

form with Indo-Pacific specimens of *M. peripatus*, but there were no gonad ossicles and the tentacle ossicles were significantly more irregularly branched than in *M. peripatus*. The determination is uncertain. Imaoka (1990) reported and illustrated tube foot plates and anal body wall ossicles for *P. tuberculatus* which are considered here to be not holothurian ossicles, and did not find ossicles in the gonad of the single specimen described (absence in a single specimen is not diagnostically reliable). The globigerine-covered grey translucent body with distinctive serrated margin, distribution of tube feet, form of gonad tubules and colour photo of the holotype are diagnostically identical with *M. peripatus*.

Mitsukuri (1912) conducted a detailed study of the holothurians of the Sagami Sea, and reported *Meseres hyalegerus* (as *P. trachus*) up to depths of 564 m and probably did not sample depths at which *M. peripatus* occurs. *M. peripatus* is reported off southern Japan at 1058–1680 m by Ohshima (1915, as *P. unguiculatus*) and at 660–700 m by Imaoka (1990, as *P. tuberculatus*). *M. peripatus* is a deep bathyal to upper abyssal cosmopolitan species.

***Meseres propinquus* (Fisher)**
comb. nov.

Pseudostichopus propinquus Fisher, 1907: 691–693, pl. 71 fig. 3, pl. 72 fig. 2, pl. 73 fig. 3, pl. 74 fig. 1, pl. 76 fig. 3.—Imaoka, 1978: 382.—Rowe (in Rowe and Gates, 1995): 285.

Pseudostichopus (Trachostichopus) propinquus.—Heding, 1940: 357.—Imaoka, 1978: tbl. 1–1.—Imaoka, 1990: 148, 152.

Material examined. Holotype. Hawaiian Is, 21°11'N, 156°35'W, 518–519 m [USNM 21217].

Remarks. The holotype is in a very poor state of preservation. Based on the description and illustrations by Fisher (1907), this species has the characteristics of *Meseres* including a thin translucent body wall, acute lateroventral margin with mammiform tubercles, small radial tube feet, scattered very small thread-like appendages, and body cover of sponge spicules and foraminiferans. A unique diagnostic character is the presence of ossicles in both gonads and respiratory trees. Rowe (in Rowe and Gates, 1995) synonymised *P. propinquus* with *Pseudostichopus pustulosus* Sluiter, 1901. *P. pustulosus* lacks respiratory tree and gonad ossicles, and has multiple-branching gonad tubules (Sluiter, 1901a), and the synonymy is rejected here.

***Meseres spiculiferus* sp. nov.**

Figures 1a–f, 2a–d

Pseudostichopus sp. MoV 2068.—O'Loughlin et al., 1994: 253–255.

Material examined. Holotype. Prydz Bay, 67°10'S, 74°28'E, 428 m, T. Bardsley, R. Ickeringill and C. Hayward, 6 Mar 1997, NMV F81857.

Paratypes (8). Prydz Bay, 66°46'–67°34'S, 70°42'–77°32'E, 298–540 m, 1991, 1997, NMV F68054 (1), F68156 (1), F72542 (1), F81805 (4), F81806 (1).

Other material. Eastern Antarctica, off Wilkes Land, 65°07'S, 107°29'E, 695 m, 1931 [BANZARE Stn 98, SAM K1853 (1)]; Prydz Bay, 66°48'S, 71°24'E, 456 m, 1929 [BANZARE Stn 30, SAM K1851 (2)]; off Mac-Robertson Land, 66°45'S, 62°03'E, 177 m, 1931 [BANZARE Stn 107, SAM K1852 (7)]; off Enderby Land, 65°48'S, 53°16'E, 193 m, 1930 [BANZARE Stn 41, SAM K1850 (1)]; Prydz Bay, Vincennes Bay, 65°33'–68°32'S, 70°20'–108°48'E, 290–600 m [ANARE, NMV F68153 (2), F68163 (1), F76598 (1), F81807 (4), F81813–81815 (3), F81824 (1), F81838–81840 (6), F81860 (1), F81862 (1), F82701 (1), F90071 (1)].

