

Results of the Rumphius Biohistorical Expedition to Ambon (1990)



Part 2. An unusual triphorid (Mollusca: Gastropoda) from the Moluccas, Indonesia

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Costatophora is introduced as a new subgenus of *Tetrastoma* Laseron, 1958 for *Triforis seranus* P.J. Fischer, 1927, a triphorid with distinctive teleoconch sculpture and radular morphology.

Introduction

The present contribution was initiated during a visit to Leiden in 1992 when I was invited by Mr Hermann Strack to view the Rumphius Biohistorical Expedition (1990) collections at the Nationaal Natuurhistorisch Museum (RMNH). A triphorid from Ambon drew my immediate attention because its sculpture was predominantly axial instead of reticulate as in the majority of the 500 or more living species of Triphoridae. A search of the literature revealed that it is probably conspecific with *Triforis seranus* P.J. Fischer, 1927, described as a Pliocene fossil from adjacent Seram (Seran or Ceram) Island, and hitherto unrecorded from the Recent fauna.

Systematics

Order Neotaenioglossa Haller, 1882
Suborder Ptenoglossa Gray, 1853
Superfamily Triphoroidea Gray, 1847
Family Triphoridae Gray, 1847
Subfamily Triphorinae Gray, 1847
Genus *Tetrastoma* Laseron, 1958

Tetrastoma Laseron, 1958: 625. Type species (by original designation): *Tetrastoma mapoonensis* Laseron, 1958; Recent: Queensland.

Costatophora subgen. nov.

Type species.— *Triforis* (*Monophorus*) *seranus* P.J. Fischer, 1927: Pliocene; and Recent: Moluccas, Indonesia.

Diagnosis.— First whorl of planktotrophic larval protoconch reticulately sculptured, subsequent protoconch whorls with one submedian spiral thread. Teleoconch sculptured with axial costae, spiral cords obsolete, no nodules. Aperture simple, no posterior notch. Anterior siphonal canal short, not enclosed. Radula 1 + 1 + 1 + 1 + 1. Central and lateral teeth subquadrate, with short cusps. Marginal teeth with 2 long slender cusps.

Description.— As for the type species (see below).

Remarks.— Among named triphorid genera, *Costatophora* is most closely related to *Tetrastoma* Laseron, 1958. Accordant shell characters include the reticulate sculpture on the first protoconch whorl, single submedian thread on subsequent protoconch whorls, convex teleoconch whorls, simple aperture, and short open anterior siphonal canal. The spiral grooves, which define the boundaries of former spiral cords, indicate that the median teleoconch spiral (P2) commenced immediately after the protoconch as in *Tetrastoma* species. The radula is also similar to that of *Tetrastoma* species in having only 5 teeth per transverse row (Marshall, 1983) but differs by having long instead of short cusps on the marginal teeth. While it seems likely that the absence of spiral cords is due to reduction, character state polarity for length of the cusps on the marginal teeth is unclear. It seems likely that *Costatophora* is derived from *Tetrastoma*, and for this reason I prefer to interpret it as a subgenus.

Tetrastoma (*Costatophora*) *serana* bears a superficial resemblance to the type species of *Kallosinistralla* Stilwell & Zinsmeister, 1992 (*K. antarctodelicata* Stilwell & Zinsmeister, 1992) from the lower Tertiary La Meseta Formation of Seymour Island, Antarctica. The Antarctic species differs, however, by attaining larger size (height up to 24 mm), by lacking a siphonal canal, and in that the teleoconch whorls are spirally lirate and higher relative to their width. The familial position of *Kallosinistralla* is unknown.

The type species of *Allostrophia* Kittl, 1894 and *Virgella* De Gregorio, 1930 are also superficially similar but they both have holostomatous apertures and are currently grouped in Loxonematoidea (Ponder & Warén, 1988).

Tetrastoma (*Costatophora*) *serana* (P.J. Fischer, 1927) comb. nov.

(figs. 1-6)

