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PARANDALIA BENNEI (PILARGIDAE) AND *SPIOPHANES LOWAI* (SPIONIDAE), NEW SPECIES OF POLYCHAETOUS ANNELIDS FROM MAZATLAN BAY, PACIFIC COAST OF MEXICO

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Abstract.—Two new species of polychaetes from the Pacific coast of Mexico are described: *Parandalia bennei* and *Spiophanes lowai*. Both are from shallow sandy bottoms.

During a recent survey of the benthic fauna of Mazatlan Bay, a number of polychaetous annelids new to science were encountered. Two of them are described below.

The study area is the bay of Mazatlan, a shallow zone, between 3.5 and 25 meters with active sediment transport and predominately sandy bottoms.

The generic definitions follow Fauchald (1977).

The types of the new species are deposited in the following institutions: National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM), Allan Hancock Foundation (AHF), and Instituto de Ciencias del Mar y Limnología, Universidad Nactional Autónoma de México (ICML).

Family Pilargidae

Parandalia Emerson and Fauchald, 1971

The genus *Parandalia* was separated from *Loandalia* Monro, 1936, as emended by Hartman (1947:505) (see also Thomas 1963:29, and Pettibone 1966:195) chiefly on the basis of the presence of emergent notopodial spines or acicula in *Parandalia* and their absence on *Loandalia*.

Parandalia bennei, new species
Figs. 1A–D, 2 A–E

Material examined.—Mazatlan Bay, Mexico, 23°11′55″N, 106°25′20″W, 22 Aug. 1979, holotype ICML-1011; 2 paratypes, ICML 1011-1, ICML 1011-2; one paratype, USNM 073015, one paratype AHF-1345.

Description.—The holotype is complete with 59 setigers. The four complete paratypes have 53, 59, 66 and 68 setigers respectively.

The body is long and slender, 46 mm long and 0.9 mm wide, including the setae. It is anteriorly inflated and rounded in cross section; the middle and posterior part of the body is somewhat flattened dorsoventrally. The color of the preserved specimens is light brown to yellowish. The parapodia are all biramous. The body, after the first 7 setigers, becomes somewhat flattened dorsoventrally. The segmentation is rather indistinct in the anterior region, becoming very con-