Description. Up to 105 mm long, 27 mm broad, 21 mm high; body wall soft, off-white; body normally covered with sponge spicules, sometimes globigerines; body flat ventrally, domed dorsally, rounded anteriorly and posteriorly, posterior pygal vertical furrow; mouth, anus ventral; lateroventral margin semi-acute, rounded, some reticulate ridges with very small digitate projections, lacking prominent ventrolateral projections; up to 20 reddish-brown tentacles; very small thread-like appendages variably present over whole body, typically 0.2 mm diameter, prominent around mouth and furrow, frequently entangled; small radial tube feet, up to 1.0 mm diameter, largest along lateroventral margin in band up to 5 very irregular rows wide continuous around anterior body, irregular double rows dorsolaterally, sparse to absent midventrally; longitudinal muscles rounded, undivided; single ventral polian vesicle; calcareous ring plates solid, more wide than high, lacking posterior prolongations, radials frequently with 4 posterior teeth on edge of indentation; ossicles in tentacles, tube feet, gonads, absent from body wall (including posterior lobes), respiratory trees; tentacle ossicles curved to straight rods up to 0.28 mm long, frequently with central rarely distal swellings, very rarely branched, rarely bluntly spinous; tube feet distal support rods up to 0.20 mm long, same form as tentacles; “endplates” up to 0.13 mm wide, open mesh of irregular thin knobbed branched rods;

