

NEW MICROSOLENIID
GENUS *ECOMOSERIS* (SCLERACTINIA,
EARLY LIAS – CENOMANIAN)

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Abstract: New microsolenid coral genus *Ecomoseris* is characterized by thamnasterioid-subcerioid colony. Its earliest species are from the lowermost sequence of the early Liassic Gurumdin Svite of the South-East Pamirs, while the latest from the lowermost Cenomanian of Westfalen, Germany. The paper describes two Liassic and one Cenomanian species.

Key words: Scleractinia, Microsolenidae, taxonomy, Lias, Cenomanian, Pamirs, Central Asia, West Europe.

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INTRODUCTION

Apparently, the genus *Ecomoseris* was a common component of coral fauna in the Early Liassic of the epicontinental seas and the Tethys. Although it belongs to persistent Mesozoic faunal elements, its presence has been, up to now, overlooked.

Liassic Pamirian species described in the paper belong to the earliest representatives of the family Microsolenidae. They have been found in the beds initiating calcareous sedimentation of a thick (20 - 80 m, 120 m) early Sinemurian member of the Gurumdin Svite (Dronov & Melnikova, 1987), overlying Hettangian deposits. It is supposed that the base of the svite corresponds to the Hettangian-Sinemurian boundary. Coralliferous beds outcropping in the Zurchirtsek and Alichur Valleys contain coral complex of a mixed Triassic/Jurassic character: *Stylophyllopsis* sp. sp., *Pinacophyllum* sp., *Allocoeniopsis* sp. sp., *Archaeosmiliopsis densus* Melnikova, *Archaeosmilia beata*

Melnikova, simple microsolenid indet., *Eocomoseris lamellata* sp.n. and *E. ramosa* sp. n.; colonial growth forms dominate over simple forms.

The Cenomanian species delimits comoseriid upper stratigraphic range. It has been found in the West Europe, Westfalen (Germany) (Loeser, 1994, in press). The species is a component of a well taxonomically diversified coral assemblage of a distinct Jurassic character.

MATERIAL

The Pamirian specimens are housed at the Geological Institute of the Tadzhik Academy of Sciences, Dushanbe, Tadzhikistan (abbreviated IGD), while the Cenomanian material in the Ruhrlandmuseum Essen, Germany (RE); *Eocomoseris* material belongs to the collection of the Institute of Paleobiology, Warsaw, Poland (ZPAL).

DESCRIPTIONS

Abbreviations used in the descriptions: c-c – distance between corallite centres, D – diameter of corallites, D tr – diameter of trabeculae, s – number of septa, sd – septal density, S1-S3 septa of 1st-3rd order.

Family *Microsolenidae* Koby, 1889

Genus *Eocomoseris* nov.

Type species: *Eocomoseris ramosa* Melnikova sp.n.

Derivation of the name. *Eos* (Greek) – dawn, referring to the early stage of the comoseriid phylogeny. (Femin.)

Diagnosis. Colony thamnasterioid-subcerioid in type; corallites of small dimensions, provided with monotrabeular columella; radial elements of bi-septal type built of a few trabeculae and ornamented with strong menianes; internal border provided with terminal pennulae; dissepiments expanded, abundant. Synapticulae rod-like, rare, constituting incomplete wall. Budding intra- and intercalicular.

Species included: Lias: *Actinaraea bevoayensis* (Alloiteau, 1958) in Turnšek *et al.*, 1975, *Microsolena fromenteli* Terquem et Piette, 1868, *Eocomoseris lamellata* Melnikova sp.n., *Eocomoseris ramosa* Melnikova sp.n.; Kimmeridgian/Tithonian: ? *Thamnasteria vereschagini* Krasnov, 1983; Cenomanian: *Eocomoseris raueni* Loeser sp.n. Species of *Eocomoseris* (see also p. 000 and p. 000) are also known from the Lias of Morocco (Le Maitre, 1933, pl. 1: 4 – *Spongiomorpha crassa*, and pl. 3: 1, 3, 4 – *Spongiomorpha (Heptastylopsis) asiatica*) and from the Malm of Spain (Flügel & Hötzl, 1966, pl. 18: 1-3 – *S. globosa*).

Stratigraphic range: Sinemurian through Cenomanian.

Discussion. From perfectly thamnasterioid *Microsolena* Lamouroux 1821, the new genus differs mainly in having bisepthal radial elements; they are more frequently subconfluent or even nonconfluent rather than confluent, thus, its colony is more subcerioid than purely thamnasterioid in type. Moreover, in *Ecomoseris* the synapticalae developed peripherally delimiting boundaries of calices in the form of an incomplete wall, while in *Microsolena* they are distributed regularly and never form a wall. Monotrabeccular columella in *Ecomoseris* differs from parietal (if ever developed) columella in *Microsolena*.

