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# RADIOLARIAN ASSOCIATIONS FROM RADIOLARITES OF THE KYSUCA SUCCESSION OF THE KLIPPEN BELT IN THE VICINITY OF MYJAVA — TURÁ LÚKA (WEST CARPATHIANS)

*(Figs. 6, Pls. VIII)*

Abstract: The analysis of radiolarian associations from radiolarites, which belong to a Bathonian—Kimmeridgian formation of radiolarites, radiolarian limestones and nodular limestones of the Klippen Belt Kysuca unit in the neighbourhood of Myjava—Turá Lúka, proved stratigraphic range of the associations — Late Oxfordian—Early Tithonian. A new species — *Acotripus sphericus* n. sp. has been found in associations of the samples TL-6 and TL-2.

Резюме: Анализ радиоляриевых ассоциаций радиоляритов, составляющих часть толщи радиоляритов, радиоляриевых известняков и почковидных известняков батско-киммериджского возраста кисуцкой последовательности утесовой зоны в окрестности сс. Мыява — Тура Лука подтвердил стратиграфическую шкалу ассоциаций — верхний оксфорд—нижний титон. В ассоциациях проб TL-6 и TL-2 был обнаружен новый вид *Acotripus sphericus* n. sp.

## *Introduction*

In the past, radiolarite layers in the Dogger—Malm formation of the Klippen Belt Kysuca succession in the vicinity of Myjava—Turá Lúka had been relatively exactly stratigraphically assigned only on the basis of their position in profiles.

The aim of this work has been to determine their exact stratigraphic range by means of the evaluation of present radiolarian associations.

## *Summary of hitherto knowledge and exact location of the investigated area*

The lower part of the formation of radiolarites, radiolarian limestones and nodular limestones of the Klippen Belt Kysuca succession in this area contains partly brown or green-gray radiolarian limestones interbedded with brown and green radiolarites and thin layers of siliceous schists. Red radiolarites and red nodular limestones occur above. The age of the overall formation is Bathonian—Kimmeridgian, whereas the red radiolarites and nodular limestones are of Callovian—Kimmeridgian age (Buday et al., 1963).

The analysed samples have been taken from the following localities (see Fig. 1):

1) From radiolarite of rusty-red colour in a quarry near the western end of Myjava—Turá Lúka (positive samples TL-6, TL-2). In the profile there occur highly tectonically deformed layers of rusty-red radiolarites, radiolarian

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limestones and siliceous schists of Callovian—Oxfordian age, Kimmeridgian nodular limestones with radiolarite lenses, Tithonian—Neocomian cherty limestones as well as green and red marly shales of Albian—Cenomanian age (B u d a y et al., 1967).

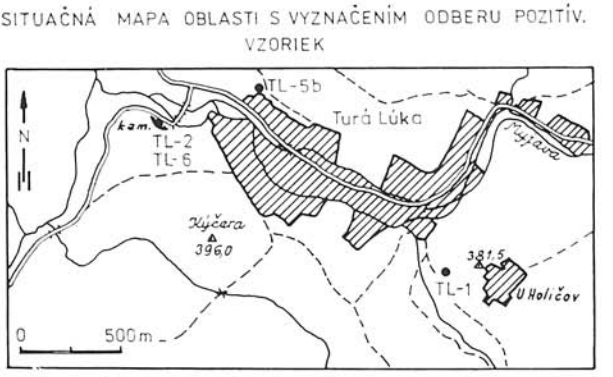


Fig. 1. Map of the area location with sites of positive sampling.

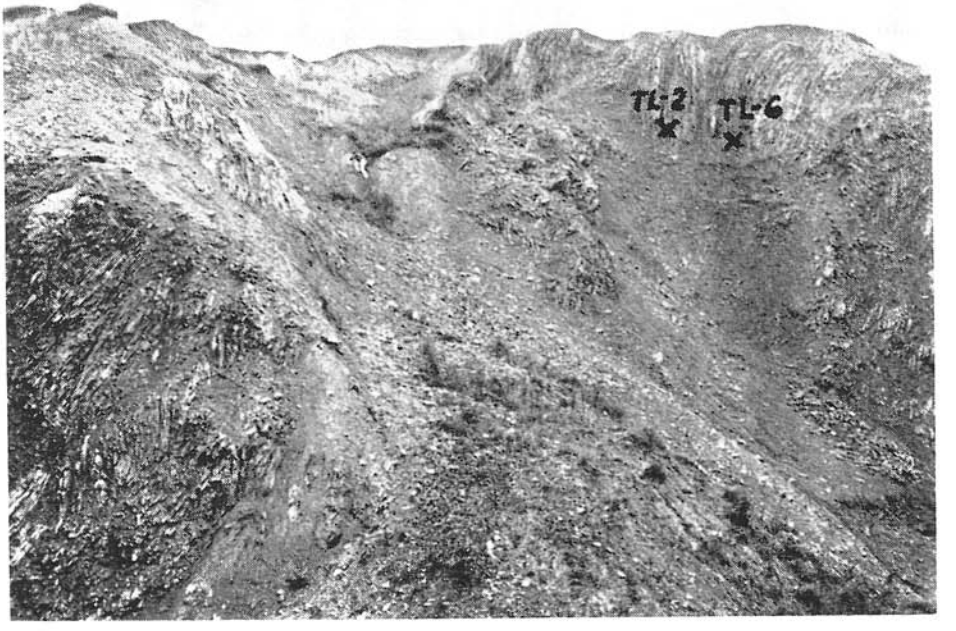


Fig. 2. Location of samples TL-6 and TL-2 in the face of a quarry near the western end of Myjava—Turá Lúka.

The sample TL-6 has been taken from a radiolarite horizon in the right part of the exposed quarry face. The sample TL-2 represents a radiolarite lens in nodular limestones (Fig. 2).

2) From an excavation for the construction of a row of houses about 500 m ENE of the quarry. The excavation exposed red nodular limestones with radiolarite layers of rusty-red colour in the lower part and gray-green in the upper part (positive sample TL-5b). The rocks were highly tectonically deformed resulting in irregularly trending beds. In the central part of the excavation there were weathered, also deformed red and green shale layers.

3) From an old waste-covered quarry, west of the settlement U Holičov in southern part of Myjava—Turá Lúka. Samples could have been taken only from waste fragments, which involved rusty-red nodular limestones and radiolarites of the same colour (sample TL-L).

*Evaluation of radiolarian associations from the analysed samples*

Samples containing rich radiolarian associations have been chosen for the analysis. The review of taxons evaluated in individual samples, their stratigraphic range and age of individual associations are given in Figs. 3, 4, 5, 6.

The stratigraphic range data of individual taxons have largely been taken over from Baumgartner's (1984) biostratigraphic zonation. For the data on taxons, which are not included in that work I consulted other publications (De Wever et al., 1968; Kocher, 1981 and others).

The stratigraphic range of some species has been modified, e.g. in the case of the species *Emiluvia sedecimporata elegans* (WISNIOWSKI). According to Baumgartner (1984) the stratigraphic range of its occurrence is Bathonian—Early Tithonian. In our territory, however, this species was present also in Early Berriasian limestones in the locality Šípkovský Háj in the Čachtické Karpaty Mts. (Ožvoldová—Sýkora, 1984). The range of the species *Cinguloturris carpatica* DUMITRICA was problematic, too. The species has been described by the author from the Callovian—Oxfordian radiolarites at the locality Bohúňovo in the Silica Nappe of the Slovak karst (Dumitrica—Mello, 1982). Nevertheless, Japanese authors describe it also from the Tithonian (Matsuoka — Yao, 1985). As in the Tethyan area this young occurrence has not been recorded, the continuation of this range to the Tithonian is problematic here.

Besides taxons given in Figs. 3, 4, 5, 6, also forms of uncertain or equivocal specific assignation were present in the individual associations. Their description is given in the systematic part.

In the sample TL-6 they were: *Orbiculiforma* sp., *Pseudocrucella* cf. *procera* OŽVOLDOVÁ, *Spongocapsula* cf. *perampla* (RÜST).

In the sample TL-5b: *Parahsuum* sp., *Parvicingula* cf. *vera* PESSAGNO et WHALEN, *Sethocapsa* sp., *Thanarla* sp., *Tricolocapsa* sp. A, *Tricolocapsa* sp. B.

In the sample TL-2: *Hsuum* sp.. *Obesacapsula* aff. *rotunda* (HINDE), *Orbiculiforma* sp., *Paronaella* sp., *Perispyridium* cf. *tamanense* PESSAGNO, *Pseudocrucella* cf. *procera* OŽVOLDOVÁ, *Tricolocapsa* sp. B. In the association of this sample, a new species — *Acotripus sphericus* n. sp., occasionally present also in the sample TL-6, has been described.

