

PSYCHRONAETES HANSENI, A NEW GENUS AND
SPECIES OF ELASIPODAN SEA CUCUMBER
FROM THE EASTERN CENTRAL PACIFIC
(ECHINODERMATA: HOLOTHUROIDEA)

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Abstract.—A new genus and species in the elasipodan family Laetmogonidae is described. Distinguishing features include large size (largest specimens probably exceed 30 cm in length), presence of a pronounced anterior "head" region with large, irregularly sized papillae, presence in the bodywall of wheels of only one type, and absence of circumoral papillae. The genus is known so far only from the eastern central Pacific. A revised key to genera in the family Laetmogonidae is presented.

During a benthic sampling and photographic survey of a large area of the eastern central Pacific, the Ocean Mineral Company collected specimens of a reasonably common, large, elasipodan holothurian, which proved to represent a new genus. Seafloor photographs of the animal *in situ* were also obtained. Specimens and photographs were entrusted to me for study.

Hansen (1975) revised the elasipodan family Laetmogonidae, and it now comprises four genera. The new genus described here is distinctive in several important respects, and appears to bear no close relationship to any other genera in the family.

Order Elasipodida Theel, 1882
Family Laetmogonidae Ekman, 1926
Psychronaetes, new genus

Diagnosis.—Body fusiform, maximum length approximately 30 cm. Midventral radius naked, lateral ventral radii each with approximately 15 triangular tubefeet. Dorsal radii each with approximately 30 papillae. Dorsal papillae forming an irregular fringe around anterior dorsal end of body. Tentacles 15, no circumoral papillae. Ossicles in bodywall wheels of one type, usually 50–60 μm in diameter, usually with 9–12 spokes.

Type-species.—*Psychronaetes hanseni*, new species

Etymology.—The genus-name is of masculine gender, derived from Greek, *psychros* cold, and *naetes* inhabitant. The species is named in honor of Dr. Bent Hansen of the Universitetets Zoologiske Museum, Copenhagen, in acknowledgment of the valuable contributions he has made to our knowledge of the deep-sea holothurian fauna.

Remarks.—This new genus can be distinguished from others in the family Laetmogonidae as follows. The key is a modified version of that given by Hansen (1975).

Key to genera of family Laetmogonidae

1. Circumoral papillae present *Benthogone* Koehler, 1896
- Circumoral papillae absent 2
2. Midventral tubefeet present. Body wall ossicles wheels with marginal teeth *Pannychia* Theel, 1882
- Midventral tubefeet absent. Wheels lack marginal teeth 3
3. Ventrolateral papillae present, fused to form continuous brim around body *Apodogaster* Walsh, 1891
- Ventrolateral papillae absent. Brim, when present, composed of fused ventrolateral tubefeet 4
4. Body fusiform, up to 30 cm long, with pronounced anterior “head” region with irregular fringe of dorsal papillae *Psychronaetes*, new genus
- Body more or less cylindrical, usually considerably less than 20 cm long, lacking pronounced anterior “head” region.
- No anterior fringe of dorsal papillae *Laetmogone* Theel, 1879

Psychronaetes hanseni, new species

Figs. 1, 2

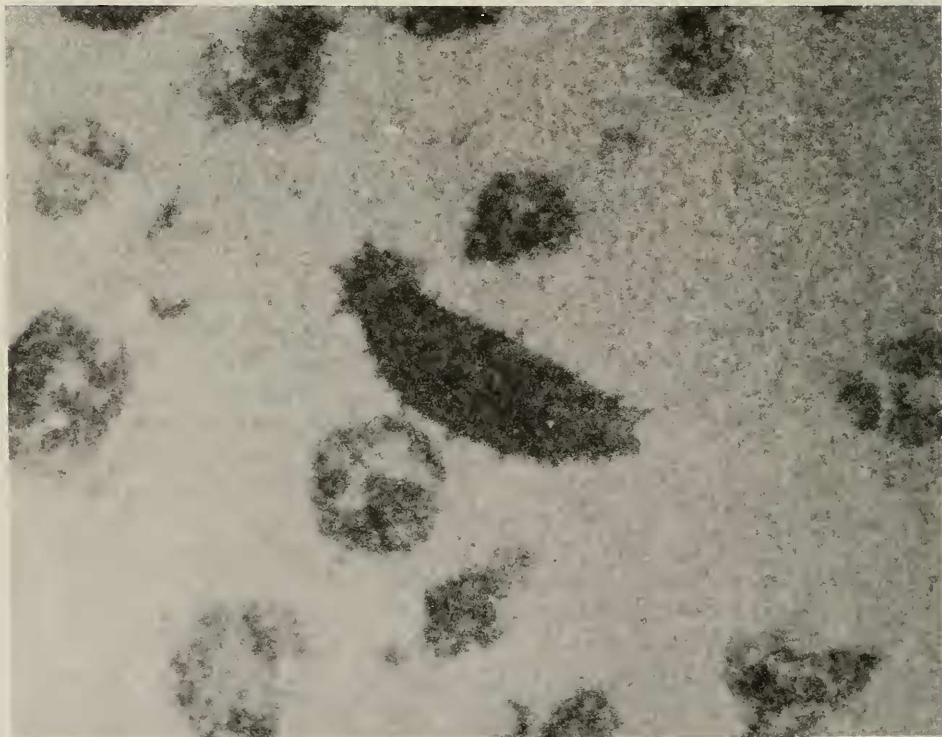
Diagnosis.—As for genus.

