

A New Species of Fossil *Pseudosimnia* (Gastropoda: Ovulidae) from the Miocene of West Java, Indonesia

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ABSTRACT A new species of Ovulidae Schilder, 1968, *Pseudosimnia javanensis* n. sp., is described from Miocene formations in the hills south of Tasikmalaya, West Java, Indonesia. The general appearance of the new taxon shows a combination of characters that distinguish it from any other living species of *Pseudosimnia* Schilder, 1925. One subspecies is also described, *Pseudosimnia javanensis elongata* n. ssp.

KEY WORDS Gastropoda, Ovulidae, *Pseudosimnia*, *P. javanensis*, *P. javanensis elongata*, Miocene, Tasikmalaya, Java, Indonesia

INTRODUCTION

Ovulidae Schilder, 1968, also commonly called "allied cowries" or "false cowries" are, as their name suggests, gastropod mollusks closely related to Cypraeidae Rafinesque, 1815, which is one of the best-documented families of the animal kingdom (Lorenz & Fehse 2009). If Ovulidae have, for some genera at least, a cowry-like shell, one of their common characteristics is not to have columellar teeth. For the rest, they have a smooth or finely striated shell and, in the vast majority of cases, an internalized spire at the posterior end. Whereas knowledge of the animal often provides valuable information for identifying species within a given genus, a close examination of the shell is generally sufficient, to attribute a precise genus to Ovulidae found dead. Although the Ovulidae have relatively fragile shells, thus subject to rapid disintegration upon death of the animal (Lorenz & Fehse 2009), a number of fossil species are known from this family.

In Europe, species belonging to genera still living today have been found in deposits dating from the Ypresian (Lower Eocene): *Sandalia* Cate, 1973, to the Zanclean (Lower Pliocene): *Neosimnia* Fischer, 1884, through the Rupelian (Oligocene): *Neosimnia* Fischer, 1884, the Langhian and Serravalian (Middle Miocene): *Neosimnia* Fischer, 1884 and *Simnialena* Cate, 1973. Recently, in the West Java region of Indonesia, south of the city of Tasikmalaya, a considerable number of marine mollusk specimens have been found, in particular representatives of the family Cypraeidae, Strombidae Rafinesque, 1815, Melongenidae Gill, 1871, Terebridae Mörch, 1852, Marginellidae Fleming, 1828, and more rarely of the family Ovulidae Fleming, 1822. Some genera of the aforementioned families are not clearly assignable due to the deformation of some shells from crushing or because they are probably extinct genera that remain to be described.

Of all the genera observed, the specimens belonging to the genus Ovulidae are considerably fewer, either because they are

much less represented in these deposits, or simply because the specimens are much smaller and less spectacular, therefore of less interest to local miners. However, 28 fossil specimens of Ovulidae have been examined and found to have outline, terminal, aperture and fossula features not attributable to previously described species. The repeatability and constancy of the characteristics of these shells are typical of the genus *Pseudosimnia* Schilder, 1925, but with notable differences with respect to contemporary species known in the same region or any other part of the world. We compare them with other species of *Pseudosimnia*, especially *Pseudosimnia jeanae* (Cate, 1973) to which it is the most closely related in appearance, to highlight similarities and differences, and conclude that there are no living species of *Pseudosimnia* with analogous traits. We are only aware of a few photos of fossil Ovulidae from Java, published in Dharma (2005). Among them, one (Fig. 23, Plate 140, page 351, Dharma, 2005) corresponds exactly to the species introduced here. However, on the one hand, the taxon had still not been described, and on the other hand, it was attributed to the genus *Margovula* Cate, 1973. Therefore, we describe this species as new to science, named *Pseudosimnia javanensis* with the related subspecies *elongata*.

ABBREVIATIONS

ACC Alain Clezard collection (Epinal, France)
 MDC Matteo Dovesi collection (Bologna, Italia)
 IGF Firenze Museum, Florence, Italia

MATERIAL EXAMINED

Twenty-six complete fossil shells and two fossils in matrix of *Pseudosimnia javanensis* were examined, all from the southern area of Tasikmalaya City, West Java, Indonesia, found between 2 and 4 meters deep in the subsoil of Miocene sediments when they were collected.

