

Strebloceras oliverioi spec. nov., a new species from the southern Red Sea (Gastropoda, Caecidae)

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Strebloceras oliverioi spec. nov. is described on the basis of two specimens collected from a depth of 60-76 m in the southern Red Sea. The new species is characterized by a small size for the genus and by a large trochospiral protoconch with weak sinusigera.

Keywords: Caecidae, *Strebloceras*, new species, Red Sea.

INTRODUCTION

The genus *Strebloceras* Carpenter, 1859 includes tiny benthic marine gastropods distributed in the Indo-West Pacific. Fossil representatives occur in Europe and New Zealand in a wide temporal range spanning from the early Eocene to the early Miocene.

In this genus, the shell is characterized by a trochospiral protoconch and an openly-coiled tubular teleoconch. In contrast to the other members of the Caecinae, no truncation of the earlier portions of the shell occurs during ontogeny, and the protoconch is retained during the whole lifetime. This unique combination of characters led Bandel (1996) to the creation of the subfamily Strebloceratinae containing a single genus. To date, nothing is known about the soft parts of any species belonging to this genus and the placement of *Strebloceras* within the family Caecidae is justified by the synapomorphies shared with other members of this family such as the openly-coiled, tubular teleoconch with circular cross section and the small size.

In *Strebloceras*, both protoconch and teleoconch lack the complex ornamentation which is commonly found in other caenogastropods. Only in the case of *Strebloceras subannulatum* de Folin, 1880, a clear annular sculpture occurs, whereas other species are substantially smooth apart from the presence of growth lines or irregularly-spaced collabral

ribs. Therefore, distinguishing characters have to be determined in more subtle features, such as shape and size of the protoconch, presence and strength of the sinusigera, and size and shape of the teleoconch.

The genus *Strebloceras* has recently been revised and 7 species, spanning from early Eocene to Recent are considered valid so far, (Vannoizzi, 2016). No finding from the Plio-Pleistocene is known. Recent species include *S. subannulatum* de Folin, 1880, *S. pizzinii* Vannoizzi, 2016 and an unnamed species known only from a single specimen from the Red Sea. The discovery of an identical specimen from Yemen permitted us to ascertain the validity of the latter, which is formally described in the present paper.

MATERIALS AND METHODS

The following abbreviations are used: AMNZ = Auckland War Memorial Museum, Auckland, New Zealand; MCZR = Museo Civico di Zoologia, Rome, Italy; MZB = Museo di Zoologia dell'Università di Bologna, Bologna, Italy; sh = empty shell.

The new species is based on two specimens collected in 1992 by Antonio Bonfitto (MZB) in the framework of the RED SEA Expedition and by Marco Oliverio (Sapienza University of Rome, Rome, Italy) during deep water SCUBA sampling. Specimens are illustrated at the same magnification to facilitate comparison. The number of protoconch whorls were counted according to Verduin (1982).

SYSTEMATICS

Class Gastropoda Cuvier, 1797

Superfamily Truncatelloidea Gray, 1840

Family Caecidae Gray, 1850

Subfamily Strebloceratinae Bandel, 1996

Genus *Strebloceras* Carpenter, 1859

Type species (by subsequent designation of Finlay, 1931: 20): †*Strebloceras cornuoides* Carpenter, 1859 (Hamstead Beds, UK, early Oligocene).

Strebloceras oliverioi spec. nov.

(Fig. 1)

Strebloceras sp. A — Vannozzi, 2016: p. 118, fig. 3G-M.

Type material. — Holotype (sh) MZB 60080 from type locality, legit A. Bonfitto 4.ix.1992; paratype (sh) MCZR - Pizzini collection from Sudan, Sha'ab Rumi, 60 m depth, leg. M. Oliverio 3.ii.1992.

Type locality. — Southern Red Sea, offshore Yemen, 14°47'12"N, 42°33'22"E, 76 m depth, dredging, muddy sand (= station RS3, Marine Survey Red Sed '92 European Community Project, September 1992, Gulf of Aden and South Red Sea, n/o "Marion Dufresne").

Description. — Shell small for the genus. Protoconch low trochospiral, smooth, of about 1.9 whorls. Sinusigera notch very shallow. Teleoconch tubular, twisted, with circular cross section. Teleoconch initially tapering and then slowly growing until the aperture where the tube is slightly dilated. Sculpture of irregular collabral ribs, slightly inclined with respect to the axis of the tube. Aperture simple. Dimensions of the holotype: length 2.0 mm, aperture width 0.38 mm, protoconch diameter 340 µm.

