

MEDITERRANEAN NEOGENE *STHENORYTIS*: TAXONOMIC AND NOMENCLATURE STATUS OF BROCCHI'S (1814) *TURBO RETUSUS* AND *TURBO TROCHIFORMIS* (GASTROPODA EPITONIIDAE)

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Abstract The taxonomic and nomenclature status of the two earliest established Mediterranean *Sthenorytis* species: *Turbo retusus* Brocchi 1814 and *Turbo trochiformis* Brocchi 1814, was re-examined. The identity of *Turbo retusus* remains uncertain because there are no specimens with certain type status or topotypes on which to designate a neotype. In fact, we agree with de Boury (1890) that Brocchi had no specimens of this species and that he described it on the basis of Monti's (1746) figure, the specimen of which has been lost. The identity of *Turbo trochiformis* was clarified, designating the only existing historical topotype as neotype.

INTRODUCTION

Sthenorytis Conrad 1862, includes unusual, conspicuous, medium to large epitoniids with solid, imperforate, turbinated shell having strong axial lamellate ribs and a round aperture, downwards inclined with respect to axis.

The few living species occur in the West Indies, the Pacific coasts of Central and South America and the Galapagos Islands, but fossil species are known from the late Miocene to Recent of the Americas, the Miocene of Atlantic Africa and the late Eocene to Pliocene of Europe (de Boury, 1912; Darteville & Roger, 1951).

Reports from the Mediterranean are frequent from Miocene sites but rather scarce from Pliocene ones and their taxonomic and nomenclature setting has not been revised since classical papers by de Boury (1890, 1912) and Sacco (1891).

In this paper, we analysed the taxonomic and nomenclature status of the two earliest established Mediterranean species: *Turbo retusus* Brocchi 1814 and *Turbo trochiformis* Brocchi 1814.

HISTORICAL BACKGROUND

The main steps in the discovery of fossil Mediterranean *Sthenorytis* are: some early eighteenth century reports; the description of the first

two species by Brocchi (1814); two independent, but very different, coeval late nineteenth century revisions by De Boury (1890) and Sacco (1891), respectively; and a final revision by De Boury (1912).

There are at least four eighteenth century reports of *Sthenorytis* from the Neogene of the Mediterranean. Three are well known (Monti, 1746; Davila, 1767; Soldani, 1780; see de Boury, 1890) and one was only recently discovered (Bartalini, 1776; see Manganelli *et al.*, 2011). The first two reports, one by Monti (1746: 295, pl. 8, fig. 8) from Monte di San Luca near Bologna and the other by Davila (1767: 59, pl. 2, fig. F) from an unknown Italian locality, concern Miocene specimens (de Boury, 1890). The other two reports, one by Bartalini (1776: 129) and another by Soldani (1780: 29, 113, Pl. 10, fig. EE) concern Pliocene specimens from southern Tuscany. As regards the former, Bartalini first mentioned this epitoniid, without details, in a list of Siennese fossils, published as an appendix to a catalogue of wild plants growing around Siena, and then in an unpublished memoir of 1777, where he reported to have examined three specimens belonging to two collectors (Manganelli *et al.*, 2011). On the contrary, Soldani (1780) stated to have examined two specimens found near Montalcino, one kept in the Museo d'Istoria Naturale of the Olivetan Benedictine Abbey of Monte Oliveto Maggiore and the other, that illustrated, belonging to Giuseppe Baldassarri.

Many years later, Brocchi (1814) described two new species: *Turbo retusus*, quoting the Miocene specimen reported from San Luca by Monti (1746); and *Turbo trochiformis*, quoting the Pliocene specimens reported from Montalcino by Soldani (1780). These species were occasionally reported again but only one (*Turbo retusus*) on the basis of new material (see synonymies given by de Boury, 1890 and Sacco, 1891).

