Revision of *Flabelliderma* Hartman, 1969 (Polychaeta: Flabelligeridae)

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**Abstract**

The flabelligerid genus *Flabelliderma* Hartman, 1969 is redefined and its type species is re-established. In comparison with *Flabelligera* Sars, 1829, the diagnostic features include the fusion of papillae forming tubercles, often adhering sediment particles, and notopodial lobes forming large ovoid lobes. Four species are described and presented as new combinations, and three others were previously undescribed; thus the species included are *F. papillosa* (Essenberg, 1922) from southern California, *F. berkeleyorum* n. sp. from Washington, *F. claparedei* (de Saint-Joseph, 1898) from the Bay of Biscay, *F. gourdoni* (Gravier, 1906) from Antarctica, *F. lighti* n. sp. from Guadalupe Island, western Mexico, *F. ockeri* n. sp. from southern California, and *F. pruvoti* (Fauvel, 1930) from New Caledonia.

**Keywords:** Polychaeta, Flabelliderma, Flabelligera, key, new species, taxonomy

**Introduction**

There are five flabelligerid genera (TS: type species) resembling *Flabelligera* Sars, 1829 (TS: *F. affinis* Sars, 1829): *Chloraema* Dujardin, 1839 (TS: *C. edwardsi* Dujardin, 1839), *Flabelliderma* Hartman, 1969 (TS: *Flabelligera essenbergae* Hartman, 1961, but see below), *Siphonostoma* Rathke, 1843 (TS: *S. vaginiferum* Rathke, 1843), *Siphostoma* Otto, 1821 (TS: *S. diplochaitus* Otto, 1821), and *Tecturella* Stimpson, 1854 (TS: *T. flaccida* Stimpson, 1854) (Hartman 1959, 1965, 1971; Fauchald 1977; Light 1978). These six generic names, however, are reduced to only two valid ones: *Flabelliderma* and *Flabelligera*; the former is monotypic, while the latter contains about 60 species.

The members of these two genera have three main modifications of the anterior end, in comparison with the other flabelligerid genera: (1) the chaetae of the first chaetiger, or cephalic cage, are arranged in a transverse line, making an almost complete circle around the head; (2) the head region, which includes prostomium, peristomium, nephridial lobes, and branchiae, is rarely eversible—there seems to be a direct relationship between the length of the eversible head region and the size of the cephalic cage chaetae; the region covering the eversible head is the cephalic hood; and (3) the neurohooks are
multiarticulated and distally bent, such that the tip, or crest (as originally designated by Günther 1912, p 43, Figure 20, Plate 1, Figure 1), folds inwards and is used for walking on the substrate. The non-exposed region, or handle, is often multiarticulated, with articles of varying length, which become less developed towards the bending site of the distal piece, or crest. The species in these two genera could be grouped using several morphological features as follows.

1. Tunic. The tunic can vary in thickness, relative development, and opacity. Generally, it makes a thick smooth layer covering most papillae, such that individual papillae cannot be easily detected, while in some species, the papillae might agglomerate resulting in variously shaped superficial bumps or tubercles. Many species have a transparent tunic such that parapodia can be easily seen from above, while few have an external cover that precludes the observation even of individual papillae. There are variations in the degree of adheriveness of the body papillae such that the tunic’s external surface might be smooth, or it can aggregate particles of different sizes resulting in a homogeneous or spotty pattern. Further, some species have large dorsal tubercles, instead of a homogeneous tunic, as in Flabelligera pruvoti Fauvel, 1930 (see below), but without adhering foreign particles.

2. Parapodial position. In cross-section, most species have lateral parapodia with dorsolateral notopodia and ventrolateral neuropodia; however, there are some few species having notopodia markedly latero-ventral, as in F. induta Ehlers, 1897, and one even has neuropodia ventrally displaced, approaching the midventral line, as in F. commensalis Moore, 1909. However, this does not imply that both parapodial rami migrate together.

3. Notopodial alignment. In lateral view, most species have notopodia placed at about the same level as if they were aligned along a smooth lateral line, and because of this alignment they are called homogeneous; in other species, however, such as F. mundata Gravier, 1906, notopodia are not placed at the same level, being instead arranged in a zigzag line, forming series of three successive notopodia (triads) in subsequently descending positions, and this pattern is called heterogeneous.

4. Notopodial lobe development. In most species, notopodial lobes completely cover the notochaetae; however, in some species, such as F. commensalis, the notopodial lobes are restricted to an external fan-like layer of papillae, while in others, they form an ovoid case. The individual papillae may be closely packed or loosely packed and they can vary in the amount of foreign sediment particles attached to them.

5. Neurohooks. Most species have multiarticulated neurohooks with an articulated “handle” and an entire blunt crest; however, in some species, the handle articulation is much reduced or even absent, F. mundata, while in F. mastigophora Annenkova, 1952, the crest is apparently articulated and tapering.

Hartman (1969, p 286) proposed Flabelliderma to separate some species previously included in Flabelligera; for its definition, she stated: “the body lacks a mucus-sheath and is covered by papillae” while “in Flabelligera the epithelium (tunic) is smooth or nearly so, and the body is covered by a thick, mucoid sheath”. In fact, there is a tunic or “mucus-sheath” around the body in all flabelligerids, although in several genera it does not completely cover, or obliterate, the individual papillae. The papillae, in turn, may attach sediment grains independently, thus forming tubercles or sediment masses surrounding individual papillae, or fusing them in larger tubercles. Thus, the most relevant feature for Flabelliderma was the difference in the body wall because of the formation of dorsal tubercles. Hartman did not
explain its etymology, but she was obviously stressing this skin difference. *Flabelliderma* has been restricted by Light (1978) such that now it is regarded as a monotypic genus.

In this contribution, the type species for *Flabelliderma* is re-established, and the genus is redefined based upon a revision of several species previously included in *Flabelligera*. By sharing notopodial lobes with globular papillae, dorsal tubercles of varying length, and neurohooks with articulated handle and blunt entire crest, they are redescribed and transferred to *Flabelliderma*. A key to all species is also included. The revision and delineation of *Flabelligera* are part of another forthcoming contribution but the species therein included do not form an homogeneous group.

**Material and methods**

All materials were studied with ordinary light microscopy, and specimens of two species were studied alive. Preserved specimens were washed in a 50/50 mixture of commercial vinegar and 70% ethanol to remove adsorbed or foreign materials; some were temporarily stained by placing them for a few seconds in an oversaturated solution of methyl green in 70% alcohol. Photographs were made with digital cameras and photos were employed to prepare the plates. Most figures are based on a series of photographs with a selection of the best areas, and then pasted together. This has been preferred over line-drawings because it illustrates the features as they really are and not what the illustrator thinks that they should be. Unless otherwise stated, body length does not include the anterior long chaetae, and body width does not include notochaetae.

