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Holothuria (Selenkothuria) parvispinea n. sp. (Echinodermata, Holothuroidea, Holothuriidae) with key to the sub-genus *Selenkothuria*

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Abstract

Description of a new species from Australia, belonging to the subgenus *Selenkothuria* (*Holothuria*, Aspidochirotida). A dichotomous key of the thirteen valid species included in the subgenus is also given. The species *H. perrieri* Thandar, 1977 and *H. spinea* Cherbonnier, 1988 are considered as non valid.

Key words: Echinodermata, Holothuroidea, *Holothuria (Selenkothuria)*, **sp. nov.**, Australia, dichotomous key

Résumé

Description d'une nouvelle espèce australienne du sous-genre *Selenkothuria* (*Holothuria*, Aspidochirotida). Une clé dichotomique regroupe les 13 espèces valides. Les espèces *H. perrieri* Thandar, 1977 et *H. spinea* Cherbonnier, 1988 sont considérées comme non valides.

Introduction

During a digitalisation effort of the collections of the Royal Belgian Institute of Natural Sciences (RBINS) an exhaustive search for unidentified sea cucumbers was undertaken. Among a lot of common Mediterranean and Indo-Pacific species, a new species belonging to the subgenus *Selenkothuria* was discovered. It is described in the present note, together with a key of the subgenus *Selenkothuria*.

Material and methods

Material examined:

H. parvispinea, holotype, Pelorus Island, Station B22, Great Barrier Reef, Australia, coll. J. Théodor 18–21/viii/1967, RBINS IG 24046.

H. spinea, holotype, Nosy Bé, Madagascar, coll. J. Millot, 1959, Muséum national d'Histoire naturelle Paris (MNHN) EcHh 2832.

H. bacilla, holotype, Tuléar, Madagascar, coll. Galenon 1972, MNHN EcHh 2952.

H. vittalonga, holotype, Tuléar, Madagascar, coll. B. Thomassin, 1972, MNHN EcHh 3547.

H. erinaceus, holotype, Bohol, Philippines, coll. C. Semper, 1868, Zoologisches Museum Hambourg (ZMH), E 2551.

H. parva, holotype, Natal, South Africa, coll. F. Krauss, ZMH E2609.

The 12 different kinds of ossicles from body wall and tentacles allowing characterizing the species of *Selenkothuria* are illustrated in the figure 1.