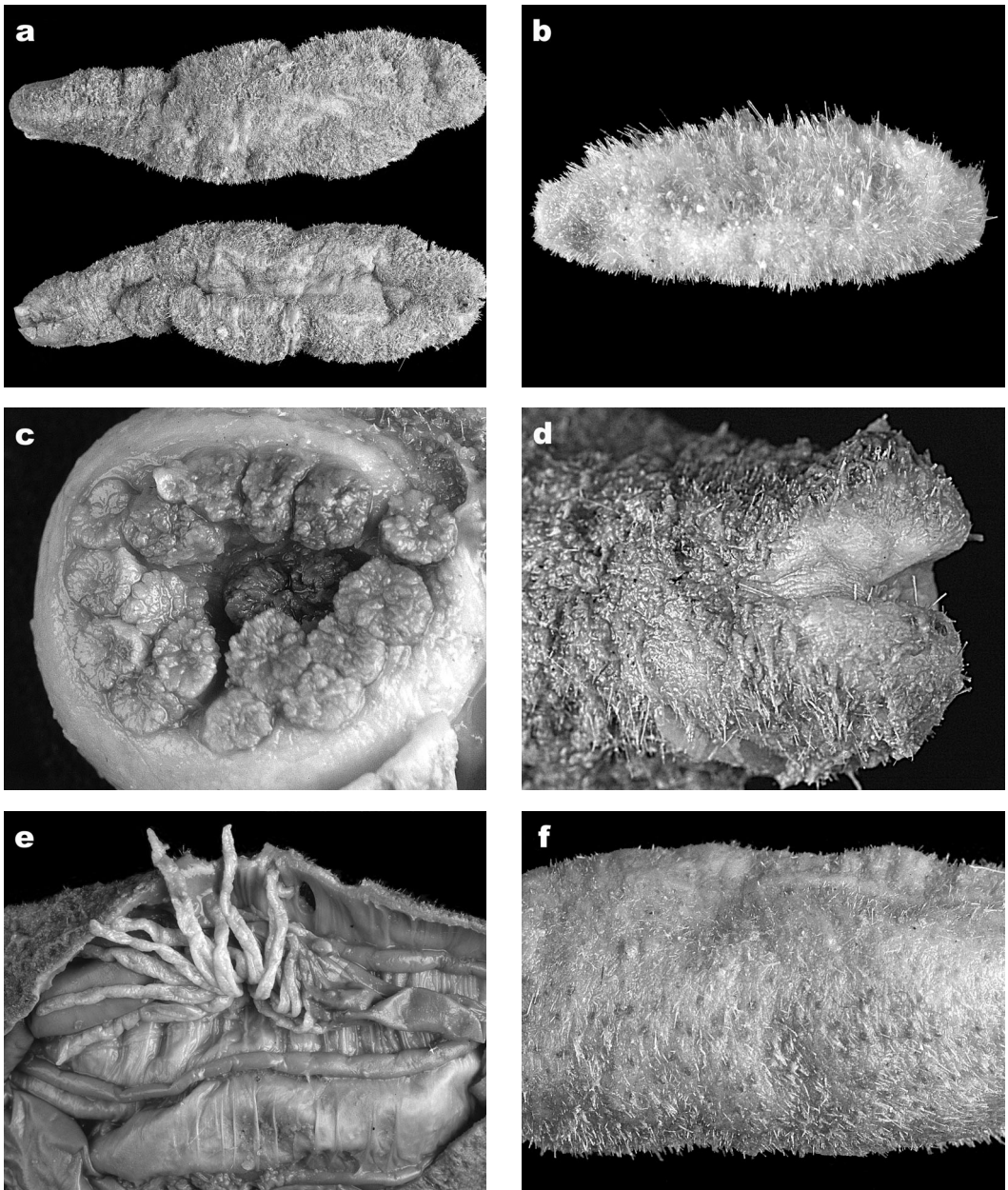


Figure 1. a–f, *Meseres spiculiferus* sp. nov. a. dorsal (above) and ventral (below) views of holotype (102 mm long); b, sponge cover, dorsal (paratype F68054, 30 mm long); c, tentacles (paratype F72542, specimen 83 mm long); d, pygal posterior furrow (paratype F81805, specimen 95 mm long); e, unbranched gonad tubules and rounded longitudinal muscles (paratype F81806, specimen 100 mm long); f, lateroventral tube feet (paratype F68156, specimen 54 mm long).