SYSTEMATICS

Class	Gastropoda Cuvier, 1795
Subclass	Caenogastropoda Cox, 1960
Order	Littorinimorpha Golikov & Starobogatov, 1975
Superfamily	Cypraeoidea Rafinesque, 1815
Family	Ovulidae Fleming, 1822
Subfamily	Prionovolvinæ Fehse, 2007
Genus	<i>Pseudosimnia</i> Schilder, 1927

Pseudosimnia javanensis new species †
 Celzard and Dovesi, 2023
 (Plates 1-3)

Description. Shell rather small, pyriform, smooth over the entire surface; dorsum glossy, with a hammered-like surface; anterior terminal elongated, broad and spatulate, rounded, slightly oblique; posterior terminal protruding, slightly twisted; ventrum bulbous, with a slightly marked dorsal keel, giving the shell a somewhat rhomboidal outline; labrum rounded, calloused and smooth; aperture narrow in consideration of the width of the shell, hardly widening anteriorly; fossula shallow; inner adaxial carinal ridge absent; funiculum slightly marked, smooth and almost without relief, merging with the left part of the anal canal.

Type Material. Holotype IGF105105, length 11.5 mm, width 6.9 mm, preserved in the Museo di Scienze Naturali dell'Università di Firenze (Firenze, Italia) (Plate 1). *Pseudosimnia javanensis* paratypes in mineral matrix (Plate 2) A= length 11.6 mm, (MDC); B, length 12.8 mm, (ACC); Other *P. javanensis* paratypes (Plate 3): A= length 14.9 mm, width 9.2 mm, (MDC); B= length 15.8 mm, width 9.3 mm, (MDC); C= length 16.2 mm, width 9.4 mm, (MDC); D= length 14.0 mm, width 7.9 mm, (MDC); E= length 11.3 mm, width 6.7 mm, (MDC); F= length 12.0 mm, width 7.3 mm, (MDC); G= length 13.4 mm, width 7.9 mm, (ACC);

H= length 17.9 mm, width 10.9 mm, (ACC);
I= length 13.9 mm, width 8.1 mm, (ACC);
J= length 12.2 mm, width 7.2 mm, (MDC);
K= length 9.3 mm, width 5.5 mm, (ACC).

Plate 1 shows the holotype, Plate 2 shows two fossils in two different types of matrix (compressed sand and rock), while 11 paratypes are presented in Plate 3. For all the material examined, no apparent evidence of concentric striations could be seen near the terminal collars, unlike what is more often seen in modern *Pseudosimnia*.

Pseudosimnia javanensis elongata new
subspecies †
Celzard and Dovesi, 2023
(Plate 4)

Description. Shell described here as subspecies of *Pseudosimnia javanensis*, conforming to overall shell characters of nominate subspecies; shell rhomboid in shape, with more elongated outline; body whorl less inflated than that of nominate subspecies; aperture very narrow, with width being half that of nominate subspecies.

Type Material. Holotype IGF105162, length 18.3 mm, width 10.1 mm, shown on Plate 4 Figure B, preserved in the Museo di Scienze Naturali dell'Università di Firenze (Firenze, Italia). *P. javanensis elongata* paratypes (Plate 4):

A= length 15.6 mm, width 8.1 mm, (MDC);
C= length 13.8 mm, width 7.6 mm, (MDC);
D= length 11.5 mm, width 6.5 mm, (MDC);
E= length 11.2 mm, width 6.2 mm, (ACC);

F= length 13.8 mm, width 7.7 mm, (ACC);
G= length 12.1 mm, width 7.1 mm, (ACC);
H= length 13.6 mm, width 7.8 mm, (ACC);
I= length 17.0 mm, width 9.3 mm, (ACC);
J= length 14.3 mm, width 7.6 mm, (ACC);
K= length 15.0 mm, width 8.4 mm, (ACC);
L= length 15.6 mm, width 8.6 mm, (ACC);
M= length 17.5 mm, width 9.0 mm, (ACC);
N= length 12.7 mm, width 6.9 mm, (ACC).

