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Momarhynchus, new Lower Famennian Rhynchonellid Brachiopod genus from Yakutia.

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Abstract

A new rhynchonellid genus, *Momarhynchus*, with type species *M. indigirkaensis* n. sp., is described from the lower Famennian of eastern Yakutia, Russia, North-East Asia. The new genus and the new species allow us to better define the so-called *Leiorhynchus ursus* Zone in the area concerned. This zone, also referred to as the *Zigania ursa* Zone, is recognized over a wide territory of the former USSR, and is included in some Regional Unified Stratigraphical Schemes; its understanding is unfortunately hampered by technicalities.

Key-words: rhynchonellids - brachiopods - *Momarhynchus* - lower Famennian - Yakutia

Résumé

Un nouveau genre, *Momarhynchus*, est décrit dans le Famennien inférieur de la Iakutie orientale, située dans la Russie d'Asie nord-orientale. Le genre et son espèce-type, *M. indigirkaensis* n. sp., permettent de mieux définir la prétendue Zone à *Leiorhynchus ursus* de la région concernée. Cette zone, aussi appelée Zone à *Zigania ursa*, est reconnue dans une vaste étendue de l'ancienne URSS et est incluse dans plusieurs Schémas Stratigraphiques Régionaux Unifiés. Des considérations d'ordre technique empêchent malheureusement la compréhension de cette zone.

Mots-clefs: Rhynchonellides - Brachiopodes -Famennien inférieur - *Momarhynchus* - Iakutie

Introduction

In the former USSR the *Leiorhynchus ursus* Zone or the *Zigania ursa* Zone, a widely spread Famennian zone, is known in the literature under this name as well as under many other expressions in which this brachiopod is associated with various goniatites and/or other brachiopods.

This zone has been mentioned in the following regions: Ural Mountains (South, Central, North, Pripolar), Volga-Ural region, Kazakhstan (Mugodzhary Mountains), Arctic region (Novaya Zemlya, Pai-Khoi, Taimyr, Timan-Pechora, Vaigach), North-East (Omolon Massif, Omulevka Mountains, Sette-Daban Range, eastern Yakutia), and the Russian Platform.

In the course of time the age of the zone oscillated between the lower and upper Famennian. The lower part of the upper Famennian is nowadays the widely accepted

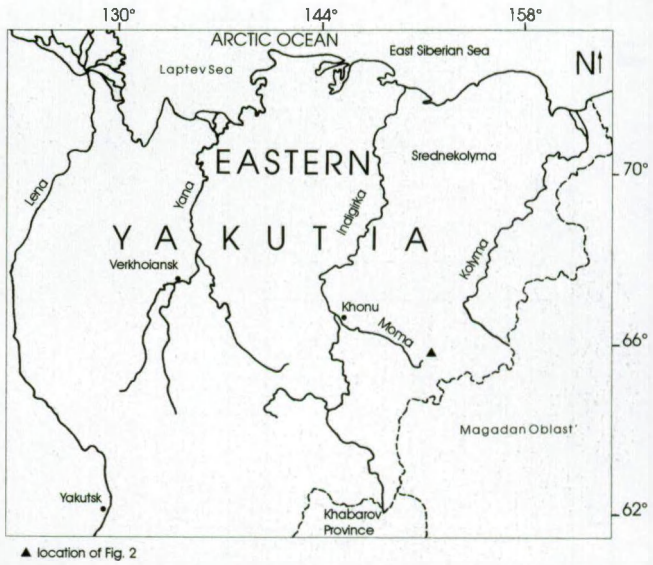


Fig. 1 — General geographical setting of eastern Yakutia, Russian Federation, Northeast Asia. Scale: 1:20.000.000