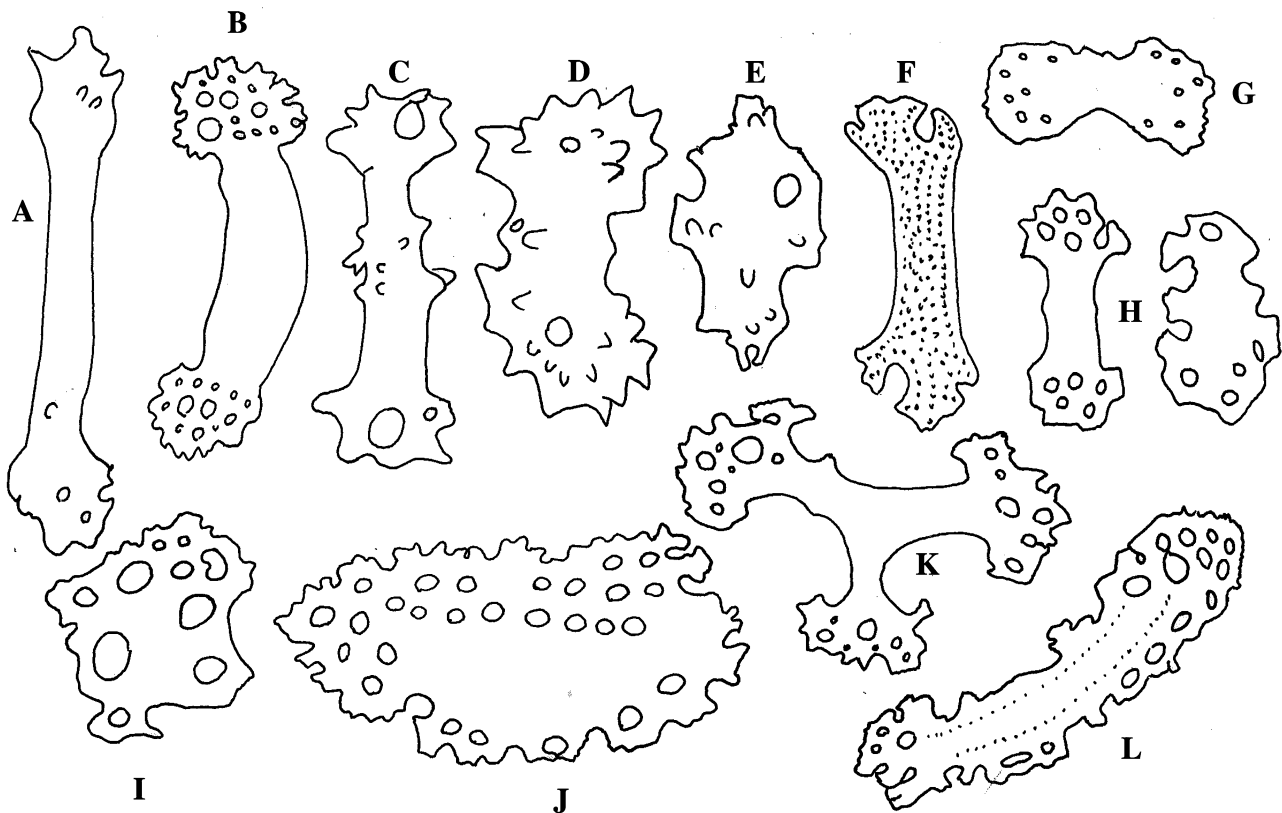


FIGURE 1.

- A. smooth rods with few holes at their extremities (figure 3C, present work). Length of ossicle = 130µm.
 B. smooth rods with many holes at their extremities (pl. 6, fig. 19 in Deichmann 1958). Length of ossicle = 80 µm.
 C. Spiny rods with few strong spines, mainly at mid length and at the extremities (fig. 22E in Cherbonnier, 1988). Length of ossicle = 120 µm.
 D. Spiny plates with strong spines all over (pl. 6, fig. 2 in Deichmann, 1958); Length of ossicle = 70 µm.
 E. Massive spiny plates (fig. 24D in Cherbonnier, 1988). Length of ossicle = 55 µm.
 F. Granulose rods without holes (fig. 12B in Massin, 1996). Length of ossicle = 85 µm.
 G. Perforated plate (fig. 22C, in Cherbonnier 1988). Length of ossicle = 70 µm.
 H. Perforated plate and rods (pl. 7, figs 3, 4, in Deichmann 1958). Length of ossicles = 70 µm.
 I. Round plate with irregular edge and a few large holes (pl. 7 fig. 1 in Deichmann, 1958). Length of ossicle = 90 µm.
 J. Plate with ragged edge with several rows of holes (pl. 6, fig. 18 in Deichmann, 1958). Length of ossicle = 100 µm.
 K. Triradiate rods (fig. 21i, in Cherbonnier, 1988). Length of ossicle = 100 µm.
 L. Plate with ragged edge and rows of holes at the extremities (text figure 6–3 in Deichmann 1938). Length of ossicle = 190 µm.

Systematics

Family Holothuriidae Ludwig, 1894

Genus *Holothuria* Linnaeus, 1767

Sub-genus *Selenkothuria* Deichmann, 1958

Holothuria (Selenkothuria) parvispinea sp. nov.

Fig. 1 A–L, fig. 2A–B; fig. 3A–E

Description Body cylindrical, 110 mm long and 11 mm width on its all length (fig. 2 A, B). Colour in alcohol

brown dorsally and ventrally. Ventrally, numerous white tube feet; dorsally tube feet brown to beige (fig. 2A); tentacles yellowish. Mouth ventral; anus terminal; mouth surrounded by at least 16 short, peltate tentacles; anus surrounded by numerous papillae with white tip. Ventral tube feet densely crowded (fig. 2B), large, conical at the base and cylindrical at the top. Dorsal tube feet less numerous than ventral ones but present all over the bivium. Skin smooth to the touch, 1 mm thick.

