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DYBOWSKINIA RAKVERENSIS, A NEW LAMBELASMATID CORAL (RUGOSA) FROM THE MIDDLE ORDOVICIAN OF ESTONIA

An everted axial structure (columella or axial boss) evolved for the first time already in the Late Middle Ordovician during the initial phylogenetic radiations of Rugosa. The apomorphic skeletal feature, which much later becomes extremely typical of Permo-Carboniferous coral faunas, appeared in at least two independent Viruan lines, within Lambelasmatidae (and their descendants Calostylidae) and within Streptelasmatidae. The more flourishing former group comprises the genera *Coelostylis* Lindström, 1880, *Dybowskinia* Weyer, 1973, *Neotryplasma* Kaljo, 1957, and *Calostylis* Lindström, 1868, the Middle Caradocian species of which have been recently described by Lin Baoyu (Лин Бао-юй, 1965), B. Neuman (1967), M. Shurygina (Шурыгина, 1973), and D. Weyer (1973, 1982). The latter group is known from but one *Grewingkia*-like species (*Leolasma* ? sp. of D. Weyer, 1974; text, Fig. 3, probably identical with *Eogrewingkia* nom. nudum of Neuman, 1979); somewhat similar, though not necessarily related corals, as yet of uncertain systematic position, are *Grewingkia* ? *lutkevitshi* Reiman, 1958 (Rakvere Regional Stage of western Leningrad Region); and «*Kenophyllum* ? *canaliferum* Reiman in Kaljo, 1958» of V. Sytova (Сытова, 1975) (lower Molodovo Regional Stage of Podolia). Finally, even one colonial columellate genus occurs as early as in the Late Viruan beds: the interesting but doubtful taxon *Yohophyllum* Lin, 1965 (Kweichow and Szechwan provinces of China).

Undescribed Baltoscandian collections demonstrate a richer development and farther distribution of corals characterized by such a morphology, *Dybowskinia rakverensis* from the Estonian Rakvere Regional Stage of the latest Middle Ordovician, being a well defined new species of a hitherto monotypic genus. The studied Rugosa specimen is deposited at the Institute of Geology, Academy of Sciences of the Estonian SSR, Tallinn. The author is greatly indebted to Dr. D. Kaljo, director of that institution, for the possibility to see the Estonian coral collections in his care and for kind help during my visit to Tallinn. Duplicate peels are kept in the Palaeontological Department, Natural History Museum of Humboldt-University, Berlin.

Suprafamilia Calostyliceae Zittel, 1879

Familia Lambelasmatidae Weyer, 1973

Subfamilia Lambelasmatinae Weyer, 1973

Genus *Dybowskinia* Weyer, 1973

Dybowskinia rakverensis sp. n.

Plate I, Figs 1—6; Plate II, Figs 1—13; Plate III, Figs 1—12

Holotype. Specimen N Co1341 (Institute of Geology, Tallinn) =

28 cross-sections (25 peels, 3 thin sections); a series of 21 duplicate peels (cross-sections Nos 1—21) is kept in Berlin (N K. 101, Natural History Museum). Locality Rakvere (outcrop near the Secondary School N 1 of the town), Estonian SSR; aphanitic limestone of Rakvere Regional Stage (top Viruan, middle Caradoc, zone of *Dicranograptus clingani*).

Diagnosis. *Dybowskinia* having multitrabecular septal margins at the calicular rim, unshortened cardinal septum and rather long minor septa in the upper part of the calice.

Description. The only known holotype corallum is solitary, conical and straight, having a completely preserved calicular margin with 52 septa and a diameter reaching 16 mm; height 25 mm, originally about 28—30 mm, but proximal end broken off at a diameter of 2 mm. Depth of calice amounts to 80% of polyparium length. Archaeotheca covered by very fine growth rugae, strongly ribbed longitudinally (broad, well rounded interseptal ribs, pinnately arranged narrow septal furrows multiplying by splitting at four points of growth according to the law of Kunth). There are no additional furrows of a «third order» of septa (hyposepta).

Structures of the septal apparatus and the proportions of septa; wall thickness and interseptal loculi changing during calicular ontogenetics are demonstrated in the detailed series of cross-sections. At about midlength of the corallum, major septa unite near the centre with a small low axial structure built of somewhat vertically deflected and prolonged trabecular spines of proximal free septal margins. The typical pinnate or zaphrentoidid arrangement in four quadrants is well marked in the lower calice (Pl. II, Figs 7—11). Cardinal septum unshortened, equal in length to metasepta. Strongly spiny free minor septa rather long in the upper and middle calice, completely reduced at calicular base after biformous incorporation into the slowly thickening wall.

