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Redescription of *Psolus tessellatus* Koehler, 1896 (Echinodermata, Holothuroidea) with neotype designation

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Abstract. In the bycatch of a scientific campaign in the Bay of Biscay (VITAL 2002) a third specimen of *Psolus tessellatus* Koehler, 1896 was collected very close to the type locality. This specimen is here fully illustrated and designated as the neotype.

Key words. Psolidae, Bay of Biscay, redescription, first illustration, neotype.

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Introduction

In 1895, the University of Lyon organized a campaign on board of the "Caudan" in the Bay of Biscay. During that expedition, material was collected between 110 and 1.710 m depth (Koehler 1896). Four new holothurian species were described and housed in the collections of the University of Lyon: *Holothuria roulei* Koehler, 1896 (= *Mesothuria roulei* (Koehler, 1896)), *Paroriza pallens* Koehler, 1896 (= *Stichopus pallens* (Koehler, 1896)), *Benthogone rosea* Koehler, 1896 and *Psolus tessellatus* Koehler, 1896. In 1985, Jangoux revisited the types in the collections of Lyon and only found the type material of *Holothuria roulei* and *Benthogone rosea*. The type material of *Paroriza pallens* and *Psolus tessellatus* was missing and must be considered as lost. Moreover, *P. tessellatus* was not illustrated by Koehler (1896).

A second catch of *P. tessellatus* was mentioned between the Azores and Madeira at 1.100 m depth by Fiege & Janssen (1998), who first illustrated the species.

In 2002, IFREMER Nantes organized a campaign (VITAL) in the Bay of Biscay for the evaluation of fish populations. In the bycatch of trawled material one specimen of *Psolus tessellatus* was collected. It is the object of the present note.

Material and methods

The specimen of *Psolus tessellatus* was collected at Station 14 of the VITAL campaign (47°36' N – 8°25' W, 1399-1442 m, collecting date 23 Aug. 2002). It was fixed on a small stone (40 x 44 x 50 mm) and housed in the collection of the RBINS under the catalogue number IG31016-HOL 1304.

Abbreviations

BIOGAS = BIOlogie golf GAScogne
IFREMER = Institut Français de Recherche pour l'Exploitation de la Mer.
RBINS = Royal Belgian Institute of Natural Sciences
VITAL = VIctor rove TALus continental

Results

Phylum Echinodermata Brugière, 1791
Order Denrochirotida Grube, 1840
Family Psolidae Forbes, 1841
Genus *Psolus* Oken, 1815

Psolus tessellatus Koehler, 1896
Figs 1A-D, 2A-G

Psolus tessellatus Koehler, 1896: 119.

Psolus tessellatus – Mortensen 1927: 414. — Fiege & Janssen 1998: 341, figs 2-3.
Psolus tesselatus – Costelloe *et al*. 2001: 348.