Type Locality and Stratigraphic Range. The physiography of West Java has geological features consisting of flood plains, folded hills and volcanoes. Based on physiography, van Bemmelen (1949) divided West Java into four zones: Jakarta Zone, Bogor Zone, Bandung Zone, Southern Mountains Zone. South of Tasikmalaya, the area of discovery of the presented material in the southern mountains, is a plateau with a Miocene sedimentary rock surface, as shown in the papers by Sampurno, 1976 (Figure 1). This area, in several places, has a deeply incised surface so that it is no longer a plateau but consists of hills with deep fissures and landslides where many fossils have been found.

Etymology. The species presented is called *javanensis*, in obvious reference to its geographical origin, while the name of the subspecies *elongata* speaks for itself.

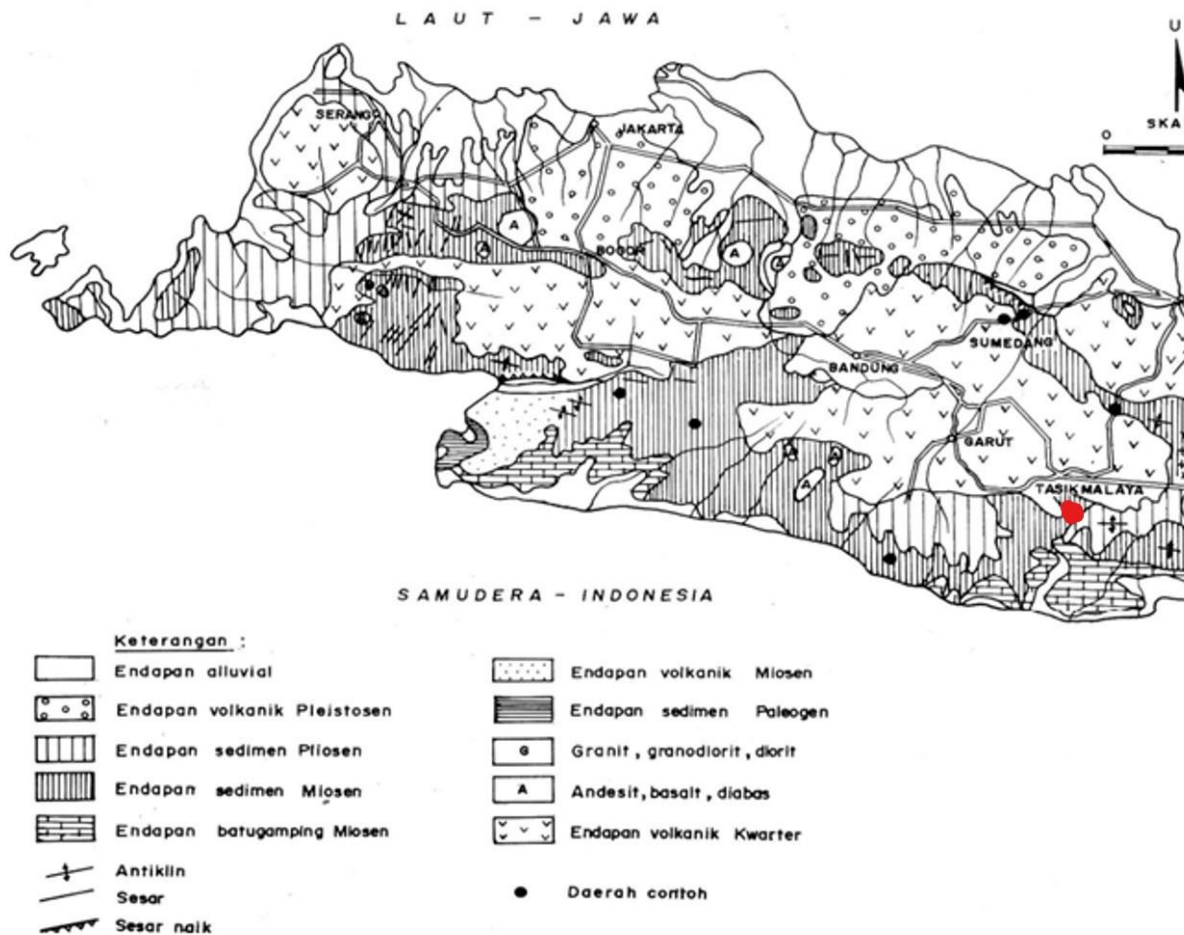


Figure 1. Map of West Java (Sampurno, 1976). The red point indicates the site of origin.

