

New Species of the Genus *Chelotia* (Pleurotomariidae, Gastropoda) from the Middle Eocene of Ukraine

A. A. Berezovsky^{a, *} and J.-M. Pacaud^{b, **}

^aKrivoi Rog National University, Krivoi Rog, 50027 Ukraine

^bMuséum National d'Histoire Naturelle, Paris, France

*e-mail: berez-08@mail.ru

**e-mail: pacaud@mnhn.fr

Received August 9, 2017; revised February 18, 2019; accepted April 2, 2019

Abstract—A new species of the genus *Chelotia*, *C. pervicina* sp. nov., from Middle Eocene deposits of the southern outskirts of the town of Krivoi Rog (Ukraine) is described. This species is compared with the most similar species *C. concava* (Deshayes) based on studying *Chelotia* specimens from the collection of the National Museum of Natural History (Paris, France).

Keywords: Mollusca, shells, Paleogene, Ukraine

DOI: 10.1134/S0031030119060029

In 1989, A.A. Berezovsky found two relatively large gastropod shells in a bed of Middle Eocene sandy deposits on the western side of the quarry of Ingulets Mining and Processing Plant (InMPP, town of Ingulets, Krivoi Rog district, Dnepr Region, Ukraine). These shells were described in his Candidate (Geol.–Mineral.) Dissertation as *Pleurotomaria concava* Deshayes (Berezovsky, 1994).

G.N. Voshchina used one of these specimens under the name *P. concava* Deshayes to illustrate the findings of the most spectacular and large shells of Middle Eocene gastropods of Ukraine (Voshchina, 2012). In 2016, J.-M. Pacaud studied the image published by Voshchina and came to the conclusion that this shell does not belong to *P. concava* and should be considered as a new species.

The detailed structure of the lower part of the Eocene sequence exposed on the western side of the InMPP quarry, where new species shells were discovered, is presented in Fig. 1. Lithology and stratigraphy of deposits overlying the Eocene deposits are described in (Berezovsky, 2009).

A rather thick sequence (about 70 m) of sedimentary deposits of Paleogene, Neogene and Quaternary age, lying on Archean plagiogranites and Proterozoic rocks of an iron-siliceous formation, is exposed in the InMPP iron ore quarry, which is located on the southern outskirts of the town of Ingulets. Paleogene deposits are represented by Middle Eocene sandy–silty–clay deposits, as well as Lower Oligocene sands

and clays. Middle Eocene deposits are subdivided into three formations at the local stratigraphic scale (from bottom to top): Rakhmanovo, Malinovka (includes Vysokopol'e and Nikolo-Kozelsk beds) and Saryi Ingulets (includes Kryazhev, Mogilev, and Zagrad beds). Lower Oligocene deposits are combined into the Borisfen Formation. The Rakhmanovo and Malinovka formations and the most part of the Saryi Ingulets Formation are correlated without any doubt with the Lutetian Stage of the General Stratigraphic Scale. The Upper Saryi Ingulets Formation is less clearly defined in terms of geochronology. It is correlated preliminarily with the Bartonian Stage, while the Borisfen Formation—with the Rupelian Stage.

Mollusk valves and complete shells occur at different levels of the Middle Eocene sequence exposed on the western side of the InMPP quarry. The richest intervals in this respect are sands in the upper part of the Nikolo-Kozelsk beds (Fig. 1, Bed 12). A large number of valves and complete shells of mollusks (over 10000), as well as coral polyparies (about 3500) of good preservation were extracted from this interval. Bivalves are the most abundant. Most of 130 species discovered here are represented by 30 or more specimens. Shells belonging to 90 species were found among gastropods (including those described in this work). In general, however, gastropod species are represented by a few (up to five) specimens.