Distribution. — Southern half of the Red Sea.

Etymology. — Dedicated to Marco Oliverio (Rome, Italy) for his contribution to malacology and to the knowledge of the family Caecidae in particular.

Remarks. — This species has been already illustrated by Vannozzi (2016) based on the paratype from Sudan, but its status remained pending due to the lack of comparative material which might allow a clear separation from the closely related *Strebloceras pizzinii*. Both species in fact show a similar overall appearance and are differentiated from *S. subannulatum* s.l. due to the large protoconch (diameter about 280 µm, 320 µm and 340 µm for *S. subannulatum*, *S. pizzinii* and *S. oliverioi* spec. nov., respectively) showing the same number of whorls and the lack of a pronounced sinusigera. The discovery of an identical specimen from Yemen enabled us to confirm the differences with *S. pizzinii*, which shows a different protoconch. In fact, in the new species the protoconch is wider and more depressed than in *S. pizzinii*. In particular, in the new species the last portion of the protoconch expands more rapidly, resulting in a more elliptical outline. *Strebloceras oliverioi* strongly recalls also *S. hinemoa* Finlay, 1931 from the early Miocene of New Zealand (Fig. 2), which shows a similar protoconch. However, the latter shows a larger, more inflated and less curved teleoconch and a larger and more globose protoconch.

DISCUSSION

Fossil species include *S. cornuoides* Carpenter 1859, *S. ed-*



Figs 1-2. *Strebloceras* taxa. Fig. 1. *Strebloceras oliverioi* spec. nov., holotype (MZB 60080). Fig. 2. *Strebloceras hinemoa* Finlay, 1931, syntype (AMNZ AK 70730). Scale bars: 500 µm (Figs 1a-b, 2a-b); 100 µm (Figs 1c-d).

wardsi (Deshayes, 1861) and *S. bezanconi* (Cossmann, 1888) from Europe and *S. hinemoa* and *S. sp.* Beu & Maxwell, 1990 (undescribed) from New Zealand. Only *S. bezanconi* shows a paucispiral protoconch of about 1 whorl, whereas in all other species, either extant or fossil, the protoconch is multispiral with about 2 whorls. All fossil species are smooth and are mainly distinguished from each other by the shape of the teleoconch. Moreover, the transition between protoconch and teleoconch is simple without sinusigera. On the contrary, all three extant species show a more or less developed sinusigera.

Strebloceras subannulatum from Hawaii is characterized by a relatively small protoconch and a slender teleoconch showing a fine sculpture of well-defined collabral rings. The protoconch shows a clear sinusigera with rather deep notch and a thickened lip, easily visible also by light microscopy.