**Museum and collections acronyms**

BMNH, The Natural History Museum, London; CAS, California Academy of Sciences, San Francisco; ECOSUR, Colección de Referencia, El Colegio de la Frontera Sur, Chetumal; IRFA, Institut de Recherche Fondamentale et Appliquée, Université Catholique de l’Ouest, Angers; LACM-AHF, Museum of Natural History, Los Angeles County, Allan Hancock Foundation Polychaete Collection; MNHN, Museum National d’Histoire Naturelle, Paris; SMNH, Swedish Museum of Natural History (formerly NHRM, Naturhistoriska Riksmuseet), Stockholm; USNM, National Museum of Natural History, Smithsonian Institution, Washington, DC; ZMB, Zoologisches Museum, Berlin.

**Abbreviations for figures**

b, branchia; bs, branchial scars; c, caruncle; dl, dorsal lip; ll, lateral lip; nl, nephridial lobe; pl, palp lobe; ps, palp scar; vl, ventral lip.

**Systematics**

Class POLYCHAETA Grube, 1850  
Order FLABELLIGERIDA Pettibone, 1982  
Family FLABELLIGERIDAE de Saint-Joseph, 1894  
*Flabelliderma* Hartman, 1969

*Flabelliderma* Hartman 1969, p 286; Fauchald 1977, p 116–117; Light 1978, p 683 (*partim*).

Type species. *Stylarioides papillosa* Essenberg, 1922, reinstated.
Diagnosis (emended)

Body papillae abundant, usually grouped forming dorsal and lateral tubercles, making elongate thick notopodial lobes, free from from the rest of the body. Cephalic hood reduced. Branchiae cirriform, sessile on a branchial plate, arranged in two lateral groups. Nephridial lobes placed medially on the branchial plate, separated from the branchiae. Parapodia lateral, homogeneous. Notopodial lobe thin or ovoid, often including globular or vesicular papillae. Neurohooks multiarticulated; handle articulated, crest entire. Free-living in rocky or mixed bottoms, rarely symbiotic with sponges.

Discussion

Hartman (1961, p 118) proposed Flabelligera essenbergae as a replacement name for Stylarioides papillosa Essenber, 1922; in her catalogue, she had regarded this name as a secondary junior homonym of Siphonostomum papillosum Grube, 1840, described from the Mediterranean Sea (Hartman 1959, p 416). However, Siphonostoma papillosum was regarded, in turn, as a questionable synonym of Flabelligera affinis Sars, 1829, or Pherusa monilifera delle Chiaie, 1831 (Hartman 1959, p 420) which are very different genera. However, she had regarded Stylarioides papillosa (Grube) as a member of Flabelligera (Hartman 1959, p 421), but based on the study of type material, this conclusion is incorrect.

This confusion was due to the fact that Grube (1850, p 320) regarded his species as a junior synonym of Siphonostoma diplochaitus Otto 1821, which belongs in Flabelligera. However, Grube himself later solved the problem by regarding his species as a junior synonym of Stylarioides monilifer, which was commented upon several times in his revision (Grube 1877, p 60, 67, 71). Further, this synonymy was repeated by Fauvel (1927, p 118); unfortunately these synonymy statements were overlooked by Hartman. Therefore, Siphonostomum papillosum Grube, and Stylarioides papillosa Essenber are not congeneric, and following Article 59.4 (International Commission on Zoological Nomenclature (ICZN) 1999), this should be resolved. Thus, the solution should involve a new combination for the original name, instead of a replacement name, the original name should be used as the type species of the genus, and Flabelliderma essenbergae Hartman, 1961, must be regarded as a junior objective synonym of Stylarioides papillosa Essenber, 1922 (see below).

Flabelliderma contains only two species after Hartman’s key (1969, p 286): F. essenbergae and F. commensalis. She noticed the large notopodial development in what she regarded as the type species, although neuropodial alignment is very different as well. Later, Fauchald (1977, p 116–117) presented the genus as monotypic, with Flabelligera commensalis Moore, 1909, as the type species, and added a diagnostic feature improving the original definition to: “body papillae with thick mucus and encrusted with debris”. Light (1978, p 682–685) noticed these confusions, brought back F. commensalis to Flabelligera, and emended the generic definition stressing the long pedunculate and vesicular papillae, as well as the enlarged notopodial lobes. This definition is partially followed here, but F. commensalis does not fit in Flabelligera because its neuropodia are placed very close to the midventral line, and because of its symbiotic habit. This issue will be documented elsewhere.

Thus, in comparison with Flabelligera, the main diagnostic features for Flabelliderma are that individual papillae, or their groups, are easily seen because they make sediment-loaded tubercles, and by the large notopodial lobe development, often with large vesicular papillae. As currently redefined, the genus includes Flabelliderma papillosa (Essenberg, 1922) n.
F. berkeleyorum n. sp., F. claparedei (de Saint-Joseph, 1898) n. comb., F. gourdoni (Gravier, 1906) n. comb., F. lighti n. sp., F. ockeri n. sp., and F. pruvoti (Fauvel, 1930) n. comb. Three additional new species are described: F. berkeleyorum n. sp. collected while swimming in Friday Harbor, Washington, F. lighti collected in a shallow subtidal sponge in Guadalupe Island, and F. ockeri collected in dead giant kelp holdfasts, a species that has previously been identified as F. essenbergae (i.e. F. papillosa).

Diagnostic features

On the basis of this redefinition, Flabelliderma is not monotypic and certainly it is far from being a well-known genus. Since there are species collected in tropical, temperate, or polar environments, many more species might remain undescribed. The following are the main diagnostic features for the species in the genus.

Body papillae. There are several differences in body papillae among different Flabelliderma species. Individual papillae are lageniform, often provided with long stems and sometimes carry a long mucro. Most species adhere sediment particles on each individual papilla; these particles are mostly fine, loosely adhered to the papillae but sometimes they form dehiscent clavate sediment tubercles, with abundant sediment (Figures 1B, C, 2D, 3A, D, 5A, B), or with little sediment (Figure 4A–C), or stiff rectangular tubercles, especially dorsally (Figure 6A, B, D). The only exception is F. pruvoti, because their papillae are spherical or with a tiny mucro, and are mostly sediment-free (Figure 7A–C). Dorsal papillae are often fused forming large sediment tubercles or masses and their relative number per transverse line, along a median segment, is given to clarify specific features.