Septal microstructure changes from a peripheral multitrabecular zone at the top of the calice (Pl. III, Figs 11—12) where minor septa grow as long as the major ones, towards strong monacanths in deeper regions with interior septal margins bearing very long and thick spines. Fusion of these prominent and excessive trabeculae results in mainly laminar septa, but leaves numerous pores which occur throughout the total length of the major septa (both near the wall and the axial stereozone), reaching the base of the calice in spite of continuously increasing stereoplasmatic skeleton thickenings. One septal pore is found even in subtabular areas (Pl. II, Fig. 2, the second last major septum of left counter-quadrant).

A few thick convex tabulae have been deposited near the basal tip. Subtabular parts of corallum with comparatively large open interseptal spaces. True cardinal fossula not developed, but distinct counter, cardinal and lateral pseudofossulae can be seen near the bottom of the calice (Pl. II, Fig. 6). Calicular rim modified by a weak starting rejuvenescence (Pl. III, Fig. 12). Septal ontogenesis proceeds according to the following formulae (n = number of major septa, N = number of all septa, D = diameter).

	$\frac{3}{4}\|\frac{3}{4}$	$\frac{3}{5}\|\frac{3}{4}$	$\frac{4}{5}\|\frac{3}{5}$	$\frac{4}{5}\|\frac{4}{5}$	$\frac{5}{6}\|\frac{5}{6}$
n	18	**19**	21	22	26
N	28	30—32	36	39	44—45
D (mm)	3.4	3.8—4.9	5.4	6.3	7.6—8.8
Pl./Fig.	II/2	II/3—4	II/5	II/6	II/7—9

5/7 | 5/6	5/7 | 6/6	5/7 | 6/7	6/7 | 6/7
27	28	29	30
47—48	49	50—51	52
9.3—10.0	10.3	10.4—11.4	11.4—15.6
II/10—11	II/12	III/1—7	III/8—12

Discussion. Distinguishing features of *Dybowskinia dybowskii* Weyer, 1973 (Baltoscandic *Macrourus* limestone), the previously monotypic type species of the genus, are its notably shorter, much earlier reduced minor septa, a slightly shortened cardinal septum in the middle calicular regions, and the absence of multitrabecular septal margins at top of the calice. Further differences of the new species may be the somewhat thicker major septa in the middle calice (Pl. III, Figs 1—5), more numerous and larger subtabular interseptal loculi, and a smaller adult septal index, probably depending upon the less conical corallum shape. Higher calicular levels resemble *Coelostylis* Lindström, 1880 (Coelostylinae), but the distinct and typical configuration of Lambelasmatinae (pinnately arranged major septa, with last metasepta being short) appears in the lower calice.