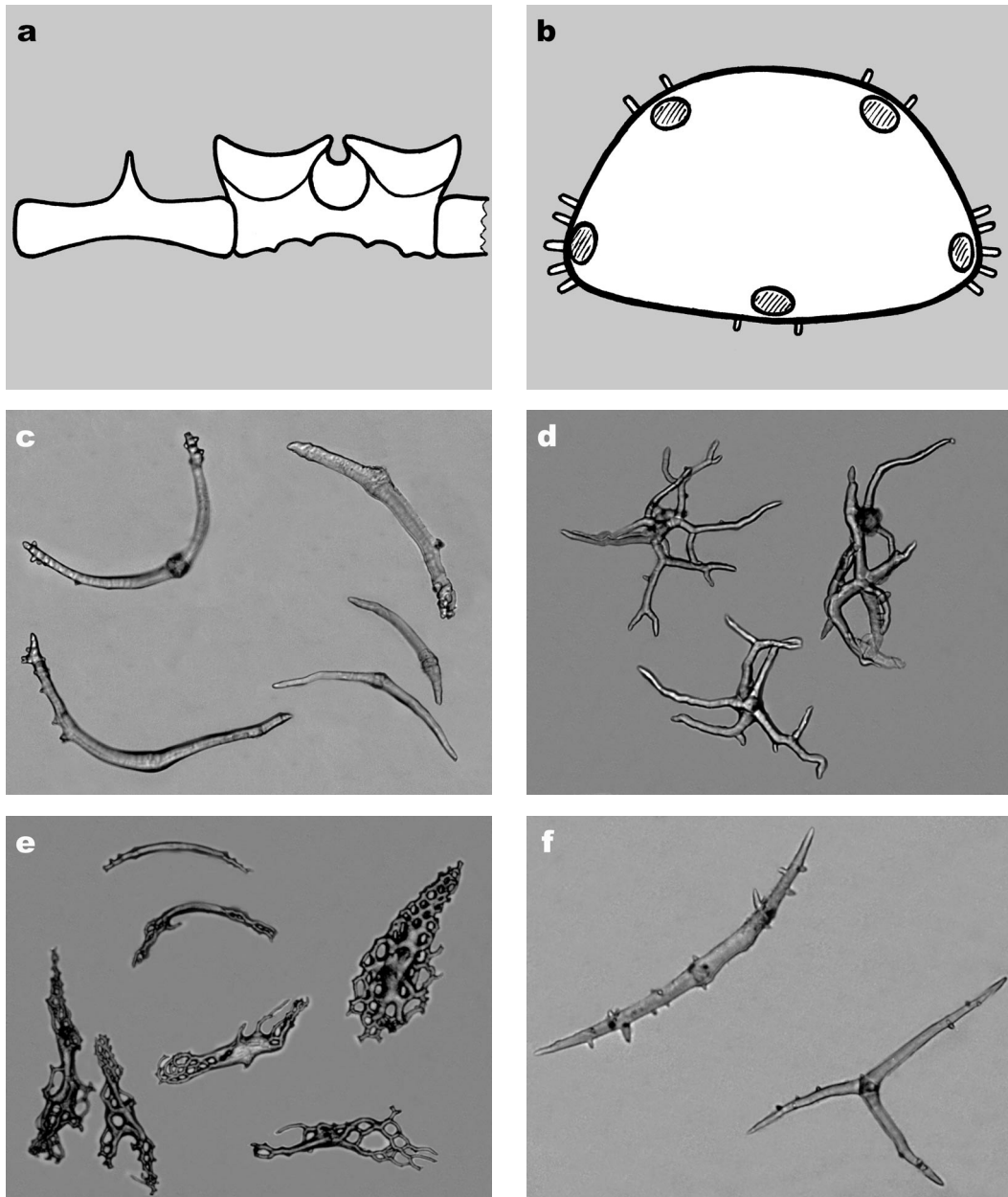


Figure 2. a–d, *Meseres spiculiferus* sp. nov. a, radial (right) and interradial (left) plates of calcareous ring; b, midbody section with tube feet distribution; c, tentacle ossicles (largest 0.22 mm across; BANZARE specimens); d, gonad ossicles (0.16 mm across; paratype F81806), e, *Meseres involutus* Sluiter. Tentacle ossicles (longest 0.30 mm long; F80451) f, *Meseres peripatus* Sluiter. Gonad ossicles (longest 0.20 mm long; F80450).

gonad tubules with abundant very irregular ossicles, frequently with large central swellings, rod to X- to Y-shaped to complex branching, branches sometimes joined to create large perforations, up to 0.30 mm long.

Etymology. From *spiculum* (Latin, sharp point) referring to sponge spicules, and *ferre* (Latin, to bear), describing the attached body cover of sponge spicules.

Distribution. Eastern Antarctica, off Wilkes, MacRobertson, Enderby Lands, 177–695 m.

Remarks. The distinguishing diagnostic characters of *M. spiculiferus* are very irregular ossicles in unbranched gonad tubules, absence of conspicuous lateroventral body wall projections, and narrow rounded and undivided longitudinal muscles. *Pseudostichopus atlanticus* Perrier, 1898 has similar gonad ossicles, but gonad tubules are branched and longitudinal muscles broad and flat. *M. peripatus* has gonad ossicles which overlap in form but are smaller (up to 0.18 mm long), and less branched; has smaller tube foot support rods (up to 0.14 mm long); and has prominent lateroventral marginal projections.

In the light of a general circumpolar occurrence of Antarctic holothurian species, and inadequate diagnostic detail recorded, material reported from western Antarctica as *Pseudostichopus mollis* Théel and *P. villosus* Théel was possibly *M. spiculiferus*. Gutt (1991a) reported that "sponge spicules adhere to the body wall of *Pseudostichopus villosus* giving it a furry appearance". This is not true of *M. villosus* in eastern Antarctica, and the description accurately fits *M. spiculiferus*.