In the morphology of corallites, structure of radial elements and columella, the new genus is closely related to *Comoseris* d'Orbigny, 1849 and *Dendraraea* d'Orbigny, 1849. In all of them the corallites are small, septa are built of spaced, few trabeculae (compare to *Comoseris* Pl. I: 6), and the menianes are very strong. *Ecomoseris* differs from *Comoseris* in lacking collines. It differs from *Dendraraea* mainly in its imperfect porosity of septa and in different mode of growth of branches. The latter difference results in the lack of discernible corallites in branch cross sections of *Dendraraea*. In contrast to this, *Ecomoseris* always has well expressed corallites. More detailed comparison could be made when the structure of *Dendraraea* is known (Gill, in press, Lathuilière & Gill, in prep.) The internal septal border in *Ecomoseris* bears, like in *Aspidiscus* (Gill & Lafuste, 1987), large terminal pennulae, the elements presumably typical of many pennular corals.

Stratigraphically, *Ecomoseris* (early Lias-Cenomanian) foreruns *Comoseris* and its range overlaps that of *Comoseris* (Bathonian - Albian - Cenomanian?). Their close structural similarities allow for a supposition of their being directly related as the ancestor-descendant forms.

The microsolenid Liassic forms included above to the range of the genus, i.e. *Microsolena fromenteli* Terquem et Piette and *Actinaraea bevoayensis* Alloiteau *sensu* Turňšek, 1975, are distinctive in having densely packed small calices and a monotrabeccular columella – the set of features unknown among microsolenids beyond the comoseriid line. All known Liassic species differ from the Cenomanian one in their much smaller diameters and thinner trabeculae, and the described Pamirian *E. ramosa* is the most delicate of all.

The Late Jurassic *Thamnasteria vereschagini* of Sakhalin presented by Krasnov (1983) shows small corallites with trabecular columella, synaptical incomplete wall and porous septa built of a few trabeculae. The above features seem to fit well in the *Ecomoseris* diagnosis. However, the coral is poorly preserved and its ornamentation, decisive in taxonomical considerations, cannot be defined.

Ecomoseris ramosa Melnikova sp. n.
(Pl. I: 1-3)

Holotypus. IGD 8-Zch; three thin sections with many cross and longitudinal sections of the branches

Locus typicus. Zurchirtsek Valley, SE Pamirs

Stratum typicum. Hettangian?/lower Sinemurian bed at the lowermost sequence of the Gurumdin Svite in the Zurchirtsek Valley

Diagnosis. Corallites with about 16 septa at the diameter of 1 mm; 3 - 3.5 menianes in 400 μ m.

Material. Alichur Valley, Say Sedek IGD 3411-S, 3629-S, 3632-S; Zurchirtsek Valley - IGD 2-Zch (together with *E. lamellata*), 8-Zch. Eight thin sections.

Measurements.

D	c-c	s	sd	menianes	D tr
1 mm	0.9 - 1.2 mm	13 - 16	6/1 mm	3 - 3.5/400 μ m	60 - 100 μ m

Description. Colony ramose, branches of 5-30 mm in diameter. Corallites densely packed with mostly subconfluent and nonconfluent, irregularly perforated septa. Septa subequal in thickness, built of very few trabeculae. Trabecular interpenannular axial portions are from 60 to 100 μ m in diameter or thicker. Septa differentiated into three orders. About 6 - 7 septa S1 reach the columella, septa S2 slightly shorter, anastomosing with septa S1, septa S3 rare, anastomosing with the septa of other orders. Menianes thick and continuous. Synapticulae present near the internal ends of septa and in the wall region. Synapticulotheca incomplete. Endotheca composed of extended and densely spaced dissepiments. Columellar trabecula equally thick as other trabeculae.

Comparison. Among all the known species of the genus, this one seems to be the smallest and to have the lowest number of septa. Among spongiomorphids from the Dommerian of Morocco, Le Maitre (1933) described briefly some lamellate colonies resembling in character the species concerned. Three longitudinal sections (op. cit., *Spongiomorpha (Heptastylopsis) asiatica* Yabe & Sugiyama, p. 33, pl. 3: 1, 3, 4, Tarhzeit, Middle Atlas) disclose a colony structure typical of the genus *Eocomoseris*. The density of menianes (10/2 mm) resembles that in *E. ramosa*. The cross section of a colony fragment shows poorly discernible, disorderly distributed calices with rows of septal trabeculae. Any information on the number of septa is lacking.