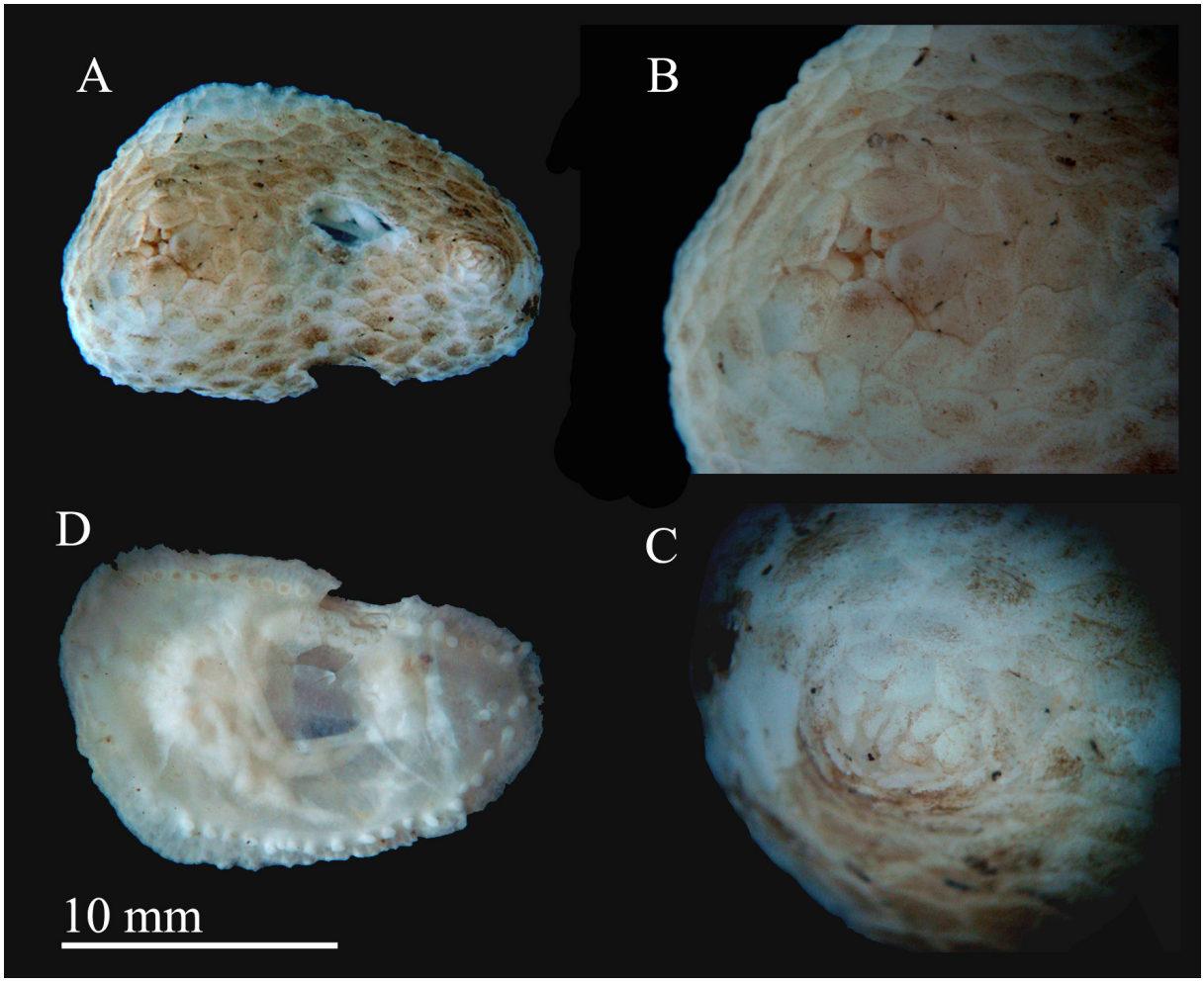

Fig. 1. *Psolus tessellatus* Koehler, 1896. **A**. Dorsal view. **B**. Buccal cone. **C**. Anal cone. **D**. Ventral view.

Redescription

Small oval specimen, 17.4 mm long, 10.6 mm broad and 2.4 mm thick (Fig. 1A). Dorsal body wall covered by large scales (from 850 x 550 to 1350 x 1100 µm) (Figs 1A-C, 2A). The scale consists of one layer at the edge but rapidly becomes multilayered when going to the centre (Fig. 2B). No tube

