

## A NEW SPECIES OF SUBANTARCTIC ECHINOID (ECHINOIDEA: SCHIZASTERIDAE)

### Una nueva especie de equinoideo subantártico (Echinoidea: Schizasteridae)

ALBERTO P. LARRAIN\*

#### RESUMEN

*Tripylus beatriceae* sp. n., una nueva especie de equinoideo subantártico del Paso de Drake tiene una forma poco corriente piriforme, elongada, sistema apical etmolítico con tres gonoporos y plastrón mesanfisterno, angosto y alargado. La relación entre la fasciola peripetal y los pétalos pares anteriores tiene caracteres intermedios entre *Tripylus* y *Abatus*. Las hembras tienen los cuatro pétalos pares marsupiales e incuban a los juveniles. La *terra typica* sugiere que el Paso de Drake no sería tan efectivo a largo plazo como barrera de dispersión para los equinoideos de la infauna bentónica.

#### SUMMARY

A deep water (3550-3800 m) subantarctic echinoid from the Drake Passage, *Tripylus beatriceae* sp. n. has an unusual elongated, pyriform shape, typical three-gonopored ethmolytic apical system and a narrow, elongated mesamphisternous plastron. The relationship between the peripetalous fasciole and the anterior paired petals is intermediate between the genus *Tripylus* and *Abatus*. Females have all four paired petals marsupial and incubate their young. Its *terra typica* suggests the Drake Passage is ineffective as long term dispersal barrier for infaunal benthic echinoids.

Keywords: new species, Subantarctic, echinoid, taxonomy, biogeography.

#### INTRODUCTION

The genus *Tripylus*, originally established by Philippi (1845) as a subgenus of *Spatangus* currently includes three known Antarctic-Subantarctic irregular sea-urchins: *Tripylus abatooides* (Clark, 1925), *Tripylus cordatus* (Koehler, 1912) [= *T. reductus* (Koehler, 1912)] and *Tripylus excavatus* (Philippi, 1845). They are all characterized by tests ovoid or elongate, sub-circular or attenuated posteriorly, small to medium sized, and lack the anterior notch

that frequently characterizes heart-urchins. They exhibit a typical ethmolytic, subcentral apical system. The paired ambulacra (I, II, IV and V) are marsupial in females. There are narrow peripetalous and a lateroanal fascioles, although the posterior part of the peripetalous is sometimes reduced. The anterior part of the peripetalous fasciole runs very close to the ambitus. Petals II and IV do not reach the peripetalous fasciole.

Fischer's diagnosis of this genus (1966: 578) includes females with only the anterior paired petals marsupial. However, all female specimens I have revised bear all four paired petals

\*Departamento de Zoología Universidad de Concepción.

marsupial. Even though fascioles tend to be reduced in adults, both in their outline and width, the two, peripetalous and lateroanal are usually found in juvenile specimens. Some specimens are virtually impossible to differentiate from species of *Amphipneustes* and *Abatus* from just the external appearance and shape of the test, mainly because of the variability in the expression of the fascioles (Mortensen, 1936: 232-233).

The material studied was collected by the University of Southern California (USC) team during the 1962 Antarctic leg of the R.V. "ELTANIN" in the Drake Passage area (Figure 1). Large part of this collection is now deposited in the U.S. National Museum (USNM).

The new species is named after my daughter Beatriz.

#### SYSTEMATIC DESCRIPTION

Class Echinoidea Leske, 1778

Order Spatangoida Claus, 1876

Family Schizasteridae Lambert, 1905

Genus *Tripylus* Philippi, 1845

*Tripylus beatriceae* sp. nov.