Material examined.—HOLOTYPE, USNM E27566, total length approximately 240 mm, greatest width approximately 60 mm; PARATYPE USNM E27567, total length approximately 70 mm, greatest width approximately 25 mm. Type-locality, eastern central Pacific, Clarion-Clipperton Fracture Zone, West of 120°W, depth 4800–5200 meters, collected by Ocean Minerals Company.

Description.—Color in alcohol variegated dark purple, lighter in smaller specimens. Body fusiform, tapering anteriorly and posteriorly (Fig. 1). Pronounced “neck” anteriorly, approximately 15% of body length from anterior end. Head region with mouth, ventrally directed, and tentacles. No circumoral papillae. Tentacles 15, with short stems and large elongate oval discs 9×5 mm in holotype, with long axis of disc directed towards mouth. Anus posterodorsal. Body-wall firm, leathery, not gelatinous.

Midventral radius naked. Lateral ventral radii each with 15 large and conspicuous triangular tubefeet, each approximately 10 mm long and 8 mm wide at base. Feet evenly scattered along entire lateral ventral radii. Dorsal surface with 2 poorly defined rows of numerous papillae, approximately 30 in each row, papillae apparently arising from medial side of each dorsal radius. On head region, papillae become enlarged, forming an irregular fringe around anterior dorsal end of body. Fringe contains approximately 15 papillae in larger specimens, largest papillae approximately 15 mm long and 9 mm wide at base.

Ossicles in bodywall exclusively wheels, greatly variable in size (Table 1). Wheels having smooth rim, short spokes (Table 2) and large central region; at center of wheel, raised hub made up of 4 struts. Dorsal bodywall wheels are slightly larger in average diameter and tend to have a greater number of spokes than wheels from ventral bodywall. Entire wheel strongly concave (Fig. 2a). Wheels present everywhere in bodywall, and also in tubefeet and papillae. Tentacles contain wheels, also rods (Fig. 2c) of greatly variable size (150 μ m to 1