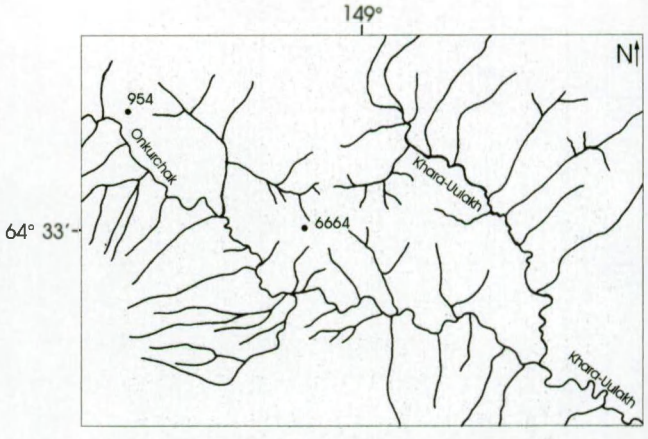
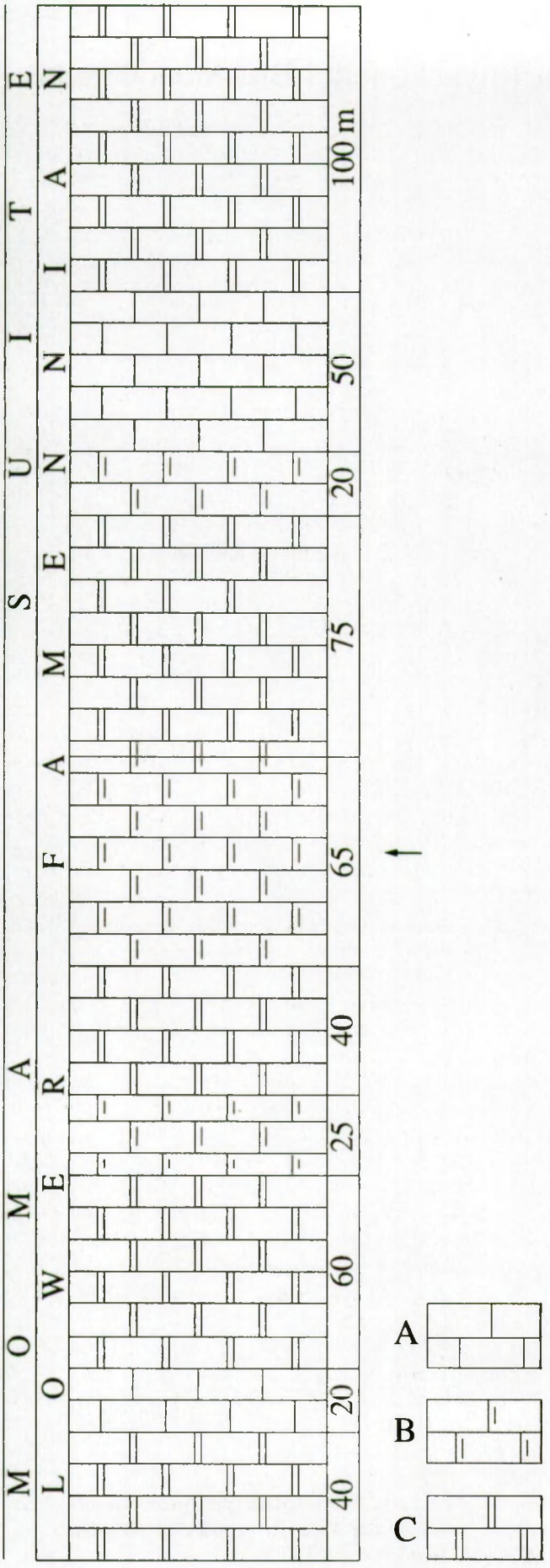


Fig. 2 — Location of the two outcrops where *Momarhynchus indigirkaensis* n. gen., n. sp. was collected. Scale: 1:333.330



age as exemplified in the Unified Stratigraphical Schemes of some regions, e.g. in the Unifitsirovannye i korrelyatsionnye stratigraficheskie skhemy Urala (Sverdlovsk, 1980).

On account of this it would seem reasonable to assume that *Liorhynchus* (now *Leiorhynchus*) *ursus* NALIVKIN, 1947 is well known. This is not the case and one should not mistake the many references to the species found in the literature for the knowledge of the species. As a matter of fact, our knowledge rests on a single specimen, the holotype, from the lower Famennian of the Zigan River in the southern Urals. Until topotypical material is collected, studied and made available, this state of affairs precludes any possibility of examining the internal characters of the species. Although one of us (PS) has been convinced for a long time that *L. ursus* belongs to a new genus, the conditions just mentioned prevented him from choosing it as the type species of such a genus.