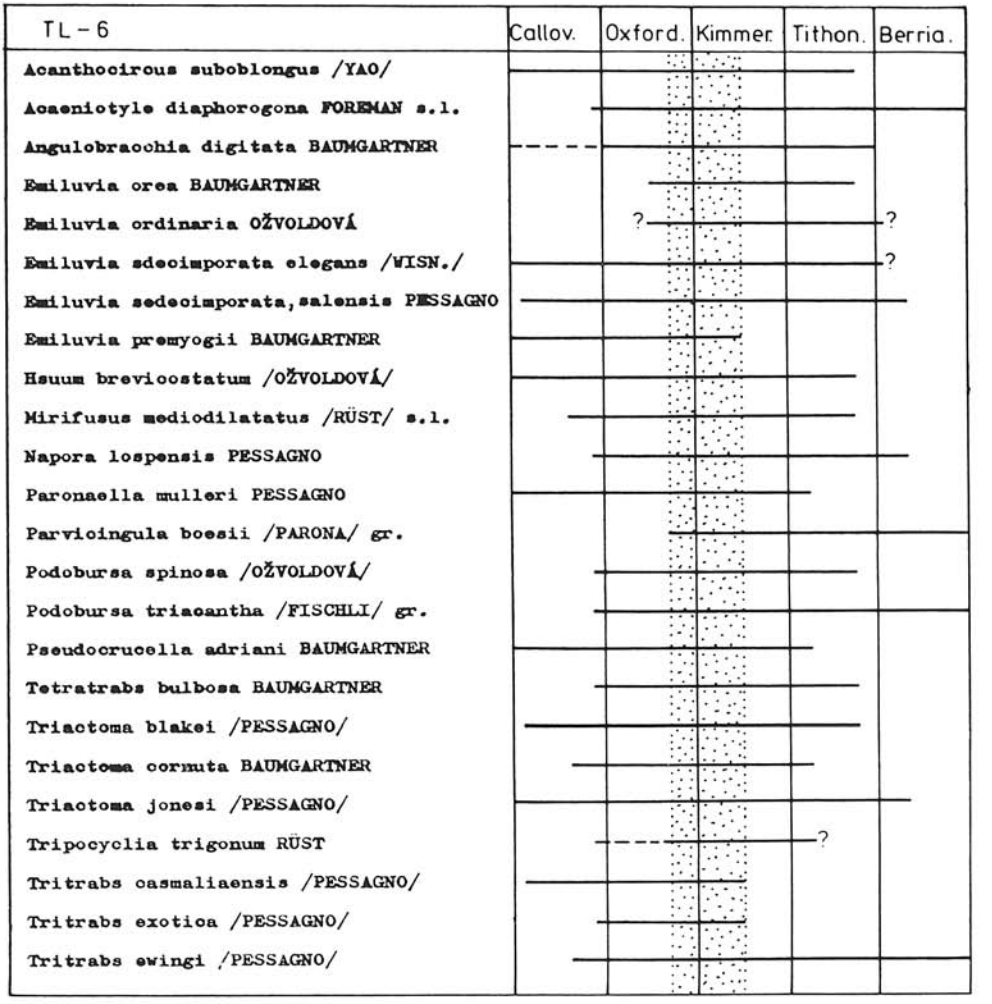


Fig. 3. Stratigraphic range of evaluated taxons in the sample TL-6. The dotted zone represents the age of the association.

In the sample TL-1: ?*Syringocapsa* cf. *limatum* FOREMAN.

The radiolarian association from the sample TL-6 (Fig. 3) (radiolarite horizon) is of the same age as that of TL-5 (Fig. 4) (radiolarite intercalation in nodular limestones). Both associations represent stratigraphic range of Late Oxfordian—Early Kimmeridgian. The quantitative compositions of the associations, however, were substantially different. In the sample TL-6, the genera *Podobursa*, *Emiluvia*, *Triactoma*, *Tritrabs* and *Tetratrabs* prevailed over conical and spindle-shaped shells, whereas in the association TL-5b the latter highly prevailed, with a significant share of the species *Hsuum brevicostatum* (OŽVOLDOVÁ).

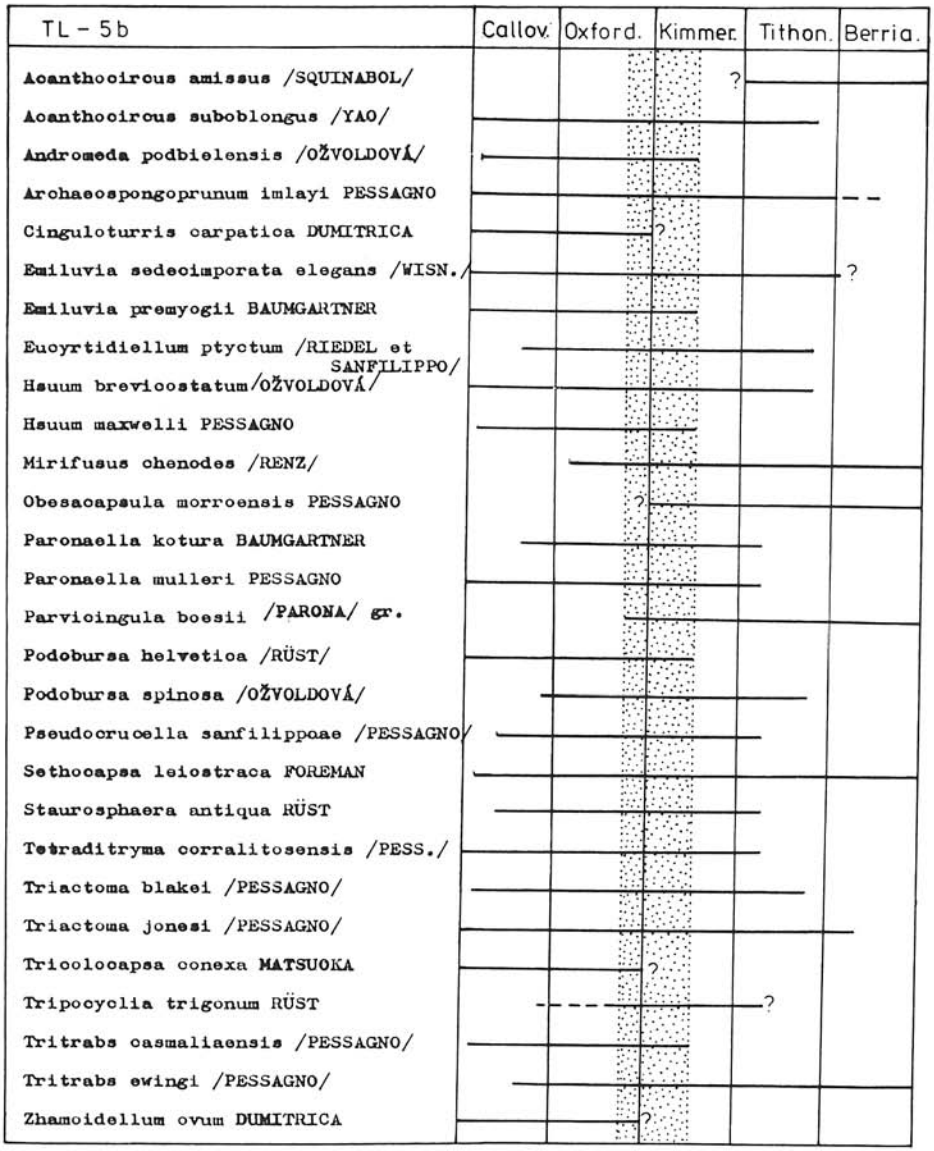


Fig. 4. Stratigraphic range of evaluated taxons in the sample TL-5b. The dotted zone represents the age of the association.

In the TL-2 association (Fig. 2) (radiolarite lens in nodular limestones), it may be noted that among larger forms the species *Podocapsa amphitreptera* FOREMAN occupies a significant share. In the association there are species, whose occurrence ends in the Early Kimmeridgian (*Hsuum maxwelli* PES-

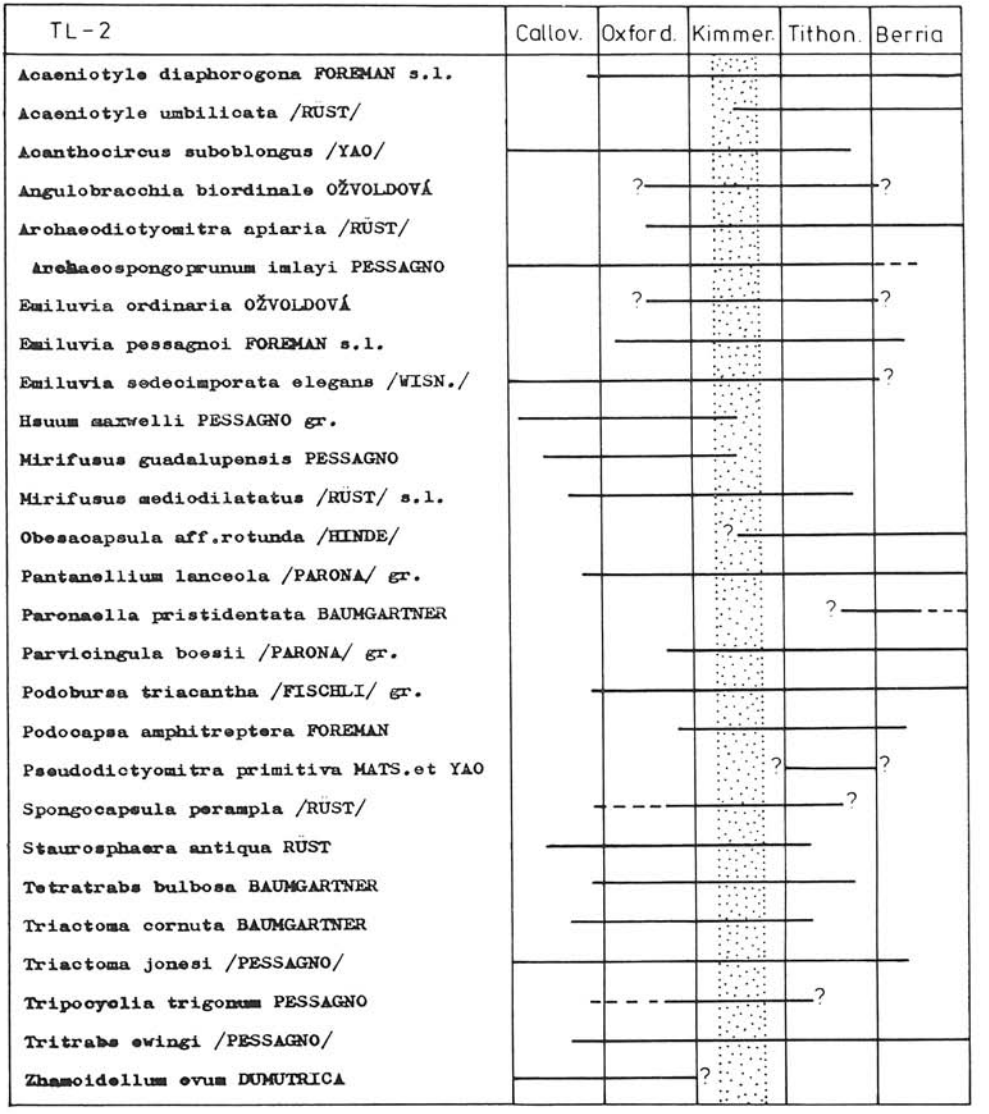


Fig. 5. Stratigraphic range of evaluated taxons in the sample TL-2. The dotted zone represents the age of the association.

