On a new species of *Actinopyga* Bronn, 1860 (Echinodermata, Holothuroidea) from the Indo-West Pacific

Francis W. E. ROWE
Research associate, Australian Museum,
6 College Street, Sydney, NSW 2010 (Australia)

Claude MASSIN
Royal Belgian Institute of Natural Sciences, Department of Malacology,
29 rue Vautier, B-1000 Brussels (Belgium)
claude.massin@naturalsciences.be

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ABSTRACT
Actinopyga capillata n. sp., with nocturnal habits, has first been observed in the Mascarene Islands, but has a wide Indo-West Pacific distribution. The new species is clearly separated from its congeners by its colour pattern and by the presence of very long and thin dorsal tube feet. *Actinopyga capillata* n. sp. is compared with *Bohadschia mitsioensis* Cherbonnier, 1988, with which it shares similar ossicle forms.

KEY WORDS
Echinodermata,
Holothuroidea,
Actinopyga,
Mascarene Islands,
Philippines,
new species.

RÉSUMÉ
*Une nouvelle espèce d'*Actinopyga *Bronn, 1860 (Echinodermata, Holothuroidea) de l'Indo-Ouest Pacifique.*
Actinopyga capillata n. sp., de mœurs nocturnes, a été découverte aux îles Mascareignes mais présente une vaste distribution indo-ouest pacifique. La nouvelle espèce se distingue des autres espèces du genre *Actinopyga* Bronn, 1860 principalement par la coloration et la présence de podia dorsaux très longs et fins. *Actinopyga capillata* n. sp. est aussi comparée à *Bohadschia mitsioensis* Cherbonnier, 1988 avec laquelle elle présente une grande analogie de spicules.

MOTS CLÉS
Echinodermata,
Holothuroidea,
Actinopyga,
îles Mascareignes,
Philippines,
espèce nouvelle.

INTRODUCTION

Subject to some minor taxonomic adjustments, between 45 and 50 species of holothuroids are now known from the Mascarene Islands of La Réunion, Mauritius and Rodrigues (Clark & Rowe 1971; Conand & Mangion 2002; Rowe & Richmond 2004). However, all records prior to 1971 appear to relate to collections made from Mauritius.

Although 22 species have Mauritius as type locality (de Blainville 1821 [1]; Quoy & Gaimard 1833 [3]; Semper 1868 [1]; Haacke 1880 [13]; Heding 1928 [1]; Cherbonnier 1953 [1]; Heding & Panning 1954 [2]), only eight of these are now taxonomically valid. The rest (including 12 of the 13 species of Haacke 1880!) have been referred to the synonymy of other taxa (see references in Clark & Rowe 1971; Rowe & Richmond 2004). No new species of holothuroids have been described from the Mascarene Islands since 1954.

Rowe & Richmond (2004) included detailed comments on a new, but unnamed, species of *Actinopyga* Bronn, 1860, based on three specimens collected from Rodrigues Island. They recognised that the species occurred also in nearby Mauritius Island as well as in the Philippine Islands. This widespread, Indo-West Pacific distribution was based on other, unpublished and published works in which the species had been illustrated and either incorrectly identified or identified only at generic level (Arakaki & Fagoonee 1996; Muller 1998; Erhardt & Baensch 2000).

Independently, one of us (CM) received a specimen collected from La Réunion Island which clearly represents the same species of *Actinopyga* reported by Rowe & Richmond (2004) from Rodrigues Island.

The purpose of this paper is to describe this new species in the genus *Actinopyga*. This will add an 18th species to this small genus, which has most recently been briefly reviewed by Samyn *et al.* (2006).

ABBREVIATIONS

AM	Australian Museum, Sydney;
BMNH	Natural History Museum, London;
MNHN	Muséum national d'Histoire naturelle, Paris.

SYSTEMATICS

Family HOLOTHURIIDAE Ludwig, 1894
Genus *Actinopyga* Bronn, 1860

Actinopyga capillata n. sp.
(Figs 1-3)

Labidodemas semperianum – Arakaki & Fagoonee 1996: 122, pl. XIII, 4 (non *L. semperianum* Selenka, 1867).

Bohadschia subrubra – Muller 1998: 33, pl. 4a-d, g, h, pl. 6, figs g-j (non *B. subrubra* (Quoy & Gaimard, 1833)).

