

New data on *Stenoplax veneta* (Mollusca: Polyplacophora: Ischnochitonidae) from the Oligocene of Italy

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Abstract

Stenoplax veneta Dell'Angelo & Palazzi, 1992 was described from the Lower Oligocene (Rupelian) of Case Soghe (Arcugnano, Vicenza), on the basis of four valves, the holotype (a tail valve) and three paratypes (a head and two tail valves). Only a tail valve (paratype) was figured in dorsal view, and so many characters of the species were not adequately illustrated. The new material found in recent years, in the same outcrop, consists of five valves (two intermediate and three tail valves), enabling to improve the main characters description of this rare species, which is the only known from the Oligocene of Italy.

Key words

Ischnochitonidae, Systematic, Oligocene, Case Soghe, NE Italy.

Riassunto

Stenoplax veneta Dell'Angelo & Palazzi, 1992 è stata descritta per l'Oligocene inferiore (Rupeliano) di Case Soghe (Arcugnano, Vicenza), sulla base di quattro piastre, l'olotipo (una piastra posteriore) e tre paratipi (una piastra anteriore e due piastre posteriori). Solo una piastra posteriore (paratipo) è stata illustrata in vista dorsale, e pertanto molte caratteristiche della specie non sono state supportate da una documentazione adeguata. Recentemente, nella stessa località, è stato rinvenuto del nuovo materiale, cinque piastre in tutto, due intermedie e tre posteriori, che ci consente di completare la descrizione di questa rara specie, l'unica conosciuta nell'Oligocene italiano, ed illustrare più dettagliatamente i suoi principali caratteri diagnostici.

Parole chiave

Ischnochitonidae, Sistematica, Oligocene, Case Soghe, Italia settentrionale.

Introduction

The knowledge of the chiton fauna from the Cenozoic of Italy has been greatly developed in recent years, with many works relating to Neogene (Laghi, 1977; Dell'Angelo & Palazzi, 1989; Dell'Angelo et al., 1999, 2001, 2012a, 2013, 2014; Chirli, 2004; Dell'Angelo & Bonfitto, 2005). Very scarce are instead the data from Paleogene, with only two records, a single indeterminate chiton valve (Genus indet. sp.) from the Middle Eocene (Lutetian) of the Grola Quarry (Cornedo Vicentino, Vicenza) (Dell'Angelo et al., 2012b) and a species described from the Lower Oligocene (Rupelian) of Case Soghe (Arcugnano, Vicenza), *Stenoplax veneta* Dell'Angelo & Palazzi, 1992. The latter was so far known by a few (one head and three tail) valves only. Newly collected material comprises also intermediate valves, permitting us to re-describe and illustrate this rare species.

Materials and methods

The collected chiton valves were found by one of the authors (E. Quaggiotto) and by Luca Bertolaso (Reggio Emilia) and Paolo Mietto (University of Padova) in the outcrop of Case Soghe, during many years of research in the Monti Berici area. The valves were collected both

manually inside the exposure of the sediments and by picking after the wet-sieving (sieve mesh width 0.5, 1.0, and 2.0 mm) of bulk samples.

The Oligocene outcrop of Case Soghe (Fig. 1), located in the eastern-central side of Monti Berici (near Monte Lungo, Arcugnano, Vicenza, NE Italy) was first discovered and described by Rossi (1962); it is composed of whitish sparsely fossiliferous limestones, of lagoon origin pertaining to the upper fraction of Lower Oligocene (Upper Rupelian). The samples were collected in a small exposure of brownish yellow silty sandstone capping, in stratigraphic unconformity, a "Pietra di Vicenza" quarry near Case Soghe (Mietto, 1988, 1997). The overlying levels described by Rossi (1962) are formed by a series of arenaceous-clayey levels of volcanic origin, including a fauna of corals and molluscs, studied by Accorsi Benini (1971, 1974), rare decapod crustaceans (De Angeli & Beschin, 2008; De Angeli et al., 2010), and plant remains (Charrier, 1962).