SAGNO, *Mirifusus guadalupensis* PESSAGNO), as well as forms, the first occurrence of which has been recorded in the Late Kimmeridgian (*Acaeniotyle umbilicata* (RÜST)). The association is likely to represent a transitional interval between the Early and Late Kimmeridgian.

Of larger forms, besides the species *Podocapsa amphitreptera* FOREMAN, also the species *Sethocapsa cetia* FOREMAN and *Podobursa triacantha* (FISCH-

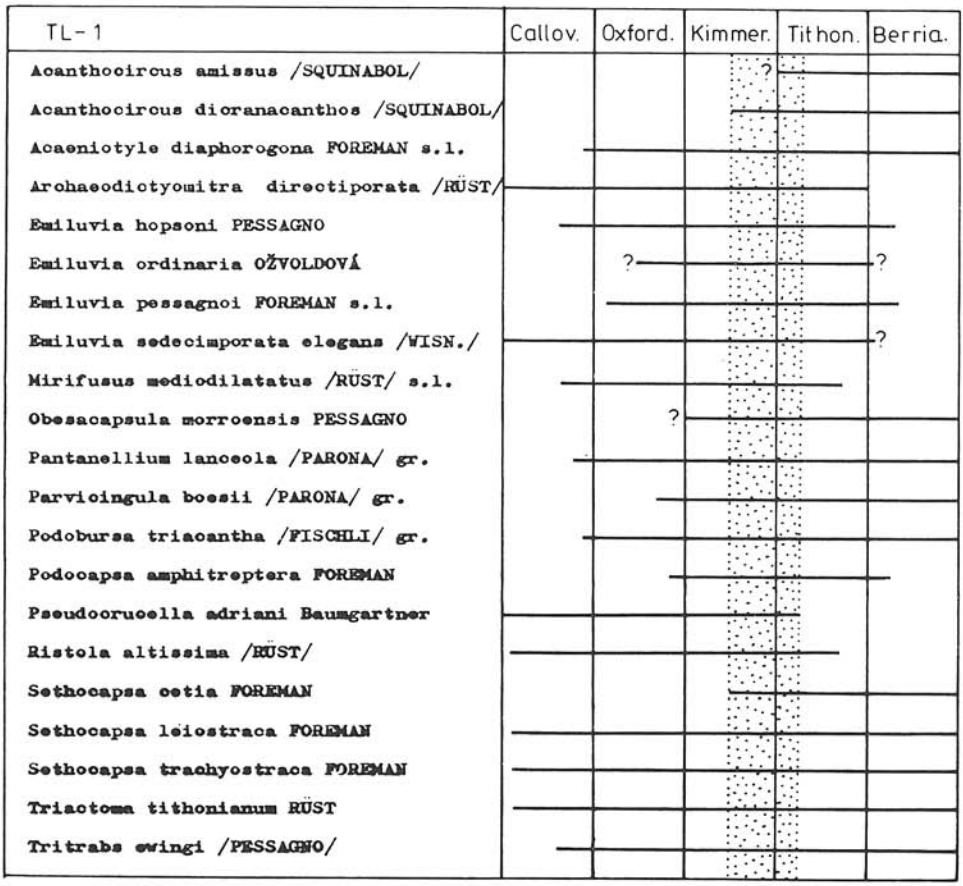


Fig. 6. Stratigraphic range of evaluated taxons in the sample TL-1. The dotted zone represents the age of the association.

LI) were abundant in the sample TL-1 (Fig. 6). All forms of the species *Sethocapsa cetia* had a circular depression without an aperture in the oral part of the shell (Pl. IV, Fig. 7), in which they did not correspond quite well with the holotype diagnosis. The association composition, with the abundant species *Sethocapsa cetia* FOREMAN and relatively rare species *Pseudocrucella adriani* BAUMGARTNER, indicates the stratigraphic range Late Kimmeridgian—Early Tithonian.

This evaluation suggests that the sample from the waste-covered quarry most probably represents a radiolarite intercalation in nodular limestones.

## *Conclusion*

The micropaleontological analysis of radiolarian associations from the radiolarite horizon and radiolarite intercalations in nodular limestones has revealed the presence of radiolarian associations within the stratigraphic range - Late

Oxfordian—Early Tithonian. The Kimmeridgian/Tithonian boundary cannot be distinguished in the present stage of investigation of this organic group. The presence of Early Tithonian radiolarite intercalations cannot be ruled out, however. Older parts have not been found in the radiolarite horizon, yet and the discovery of these layers and evaluation of their microfaunistic content remain to be carried out in the future.

*Systematic part*

This chapter, besides the description of the new species *Acotripus sphericus* n. sp., contains the descriptions only of such specimens, the specific assignation of which is problematic or which are not quite identical with the diagnosis of the species.

Genus *Acotripus* HAECKEL, 1881
Typical species: *A. urceolus* RÜST, 1885
*Acotripus sphericus* n. sp.
Pl. V, Figs. 1—5, 7

Holotype: No. 2951, 2952, Pl. V, Figs. 1, 2. Deposited in the Slovak National Museum in Bratislava (SNM 19785).

Type locality: Myjava—Turá Lúka, Myjavská pahorkatina hills (sample TL-2).

Stratotype: radiolarites — Middle Kimmeridgian.

Denomination: Sphericus-spherical, according to the spherical shape of the terminal segment.

Description: The test consist of 4 segments. The first three of them, of approximately the same height, form a conus. The final one has a globular shape, slightly flattened along the main axis and is roughly twice as high as the first three segments. Structures between the first three segments are absent. The aperture is not exposed. The cephalis surface is lined with longitudinal depressions, in which elongated pores are situated. The apical horn is absent. The thorax and abdomen are covered with small, diagonally arranged pores. The meshwork of the terminal segment consists of hexagonal frames.

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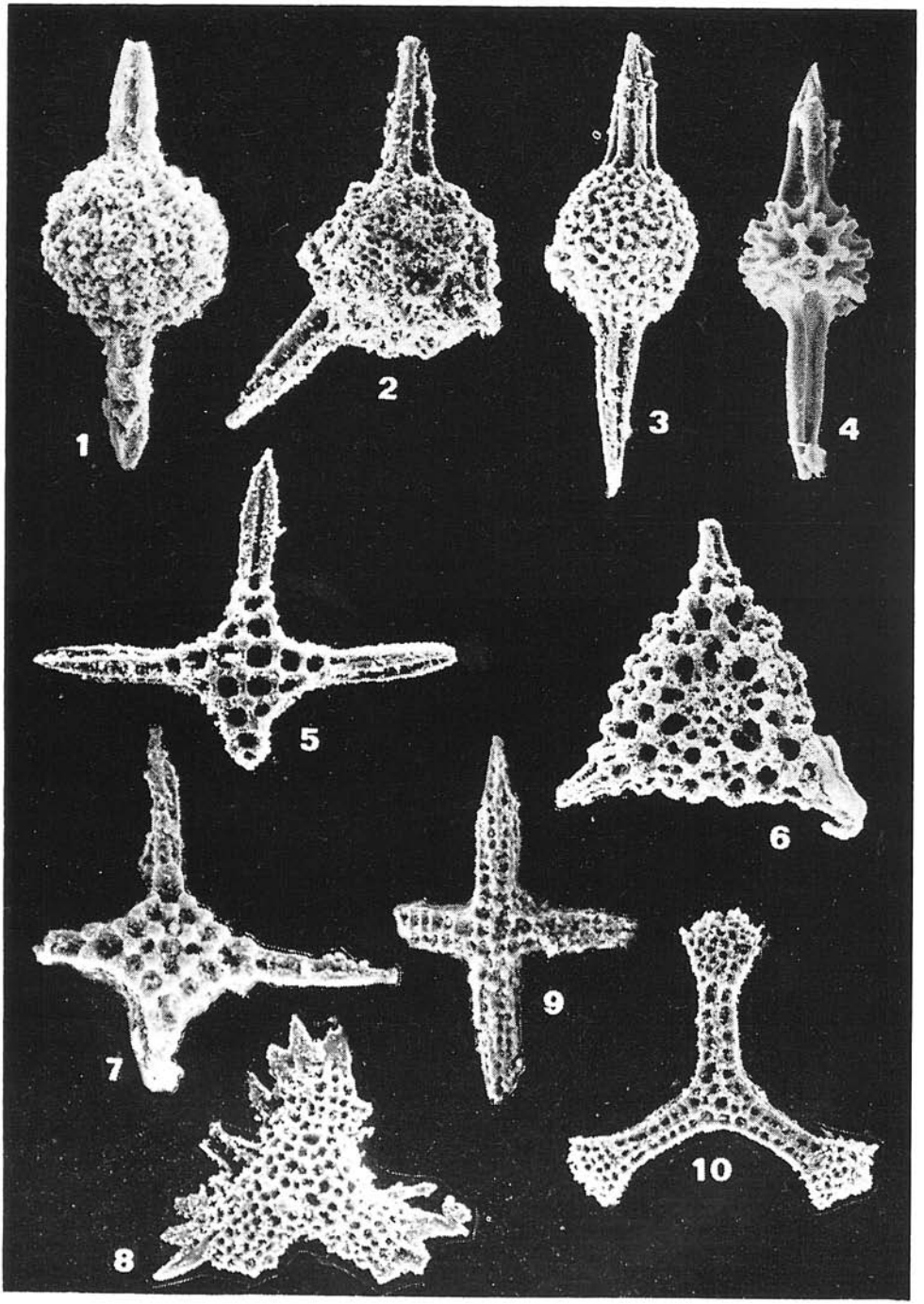
Plate I