Notopodial lobes. The notopodial papillae fuse to each other forming notopodial lobes, which often include globular or vesicular papillae. This term refers to their position, but it must be kept in mind that they are not body wall outgrowths from the notopodia; they are rather a complex construct of notopodial papillae. The notopodial lobes might be thin or ovoid (Figures 2A, B, E, 3D, 4C, 5D, 7A–C), or more or less funnel-shaped or distally expanded (Figure 5D). They may also differ in the relative amount of sediment adhered on individual papillae; thus, those having sediment restricted to their bases give a pilose or “hairy” appearance to the lobes (Figures 4B, C, 5D). However, if the papillae are spherical, with a long stem but without mucro, the sediment will be very sparse and the notopodial lobes will appear clean (Figure 7C).

Notochaetae. All notochaetae are covered by the notopodial lobes. There may be some variations in their number, in the type of articulation, or in the relative size of the articles along the chaetae. The number of notochaetae may be size-dependent and probably of limited usage. However, the pattern of articulation might be more specific, although some chaetae have articulations better defined or extended throughout its length. Thus, the articles can be short if they are wider than long, medium-sized if they are as long as wide, and long if they are longer than wide. Further, the articulation size varies among the chaetae and this feature is useful.

Neurohooks. Neurohooks can be divided in two parts. The exposed portion includes the distal piece, or crest, which is often thin and curved; in most species it is tapering and sharp, and rarely it can be medially expanded and blunt (Figure 7D). The handle is not exposed...
and it is multiarticulated; the articulations will be referred to as short, if they are wider than long, medium-sized if they are as long as wide, and long if they are longer than wide. The number of long articles in the median region, as well as their relative length, differs among species, and there is a tendency to become shorter and poorly-defined towards the crest. The relative size and degree of pigmentation of the crest varies along the body; anterior or posterior neurohooks are more delicate, and slightly less pigmented, than those present in median chaetigers.

**Flabelliderma papillosa** (Essenberg, 1922) n. comb., re-instituted
(Figure 1)

*Stylarioides papillosa* Essenberg 1922, p 379–381, Figures 1–8.
*Flabelligera essenbergae* Hartman 1961, p 118–120, Plate 22, Figures 1, 2, Plate 23, Figures 1–4 (*partim*).
*Flabelliderma essenbergae*: Light 1978, pp 685–686, Figures 1–4 (*partim*).

Figure 1. *Flabelliderma papillosa* (Essenberg, 1922) n. comb. (A) Neotype (LACM-AHF 2187) in dorsal view; (B) neoparatype (LACM-AHF), anterior end in dorsal view; (C) another paraneotype, eversible anterior end in frontal view; branchiae and palps removed; (D) same, a complete median chaetiger in frontal view; (E) tip of neurohook from a median chaetiger. Scale bars: 1.5 mm (A); 1.0 mm (B); 0.5 mm (C, D); 90 μm (E).
Type material

Eastern Pacific Ocean: neotype (LACM-AHF 2187) and many neoparatypes (LACM-AHF, MNHN, ECOSUR) collected in kelp holdfasts, off Goleta sewer outfall pipe (32°24.6′N, 119°44.5′W), Santa Barbara, California, 12 m, 18 February 2004, S. Anderson, coll.

Additional material

Two specimens (CAS-12) collected off Point Lobos (36.52°N, 121.95°W), Whaler’s Cove, Monterey, California, 20 m depth, 6 May 1972, sand, scuba-diving, A. J. Ferreira, coll.

Description

Neotype (LACM-AHF 2187) complete, pale, fusiform, delicate, slightly damaged (Figure 1A). Body densely papillated; papillae forming long clavate sediment tubercles dorsally (12–14 per segment), and laterally (Figure 1B); smaller ventrally. Papillae long, covering noto- and neurochaetae, with adherent sediment particles. It is 13 mm long, 4 mm wide (including notopodia), cephalic cage 1.5 mm long, 27 chaetigers.

Anterior end and branchial structure based on neoparatypes. Prostomium high cone with four dark-reddish large eyes. Caruncle well developed, lateral keels elevated, thin, median one wider, swollen. Palps long, tips eroded; palp bases rounded, small. Lips damaged. Branchiae mostly lost; each lateral group with about 40 scars. Nephridial lobes long, one lost, as long as palps, placed towards the dorsal margin, separated from the branchiae (Figure 1C).

Cephalic cage chaetae as long as one-ninth body length, densely covered by papillae, difficult to count. Anterior dorsal margin of first chaetiger with long papillae (mostly damaged). Anterior chaetigers without especially long papillae, with large vesicles. Chaetigers 1–3 of about the same length. Chaetal transition from cephalic cage to body chaetae abrupt, neurohooks present from chaetiger 2. Gonopodial lobes not seen.

Parapodia well developed, placed on the body corners (Figure 1D); median neuropodia ventrolateral. Notopodial lobes ovoid with rough surface. Dorsal sediment tubercles about as long as notopodial lobes, mostly of a single size; soft, made by loosely packed large globular papillae; most papillae ovoid, with a short nipple-like distal projection. Some large vesicular papillae separated from the lobes. Neuropodia shorter lobes, masked by elongate papillae almost completely covering the neurohooks.

Median notochaetae arranged in a short transversal line; four to five multiarticulated capillaries per bundle, as long as two-thirds body width, with short articles basally and medially, longer distally. Neurochaetae multiarticulated hooks from chaetiger 2, mostly a single hook per ramus. Handle articulation with three longer articles medially, becoming progressively longer, distal articles shorter. Crest darker, tapering, acute, slightly curved distally (Figure 1E). Posterior end tapering; pygidium with anus terminal (as seen in neoparatypes), without anal cirri, or pigment, rarely pale brownish.

Discussion

Essenberg (1922) did not designate type material and his single specimen is lost. When Hartman (1961) changed the original name and redescribed the species, she failed to designate any of her three specimens as types, but her materials belong elsewhere (see below). Later, Light (1978) regarded two of Hartman’s specimens as syntypes, which
cannot be the case because they were not employed for the original description, but did not recognize any of them as neotypes. He further expanded the species definition by introducing some rather different specimens under the same species name. Thus, in order to avoid any instability in the usage of the species name, a neotype and neoparatypes are herein designated. The specimens come from about 0.3° north from the type locality (San Diego, California), and were found in the same type of environment (subtidal, eelgrass roots). The other specimens indicate that size can be 8–26 mm long, with 25–27 chaetigers.

In introducing *Flabelligera essenbergae* as a new name, Hartman (1961, p 338) stated that “The specific name is preoccupied (Hartman 1959, p 416) and here replaced with one in honor of the first describer”. However, she was not aware that her materials differ from the original ones in at least one basic and relevant feature: the dorsal tubercles are different. In *F. papillosa* they are “long, finger-shaped, attached to the body by a narrow neck” (Essenberg 1922, p 379), while Hartman (1961) provided no details of the dorsal papillae, but her illustrations show they are larger, thicker, less abundant, and with a very wide base. Therefore, *F. essenbergae* becomes a junior subjective synonym, because it was introduced as a replacement name, and a new name is required for the other form (see below).

