

KOSOVINA, A NEW SILURIAN TRYBLIDIID GENUS (MOLLUSCA, TERGOMYA) FROM BOHEMIA (CZECH REPUBLIC)

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Abstract. A new genus and species of tryblidiid tergomyans (monoplacophorans of previous usage), *Kosovina peeli* gen. et sp. n., is described from the Silurian (Přídolí) of the Barrandian Area, Bohemia, Czech Republic. It is related to *Pilina* KOKEN et PERNER, 1925, but it has seven or eight sets of paired dorsal muscle scars of different shape and configuration and a rather thick, widely ovoid and deep shell. Besides *Retipilina* HORNÝ, 1956, it is the second representative of the Subfamily Tryblidiinae so far discovered in the Silurian of Bohemia.

■ Mollusca, Tergomya, Tryblidiidae, *Kosovina peeli* gen. et sp. n., internal shell morphology, muscle scars, Silurian, Barrandian Area, Bohemia, Czech Republic

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Introduction

Tryblidiid tergomyans constitute an inconspicuous element of Lower Palaeozoic epifaunal marine communities in the Barrandian Area. Nevertheless, if compared with published data from foreign territories, they are more numerous here, particularly in various types of Silurian limestones. Genera verifiably pertaining to the Family Tryblidiidae (*sensu* Knight and Yochelson 1958, 1960) occur in the Ordovician (*Pentalina* HORNÝ, 1961), Silurian (*Drahomira* BARRANDE in PERNER, 1903, *Retipilina* HORNÝ, 1956, *Pragamira* HORNÝ, 1995), and Devonian (*Kotysium* HORNÝ, 1961). The new genus described herein, *Kosovina* gen. n., is of Silurian age. Except for these genera, the systematic position of which is confirmed by the presence of muscle scars, several more genera of uncertain position were hitherto described: *Undicornu* HORNÝ, 1970 (Silurian), *Ladamarekia* HORNÝ, 1992, *Platypilina* HORNÝ, 1961, *Pilinopsis* HORNÝ, 1961, and *Litavina* HORNÝ, 1963 (all from the Devonian). Besides these, additional unpublished “monoplacophoran shells” have been found, lacking visible muscle scars and therefore not determinable. None of the genera given above have been found outside the Bohemian massif, and none of the foreign tryblidiid tergomyans has been so far discovered in the Barrandian Area. (For relationships and systematic of tryblidiids see also Lemche and Wingstrand [1959] and Wingstrand [1985].)

The low frequency of finds of individual species of tryblidiid genera is interesting. *Pentalina* (with one species *P. prantli* HORNÝ, 1961) is known from three specimens derived from mutually quite distant localities of the Šárka and Dobrotivá Formations. The genus *Drahomira* includes three species: *D. rugatum* (PERNER, 1903) from the Kopanina and Požáry Formations (about 30 specimens from various localities), *D. glaseri* BARRANDE in PERNER, 1903 from the Požáry Formation (about five specimens from various

localities). *D. barrandei* (PERNER, 1903) from the Požáry Formation is based on one specimen. Similarly, the genus *Pragamira* (one species, *P. perlonga* HORNÝ, 1995) was described from one specimen from the Požáry Formation. The only species of *Retipilina*, *R. knighti* (HORNÝ, 1956) is relatively common in the Kopanina Formation (more than 10 specimens found at one locality). It is possible, of course, that additional specimens are present in private collections. The recently described genus, *Kosovina* gen. n., is based on one species, *Kosovina peeli* sp. n. with a unique specimen, coming from the Požáry Formation. The only Devonian species, *Kotysium praeposterum* (BARRANDE in PERNER, 1903), was described on one specimen from the Suchomasty Limestone. (For details see Horný 1956, 1963, 1970, 1995.)

The holotype of *Kosovina peeli* is housed in the collections of the Department of Palaeontology, National Museum, Prague.