Sample TL-2; photographed by SEM, Geological Inst. of D. Štúr, Bratislava (photo: K. Horák)

Fig. 1 — *Acaeniotyle umbilicata* (RÜST) — 1858, 140 × magn.; Fig. 2 — *Acaeniotyle diaphorogona* FOREMAN — 0862, 140 × magn.; Fig. 3 — *Archaeospongoprunum imlayi* PESSAGNO — 0870, 170 × magn.; Fig. 4 — *Pantanellium lanceola* (PARONA) — 1615, 170 × magn.; Fig. 5 — *Emiluvia ordinaria* OŽVOLDOVÁ — 0865, 115 × magn.; Fig. 6 — *Perispyridium* cf. *tamanense* PESSAGNO et BLOME — 0863, 140 × magn.; Fig. 7 — *Emiluvia sedecimporata elegans* (WIŚNIOWSKI) — 1853, 130 × magn.; Fig. 8 — *Paronaella pristidentata* BAUMGARTNER — 0866, 125 × magn.; Fig. 9 — *Pseudocrucella* cf. *procera* OŽVOLDOVÁ — 1623, 115 × magn.; Fig. 10 — *Angulobracchia biordinale* OŽVOLDOVÁ — 0861, 130 × magn.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Pores of the frames are large, circular. In the basal part of the terminal segment. 3 stout at the base three-ridged, at the terminal smooth spines branch into the sides.

| Dimensions | holotype | min. | max. |
|---|---|---|---|
| Total test height | 0.260 | 0.255 | 0.290 |
| Height of the first three segments | 0.090 | | |
| Height of the terminal segment | 0.170 | | |
| Max. width of the terminal segment | 0.200 | 0.180 | 0.215 |
| Spine length | 0.095 | 0.080 | 0.105 |

Remark: Our specimens resemble the specimen *Cyrtocapsa* sp. (De Wever, 1986, Pl. 10, Fig. 4). In their diagnostic characteristics, however, they better correspond with the genus *Acotripus* (Petrushevskaya, 1981).

Occurrence: Samples TL-2, TL-6.

Stratigraphic range: Late Oxfordian—Middle Kimmeridgian.

## Genus *Hsuum* PESSAGNO, 1977

### *Hsuum* sp.

Pl. III, Figs. 1, 2

Description: Wide conical test. The cephalis is small, with a short apical horn, together with the thorax covered with fine pores. On the other segments, which are perforated by circular medium-sized pores there occur longitudinal discontinuous costae of variable thickness, stretching over 2—3 segments.

Remark: Our specimens are likely to represent a transitional type between *H. robustum* PESSAGNO et WHALEN and *H. maxwelli* PESSAGNO. The species *H. robustum* differs from *H. maxwelli* in its wide-conical test and longer, more massive horn (Pessagno — Whalen, 1982).

In their size and length/width ratio of the test, our specimens do not correspond very well with the diagnosis of the species *H. robustum*. From the species *H. maxwelli* they differ in the wide-conical test.

Occurence: Sample TL-2.

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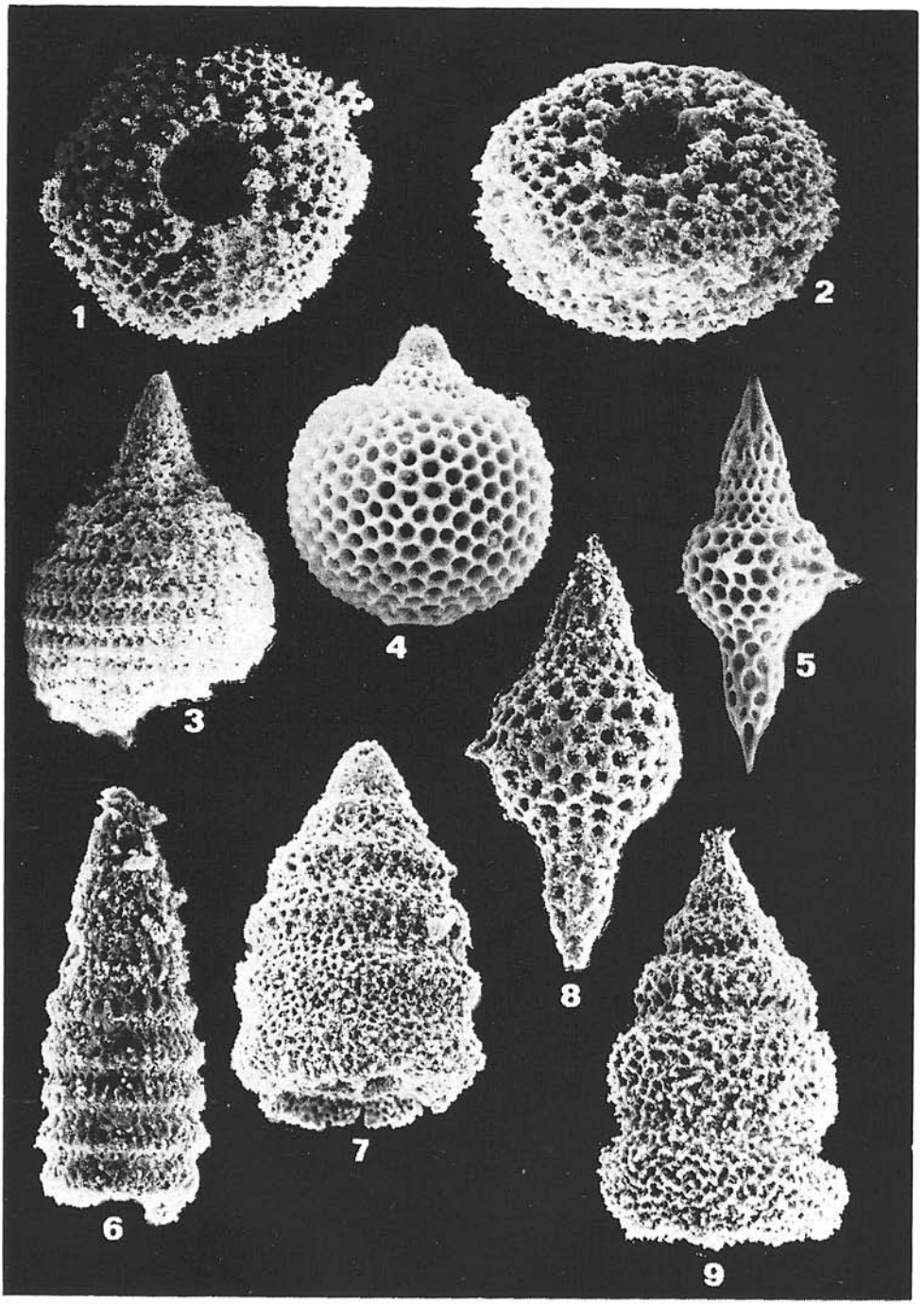
Plate II

Sample TL-2; photographed by SEM, Geological Inst. of D. Štúr, Bratislava (photo: K. Horák)