De Boury (1890) carefully revised all the records of Miocene and Pliocene Italian *Sthenorytis*, re-described Brocchi's species and established the new species *Scalaria (Sthenorytis) globosa*. He surmised that Brocchi (1814) had not found *Scalaria retusa* and *Scalaria trochiformis* again but had based his description of the former on Monti's figure and that of the latter on Baldassari's (or his heirs') material. Concerning *Scalaria retusa*, de Boury received a very fine topotype from L. Foresti (de Boury, 1890: pl. 4, fig. 15) (Fig. 1) which he designated "post-type" (an obsolete term for neotype; Hawksworth, 2010), but this cannot be considered a valid neotype designation because it did not fulfil the provisions of Art. 75.3 of ICZN (1999). According to de Boury, this specimen showed that Monti's figure was not accurate: its general shape was too globose, the ribs were incorrectly depicted (they lack peripheral thorns) and the peristome too thickened. He received some more specimens from D. Pantanelli: they came from a different locality (Pantano) and resembled the variety *spinosa* established by Bellardi & Michelotti (1841).

Concerning *Scalaria trochiformis* de Boury claimed to know only three specimens of this species which had never been reported again since the eighteenth century: one collected at Bacedasco, received from D. Pantanelli (1), one without collecting data, kept in the Museum of Paris (2), and one from Île de Cos, studied by Tournouër (1876) and kept in the Museum of Sorbonne. A fourth specimen from "Plaisantin" was received later from L. Foresti. He intended to designate the second specimen (that without collecting data) as the "post-type" and to illustrate the one from the Île de Cos in his *Monographie des Scalaridae*.

Finally, de Boury described the new species *Scalaria globosa* on specimens from Italian Late Miocene and Pliocene, selecting a specimen from Castellarquato as type. This species, already reported as *Scalaria retusa* (e.g. Michelotti, 1847;

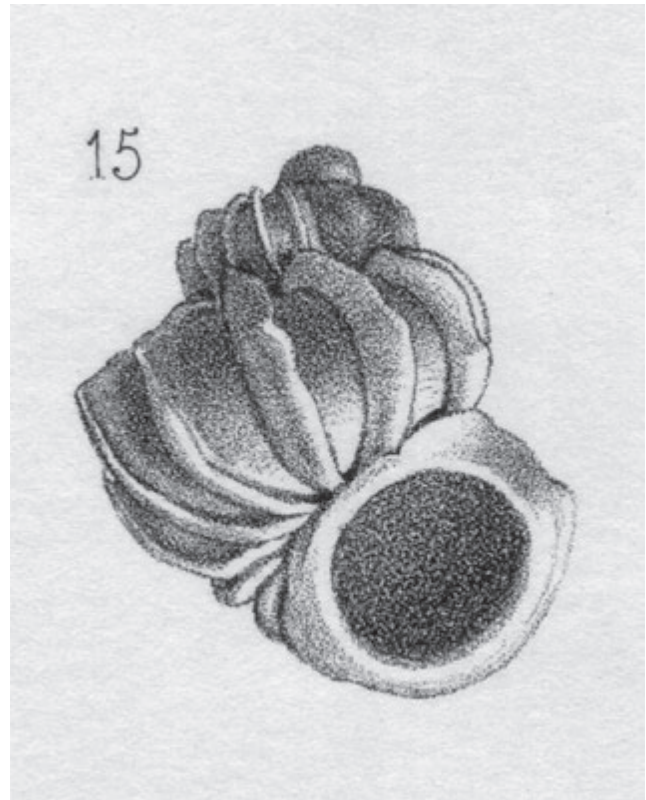


Figure 1 *Sthenorytis retusus* (Brocchi 1814). Topotype from San Luca, collected by L. Foresti and published by de Boury (1890: pl. 4, fig. 15). The figure was upside down and larger than the original (which was 22 mm in height).

Montagna, 1864), was distinct from the other two by virtue of its more numerous and less flexuous ribs.