Actinopyga sp. – Erhardt & Baensch 2000: 960.

Actinopyga sp. nov. – Rowe & Richmond 2004: 3299, fig. 9 (as *Bohadschia* sp. 1 in the legend of fig. 9; sphalm. typogr.).

HOLOTYPE. — **La Réunion.** Trou d'eau, night dive, back reef, 1 m depth, VII.2003, coll. M. Rard (MNHN EcHh 8078)

TYPE LOCALITY. — La Réunion.

PARATYPES. — **Rodrigues Island.** Grande Baie, reef crest, Royal Geographical Society, Royal Society Shoals of Capricorn Programme, western Indian Ocean 1998-2001 (Shoals contribution no. P043), 22.IX.2001 (BMNH 2004.2834). — Same data, upper shore, under stone, 19.IX.2001 (BMNH 2004.2835). — Same data, reef crest, 16.IX.2001 (AM).

OTHER MATERIAL EXAMINED. — Holotype of *Bohadschia mitsioensis* Cherbonnier, 1988 (MNHN EcHh 3545).

DISTRIBUTION. — Mascarene Islands (La Réunion, Rodrigues Island, Mauritius), Philippines.

ETYMOLOGY. — "*capillata*" (Latin *capillata* = hairy) refers to the very long (1 cm) and thin, hair-like, dorsal tube feet of the species.

DESCRIPTION

Medium size holothuroid, holotype 90 × 35 mm, paratypes 67 × 24 to 120 × 24 mm. Body cylindrical, tapering posteriorly. Mouth ventral, surrounded by 16-20 greyish peltate tentacles; anus terminal with five small anal "teeth" (not observed in the two smallest paratypes); anal "teeth" yellowish, bearing knobs and blunt spines at the tip. Tube feet numerous dorsally and ventrally; ventrally feet

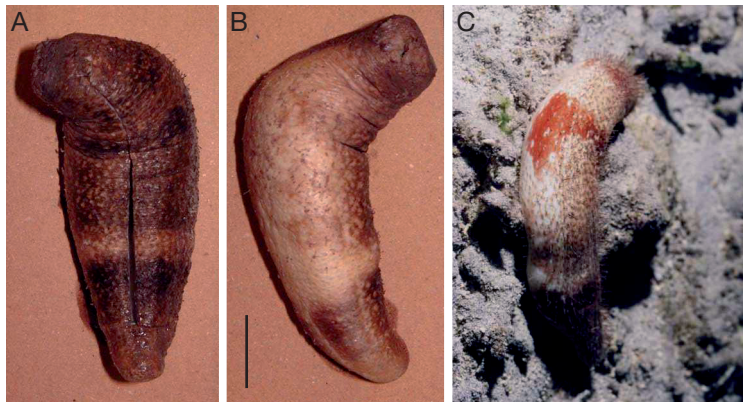

FIG. 1. — *Actinopyga capillata* n. sp.: **A**, holotype, dorsal face (photo Y. Samyn); **B**, holotype, ventral face (photo Y. Samyn); **C**, specimen from La Réunion (photo M. Rard). Scale bar: A, B, 2 cm.

stout, well developed in three broad bands along the ventral radius, dorsally scattered irregularly, very thin, long (up to 1 cm), hair-like.

Colour pattern of the type specimens: holotype (Fig. 1A, B) from La Réunion (90 mm long) dorsally with white/beige background, with one, well marked brown/orange transverse band at posterior end, and with at least two transversal bands at anterior end, ventral surface beige. Orange transverse bands prominent on a specimen photographed at La Réunion (Fig. 1C). The largest paratype from Rodrigues (120 mm long, preserved) dorsally beige/white background with at least 4, irregular, light-dark brown transverse patches, dorsal tube-feet/papillae brown (see Rowe & Richmond 2004: fig. 9), ventral colour not recorded.

Other specimens: Muller (1998) described specimens from Mauritius as being 15-20 cm long (in life) and as having "irregular pink-brown patches on a white background, papillae darkened at ends (i.e. tips), ventral side paler than dorsal side".

Erhardt & Baensch (2000: 960) recorded the Philippine specimen in their photograph as being 25 cm long, with colour showing dorsal surface predominantly brown with 1 or 2 darker, transverse bands, shading lighter to white at posterior end and around anus; small spots and patches of white occur along dorsal-lateral edge and sparsely across dorsal surface; dorsal tube-feet/papillae black.