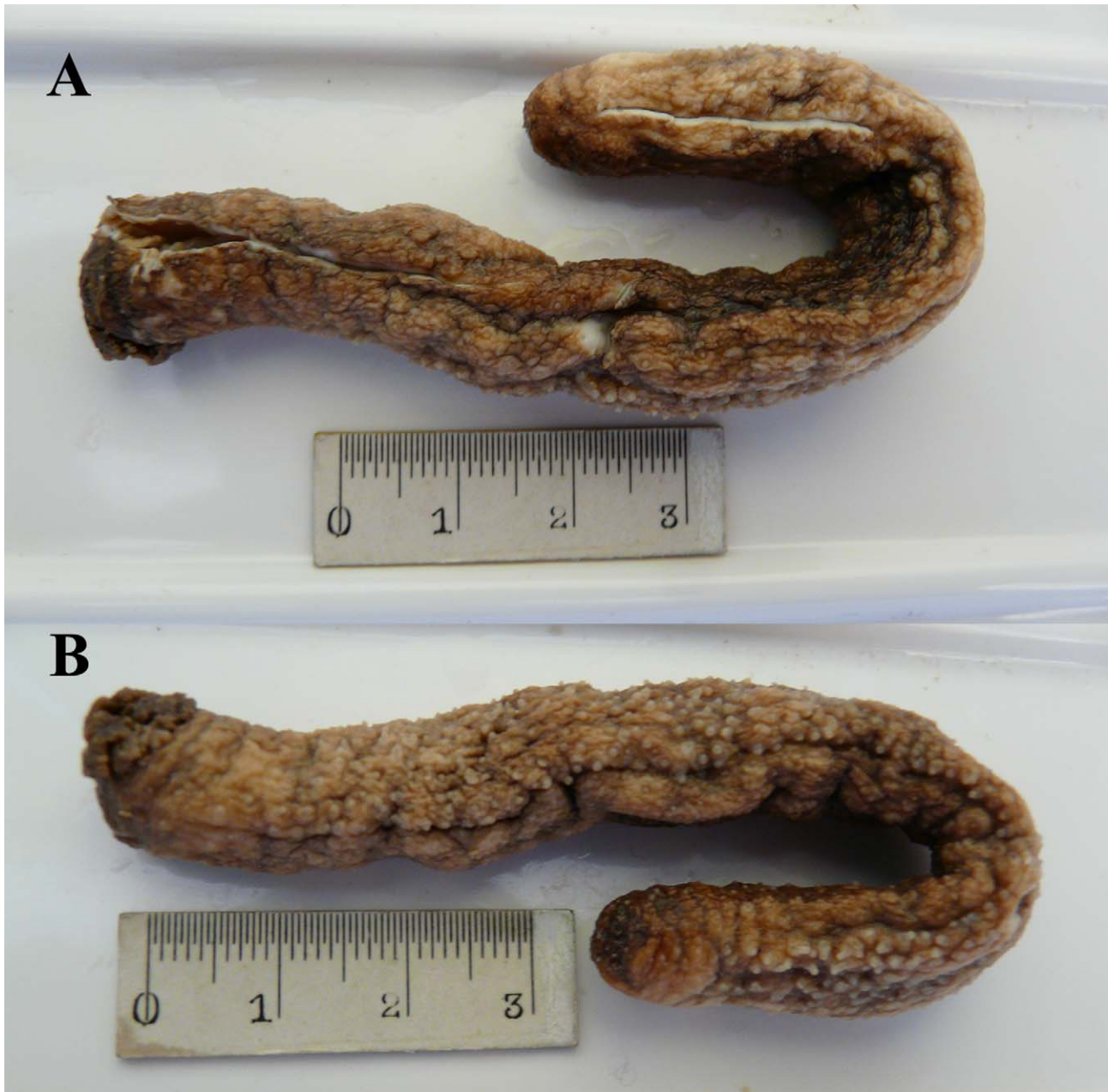


FIGURE 2. A: dorsal view; B: ventral view.

Calcareous ring with large quadrangular radial pieces (fig. 3A); interradial pieces narrower with an anterior median spine. Tentacle vesicles 2.5 to 5.2 mm long. Three Polian vesicles 2.4 to 3.2 mm long. Stone canal not observed. Longitudinal muscles large, bifid, cylindrical. Holotype being eviscerated, no information on the digestive tract, gonad and Cuvierian organ.

Ossicles: in the body wall and the tube feet, as well dorsally than ventrally, rods only (fig. 3B–C). Dorsally the rods are 70–110 μm long with smooth edges and with few terminal perforations (fig. 3 B). Some rods with small spines along the edges. End plate of dorsal tube feet around 400 μm across. Ventrally, the rods are 65–140 μm long (fig. 3C), similar to the ventral ones. Rods with spines on the edges rare. End plates 400–450 μm across, in single

pieces. Tentacles with smooth rods, although with spiny extremities (fig. 3D), 120–230 μm long. Ossicles in longitudinal muscles missing but present in retractor muscles of cloaca (fig. 3E). These rods, 50–100 μm long, are smooth some with perforated extremities (fig. 3E)

Etymology. *parvispinea* means “with small spines “. It refers to the rods with small spines on the edges or no spines at all.