Eocomoseris lamellata Melnikova sp. n.

(Pl. I: 4, 5)

Holotypus. Lamellate colony No. IGD 1e-Zch; five thin sections with longitudinal and cross sections

Locus typicus. Zurchirtsek Valley, SE Pamirs

Stratum typicum. Hettangian?/lower Sinemurian beds at the base of the Gurumdin Svite in the Zurchirtsek Valley

Diagnosis. *Ecomoseris* of corallite diameters ca. 2 mm and 16-20 septa; 2 - 2.5 menianes in 400 μ m.

Material. Zurchirtsek Valley - lamellate colonies No. IGD 1e-Zch and 2-Zch (together with *E. ramosa*), ramose colonies IGD 15-Zch and 18-Zch; Alichur Valley, Say Sedek - lamellate colony No. IGD 3363. Nine thin sections.

Measurements.

D	c-c	s	sd	menianes	D tr
1.3 - 2 (2.5) mm	1.8 - 2.5 - 3	16 - 22	4/1 mm	2-2.5, 3/400 μ m	120 - 160 μ m

Description. Colonies lamellate and ramose; diameter of branches from 5 mm (IGD 15-Zch) to 20 mm (IGD 18 Zch). Corallites well delimited. Septa generally subconfluent and nonconfluent, irregularly perforated, subequal in thickness. Septa S1 about 6 - 8 in number, approaching the centre. Septa S2 shorter and anastomosing with septa S1. Septa S3 rare, anastomosing with others. Trabeculae thick, reaching 140 - 180 μ m in diameter; menianes strong, their course seemingly subhorizontal, in places sinusoidal. Synapticular wall incomplete. Dissepiments extended, thin-walled, abundant.

Comparison. The species differs from those having similarly small corallite diameters (*Actinaraea bevoayensis* (Alloiteau, 1958) in Turnšek *et al.*, 1975 and *Microsolena fromenteli* Terquem et Piette, 1868) in having far smaller number of septa (above 25 septa per calice in *A. bevoayensis* and *M. fromenteli*).

Ecomoseris raueni Loeser sp.n.

(Pl. II: 1 - 6)

Holotypus. Ruhrlanmuseum Essen (Germany), RE 551.763.31 A 1323/21

Locus typicus. Quarry "Rauen" at the hill Kassenberg in the town Muelheim/Ruhr; Westfalen (Germany)

Stratum typicum. Lowermost Cenomanian, zone of *Hypoturrilites carci-tanensis* (Matheron)

Diagnosis. *Ecomoseris* with calices of average diameter of 2.5 mm and 24 septa (average).

Material. Holotype, other 9 complete specimens and 5 fragments; 2 cross and 2 longitudinal thin sections from the holotype, other 3 cross thin sections.

Measurements.

D	c-c	s	sd	m	D tr
2 - 3 mm	(1.5)	20 - 24 - 30	7 - 8/2 mm	3/1 mm	100 - 200 μ m
	2 - 3 (3.5) mm				

Description. Massive globular or massive flat colony, thamnasterioid to sub-crioid, lacking holotheca. Holotype colony measuring 70 x 55 x 20 mm.

Calices varying in size and spacing, even in the same colony, rarely arranged in short rows. Corallite (calice) density 4 - 5 in 10 mm. Calices well delimited by elevated wall region. The confluent to non-confluent septa are rather straight, seldom curved. They are irregularly perforated: in the cross section pore density is 4 in 1 mm. The septa are arranged in an imperfect hexamerall order; about 10 - 12 septa S1-S2 reach the centre, the septa S3 are shorter and slightly thinner, sometimes anastomosing with the former. The distal border is irregularly granulated according to the arrangement of trabeculae. The septal faces bear regular menianes. Synapticulae are mostly situated peripherally where they form very incomplete, common synapticulotheca delimiting neighbouring corallites. Columella in the form of a solid trabecular pillar (styli-form), easy distinguishable from the trabeculae of the internal septal borders. The endotheca consists of numerous, very regular, subtabular dissepiments. Colony increased by budding in the intercorallite space and by corallite division.

