Synonyms in a recently (2024) described fossil strombid species from Indonesia, Java (Gastropoda, Stromboidea, Strombidae), and comments on the validity of the new genus into which the species has been placed

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ABSTRACT

The Miocene genus *Javastrombus* Altaba, 2024 was described, including six new species from the same fossil beds in Indonesia, south central Java. Only a few weeks later V. Liverani (2024) described the same fossil named *Persististrombus bogoriensis*, so in a different genus. Five of the six fossil species described by Altaba are made synonym of the typespecies of his new genus by lack of clear differences, the minor differences mentioned are well within the variability of this species. *Persististrombus bogoriensis* Liverani, 2024 is synonymzed with *Javastrombus praegracilis* Altaba, 2024. Comments on the generic placement are made and *Javastrombus* is accepted herein.

Key words – Strombidae, *Javastrombus, Persististrombus, Thetystrombus,* taxonomy.

INTRODUCTION

Fossil Strombidae and Cypraeidae have roused a renewed interest of collectors and authors, especially the newly discovered beds in Indonesia render new species in an excellent quality of preservation. There is a sort of rat race going on in species descriptions, both Altaba and Liverani were, unaware of each other intentions, describing a new Miocene strombid species from Java. As Altaba, 2024 was published first, the name given to the species by Liverani becomes a synonym.
Both articles are interesting in the sense that the same species was placed in 2 different genera by the two authors, Altaba introduced a new genus, *Javastrombus,* for his six new species. In the paper of Liverani (2024), the new species is described in the genus *Persististrombus* Kronenberg & H. G. Lee, 2007.

Remark: The article of Altaba was written in the Catalan language, which is a pity as most of the readers of this article do not speak this language. Articles describing new taxa should preferably be written in the English language, so that it is understandable to most readers (this is also applicable for other languages as Dutch, French, German, Chinese, etc.).

Abbreviations:
AMD – (the collection of) Aart M. Dekkers, the Netherlands
CRA – (the collection of) C. R. Altaba, Spain
L – length of the shell
NHMW - Natural History Museum Vienna, Vienna, Austria

MATERIAL AND METHODS

Some of the material described here is deposited in the Natural History Museum Vienna (NHMW).
Matrix for geological dating was taken from three samples at random. Preparation for smear slides followed the standard method described by Perch-Nielsen (1985a, b). Nannofossil identifications were made using light-microscopy (Leica DMLP). All samples were investigated under 1000× magnification with parallel and crossed nicols. Biostratigraphic assignments were made in accordance with the nannoplankton zonation of Martini (1971).

GEOLOGICAL SETTING

The second author made a review of content of the matrix taken out of the aperture of the fossil shells. The sample contains common calcareous nannofossils with following species.

Calcidiscus leptoporus (Murray & Blackman 1898) Loeblich & Tappan, 1978
Calcidiscus tropicus (Kamptner, 1955) Varol 1989 sensu Gartner, 1992
Calcidiscus sp.
Coccolithus pelagicus (Wallich 1877) Schiller, 1930

Cyclicargolithus floridanus (Roth & Hay, in Hay et al., 1967) Bukry, 1971
Helicosphaera carteri (Wallich 1877) Kamptner, 1954
Helicosphaera minuta Müller (1981)

Reticulofenestra haqii Backman, 1978
Reticulofenestra minuta Roth, 1970 common
Reticulofenestra perplexa (Burns 1975) Wise1983
Reticulofenestra pseudoumbilicus (Gartner, 1967) Gartner, 1969
Sphenolithus abies Deflandre in Deflandre & Fert, 1954
Sphenolithus moriformis (Brönnimann & Stradner, 1960) Bramlette & Wilcoxon, 1967 common
Sphenolithus pseudoheteromorphus Fornaciari & Agnini 2009
Syracosphaera pulchra Lohmann, 1902
Thoracosphaera saxea Stradner, 1961
Triquetrorhabdulus milowii Bukry, 1971
Umbilicosphaera jafari Muller, 1974

Helicosphaera minuta Müller (1981) was first described from the Middle Miocene of the Philippines (Island Cebu), occurring in the upper NN5 and NN6. Zone marker for NN5 (*Sphenolithus heteromorphus*) could not be found in the sample, therefore we conclude that the sediment can be attributed to NN6, Serravallian. The co-occurrence of other nannofossils in the assemblage is supporting this attribution. The geological age is thus younger than for the genus *Spinatus* Dekkers, Liverani, Ćorić, S. J. Maxwell & Landau, 2020, which is from the Miocene, Langhian.