Systematic palaeontology

Class **Tergomya** HORNÝ, 1965

Order **Tryblidiida** LEMCHE, 1957

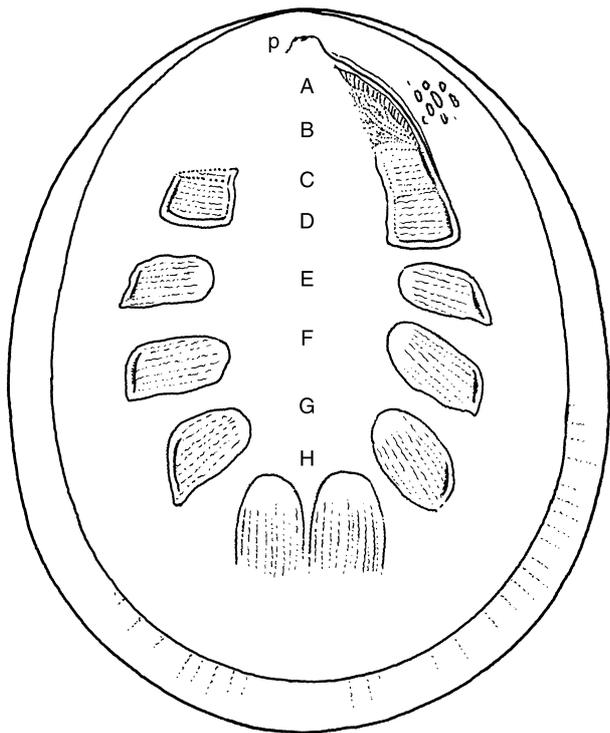
Family **Tryblidiidae** PILSBRY in ZITTEL-EASTMAN, 1899

Subfamily **Tryblidiinae** PILSBRY in ZITTEL-EASTMAN, 1899

Kosovina gen. n.

Type species: *Kosovina peeli* sp. n. Upper Silurian, Přídolí, Barrandian Area, Czech Republic.

Derivatio nominis: *Kosovina*, after the Kosov quarry.



Text-fig. 1. *Kosovina peeli* gen. et sp. n. Slightly schematised drawing showing structures on the internal mould. p, protoconch, A – H, paired muscle insertions; structures in the area covered with shell omitted. Orig.

Diagnosis. Genus of the Subfamily Tryblidiinae with widely ovoid, deep shell with seven or eight sets of paired scars, the anterior three or four in close juxtaposition. Diaphragm muscle scars not preserved. A group of small scars is located in an anterolateral position. Apex does not overhang the anterior margin.

Discussion. *Kosovina* gen. n. is closely related to the Upper Ordovician-Silurian *Pilina* KOKEN et PERNER, 1925, but it is distinguished by its widely ovoid, deep and thick shell, seven or eight sets of paired, mostly large symmetrical muscle scars (the first three or four being in close juxtaposition), and the presence of a group of small anterolateral scars. The Ordovician *Archaeophiala* PERNER, 1903 differs from *Kosovina* in having a high, sugarloaf-shaped shell with subcentral apex. The Silurian *Tryblidium* LINDSTRÖM, 1880 is characterized by a rather heavy shell with frilled lamellae making a reticulate surface, and a muscle scar pattern similar to that of *Pilina*. The Silurian *Retipilina* HORNÝ, 1970 has a wavy, densely reticulated shell surface and a much weaker muscle scar pattern, consisting of six sets of paired scars. The Lower Devonian *Kotysium* HORNÝ, 1961, with a flat shell, is imperfectly known but probably has five sets of paired muscle scars.

So far only a single specimen of the type species has been found. Nevertheless, its morphology is so distinct and different from other tryblidiids that its description is justi-

fied. There is no evidence to suggest the influence of some kind of pathological disorder.

Species. *Kosovina peeli* sp. n. Upper Silurian, Přídolí, Czech Republic.

Kosovina peeli sp. n.

Pl. 1, figs 1–6; Pl. 2, figs 1–2; Text-figs 1, 2

Holotype. Specimen NM L 37803, figured here on Pls 1, 2, and Text-figs 1, 2.

Stratum typicum. Upper Silurian, Přídolí, basal parts of the Požáry Formation, Biozone *Monograptus parulitimus* to *M. ultimus*.

Type locality. Dlouhá hora near Králův Dvůr, corn field above the southern margin of the Kosov quarry (situation in 1980 when the specimen was collected by the author).

Derivatio nominis. Named in honour of Prof. John S. Peel in acknowledgement of his contribution to our knowledge of the morphology and systematics of tergomyans.

Material. Besides the holotype none.

Diagnosis. See the genus.

Preservation. The holotype is preserved as an internal mould with a patch of shell in the antero-lateral area. It lies on a surface of dark grey muddy limestone containing fragments of various fossils. The sample was collected in a corn field with a soil skeleton of typical platy limestones of the Požáry Formation. The surface of the fossil is slightly mechanically damaged and locally weathered.