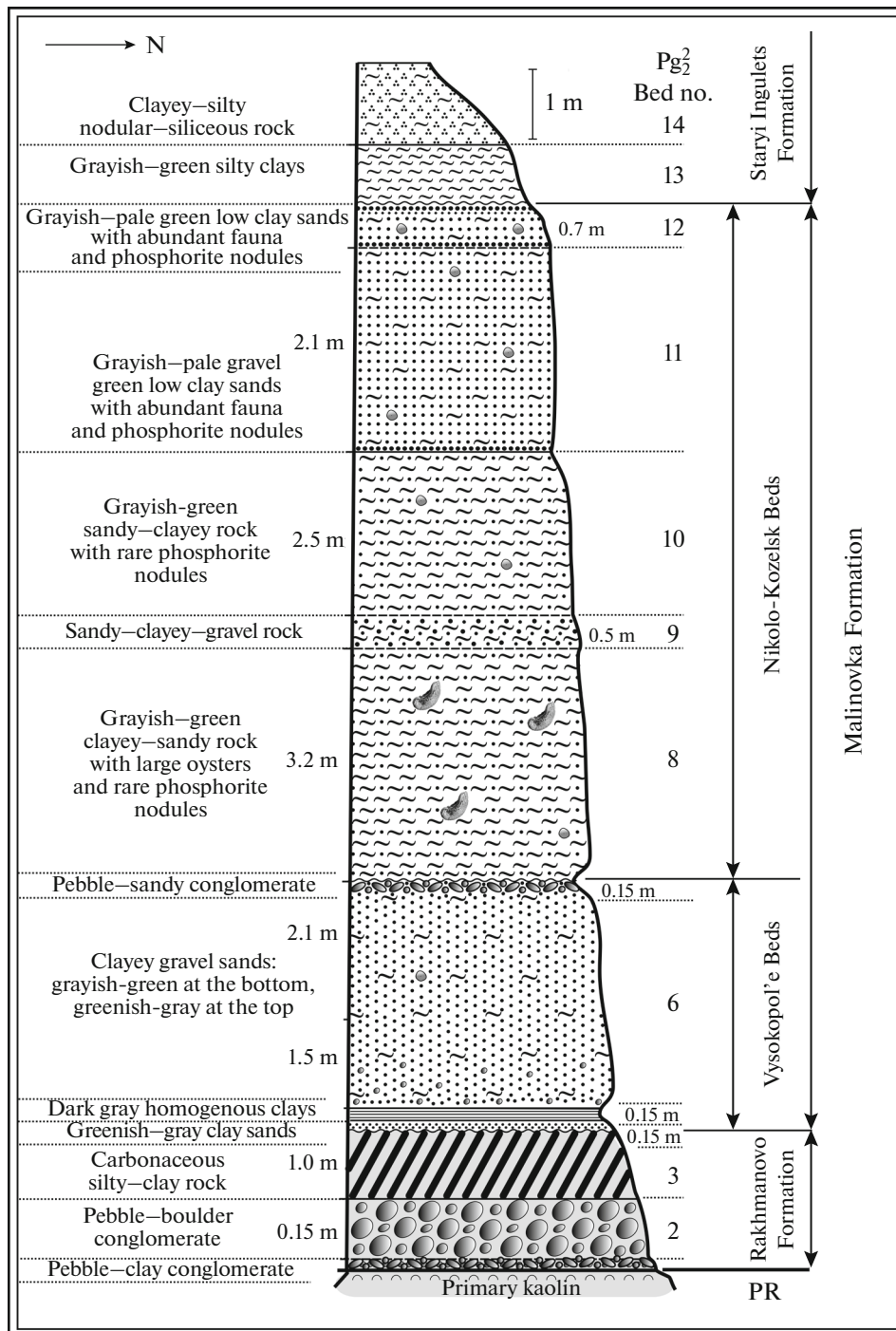


Fig. 1. Geological section of the lower part of the Eocene deposits exposed on the western side of the quarry of the Ingulets Mining and Processing Plant (town of Ingulets, Krivoi Rog Region, Ukraine).

The description of the new species *Chelotia pervicina* and its comparison with *C. concava* (Deshayes) (a genus type and the sole *Chelotia* species found in the Paleogene of the Anglo-

Paris-Belgian basin) (Cossmann and Pissarro, 1907) based on specimens stored in the National Museum of Natural History (Paris, France) are given below.

SYSTEMATIC PALEONTOLOGY
SUBCLASS VETIGASTROPODA

Order Pleurotomariida

Superfamily Pleurotomarioidea Swainson, 1840

Family Pleurotomariidae Swainson, 1840

Genus *Chelotia* Bayle in Fischer, 1885

Chelotia pervicina Pacaud et Berezovsky, sp. nov.

Plate 7, fig. 1 (see inset)

Pleurotomaria concava Deshayes: Voshchina, 2012, p. 79, text-fig. 3.

Etymology. From Latin *vicina* (closest), because of similarity to species *C. concava* (Desh.), with Latin prefix *per* (through).