TAXONOMY

Class Gastropoda Cuvier, 1795
Superfamily Stromboidea Rafinesque, 1815
Family Strombidae Rafinesque, 1815

Genus *Javastrombus* Altaba, 2024
Type species *Javastrombus praegracilis* Altaba, 2024, by original designation

Original description. – Translated from the Catalan language: “Shell of moderate size or rather small in the context of Strombidae, rather graceful and moderately solid, with a row of 4 or 5 thin, rounded, more or less strong spines, orthogonal to the coiling axis or slightly inclined adapically or abapically, and regularly spaced on the shoulder of the last whorl; the first of these is small, while the central ones are the most developed.
Generally, there are also between one and three low spikes, in the abapical part of the dorsum; which are distinctly less prominent, are spirally aligned with the stromboid sinus and in some cases are joined by a faint spiral ridge. The spiral is conical, has about 7 or 8 whorls, forms an angle between 45º and 66º, and presents a regular growth until the last quarter of the last whorl, where it expands.
The body of the last whorl, before the expansion of the lip, varies from narrow to swollen. The lip is wing-shaped, little or moderately expanded and more or less thickened in part, but

has a rounded margin and very thin at the ends; it has a more or less marked prosocline inclination and a profile that goes from almost rectilinear to strongly curved; its posterior end is little or not at all prominent, forming a rather or rather deep posterior channel, after which it is inserted into the last turn; at the anterior end there is a very marked and strongly sinuous stromboid sinus, adjacent to the stromboid lobe, which is more or less prominent and more or less twisted forward. The posterior sinus is open, short and slightly or moderately reflected. The columella is wide, thickened and smooth; it is limited later by an angular shape, the result of the nodules of the spiral that become low, narrow and wide until they form this keel on the shoulder of the beginning of the last whorl. Adapically, the columella forms a callus that joins the lip, while covering the subsutural ramp of the beginning of the last whorl to a variable degree.
The external surface is almost smooth, without any granular areas; it is furrowed by colabral growth striae, which are irregular and weak, and are crossed by thin and numerous spiral cords, quite regular. These spiral cords are more marked on the subsutural ramp, up to the base of the spines of the crown, as well as on the last whorl of the teleoconch; very weakened, they can appear on areas of the dorsum. The protoconch is paucispiral, thin and conical, and consists of little more than two smooth turns (despite the good state of preservation, no micro sculpture can be seen). The beginning of the teleoconch is marked by the appearance of axial, orthocline, and very regular ribs, between which the spiral cords appear.
This axial sculpture reaches a limit between two and almost four turns from the aperture; from this limit there is a rapid transition to the sculpture of angular nodules, also regularly spaced, located more or less above the suture, which become the supracolumellar keel and then spikes in the last half whorl."

Comparison. – Translated from Altaba, 2024: "The genus is distinguished from *Persisti-strombus* Kronenberg & Lee, 2007 and *Afristrombus* Bandel, 2007, the morphologically closest genera, by its reduced size and delicate structure, the remarkable development of the apertural sinuses, a supracolumellar keel and the delicate spiral sculpture."
Altaba overlooked that *Afristrombus* Bandel, 2007 is unavailable (unavailable name under ICZN Art. 13.1.1 (no description), MolluscaBase), *Thetystrombus* Dekkers, 2008, with type species *Strombus latus* Gmelin, 1791, is the available name which should be used instead.

Discussion. – The genus *Javastrombus* was introduced by Altaba (2024), while Liverani (2024) attributed his sole species to *Persististrombus* Kronenberg & Lee, 2007. *Persististrombus*, type species *Strombus granulatus* Swainson, 1822, is a genus which arose in the Oligocene-Miocene of SW France (Lozouet & Maestrati, 1986) and spread to northern America where it is still represented in the eastern Pacific by *Persististrombus granulatus* (Swainson, 1822) and by fossil species in the Caribbean (as *Lentigo* Jousseaume, 1886. Jung & Heitz , 2001). Thus a western directed spread of species (what we currently know). But the discovery of a large Miocene species in Oman, described as *Strombus gijskronenbergi* Harzhauser, 2007, seems to form an eastern directed spread of the genus *Persististrombus*. *Strombus gijskronenbergi* unmistakably belongs to *Persististrombus* due to the heavy shoulder knobs and the form of the shell (the cast made of a topotype, see the relevant page on www.stromboidea.de), is very similar to the extant type species of *Persististrombus*.