In the sampled strata shells are not abundant (Dell'Angelo & Palazzi, 1992), and generally in far better condition respect to similar aged samples coming from other Venetian outcrops; the finer details of the sculpture are also sometimes preserved, but this is quite rare and more commonly they are scantily visible. Fig. 2 shows the status of the outcrop of Case Soghe (Vicenza) in 2008.



Fig. 1 - Location map.

Fig. 1 - Ubicazione dell'affioramento.

The following abbreviations are used:

BD = B. Dell'Angelo collection, Genova, Italy (will be deposited to MZB).
MGP-PD = Museo geo-paleontologico dell'Università di Padova, Italy.
MZB = Museo di Zoologia dell'Università di Bologna, Bologna, Italy.

Systematics

Order Chitonida Thiele, 1909
Suborder Chitonina Thiele, 1909
Family Ischnochitonidae Dall, 1889

Genus *Stenoplax* Dall, 1879

Type species

Chiton limaciformis Sowerby, 1832, by original designation.

Remarks

Stenoplax is a distinct taxon whose members are highly elongate, and whose intermediate valves have prominent sutural laminae and generally raised lateral areas. The depressed and much more elongated tail valve (relative to other valves) with prominent diagonal line is diagnostic for this genus.

Distribution

East Pacific Ocean (from Canada to Peru), Indo-Pacific Ocean (from Japan to India), Indian Ocean (Madagascar)

scar), West Atlantic Ocean (from Florida to Brazil). Eocene - Recent.

Stenoplax veneta Dell'Angelo & Palazzi, 1992 Figs 3A-L

Stenoplax veneta Dell'Angelo & Palazzi, 1992: 27, figs 1-3.
Stenoplax veneta - Schwabe, 2005: 104.

Stenoplax veneta - Dell'Angelo et al., 2011: 941, 953.

Stenoplax veneta - Dell'Angelo et al., 2012b: 27.

Stenoplax veneta - Dell'Angelo et al., 2014: 51, pl. 1, figs 1-9.

Material examined

Case Soghe: holotype (tail valve, MZB 10301) and three paratypes (a head and two tail valves, BD 3039, Figs 3A-C, 3G-H); 2 intermediate (maximum width 2.7 mm, Figs 3I-J) and 1 tail valves (width 4 mm, Figs 3D-F) (BD); 1 tail valve (MGP-PD 31475, width 3.8 mm, Fig. 3K); 1 tail valve (MGP-PD 31476, width 3 mm, Fig. 3L).

Description

Head valve (paratype) probably semicircular (it is made by a fragment about half of the valve, Figs 3G-H). Intermediate valve rectangular, anterior margin straight, posterior margin seem straight for the visible part, lateral area poorly defined, not distinctly separated by central area, only a sign of a diagonal fold between lateral and central areas is present, but hardly evidenced. Tail valve semi-elliptical, depressed, anterior margin almost straight, mucro subcentral, not elevated, antemucronal



Fig. 2 - Field image of the Oligocene outcrop of Case Soghe (Vicenza).

Fig. 2 - Veduta dell'affioramento oligocenico di Case Soghe (Vicenza).

slope straight or slightly convex, postmucronal slope almost straight just behind the mucro.

Tegumentum fully covered by small granules, irregularly disposed and some coalescing in head valve, lateral areas of intermediate valves and postmucronal area of tail valve, arranged in groups that seem obliquely directed in central area of intermediate valves and in antemucronal area of tail valve. Marked concentric lines of growth are visible on the postmucronal area of the tail valve.

Articulamentum with trapezoidal apophyses in tail valve, separated by a straight sinus, teeth short and irregular, slit formula: ? / 1? / 12-16.