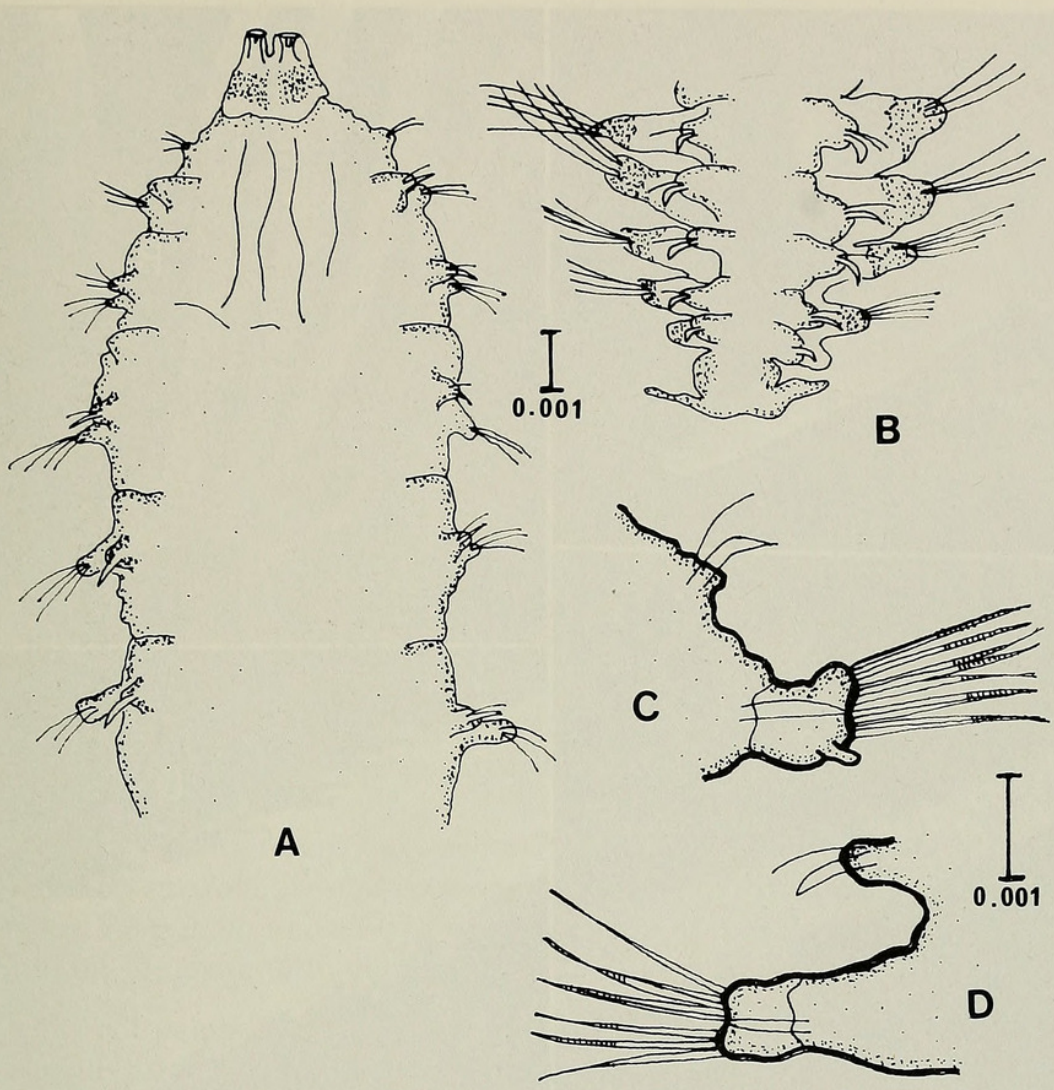

Fig. 1. *Parandalia bennei* (holotype): A, Anterior end, dorsal view; B, Posterior end, dorsal view; C, Parapodium from right setiger 36, posterior view; D, Left parapodium from setiger 50, anterior view. Scales in mm.

spicuous posteriorly. The segments are hexagonal in shape and the septal regions are narrowed.

The prostomium is less than half as wide as the first setiger, with a longitudinal cleft between the bases of the palpophores. Distally on each of the well developed palpophores are located two short and retractile rodlike palpostyles (Fig. 1A). The proboscis was not everted in any of the specimens; however, one can see through the body wall that there are no jaws associated with the large mouth. The peristomium is not clearly distinguished from the prostomium and bears no tentacular cirri or any other structure.

The parapodia are poorly developed on the first 7 setigers. The first parapodium bears only the neuropodium. The acicular spine protrudes from notopodium on all setigers starting at setiger 6.

The neuropodia increase in size from setiger 7 to about 10 segments from the posterior end from which they decrease gradually.

The notopodia are similar in size all along the body, each bearing a single thick