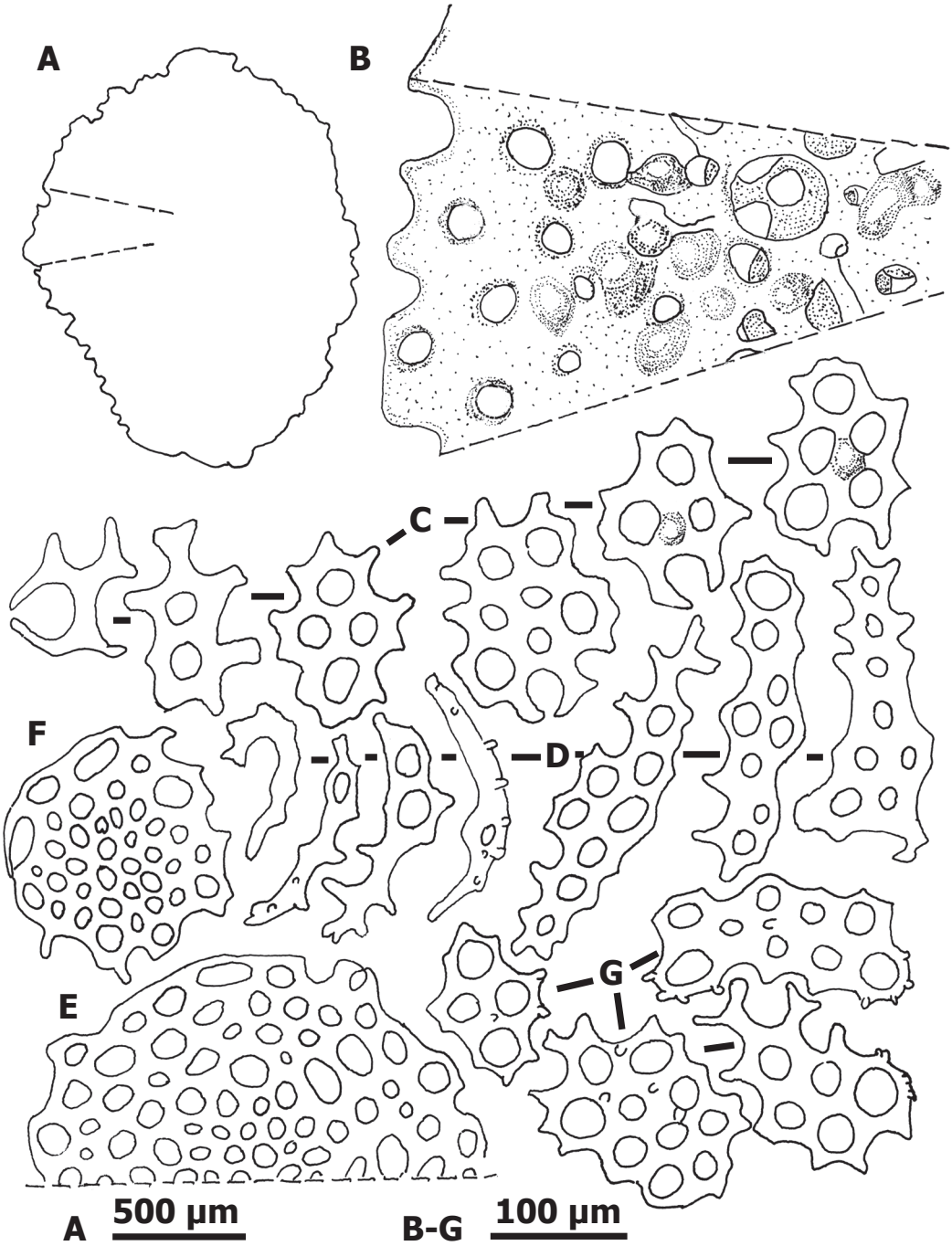

Fig. 2. *Psolus tessellatus* Koehler, 1896. **A**. Dorsal scale. **B**. Detail of dorsal scale. **C**. Plates of ventral sole. **D**. Rods of large tube feet. **E**. End plate of large tube feet. **F**. End plate of small tube feet. **G**. Perforated plates at the base of the large tube feet.

feet dorsally. Ten scales between mouth and anus. Anus surrounded by irregular small plates (Fig. 1C). Mouth surrounded by 10 scales: five large triangular scales alternating with 5 small, elongated scales (Fig. 1A, B). Tentacles fully retracted, not observed.

Ventral sole very thin, translucent, calcareous ring and digestive tract visible by transparency (Fig. 1D). Ossicles as perforated plates, 100-160 µm long with 1-8 holes (Fig. 2C). Ventral sole with 2 rows of tube feet at the edge (Fig. 1D). Inner row of tube feet large, with perforated rods, 125-280 µm long (Fig. 2D) and large end plate in one piece (more or less 300 µm across) (Fig. 2F). External row with very small tube feet with small end plates made of one piece (more or less 100 µm across) (Fig. 2E). At the base of the large tube feet, perforated plates, 100-170 µm long, similar to those of the ventral sole, sometimes knobbed (Fig. 2G). No mid ventral tube feet except 1-2 at the rear (Fig. 1D).

Discussion

The specimen at hand belongs without any doubt to the genus *Psolus:* thick dorsal surface covered by scales, thin ventral sole, tube feet restricted to the ventral sole. Only 7 *Psolus* species are known from the Northeast Atlantic Ocean, viz *P. fabricii* (Duben & Koren, 1846), *P. hypsinosus* Heding, 1942*, P. nummularis* R. Perrier, 1899*, P. phantapus* (Strussenfeld, 1767), *P. pourtalesi* Théel, 1886*, P. squamatus* (Müller, 1776), and *P. tessellatus* Koehler, 1896.

P. tessellatus is readily separated from the other mentioned species by the valves surrounding the mouth: 5 large triangular ones alternating with 5 narrow ones. It is also the only *Psolus* species mentioned here with 10 scales present between mouth and anus. For *P. hypsinosus* and *P. fabricii* (see Heding 1942) there are only 5-7 scales between mouth and anus, whereas for *P. pourtalesi*, *P. squamatus* and *P. nummularis* (see Théel 1886; Deichmann 1930; Madsen & Hansen 1994; Perrier 1902) there are over 15. *P. tessellatus* is also the only *Psolus* species present in the Bay of Biscay.

The species seems to have a very restricted distribution and bathymetry in the Bay of Biscay: 45°47' N – 6°15' W and 1.700 m for the holotype, and 47°36' N – 8°25'W and 1.400 m for the present specimen. In deeper water (1900-4800 m) holothurians are abundant (34 species, Sibuet 1977) but *P. tessellatus* was not mentioned in spite of intensive sampling by IFREMER Brest (BIOGAS, Sibuet 1977; Sibuet & Segonzac 1985). IFREMER Nantes has intensively sampled at depths of 0-500 m with a few samples at 1000 m (J. Martin, personal communication; Sea Cruises Inventory 2012), but no *P. tessellatus* were collected.

The rarity of *P. tessellatus* could be an artefact linked to the low intensity of sampling between 1.000 and 1.700 m, a zone obviously favourable to the species (Fiege & Janssen 1998).

Since the holotype is lost and Koehler (1896) did not give any illustrations of the holotype (general aspect and ossicles) and since the specimen studied here was collected very close to the type locality, it is here designated as the neotype of *P. tessellatus* (see International Code of Zoological Nomenclature, articles 75, 75.3.4, 75.3.6.).

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