

First record of a Psolidae (Holothuroidea, Echinodermata) in the Mediterranean Sea (Sicilian Channel)

by Claude MASSIN

Abstract

Psolidium complanatum is mentioned for the first time from the Mediterranean Sea. It is also the first record of a Psolidae in this sea.

Key-words: Echinodermata, Holothuroidea, Psolidae, first record, Mediterranean Sea.

Résumé

Psolidium complanatum est mentionné comme espèce nouvelle pour la faune de Méditerranée. C'est aussi la première fois qu'un Psolidae est signalé dans cette mer.

Mots-clés: Echinodermata, Holothuroidea, Psolidae, première mention, Méditerranée.

Introduction

The holothurian fauna of the Mediterranean Sea is fairly well known and many faunistic lists have already been published (CHERBONNIER, 1956; TORTONESE, 1965, 1980; PEREZ-RUZAFÀ & LOPEZ-IBOR, 1988). Recent dredgings on the continental slope (200-2000 m) have brought new species for the Mediterranean fauna or new bathymetrical distributions of known species (ALVA, 1991; MASSIN, in press). Dendrochirote holothurians are represented by many species. However, not a single Psolidae has been mentioned up to now.

During the expedition CS96 of R/V *Urania* (chief scientist M. TAVIANI) in the Sicilian Channel (27-12-96 to 09-01-97) within the frame of the I.G.M.-C.N.R. project on deep-sea carbonate sedimentation, four small Psolidae have been collected between 274 and 786 m depth from hard substrate, such as fossil lithified sponges and fossil oyster shells. H. ZIBROWIUS sorted the material on board and sent it to me for identification. It is the object of the present note.

Results

O. Dendrochirotida GRUBE, 1840

F. Psolidae R. PERRIER, 1902

G. *Psolidium* LUDWIG, 1886

Psolidium complanatum CHERBONNIER, 1969

Fig. 1A-B, Fig. 2A-F, Fig. 3A-D

Psolidium complanatum CHERBONNIER, 1969: 355, fig. 4A-R;
CHERBONNIER, 1970: 1268-1271.

MATERIAL EXAMINED

CS96-St.143 (30-12-96, 36°50'28"N-13°10'11"E, 786-274, dredge) one specimen; CS96-St.158 (31-12-96, 36°29'48"N-12°57'41"E, 397-375, dredge) two specimens; CS96-Sta.229 (04-01-97, 36°51'50"N-13°08'24"E, 768-403, dredge) one specimen. The specimens from station 158 are held in the Muséum National d'Histoire Naturelle (MNHN), Paris (France), the specimen of station 143 is held in the Zoological Museum of the University of Bologna (ZMB), Bologna (Italy) and the specimen of station 229 is held in the Royal Belgian Institute of Natural Sciences (IRSNB), Brussels (Belgium).

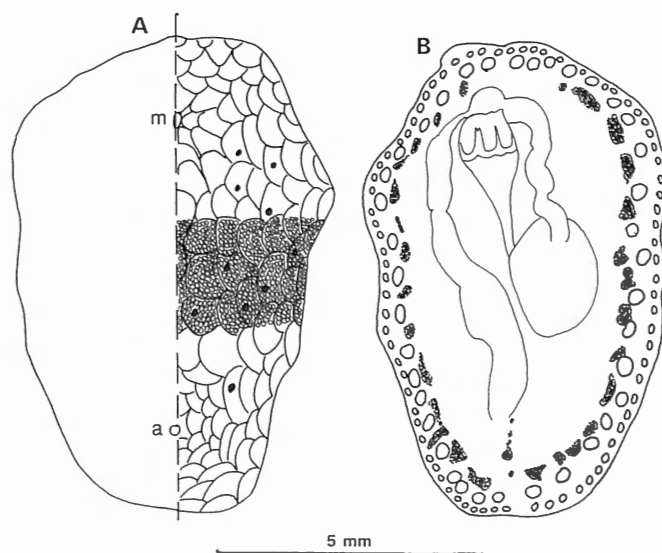


Fig. 1. – *Psolidium complanatum*. General view. A: dorsal; B: ventral. a: anus; m: mouth.