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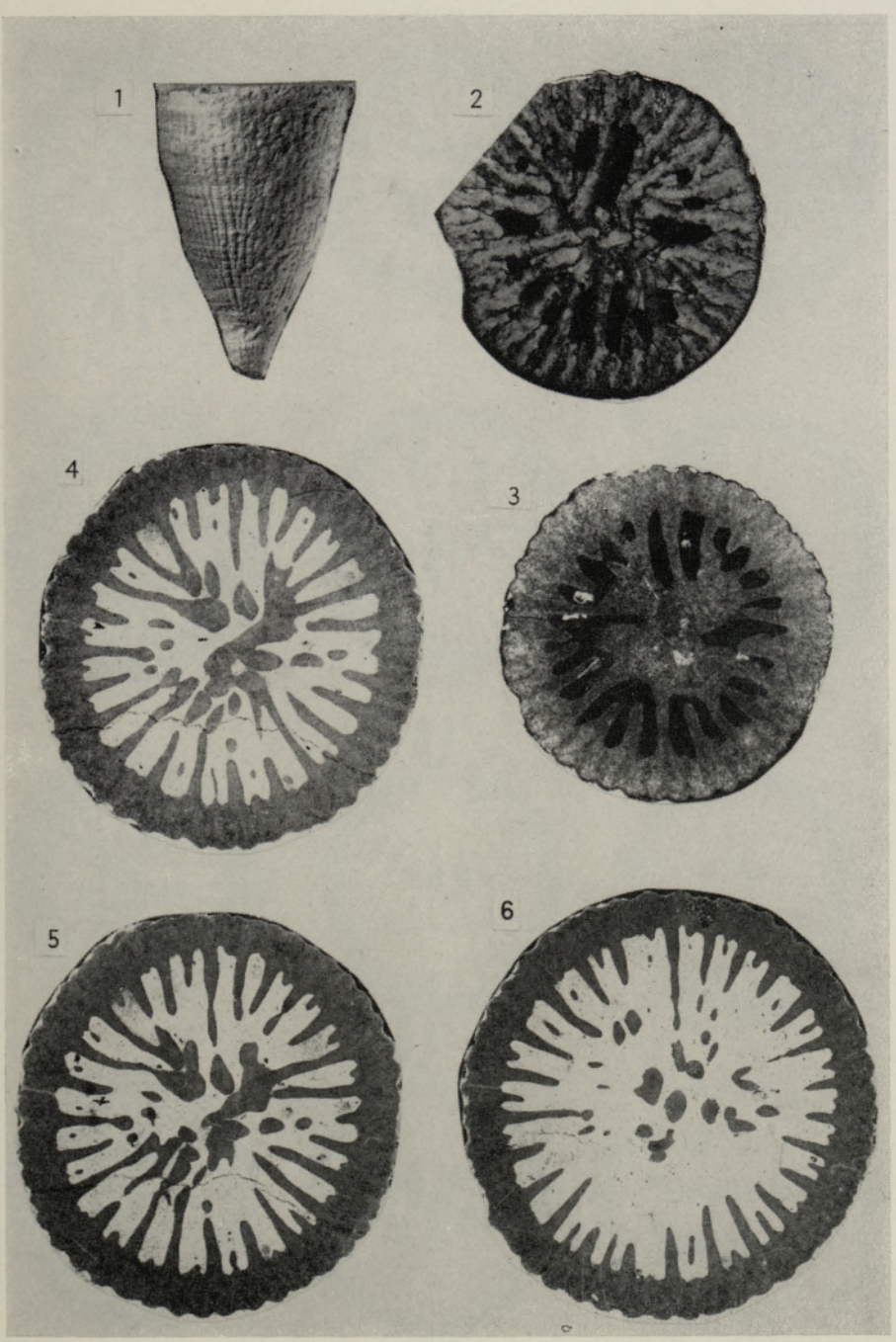
DYBOWSKINIA RAKVERENSIS, UUS LAMBELASMATIIDNE RUGOOS EESTI KESKORDOVIITSIUMIS

Rakvere lademest Ida-Eestis on kirjeldatud kõnealust uut liiki, mis on osutunud selle perekonna esmasleiuks Ida-Baltikumis. Perekonna tüüpliik on kirjeldatud *Macrourus*-lubjakivi rändpangasest Poola loodeosast.

Д. ВЕЙЕР

DYBOWSKINIA RAKVERENSIS, НОВЫЙ ВИД ЛАМБЕЛАЗМАТИДНЫХ РУГОЗ ИЗ СРЕДНЕГО ОРДОВИКА ЭСТОНИИ

Описанный вид происходит из раквереского горизонта Восточной Эстонии. Это первая находка рода в Восточной Прибалтике, типовой вид рода описан из эрратического валуна известняка *Macrourus* из северо-западной части Польши.



Plates I—III. *Dybowskinia rakverensis* sp. n., holotype N Co1341 (Institute of Geology, Tallinn), Rakvere Stage, the town of Rakvere (eastern Estonia).
Fig. 1. Lateral view of corallum seen from cardinal side, X1.6.
Figs 2—6. Calicular cross-sections (23, 18, 14, 13, 9), X5.6 (2) and X4.8 (3—6); for drawings compare Pl. II, Fig. 7, and see Pl. II, Fig. 10, Pl. III, Figs 1, 2, 6; axial structure of Fig. 3 with four tiny subtabular loculi filled by sparitic calcite.