Liverani (2024) placed his newly described species *Persististrombus bogoriensis* (as *P. bogoriense*, incorrect grammatical agreement of specific epithet) in this genus, but this was not based on morphologic similarities. He writes: "However, there are no proofs to link *P. bogoriense* sp. nov. directly to the tethyan lineage of *Persististrombus*, since no similar fossils have been found elsewere in older sediments". The placement by Liverani of his new species in *Persististrombus* was therefore not justified by solid arguments and *Javastrombus* is herein accepted as the proper genus, as used by Altaba (2024).
Altaba (2024) and Liverani (2024) do not compare *Javastrombus* with *Strombus* Linnaeus, 1758, the type genus of Strombidae from America. The shells of their new species are a kind of miniature versions of extant *Strombus* and of *Thetystombus* species, which are both primarily different by the lack of the small spines on the anterior end of the shells. *Thetystrombus* and *Persististrombus* are molecularly different, but are closely related branches (Irwin et al., 2024).
The size reflects the increasing size of shells from the Miocene to present day. *Antestrombus* Maxwell et al., 2020 from the Miocene of Florida, USA, is also similar to *Javastrombus* (also in size), species of that genus are lacking the spines on the anterior part of the shells too. During the Early to Middle Miocene a tropical worldwide oceanic current was running with a westward directed flow, but it is not very likely that *Javastombus* and *Antestrombus* have a shared, but as yet unknown, ancestor.

Javastrombus praegracilis **Altaba, 2024**
(Pl. 1 figs 1-7, Pl. 2 Figs 1-4, Pl. 3 Figs 5-7)

Javastrombus praegracilis Altaba, 2024
Javastrombus cylindratus Altaba, 2024 (**new synonym**)
Javastrombus kecil Altaba, 2024 (**new synonym**)
Javastrombus pinguis Altaba, 2024 (**new synonym**)
Javastrombus sondaicus Altaba, 2024 (**new synonym**)
Javastrombus subinermis Altaba, 2024 (**new synonym**)
Persististrombus bogoriensis Liverani 2024 (**new synonym**)

Plate 1. ***Javastrombus praegracilis*** **Altaba, 2024**. **Overview.** Figs 1-7. Details are mentioned in the legends of Pls 2-3. All photos taken from Altaba (2024).

Original description. – Translated from the Catalan language: "Shell of moderate size (holotype: 54.6 mm; paratypes: between 49.3 and 49.6 mm), quite graceful (as indicated by its specific name) and moderately solid, with a crown of 5 or 6 thin, rounded spines , short and wide, only slightly inclined adapically; there are 2 or 3 very low spines, much less prominent (some of them very poorly developed) and aligned on the abapical part of the back, along an incipient spiral ridge, with the stromboid sinus.

The spiral is conical and high, relatively long and narrow, with 8.2-8.6 whorls of regular growth and forms an angle of about 50º; the body of the last whorl, before the expansion of the lip, is quite narrow. The lip is wing-shaped, slightly expanded, and rather thickened in the middle, prosocline but almost straight throughout the central part; the margin is rounded, but very thin in the posterior sinus, which is broad, shallow and elongated forward. The posterior end of the lip is not prominent and is inserted in the last turn, where it covers up to half of the subsutural ramp; at the anterior end the stromboid sinus is very marked and deep, adjacent to the stromboid lobe, which is relatively large and well bent prosoclinally; the anterior sinus is less incised, a little elongated and well curved.

The columella is thickened and smooth, attached adapically to the lip above the keel at the shoulder. The external surface is almost smooth, with irregular growth striae, very fine spiral cords, a little more marked on the back, and on the other hand quite strong on the subsutural ramp, where there are 11 fairly regularly distributed that increase its thickness towards the suture (and 5-7 much weaker ones, interspersed); these continue along the spiral (in the most adapical part, visible in the spaces between the axial ribs). The protoconch consists of 2.4-2.5 apparently smooth whorls. The beginning of the teleoconch is marked by the appearance of axial, orthocline and very regular ribs, which extend along 3.2-4.2 whorls, and stop 2.5 whorls from the opening ; the subtriangular nodules (10 or 11 in the penultimate whorl) are regularly spaced and clearly located above the suture."

Holotype. – CRA-23130-1 in the author's malacological collection (Altaba 2024: 22)

Type locality. – Indonesia, Java, close to Jakarta, Serpong (Suradita).

Type stratification. – Middle Miocene according to Altaba, 2024, herein shown to be from the Serravallian (see section geological setting).

Comparison. – The species and the other (now) five simultaneously described synonyms were based on a collection of 24 examples in the author's collection (Altaba 2024: 22). Liverani's description was based on 45 specimens (Liverani 2024). Liverani did not recognize other species in his larger sample all originating from Bogor, Java, south of Jakarta, which is relatively close to the type locality and probably the same stratification.
In the collection of NHMW four examples have been seen (AMD), and about 20 in the author's collection (AMD).

Table 1. Sizes of types

	size of holotype mm	size range others mm	total nr of shells
J. praegracilis	54.6	49.3 – 49.6	4
J. pinguis	48.2	46.2 – 50.6	5
J. cylindratus	51.6	50.2 (only one)	2
J. kecil	43.2	35.0 – 42.0	5
J. subinermis	50.0	(holotype only)	1
J. sondaicus	54.5	47.3 – 55.7	4
P. bogoriensis	56.5	40 – 60	45

Note: Although Altaban (2024: 22) used 24 specimens, two paratypes were not listed in his species descriptions. All size ranges cover roughly the same range, from 35 mm to 60 mm for the largest.