Fig. 1 — *Orbiculiforma* sp. — 0872, 170 × magn.; Fig. 2 — *Orbiculiforma* sp. — 0871, 170 × magn., side view of Fig. 1.; Fig. 3 — *Mirifusus guadalupensis* PESSAGNO — 1848, 110 × magn.; Fig. 4 — *Tricolocapsa* sp. B — 1852, 285 × magn.; Fig. 5 — *Podobursa triacantha* (FISCHLI) — 1616, 170 × magn.; 6 — *Pseudodictyomitra primitiva* MATSUOKA et YAO — 0875, 255 × magn.; Fig. 7 — *Spongocapsula perampla* (RÜST) — 0864, 150 × magn.; Fig. 8 — *Podobursa triacantha* (FISCHLI) — 0877, 200 × magn.; Fig. 9 — *Obesacapsula* aff. *rotunda* (HINDE) — 0868, 155 × magn.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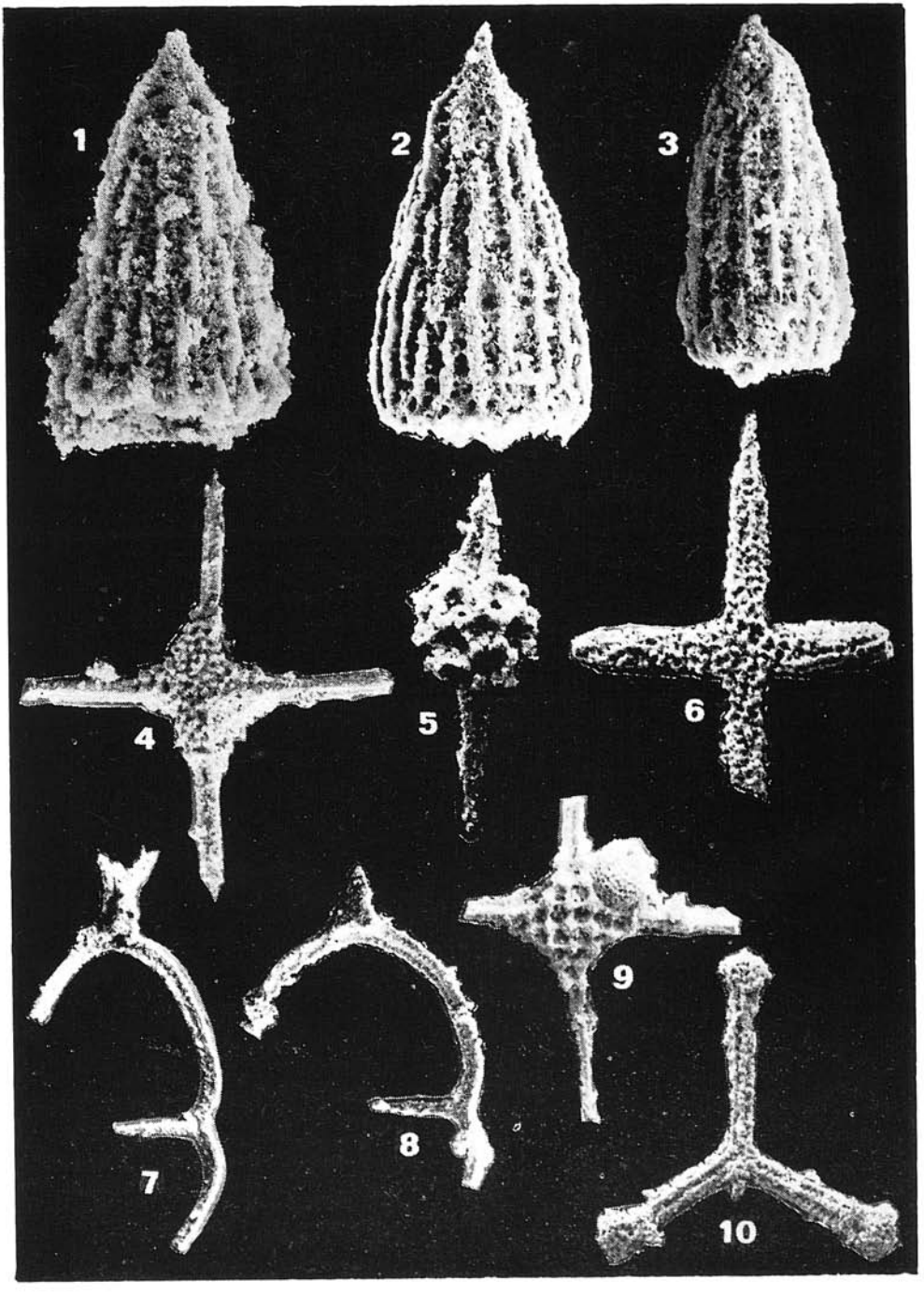
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Genus *Obesacapsula* PESSAGNO, 1977
*Obesacapsula* aff. *rotunda* (HINDE, 1902)
Pl. II, Fig. 9

1900 *Stichocapsa rotunda* HINDE — H i n d e: Description of fossil Radiolaria etc., p. 41, Tab. 3, Fig. 24.
1977 *Obesacapsula rotunda* (HINDE) — P e s s a g n o: Lower Cretaceous Radiolarian Biostratigraphy etc., p. 53, Tab. 9, Fig. 4.
1984 *Obesacapsula* sp. aff. *O rotunda* (HINDE) — P e s s a g n o: A revised Radiolarian Zonation etc., p. 30, Tab. 4, Fig. 9.

R e m a r k: This species differs from the species *O. rotunda* (HINDE) mainly in a larger apical part of the test, less inflated postabdominal segments and less pronounced strictures between postabdominal segments.

As a probable ancestor of the species *O. rotunda*, it has been defined (P e s s a g n o, 1984) for Late Jurassic specimens differing from the Early Cretaceous species *O. rotunda* in the above-mentioned characteristics.

S t r a t i g r a p h i c r a n g e: Late Kimmeridgian(?) — Early Tithonian to Middle Valanginian.

O c c u r e n c e: Sample TL-2.

Genus *Orbiculiforma* PESSAGNO, 1973
*Orbiculiforma* sp.
Pl. II, Figs. 1, 2

D e s c r i p t i o n: Oval-shaped test with a central cavity, which occupies almost 1/4 of the test diametre. The meshwork consists of polygonal pore frames, which are much larger around the central cavity, with prominent nodes. The central cavity is obscures by a meshwork with small densely seated circular pores.

O c c u r e n c e: TL-2, TL-6.

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P l a t e III

Sample TL-2; photographed by SEM, Geological Inst. of D. Štúr, Bratislava (photo: K. H o r á k)

Fig. 1 — *Hsuum* sp. — 1856, 285 × magn.; Fig. 2 — *Hsuum* sp. — 0874, 255 × magn.; Fig. 3 — *Hsuum maxwelli* PESSAGNO — 2958, 190 × magn.;

Sample TL-1; photographed by SEM, Geological Inst. of Slov. Acad. Sci., Bratislava (photo: I. H o l i c k ý)

Fig. 4 — *Emiluvia pessagnoi* FOREMAN — 0846, 80 × magn.; Fig. 5 — *Pantanellium lanceola* (PARONA) — 0802, 190 × magn.; Fig. 6 — *Pseudocrucella adriani* BAUMGARTNER — 0847, 100 × magn.; Fig. 7 — *Acanthocircus dicranacanthos* (SQUINABOL) — 0851, 115 × magn.; Fig. 8 — *Acanthocircus amissus* (SQUINABOL) — 0855, 120 × magn.; Fig. 9 — *Emiluvia ordinaria* OŽVOLDOVÁ — 0790, 100 × magn.; Fig. 10 — *Tritrabs ewingi* (PESSAGNO) — 1871, 80 × magn.

Genus *Parahsuum* YAO, 1982
*Parahsuum* sp.
Pl. VI, Fig. 9

Description: The test has seven segments forming a wide cone. The cephalis is poreless, without an apical horn. The thorax is trapezoid-shaped, with indistinct structure. The abdomen and post-abdominal segments with 26 continuous longitudinal costae, separated by a longitudinal row of pores formed by tetragonal pore frames. Each of the post-thoracic segments has 4 transverse rows of pores.

Occurence: Sample TL-5b.

Genus *Paronaella* PESSAGNO, 1971
*Paronaella* sp.
Pl. V, Fig. 6

Description: The test is made up of 3 rays, oblong in a longitudinal profile and ellipsoidal in a transversal one, terminated by a short central and several lateral spines, which are preserved only in the form of relics on our specimens. The meshwork of rays is regular, consisting of 5 longitudinal beams connected by bars, which form 4 longitudinal rows of tetragonal pore frames. The central area is made up of large irregular tetragonal or polygonal pore frames.

Occurence: TL-2, in other localities of the West Carpathians — Brodno, Snežnica — Oxfordian radiolarites.

Genus *Parvicingula* PESSAGNO, 1977
*Parvicingula* cf. *vera* PESSAGNO et WHALEN, 1982
Pl. VII, Fig. 6

1982 *Parvicingula vera* PESSAGNO et WHALEN, n. sp. — Pessagno — Whalen: Lower and Middle Jurassic Radiolaria etc., p. 144, Tab. 11, Figs. 3—5, 11, 19; Tab. 13, Fig. 8.