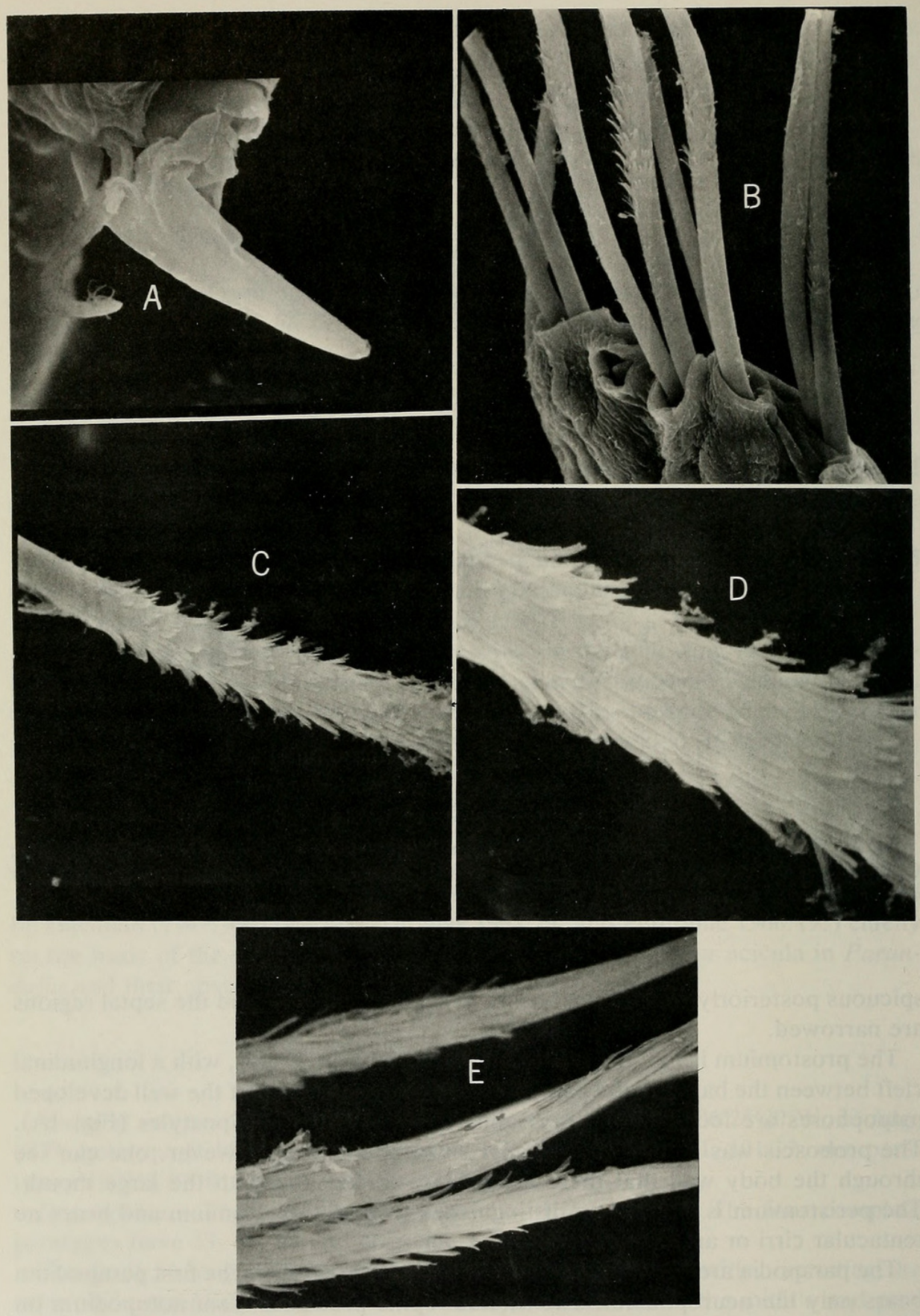

Fig. 2. *Parandalia bennei* (holotype): A, Notopodium showing spine and notoseta from middle setiger (×2600); B, Posterior neuropodium showing bases of neurosetae (×1000); C, Base of neuroseta from middle setiger (×1100); D, Middle portion of same (×2400); E, Distal ends of neurosetae (×2200). Scanning electron microscope (SEM).

colorless emergent spine or aciculum which is short and pointed distally. In addition, 1 or 2 simple slender capillary notosetae are present and there is no dorsal cirrus (Figs. 1C, D, 2A).

The neuropodia bear simple capillary setae in numbers varying from 6 (anteriorly) to 12 posteriorly (Fig. 1C, D). Where 12 setae are present, they emerge from the neuropodium in pairs (Fig. 2B).