Body wall smooth to the touch, 3.5-4.5 mm thick in contracted specimens, 1 mm thick in relaxed specimen.

Calcareous ring similar to that of other species of *Actinopyga* with radial plates twice as wide as interradial plates (Fig. 2A). Stone canal single, very short, ending in ovoid madreporic plate located close to calcareous ring (Fig. 2A). Tentacle ampullae 1/10 of body length. Longitudinal muscles double, prominent. Few branched Cuvierian tubules, of actinopygid type with irregular, knobbed surface. Gonad of fine branched tubules (1 or 2 branches/tubule). Polian vesicle not observed.

Few ossicles in body wall. Ossicles delicate, often (particularly in paratype specimens) broken in microslide preparations. Body wall ossicles, dorsally and ventrally, with smooth rosettes with rounded terminal swellings. At anterior end, dorsal body wall rosettes are 12-30 µm long (Fig. 2B); at posterior end they are somewhat smaller (14-25 µm long) and more compact (Fig. 2C); ventral body wall rosettes, similar at anterior and posterior ends, 14-35 µm long (Fig. 2D). Ventral tube feet with rods, 20-70 µm long (Fig. 2E) and an end plate, 320-730 µm across, made of several pieces. Dorsal tube feet with long rods, 60-100 µm long, straight or slightly curved with spiny extremities (Fig. 3A) and with small rods, 28-50 µm long, derived from rosettes (Fig. 3B); end plate of dorsal tube feet in one piece, 170-350 µm in diameter. Longitudinal muscles and retractor muscles of cloaca with small