The authors have decided to tackle the problem indirectly, i.e. to deal with species, which although erroneously attributed to *L. ursus*, could belong to the same genus or to a genus close to it. The small collection made in Yakutia opens this possibility. At the same time it has the advantage of stressing the fact that new knowledge is coming from a remote area of the world, where palaeontological and stratigraphical information are still in their infancy. Therefore, any new information should be most welcome.

Momarhynchus n. gen.

DERIVATIO NOMINIS

Moma Range, eastern Yakutia, Russian Federation, north-east Asia.

←

Fig. 3 — Stratigraphical column of the lower Famennian in the area of the divide between the Onkurchak and Khara-Uulakh Rivers. From base to top:

1. Grey and light-grey dolomites 40m
2. Dark-grey limestones 20m
3. Grey dolomites 60m
4. Grey dolomitic limestones 25m
5. Grey dolomites 40m
6. Grey and dark-grey dolomitic limestones with *Momarhynchus indigirkaensis* n. gen., n. sp. and *Cyrtospirifer Tschernyschewi* KHALFIN, 1933 ..... 65m
7. Grey and light-grey dolomites 75m
8. Grey and dark-grey dolomitic limestones 20m
9. Grey limestones 50m
10. Grey dolomites 100m

A = limestone; B = dolomitic limestone; C = dolomite.

← = position of *Momarhynchus indigirkaensis* n. gen., n. sp.

DIAGNOSIS

Large-sized. Transversely subelliptical. Sulcus and fold wide at front. Tongue low. "Lunules" present. Surface of shell smooth or with low and commonly bifurcated median costae. Lateral costae rarely present. Maximum thickness of shell always posterior to frontal commissure. Width by far the greatest dimension. Crural plates present. No dental plates. Stout divided hinge plate. Median septal ridge. Stout teeth. Relatively long radulifer crura.

TYPE SPECIES

Momarhynchus indigirkaensis n. gen., n. sp.

SPECIES ATTRIBUTED TO THE GENUS

Besides the type species, one or more species so far attributed to *Leiorhynchus ursus* might be assigned to the genus, and, eventually, *L. ursus* itself.

DESCRIPTION

Large-sized. Inequivalve, the thickness of the pedicle valve varying from 40 to 47 per cent of the thickness of shell. Front margin uniplicate. Frontal and lateral commissures slightly to very slightly undulated by costae, when costae are present. Transversely subelliptical in ventral and dorsal views. In cardinal view, contour of shell is a half-ellipse in the pedicle and in the brachial valve. Flanks of both valves regularly convex. Dorsal umbonal region never extending beyond the pedicle beak. Commissure sharp. At the lateral commissures, which are located relatively high as seen in lateral profile, flanks join at acute angle. Posterolateral margins concave near commissure.

Pedicle valve evenly convex with gently sloping flanks. Well marked sulcus beginning at a short distance from beak, widening rapidly and reaching its greatest width (55 to 62 per cent of width of shell) at the junction of the frontal and lateral commissures. Bottom of sulcus slightly concave to flat. The sulcus passes to the flanks through hog-backed edges. Sulcus shallow, sometimes moderately shallow. Tongue slightly arched to trapezoidal, low with sharp borders, standing out clearly. Top of tongue slightly convex. Crest of tongue stretched anteriorly. Beak small, wide, slightly to strongly incurved, almost in contact with the dorsal umbonal region, overhanging the cardinal line. Very short and low interarea. Long "lunules" (around 70 per cent of length of shell) present on both sides of the beak; they are separated from the flanks by blunt beak ridges, which fade out rapidly laterally.

Brachial valve moderately high, rarely high. Slopes of flanks generally gentle. Well marked fold, low to moderately high, beginning at a short distance from beak. Top of fold gently curved.

Surface of shell smooth or with median costae. Lateral costae are rarely present. These costae, averaging 10 (6 to 14) in number at front, are wide, low and rounded; they start at a short distance from the beaks, about on level with the sulcus and fold. Median costae are commonly bifurcated. A fine radial striation has been observed in places on some specimens.