***Meseres torvus* (Théel) comb. nov.**

Stichopus (?) *torvus* Théel, 1886a: 164–165, pl. 10 figs 2–4.—Ludwig, 1894: 34.

Type locality. Southern Pacific Ocean, off Chile, 33°42'S, 78°18'W, 2516 m.

Remarks. This species is known from a single damaged specimen. Théel (1886a) described a wrinkled body covered with foreign matter, lateroventral conical projections, 20 tentacles, small crowded tube feet, solid calcareous ring lacking posterior prolongations, and absence of body wall ossicles. All are features of *Meseres*, to which *S. torvus* is assigned here. Gonad tubules were branched, and longitudinal muscles not divided. Reference was not made to ossicles in gonad tubules or respiratory trees or perianally, or to a pygal furrow which is presumed here to have

been obscured by damage or the cover of foreign matter. Data are insufficient to confirm any synonymy.

***Meseres trachus* (Sluiter)**

Pseudostichopus trachus Sluiter, 1901a: 15–16.—Sluiter, 1901b: 52–53, pl. 5 fig. 1, pl. 8 fig. 8.—Perrier, 1902: 337–338.—Fisher, 1907: 693.—Savel'eva, 1941: 74.—Djakonov, 1952: 127, 129.—Baranova, 1957: 239.—Djakonov et al., 1958: 366.—Imaoka, 1978: 384.—Cherbonnier and Féral, 1981: 383, 385, fig. 16.

Pseudostichopus (Trachostichopus) trachus.—Heding, 1940: 353–362, fig. 17.—Imaoka, 1978: tbl. 1–2.—Thandar, 1992: 166.

Meseres trachus.—Rowe (in Rowe and Gates, 1995): 285.—O'Loughlin, 1998: 497.

Material examined. Syntype. Indonesia, Arafura Sea, 8°50'S, 127°02'E, 883 m, *Siboga* Stn 286 [ZMA 2496.1 (1)].

Other material. Eastern Australia, Tasman Sea, 882–1198 m [AM J16836 (1), J23220 (1), J22957 (1), J22972 (1), J23218 (1); NMV F80175 (1), F80176 (1), F80448 (1)].

Distribution. Indo-Pacific, Indonesia, Arafura Sea, 798–883 m (Sluiter, 1901a); Philippines, 14°N, 120°E, 448–1125 m (Cherbonnier and Féral, 1981); Sea of Japan, 1600 m (Savel'eva, 1941); off Kuril Is, 113–560 m (Djakonov et al., 1958); Bering Sea, 110 m (Baranova, 1957); eastern Africa, off Kenya, 638–977 m (Heding, 1940); eastern Australia, Tasman Sea, 882–1198 m (this paper).

Remarks. Rowe (in Rowe and Gates, 1995) re-assigned *P. trachus* to *Meseres*. Based particularly on the presence of a series of small but distinct lateroventral projections on a subacute ventrolateral margin, which were noted by Sluiter (1901b) and observed here on the type, the re-assignment is supported here. Diagnostic characters for *M. trachus* are discussed under *M. hyalegerus* above. There is an absence of reference to other *Meseres* species, such as *M. hyalegerus*, and insufficient diagnostic data in the reports of *P. trachus* by Heding (1940), Savel'eva (1941), Baranova (1957), Djakonov et al. (1958) and Cherbonnier and Féral (1981), to confirm their determinations. Depths as shallow as 110 m (Baranova, 1957) and 113 m (Djakonov et al., 1958), complete sponge spicule cover (Savel'eva, 1941), and specimens up to 300 mm long (Djakonov et al., 1958), raise doubts about the determinations. Mitsukuri (1912) and Ohshima (1915) reported *P. trachus* for Japan, but their material is considered above to be *M. hyalegerus*.