DISCUSSION

The present new species and subspecies unquestionably belong to the genus *Pseudosimnia*. Indeed, according to Cate (1973), the shells of *Pseudosimnia* are fairly small, pyriform, inflated, with unusually broad projecting terminals and, for the most part, lacking significant dorsal and ventral incised striation. The shells have an anterior terminal broadly projecting, a funiculum that forms the left wall of the anal canal and a cowry-like terminal ridge (Lorenz & Fehse 2009). Such a definition agrees very well with the former description of *P. javanensis*, although the labrum is completely smooth, while Lorenz &

Fehse (2009) include in their diagnosis of *Pseudosimnia* that the labrum is distinctly denticulate along the inner margin. However, the living species *P. juanjosensii* (Pérez & Gómez 1987) also presents an almost smooth inner margin.

P. javanensis and *P. javanensis elongata* are, from the 28 specimens examined, surprisingly variable in size and shape. Indeed, in addition to very small specimens, which nevertheless do not show any juvenile character, there are specimens of quite remarkable size for the genus *Pseudosimnia*, since several of them exceed 17 mm in length. The vast majority of living *Pseudosimnia* are only slightly larger

than 10 mm in length, on average. The larger specimens of *P. javanensis* are oval pyriform, inflated, and with a smoother surface without losing the hammered-like character. The slightly smaller specimens, around 15 mm, are rather oval-rhomboid roundly, and have a clearly hammered-like surface. However, it is possible to make a series of shells in which all the intermediate variations exist between extreme specimens, either particularly globular and bulging, or particularly elongated and rhomboid, and this at the same time whether they are larger or on the contrary smaller.

Figure 2 shows the length, width and height measurements of each specimen examined, and the aspect ratios length/width (L/W) and length/height (L/H) are calculated and plotted in Figure 3. It is thus possible to distinguish the variability *P. javanensis* n. sp. from that of the more tapered *P. javanensis elongata* n. ssp. with a wider radius of curvature.

A comparative survey can be made with the living species related to *P. javanensis* to be convinced that the latter is definitely different from any other living species. The most morphologically related species is *P. jeanae* (Cate, 1973), which has a wide distribution area, from Japan to New Caledonia, passing through China and the Philippines. However, viewing a large number of specimens did not allow the authors to identify any example as rostrate and/or with a terminal anterior as developed and an outer lip as broad and calloused as those which systematically characterize *P. javanensis*. Two species close to *P. jeanae*, and with which they are sometimes confused, are *P. pyrulina* (Adams, 1855) and *P. shikamai* (Cate, 1973), with rather similar distribution ranges. However, if *P. pyrulina* is generally larger than *P. jeanae*, its shell is also thinner and lighter and its aperture wider, which is not consistent with the fossils discussed here. As for *P. shikamai*, it has

a distinctly striated dorsum, which is absolutely not the case here. *P. diaphana* (Liltved, 1987), reported from Japan and Taiwan, is more rhombohedral, similar to some forms of *P. javanensis*, but has also the dorsum entirely striated. *P. wieseorum* (Lorenz, 1985) is an East African species similar to *P. pyrulina* and *P. jeanae*, but again with a thinner shell and a much larger aperture than *P. javanensis*.

The European and Northwest African species *P. carnea* (Poiret, 1789) is stockier and rarely rostrate, whereas this is a systematic character of *P. javanensis*. The species *P. angusta* (Celzard, 2017) from the same region although more present in the near Atlantic area, and of which a few rare specimens are sometimes found within populations of *P. carnea*, has many similarities with *P. javanensis elongata* in terms of rostration, general outline and variability. However, *P. angusta* has a thinner and lighter shell, a surface lacking the hammered-like character but finely striated near the terminal collars, and a prominent funiculum. Also, in terms of rostration and contour, rather pyriform sometimes inflated, sometimes more rhomboid, some specimens of *P. javanensis* recall the very rare species *P. vanhyningi* (Smith, 1940), known from the tropical waters of the Western Atlantic, but the strong dentition of the labrum excludes any further comparison. In the end, no matter which living species of *Pseudosimnia* is considered, there is always at least one feature contradicted by examination of the available fossil record, and none of these contemporary species further combine lack of denticulation on the labrum, narrowness of the aperture, and insignificant or absent funiculum.