The neuropodium bears a single stout colorless aciculum which is thicker than the neurosetae. It reaches the distal edge of the neuropodium and may protrude slightly in some parapodia. The neurosetae are long and slender, sometimes showing double curvatures. The basal third of the neuroseta is smooth; the middle third has groups of fibers which fan out and sometimes show an irregular spiral pattern (Fig. 2C, D); in the distal third the fibers become parallel to the axis of the neuroseta (Fig. 2E).

In the posterior region, the parapodia become more elongated with brown pigmented patches on the distal tips of the neuropodia (Fig. 1D). The last few segments decrease in size towards the pygidium and lose their hexagonal shapes. The posteriormost segment bears no setae.

The pygidium has 3 anal cirri (Fig. 1B) including a pair of lateral long cirri and a shorter midventral one. The anal aperture is ventrally located but rather inconspicuous.

Remarks.—The different species of *Parandalia* closely resemble each other externally. *Parandalia bennei* is closest to *P. fragilis,* Hartmann-Schröder, 1959, referred to *Loandalia fauveli* by Pettibone, 1966. Based on Hartmann-Schröder's description, the main differences between the two species are the following:

—A pair of palpostyles are present in each palpophore in *P. bennei* and only a single palpostyle per palpophore in *P. fragilis* (and other *Parandalia* spp.).
—Palpostyles are round and papilliform in *P. fragilis,* rodlike in *P. bennei.*
—There is no anterior asetigerous segment present in *P. bennei* as there is in *P. fragilis.*
—First parapodium is uniramous in *P. bennei* and biramous in *P. fragilis.*
—The pygidium constitutes the most conspicuous way to separate *P. bennei* from other species: in *P. fragilis* the pygidium forms a pigmented, well developed disc with small cirri. In *P. bennei,* the lateral cirri are large, the anal plate is reduced, never concave, and there is no pigmentation.

Etymology.—The specific name is a free derivation of the name of my husband, to whom this species is dedicated.

Distribution.—*Parandalia bennei* was found in shallow bottom areas in three different stations in Mazatlan Bay. There is a predominance of fine sands in two stations and coarse sands in one station.

Family Spionidae
Spiophanes Grube, 1860
Spiophanes lowai, new species
Figs. 3A–D, 4A–G, 5A–C

Material examined.—Mazatlan Bay, Mexico, 23°11′55″N, 106°25′20″W, 9 m, 25 May 1979 (holotype ICML-1012). Sinaloa coast south of Mazatlan, Mexico,