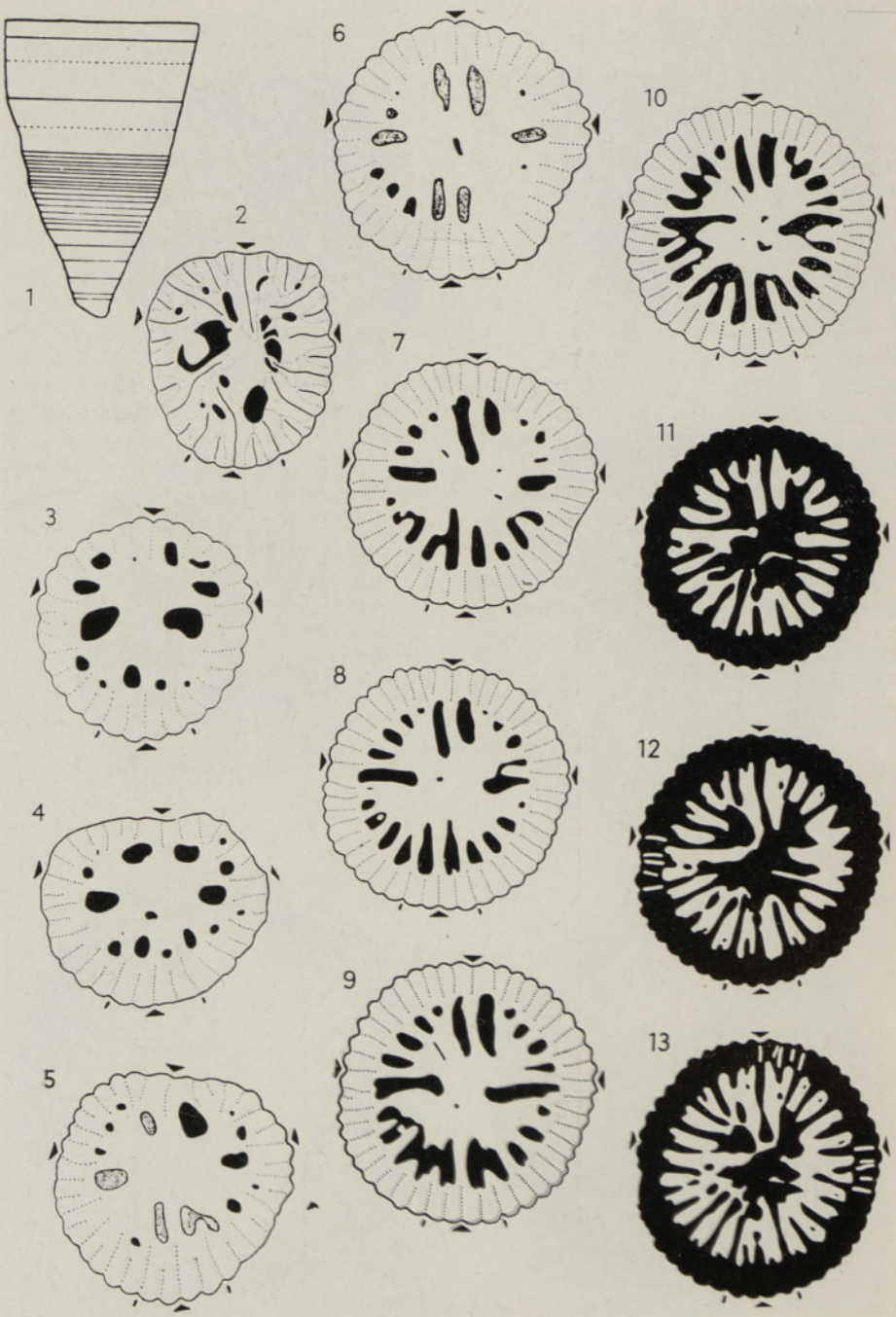
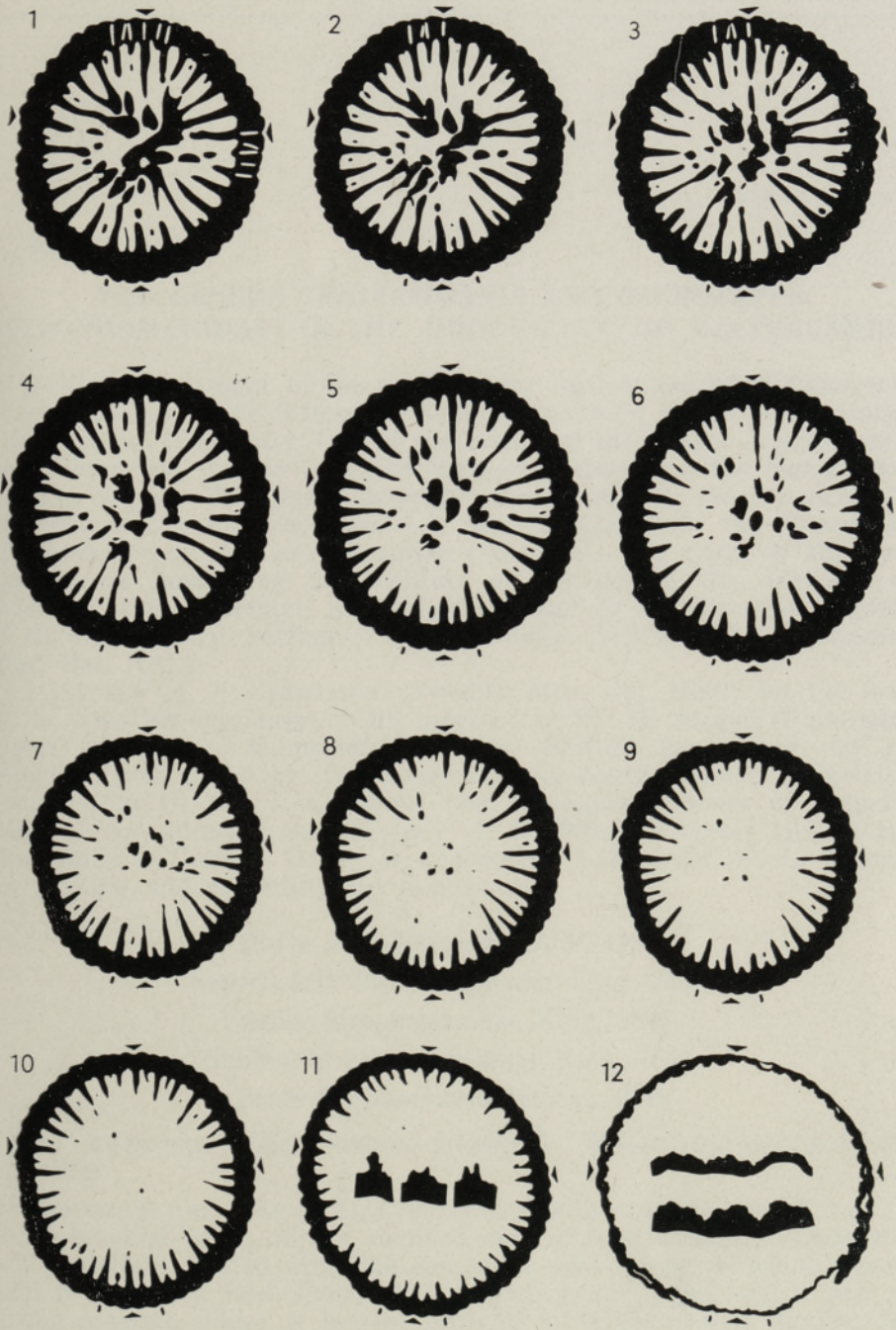