Type material: Holotype (MNHN, EcHh. 3447); Paratypes (MNHN, EcHh. 3431)

DESCRIPTION

Small holothurians (see table 1), very flat, with a distinct ventral sole, whitish in alcohol. The dorsal side is covered by large, overlapping scales (Fig. 1A), 500-950 μm in diameter. These scales are smaller near the edge of the body and on the buccal and anal cones. Between the two cones, there are four to five scales. The 20 to 44 dorsal podia are small and scattered. The number of dorsal podia is not related to the size of the specimens. The ventral face is translucent and the internal organs are partly visible. The midventral ambulacrum is free of podia. Both lateral ambulacra have a double row of podia (Fig. 1B). The ones of the internal row are large whereas those of the external row are small and twice as numerous as the large ones (see table 1). The number of podia increases with body length (see table 1). In between the podia of the internal row and posteriorly along the midventral ambulacrum there are brown spots of pigment (Fig. 1B). Their number and size vary greatly from one specimen to another. Tentacles are digitiform.

The calcareous ring is made of ten pieces without posterior projections (Fig. 2A). Radial and interradial pieces are of the same width and height. The anterior tooth of the radial pieces is bifurcated at the apex and is larger than the one of the interradial pieces (Fig. 2A). The gonad is made of several large white tubes.

The ossicles of the ventral sole are numerous but well separated from each other. They are perforated plates with 4 to 8 holes, exceptionnally 12 (Fig. 2B), 55-100 μm in diameter. Most of the plates have blunt spines. The ventral podia end by a terminal plate (Fig. 2C), 150 μm in diameter. The wall of the podia is sustained by elongated perforated plates (Fig. 2D), 75-210 μm long, sometime knobbed.

Dorsally, there are scales with their edge made of one layer perforated by small holes (Fig. 2E). Towards the center, the number of layers increases and the center of the scale looks like knobbed (Fig. 2E). Together with

the large scales small nodular buttons can be observed (Fig. 2F). They are very rare and can be easily overlooked. The dorsal podia have only small arched perforated plates (Fig. 3A) and nodular cups (Fig. 3B). In the introvert, there are large knobbed perforated plates (Fig. 3C), 100-180 μm long. In the tentacles, there are curved rods, perforated at the extremities and with two, sometimes three, central perforated apophyses (Fig. 3D).

BATHYMETRICAL RANGE: 274-1045 m.

DISTRIBUTION: Coast of Spain (Galicia) and Sicilian Channel.

ECOLOGY: *Psolidium complanatum* is always associated with rocky bottom or soft bottom containing large amount of pebbles and stones on which it is adhering by the ventral sole.

REMARKS: This is the first record of a Psolidae in the Mediterranean Sea. Psolidae are not very abundant in the temperate part of the East Atlantic Ocean. Only three species are known from the north coast of Spain, the Bay of Biscaye, Madeira Islands, Canary Islands and the coast of Morocco, viz. *Psolus nummularis* R. PERRIER, 1902, *Psolidium arcuatum* HEROUARD, 1912 and *Psolidium complanatum* CHERBONNIER, 1969.

The Mediterranean specimens of *P. complanatum* are similar to the Atlantic ones with minor variations. The Mediterranean specimens are characterized by the presence of small knobbed plates dorsally, by the presence of perforations at the apex of the apophyses of the tentacular rods, by the cups of the dorsal podia being knobbed instead of smooth and by the ventral pigment in between the podia. Those variations are less important than the variations which occur between the holotype and paratypes (at the level of the tentacular rods for example).

No intermediary populations are known, up to now, between the Atlantic coast of Spain and the Straits of Sicilia. A direct gene flow between both populations is unlikely because of the brief planktonic stage of most

Table 1. Measures and observation on *Psolidium complanatum*. Diam: diameter; DP: dorsal podia; DS: dorsal scale; DS M-A: number of scales between mouth and anus cones; H: height; L: left ventral row; LP: large podia; Lt: length; Nbr: number; Pig: pigmentation; R: right ventral row; SP: small podia; Sta: station; W: width.