Highest part of pedicle valve located between 22 and 33 per cent of the length of shell. Maximum thickness of shell always located in the anterior part of shell at a variable point posterior to the frontal commissure; from this point the brachial valve curves gently toward this commissure. Width is by far the greatest dimension. Maximum width of shell occurs at a point between 49 and 64 per cent of the length anterior to the ventral beak. The apical angle varies from 124° to 130°.

Shell thick in the apical region. Stout and short teeth. Well developed denticula. Thick crural plates thinning anteriorly in becoming lamellar. Stout divided hinge plate extending far inward as thin and wide outer hinge plates, sometimes subhorizontal, but usually slightly convex and inclined toward each other. Short dental sockets. Inner socket ridges low. Low and long median septal ridge, thin, except in its posterior part; sometimes it is well observed in transverse serial sections, sometimes less well. Inner edges of outer hinge plates developed anteriorly into stout crural bases. Relatively long radulifer crura diverging progressively anteriorly and curving strongly ventrally at their distal end. Shape of crura in transverse serial sections successively, starting from the base: subtriangular, Phrygian cap, inverted L.

COMPARISONS

As mentioned above, our knowledge of *Leiorhynchus ursus* rests on a single specimen, the holotype, from the southern Urals. Therefore, any comparison is pointless before more topotypical material has been collected and properly illustrated and described. The holotype has 7/6 median costae and is smaller and flatter than *Momarhynchus indigirkaensis* n. gen., n. sp.; it is very close to that species in all other external characters.

Momarhynchus indigirkaensis n. gen., n. sp.

SYNONYMY

Momarhynchus indigirkaensis n. gen., n. sp. and/or related species are probably to be found among specimens identified during the last thirty years as *Leiorhynchus ursus*, *L.* ex gr. *ursus*, *L.* cf. *ursus*, *L.* aff. *ursus*, "*Zigania*" *ursus*, etc.. in various regions (Omolon Massif, Omulevka Mountains, Sette-Daban Range, eastern Yakutia) of the vast territory of North-East Asia. These identifications, included in publications and in internal reports, have to be checked, and probably corrected, when collections become available.

DERIVATIO NOMINIS

Indigirka River, Yakutia, Russian Federation, North-East Asia.

TYPES

The type series is deposited in the Palaeontological Institute (PIN) of the Russian Academy of Sciences in Moscow.

