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Contributions to the knowledge of the Eratoidae. VI. A new species of *Alaerato* Cate, 1977 from Palawan, Philippines

(Mollusca, Gastropoda)

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A recently discovered species of the genus *Alaerato* Cate, 1977 from Palawan, Philippines is described as *Alaerato palawanica* spec. nov. The new species is thoroughly compared with its congener *Alaerato angulifera* (Sowerby II, 1859) and other similar species like *Alaerato gallinacca* (Hinds, 1844). The new species is distinguished by its very coarse, prominent dentition, striking coloration and unusually large shells.

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Introduction

The systematic assignment of the Eratoidae and its sister-group Triviidae and their relation to the Velutinoidea Gray, 1840 and Cypraeoidea Gray, 1824 is discussed in e.g. Fehse (2010a: 13). Features that help to distinguish Eratoid taxa are also mentioned in the latter paper.

Recently, a population of large shelled *Alaerato* Cate, 1977 was discovered at Palawan, Philippines. Already on the very first sight the striking shell coloration and its coarse, prominent dentition stand out. According to its outstanding appearance compared to the other taxa of the genus the description of a new species is justified. It will be named *Alaerato palawanica* spec. nov. The new species is assigned to the genus *Alaerato* because the whole shell morphology fits well with the type species of the genus.

The coloration in Eratoidae is usually quiet, except for the well-known *Hespererato scabriuscula* (Sowerby II, 1832) and *Hespererato vitellina* (Hinds, 1844) from the Pacific coasts of the Americas and now for the new species. Unfortunately, the biology of Eratoidae is still largely unknown and someone can only speculate on the meaning of their shell coloration, but it is most probably part of their cam-

ouflage – e.g. among brown algae (Abbott 1974).

In Eratoidae juvenile specimens are recognizable by their lack of the labrum and apertural dentition. Callosities of the shell as well as pustules or a dorsal furrow are not yet developed. Subadult shells have a labrum, but their apertural dentition is obscured and the callosities, pustules and dorsal sulcus are not yet or only weakly developed. In matured specimens the apertural dentition is completely developed. The shells are callused and possess often pustules and many a dorsal sulcus or a dorsal dimple on the anterior terminal collar. Partly, the height of the spire is very variable. It is not a mark of its maturity. Therefore, the length of the labrum is used herein as a character. The possibilities and limits of morphometry are discussed in detail in Fehse (2010b: 12). That is why certain measurements of the shells are not treated herein as value-related characters (e.g. width in percentage of the length or length/width ratio).

Abbreviations

DFB	collection Dirk Fehse, Berlin, Germany
ZSM	Zoological State Collection, Munich, Germany
TL	total shell length in mm
LL	length of labrum in mm

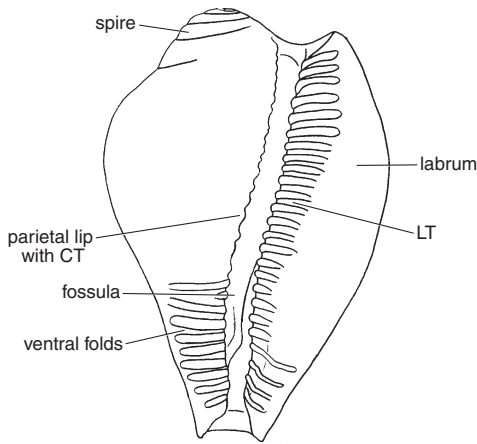


Fig. 1. Morphologically relevant parts in Eratoidea (lectotype of *Alaerato gallinacea*).

- W shell width in mm
 H shell height in mm
 LT number of labral teeth
 CT number of columellar teeth
 S height of spire in % ($S = 100 - LL/TL \times 100$)

Taxonomy

Trivioidea Troschel, 1863
 Eratoidea Schilder, 1925
 Eratoinae Schilder, 1925

Alaerato Cate, 1977

Type species: *Lachryma bisinventa* Iredale, 1931, by original designation.

Diagnosis. Shell small, pyriform, more or less minutely pustulated or wrinkled throughout; spire elevated; dorsal sulcus usually absent; posterior labral portion exaggerated, acute angular, wing-like extended; columellar and labral dentition numer-

Table 1. Measurements of holotype (H) and Paratypes (P 1-6) of *Eratoena palawanica* spec. nov.