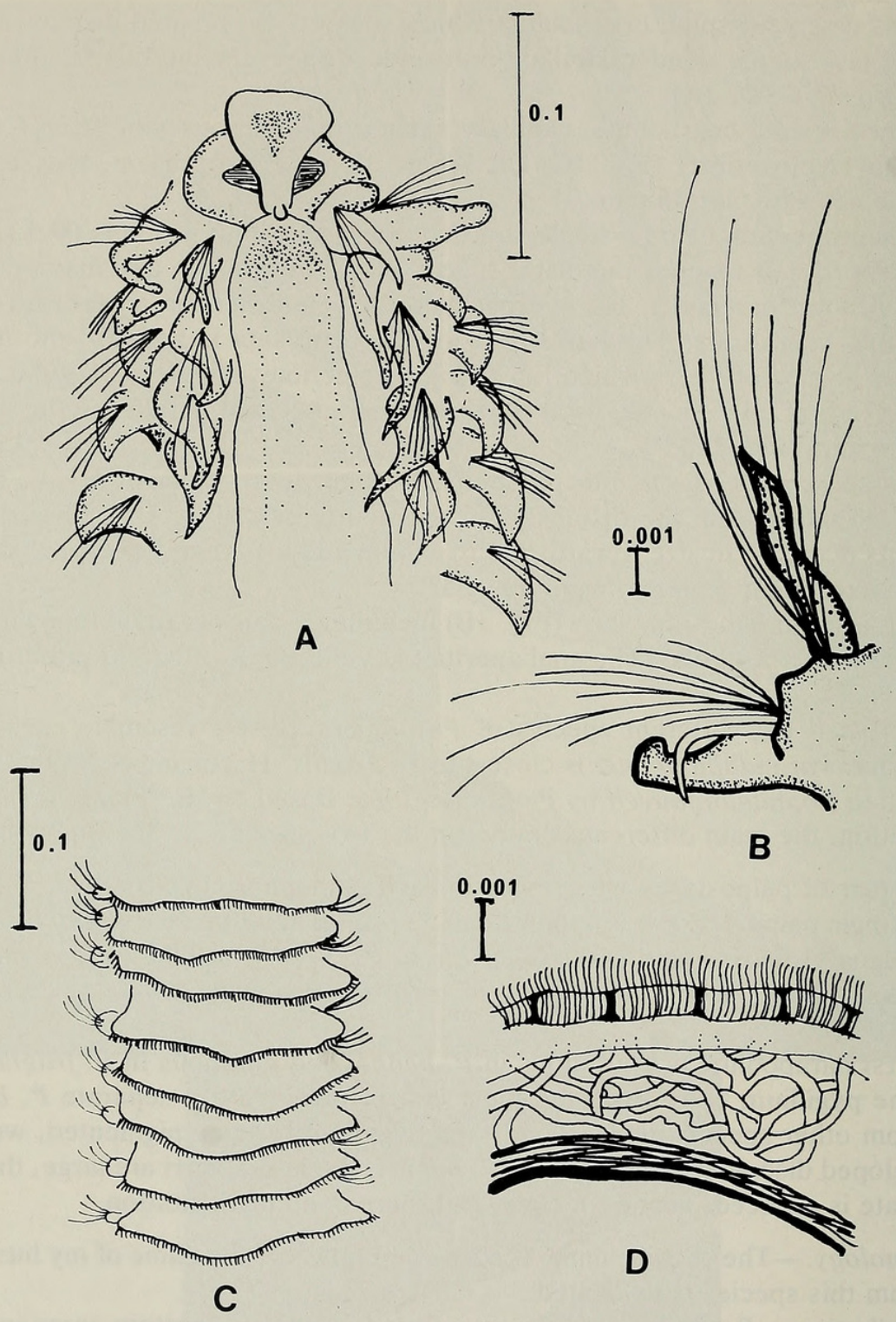

Fig. 3. *Spiophanes lowai* (holotype): A, Anterior end, dorsal view; B, Right parapodium, setiger 1; C, Dorsal view of the ciliated ridges from middle part of body; D, enlargement of part of a dorsal ridge. Scales in mm.

23°38′5″N, 106°55′6″W, 37 m, 23 August 1981 (2 paratypes, USNM 80179, 80467). The holotype is incomplete with 49 setigers, 15 mm long and 23 mm wide including the setae. Color (preserved) is white with dark brown parapodial glands in setigers 10 to 15.

The prostomium is subtriangular with very poorly developed frontal horns; it tapers posteriorly and extends to the level of setiger 1, with a small occipital antenna.