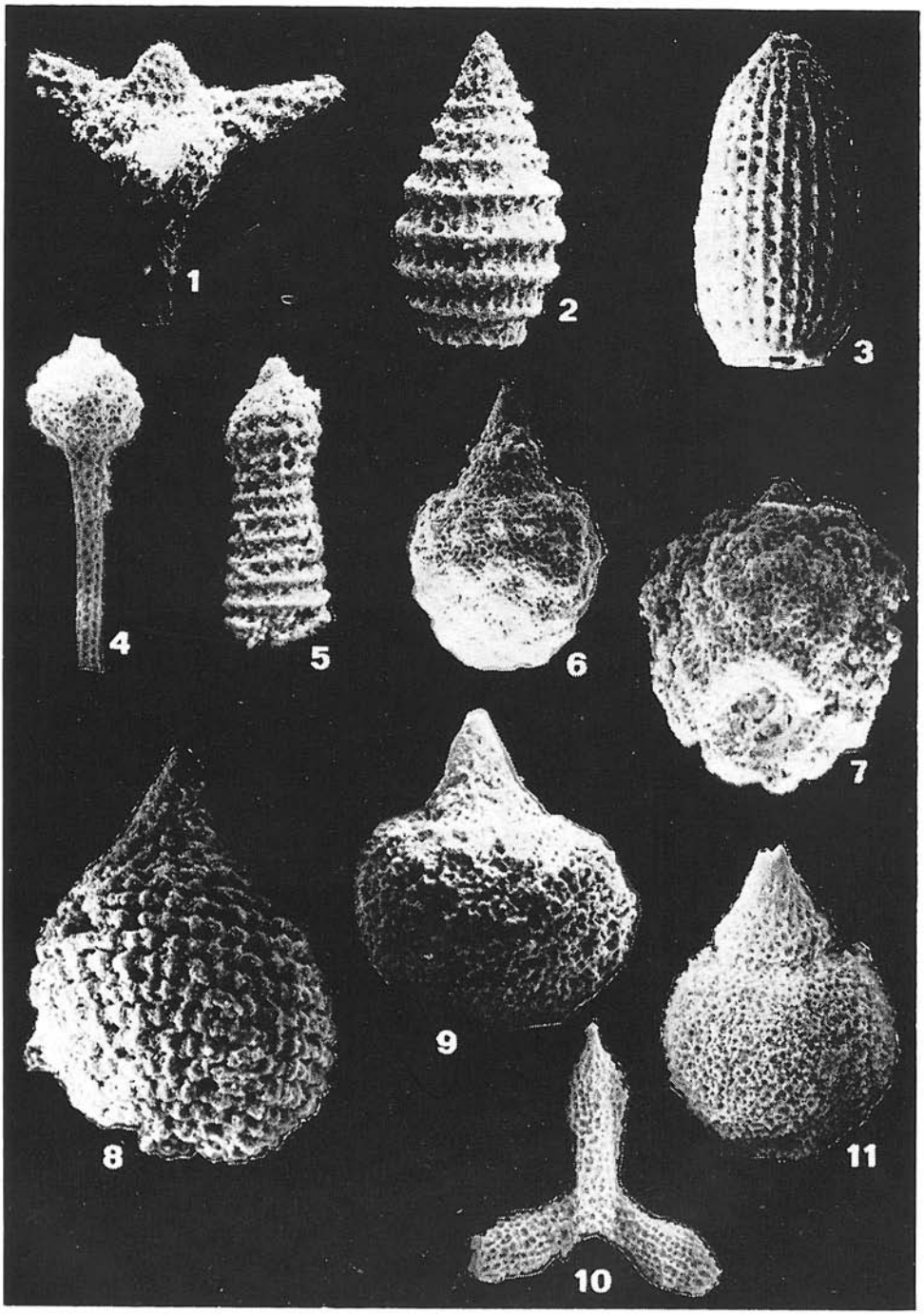
Plate IV

Sample TL-1; photographed by SEM, Geological Inst. of Slov. Acad. Sci., Bratislava (photo: I. Holický)

Fig. 1 — *Podocapsa amphitreptera* FOREMAN — 0834, 130 × magn.; Fig. 2 — *Parvicingula boesii* (PARONA) — 0837, 180 × magn.; Fig. 3 — *Archaeodictyomitra directiporata* (RÜST) — 0821, 180 × magn.; Fig. 4 — ?*Syringocapsa* cf. *limatum* FOREMAN — 1878, 80 × magn.; Fig. 5 — *Ristola altissima* (RÜST) — 1869, 130 × magn.; Fig. 6 — *Sethocapsa cetia* FOREMAN — 0844, 80 × magn.; Fig. 7 — *Sethocapsa cetia* FOREMAN — 1868, 110 × magn., view of the oral part of the test with a distinct depression; Fig. 8 — *Mirifusus mediodilatatus* (RÜST) s. l. — 1887, 120 × magn.; Fig. 9 — *Obesacapsula morroensis* PESSAGNO — 0814, 125 × magn.

Sample TL-5b; photo by SEM, Geological Inst. of Slov. Acad. Sci., Bratislava (photo: I. Holický)

Fig. 10 — *Paronaella mulleri* PESSAGNO — 6267, 100 × magn.; Fig. 11 — *Obesacapsula morroensis* PESSAGNO — 6263, 110 × magn.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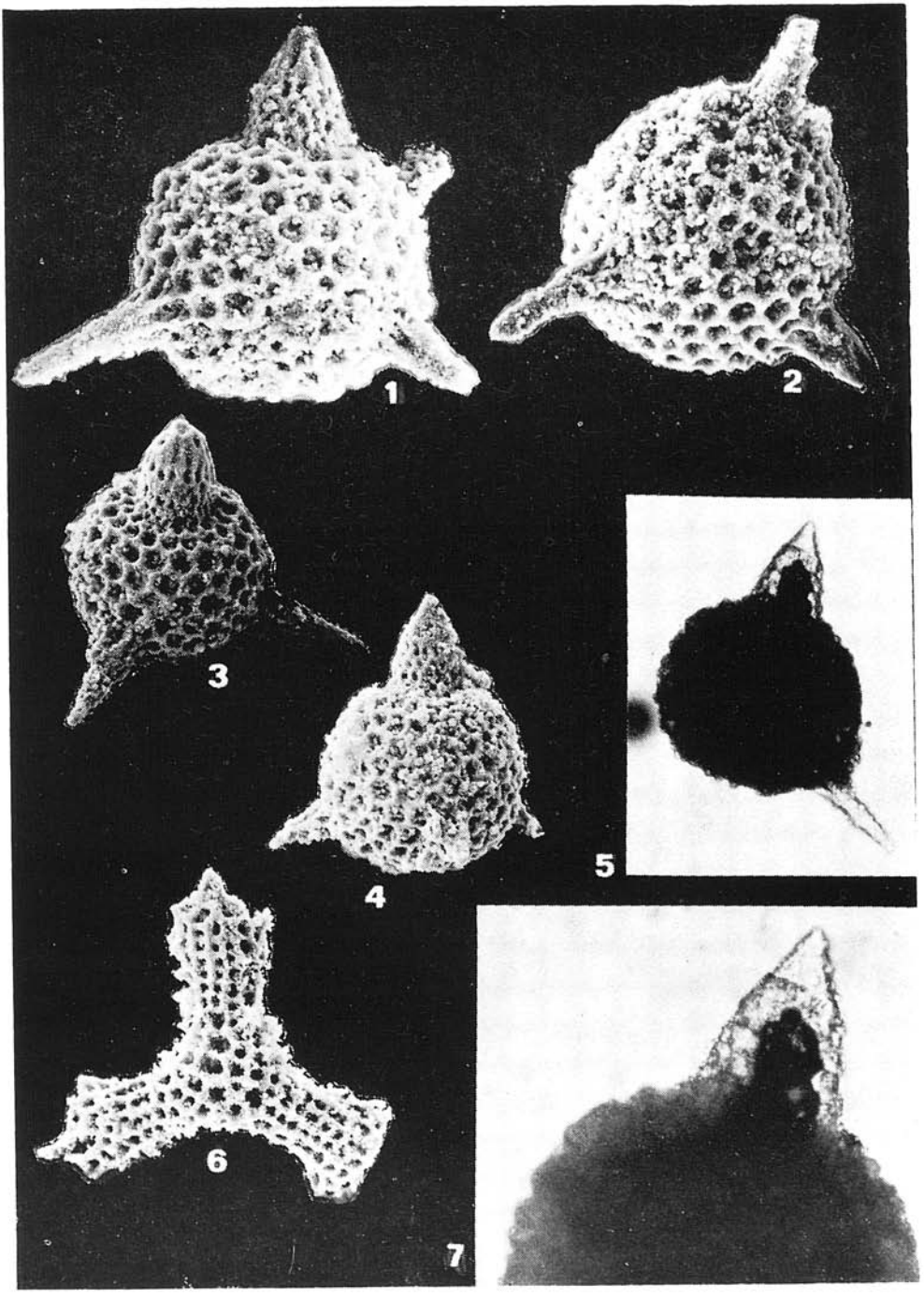
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Remark: Oour specimens correspond with the diagnosis of the species *P. vera* with the exception of the test shape, which is not wide-conical and absence of a long apical horn.

Occurence: Sample TL-5b.

Genus *Perispyridium* DUMITRICA, 1978
*Perispyridium* cf. *tamanense* PESSAGNO et BLOME, 1982
Pl. I, Fig. 6

1982 *Perispyridium tamanense* PESSAGNO and BLOME, n. sp. — Pessagno — — Blome: *Bizzare Nassellariina* etc., p. 295, Tab. 6, Figs. 1, 7—11, 13—14; Tab. 7, Fig. 3.

Remark: Our specimens differ from the species *P. tamanense* in longer spines branching from the peripheral shell and larger amount of pericephalic pores.

Occurence: Sample TL-2.

Genus *Pseudocrucella* BAUMGARTNER, 1980
*Pseudocrucella* cf. *procera* OŽVOLDOVÁ, 1984
Pl. I, Fig. 9

1984 *Pseudocrucella procera* OŽVOLDOVÁ, n. sp. — Ožvoldová — Sýkora: The Radiolarian assemblage from Čachtické Karpaty etc., p. 270, Tab. 12, Figs. 4, 8; Tab. 14, Fig. 2; Tab. 15, Figs. 6, 7; Tab. 16, Fig. 5.

Remark: The description of the specimens is almost identical with the diagnosis of the species *P. procera*. They differ in the absence of characteristic long spines. From the species *P. adriani* BAUMGARTNER it differs in regular longitudinal rows of quadrangle pore frames, whereas from the species *P. sanfilippoae* (PESSAGNO) in longer rays.

Occurence: Samples TL-2, TL-6.