Remarks

This is the sole described polyplacophoran species from the Oligocene of Italy. Originally it was described on four terminal valves only, and the morphology of the intermediate valves was unknown. A tail valve has been figured in dorsal view only, and some species characters were not sufficiently documented. The new material found in recent years consists of two intermediate and three tail valves, which for the first time allows a more comprehensive study, including the evaluation of the intermediate valves.

The valves are generally abraded and in some cases fragmented, making some characters (e.g. the apex, the profile, and the apophyses of the intermediate valves) still unknown. Also the lateral margin of the intermediate valve is not complete, and the slits in the articulamentum are not clearly visible, but it is possible to see tracks of the openings of a slit ray (**Fig. 3J**), so we can suppose that at least one slit is present.

There is a certain variability in the tail valve, the number of slits is 12 in the paratype (**Fig. 3B**), 16 in the BD valve (**Fig. 3E**), while the shape is much constant, the length/width ratio has a range between 0.70 (the holotype, see Dell'Angelo & Palazzi, 1992: fig. 1) and 0.74 (the paratype, **Fig. 3A** and the BD valve, **Fig. 3D**).

Not all characters of the species match those of the genus *Stenoplax*. The lateral areas of *Stenoplax* species are generally rather elevated (Kaas & Van Belle 1987: p. 124; Vendrasco et al. 2012: p. 34), but are little raised and poorly defined in our species. However, the same characteristic is seen in other *Stenoplax* species, e.g. *S. marnusi* (Righi, 1971).

The fossil record for *Stenoplax* is largely incomplete, and the few available records do not allow us to suggest a diversification scenario for the group. The oldest records are from the Eocene deposits of Europe, United Kingdom (Wrigley, 1943) and Ukraine (Bielokrys, 1999), and from the latest Eocene or earliest Oligocene of Washington, U.S.A. (Puchalski et al., 2008; Dell'Angelo et al., 2011). The only other fossil records of the genus *Stenoplax* are from the Miocene (Tortonian) of Italy (Dell'Angelo et al., 2014), the Plio-Pleistocene deposits of California, U.S.A. (Vendrasco et al., 2012 and the references listed therein), and an undetermined species from the Pleistocene of Japan (Itoigawa et al., 1976, 1978).

Distribution

Stenoplax veneta is known only from the Lower Oligocene of Case Soghe (Arcugnano, Vicenza, NE Italy).