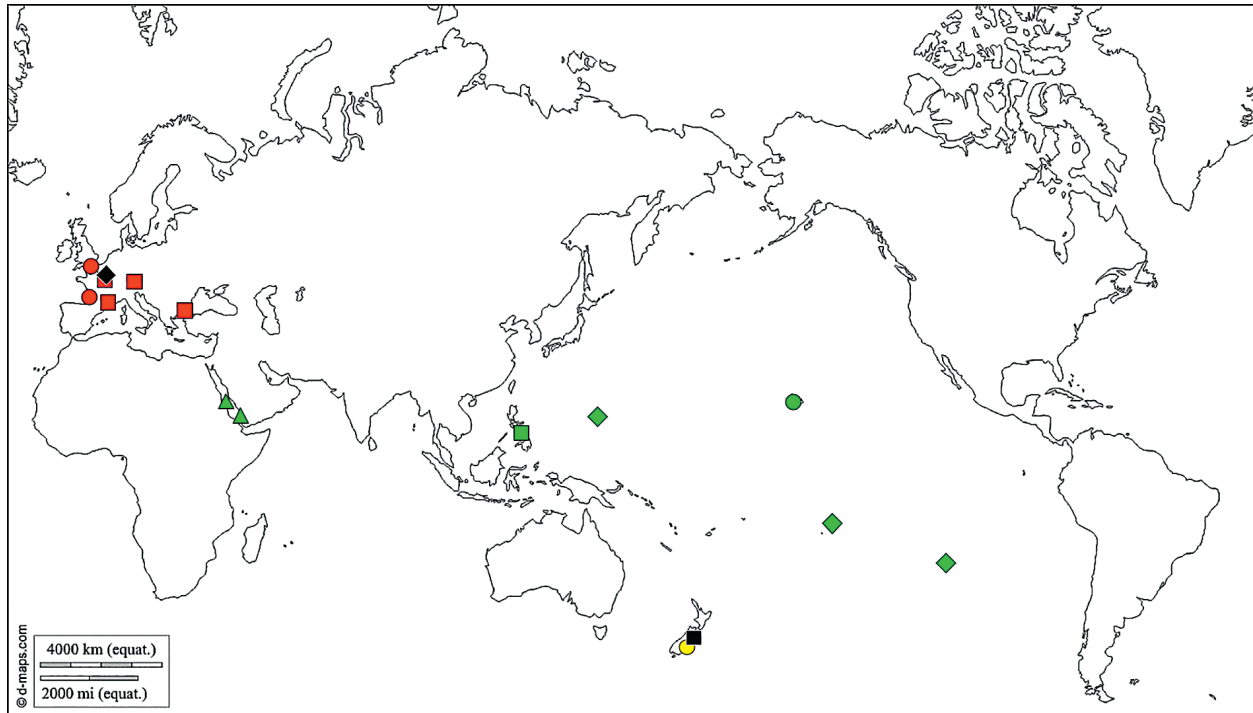


Fig. 3. Distribution of the genus *Strebloceras* based on published literature (Vannozzi, 2016 and references therein). *Strebloceras* spec. nov. Beu & Maxwell, 1990, early Eocene (black square); *S. bezanconi* (Cossmann, 1888), middle Eocene (black diamond); *S. cornuoides* Carpenter, 1859, early Oligocene (red circle); *S. edwardsi* (Deshayes, 1861), early Oligocene (red square); *S. hinemoa* Finlay, 1931, early Miocene (yellow circle); *S. subannulatum* de Folin, 1880, Recent (green circle); *S. cf. subannulatum*, Recent (green diamond); *S. pizzinii* Vannozzi, 2016, Recent (green square); *S. oliverioi* spec. nov., Recent (green triangle).

Other populations from the Indo-West Pacific, e.g. Northern Mariana Islands (Pizzini et al., 2013), French Polynesia (Pizzini & Raines, 2011; Vannozzi, 2016) and Easter Island (Raines & Pizzini, 2005), have been reported under this name. They share with *S. subannulatum* a similar protoconch, albeit slightly larger, with a pronounced sinusigera notch, but they show a different shape of the teleoconch. However, more material is necessary to evaluate the relationship between these populations and de Folin's species.

Strebloceras kilburni Pizzini, Raines & Vannozzi, 2013 differs from all other known congeners by the planispiral paucispiral protoconch and the conical, almost straight teleoconch. However, this species has been recognized as the young stage of *Mauroceras rhinoceros* (Pizzini, Raines & Vannozzi, 2013) and became a junior synonym of the latter (Vannozzi, 2019).

Strebloceras pizzinii Vannozzi, 2016 from the Philippines, although based on a single specimen, is easily separated from *S. subannulatum*. The shell of *S. pizzinii* differs by bearing a larger and differently-shaped protoconch, by the presence of a very shallow sinusigera notch and by lacking a thickened lip. The teleoconch is also more cylindrical.

Strebloceras oliverioi spec. nov. is distinguished from *S. pizzinii* by the larger and more depressed protoconch,

which is expanded in the last portion, resulting in a different attachment of the teleoconch (compare both species in Vannozzi, 2016: fig. 3).

Regarding the extant species, *Strebloceras subannulatum* is uncommon, lives in shallow water and has been reported by several authors (Kay, 1979; Draper, 1985; Lightfoot, 1992; Vannozzi, 2016), whereas the other two species are quite rare and seem to occur in deeper waters. On the other hand, fossil representatives of this genus are known from Europe (middle Eocene to early Oligocene) and New Zealand (early Eocene and early Miocene) (Fig. 3). No findings of this genus are known from the Plio-Pleistocene worldwide and this stratigraphical gap raises questions. Shell decoiling, has occurred in other families such as Planorbidae and Hydrobiidae (Brusina, 1882; Harzhauser et al., 2002; Neubauer et al., 2013; Hershler & Longley, 1986). Therefore, it can also be hypothesized that either Recent species are unrelated to fossil species or that the European species from the Paleogene and the Indo-West Pacific species (Paleogene to Recent) actually belong to two distinct lineages. However, the limited amount of available material does not allow definition of the real scenario with certainty.

CONCLUSION

Strebloceras oliverioi spec. nov. was described. Compared to both fossil and extant representatives of the genus, it is characterized by the small size and the large protoconch with an expanded last portion. The new species is known so far only from the southern Red Sea.

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