

Only a few perforated plates are found in the tegument around the anus, they are about $55\ \mu$ in length and provided with 6 fenestra at the maximum, although these ossicles might be slightly injured (Fig. 2, B). The ossicles of the tentacles are found always paired when present, but wholly missing in some tentacles. Two kinds of them are distinguishable, the one (Fig. 2, C) is a simple rod with a few to several knobs, while the other (Fig. 2, D) is more or less forked at each end and further may be furnished in other parts with some minute projections; they are about $180\text{--}220\ \mu$ in length, $200\ \mu$ on an average.

The calcareous ring (Fig. 2, E) is rather narrow. The radial piece is provided on the anterior margin with a pair of smaller median dents and two large lateral ones, and slightly and gently concave on the posterior margin. The interradial piece is a little narrower than the radial piece, provided with only a prominent median dent and concave more deeply in the posterior. A single Polian vesicle is present, about 2 mm long and roughly club-shaped with the distal end slightly swollen, and issued from the left ventral part of the ring canal. As far as the present specimens were concerned, no madreporic canal was detected. Two respiratory trees issued from a common base are extending anteriorly to the middle of the body and quite free from the plexus of pseudo-haemal vessels. Two unbranched genital tubes are present, one on each side of the dorsal mesentery. The gonads are mature in the holotype. The longitudinal muscles form single bands.

Remarks: The calcareous ring of this new species resembles somewhat one of *P. propinquus* Fisher, though in high the radial piece is much higher in this species than in the present new species. Further, the present new species is devoid of any ossicles in the ambulacral appendages and the genital tubes. In addition, the plates from the anal region and the rods from the tentacles of the present new species differ distinctly from those of any known species, that have the anal calcareous deposits, in their simplicity.

Pseudostichopus (Trachostichopus) japonensis n. sp.

Japanese name: Mukade-waraji

(Fig. 3, A)

Holotype: 35 mm male; locality the Japan Sea off the coast of Akita Prefecture, 200–300 m deep, collected by Dr. S. Nishimura in 1972–73; deposited at the Seto Marine Biological Laboratory, SMBL Type-313.

Paratypes: Four other specimens; 25, 34, 36 and 37 mm long respectively, collected and deposited the same as the holotype, SMBL Type-314.

As these five specimens had been preserved in alcohol, the condition was rather good, though the external appearances were somewhat changed. The largest specimen is about 37 mm in length. The mouth is situated ventrally near the anterior end of the body. The anus is open at the bottom of the shallow vertical furrow. The original appearance of the anal margin could not be confirmed as the margin had

been more or less injured. The tentacles are entirely retracted, 20 in all and nearly the same in size; they are coloured grayish. Each tentacle is seemingly of the shape generally seen in the genus, more or less shield-shaped; no free tentacular ampulla is found.

The body surface except the tentacles is encrusted densely with spicules of glass sponges, especially with mud and shell fragments. The tegument is reddish gray in alcohol. It is generally less than 1 mm in thickness, and of a moderate hardness. Any kind of ridge or swelling is not formed on the body surface. The ambulacral appendages are very minute, about 1 mm long and 0.2 mm broad, and wholly indiscernible along the mid-ventral ambulacrum. The appendages are arranged in double rows along the dorsal ambulacra and the ventro-lateral ones. They are 21 and 23 along the inner and outer rows of right, similarly 22 and 25 in left dorsal ambulacrum respectively. They are 102 and 89 respectively along upper and lower rows