Lt mm	W mm	H mm	Nbr.LP R-L	Nbr.SP R-L	Nbr. DP	DS M-A	Diam. DS μm	Pig.	Sta.
6.8	4.8	1.1	12-12	24-25	24	4	550-850	++	158
7.1	4.2	1.2	16-16	32-30	34	5	500-800	±	229
7.5	5.6	1.2	17-16	33-31	44	5	650-900	+	143
8.9	6.1	1.7	19-19	40-38	20	5	600-950	++	158

Psolidae (numerous species are brooding) and of the slow current (15-20 cm/s, BECKERS et al., 1997) entering the Mediterranean Sea through the Straits of Gibraltar and heading towards Sicily along the northern coast of Africa. This means that intermediate populations most probably occur between Spain and the Straits of Sicily but these are still to be discovered.

The presence of an East Atlantic (coasts of Spain, Portugal, Morocco, Canary Islands and Madeira) Psolidae in the Mediterranean Sea is not surprising regarding the well known affinities between East Atlantic and Mediterranean echinoderm fauna (PEREZ-RUZAFA & LOPEZ-IBOR, 1988), and considering that individuals living on the continental slope experience homogeneous water temperatures in both regions.

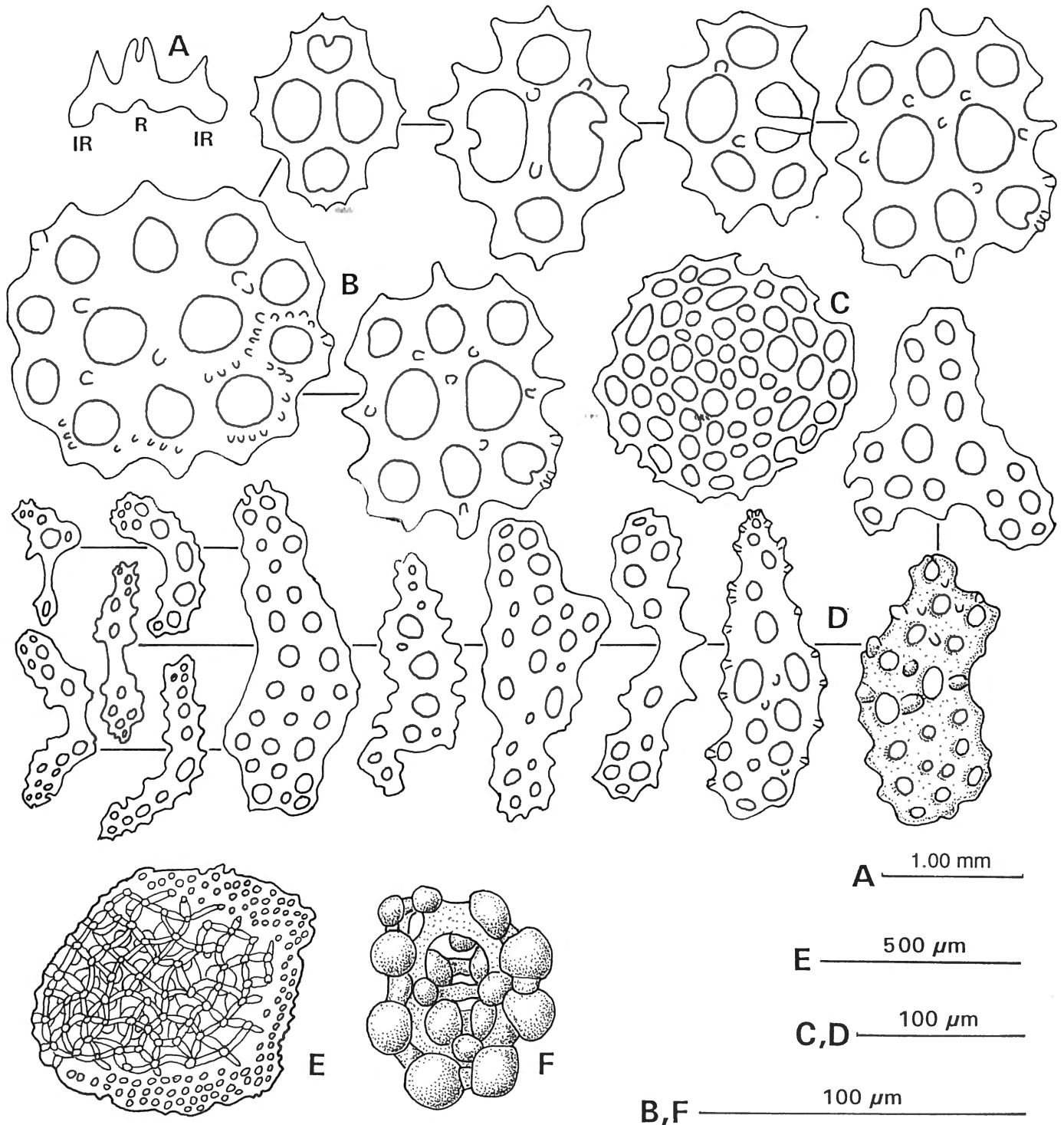


Fig. 2. - *Psolidium complanatum*. Calcareous ring and ossicles. A: calcareous ring (R: radial piece; IR: interradial piece); B: perforated plates of the ventral sole; C: end plate of a podia; D: supporting plates of the podia; E: dorsal scale; F: dorsal knobbed button.

Acknowledgements

It is a pleasure to thank H. ZIBROWIUS who invited me to study the holothurians collected during the Expedition CS96 of R/V/ *Urania*; Ph. WILLENZ for critically reading the manuscript and N. COMINARDI for welcoming me in the Laboratoire des Invertébrés Marins et Malacologie at the MNHN of Paris.

References

- ALVA, V. 1991. On three species of Mediterranean echinoderms. *Scientia Marina*, 55(2): 459-462.
- BECKERS, J.M., BRASSEURS, P. & NIHOUL J.C.J. 1997. Circulation of the western Mediterranean: from global to regional scales. In: EROS 2000 (European River Ocean System). The western Mediterranean, MARTIN J.M. (ed.). *Deep-Sea Research II*, 44(3-4): 531-549.