Holotype. Geological Museum of Krivoi Rog National University, no. G-1/1; South Ukraine, town of Ingulets, quarry of the Ingulets Mining and Processing Plant; Middle Eocene, Nikolo-Kozelsk beds of the Malinovka Formation.

Description (Fig. 2). Shells, large-size, trochoid, low (significantly lower than typical representatives of this genus), with a rounded apex. Protoconch is not preserved. Shell consists of five to six slightly convex whorls, separated by surface sutures. The body whorl occupies 1/3 of the total height. The appearance of the anal canal corresponds to the early development stage of an adult shell. The anal canal forms a fairly deep and wide groove, which is located in the upper part of the last whorl. The formation of a groove was preceded by the appearance of a shallow groove, which spirally covers almost all whorls of the shell (not visible only at the early whorl). The groove width at the place of its transformation into the anal canal reaches 1.0 mm. The groove bottom is flat, smooth (without additional sculpture elements). Above the anal canal and the preceded groove, each whorl has two closely spaced spiral ribs. These ribs are decorated with axially elongated, very distinct regular granules. Under the anal canal, a number of spiral ribs on each subsequent whorl increases rapidly due to intercalation as the shell grows. As a result, they noticeably differ at each whorl in number, width and morphology. At the last whorl under the anal canal are six spiral ribs decorated with oval granules. Of these ribs, the second rib is the widest one, if counting from the anal canal. The base is slightly concave, funnel-shaped, with a callous-like calcareous overgrowth in the central part. The surface of the basal part is covered with relatively thick spiral ribs, which are decorated with rounded granules. In the intervals of these ribs are straight or arched transverse bridges that were formed during the growth of the shell (Fig. 2a). The outer surfaces of the last whorl are convex. The column is very thick, strongly inclined, partially overlapping the umbilicus. The outer lip, thick, prosocline, with sinusoidal edge. The aperture is drop-shaped with width much greater than height.

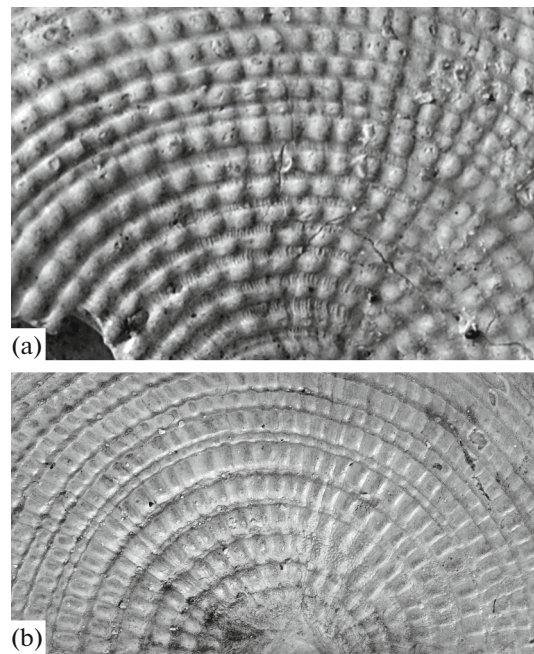


Fig. 2. Sculpture of shells of two types at the 2.7 mm segment of the base, $\times 2.6$: (a) *Chelotia pervicina* sp. nov., holotype no. G-1/1; Ukraine, town of Ingulets, quarry of the Ingulets Mining and Processing Plant; Middle Eocene, Malinovka Formation; (b) *C. concava* (Deshayes, 1832), spec. MNHN no. F.A59092; France, Chaumont-en-Vexin (Oise); Middle Eocene, Lutetian Stage.

Measurements, mm.

Spec. no	H	W	AA	HLW	HA	WA
G-1/1	40.6	59.5	95°	28.0	18.0	30.0
G-1/2	31.0	43.4	96°	20.2	—	—

Note. (H) shell height, (W) shell width (the maximum diameter at the base), (AA) apical angle, (HLW) height of the last whorl, (HA) height of aperture (measured by a line parallel to the shell axis), (WA) width of aperture (measured by a line perpendicular to the shell axis).