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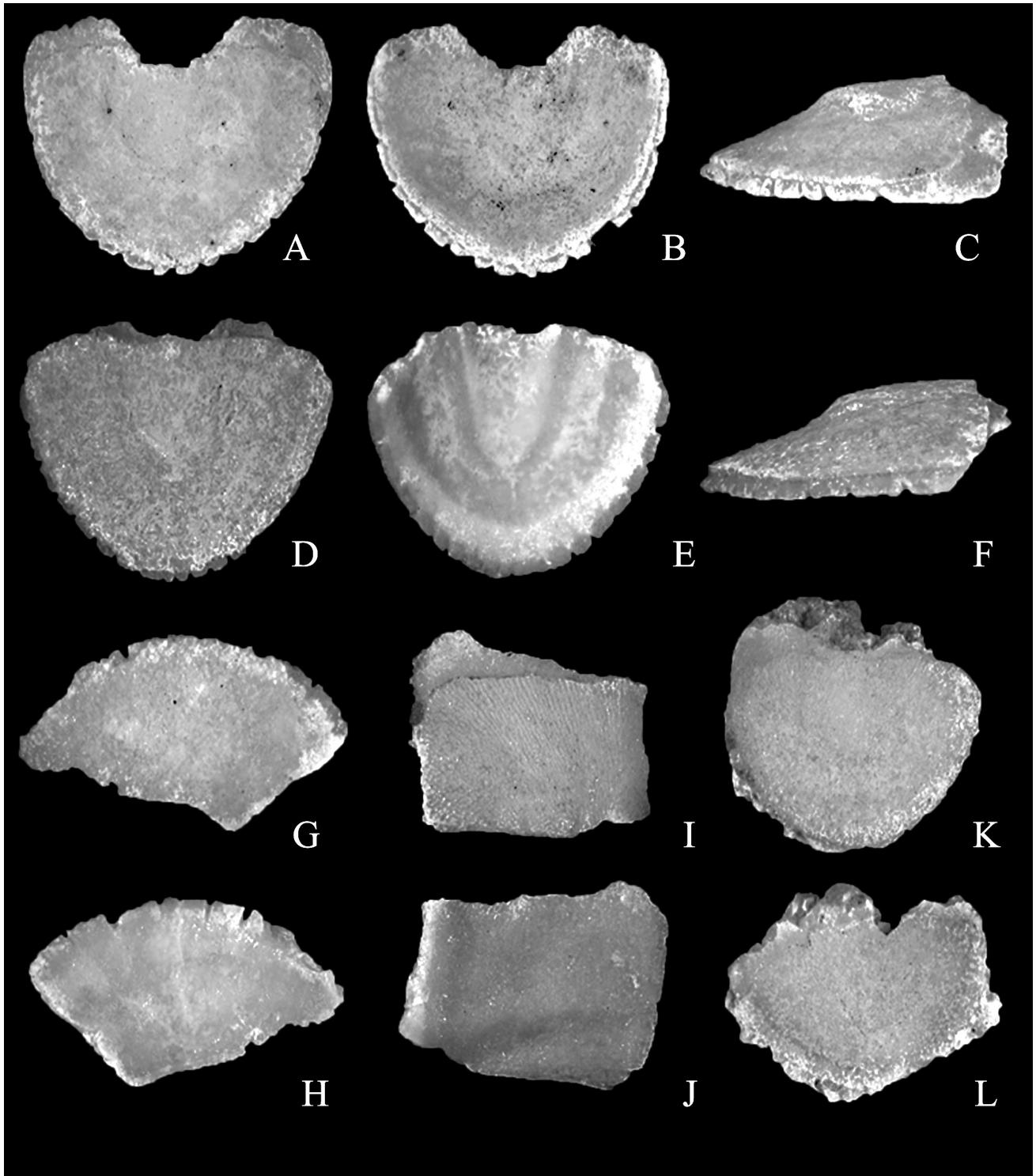


Fig. 3A-L. *Stenoplax veneta* Dell'Angelo & Palazzi, 1992, Case Soghe (Arcugnano, Vicenza), Rupelian Stage (Lower Oligocene). **A-C.** Paratype, tail valve, BD 3039, dorsal, ventral and lateral views, respectively. **D-F.** Tail valve, BD, width 4 mm, dorsal, ventral and lateral views, respectively. **G-H.** Paratype, head valve, BD 3039, dorsal and ventral views, respectively. **I-J.** Intermediate valve, BD, width 2.7 mm, dorsal and ventral views, respectively. **K.** Tail valve, MGP-PD 31475, width 3.8 mm, dorsal view. **L.** Tail valve, MGP-PD 31476, width 3 mm, dorsal view.

Fig. 3A-L. *Stenoplax veneta* Dell'Angelo & Palazzi, 1992, Case Soghe (Arcugnano, Vicenza), Rupeliano (Oligocene inferiore). **A-C.** Paratipo, piastra posteriore, BD 3039, viste dorsale, ventrale e laterale. **D-F.** Piastra posteriore, BD, larghezza 4 mm, viste dorsale, ventrale e laterale. **G-H.** Paratipo, piastra anteriore, BD 3039, viste dorsale e ventrale. **I-J.** Piastra intermedia, BD, larghezza 2.7 mm, viste dorsale e ventrale. **K.** Piastra posteriore, MGP-PD 31475, larghezza 3.8 mm, vista dorsale. **L.** Piastra posteriore, MGP-PD 31476, larghezza 3 mm, vista dorsale.

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