	TL	LL	W	H	LT	CT	S[%]	collection, no.
H	7.4	7.0	4.7	3.8	23	23	5.4	ZSM, 20100625
P 1	6.2	5.7	4.0	3.2	19	20	8.1	DFB, 10293-1
P 2	7.6	6.9	4.7	3.8	24	22	9.2	DFB, 10293-2
P 3	6.4	5.8	4.1	3.3	20	21	9.4	DFB, 10293-3
P 4	5.7	5.4	3.8	3.0	18	21	5.3	DFB, 10293-4
P 5	6.1	5.5	3.9	3.0	19	20	9.8	DFB, 10293-5
P 6	6.1	5.6	3.9	3.0	17	21	8.2	DFB, 10293-6

ous and well-defined; inner adaxial carinal ridge less developed with projecting denticle posteriorly. Dorsal coloration white or light red but more often light green with terminal tips of dorsal colour.

Six living species of the Indian Ocean, central Indo-Pacific and W Pacific are assigned to the genus.

Eratoena palawanica spec. nov.

Pl. 1, Figs 1-2; Pl. 2, Fig. 1

?1977 *Alaerato gallinacea* (Hinds, 1844) – Cate, A review of Eratoidea: text fig. 25a.

Types. Holotype: Off Roxas, N Palawan, Sulu Sea, Philippines. – Paratypes 1-6 were collected at type locality. Measurements are given in Table 1. Living specimens and fresh dead shells were dredged in depths of 10-20 m on sandy bottom in coral rubble. Only empty shells were offered to the author from several sources. Further five paratypes from Balabac Island, S Palawan, Philippines in collection DFB.

Description

Shell large, solid, pyriform with a short, conical spire. Spire highly elevated and pointed. Protoconch consisting of 1-1½ whorls with a very small nucleus and distinct suture. Junction with teleoconch not clearly defined. Teleoconch comprising 3½-4 flat-sided whorls. Body whorl about 90 % of total height, pyriform, inflated, with the maximum diameter at posterior quarter. Dorsum finely pustulated or wrinkled, roundly angled, with an indistinct incised dorsal sulcus and slightly constricted behind the anterior extremity. Aperture very narrow and slightly sinuous, 90 % of total height. Labrum broadly thickened, almost straight, flattened, anteriorly slightly declivous, exaggerated, acute angular, wing-like extended posteriorly, bearing 17-24 irregular, coarse, close-set, equal denticles on inner margin, which do extend onto the lip as coarse folds. Siphonal canal elongated, indented and straight. Anal canal deeply indented, well-defined. Columella smooth, slightly sinuous, bordered internally by a weak carinal ridge and a projected denticle posteriorly. Parietal lip angularly thickened, bearing 20-23 irregular, coarse denticles. Most anterior 7-9 denticles developed into coarse folds, which run across ventrum to outer ventral edge. Fossula marked by a weak concavity and a slightly protruding inner fossular edge. Terminal ridge simple and fine, running along border of siphonal canal.

Shell colour brown with a white callosity on mid-dorsum and anterior terminal collar. Spire, posterior labral tip and anterior terminal tip brown.

No information available on external morphology, anatomy and radula.

Variation. The dorsal sulcus is not developed in juvenile specimens and the shell is smooth. Subadult specimens are covered with more callus where the sulcus is already incised and the granulation slightly developed. Matured shells show usually a deeply incised sulcus, the granules and the dentition are fully developed. The spire varies in its elevation but is always highly elevated. The columellar denticles are occasionally somewhat obscured posteriorly also in matured specimens. Otherwise the shells are uniform concerning their morphology and coloration.

Etymology. Named after the species' type locality.

Distribution. The new species is known only from Palawan, Philippines so far.

Discussion

All mentioned species could be studied by photos of the type specimens (Cate 1977, Cossignani & Cossignani 1997) and by dozens of specimens from various localities in the author's collection.