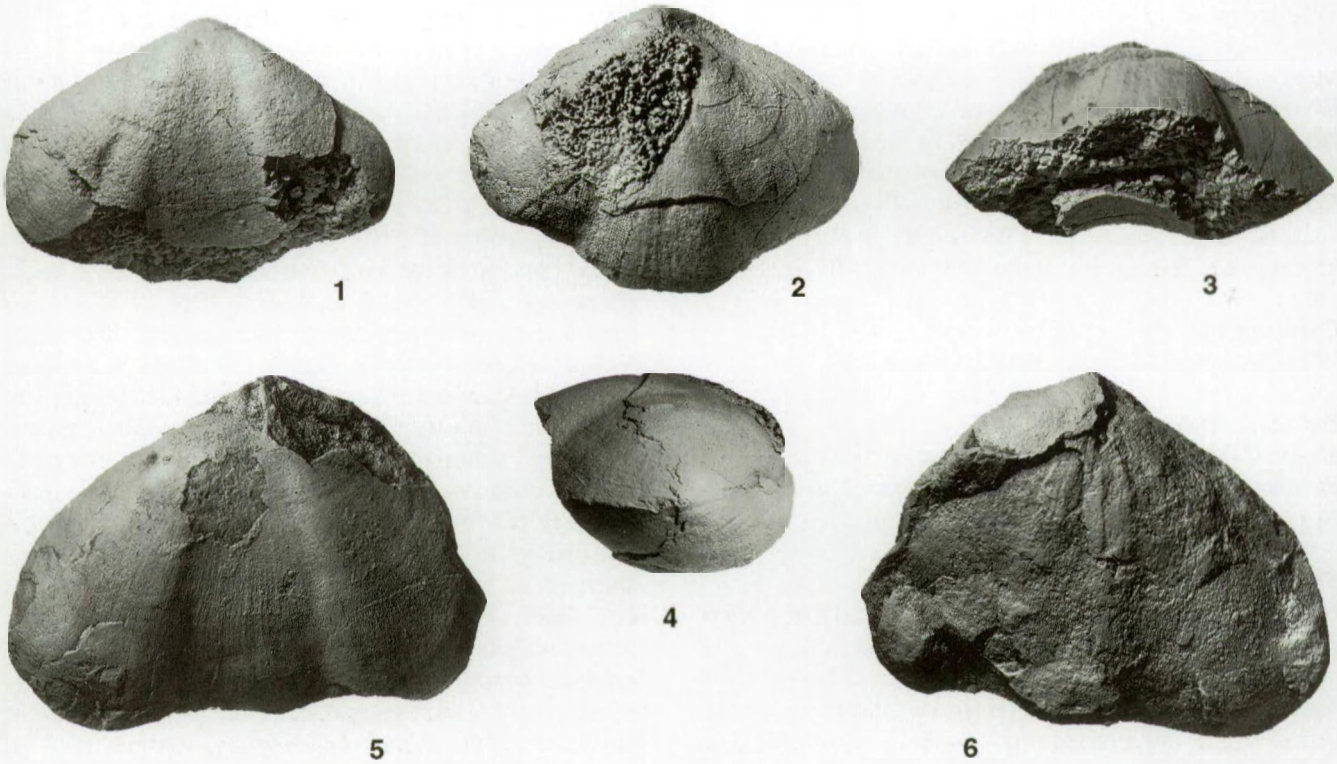


Fig. 4 — *Momarhynchus indigirkaensis* n. gen., n. sp. 1-4: Holotype, PIN N° 4114/648. Ventral, dorsal, frontal and lateral views; 5,6: Paratype A, PIN N° 4114/649. Ventral and dorsal views. Figures are x1.