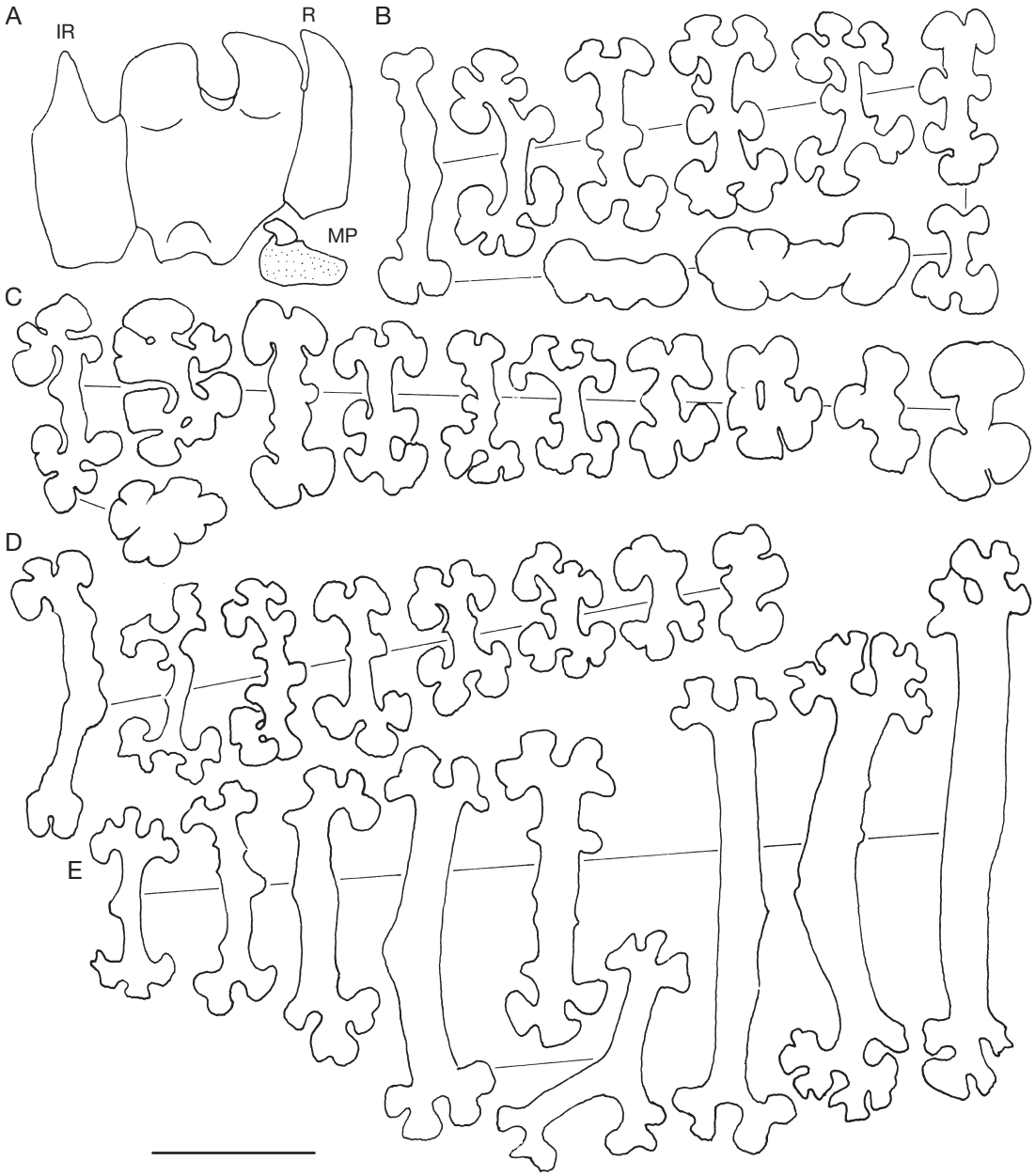

FIG. 2. — *Actinopyga capillata* n. sp., holotype: **A**, calcareous ring; **B**, rosettes of dorsal body wall (front); **C**, rosettes of dorsal body wall (rear); **D**, rosettes of ventral body wall; **E**, rods of ventral tube feet. Abbreviations: **IR**, interradial plate; **MP**, madreporic plate; **R**, radial plate. Scale bar: A, 5 mm; B-E, 20 µm.

smooth, straight rods, 12-25 µm long (Fig. 3C) and 17-50 µm long (Fig. 3D), respectively. Cloacal wall with small, smooth, straight rods, 23-50 µm long and large forked, spiny rods, 75-110 µm long (Fig. 3E, F). In holotype, small smooth rods are much more numerous than forked spiny ones; it is the reverse in