*Flabelliderma papillosa* n. comb. is closely allied to *F. lighti* n. sp. by having dorsal and lateral clavate tubercles. They differ in the relative size of dorsal sediment tubercles in comparison with the notopodial lobes, and in the relative number of dorsal sediment tubercles per transverse row on each segment. In *F. papillosa* the dorsal sediment tubercles are larger, as long as notopodial lobes, and they are less abundant than in *F. lighti* n. sp. On the other hand, *F. papillosa* resembles *F. claparedei* (de Saint-Joseph, 1898) n. comb. because they have dorsal clavate sediment tubercles; however, they differ in the relative size of their tubercles. Thus, they are of a single size in *F. papillosa* while they are of two different sizes in *F. claparedi*.

**Neotype locality**

The neotype locality is Santa Barbara, California, in subtidal kelp holdfasts (ICZN 1999, Art. 76.3).

**Distribution**

From Monterey to San Diego, California, in subtidal kelp holdfasts, seagrass root masses, and in shallow sandy bottoms (20 m).

*Flabelliderma berkeleyorum* n. sp.

(Figure 2)

*Flabelligera affinis*: Berkeley and Berkeley 1960, p 792–793 (*non* Sars, 1829).

**Type material**

Eastern Pacific Ocean: holotype (USNM-40475) and four paratypes (USNM-unnumbered) collected in Friday Harbor, Washington, swimming and spawning at night light off dock, 16 July 1956, B. L. Fernald, coll. (paratypes with sediment tubercles eroded; they are 10.5–14.0 mm long, 1.0–1.5 mm wide, cephalic cage 2 mm long, 28–30 chaetigers).
Description

Holotype (USNM-40475) complete, pale, clavate, truncate anteriorly, tapering posteriorly, with most dorsal sediment tubercles eroded (Figure 2A, B). Body densely papillated; papillae small, capitate, forming rounded sediment tubercles dorsally arranged in three to four transverse rows, each with about 12–14 papillae per row, reaching the interramal region but venter apparently deprived of papillae. It is 15 mm long, 1.8 mm wide (including notopodia 4 mm), cephalic cage 2 mm long, 28 chaetigers.

Anterior end observed in one paratype. Prostomium a low cone, with four fading eyes. Caruncle well developed. Palps white, thick, slightly longer than branchial filaments; palp bases low, rounded. Lateral and dorsal lips fused, laterals massive, ventral lip reduced. Branchial groups with filaments arranged in 15 rows, each with two to five filaments, about 40 filaments per group; longest shorter than palps. Nephridial lobes large, base rounded, tips rounded, placed above the level of the eyes (Figure 2C).

Cephalic cage chaetae as long as one-seventh body length or as long as body width; about 70 per fascicle. Anterior dorsal margin of first chaetiger papillated. Anterior chaetigers without especially long papillae. Chaetigers 1–3 slightly decreasing in size posteriorly. Chaetal transition to body chaetae abrupt; neurohooks present from chaetiger 2. Gonopodial lobes not seen in holotype (one paratype with whitish short, rounded lobes in chaetigers 5–6).
Parapodia well developed, lateral; median neuropodia ventrolateral. Notopodial lobes cylindrical, thin, soft, surface regularly slightly nodulose, made by closely packed globular papillae (Figure 2D, E). Dorsal sediment tubercles rounded, smaller than notopodial lobes, all of about the same size. Neuropodia projected lobes, carrying lageniform papillae but no globular papillae.

Median notochaetae arranged in a short transverse line; multiarticulated capillaries with short articles basally, longer medially and distally; about five notochaetae per bundle; chaetae about two-thirds as long as notopodial lobe or about two-thirds as long as body width. Neurochaetae multiarticulated hooks from chaetiger 2, one per ramus. Handle articulation with short articles basally, three to four longer ones medially, then progressively shorter. Crest darker, subbasally wider, blunt, markedly curved distally (Figure 2F). Posterior end as a rounded lobe; pygidium with anus pale, terminal, no anal cirri.

Discussion

*Flabelliderma berkeleyorum* n. sp. resembles *F. ockeri* by having short sediment dorsal tubercles. They differ especially in the relative size of the tubercles, being larger, more or less rectangular in *F. ockeri* while they are short, rounded in *F. berkeleyorum*.

This species was caught because they were swimming and were attracted to a light (Berkeley and Berkeley 1960). Swimming or swarming members of *Flabelligera* have been recorded on at least three other occasions. The first record was made by Sorby (1906, p 437; McIntosh 1915, p 112); he found that *F. affinis* was swimming abundantly during several years and that this abundance lasted for a few years. Sorby thought that while swimming, the adults may release their gametes. The second record was made by Gravier and Dantan (1928, p 159–160); they collected some specimens with a light trap in February and June in the Mediterranean but they were small specimens. In the third report, Herpin (1929, p 86–87) noticed many small specimens without sexual products, but in July, he found large males which released sperm when placed in flasks with sea water, and concluded that swarming may be made by just a few individuals. The fourth record was made by Berkeley and Berkeley (1960, p 792–793); they noticed five *Flabelligera* specimens collected with a light in Friday Harbor. They indicated that they were sexually mature and spawning; about their specific identity, they found it closer to *F. affinis* than to *F. infundibularis*, which is common in the region. However, although there are some morphological differences that might be related to reproductive transformation or epitoky, this is unlikely since there are no different chaetae and at least in the holotype there remain many dorsal sediment tubercles. Further, there were no ova in the specimens; thus, either they had spawned completely or the spherules found were rather detached dorsal sediment tubercles. It is noteworthy that Pettibone (1954, p 289) noticed that when the specimens appear in the water column, they lack any transparent tunic. This might indicate that they could be members of *Flabelliderma*, rather than *Flabelligera*, as was the case for these specimens from Friday Harbor.

Etymology

This species is named to honour the life and work of the late Edith and Cyril Berkeley. They made many relevant publications on Canadian polychaetes, especially on those living along the Pacific coast, and also made some contributions to the study of more southern polychaetes, including those living in Mexican waters.
Type locality

Friday Harbor, Washington.

Distribution

Northeastern Pacific coasts but apparently restricted to the type locality, although it might have been confused with the other common species there, *Flabelligera infundibularis* Johnson, 1901.

*Flabelliderma claparedei* (de Saint-Joseph, 1898) n. comb.

(Figure 3)

*Flabelligera claparedi* de Saint-Joseph 1898, p 363–365, Plate 21, Figures 176–179.