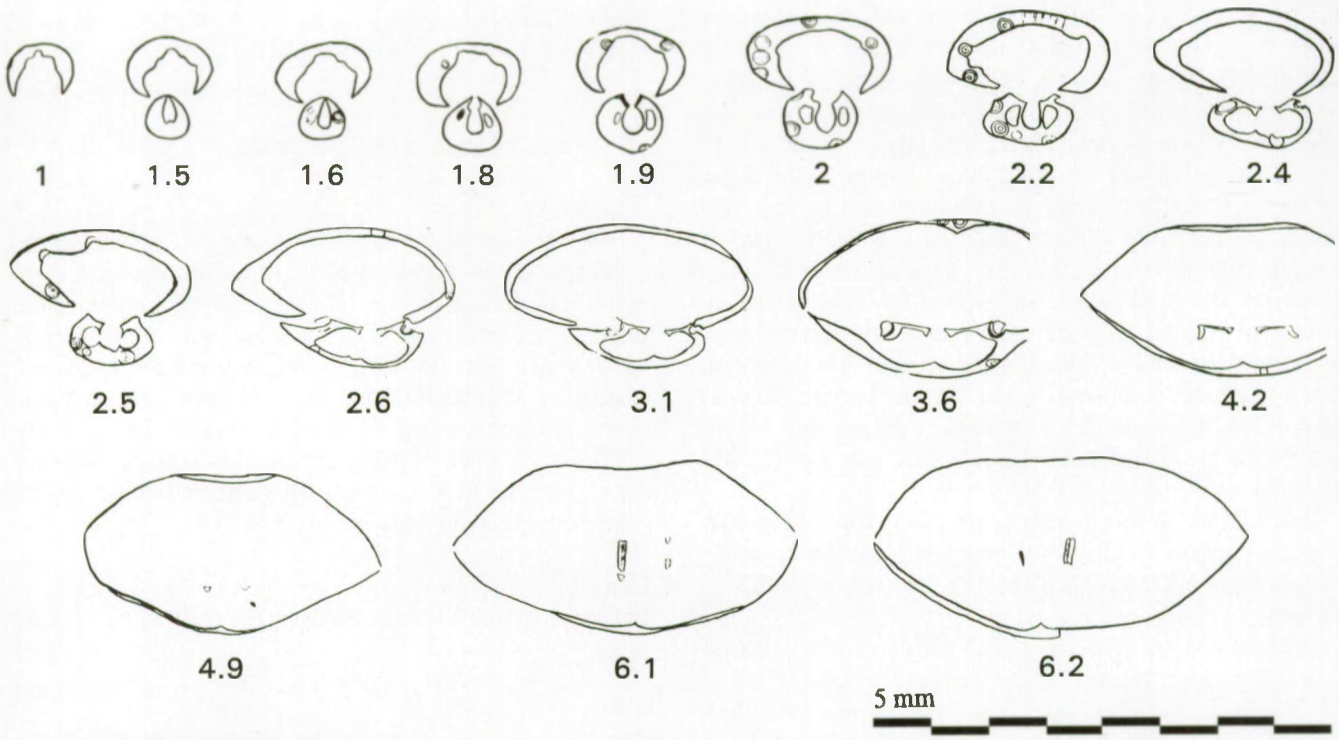


Fig. 5 — *Momarhynchus indigirkaensis* n. gen., n. sp. Transverse serial sections; figures are distances in mm of the section forward of the crest of the ventral umbo. Paratype K, PIN N° 4114/650. Measurement: width = 19.2 mm.

Holotype, PIN N° 4114/648 (Fig.4: 1-4); Paratypes A, PIN N° 4114/649 (Fig.4: 5,6), B-J, PIN N° 4114/680-688. Moma River, between Khara-Uulakh and Onkurchak Rivers, Moma Range, Yakutia, Russian Federation, North-East Asia. Upper half of Moma Suite, *Cyrtospirifer tschernyschewi* Zone, lower Famennian. Locality 6664. Collector: Surmilova, E.P., 1972, 1973.

Paratypes K, PIN N° 4114/650 (Fig.5), L, PIN N° 4114/651 (Fig.6), M-Q, PIN N° 4114/689-693. Moma Range, 10km NW of locality 6664. Upper half of Moma Suite, *Cyrtospirifer tschernyschewi* Zone, lower Famennian. Locality 954. Same collector.

LOCUS TYPICUS

Moma River, between Khara-Uulakh and Onkurchak Rivers, Moma Range, Yakutia, Russian Federation, North-East Asia.

STRATUM TYPICUM

Upper half of Moma Suite, *Cyrtospirifer tschernyschewi* Zone, lower Famennian.

MATERIAL, STATE OF PRESERVATION

Eighteen specimens. Five specimens are in a satisfactory state of preservation; the remainder of the material contains seven brachial valves and six fragments.

DESCRIPTION

As the genus is monospecific, the description of the genus applies to the species.

GEOGRAPHICAL LOCATION AND STRATIGRAPHICAL POSITION

The two outcrops (6664 and 954) of the Moma Range in eastern Yakutia, Russian Federation, North-East Asia, are marked on Figure 2. They are 10 km apart and, thus, the stratigraphical column of Figure 3 is valid for both. *Momarhynchus indigirkaensis* n. gen., n. sp. has been collected in rocks also containing *Cyrtospirifer Tschernyschewi* KHALFIN, 1933. The latter species is the index species of the lower Famennian regional (North-East Russia) *C. tschernyschewi* Zone. According to GAGIEV (1985, table, p. 61), the range of this zone in the south-western part of the Fore-Kolyma uplift is in terms of the conodont zonation: *Palmatolepis crepida* and *P. rhomboidea* Zones. How far this applies to the Moma Range has still to be substantiated.