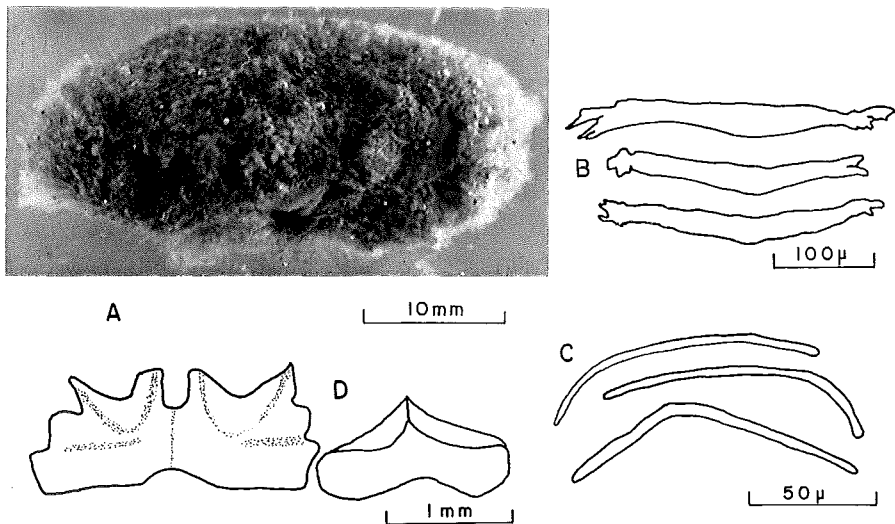


Fig. 3. *Pseudostichopus* (*Trachostichopus*) *japonensis* n. sp. A: Dorsal view. B: Rods from a tentacle. C: Rods from an appendage. D: Calcareous ring.

in right, similarly 106 and 90 in left ventro-lateral ambulacrum, they are larger than the dorsal ambulacral ones in size. The interambulacral appendages exist only as in the surroundings of the ventro-lateral ambulacra; they are nearly as large as the ventro-lateral ambulacral appendages. Differentiation into the pedicels and papillae could not be confirmed in the present specimens; all the appendages are of a simple appearance, without any kind of terminal structure.

The ossicles are confined to the tentacles, appendages, ventral tegument and around the anus. The ossicles of the tentacles (Fig. 3, B) are rather thick and nearly straight, showing faintly a sign of bifucation and furnished with some minute papillae around each end; they are about 200–400 μ in length, 300 μ on an average. While the rods (Fig. 3, C) found in the extremities of the dorsal appendages are thin, well

bent, and about 90–130 μ in length, 110 μ on an average. Furthermore, the rods found in the ventral tegument and around the anus are short, thick, and about 42–146 μ , 63 μ in length on an average.

The calcareous ring (Fig. 3, D) is of a moderate breadth. The radial piece is provided on the anterior margin with a pair of median stouter dents and two lateral weaker ones, and slightly concave around the middle of the posterior margin. The interradial piece is a little narrower than the radial, provided with only a prominent median dent and the posterior margin is concave slightly and gently. A single Polian vesicle is present; it is issued from the left ventral part of the ring canal. As far as the present specimens were dissected, no madreporic canal was detected. Two respiratory trees issued from a common base reach the anterior two-thirds of the body length, quite free from the plexus of pseudo-haemal vessels. Two unbranched genital tubes are present, one on each side of the dorsal mesentery. The gonads are mature. The longitudinal muscles form single bands.

Remarks: The existence of the ossicles in the extremities of the appendages of this new species may remind us them of *P. nudus* Ohshima, *P. unguiculatus* Ohshima, *P. molpadioides* Ohshima and *P. dilatorbis* n. sp., however, the present new species differs from *P. nudus*, *P. unguiculatus* and *P. molpadioides* in the shape of the calcareous ring and the rods of the appendages and tentacles, and from *P. dilatorbis* in the appearance of the genital tubes (unbranched in the former), the distribution of the appendages and the absence of the ossicles in the tentacles in the former. In the shape of the calcareous ring, this new species resembles somewhat *P. trachus* Sluiter described by Mitsukuri (1912) and Ohshima (1915, 1917). However, the real status of the specimens treated by these two authors seems rather questionable, present new species and those specimens may better be reserved till the further detailed check on them is finished.

This new species might be included among the subgenus *Pseudostichopus* as the ventro-lateral and other appendages are differentiated in size. However, the new species is furnished with the ossicles in the ventral tegument and around the anus, and this is evidently a very important character of the subgenus *Trachostichopus*, therefore, I want to treat here this new species under *Trachostichopus* provisionally.

The comparison between the present three new species and thirteen already known species which have been included by Heding (1940) in the genus *Pseudostichopus* is attempted as follows, as shown in next table.

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