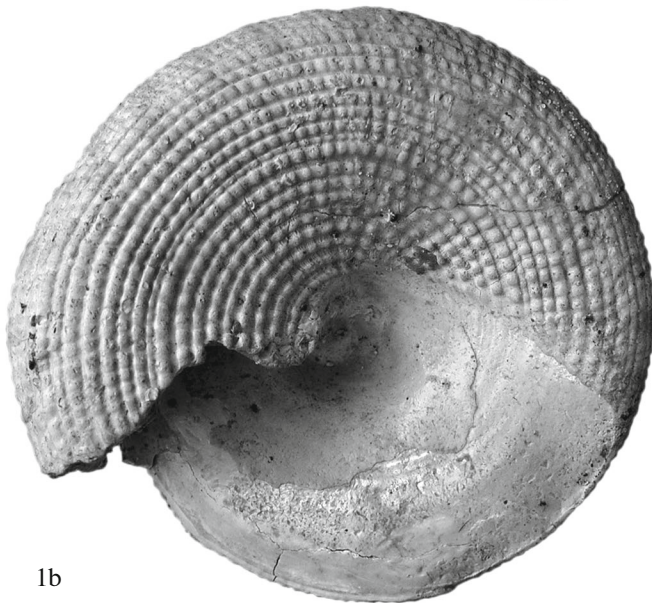
Comparison. The above-described species is extremely similar to *C. concava* (Deshayes, 1832), but differs from it in a much less high contour of shells, more numerous and noticeably more rounded granules on spiral ribs. Spiral ribs in *C. concava* shells are covered with strongly elongated quadrangular granules, while the latter in *C. pervicina* are rounded (Fig. 2). This feature of *C. concava* is clearly visible on the first rib below the anal canal in specimens from the Lutetian deposits of the Paris Basin (Pl. 7, figs. 2, 3). The sculpture of the basal parts of the shells under consideration also shows the aforementioned differences in the structure of spiral ribs. The basal part of



1a



2a



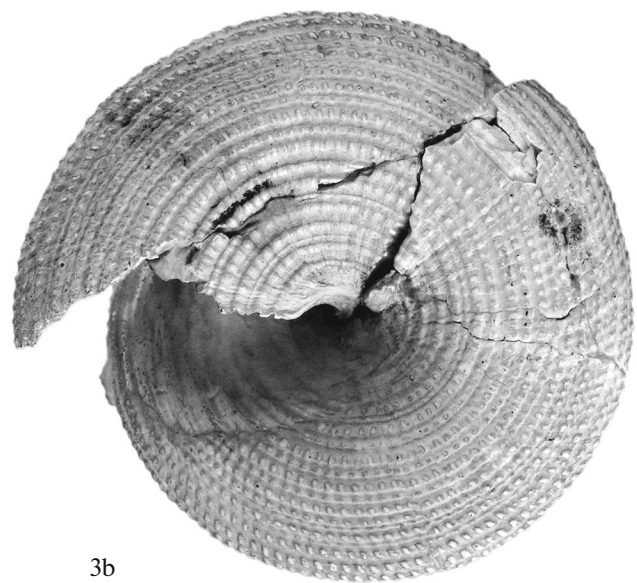
1b



2b



3a



3b

Explanation of Plate 7

Fig. 1. *Chelotia pervicina* sp. nov., holotype no. G-1/1 of Geological Museum of Krivoi Rog National University (Krivoi Rog, Ukraine), $\times 1.5$: (1a) apertural view, (1b) ventral view; South Ukraine, town of Ingulets, quarry of the Ingulets Mining and Processing Plant; Middle Eocene, Malinovka Formation.

Figs. 2 and 3. *C. concava* (Deshayes, 1832) ((a) apertural view, (b) ventral view): (2) spec. MNHN no. F.A59092, $\times 1.5$; France, Chaumont-en-Vexin (Oise); Middle Eocene, Lutetian Stage; (3) spec. MNHN no. F.A59091, $\times 1.8$; France, Chaumont-en-Vexin (Oise); Middle Eocene, Lutetian Stage.

C. pervicina is covered with relatively thick spiral ribs bearing distinctly rounded granules.

The basal part of *S. concava* (if we compare shells of the same size) has more abundant, thinner spiral ribs that are decorated with quadrangular granules.

Remarks. The study of different *Pleurotomaria* species showed that typical shells of this genus occur in Triassic–Cretaceous deposits and they are significantly different from *Chelotia* ones. Based on this fact, *Chelotia* species were removed from the composition of genus *Pleurotomaria* and combined into an independent genus.

Material. Two shells from the same locality.

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Translated by D. Voroshchuk