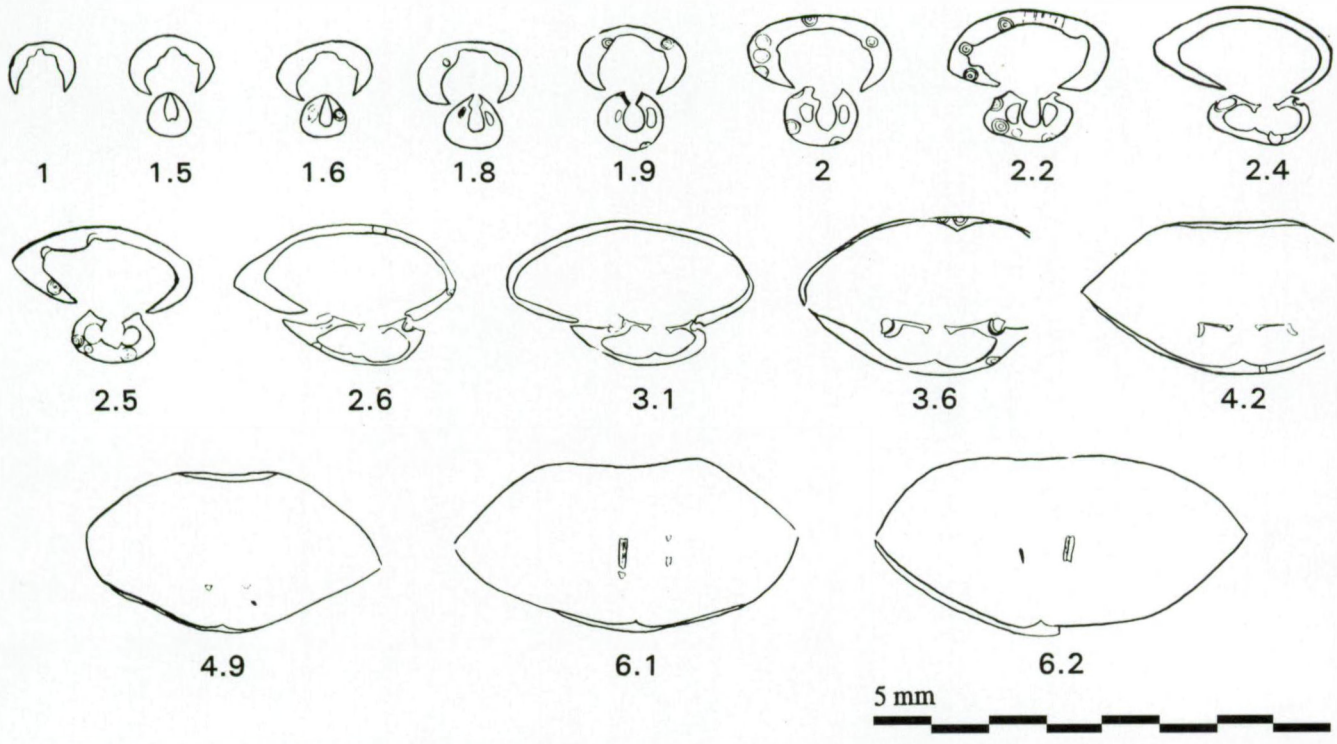


Fig. 6 — *Momarhynchus indigirkaensis* n. gen., n. sp. Transverse serial sections; figures are distances in mm of the section forward of the crest of the ventral umbo. Paratype L, PIN 4114/651. Measurements: length = 25.5 mm; width = 50.5 mm; thickness = 21.8 mm.

References

GAGIEV, M.Kh., 1985. Subdivision and correlation of Frasnian-Famennian boundary deposits (in terms of conodonts), USSR North-East (Fore-Kolyma uplift). *In*: ZIEGLER, W. & WERNER, R. (eds.), Devonian Series Boundaries - Results of world-wide studies. *Courier Forschungsinstitut Senckenberg*, 75: 53-63.

KHALFIN, L.L., 1933. Materialy k stratigrafii severnoi okrainy Kuzbassa. II. Verkhniy devon sela Jarkovskogo na r. Yae. *Trudy naouchno-issledovatelskogo ugolnogo instituta*. "Kuzbassuglya", 72 pp.

NALIVKIN, D.V., 1947. Klass *Brachiopoda*. Brakhiopody. *In*: NALIVKIN, D.V. (Red.), Atlas rukovodyashchikh form iskopaemykh faun SSSR, III, Devonskaya Sistema. Moskva, Leningrad, pp. 63-134.

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