Sacco's (1891) contribution, in Bellardi & Sacco's series on *I molluschi dei terreni terziari del Piemonte e della Liguria*, was based on such an abundance of material, from many different localities in northern Italy spanning a large stratigraphic gap (Oligocene to Pliocene) that probably no one after him examined so many specimens. Sacco identified 22 taxa (8 species and 14 varieties), 18 of which were described as new. As usual his taxonomy was poor: description of intra- and inter-taxa variability is inaccurate; varieties were described with reference to a typical form (named "species typica"); and usually no detailed remarks were given. He did not make any comment about *Scalaria trochiformis* but dealt extensively with *Scalaria retusa*, observing that it was common in the Helvetian of Piedmont and highly variable. He did not redescribe the species, but established four new taxa as varieties,

differentiating them from the typical form, and postulated that a species from the Tongrian of Carcare (*Scalaria pseudoretusa*), assigned to the subgenus *Cirsotrema*, was the ancestor of *Scalaria retusa*.

In 1912, de Boury published an exhaustive revision of *Sthenorytis* based on literature and collections of the Museum of Paris. In this monograph, overlooked by most scholars recently involved in the subject, he listed 37 *Sthenorytis* species, both fossil and extant. Since he did not use varietal taxa, he regarded some of Sacco's varieties as full species and others as synonyms. Remarkably, he considered *Scalaria retusa* to be a species from the Early Miocene (Aquitanian), to which three of the varieties described by Sacco (1891) must be assigned as synonyms (he regarded a fourth as a distinct species). Concerning *Scalaria trochiformis*, he did not add much to what he had already written in 1890.

THE STATUS OF *TURBO RETUSUS* BROCCHI 1814

De Boury (1890) stated that probably Brocchi (1814) had never again found *Sthenorytis retusa* and based his description on Monti's (1746) figure. However, Rossi Ronchetti (1955) found a fine specimen assigned to this species in what remains of Brocchi's collection at Museo Civico di Storia Naturale of Milan (MSNM i 5023) and regarded it as the holotype (see also Pinna & Spezia, 1978).

We agree with de Boury (1890) that Brocchi had no specimens of this species and that he described it on the basis of Monti's figure. This would imply that the specimen identified as the holotype by Rossi Ronchetti (1955) has no type status because it did not originally belong to Brocchi's collection or may have been acquired after the publication of *Conchiologia*.

The specimen is accompanied by three labels (apparently none written by Brocchi), which do not report any information useful for establishing when it was collected (1st label – XIII/25 *T. retusus* nob. N. 193 / M.te S. Luca; 2nd label – 189 / *Turbo retusus* / Brocchi; 3rd label – *Turbo retusus*, Br. / Terziario / M. San Luca (Bologna); A. Garassino, pers. comm., 9 June 2010). If Brocchi really did possess this specimen, it is amazing that he did not illustrate it, considering that he figured almost all the taxa he described as new.

This specimen agrees very well with the Pliocene specimens assigned to *Sthenorytis trochiformis* but it is slightly different from that from San Luca, collected by Foresti and depicted by de Boury: the former has a conical shell with four whorls and the latter a globose shell with three whorls respectively.

Monti's specimen is not present in what remains of the eighteenth century collections of the Istituto delle Scienze di Bologna (Sarti, 1988; D. Scarponi, pers. comm., 16 September 2010) and Foresti's specimen studied by de Boury (1890) no longer exists in Foresti's collection (D. Scarponi, pers. comm., 16 September 2010). Consequently this nominal taxon has no specimens with certain type status or topotypes.