Figure 3. *Flabelliderma claparedei* (de Saint-Joseph, 1898) n. comb. (A) Non-type specimen (MNHN-449) in dorsal view; (B) holotype (MNHN-447), anterior end in dorsal view; (C) eversible anterior end (MNHN-448) in frontal view, distorted by compression; branchiae and palps removed; (D) close-up of the median region, in ventral view, showing the sediment tubercles (MNHN-449); (E) same, tip of neurohook from a median parapodium, surrounding cuticle and papillae removed. Scale bars: 2 mm (A, B); 1.25 mm (C); 1.00 mm (D); 40 μm (E).
Type material
Northeastern Atlantic Ocean: holotype (MNHN-447) collected at Remardy, close to St. Jean de Luz (43°22′48″N, 01°40′12″W), Aquitaine, Gulf of Biscay, southwestern France, rocky shores, 31 March 1892, A. de Saint-Joseph, coll.

Additional material
Four specimens, three compressed, another one dried out (MNHN-448) collected in the same locality, 27 July 1908, A. de Saint-Joseph, coll. One specimen (MNHN-449) collected in the same locality, 30 July 1900, A. de Saint-Joseph, coll.

Description
Holotype (MNHN-447) complete, pale brown, depressed (has been squashed during preservation), almost without papillae, with a longitudinal dorsal dissection reaching chaetiger 30 (Figure 3B). It is 34 mm long, 7 mm wide, cephalic cage 5 mm long, 34 chaetigers. Better specimens (MNHN-449) with body densely papillated; papillae forming long clavate sediment tubercles dorsally (about 20 per segment), abundant, elongate, globular, fragile; smaller laterally and ventrally (Figure 3A). Most body papillae brushed off, with a thick opaque tunic, with fine sediment particles adhered, forming clavate sediment masses of two different sizes dorsally, all small ventrally (Figure 3D).

Prostomium low cone (damaged), with four dark eyes. Caruncle well developed, lateral keels elevated, thin, median one wider, swollen. Palps lost in holotype; non-type specimen (MNHN-448) with palps large, pale, corrugated, appearing annulated); palp lobes rounded, elevated. Lateral lips dark, well developed; ventral lip reduced, dorsal lip even more reduced. Branchiae all lost in holotype; non-type specimen (MNHN-448) dissected. Branchiae arranged in rows; each lateral group with about 60 filaments, decreasing in size ventrally. Nephridial lobes contracted, as long as palps, rounded, placed at the level of prostomium (Figure 3C).

Cephalic cage chaetae as long as one-seventh body length, or five-sevenths body width; chaetae reducing in size middorsally and midventrally; 36–40 notochaetae, 30–32 neurochaetae. Anterior dorsal margin of first chaetiger smooth (papillae eroded). Anterior chaetigers without especially long papillae. Chaetigers 1–3 of about the same length. Chaetal transition from cephalic cage to body chaetae abrupt; chaetiger 2 with compound neurohooks. Gonopodial lobes not seen.

Parapodia well developed, lateral; median neuropodia ventrolateral (Figure 3D). Notopodial lobes flat, smooth projected lobes. Dorsal sediment tubercles about as long as notopodial lobes, mostly in two different sizes; soft, delicate, with many globular short-stemmed papillae. Neuropodia conical projected lobes, with globular and globular-mucronate papillae, globular ones uncommon on neuropodial lobes.

Median notochaetae arranged in a short transverse line; 12–14 multiarticulated capillaries per fascicle, about as long as body width, with articles long, basally and medially, becoming slightly shorter distally. Neurochaetae multiarticulated hooks from chaetiger 2, one hook per ramus. Handle articulation with three longer articles medially, first shorter, two others of about the same length; more distal articles shorter. Crest darker, tapering, acute, only tip markedly curved (Figure 3E). Posterior end tapering distally, truncated; pygidium with anus terminal, as a rounded muscular lobe; no anal cirri.
Discussion

In the original description, there were detailed measurements of article length in each type of chaetae, but little information about the general aspect of the worm. However, there were two statements that are indicative of this new generic placement; de Saint-Joseph (1898, p 363) stated that the worm had sediment on the outer cuticle: “…entourné d’une couche épaisse de mucus mélangée de sable et de vase…” and that it had notochaetal lobes with globular papillae, some with a distal lobe, with long stems (1898, p 364, Plate 21, Figures 178, 179): “Les papilles qui accompagnent les soies sont lagéniformes (fig. 176); les autres ont 3 formes différentes: 1° en massue (fig. 177); 2° sphérique (fig. 178); 3° sphérique surmontée d’une pointe cylindrique.” However, the holotype had been manipulated too much and most papillae and sediment tubercles were removed; so, for the original description, these features were based on a curled specimen that had not been brushed before.

Because of the shape of the dorsal tubercles Flabelliderma claparedei (de Saint-Joseph, 1898) n. comb. resembles F. papillosa and F. lighti n. sp; however, F. claparedei differs by having dorsal sediment tubercles of two different sizes, and its notopodial lobes are foliose, instead of cylindrical or globose, as is the case in the other species. The original name employed by de Saint-Joseph, “claparedii” must be modified since it was formed after Edouard Claparède, it must be claparedei.

Distribution

Only known from the type locality, St. Jean de Luz, southwestern France, in rocky shores.

Flabelliderma gourdoni (Gravier, 1906) n. comb.

(Figure 4)

Flabelligera gourdoni Gravier 1906, p 536–537; Gravier 1907, p 35–37, Plate 3, Figure 28, Plate 4, Figures 29, 30, Text figures 19–21; Hartman 1966, p 35–37, Plate 10, Figures 7–9; Knox and Cameron 1998, p 71.

Flabelligera pennigera Ehlers 1908, p 123–124, Plate 16, Figures 9, 10; Günther 1912, p 13; Monro 1930, p 161; Hartman 1953, p 51, Hartman 1966, p 39, Plate 11, Figures 5, 6, (aff.); Hartmann-Schröder and Rosenfeldt 1989, p 72–73.

Flabelligera induta: Hartman 1953, p 50 (partim, non Ehlers).

Type material

Antarctic Ocean: holotype of Flabelligera gourdoni Gravier, 1906 (MNHN-446) collected off Port Charcot, Carthage Bay, Booth Island (65°08’S, 64°02’W), Wilhelm Archipelago, Western Antarctic Peninsula, RV Français, Stat. 435, 40 m, 15 April 1904, Turquet, coll.