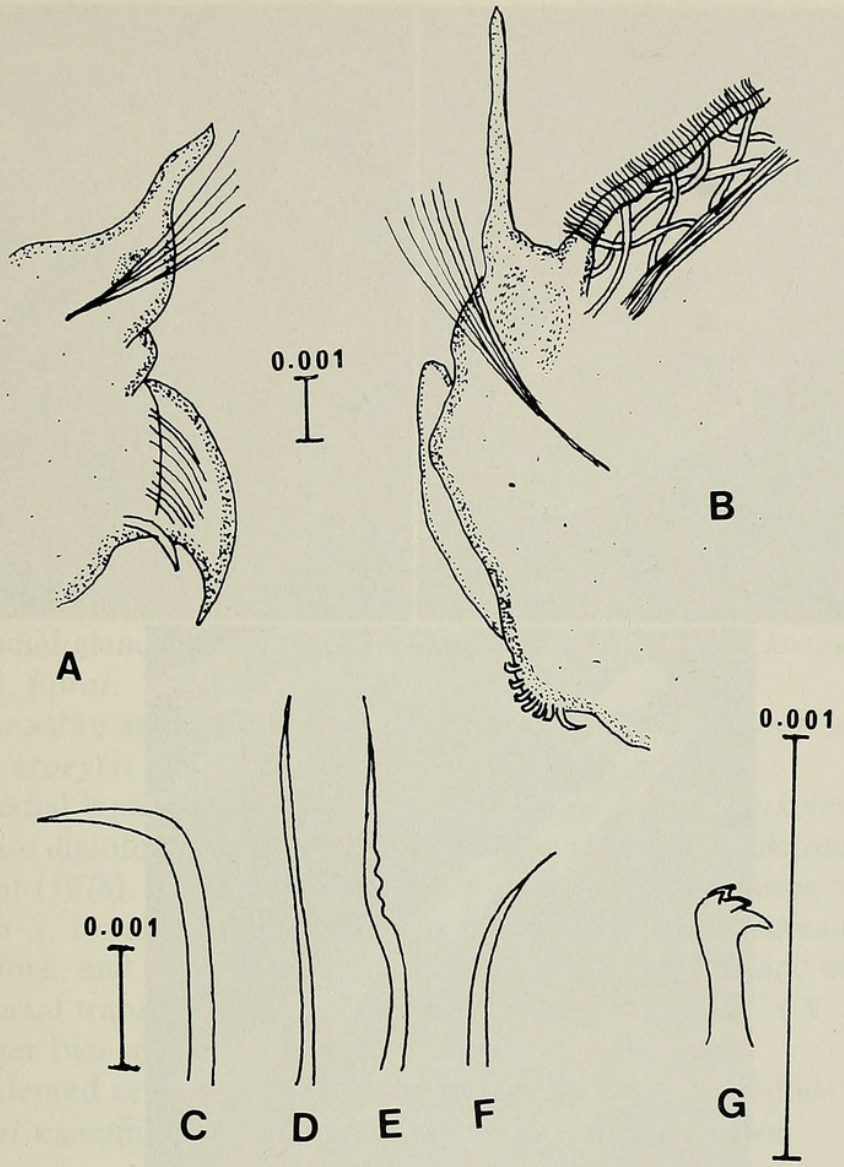

Fig. 4. *Spiophanes lowai* (holotype): A, Left parapodium of setiger 8; B, Right parapodium of setiger 43, anterior view; C, Neuropodial spine of first setiger; D, Capillary notoseta; E, Indented setae of setigers 8 and 9; F, Sabre setae; G, Neuropodial hook. Scales in mm.

There are large pigmented areas on the dorsal part of the prostomium and at the level of the first 2 setigers (Fig. 3A). The palps are missing. The enlarged peristomium forms a conspicuous lateral collar. Nuchal organs are poorly developed, appearing as thin bands extending to setiger 2. The neuropodia of the first setiger bear a long smooth spine, curved at right angles as is characteristic for *Spiophanes* (Figs. 3B, 4C). The first notopodial lamellae are cirriform (Fig. 3A, B). From setiger 2 to 4, the notopodial lamellae increase in size and become foliose in shape (Fig. 3A). More posteriorly, the notopodial lamellae become reduced, retaining a broad base and a slender cirrus (Fig. 4B). Neuropodial lamellae are similar in shape and size through the first 17 setigers (Figs. 3B, 4A). More posteriorly, the lamellae become smaller and remain uniform in shape and size through the rest of the body (Fig. 4B).