We can also specify that, by placing the specimens under a UV lamp, either at a wavelength of 365 nm or 254 nm, no residual color pattern could be demonstrated. Modern *Pseudosimnia* are species with generally

uniform colorations in the pastel range, and sometimes with a paler band at mid-dorsum. They also show the greatest color contrast at the tips and around the margin, often with a distinct yellow suture line along the labrum and the terminal collars. Living *Pseudosimnia* species with a thickened lip, such as *P. carnea*, *P. pyrulina*, *P. jeanae*, *P. shikamai*, *P. diaphana*, and *P. wieseorum*, typically exhibit this yellow suture line. However, nothing like this could be observed under ultraviolet light on *P. javanensis* or *P. javanensis elongata*.

The set of morphological characteristics, thick but completely smooth labrum, indistinct funiculum, extremely narrow aperture, total absence of striae on the terminal collars, and significant rostration, not attributable to other known *Pseudosimnia*, characterize the new species presented, with its relative subspecies, originating from the Miocene of the southern areas of Tasikmalaya in West Java, Indonesia.

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LITERATURE CITED

- Cate, C.N. 1973.** A systematic revision of the recent cypraeid family Ovulidae. The Veliger 15(Supplement):1-117.
- Dharma, B. 2005.** Recent & Fossil Indonesian Shells. ConchBooks, Hackenheim, Germany. 424 pp, 11 colour plates and 40 black-and-white plates (fossils).
- Lorenz, F. & D. Fehse. 2009.** The Living Ovulidae, ConchBooks, Hackenheim, Germany. 650 pp, 203 colour plates and 375 illustrations.
- Sampurno, 1976.** Geologi Daerah Longsor Jawa Barat, Geologi Indonesia, V 3(1):45-52.
- Schilder, F.A. 1925.** Revision der Cypraeacea (Mollusca, Gastropoda). Archiv für Naturgeschichte 91, Jahrgang, Abteilung A, 10. Heft: 81.
<https://doi.org/10.1002/mmnd4801>
- van Bemmelen, R.W. 1949.** The geology of Indonesia, Vol. 1A, General geology of Indonesia and adjacent archipelagoes. Government Printing Office, The Hague. 732 pp.


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<i>Pseudosimnia javanensis</i>												
	Hol	P3-A	P3-B	P3-C	P3-D	P3-E	P3-F	P3-G	P3-H	P3-I	P3-J	P3-K
Length	11.5	14.9	15.8	16.2	14.0	11.3	12.0	13.4	17.9	13.9	12.2	9.3
Width	6.9	9.2	9.3	9.4	7.9	6.7	7.3	7.9	10.9	8.1	7.2	5.5
Height	5.5	7.7	7.8	7.9	7.2	5.5	6.2	6.7	9.1	6.7	5.9	4.5
L/W	1.65	1.63	1.70	1.71	1.76	1.69	1.64	1.69	1.65	1.70	1.68	1.68
L/H	2.07	1.94	2.03	2.03	1.94	2.05	1.94	2.00	1.97	2.05	2.05	2.07

<i>Pseudosimnia javanensis elongata</i>														
	P4-A	P4-B	P4-C	P4-D	P4-E	P4-F	P4-G	P4-H	P4-I	P4-J	P4-K	P4-L	P4-M	P4-N
Length	15.6	18.3	13.8	11.5	11.2	13.8	12.1	13.6	17.0	14.3	15.0	15.6	17.5	12.7
Width	8.1	10.1	7.6	6.5	6.2	7.7	7.1	7.8	9.3	7.6	8.4	8.6	9.0	6.9
Height	6.9	8.0	6.4	5.4	5.0	5.9	5.3	6.3	8.1	6.7	6.8	6.7	7.9	5.5
L/W	1.92	1.82	1.83	1.79	1.81	1.81	1.72	1.76	1.82	1.88	1.80	1.83	1.94	1.84
L/H	2.28	2.28	2.17	2.15	2.26	2.34	2.30	2.17	2.12	2.15	2.22	2.34	2.22	2.31

Figure 2. Dimensions of the *P. javanensis* n. sp. and *P. javanensis elongata* n. ssp. analyzed (measurements are in mm and indexed by Plate and figure letter).