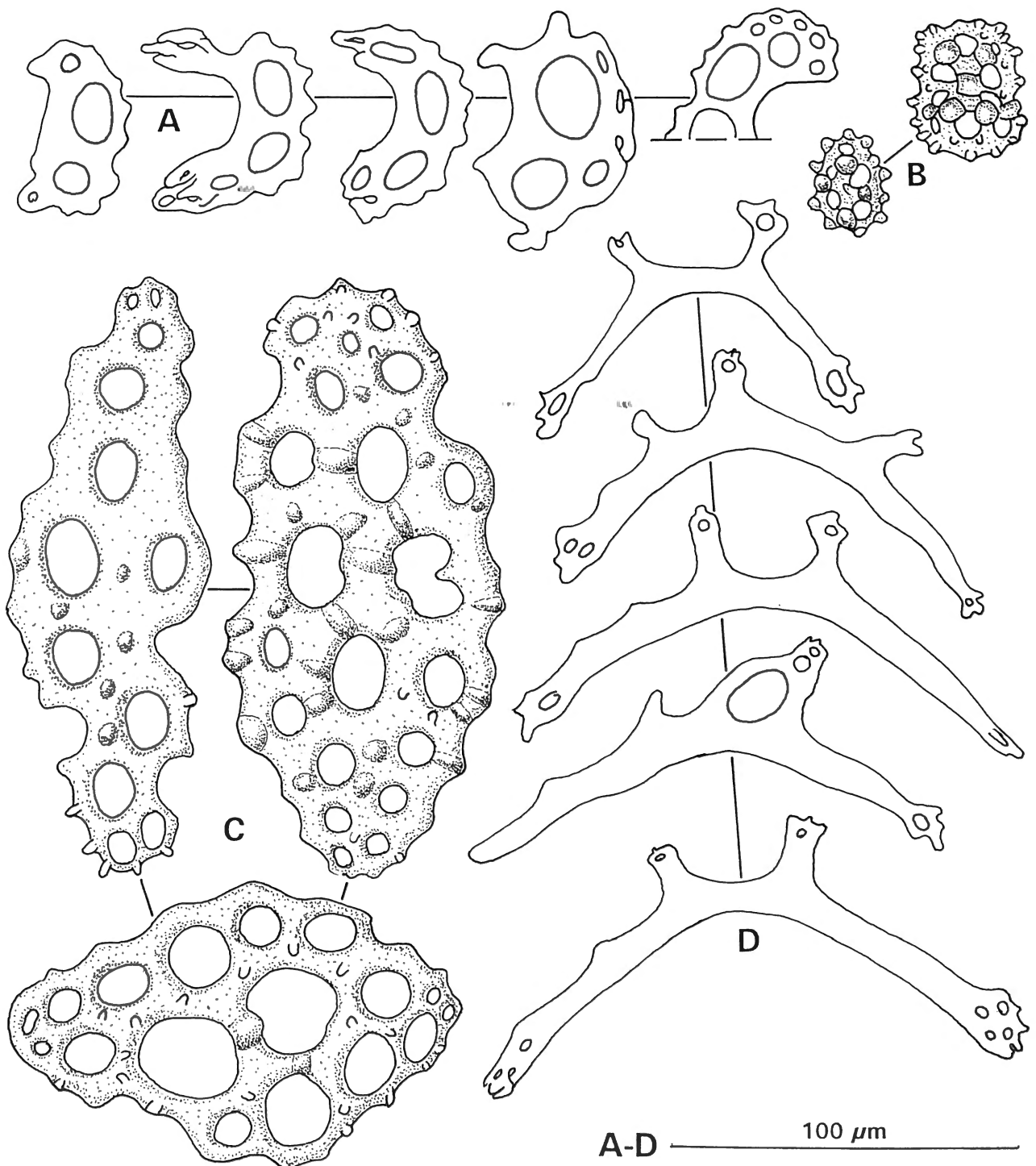


Fig. 3. – *Psolidium complanatum*. Ossicles. A: arched perforated plates of the dorsal podia; B: cups of the dorsal podia; C: plates of the introvert; D: rods of the tentacles.

- CHERBONNIER, G. 1956. Les Echinodermes de Tunisie. *Bulletin de la Station océanographique de Salammbô*, 53: 1-23.
- CHERBONNIER, G. 1969. Echinodermes récoltés par la "Thalassa" au large des côtes ouest de Bretagne et du Golfe de Gascogne (3-12 août 1967). *Bulletin du Muséum national d'Histoire naturelle*, Paris, 2ème sér., 41(1): 343-361.
- CHERBONNIER, G. 1970. Echinodermes récoltés par la "Thalassa" au large des côtes d'Espagne et du Golfe de Gascogne (18-25 octobre 1968). *Bulletin du Muséum national d'Histoire naturelle*, Paris, 2ème sér., 41(5): 1266-1277.
- MASSIN, C. In press. Holothurians (Echinodermata) récoltées sur le talus continental méditerranéen (NW) lors de la campagne DEPRO96. *Mésogée*.
- PEREZ-RUZAFÀ, A. & LOPEZ-IBOR, A. 1988. Echinoderm fauna from the south-western Mediterranean- Biogeographic relationships. In: Echinoderm Biology, BURKE, R.D., MADLENOV, P.V., LAMBERT, P., PARSELY, R.L. (eds.), *Proceedings of the 6th international Echinoderm Conference, Victoria (22-28 August 1987)*, Rotterdam, A.A. Balkema, 355-362.
- TORTONESE, E. 1965. Echinodermata. Fauna d'Italia, 6. Calderini, Bologna, i-xiii + 422pp.
- TORTONESE, E. 1980. Review of present status of knowledge of the Mediterranean echinoderms. In: Echinoderms: Present and Past, JANGOUX, M. (ed.), *Proceedings of the European Colloquium on Echinoderms, Brussels (3-8 September 1979)*, Rotterdam, A.A. Balkema, 141-149.

C. MASSIN
Section Malacologie
IRSNB, 29 rue Vautier
1000 Brussels, Belgium