Shell morphology. The shell (including the brim) is widely ovoid, 22.0 mm long, 18.7 mm wide, and 11.5 mm high. The apex is partly damaged, but does not overhang the anterior margin. The posterior margin is rounded. The dorsum of the internal mould is shallowly convex between the apex and posterior margin. The transverse profile is strongly convex, with steep lateral slopes. The base of the anterior pit is observable as an internal mould. The apertural margin is planar, reflexed to produce quite a wide (max. 1.8 mm), oblique brim, which is striated perpendicularly to the shell margin and reduced in width under the apex. The shell is preserved laterally and below the apex, and is quite thick, 0.8–1.2 mm. It consists of large calcite crystals; irregular internal lamellae are preserved near the posterior margin of the shell. External sculpture consists of simple, somewhat irregular and unequal, slightly lamellar, growth lines (Pl. 1, figs 5, 6). Most of the dorsal surface of the internal mould is covered with dense, fine granulation that appears, although rarely, even within depressed muscle scars (Pl. 2, figs 1, 2). This structure may have originated by prediagenetic microbiobiochemical processes.

Muscle scars. Muscle scars are preserved as shallow depressions on the internal mould. This mode of preservation is similar to that in *Proplina cornutaformis* (WALCOTT, 1879), figured by Yochelson (1958) (figs 10–13, p. 9). Horný (1991) figured and briefly discussed this unusual preservation of dorsal scars in one specimen of

the Ordovician cyrtoneid *Sinuitopsis neglecta* PERNER, 1903 (Pl. 6, fig. 5), while the majority of specimens had typically raised scars.

The surface of depressed muscle scars in *K. peeli* shows the impression of radially arranged fibrous structure of deeper shell layers below myostracum. Peel (1977) showed variable and sometimes imprecise preservation of muscle scars in *Pilina cheyennica* PEEL, 1977; this is also the case in *Kosovina peeli*. It is not possible, therefore, to study each minor scar of pedal attachments and associated muscles as illustrated in the exceptionally well-preserved specimen of *Pilina unguis* (LINDSTRÖM, 1880) from Gotland by Lemche and Wingstrand (1959).

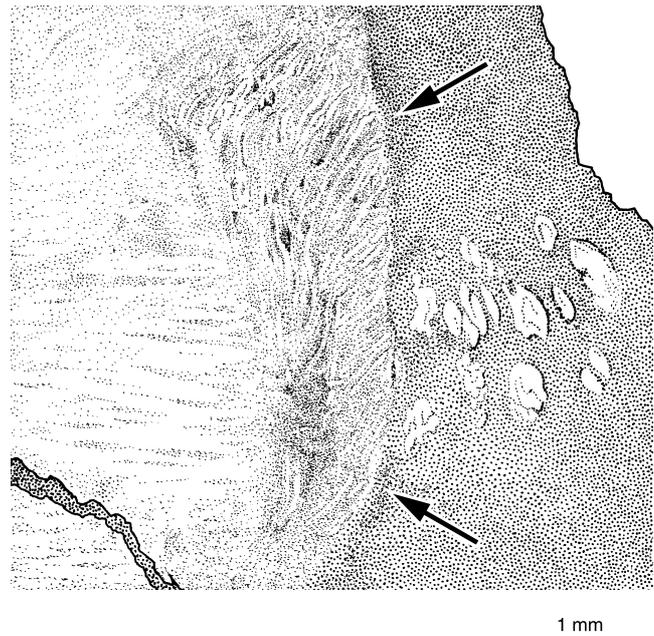
The muscle scar pattern of *K. peeli* consists of three or four anterior sets of paired scars in close juxtaposition (A–D, Pl. 1, fig. 4, Pl. 2, fig. 1), and four posterior sets of paired, more or less radially arranged sub-trapezoidal and oblong scars (E–H, Pl. 1, fig. 3, Pl. 2, fig. 2). Compared with *P. unguis* and *P. cheyennica*, the whole muscle scar complex is shifted adapically, so that the first set of paired scars (A) is located close to the anterior protuberance. The left side of the anterior part of the internal mould is covered with shell.

The anterior complex (Pl. 1, fig. 4, Pl. 2, fig. 1). The anterior complex is bordered with a continuous peripheral, lateral furrow/ridge structure. The first, narrow and long paired scar (A) is located at the internal slope of the frontal end of the furrow/ridge structure, near the anterior median protuberance. Its exact shape is not clear, but it is narrow, 1.8 mm long, and axially striated. It contacts the second scar (B), which is irregularly dendritic, resembling structures developed in *Pilina unguis* and interpreted as scars of the radular muscles (Lemche and Wingstrand 1959). The anterior extremity of the furrow/ridge structure may be, by position, homologous with the diaphragm scar (Lemche and Wingstrand 1959, Peel 1977) which, however, almost reaches the anterior median protuberance. The third and fourth scars (C, D) are sub-trapezoidal, radially striated and 2 and 3 mm long and have coalesced to form the largest muscle insertion of the anterior complex. The posterior margin of the fourth scar is bordered by the incurved, posterior transversal extremity of the furrow/ridge structure.