Additional material

Four specimens (MNHN-A184) collected during the Paris Museum Cape Horn Mission, 1883, Stat. P-1460 (damaged, most outer cuticle removed, two complete ones are 12–25 mm long, 1.5–2.0 mm wide, cephalic cage 1.5–2.0 length, 18–35 chaetigers). Two specimens broken in two pieces, previously dried out (ZMB-4485), collected in the Kerguelen Islands, Deutsche Tiefsee Expedition; they were put in 70% ethanol to reduce further damage (they are 11.5/17 mm long, 3/4.5 mm long, 32/35 chaetigers).
Southwestern Atlantic Ocean: one anterior fragment (SMNH-55705), collected during the Swedish South Polar Expedition 1901–03, Stat. 33 (54°22′S, 36°28′W), Grytviken, South Georgia Island, 22 m, mud and algae, 30 May 1902 (12.5 mm long, 2.8 mm wide, cephalic cage 2 mm long, 22 chaetigers). Two specimens (SMNH-55724), one without outer cuticle, collected during the Swedish South Polar Expedition 1901–03, Stat. 37a (54°22′S, 36°28′W), Grytviken, South Georgia Island, in rocks, 14 June 1902 (13–17 mm long, 2 mm wide, cephalic cage 1.0–1.5 mm long, 26–35 chaetigers; one specimen with anterior region with large nodular sediment spots; posterior region contracted). One specimen (SMNH-55728), damaged, collected during the Swedish South Polar Expedition 1901–03, Stat. 55 (52°11′S, 60°26′W), Port Albermarle, Falkland Islands, 40 m, sand with algae, 8 September 1902 (13 mm long, 2 mm wide, cephalic cage 1 mm long, 31 chaetigers). One specimen (SMNH-55733), collected during the Swedish South Polar Expedition 1901–03, Stat. 1, May Bay, Mouth of West Fjord, South Georgia Islands, on Macrocystis holdfasts, 3 May 1902 (28 mm long, 3.5 mm wide, cephalic cage 3.5 mm long, 34 chaetigers).

Figure 4. *Flabelliderma gourdoni* (Gravier, 1906) n. comb. (A) Holotype (MNHN-446) in lateral view; (B) same, close-up of the anterior end in lateral view; (C) same, posterior end in lateral view; (D) same, close-up of papillae of the neuropodial lobe; (E) same, tip of neurohook from a median parapodium with surrounding cuticle and a papilla tip; (F) non-type specimen (MNHN-A184), anterior end in ventral view with two copepod egg-masses indicated by arrows; both removed, slightly enlarged as inserts above it. Scale bars: 3.8 mm (A); 0.8 mm (B); 1.0 mm (C); 110 μm (D, E); 50 μm (F).
Description

Holotype (MNHN-446) complete, whitish, tapering slightly posteriorly, with some parapodia previously removed (Figure 4A). Body scarcely papillated (papillae eroded); papillae forming small rounded sediment tubercles (40–50 per segment); each papilla long, subdistally swollen, mucronate (dorsal ones mostly lost), making noto- and neurochaetal lobes well defined, but distal portion of papillae mostly detached from the core (Figure 4B, D), more evident in posterior chaetigers (Figure 4C). It is 26.5 mm long, 3 mm wide, cephalic cage 2 mm long, 20 chaetigers.

Prostomium a low cone; four dark eyes, anterior ones larger. Caruncle well developed, with low marginal keels, central area slightly higher than the margins. Palps thick, corrugated, appearing annulated; palp bases rounded, small. Lateral lips well developed; ventral and dorsal lips not seen (to avoid further damage to the specimen). Branchiae thick; branchial groups with branchiae arranged in rows; each group with about 40 filaments. Nephridial lobes not examined to avoid further damage.

Cephalic cage chaetae as long as two-thirds body width; 18–20 neurochaetae, 26–28 notochaetae. Anterior dorsal margin of first chaetiger papillated. Chaetigers 1–3 of about the same length. Chaetal transition from cephalic cage to body chaetae abrupt; neurohooks present from chaetiger 2. Gonopodial lobes not seen.

Parapodia well developed, lateral; median neuropodia ventrolateral. Notopodial lobes ovoid projections, made by elongate subdistally swollen papillae, their distal part being detached, giving a hairy or loose appearance. Dorsal sediment tubercles much smaller than notopodial lobes (most eroded) (Figure 4B). Neuropodia conical lobes covered by a similar chaetal lobe, not covering the whole neurohook, with similar papillae (Figure 4D).

Median notochaetae arranged in a short transverse line; eight to nine multiarticulated capillaries per fascicle, as long as one-fourth to one-third body width, with articles long basally and medially, becoming shorter distally. Neurochaetae multiarticulated hooks from chaetiger 2. Handle articulation with two longer articles medially, proximal article about half as long as distal one, more distal articles shorter. Crest slightly darker, tapering, tip blunt, curved distally (Figure 4E).

Posterior end tapering (Figure 4C); pygidium with anus terminal, short muscular ring, no anal cirri. One specimen collected in May (SMNH-55733) had ova of about 125 μm. Another specimen (MNHN-A184) has two parasite egg-masses in the cephalic area (Figure 4F); one is complete, oval, 1 mm long with about 10 eggs in line; another one broken. In both cases there is a thin membrane and a very thin, transparent, short peduncle attaching it to the flabelligerid anterior end.

Discussion

*Flabelliderma gourdoni* (Gravier, 1906) n. comb. is unique in having hirsute notopodial lobes, which is due to the fact that their papillae have long mucrones and they are sediment-free. It includes *F. pennigera* Ehlers, 1908; the latter was described on the basis of having notochaetal lobes resembling feathered projections, which is precisely the diagnostic feature for *F. gourdoni*. On the other hand, *F. pennigera* was described as having neurohooks from chaetiger 3, not from chaetiger 2 as is the case in *F. gourdoni*. However, the second parapodia are ventrally displaced, giving the impression that first neurohooks appear in chaetiger 3, when the adjacent notochaetae are regarded as second chaetiger neurochaetae.
**Distribution**

Besides the type locality, it has been recorded in Antarctic and subantarctic areas in deep water (76–385 m).

*Flabelliderma lighti* n. sp.

(Figure 5)

*Flabelliderma essenbergae*: Light 1978, p 685–686, Figures 1–4 (*partim, non* Hartman 1961).

**Type material**

Eastern Pacific Ocean: holotype (CAS-168303) collected in Old Sealer’s Cove (Old Sealer’s Station), southeastern side of Isla Guadalupe (28°53’N, 118°18’W), Mexico, miscellaneous scrapings in low intertidal, associated with yellow sponge that turned red purple in preservation, staining the polychaete, 1 January 1975, W. L. Lee and A. J. Ferreira, coll.