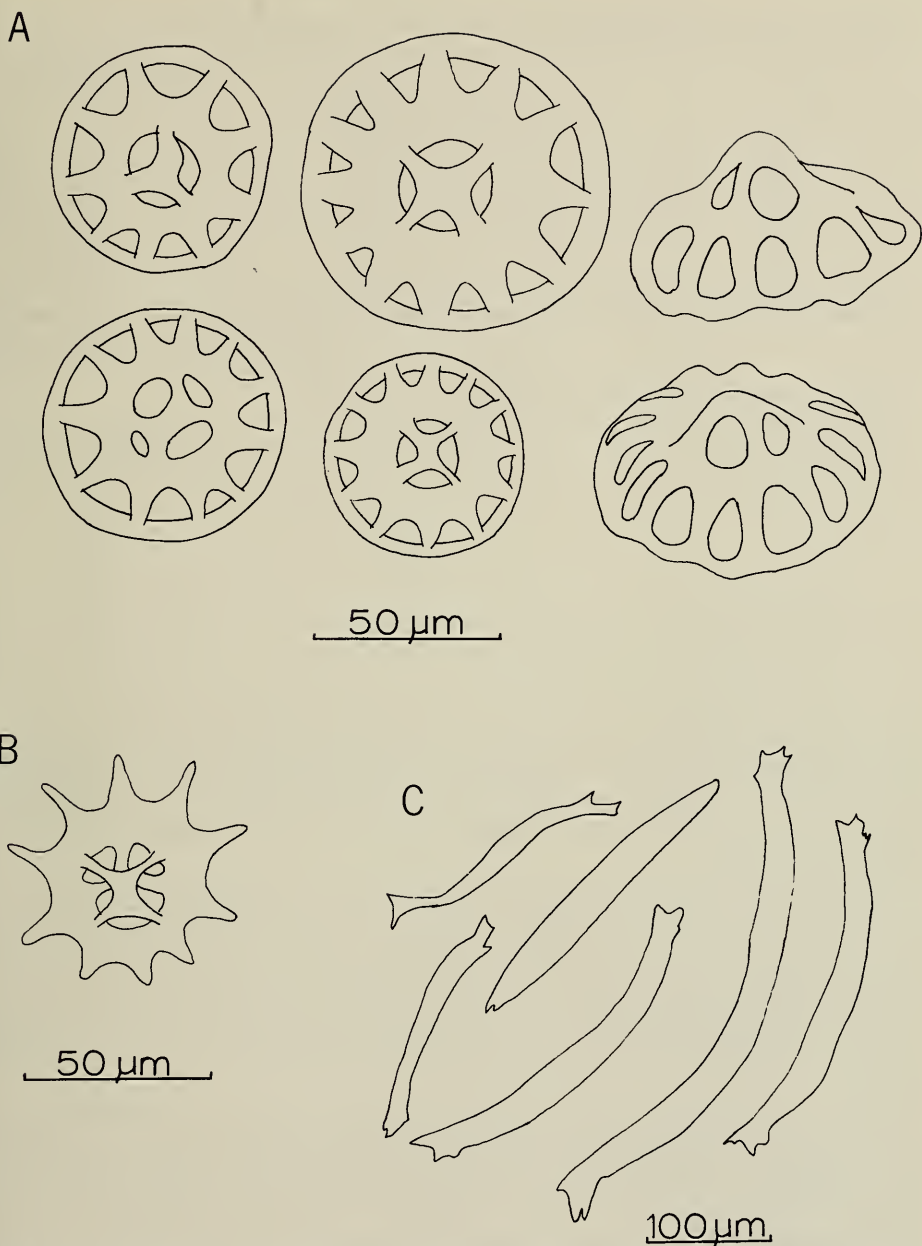


Fig. 2. *Psychronaetes hansenii*, ossicles: A, Wheels from bodywall; B, Stage in development of bodywall wheel; C, Rods from tentacles.

Fig. 1. Upper and lower, specimens of *Psychronaetes hansenii* on the seafloor in the vicinity of the type-locality. Dark-colored objects are manganese nodules. Each specimen is approximately 25 cm long. Note anterior "head" region with papillae, and, on upper specimen, the double row of dorsal papillae.

Table 1.—Diameter of wheel ossicles from bodywall.

Size ranges (μm)	Dorsal wheels (n = 50) Size range 51–80 μm		Ventral wheels (n = 50) Size range 48–76 μm	
	46–50	0	0%	3
51–55	14	28%	10	20%
56–60	18	36%	23	46%
61–65	3	6%	4	8%
66–70	9	18%	4	8%
71–75	5	10%	4	8%
76–80	1	2%	2	4%

Table 2.—Number of spokes in wheel ossicles from bodywall.

Number of spokes	Dorsal (n = 50) Number of wheels		Ventral (n = 50) Number of wheels	
	8	0	0%	8
9	3	6%	16	32%
10	10	20%	17	34%
11	12	24%	6	12%
12	23	46%	3	6%
13	2	4%	0	0%

mm long), usually slightly curved, often with slightly prickly ends. Developmental stages of wheels common in bodywall and tentacles (Fig. 2b). At an early stage of development, before wheel rim has formed, central 4-strut hub is underlain by tripartite piece; this piece eventually disappears, and is seldom seen in fully developed wheels.

Habitat and ecological aspects.—The sediments on which *Psychronaetes hansenii* occurs are commonly Quarternary siliceous oozes and siliceous clays consisting of clay minerals and siliceous microfossils. These sediments are fine, 65% of the material having a particle size of less than 4 μm . Preliminary analyses of seafloor photographs indicate that in three discrete sampling areas, population densities of approximately one individual of *Psychronaetes hansenii* per 1000 m^2 occur.

Remarks.—*Psychronaetes hansenii* is among the largest known elaspodan holothurians. It is surprising that this distinctive species was not encountered during the "Albatross" expeditions in the eastern tropical Pacific (Clark 1920). Its apparent absence from "Challenger" and other collections is perhaps due to its restricted distribution pattern. Certainly, this species can be identified in seafloor photographs, and no specimens representing this species have as yet been recognized in collection of several thousands of photographs from the southern Pacific and southern Atlantic Oceans examined by the author.

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