(Figures 2a-f)

*Holotype*: USNM E11008, female, RV "Eltanin" Sta. 353, south east of Cape Horn, 55°15'

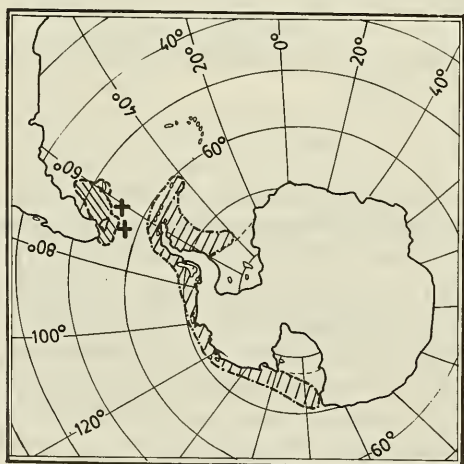


Figure 1: Terra typica of *Tripylus beatriceae* sp. n., showing the Antarctic-Subantarctic distribution of the species of *Tripylus*.

to 55°18'S - 58°55' to 58°58'W, 3514 to 3642 m, USC coll. 12/05/62.

*Paratypes*: USNM E11018, 9 specs., RV "Eltanin" Sta. 353, south east of Cape Horn, 55°15' to 55°18'S - 58°55' to 58°58'W, 3514 to 3642 m, USC coll. 12/05/62. USNM E14618 RV "Eltanin" Sta. 126, south east of Cape Horn, 57°12' to 57°14'S - 62°45' to 62°51'W, 3733 to 3806 m, USC coll. 07/26/62.

*Diagnosis*: Test small to medium sized, elongated, V shaped posteriorly, without notch at ambulacrum (A) III. Peripetalous fasciole narrow, marginal anteriorly. Posterior paired petals equal to (or slightly longer than) anterior paired. Anus circular in posterior elongation of the test. Globiferous pedicellariae with two narrow terminal teeth.

*Description of Holotype* (Figure 2 a, b): Female, total length (TL) 33 mm, total width (TW) 25 mm, height (H) 17 mm. Test clean, white, highest at interambulacrum (IA) 5 adapically. Petal (P) I slightly longer than P II.

*Description of paratypes* (Figure 2 c-f): Nine specimens, five females and four males, partially cleaned. Test elongated, cordiform to subtriangular, whitish when clean and light brown in ethanol, small to medium sized. Ambitus without notch at A III, semicircular anteriorly, V shaped posteriorly. P II and IV (and marsupia) do not reach the fasciole. P I and V equal to or longer than the anterior paired, P I between 40% and 47% TL, P II between 36% and 48% TL. Peripetalous fasciole narrow, four to five tubercles wide, marginal anteriorly, without indentations in interambulacral areas, shaped as a U in IA 5 (Figure 2a), following the shape of the test. No lateroanal fasciole in adults, but present in incubating juveniles of a large female (Figure 2e). Three-gonopored ethmolytic apical system (Figure 3c). Anus circular, in the center of the protruded posterior face of the test. Plastron narrow, elongated, mesmiphisternous (Figure 2d). Labrum depressed, labium wide. Tridentate and tripholiate pedicellariae present, globiferous pedicellariae with two very thin terminal teeth and a broad triangular base.