Fig. 1. Outline of corallum indicating positions of 26 prepared cross-sections, X1.6; stippled sections N 2 and 4 not figured, sections N 21 and 23 omitted, being nearly identical with those of Nos 20 and 22.
Figs 2—13. Series of cross-sections (Nos 28—24, 22, 20—15) from subtabular and lower calicular regions, X8 (2—3), X6.4 (4), X6 (5), X5.6 (6), X4.4 (7), X4 (8—9), X3.6 (10), and X3.2 (11—13); interseptal lumina are subtabular in Figs 2—4, supratabular in Figs 7—13 (excepting some small central areas in Figs 7—10), and mixed in Figs 5—6 (stippled areas supratabular); distances from the basal section (2) 0.4 (3), 1.7 (4), 3.2 (5), 4.5 (6), 5.7 (7), 6.5 (8), 6.9 (9), 7.4 (10), 8.0 (11), 8.5 (12), and 9.0 mm (13).



Figs 1—12. Series of cross-sections (Nos 14—5, 3, 1) from middle and upper calicular regions (without any subtabular areas), X3.2 (1—6), X2.8 (7—10), and X2.4 (11—12); septal details within Figs 11 and 12 X7.2 and X8; distances from the basal section of Pl. II, Fig. 2, are 9.4 (1), 9.7 (2), 9.9 (3), 10.2 (4), 10.5 (5), 10.7 (6), 11.1 (7), 11.4 (8), 11.7 (9), 12.0 (10), 16.6 (11), and 21.6 mm (12).