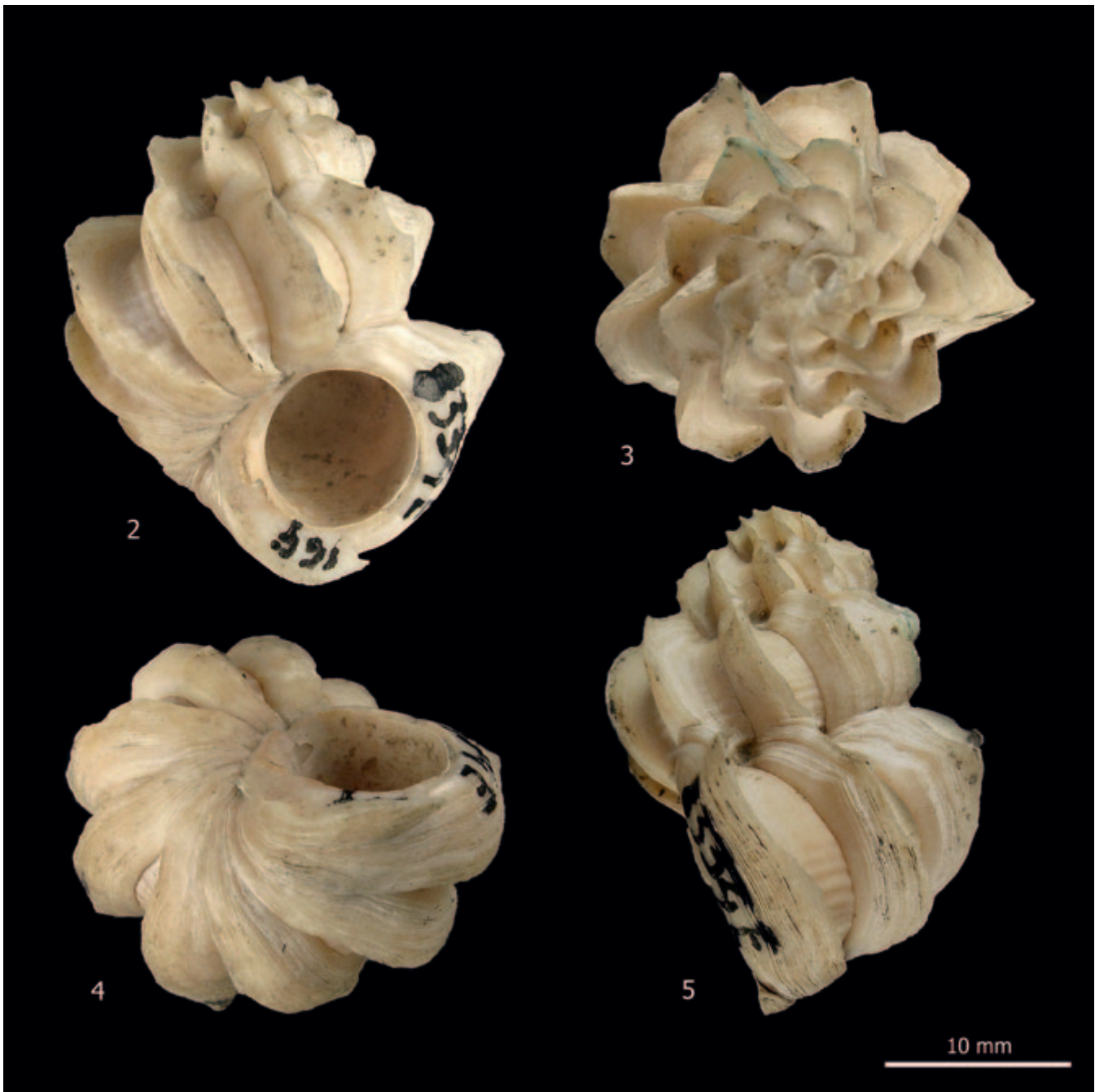
THE STATUS OF *TURBO TROCHIFORMIS* BROCCHI 1814

Turbo trochiformis Brocchi 1814, is a junior primary homonym of *Turbo trochiformis* Born 1778, now *Trochita trochiformis* (Gastropoda, Calyptraeidae). As both names are in use to denote valid taxa which have not been considered congeneric after 1899, the case is ruled by Art. 23.9.5 of ICZN (1999) and will be referred to the ICZN for a ruling under the plenary powers. Meanwhile the prevailing use of both names has to be maintained.