Plate 2. *Javastrombus praegracilis* Altaba, 2024. Fig. 1. Holotype of *J. praegracilis*, L 54.6 mm. Fig. 2. holotype of *J. pinguis*, L 48.2 mm. Fig. 3. holotype of *J. cylindratus*, L 51.6 mm; Fig. 4. Holotype of *J. kecil* L 43.2 mm. All photos taken from Altaba (2024).

An overview of all new species described by Altaba (2024) is given on Plate 1, in Altaba they are shown on separate plates. On Plates 2-3 the holotypes of the new species are shown in larger size. This overview of the supposed "different" species clearly shows they are all very similar to the first described species (and type species of *Javastrombus*). There is only a very modest variation in shell width and the size of the spines especially on the anterior part of the shells. The only conclusion is they are all the same species.

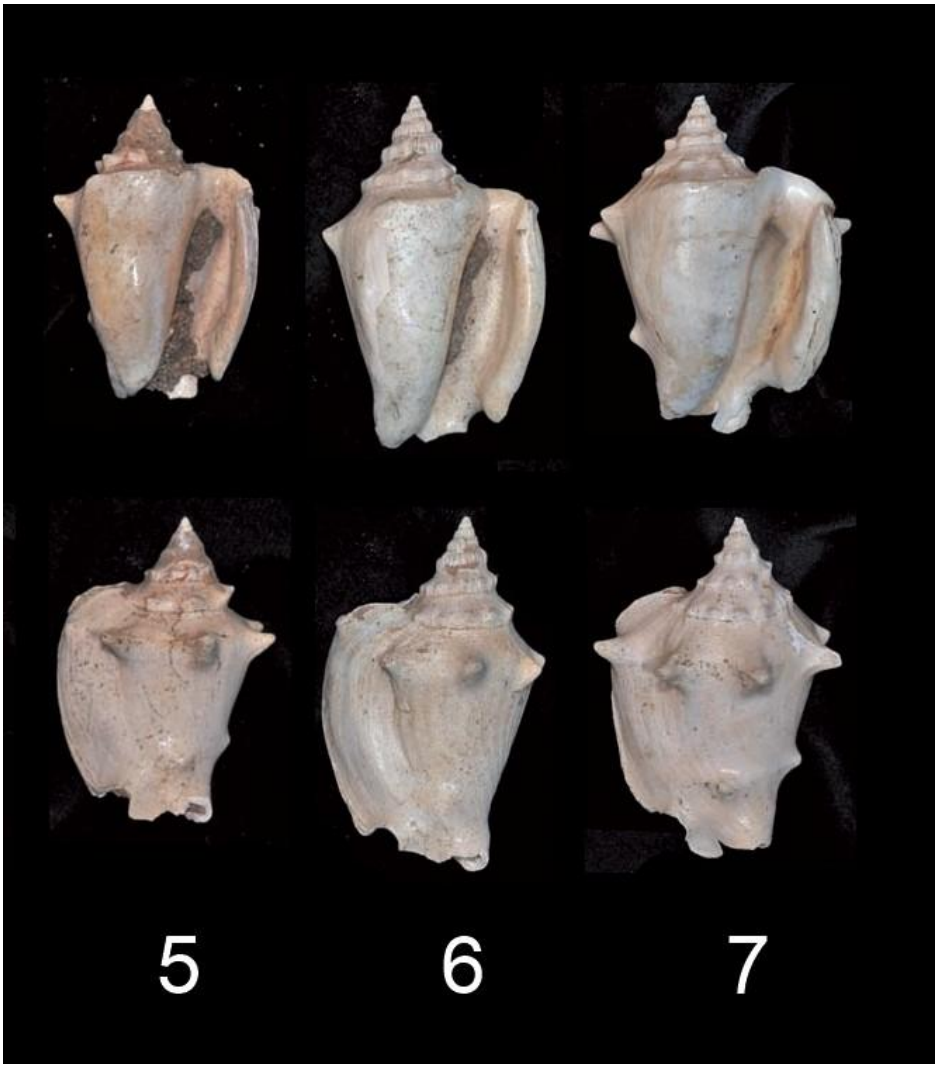

Plate 3. *Javastrombus praegracilis* Altaba, 2024. Fig. 5. Paratype of *J. kecil*, L 39.3 mm. Fig. 6. Holotype of *J. subinermis*, L 50.0 mm. Fig. 7. Holotype of *J. sondaicus*, L 54.5 mm. All photos taken from Altaba (2024).

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