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Figure 5. *Flabelliderma lighti* n. sp., holotype (CAS-168303). (A) Dorsal view; (B) anterior end in dorsal view; (C) eversible anterior end in frontal view; branchiae and palps removed; (D) median body chaetigers, seen from below, showing a large globular papilla; (E) tip of a neurohook from a median parapodium, broken, with some papillae. Scale bars: 1.5 mm (A, B); 0.9 mm (C); 0.3 mm (D); 45 μm (E).
Description

Holotype (CAS-168303) complete, red purple, fusiform with blunt ends, slightly damaged (Figure 5A). Body densely papillated, papillae grouped in tubercles, dorsally and laterally long, clavate, thin, smooth (about 20–22 per segment); ventrally densely papillated with smaller rounded tubercles. Papillae long covering noto- and neurochaetae, with adherent sediment particles (Figure 5B, D). It is 19 mm long, 4 mm wide (6 mm including notopodia), cephalic cage 1.5 mm long, 33 chaetigers (an anterior ventral dissection already made).

Prostomium high cone with four dark eyes (not clearly seen against the red purple colour). Caruncle present, wide basally, medially elevated, projected dorsally. Palps missing; palp bases rounded, large. Branchial groups with about 40 filaments. Two nephridial lobe scars, placed towards the dorsal margin, separated from the branchiae (Figure 5C).

Cephalic cage chaetae short, one-twelfth as long as body or two-thirds as long as body width (excluding notopodia); chaetae densely covered by papillae, difficult to count. Anterior dorsal margin of first chaetiger without papillae, probably eroded. Anterior notopodia without especially long papillae. Chaetigers 1–3 of about the same length. Chaetal transition from cephalic cage to body chaetae abrupt, neurohooks present from chaetiger 2. Gonopodial lobes not seen.

Parapodia well developed, placed on the body corners; median neuropodia ventrolateral. Notopodial lobes ovoid, rough projections, made by loosely packed globular papillae. Dorsal sediment tubercles thin, smaller than notopodial lobes, mostly of a single size; soft (Figure 5D). Most papillae cylindrical, with long distal nipple-like projections. Some large globular papillae outside the notopodial lobes. Neuro- podia shorter lobes, masked by elongate papillae almost completely covering the neurohooks.

Median notochaetae arranged in a transverse short line, tips not exposed, four to five multiarticulated capillaries per bundle, as long as half body width, with short articles basally and medially, longer distally. Neurochaetae multiarticulated hooks from chaetiger 2, mostly a single hook per ramus. Handle articulation with three longer articles, proximal one shorter, the others slightly longer. Crest darker, tapering, acute, slightly curved distally (Figure 5E).

Posterior end tapering; pygidium with anus terminal, without anal cirri.

Discussion

Some of the specimens herein regarded as members of Flabelliderma lighti n. sp. and F. ockeri n. sp. were included by Light (1978) in F. essenberga, which is a junior synonym for F. papillosa. These two species are different regarding the dorsal sediment tubercles, since they are soft, clavate, pedunculate in F. lighti n. sp., while they are stiff, with a wide base and sessile in F. ockeri n. sp.

Flabelliderma lighti n. sp. is closely allied to F. papillosa. As stated above, they differ in the relative size and number of dorsal sediment tubercles. In F. lighti they are smaller than the notopodial lobes and more abundant per segment, while in F. papillosa they are at least of about the same size as the notopodial lobes and less abundant per segment. Further, they come from different environments: F. lighti was associated with a low intertidal sponge, collected on a rocky shore, while F. papillosa is free-living in mixed bottoms, in crevices, in intertidal or subtidal depths.
**Etymology**

This species is named after William J. Light, who made important publications on spionids and maldanids, and especially solved some problems in the taxonomy of flabelligerids.

**Distribution**

Currently only known from the type locality in shallow subtidal rocky shores in Guadalupe Island, Mexico, associated with a yellow sponge.

**Flabelliderma ockeri** n. sp.

(Figure 6)

*Flabelligera essenbergae* Hartman 1961, p 118–120, Plate 22, Figures 1, 2, Plate 23, Figures 1–4 (*partim*).

*Flabelliderma essenbergae*: Hartman 1969, p 287–289, 6 text figures; Light 1978, p 685–686, Figures 1–4 (*partim*).

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Figure 6. *Flabelliderma ockeri* n. sp. (A) Holotype (LACM-AHF-536), dorsal view; (B) same, close-up of the anterior end, dorsal view; (C) non-type specimen (ECOSUR), eversible anterior end in frontal view, branchiae and palps removed; (D) median chaetiger from paratype (LACM-AHF-537), showing globular papillae in the notopodial lobe; (E) tip of a neurohook from a median parapodium, without cuticle or papillae. Scale bars: 2 mm (A); 1 mm (B); 0.4 mm (C); 0.8 mm (D); 60 μm (E).
Type material

Eastern Pacific Ocean: holotype (LACM-AHF-536) and one paratype (LAMNH-537) collected in the intertidal, Arch Rock, south of Corona del Mar, California, RV Velero III, Stat. 1443 (33°35′00″N, 117°51′40″W), 0.5 m depth, 19 December 1941, rocks, eelgrass beds (paratype in two fragments, one segment originally separated for illustrations by Hartman); 14 paratypes (ECOSUR, MNHN) collected in Macrocystis holdfasts, off Goleta sewer outfall pipe (34°24.6′N, 119°44.5′W), Santa Barbara, California, 12 m depth, 18 February 2004, S. Anderson, coll.

Additional material

One specimen (LACM-AHF) collected in the intertidal, Laguna Beach, 6 December 1938, O. Hartman, coll.; three specimens (LACM-AHF) collected at Rocky Point, Palos Verdes, California, November 1961, R. Zimmer (one dissected already, anterior end extracted for this description); one specimen (LACM-AHF) collected in Federal Breakwater, Los Angeles Harbor, 10 m, 12 October 1987, under rocks, M. K. Wicksten, coll.

Description

Holotype (LACM-AHF-536) complete, pale brown, fusiform (Figure 6A). Body densely papillated, papillae grouped in large subrectangular blunt tubercles dorsally (about 10–12 per segment), or clavate tubercles laterally, smaller ventrally. Papillae long, covering noto- and neurochaetae, with adherent sediment particles (Figure 6B). It is 18 mm long, 4 mm wide (6 mm including notopodia), cephalic cage 2 mm long, 32 chaetigers (notopodia and neuropodia in chaetiger 2, and left neuropodium 21, removed).

Anterior end slightly damaged in neotype (anterior end and branchial structure based on a non-type specimen). Prostomium low cone with four dark brown eyes. Caruncle very wide basally, projected dorsally. Palps large, pale, tips darker; palp bases rounded, small. Branchial groups with about 60 filaments each; each filament about as long as palps, size decreases ventrally. Nephridial lobes lost, scars small, placed towards the dorsal margin, separated from the branchiae (Figure 6C).

Cephalic cage chaetae one-ninth as long as body length, or half as long as body width (excluding notopodia); chaetae densely covered by papillae, difficult to count. Anterior dorsal margin of first chaetiger with long papillae (smooth after their removal in neotype). Anterior notopodia without especially long papillae. Chaetigers 1–3 of about the same length. Chaetal transition from cephalic cage to body chaetae abrupt, neurohooks present from chaetiger 2. Gonopodial lobes not seen.