Compared with *P. unguis* and *P. cheyennica*, the anterior scar complex is shifted more frontally. (The left set of scars, viewed dorsally, is hidden under a patch of shell.)

The posterior complex (Pl. 1, fig. 3, Pl. 2, fig. 2). It consists of three central and one anal sets of paired scars. The fifth scars (E) are sub-trapezoidal, radially striated, at the periphery bordered with a furrow, 3.5 mm long. The sixth scars (F) are similar, about 4 mm long (the longest scar). The seventh scars (G) are sub-ovate, radially striated, about 3.5 mm long. The external margin of the EFG scars is bordered with a furrow/ridge structure. The eighth (anal) pair consists of closely positioned, slightly diverging, sub-oval, radially (axially) striated scars (H), about 3.0 mm long and 2.3 mm wide.

As in *P. unguis* and *P. cheyennica*, there exists a slight



Text-fig. 2. *Kosovina peeli* gen. et sp. n. Part of the right anterolateral area showing muscle scars adjacent to the furrow/ridge structure (arrowed). Orig.

asymmetry of the left and right sets of scars. The individual scars are not exactly mirrored and the individual scars in the left side are less densely arranged.

A group of about 15 minor, raised scars is located on the lateral steep slope in the level of the second muscle scar, peripheral to the furrow/ridge structure. The individual oblong scars are 0.3–0.8 mm long and 0.1–0.3 mm wide, and axially striated. The location of this group of muscle scars is similar to the position of muscle scars in *Barrandicella* PEEL et HORNÝ, 1999 (Peel and Horný 1999).

Pallial line and associated structures have not been ascertained.

Mode of life

K. peeli has a less elongate aperture (length:width ratio = 1.1) than *Pilina unguis* or *P. cheyennica*. Peel's (1977) conclusion that *P. cheyennica*, with a much more elongate shell (1,5), probably was a relatively mobile member of the epifauna suggests a lower degree of mobility for *K. peeli*. *K. peeli* was found in conditions of a relatively shallow sea, where flysch-like sedimentation of platy limestones was repeatedly interrupted by deposition of shale intercalations containing terrigenous material and even rare fragments of plants (*Cooksonia* sp.). Nevertheless, the limestones contain fragments of typical marine fauna of orthoconic nautiloids, indeterminate juvenile gastropods, bivalve prodyssoconchs, ostracods, and trilobites (eg. a pygidium of *Prionopeltis striatus* (BARRANDE)). A part of the outer shell surface left of the apex was overgrown with an indeterminate bryozoan. A wide brim indicates that the foot may have extended be-

yond the shell margins (see discussion in Peel 1977, p. 121). The almost circular outline of the aperture and the wide brim indicate that the animal may have lived on a soft or unconsolidated sediment-water interface as a deposit feeder or browsing mollusc. The thick shell and fragmentary fossils, however, illustrate more dynamic conditions of sedimentation and suggest that *K. peeli* may have clamped against a firm substrate in higher energy conditions. The specimen may have been fossilized in a biologic position on the surface of a carbonate deposit.

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Explanation to the plates

PLATE 1

Kosovina peeli gen. et sp. n., the holotype, NM L 37803

1. Dorsal view, $\times 4$.
2. Slightly oblique dorsal view showing the short anterior protuberance, thick shell in the apical region and the right row of muscle scars. $\times 4$.
3. Oblique posterior view, $\times 4$.
4. Morphology of the right side anterior muscle scar complex, almost reaching the short apical protuberance. $\times 6$.
5. Oblique left anterior view showing thick shell with irregular increments. $\times 4$.
6. Enlarged surface with impression of the basal surface of a bryozoan colony. Note the lamellar growth structures near the apertural margin. $\times 16$.

PLATE 2

Kosovina peeli gen. et sp. n., the holotype, NM L 37803

3. Anterior part of the furrow/ridge structure, showing relation and morphology of muscle scars. Note the dendritic structure of the second (radular?) scar and the group of minor scars outside the furrow/ridge structure. $\times 30$.
4. Posterior region of the internal mould with three last sets of paired scars. Note the subparallel position of the anal pair of axially striated scars and dense granulation of the surface of mould in the dorsal area. $\times 10$.