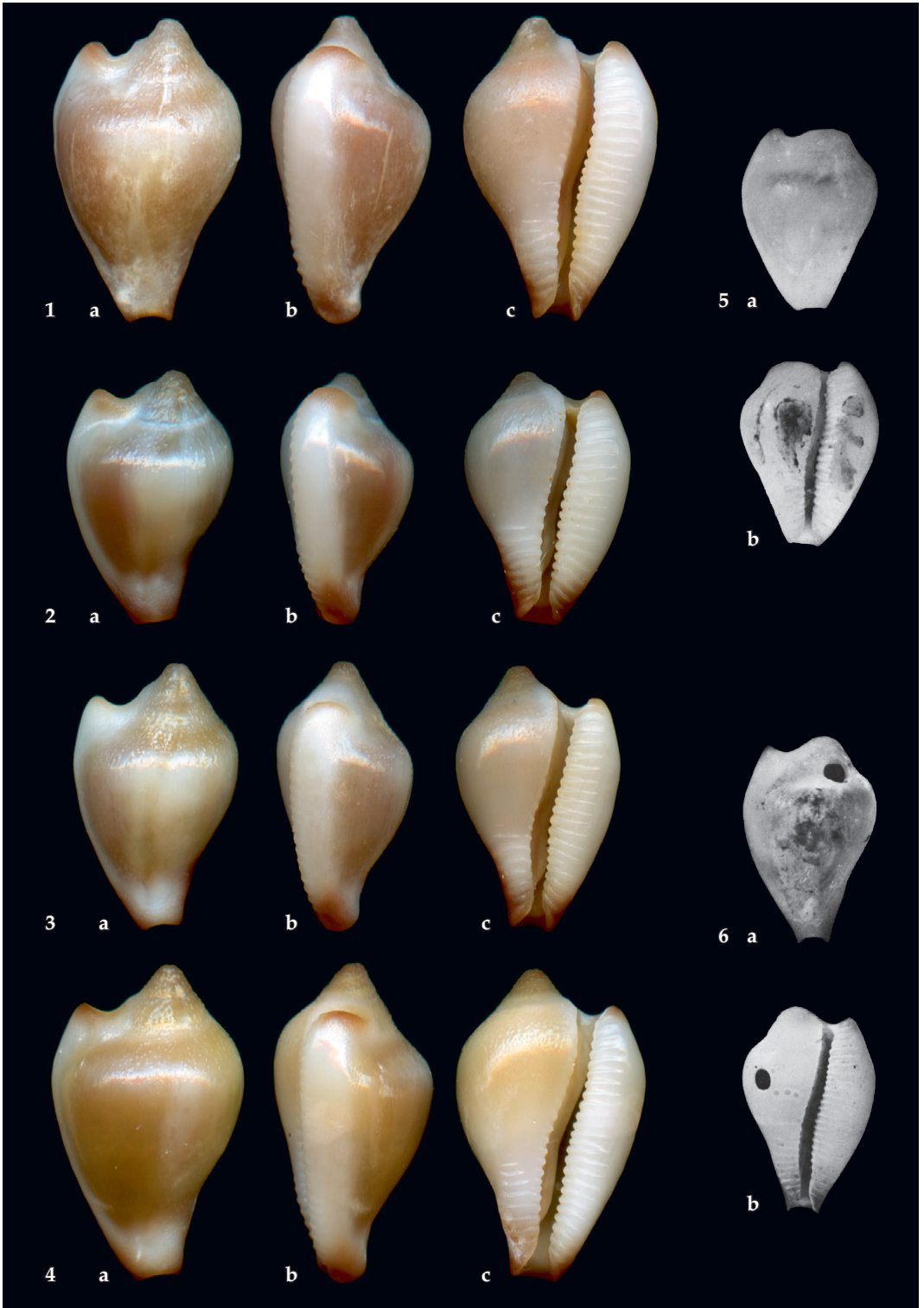
The striking coloration, large shell, dorsal sulcus and coarse dentition distinguishes *Alaerato palawanica* spec. nov. from all species in the genus *Alaerato* (see Table 2). *Alaerato amamioshima* Cate, 1977, *A. angistoma* (Sowerby II, 1832) and *A. bisinventa* (Iredale, 1931) possess very fine dentition with no or very