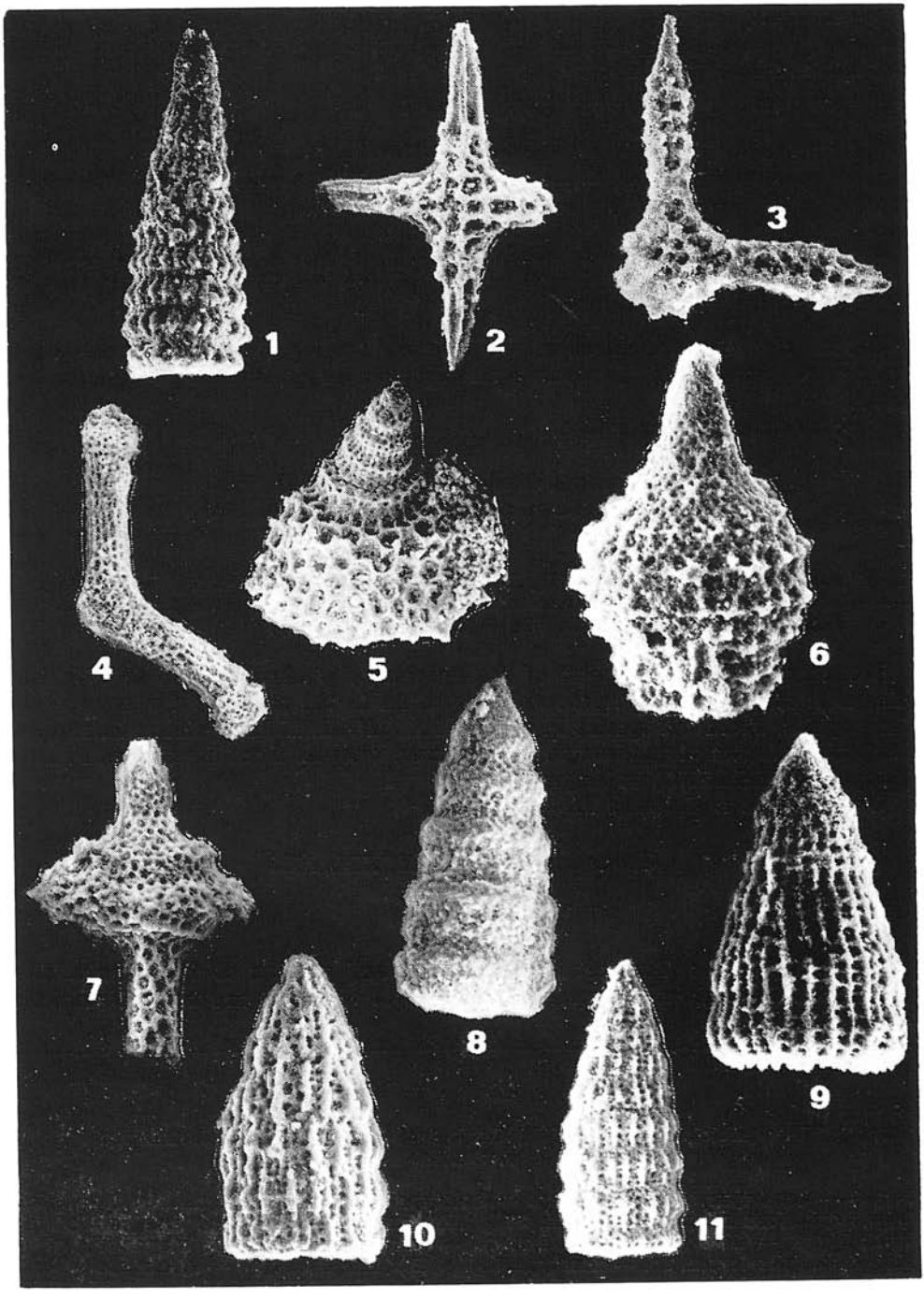
Genus *Sethocapsa* HAECKEL, 1881
*Sethocapsa* sp.
Pl. VII, Fig. 8

Description: The test is pear-shaped and consists of 5 segments. The cephalis is high, globular, poreless. The next 3 segments are truncate-conical.

Plate V

Sample TL-2; photographed by SEM, Geological Inst. of D. Štúr, Bratislava (photo: F. Caňo)

Fig. 1 — *Acotripus sphericus* n. sp. — holotype, 2952, 210 × magn., Fig. 2 — *Acotripus sphericus* n. sp. — holotype, 2951, 210 × magn., view of the oral part of the test.; Fig. 3 — *Acotripus sphericus* n. sp. — paratype, 1861, 155 × magn.; Fig. 4 — *Acotripus sphericus* n. sp. — paratype, 1854, 140 × magn.; Fig. 5 — *Acotripus sphericus* n. sp. — 150 × magn.; Fig. 6 — *Paronaella* sp. — 0876, 190 × magn.; Fig. 7 — *Acotripus sphericus* n. sp. — 300 × magn.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Strictures between segments are slightly indicated. The final segment is large, spherical, forming one half of the test height. The meshwork of the test is formed by meduim-sized hexagonal pore frames.

Occurence: Sample TL-5b.

## Genus *Spongocapsula* PESSAGNO, 1977
## *Spongocapsula* cf. *perampla* (RÜST, 1885)
Pl. VIII, Fig. 3

1885 *Lihocampe perampla* m. — Rüst: Beiträge zur Kenntniss etc., p. 315, Tab. 39 (14), Fig. 11.

Remark: Our specimens differ from the species *S. perampla* in less distinct widening of the final segments.

Occurence: Sample TL-6.

## Genus *Syringocapsa* NEVIANI, 1900
## ? *Syringocapsa* cf. *limatum* FOREMAN, 1973
Pl. IV, Fig. 4

1973 *Syringocapsa limatum* FOREMAN, new species — Foreman: Radiolaria from DSDP Leg 20, p. 268, Tab. 11, Figs. 6, 7; Tab. 16, Fig. 8.

Remark: Our specimens is not perfectly preserved. Part of the proximal portion of the test and end the terminal tube are missing. It evidently differs from the species *S. limatum* in the terminal tube length. The assignation of this species is highly problematic.

Occurence: Sample TL-1.

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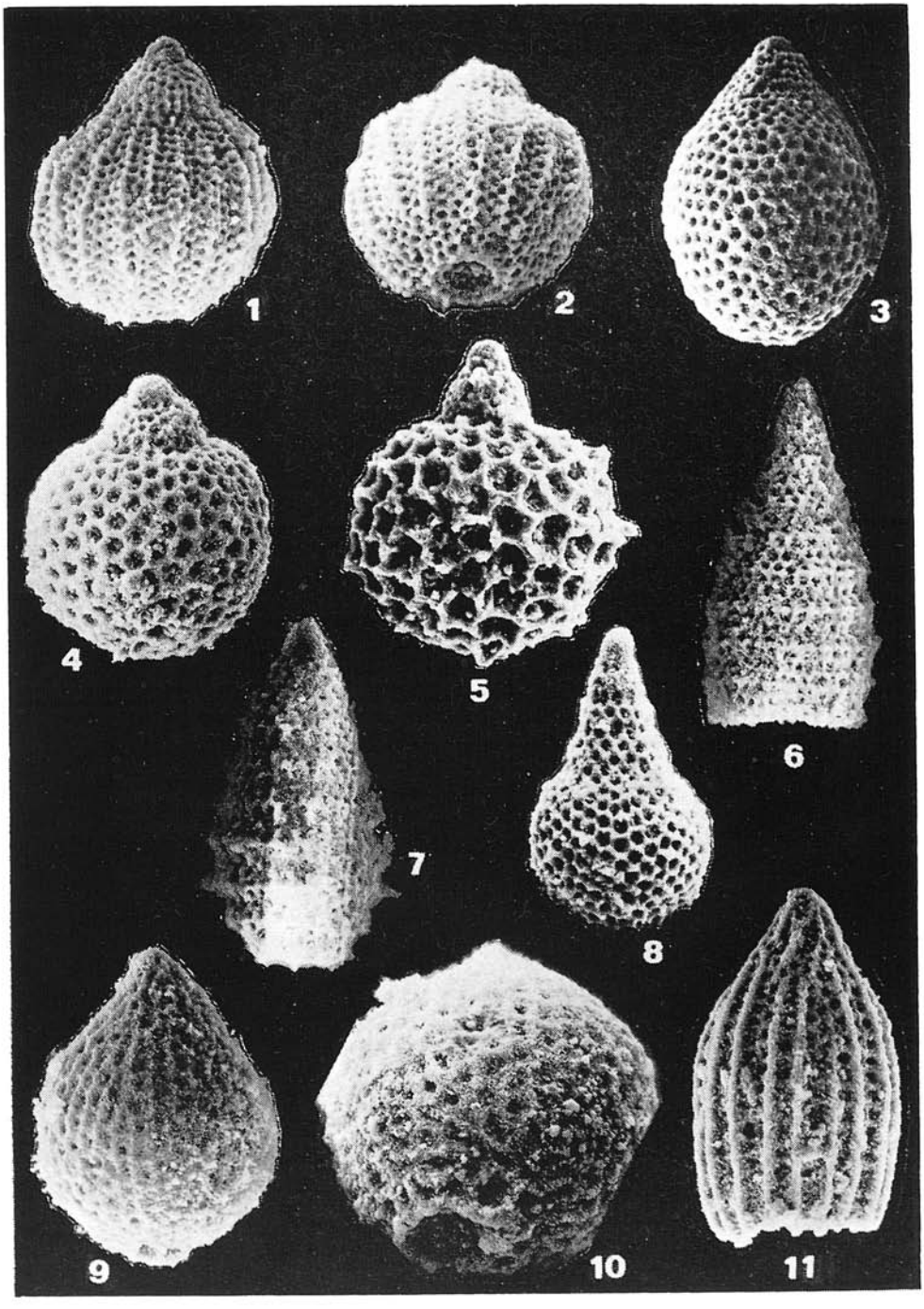
## Plate VI