Microstructure (Pl. II). Micrographs show regular and only slightly inclined trabeculae, differing in that feature from trabeculae in *Microsolena*. In contrast to that genus, in *Eocomoseris* perforations are smaller and septal blades more compact. Trabecular bodies show longitudinal striation. Pennulae, being completely fused with each other, are hardly discernible at the meniane margins. The margins are minutely ornamented. At the corallite limits, menianes of the neighbouring corallites do not fuse together. The internal septal borders are provided with large terminal pennulae seemingly triangular in upper view.

Comparison. *E. rauenii* differs from the Jurassic species in having large calice diameters and robust trabeculae.

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Streszczenie

NOWY MIKROSOLENIOWY RODZAJ *ECOMOSERIS* (SCLERACTINIA, LIAS WCZESNY - CENOMAN)

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Praca przedstawia nowy rodzaj sześciopromiennego koralu *Ecomoseris* z rodziny Microsoleniidae. Rodzina ta jest szeroko rozprzestrzeniona w doggerze, malmie i w dolnej kredzie, a poza tymi granicami występuje rzadko. Interesujące są tu zwłaszcza znaleziska liasowe, bardzo rzadkie w świecie i dotychczas mało zbadane. W ostatnich dziesięcioleciach pojawiło się parę opracowań, które znacznie uzupełniły poprzednią wiedzę o faunie koralowej liasu (Turnšek *et al.*, 1975; Beauvais, 1986).

Opisane tu dwa liasowe gatunki pochodzą z najniższych warstw wczesno-sinemurskiej wapiennej *swity* Gurumdin z SE Pamiru, uważanych za pograniczne między hettangiem a sinemurem (Dronov, Melnikova 1987). Kredowy gatunek pochodzi z najniższego cenomanu Europy (Westfalia, RFN), z zespołu koralu o charakterze jurajskim (por. Loeser 1994, w druku). Wszystkie gatunki opisano jako nowe.

Nowy rodzaj należy do koralu o tamnasterioidalnym typie kolonii, zatem przypomina pospolity rodzaj *Microsolena* i z nim mógł być dotychczas utożsamiany. Jednak odmienna budowa prostych, krótkich elementów radialnych, wykształconych jako tzw. blaszki biseptalne, stłoczenie kielichów, powodujące subceroidalny wygląd powierzchni kolonii i obecność monotrabeкулярnego słupka, odróżniają go od tamtego rodzaju (Pls. I, II). Natomiast wymienione cechy łączą go z jurajskim rodzajem *Comoseris*, który występuje od doggeru (Pl. I: 6). Ten, uznany za formę bezpośrednio spokrewnioną, ma w stosunku do *Ecomoseris* nową cechę – meandroidalną budowę kolonii, z seriami kielichów i rozdzielającymi je waleczkami.

EXPLANATION OF PLATES

Plate I

Eocomoseris ramosa Melnikova sp.n.

Hettangian?/early Sinemurian, Gurumdin Svite, Pamirs

- 1 — Colony branch in cross section. Holotype, IGD 8-Zch; x 10
- 2 — The same colony, a branch in longitudinal section; x 10
- 3 — Surface of a branch in tangential section. IGD 3411-S; x 10

Eocomoseris lamellata Melnikova sp.n.

Hettangian?/early Sinemurian, Gurumdin Svite, Pamirs

- 4 — Colony in longitudinal section. Holotype, IGD 1e-Zch; x 10
- 5 — The same colony in cross section; x 10

Comoseris minima Beauvais, 1964.

Early Kimmeridgian, Holy Cross (Świętokrzyskie) Mts., Poland

- 6 - Colony in cross section: to be noted meandroid collines (septa in black). ZPAL H.III/54; x 8.5

Plate II

Eocomoseris rauteni Loeser sp.n.

Early Cenomanian, Westfalen, Germany. Holotype, RE 551.763.31 A 1323/21

- 1 — Calicular surface: subcerioid intercorallite relationships; x 4.8.
- 2 — Colony in longitudinal section, broken surface showing sinusoid course of menianes and dissepiments; x 4.
- 3 — Slightly eroded calicular surface in upper view showing distal septal margins and menianes; x 9.
- 4 — Broken surface of the colony showing scarce septal porosity, confluent (c) and subconfluent (sc) bisepal blades with menianes disrupted at the wall; x 15.
- 5 — Lateral septal surface covered with ammonium chloride showing menianes paralleled by dissepiments (d), and vertical striation of trabecular body; x 30.
- 6 — Lateral septal surface with menianes and dissepiments (d); to be noted: a minute ornamentation of the meniane margins (o), nearly completely obliterated pennular individuality, a lack of any fusion of menianes at the limits between neighbouring corallites (arrow); x 17.5.