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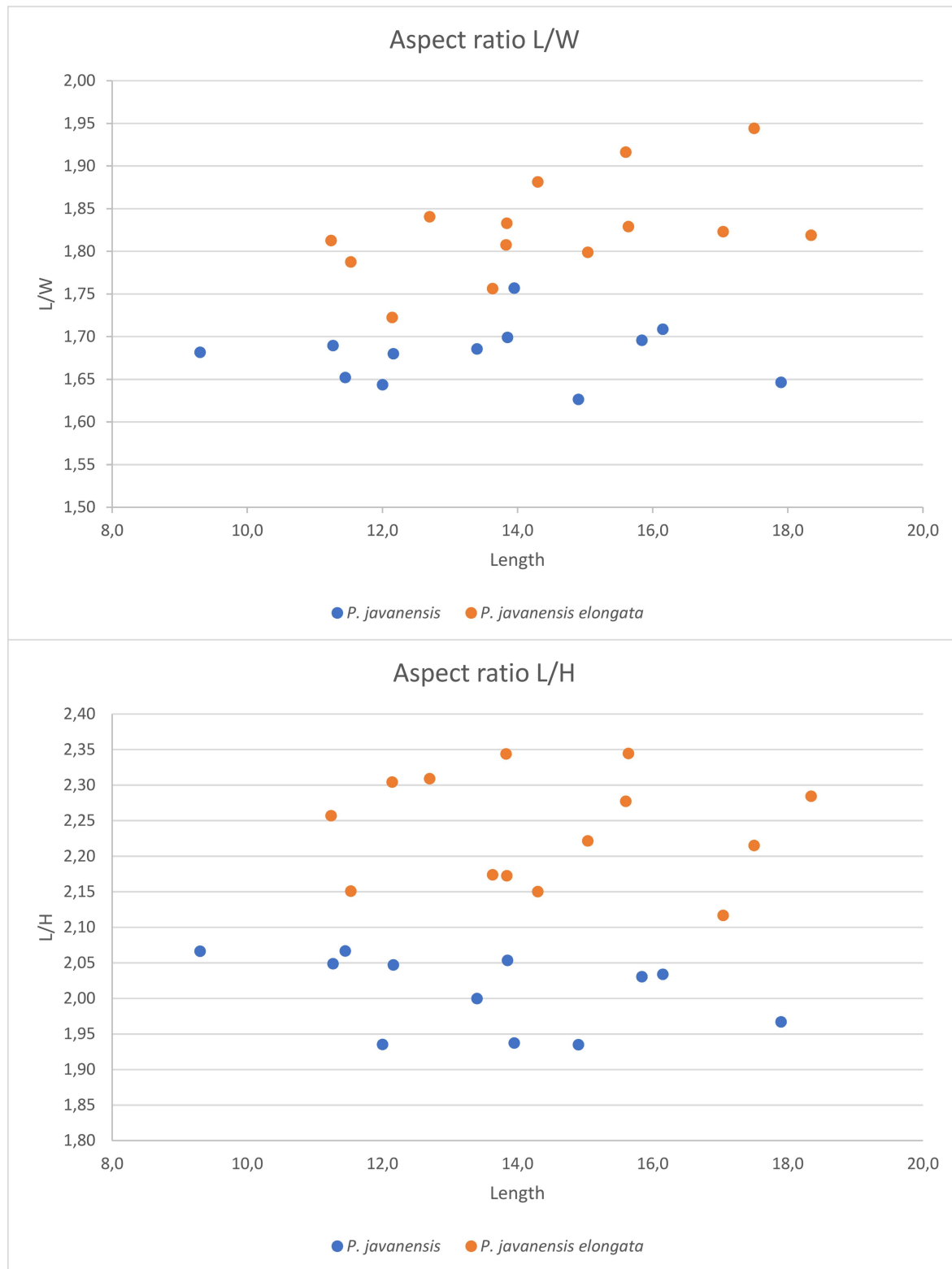


Figure 3. Aspect ratios: Length/Width (L/W) and Length/Height (L/H) as a function of length (mm) of *P. javanensis* n. sp (blue dots) and *P. javanensis elongata* n. ssp. (orange dots).