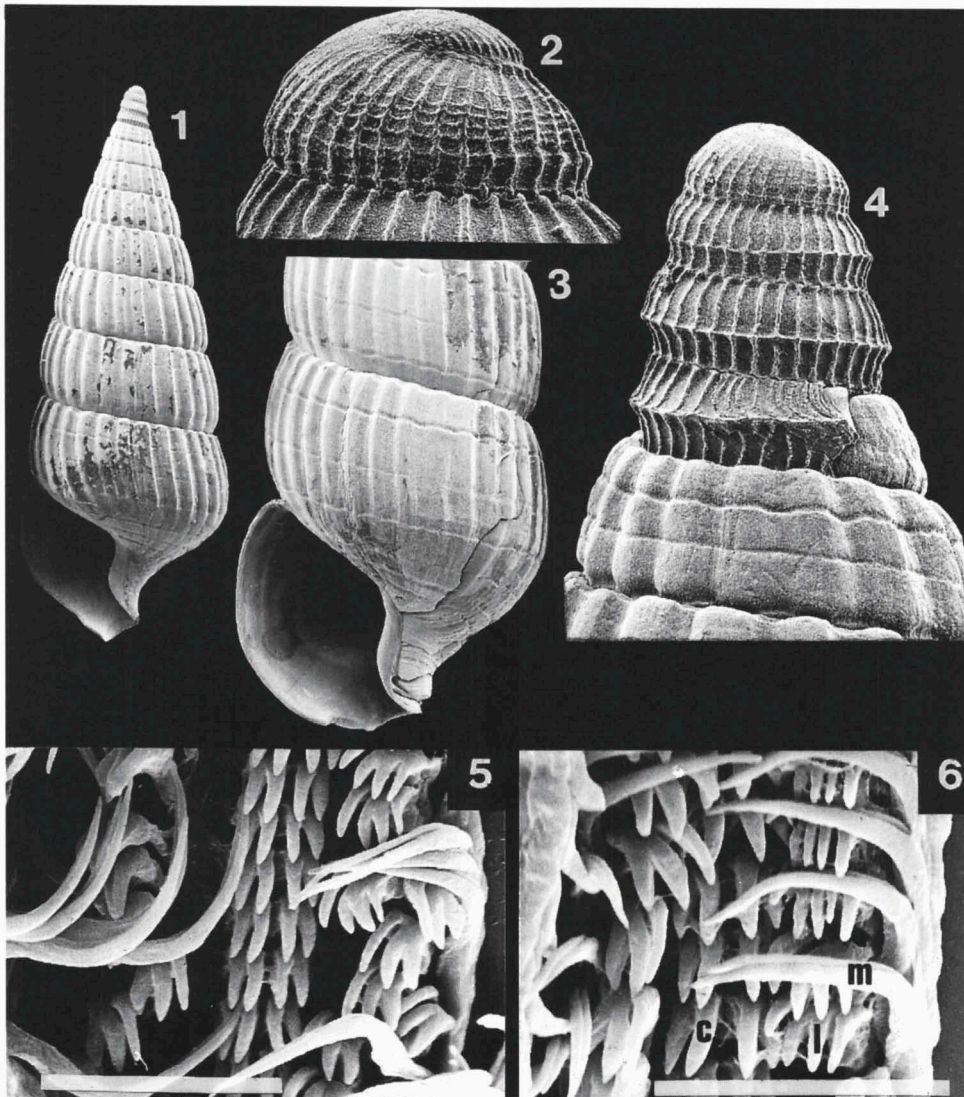
Triforis seranus P.J. Fischer, 1921: 244 (nom. nud.).

Triforis (*Monophorus*) *seranus* P.J. Fischer, 1927: 54, pl. 1, fig. 22.

Material.— Type material: Pliocene of Wai Foefa, eastern Seram, Moluccas, Indonesia (repository unknown); Rumphius Biohistorical Expedition (1990) station 5, off Galghoek, Ambon, Indonesia, 2-3 m, inside grey tubular sponge together with crabs and shrimps, 9 November 1990 (13 specimens in RMNH, 2 in Museum of New Zealand, Wellington).

Description.— Shell 6.20-8.00 (estimated) × 2.20-2.70 mm and with 12.5-14.0 (estimated) whorls at maturity, rather thin and brittle, weakly cyrtoconoid, spire 2.3-3.2 × as high as aperture plus canal.

Colour.— Protoconch very pale buff. Teleoconch translucent white.



Figs. 1-6. *Tetraphora (Costatophora) serana* (P.J. Fischer), off Ambon, Indonesia. 1, shell 6.05 × 2.20 mm; 2, first whorl of protoconch (subject width 230 μ m); 3, last 2 whorls of shell 2.20 mm wide; 4, protoconch and first teleoconch whorl (subject width 500 μ m); 5, 6, part of adult radula showing central (c), lateral (l) and marginal (m) teeth, scale bars = 10 μ m.

Protoconch of typical planktotrophic larval type, of 4 convex whorls, diameter 370-380 μ m, diameter of first whorl 180-200 μ m. First whorl reticulately sculptured with crisp spiral threads and axial riblets; subsequent whorls entirely traversed by fine axial riblets, and encircled by submedian spiral thread surmounting low angulation.

Teleoconch whorls broadly convex, sculptured with prominent, rounded axial costae, and weak, narrow, inconspicuous spiral grooves. No nodules or microsculpture. Axial entirely traversing spire whorls, evanescent on outer base, numbering 28-35 on

penultimate whorl. Spiral grooves similar, defining the edges of obsolete spiral cords, 3 on all spire whorls and 3 on base, adapical and abapical groove bordering suture. Base evenly contracted. Aperture ovate. Outer lip slightly flared at maturity, inner extremity not infolded. Parietal glaze thin, simple. No posterior notch. Anterior siphonal canal short, broad, open.

Animal white with well developed eyes.

Radula (figs. 5, 6) with the formula $1 + 1 + 1 + 1 + 1$. Central and lateral teeth subquadrate with short narrowly conical cusps. Central tooth medially cleft, with 4 cusps; lateral teeth with 3-5 cusps. Marginal teeth narrow, with 2 long narrow cusps.

Distribution.— Pliocene of Seram, and Recent off Ambon, Moluccas, Indonesia.

Remarks.— Recent specimens from Ambon are accordant with the original description and illustration of *Triforis seranus* from Pliocene beds of closely adjacent Seram Island. The original figured specimen of *T. seranus* (holotype?) is a fragment 5 mm long of a probable adult comprising only the last 5 whorls. *Tetraphora* (*Costatophora*) *serana* is outstanding among named triphorids in having a protoconch that is typical of triphorines with planktotrophic larval development coupled with a teleoconch sculpture of axial costae without the addition of spiral cords and nodules. The only Recent species with similar teleoconch sculpture is *Trifora? axialis* Barnard, 1963 from south of Madagascar at 400 m depth (Barnard, 1963). By comparison with the syntypes (South African Museum, Cape Town 29923), *T. axialis* differs in having a smooth, narrowly tapered, weakly cyrtocoid protoconch (probably lecithotrophic), a suprasutural spiral cord that is not covered by succeeding whorls, and a similar spiral cord on the outer base. There is no trace of spiral grooves on the spire, and there are instead some obscure raised spiral lines. Whilst it is highly unlikely that *T. axialis* belongs in *Costatophora*, its relationships are uncertain.

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