De Boury hypothesized that Brocchi (1814) described it using material of Baldassarri (or his heirs). Indeed Brocchi quoted a figure by Soldani (1780), who examined two specimens found near Montalcino, one kept in the Museo d'Istoria Naturale of the Olivetan Benedictine Abbey of Monte Oliveto Maggiore and the other, the one illustrated, belonging to Giuseppe Baldassarri.

No historical specimen of this rare and interesting species is still extant at Monte Oliveto Maggiore or in Siena. The one kept in the Museo d'Istoria Naturale of the Abbey was probably lost when the museum was closed and its collection dispersed on suppression of ecclesiastical institutions by Napoleon in 1808, and Baldassarri's specimen is no longer to be found in the Museo di Storia Naturale dell'Accademia dei Fisiocritici, where his collection was transferred in 1786.

A historical specimen from the Siena area (Figs 2–5) exists in the Museo di Storia Naturale dell'Università di Firenze (no. IGF 8334E). It



Figures 2–5 *Sthenorytis trochiformis* (Brocchi 1814). Neotype of *Turbo trochiformis* Brocchi, 1814, from “Senese” (Museo di Storia Naturale dell’Università di Firenze, no. IGF 8334E); apertural (2), apical (3), basal (4) and right lateral (5) views.

might be one of the two studied by Soldani. In fact, the collection he used for his *Saggio oritografico* is kept in this museum (Giuli, 1838; Campani, 1862; Fornasini, 1894). Recently, it was erroneously reported by Chirli (2009) as coming from Orciano and belonging to Cesare D’Ancona’s collection. This specimen currently bears an early 20th century label reporting “Ant.

Coll. del Museo / Senese?”. The notation “Ant. Coll. del Museo” usually refers to material existing in 1842 when Gaspare Mazzi compiled the first catalogue of the palaeontological collections (S. Dominici, pers. comm., 8 June 2010).

This specimen is the only existing topotypical specimen of *Turbo trochiformis* (since no one has ever found this species again in the Siena area;

see also De Stefani & Pantanelli, 1878–80). It is also probably the one depicted by Soldani in his *Saggio orittografico*, although the very poor figure makes this impossible to establish with certainty. Consequently it is here designated as the neotype of Brocchi's species.

DISCUSSION

The identity of *Turbo trochiformis* is clarified by designation of the Florence specimen as neotype, while that of *Turbo retusus* remains uncertain because this nominal taxon has no specimens with certain type status or topotypes on which to designate a neotype. In fact, the specimen in Brocchi's collection is of uncertain status and matches the Pliocene specimens assigned to *Turbo trochiformis*. *Turbo retusus* may therefore only be interpreted on the basis of the topotype illustrated by de Boury (1890: pl. 4, fig. 15) (Fig. 1), Monti's figure being too poor. This specimen is quite different from the Pliocene ones assigned to *Sthenorytis trochiformis* and consequently Brocchi's *Turbo retusus* and *Turbo trochiformis* may be regarded as distinct species at least for the present. New specimens from the type locality or from other sites close and coeval to the type locality are needed for a better understanding of this nominal taxon. The specimen studied by de Boury could be designated as neotype (the fact that it is no longer extant does not preclude this), but this would bias a future neotype designation, in the eventuality of new topotypes (designating the specimen studied by de Boury as neotype is still possible if new topotypes will not be found).

Besides *Sthenorytis trochiformis*, another *Sthenorytis* species occurs in the Mediterranean Pliocene, namely *Sthenorytis globosa* (de Boury 1890). It differs from *Sthenorytis trochiformis* by virtue of its more numerous and less flexuous ribs and an evident basal auricle of the peristome. The specimen reported by Palazzi (1999) as *Sthenorytis retusa* from Pliocene of Milazzo (Sicily) belongs to this species.

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