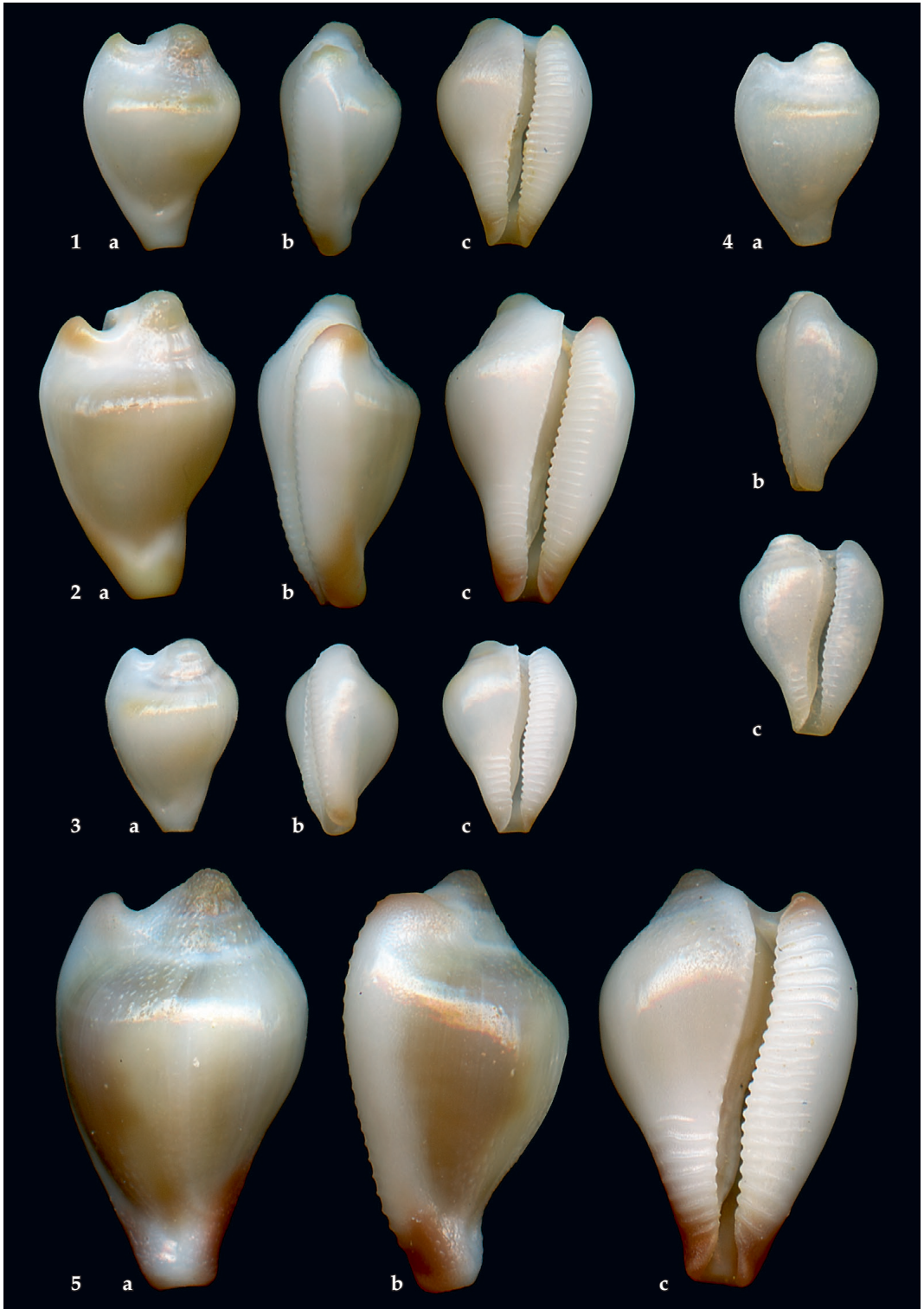
Table 2. Comparison of *Alaerato* species.

species	shell outline	spire	labral dentition	columellar dentition	ventral folds	dorsal sulcus	dorsal coloration	pustules
<i>A. amamioshima</i> Cate, 1977	pyriform	short blunt	very fine no folds	very fine almost obscured	absent	absent	light beige with brown band on dorsal angle	very fine restricted to spire
<i>A. angistoma</i> (Sowerby II, 1832)	inflatedly pyriform	short rounded	very fine close-set no folds	coarser posteriorly obscured	coarse close-set short	absent	any shades of rose	obscured to smooth
<i>A. angulifera</i> (Sowerby II, 1859)	squat	very short blunt	coarse close-set short folds	coarse close-set	coarse close-set short	anterior dimple	white with green band on dorsal angle	very fine restricted to spire
<i>A. bisinventa</i> (Iredale, 1931)	inflatedly pyriform	short pointed	very fine short folds	very fine	fine close-set short	absent	white	smooth
<i>A. gallinacea</i> (Hinds, 1844)	pyriform	short blunt	fine close-set long folds	very fine almost obscured	fine close-set elongated	absent	white	very fine restricted to spire
<i>A. mactanica</i> (Cossignani & Cossignani, 1997)	biconical	elevated blunt	very fine distant short folds	very fine almost obscured	very fine slightly distant	anterior dimple	yellowish green	obscured to smooth
<i>A. palawanica</i> spec. nov.	biconical	elevated pointed	coarse close-set long folds	coarse irregular	coarse elongated	indistinct with a dimple	brown with white clouding	fine posteriorly restricted

Plate 1.