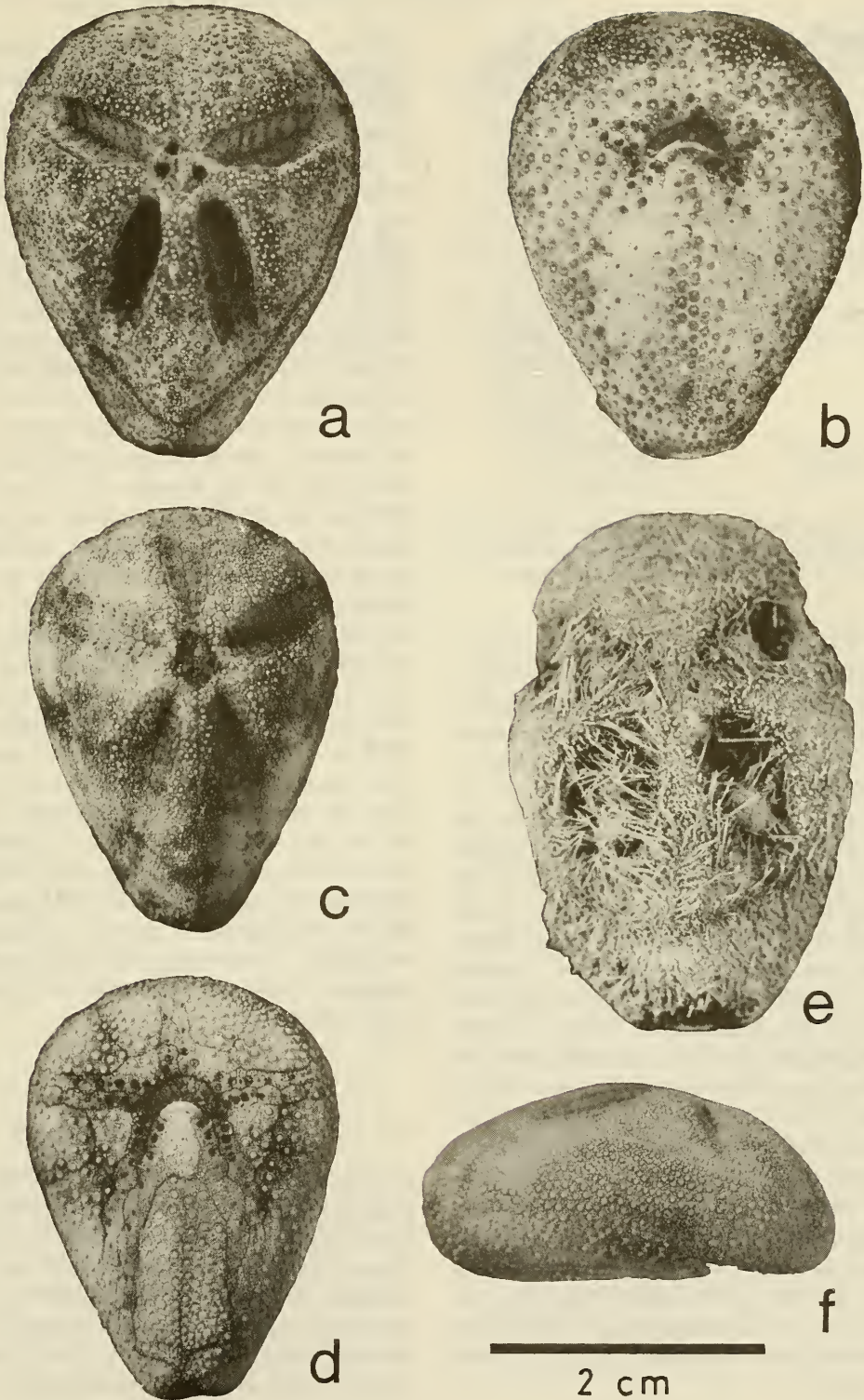


Figure 2: *Tripylus beatriceae* sp. n., a-b: Holotype USNM E11008, a = aboral, b = oral; c-d: Paratype USNM E11008, c = ab oral, d = oral, f = side view; e: Paratype USNM E14618, large female with incubating juveniles.

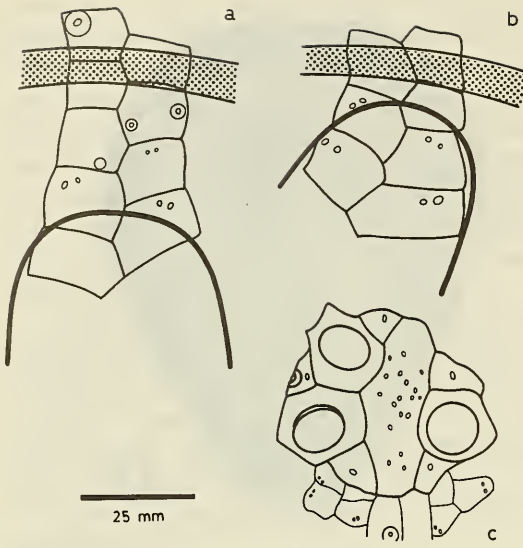


Figure 3: *Tripylus beatriceae* sp. n., holotype, schematic, a: relationship between petal and peripetalous fasciole in P II; b: same in P IV; c = ethmolytic apical system.