Sample TL-5b; photographed by SEM, Geological Inst. of D. Štúr, Bratislava (photo: F. Cañ o)

Fig. 1 — *Hsuum brevicostatum* (OŽVOLDOVÁ) — 6279, 170 × magn.; Fig. 2 — *Emiluvia premyogii* BAUMGARTNER — 6164, 140 × magn.; Fig. 3 — *Tetraditryma corralitosensis* (PESSAGNO) — 6259, 190 × magn.; Fig. 4 — *Paronaella kotura* BAUMGARTNER — 6163, 110 × magn.; Fig. 5 — *Andromeda podbielensis* (OŽVOLDOVÁ) — 2967, 130 × magn.; Fig. 6 — *Mirifusus chenodes* (RENZ) — 4368, 235 × magn.; Fig. 7 — *Podobursa helvetica* (RÜST) — 6264, 170 × magn.; Fig. 8 — *Cinguloturris carpatica* DUMITRICA — 6160, 210 × magn.; Fig. 9 — *Parahsuum* sp. — 4367, 280 × magn.; Fig. 10 — *Hsuum maxwelli* PESSAGNO gr. — 6274, 230 × magn.; Fig. 11 — *Hsuum brevicostatum* (OŽVOLDOVÁ) — 4349, 150 × magn.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Genus *Thanarla* PESSAGNO, 1977
*Thanarla* ? sp.
Pl. VII, Fig. 11

Description: The test is conical in the proximal part, in the distal part it becomes slightly narrower. The test surface is covered with longitudinal costae. Some of them do not cross throughout the test surface. There are up to 9 costae on one side of the test. Between the costae, 1—2 longitudinal rows of pores are diagonally situated.
Occurence: Sample TL-5b.

Genus *Tricolocapsa* HAECKEL, 1881
*Tricolocapsa* sp. A
Pl. VII, Figs. 1, 2

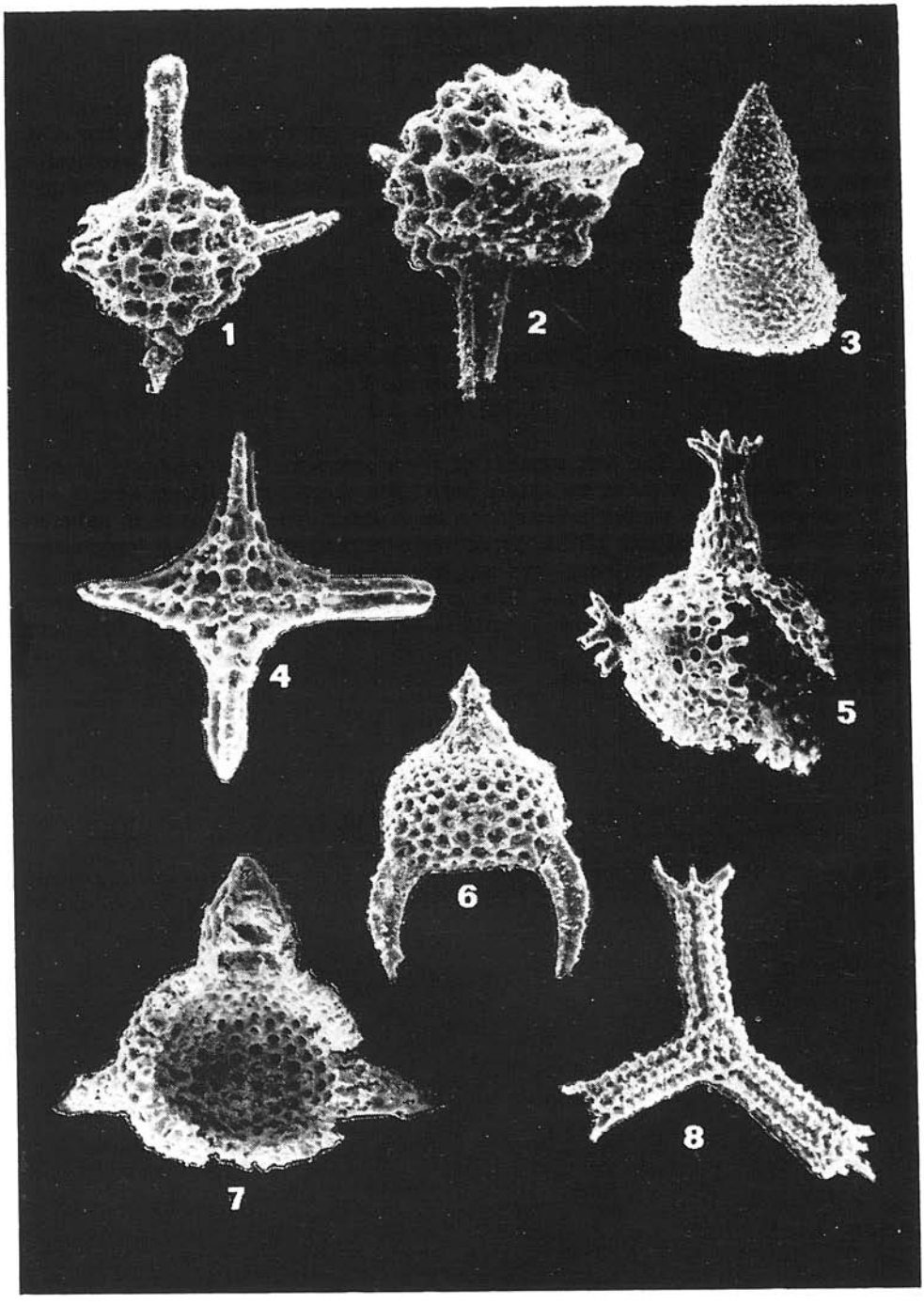
Description: The test consists of three segments. The cephalis is small, spherical, poreless, without an apical horn. The thorax with longitudinal rows of small pores. The limbar constriction is distinct. The abdomen is spherical with 20—22 longitudinal plicae, irregularly arranged and 2—3 longitudinal rows of small pores between two neighbouring plicae diagonally arranged. The pores frames are hexagonal. The plicae pinch out irregularly in the oral part of the test. The aperture is small, circular, covered with a fine-pored meshwork.
Occurence: Sample TL-5b.

*Tricolocapsa* sp. B
Pl. II, Fig. 4; Pl. VII, Fig. 4

Description: The shell consists of three segments. The cephalis is spherical, poreless, without an apical horn. The thorax is low, its height equals

Plate VII

Sample TL-5b; photographed by SEM, Geological Inst. of D. Štúr, Bratislava (photo: F. Caño)
Fig. 1 — *Tricolocapsa* sp. A — 2968, 230 × magn.; Fig. 2 — *Tricolocapsa* sp. A — 2969, 230 × magn., view of the oral part of the test; Fig. 3 — *Zhamoidellum ovum* DUMITRICA — 4365, 230 × magn.; Fig. 4 — *Tricolocapsa* sp. B — 2966, 230 × magn.; Fig. 5 — *Sethocapsa leiostraca* FOREMAN — 4366, 260 × magn.; Fig. 6 — *Parvicingula* cf. *vera* PESSAGNO et WHALEN — 6159, 210 × magn.; Fig. 7 — *Parvicingula boesii* (PARONA) — 6269, 230 × magn.; Fig. 8 — *Sethocapsa* sp. — 4342, 255 × magn.; Fig. 9 — *Tricolocapsa conexa* MATSUOKA — 2963, 340 × magn.; Fig. 10 — *Tricolocapsa conexa* MATSUOKA — 2964, 450 × magn., view of the oral part of the test; Fig. 11 — *Thanarla* sp. — 2965, 255 × magn.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approximately 1/5 of the abdomen height. The thorax walls are slightly inflated, the stricture between the cephalis and thorax is distinct. The limbar constriction is very distinct. The abdomen is large, circular, slightly flattened along the main axis. The aperture is small with a protrunding rim. The thorax and abdomen with hexagonal pore frames. On the thorax, they are smaller by 2/3. The pores of abdomen pore frames are circular, large.

Remark: From *T. yaoi* MATSUOKA it differs in inflated thorax, distinct limbar constriction and larger size of pore frames and pores.

Occurence: Sample TL-2, TL-5b, in other localities of the West Carpathians — the hill Keblie near Púchov (Ožvoldová, 1975).

Translated by L. Böhmer

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## Plate VIII

Sample TL-6; photographed by SEM, Geological Inst. of Slov. Acad. Sci., Bratislava (photo: I. Holický)

Fig. 1 — *Emiluvia orea* BAUMGARTNER — 4573, 115 × magn.; Fig. 2 — *Emiluvia orea* BAUMGARTNER — 4577, 150 × magn., side view of Fig. 1.; Fig. 3 — *Spongocapsula* cf. *perampla* (RÜST) — 4592, 130 × magn.; Fig. 4 — *Emiluvia premyogii* BAUMGARTNER — 4578, 190 × magn.; Fig. 5 — *Podobursa spinosa* (OŽVOLDOVÁ) — 4560, 130 × magn.; Fig. 6 — *Napora lospensis* PESSAGNO — 4579, 135 × magn.; Fig. 7 — *Acotripus sphericus* n. sp. — 4583, 160 × magn., test profile; Fig. 8 — *Tritrabs casmaliaensis* (PESSAGNO) — 4563, 140 × magn.

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