Plate 1. Holotype of *Pseudosimnia javanensis* n. sp., 11.5 mm in length (IGF105105).

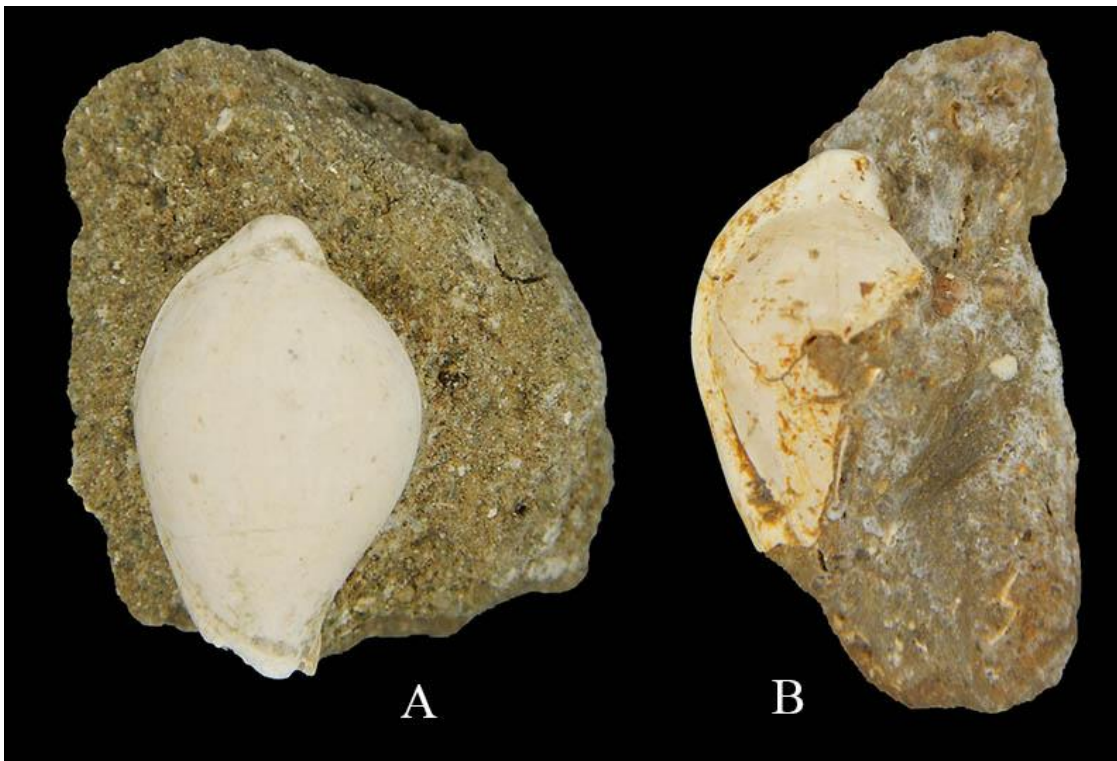


Plate 2. *Pseudosimnia javanensis* n. sp. in matrix, 18.3 mm in length: **A**= on compressed sand; **B**= on rock.