**Remarks:** This species shows interesting intermediate characters between the genera *Tripylus* and *Abatus*. Of these, the anterior petals not reaching the fascioles is a character established by Mortensen as diagnostic for *Tripylus*. It is somewhat conflictive in that it is not always constant (Mortensen, 1951), not even in the two sides of the same individual (Figure 3a, 3b). It is evident and clear in females, if the end of the marsupium is taken as the end of the petal (which is most often the case). Especially the male specimens studied of *T. beatriceae* fail to consistently show this feature and are close to the condition in *Abatus*. The narrow peripetalous fasciole, not more than five tubercles across and marginal anteriorly is definitely that of a *Tripylus*. The absence of lateroanal fasciole in adults is a reduction comparable to that in other genera of the Family Schizasteridae (*Abatus*, *Amphipneustes*).

The shape of the test, position and shape of the anus is strikingly coincident with that diagnosed by Koehler (1912) for the genus *Parapneustes* (now in the synonymy of *Tripylus*) in which he originally described *Tripylus cordatus* (= *T. reductus*).

#### DISTRIBUTION (Figure 1):

*Tripylus*, as *Abatus* is a schizasterid genus with representatives in the Antarctic Region and in the Subantarctic Magellanic Province (biogeographic units according to Hedgpeth, 1969). *T. abatoides* is restricted to Antarctica. Previously unreported records from the "Eltanin" material currently under study extend its distribution from the Ross Sea area, near Cape Adare, to the South Shetland Islands, South Orkney Islands, coast of the Weddell Sea, and Bransfield Strait, at depths between 73 and 1116 m. *T. cordatus* is sympatric with *T. abatoides* in the Antarctic area, between 75 and 600 m. One record of this species (as *T. reductus*) based on one male specimen and juveniles from Islas de los Estados and Observatorio (Bernasconi, 1953) is most likely an *Abatus*. *T. excavatus* is strictly Subantarctic, distributed in the Straits of Magellan, off Tierra del Fuego, Malvinas (Falkland) Islands to near 49°S on the Atlantic coast. It is a shallow water species, recorded between the intertidal and 128 m. The new species, *T. beatriceae* is known yet only from two deep water localities (3500-3800 m) in the Drake Passage, off Cape Horn. This fauna is poorly known, except for the aberrant deep water Pourtalesiids collected for the first time by the H.M.S. "Challenger" in the nineteenth century (Agassiz, 1881). This distribution suggests the Drake Passage may not be an impassable barrier to dispersal of eurybathic, incubating, infaunal Schizasterid echinoids between southern South America and Antarctica.

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### LITERATURE CITED

- Agazzis, A. 1881. Report on the Echinoidea dredged by H.M.S. "Challenger" during the years 1873-1876. Voyage of H.M.S. "Challenger" Reports on the Scientific Results. Zoology 3 (9): 1-321, pls. 1-45.
- Bernasconi, I. 1953. Monografía de los Equinoideos Argentinos. Anales del Museo de Historia Natural Montevideo. 2<sup>a</sup> Ser. 6 (2): 1-58, pls. 1-32.
- Fischer, A.G. 1966. Spatangoids, p. 543-640. *In*: R.C. Moore (ed.), Treatise on Invertebrate Paleontology, Part U, Echinodermata 3. Geological Society of America and University of Kansas Press, Lawrence.
- Hedgpeth, J.W. 1969. Introduction to Antarctic Zoogeography. *In*: V.C. Bushnell & J.W. Hedgpeth eds.: Antarctic Map Folio Series, Folio 11: 1-7, American Geographical Society. New York.
- Koehler, R. 1912. Echinodermes nouveaux recueillis dans les mers antarctiques par le "Pourquoi Pas?" (Astéries, Ophiures et Echinides). Zoologischen Anzeiger. 39 (4): 151-163.
- Mortensen, T. 1936. Echinoidea and Ophiuroidea. Discovery Reports. 12: 199-348, pls. 1-9. Cambridge.
- Mortensen, T. 1951. A Monograph of the Echinoidea, V 2. Spatangoida II. 593 pgs. C.A. Reitzel, Copenhagen.
- Philippi, R.A. 1845. Beschreibung einiger neuer Echinodermen nebst kritischen Bemerkungen über einige weniger bekannte Arten.