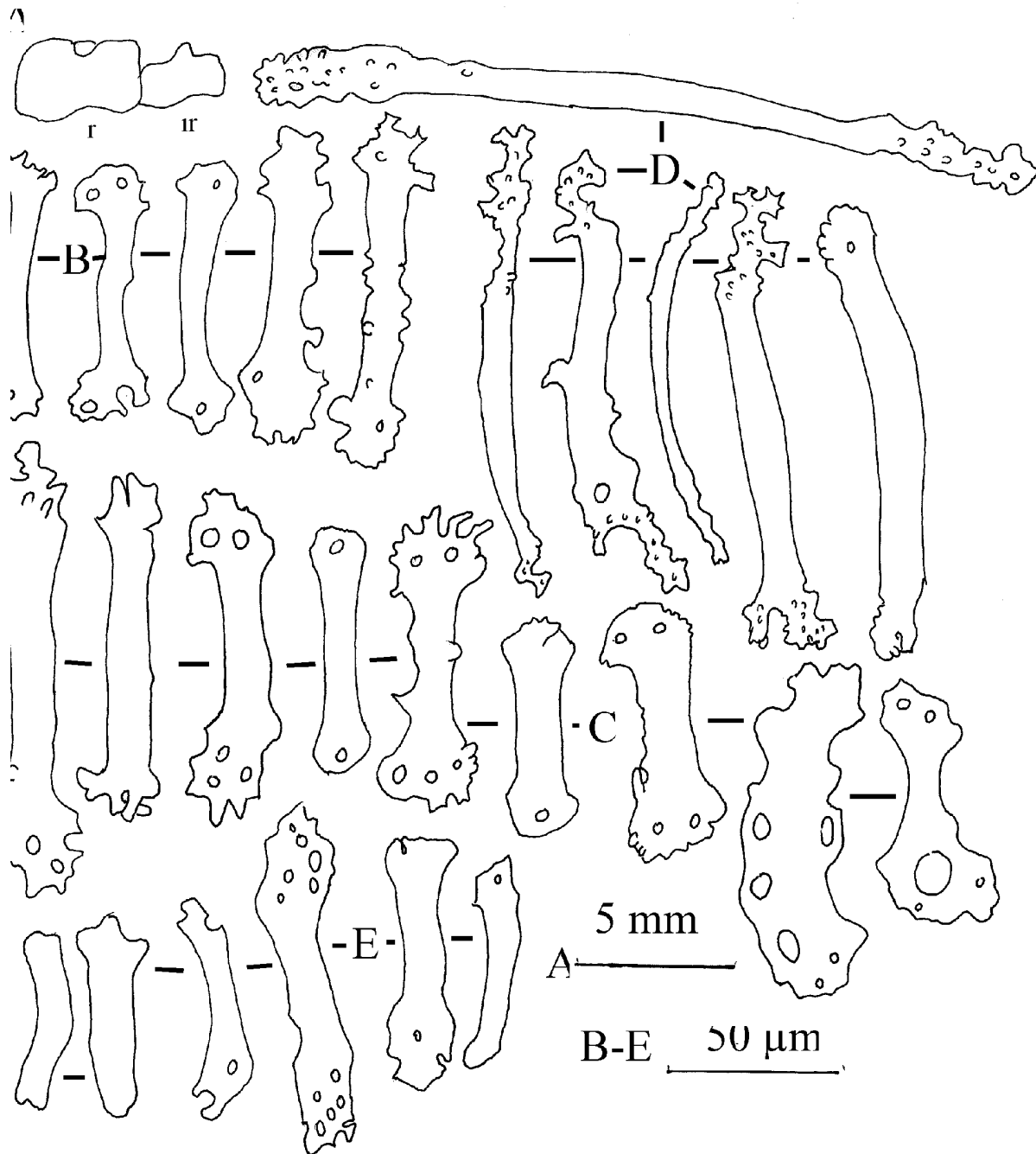


FIGURE 3. A Calcareous ring (r: radial; ir: interradial); B: rods of dorsal body wall; C: rods of ventral body wall; D: rods of tentacles; E: rods from the retractor muscles of the cloaca.

Discussion

With the new species here described, the subgenus *Selenkothuria* includes 13 species (see Honey-Escandon & Solis-Marin. 2011 and Honey-Escandon *et al.* 2012 for the list of species). Two other species have been allocated to the subgenus *Selenkothuria*: *H. (S.) perrieri* Thandar, 1977 and *H. (S.) spinea* Cherbonnier, 1988. but neither of these are mentioned, nor their exclusion justified by Honey-Escandon & Solis-Marin, 2011 and Honey-Escandon *et al.*, 2012

H. (S.) perrieri has been rejected by Thandar himself (1984) because it was established on a specimen with heavily corroded ossicles.