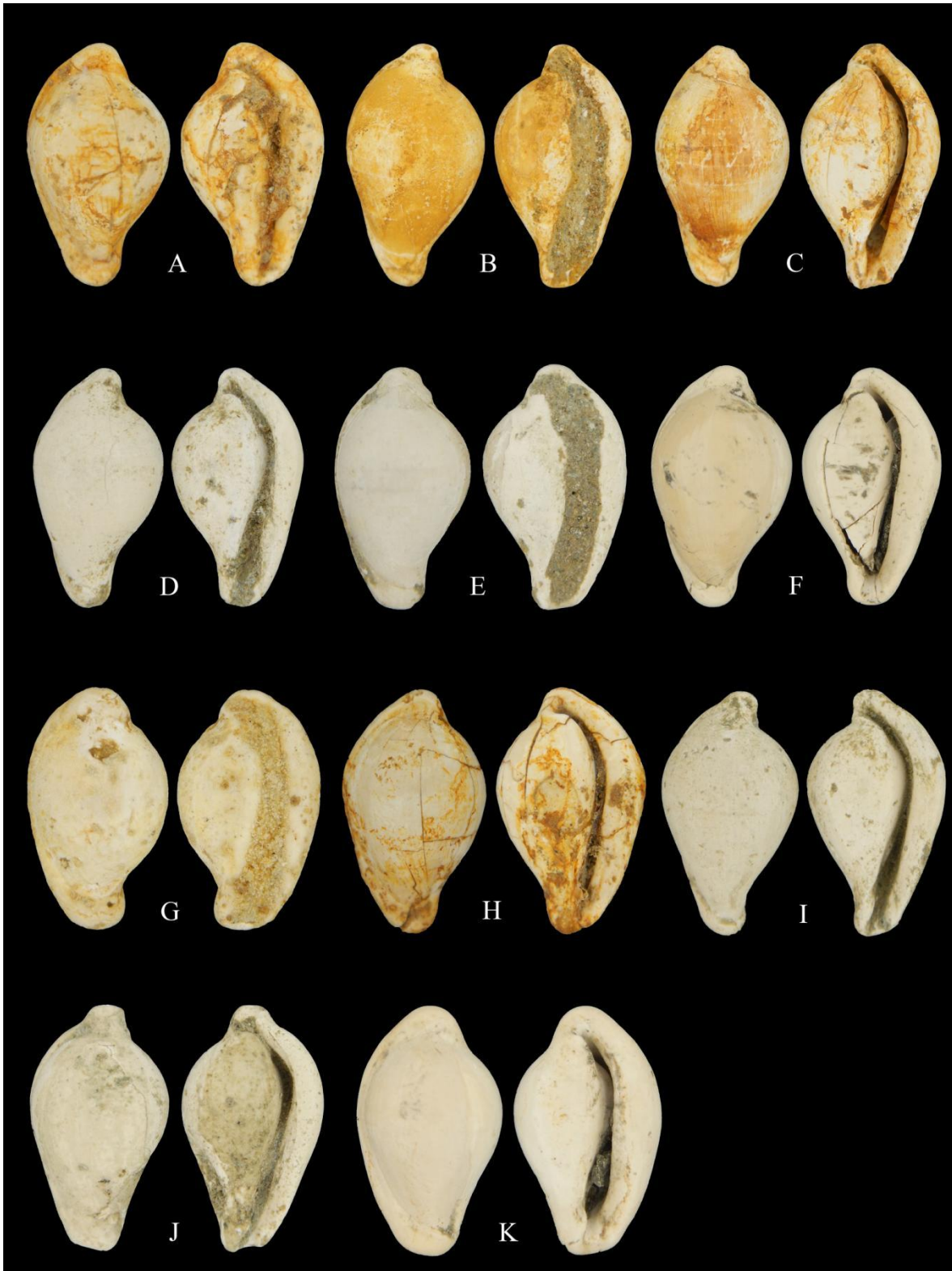


Plate 3. *Pseudosimnia javanensis* n. sp. paratypes and corresponding lengths: **A**= 14.9 mm; **B**= 15.8 mm; **C**= 16.2 mm; **D**= 14.0 mm; **E**= 11.3 mm; **F**= 12.0 mm; **G**= 13.4 mm; **H**= 17.9 mm; **I**= 13.9 mm; **J**= 12.2 mm; **K**= 9.3 mm.



Plate 4. *Pseudosimnia javanensis elongata* n. ssp.: Holotype: **B**= 18.3 mm (IGF105162); paratypes: **A**= 15.6 mm; **C**= 13.8 mm; **D**= 11.5 mm; **E**= 11.2 mm; **F**= 13.8 mm; **G**= 12.1 mm; **H**= 13.6 mm; **I**= 17.0 mm; **J**= 14.3 mm; **K**= 15.0 mm; **L**= 15.6 mm; **M**= 17.5 mm; **N**= 12.7 mm.