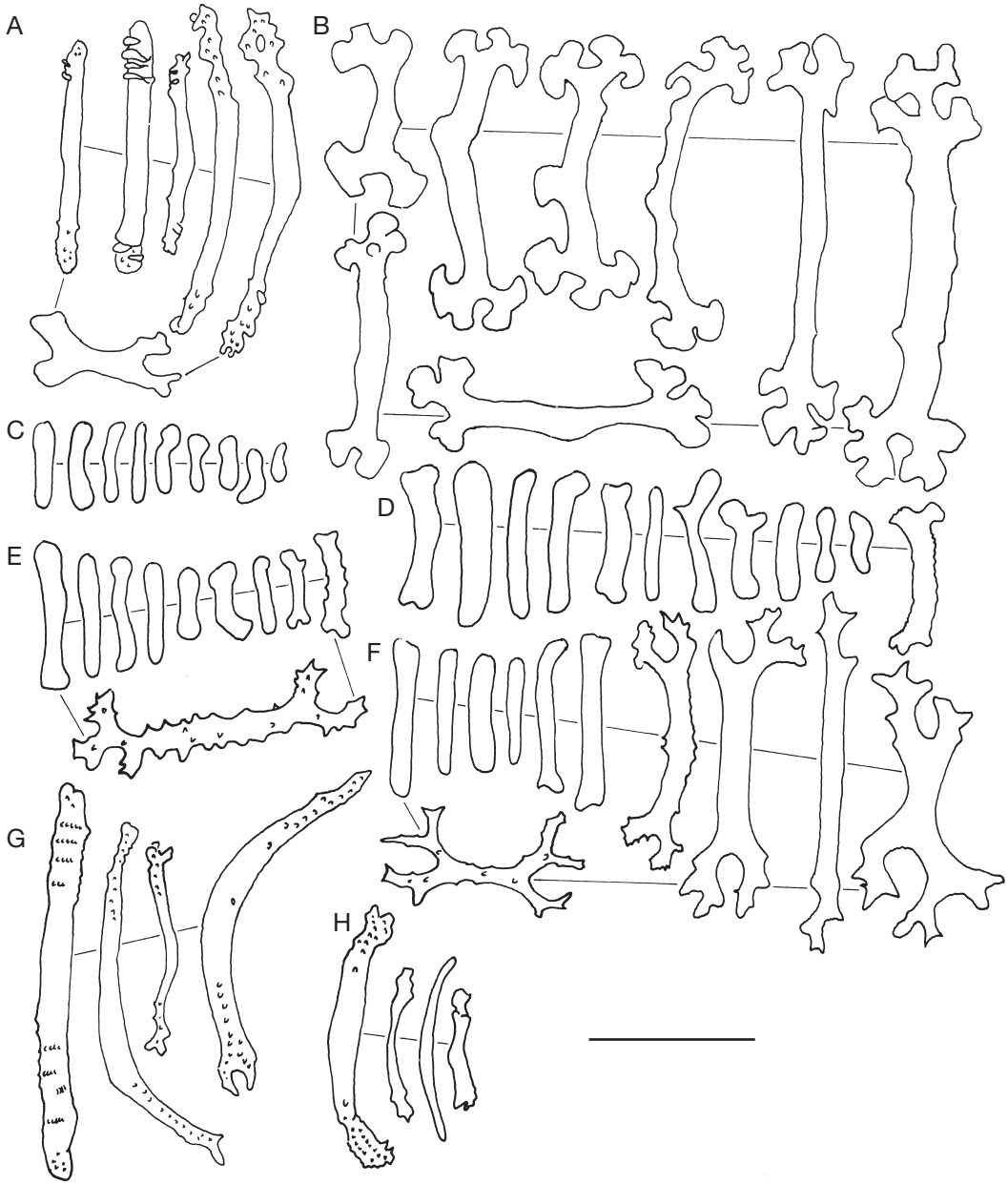

FIG. 3. — *Actinopyga capillata* n. sp.: **A-E**, **G**, **H**, holotype; **F**, paratype; **A**, **B**, rods of dorsal tube feet; **C**, rods of the longitudinal muscles; **D**, rods of the cloacal muscles; **E**, **F**, rods of the cloacal wall; **G**, **H**, rods of the tentacles. Scale bar: A, C-F, H, 50 µm; B, 20 µm; G, 100 µm.

paratype BMNH 2004.2834. Tentacles with straight or curved rods, spiny at extremities, 40-120 µm long (Fig. 3G, H).

REMARKS

Although the body wall ossicles of *Actinopyga capillata* n. sp. appear most similar to those of

A. lecanora Jaeger, 1833 and *A. agassizi* (Selenka, 1867)(e.g., see illustrations of Panning 1944: figs 15, 16, 20; Cherbonnier 1988: fig. 4; Hendler *et al.* 1995: fig. 180G-I; Massin 1996: fig. 4), as Rowe & Richmond (2004: 3299) note, the shape of the body, together with the distinctive arrangement of the elongate, modified dorsal tube feet, and the ossicle complement, all set this species apart from others in the genus *Actinopyga*. The live colour pattern is also distinctive for *A. capillata* n. sp., within the genus

Interestingly, the ossicles of *A. capillata* n. sp. are also very similar to those described and illustrated for *Bohadschia mitsioensis* Cherbonnier, 1988 from Mitsio Island, west coast of Madagascar. However, following examination of the holotype of *B. mitsioensis* it is clear that the two species cannot be considered to be congeneric for the following reasons: 1) the occurrence of "anal teeth" (these may be reduced in size or non-distinguishable in smaller specimens of *A. capillata* n. sp.) which are always absent in *Bohadschia*; 2) the presence of few, typically actinopygid, Cuvieran tubules (see Vandenspiegel & Jangoux 1992, 1993); 3) absence of *Bohadschia*-type grains in the ventral body wall (see Cherbonnier 1988: fig. 12A, B for *B. mitsioensis*); and 4) presence of ossicles in the muscles (not present in *B. mitsioensis* or other *Bohadschia* species; see Samyn & Massin 2003: 2514; Samyn *et al.* 2005: 112).

Of ecological interest is the fact that the holotype of *A. capillata* n. sp. was photographed and collected on La Réunion Island during a night dive. Muller (1998: 33, 70) who records the species (as *Bohadschia subrubra*) from "Trou d'eau douce lagoon", Mauritius, comments that it is a nocturnal species which can be present in high numbers (a night-time transect survey recorded 43 individuals). Apparently it was seen on a variety of substrates feeding on fine sediment occurring on macroalgae and dead coral (Muller 1988: 70).

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