Parapodia well developed, placed on the body corners (Figure 6D); median neuropodia ventrolateral. Notopodial lobes funnel-shaped, distally widened or ovoid with rough surface. Dorsal sediment tubercles smaller than notopodial lobes, of variable size; stiff, made by closely packed papillae and sediment. Some large vesicular papillae projecting out from the notopodial lobe. Neuropodia shorter lobes, masked by elongate papillae almost completely covering the neurohooks.

Median notochaetae arranged in a transverse short line; multiarticulated capillaries with articles poorly defined basally and medially, better defined distally, rapidly increasing their length, five to six per bundle, as long as half body width. Neurochaetae multiarticulated hooks from chaetiger 2, mostly a single hook per ramus. Handle articulation with two longer articles medially, proximal one less than half as long as next one, more distal articles
shorter. Crest darker, wider medially then tapering, acute, markedly curved distally (Figure 6E). Posterior end tapering; pygidium with anus terminal, without anal cirri.

**Variation**

Paratypes (ECOSUR) were 13–23 mm long (mean 18 mm), 4–6 mm wide (mean 5.5 mm), with 28–32 chaetigers (mean 30). Dorsal tubercles, making approximately a single line per segment, 7–13 (mean 8). When they are more abundant, they are thinner but always have wide bases.

**Discussion**

*Flabelliderma ockeri* n. sp. is the only species in the genus that forms stiff, widely-based, dorsal sandy tubercles.

**Etymology**

This species is named after Mr. David Ocker, in recognition of his long-standing generous support to polychaete workers, most having come from Chetumal. Thanks to his support, many extremely productive research visits have been made to Los Angeles.

**Type locality**

Corona del Mar, California.

**Distribution**

Southern California, low intertidal in rocky bottoms, in seagrass root masses, kelp holdfasts, or under rocks up to 12 m depth. The dead kelp holdfast, where some specimens were taken from, was 3–4 months old (S. Anderson, personal communication, 2004).

*Flabelliderma pruvoti* (Fauvel, 1930) n. comb.

(Figure 7)

*Flabelligera pruvoti* Fauvel 1930a, p 544–546, Figure 8; Fauvel 1947, p 65, Figure 60 (repeated description).

**Type material**

Southwestern Pacific Ocean: holotype (MNHN-194) and paratype (MNHN-195) collected in Île des Pines, southeastern New Caledonia (21°30’S, 165°30’E), low tide, among corals or breaking corals, 1 January 1928, A. Pruvot-Fol, coll. One slide (IRFA-M65') from the type material (with four neurohooks or crests) has been partly dehydrated.

**Description**

Holotype (MNHN-194) complete, greyish, slightly damaged, cylindrical, with long, whitish, cylindrical notopodial lobes (Figure 7A, B). Body densely papillated; papillae small, capitate, globose, very abundant dorsally (eroded in holotype; 40–50 per segment in
paratype), smaller laterally, tiny ventrally. It is 32 mm long, 3 mm wide (including notopodia 7 mm), cephalic cage 2 mm long, 42 chaetigers.

Prostomium a low cone, with four dark eyes. Caruncle well developed. Palps white, thick, as long as branchial filaments; palp bases low, rounded. Lateral lips massive; ventral and dorsal lips reduced. Branchial groups with filaments arranged in 12 rows, each with three to five filaments, about 40 filaments per group; longest as long as palps. Nephridial lobes large, base foliose, tips missing, placed at the same level as the eyes.

Cephalic cage chaetae as long as one-fifteenth body length or two-thirds body width (most damaged in holotype); about 60 chaetae per side. Anterior dorsal margin of first chaetiger papillated. Anterior chaetigers without especially long papillae. Chaetigers 1–3 of about the same length. Chaetal transition from cephalic cage to body chaetae abrupt; neurohooks present from chaetiger 2. Gonopodial lobes not seen.

Parapodia well developed, lateral; median neuropodia ventrolateral. Notopodial lobes cylindrical, soft with surface smooth, made by closely packed globular papillae (Figure 7C). Large dorsal sediment tubercles absent; dorsal papillae smaller than notopodial lobes, all of
the same size. Neuropodia projected lobes, carrying globular papillae, less densely packed, but each papilla larger, ovoid or club-shaped.

Median notochaetae arranged in a short transverse line; multiarticulated capillaries with very short articles basally and medially, become longer distally; about five notochaetae per bundle; chaetae about two-thirds as long as notopodial lobe or about two-thirds as long as body width. Neurochaetae multiarticulated hooks from chaetiger 2, one per ramus (rarely two). Handle articulation without long articles, most articles short, poorly defined. Crest darker, basally wider, then tapering, blunt, markedly curved distally (Figure 7D). Posterior end as a rounded lobe; pygidium with anus darker, dorsoterminal, no anal cirri.

Discussion

Flabelliderma pruvoti (Fauvel, 1930) n. comb. differs from other species in the genus because it has very small dorsal papillae. The record of a hirsute articulation in the neurohooks by Fauvel (1930, Figure 8d) is explained as the breakage of the oblique chaetal filaments.

Distribution

Only known from the type locality, Île de Pins, New Caledonia.

Key to species of Flabelliderma Hartman, 1969, redefined

1 Dorsum covered by large tubercles or papillae, often with sediment particles ..... 2
   - Dorsum covered by small globular papillae ..... 6
2 Dorsal tubercles soft, clavate with a thin base ..... 3
   - Dorsal tubercles tough, digitate or rectangular, with a wide base. F. ockeri n. sp.
3 Notopodial lobes compact, individual papillae mucrones not visible ..... 4
   - Notopodial lobes hirsute, individual papillae with mucrones free. F. gourdoni (Gravier, 1906) n. comb.
4 Dorsal tubercles of two different sizes; neurohook handle with three longer articles, basal short, others slightly longer. F. claparedei (de Saint-Joseph, 1898) n. comb.
   - Most dorsal tubercles clavate. ..... 5
5 Notopodial lobes with little sediment (living in sponges); 20–22 papillae per transverse row per segment, all shorter than notopodial lobes. F. lighti n. sp.
   - Notopodial lobes with abundant fine sediment (living in sandy bottoms or kelp holdfasts); 12–14 papillae per transverse row per segment, about as long as notopodial lobes, some longer. F. papillosa (Essenberg, 1922) n. comb.
6 Dorsal papillae without sediment particles; notopodial lobes thick. F. pruvoti (Fauvel, 1930) n. comb.
   - Dorsal papillae with sediment particles; notopodial lobes thin. F. berkeleyorum n. sp.

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