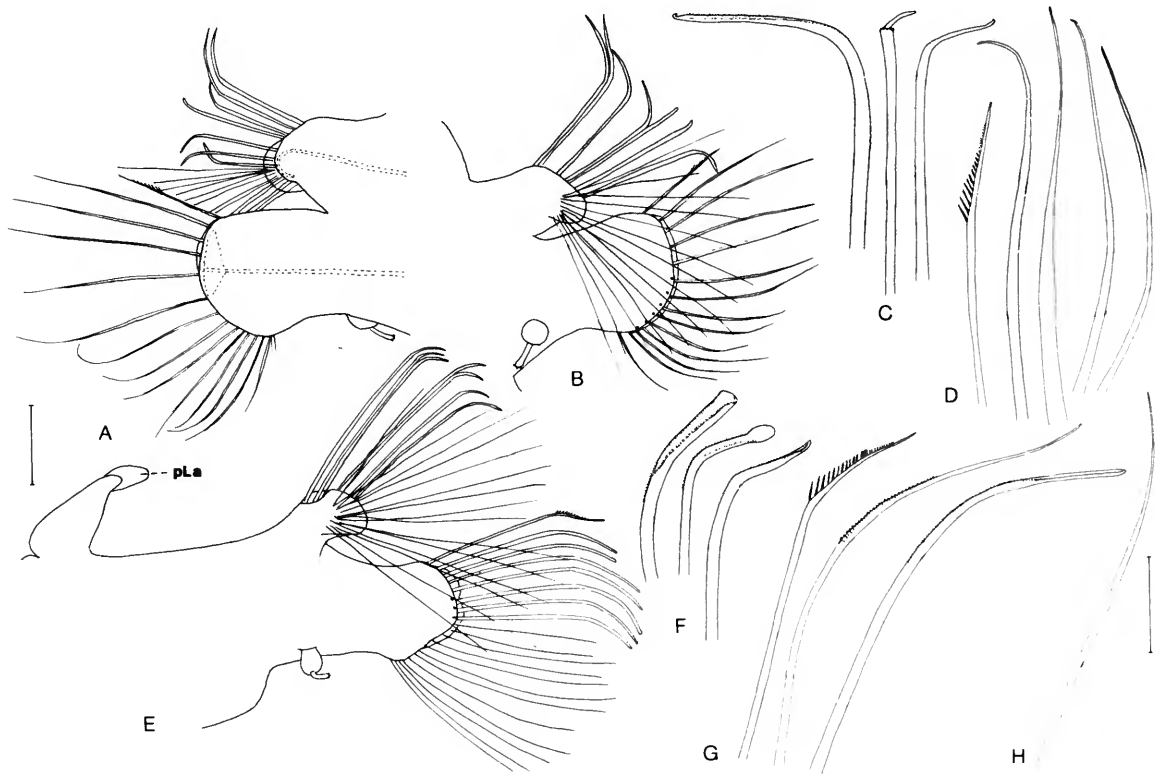


FIGURE 41.—*Grubeulepis westoni*, advanced juvenile from Puerto Rico (32 segments, 8.5 × 2.5 mm, USNM 97867): A, right 1st elytron; B, right 2nd elytron; C, right 3rd elytron; D, right 7th elytron; E, right 12th elytron; F, right elytrigerous parapodium of segment 2, posterior view; G, right cirriferous parapodium of segment 3, posterior view; H, notopodial hook from same; I, upper, middle, and lower neurosetae from same. (Scales = 0.5 mm for A–E; 0.2 mm for F,G; 0.1 mm for H,I.)