1. *Alaerato palawanica* spec. nov., holotype, ZSM, coll. no. 20100625; total shell length: 7.4 mm.
2. *Alaerato palawanica* spec. nov., paratype 1, DFB, coll. no. 10293-1; total shell length: 6.2 mm.
3. *Alaerato palawanica* spec. nov., paratype 3, DFB, coll. no. 10293-3; total shell length: 6.4 mm.
4. *Alaerato palawanica* spec. nov., paratype 2, DFB, coll. no. 10293-2; total shell length: 7.6 mm.
5. *Alaerato angulifera* (Sowerby II, 1859), lectotype, BMNH, coll. no. 197412/1; total shell length: 3.7 mm (after Cate 1977: text fig. 28).
6. *Alaerato gallinacea* (Hinds, 1844), lectotype, BMNH, coll. no. 1844.6.7.51; total shell length: 4.6 mm (after Cate 1977: text fig. 25).





short labral and ventral folds, no traces of a dorsal sulcus and a quiet colouration. The dentition of *A. gallinacea* (Hinds, 1844) (Pl. 1, Fig. 6) looks similar to *A. palawanica* spec. nov., but is much finer and close-set. The number of labral denticles and folds is higher in *A. gallinacea* (27–29 in *gallinacea* vs. 20–23 in *palawanica*). *Alaerato gallinacea* shows also no traces of a dorsal sulcus, the spire is shorter and blunt. The specimens in Pl. 2, Figs 1–2 are assigned to *A. gallinacea* because of their short and blunt spire but especially by their high number of labral denticles and the obscured columellar dentition. The colouration of their tips resembles the new species, but the dorsal ground colour is white to light green whereas it is brown in *A. palawanica* spec. nov. Specimens of *A. palawanica* spec. nov. are not known from other parts of the Philippines and *A. gallinacea* was not yet found at Palawan. The large gap in the number of labral denticles indicates that the new species is not just a variety of *A. gallinacea*.

Alaerato angulifera (Sowerby II, 1859) (Pl. 1, Fig. 5; Pl. 2, Fig. 3) possesses a squat, small shell, a short and very blunt spire, very close-set labral folds and the labrum sloping into the aperture, whereas *A. palawanica* spec. nov. is large, elongated with widely spaced ventral folds and flattened labrum. *Alaerato mactanica* (Cossignani & Cossignani, 1997) has a very fine, somewhat obscured dentition and light green coloured shell.

Cate (1977: text fig. 25a) designated a paralectotype of *A. gallinacea*, but he did not mention a collection number. The origin and whereabouts of this shell are unknown. The shell is seemingly dead collected and is partly eroded. The columellar dentition is also somewhat damaged. The dorsum of the slightly subadult shell is not yet fully callused but a dorsal dimple is already visible at the anterior terminal collar. The shell outline, especially the higher elevated and more pointed spire resembles *A. palawanica* spec. nov. The dorsal dimple differs also from *A. gallinacea*. The labral denticles and folds are somewhat coarser

and less numerous (23 in number). Similarly the columellar folds on the anterior ventrum are coarser and less numerous (7 in number vs. 11 in the lectotype of *A. gallinacea*). Unfortunately, the shell could not be examined and, therefore, its assignment to the new species is somewhat uncertain.

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◁ Plate 2.

1. *Alaerato* cf. *gallinacea* (Hinds, 1844), DFB, coll. no. 8233; total shell length: 4.2 mm. Off Hadsan Beach Resort, Mactan Island, Philippines; dredged at 150 m.
2. *Alaerato* cf. *gallinacea* (Hinds, 1844), DFB, coll. no. 8040; total shell length: 5.6 mm (a very unusual giant specimen with somewhat darker colouration). Off Damar Island, E coast of Malaysia, South China Sea; dived amongst coral and rubble at 10–20 m.
3. *Alaerato angulifera* (Sowerby II, 1859), DFB, coll. no. 8431-1; total shell length: 3.5 mm. Off Tubod, Siquijor Isl., Philippines; dredged at 85 m.
4. *Alaerato angulifera* (Sowerby II, 1859), DFB, coll. no. 8431-2, subadult; total shell length: 3.7 mm. Off Tubod, Siquijor Isl., Philippines; dredged at 85 m.
5. *Alaerato palawanica* spec. nov., paratype 8, DFB, coll. no. 9617-1; total shell length: 7.9 mm. Off Balabac Island, S Palawan, Philippines; dredged at 10–25 m.

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