Most notopodial setae are capillary, unilimbate and smooth (Fig. 4D). The setae of setigers 2 to 4 are longer than those of the rest of the body. In the notopodia

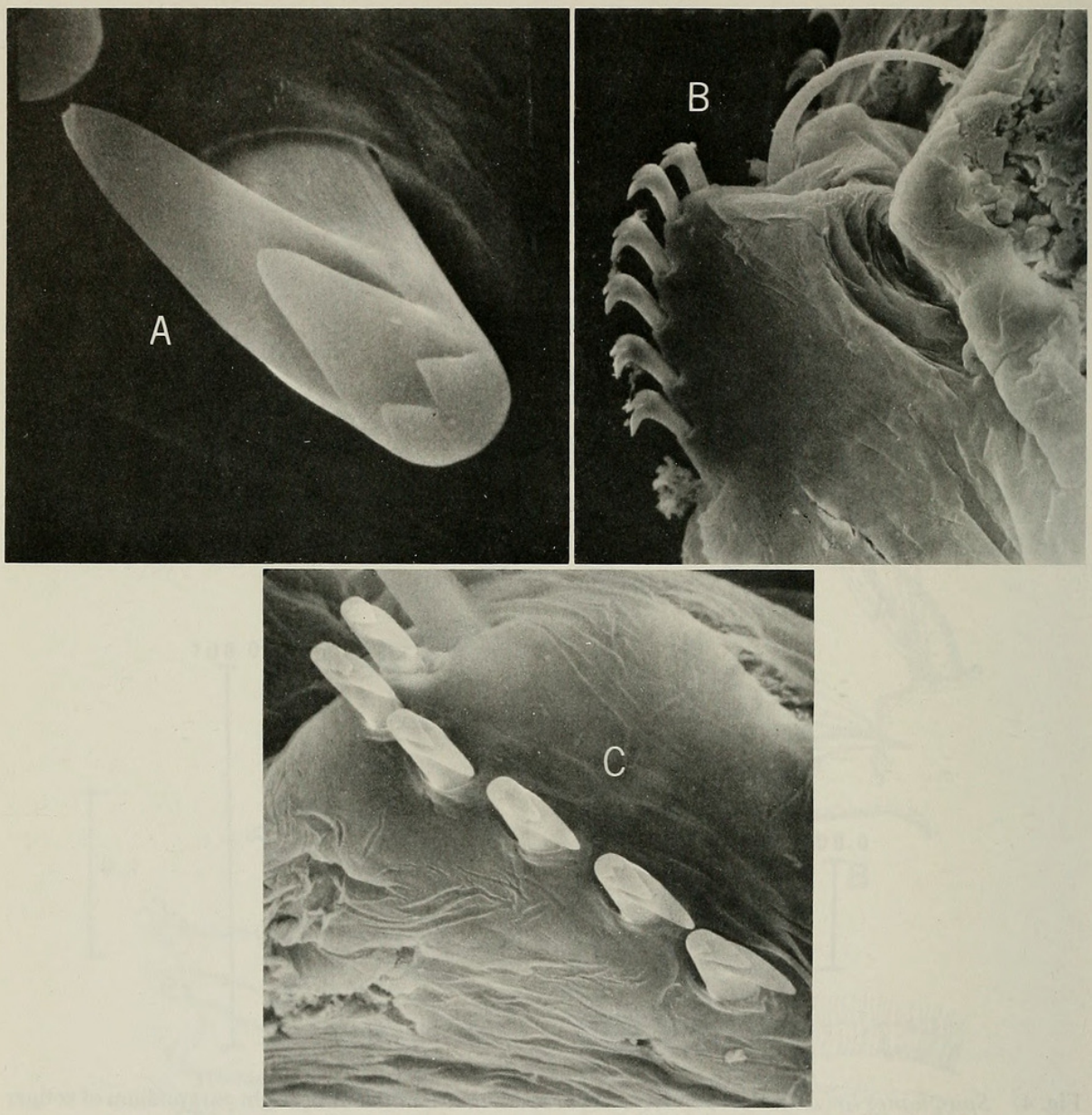

Fig. 5. *Spiophanes lowai:* A, Frontal view of neuropodial hook (×4400); B, Neuropodium of setiger 47, showing hooks and sabre setae (×440); C, Same showing basal parts of hooks (×940). Scanning electron microscope (SEM).