Literature Cited

- Amoureux, L.
1977. Annélides polychètes profondes de Madagascar: Description de deux nouvelles espèces (Collections Crosnier et Jouannie). *Bulletin du Muséum National d'Histoire Naturelle*, series 3, 495:1093–1109, 5 figures. Paris.
- Amoureux, L., F. Rullier, and L. Fishelson
1978. Systematique et ecologie d'Annelides polychetes de la Presqu'il du Sinai. *Israel Journal of Zoology*, 27:57–163, 16 figures.
- Berkeley, E., and C. Berkeley
1939. On a Collection of Polychaeta, Chiefly from the West Coast of Mexico. *Annals and Magazine of Natural History*, series 11, 3:321–346, 12 figures. London.
- Buzhinskaja, G.N.
1982. New and Rare Species and Genera of Tropical Polychaetes of the Suborder Aphroditiformia. In Marine Invertebrates of Coastal Biocenoses of the Arctic Ocean and the Pacific Ocean. *Academy of Sciences of the USSR Zoological Institute, Explorations of the Fauna of the Seas*, 29(37):27–38, 6 figures. [In Russian, English summary.]
- Chamberlin, R.V.
1919. The Annelida Polychaeta. *Memoirs of the Museum of Comparative Zoology at Harvard College*, 48:1–514, 80 plates.
- Darboux, J.
1900. Recherches sur les Aphroditiens. *Bulletin Scientifique de la France et de la Belgique*, 33:1–274, 83 figures.
- Fauvel, P.
1918. Annélides polychètes nouvelles de l'Afrique orientale. *Bulletin du Muséum National d'Histoire Naturelle*, 24:503–509, 4 figures. Paris.
- Gallardo, V.A.
1967 [1968]. Polychaeta from the Bay of Nha Trang, South Viet Nam. *The University of California Scripps Institution of Oceanography, NAGA Expedition Report*, 4(3):3–279, 59 plates.
- Grube, A.-E.
1875. Bemerkungen über die Familie der Aphroditen (Gruppe Hermionea und Sigalionina). *Jahres-Bericht der Schlesischen Gesellschaft für Vaterländische Cultur*, 52(vol. for 1874):57–79. Breslau.
- Hartman, O.
1939. Polychaetous Annelids, Part 1: Aphroditidae to Pisionidae. In *Allan Hancock Pacific Expeditions*, 7(1):1–156, 28 plates.
- Horst, R.
1913. On Two Remarkable Species of Aphroditidae of the Siboga-Expedition. *Notes from the Leyden Museum*, 35:161–168, 2 figures.
1922. On Some Polychaetous Annelids from Curaçao. *Bijdragen tot de Dierkunde Amsterdam*. Feestnummer, pages 193–201, 2 figures.
- Imajima, M.
1974. Occurrence of Species of Three Families, Eulepethidae, Apistobranchidae, and Heterospionidae (Polychaeta) from Japan. *Bulletin of the National Science Museum*, 17:57–64, 3 figures. Tokyo.
- Intes, A., and P. Le Loeuff
1975. Les Annélides polychètes de Côte d'Ivoire, 1: Polychètes errantes—compte rendu systématique. *Cahiers ORSTOM, Série Oceanographie*, 13(4):267–321, 13 figures.
- Jones, M.L.
1962. On Some Polychaetous Annelids from Jamaica, the West Indies. *Bulletin of the American Museum of Natural History*, 124(5):169–212, 146 figures, plate 52. New York.
- McIntosh, W.C.
1885. Annelida Polychaeta. In *Report on the Scientific Results of the H.M.S. Challenger . . . 1873–76 . . . Zoology*, 12(43):1–554, plates 1–55 and 1A–39A.
- Nonato, E.F., and J.C. Luna
1969 [1970]. Sobre alguns poliquetas de Escama do Nordeste do Brasil. *Boletim do Instituto Oceanográfico*, 18:63–81, 7 plates, 94 figures.
1970 [1971]. Anelídeos poliquetas do nordeste do Brasil, 1—Poliquetas bentônicos da costa de Alagoas e Sergipe. *Boletim do Instituto Oceanográfico*, 19:57–130, 111 figures.
- Pettibone, M.H.
1969. Revision of the Aphroditoid Polychaetes of the Family Eulepethidae Chamberlin (= Eulepidinae Darboux; = Pareulepidae Hartman). *Smithsonian Contributions to Zoology*, 41: 44 pages, 31 figures.
- Rioja, E.
1961. Estudios anelidológicos, 25: Un nuevo genero de

- la familia Pareulepidae del Golfo de México. *Anales del Instituto de Biología*, 32:235–249, 29 figures. México.
- Rullier, F.
1974. Quelques annélides polychètes de Cuba recueillies dans les éponges. *Travaux du Muséum d'Histoire Naturelle "Gr. Antipa"*, 14:9–77, 9 figures.
- Rullier, F., and L. Amoureux
1979. Polychaetous Annelids. In Résultats scientifiques des campagnes de la *Calypso*, Fascicule XI. *Annales de l'Institut Océanographique*, new series, 55(fascicule supplémentaire):145–206, 8 figures.
- Treadwell, A.L.
1901. The Polychaetous Annelids of Puerto Rico. *Bulletin of the U.S. Commission of Fish and Fisheries for* 1900, 2:181–210, 81 figures.
- Uebelacker, J.M.
1984. Family Eulepethidae Chamberlin, 1919. In J.M. Uebelacker and P.G. Johnson, editors, *Taxonomic Guide to the Polychaetes of the Northern Gulf of Mexico*, 3:24-1–24-13, 10 figures. Mobile, Alabama: Barry A. Vittor & Associates.
- Uschakov, P.V.
1972. On New Occurrence of *Eulepethus hamifer* (Grube) (Polychaeta, fam. Eulepethidae Chamberlin). In The Fauna of the Tonkin Gulf and Conditions of Life in It. *Issledovaniia Fauny Morei Zoologicheskii Institut Akademiia Nauk SSSR*, 10(18):329–322, 1 figure. [In Russian.]

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