H. (S.) spinea presents well developed tables in the body wall (see fig. 20 E–K, M in Cherbonnier, 1988). The subgenus *Selenkothuria* is characterized by the absence of tables or by rudimentary tables in juveniles (Rowe 1969; Thandar, 1984). After examination of ossicles of the holotype of *H. spinea* no tables could be observed and they must be considered as a contamination. *H. spinea* is thus not a valid species.

H. carere is separated from all the other *Selenkothuria* by the absence of ossicles in the body wall.

H. parvispinea sp. nov. is readily distinguished from *H. erinaceus* Semper, 1868, *H. portovallartensis* Caso, 1954, *H. sinica* Liao, 1980 and *H. vittalonga* Cherbonnier, 1988 by the absence of perforations all along the rods (ragged appearance). *H. parvispinea* sp. nov. differs also from *H. bacilla* Cherbonnier, 1988, *H. moebii* Ludwig, 1883, and *H. parva* Krauss in Lampert 1885 by the absence of strong spines along the rods and the plates. *H. parvispinea* sp. nov. is easily separated from *H. mactanensis* and *H. moebii* by the smooth surface of its rods (nodulous for *H. mactanensis* Tan Tiu, 1981 and *H. moebii*). *H. parvispinea* sp. nov. is closely related to *H. bacilla* Cherbonnier, 1988 by the ossicles of the tentacles but, differs from it by the absence of strong spine along the rods and by the rods of the retractor muscles of the cloaca. These rods are massive with most of the time perforated extremities for *H. parvispinea* sp. nov. whereas they are slender and without perforations for *H. bacilla*. *H. parvispinea* sp. nov. is separated from *H. glaberrima* Selenka, 1867 by the extremities of the body wall rods which, in the adult are straight for the first and bended for the latter. (juveniles of *H. glaberrima* have body wall rods with multiperforated extremities (Cutress, 1986).

According to Deichmann (1938: text fig. 5) small round perforated plates are characteristic of juvenile of *H. theeli*. However, Hickman (1998: p 64) considers that these ossicles are characteristic of adult of *H. theeli* and that juveniles of *H. theeli* and *H. portovallartensis* can easily be confused. Moreover, Deichmann (1938 text fig 6) illustrated large elongate perforated plates which she considers, with doubt, as ossicles from adult *H. theeli*. If these large plates belong to the species *H. theeli*, the difference between *H. theeli* and *H. portovallartensis* is much reduced. However, recent molecular phylogeny (Honey-Escandon *et al.* 2012) on the genus *Selenkothuria* considers both species as valid.

Only *H. glaberrima* is present in Atlantic tropical waters, all the other species belonging to the subgenus *Selenkothuria* are present in the Indo-Pacific tropical waters. The East Pacific is home to: *H. portovallartensis*, *H. theeli*, *H. carere* and *H. lubrica*. The West Pacific is home to: *H. erinaceus*, *H. mactanensis*, *H. parvispinea*, *H. moebii*, and *H. sinica*. West Indian Ocean includes *H. bacilla*, *H. parva* and *H. vittalonga*.

All the species belonging to the subgenus *Selenkothuria* lives in shallow waters (mostly intertidal). Their body shape and colour pattern are similar. The body length of the 13 species is more or less 100 mm (minimum 65 and maximum 150 mm). On the contrary; their ossicles (rods and plates) present a high variability (see table one) which allows sorting out a dichotomous key presented below.

Key of the subgenus *Selenkothuria*

1	ossicles absent in body wall	<i>H. carere</i>
-	ossicles present in body wall	2
2	only rods present in body wall	3
-	only plates present in body wall	6
-	rods and plates present in body wall	7
3	rods smooth, straight	<i>H. parvispinra</i>
-	rods not smooth; often curved	4
4	rods with strong spines	<i>H. bacilla</i>
-	rods with granules	5
5	fine granules	<i>H. mactanensis</i>

-	rough granules	<i>H. moebii</i>
6	numerous sharp spines	<i>H. lubrica</i>
-	few blunt spines	<i>H. parva</i>
7	triradiates absent	8
-	triradiates present	10
8	smooth round perforated plates present	<i>H. theeli</i>
-	elongated perforated plates present9
9	tentacle rods spiny	<i>H. erinaceus</i>
-	tentacle rods smooth	<i>H. sinica</i>
10	rods spiny or perforated, with strait extremities	<i>H. vittalonga</i>
-	rods smooth with bend extremities	11
11	Atlantic Ocean	<i>H. glaberrima</i>
-	Pacific Ocean	<i>H. portovallartensis</i>

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