of setigers 7 and 8 there are indented setae of the same size as the accompanying notosetae. Bacillary setae are present from setiger 5; each seta is long, slender, unsheathed and with frayed appearance. Thread glands are inconspicuous.

Lower smooth neuropodial sabre setae first appear on setiger 5 and continue posteriorly, one per ramus.

The dark colored parapodial glands are located in setigers 10 to 15. Neuropodial hooks first appear in setiger 15, posterior to the parapodial glands, usually six hooks per ramus. Each hook is straight, lacks a hood and bears 4 teeth, the lowermost tooth being much larger than the other 3 (Figs. 4G, 5A–C). Five hooks are arranged in a vertical row with the sixth hook posterior to the lower hook and anterior to the sabre setae (Fig. 5C).

Transverse dorsal ridges connecting the dorsal lamellae of the notopodia begin on setiger 17 and continue posteriorly to the end of the fragment. They are well

developed, overlapping on the following segment, highly vascularized and ciliated (Fig. 3C, D). The first ridge is lower than the rest.

Transparent and delicate genital pouches begin at setiger 15. The pygidium is unknown.

The tube of the paratype is mucous, transparent, and covered with fine sand.

Remarks.—Examination of specimens of *S. kroeyeri* Grube, 1860, and *S. berkeleyorum* Pettibone, 1962, in the collection of the USNM, show that *S. lowai* can be differentiated from these two species as follows:

1) The peristomium in *S. lowai* is broad and well developed as in *S. berkeleyorum*; it is reduced in *S. kroeyeri*.
2) Nuchal organs are poorly developed in *S. lowai*. In *S. berkeleyorum* and in *S. kroeyeri* they are very well developed (Light 1978, and examination of type-material in USNM).
3) Prostomium and anterior dorsum are pigmented in *S. lowai*. Pigmentation is absent in *S. kroeyeri* and *S. berkeleyorum*.
4) Parapodial glands are present from setiger 6 to 12 in *S. kroeyeri* and 10 to 15 in *S. lowai*.
5) Inferior sabre setae are first present on setiger 5 in *S. lowai* and on setiger 4 in *S. kroeyeri* and *S. berkeleyorum*.
6) Notopodial lamellae are similar in *S. kroeyeri* and *S. berkeleyorum* in that 1 to 4 are digitiform, and 5 to 15 are low, rounded and semicircular according to Light (1978). Posteriorly they have wide obcordate bases and digitiform tips. In *S. lowai* the first lamella is digitiform, 2 to 4 increase in size and are foliose, and posteriorly each lamella has a wide base and digitiform tip.
7) The dorsal transverse ridges are much more developed in *S. lowai* than in the other two species.
8) The indented setae were not found in specimens of *S. berkeleyorum* and *S. kroeyeri* examined, including the types of *S. berkeleyorum*.

However, in material of *S. kroeyeri* in the USNM collections, the specimens from British Columbia (Cat. No. 53249) agree with *S. lowai*; other specimens identified as *S. kroeyeri* lack indented setae and the high overlapping dorsal ridges.

Spiophanes kroeyeri is a cosmopolitan species reported from widely differing areas, and probably examination of further material will show that there are in fact more than one species involved in what is now called *S. kroeyeri* Grube.

Etymology.—The specific name is a derivation of the name Lowa Weiss to whom this species is dedicated.

Distribution.—The species was collected in shallow sandy bottoms in the bay of Mazatlan and the Sinaloa coast, south of Mazatlan.

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