

JAN ŘEHÁNEK*

NEW SPECIES OF THE GENUS *COLOMISPHAERA* NOWAK FROM THE TITHONIAN AND UPPER CRETACEOUS

(Tabs. 2, Figs. 2, Pls. 2)



Abstract: In the presented work the author mentions finds of new microfossil species, which he ranges into the group of the genus *Colomisphaera* Nowak, 1968 (incertae sedis). The species of *Colomisphaera fortis* n. sp. is found in tectonic fragments of "Biancone" type limestones (Upper Tithonian) drilled in flysch beds of the Magura unit. *Colomisphaera varia* n. sp. was described in sediments of cores of sandy-glaucinite series (Turonian — Lower Senonian) of the autochthonous Mesozoic complex of the south-eastern slopes of the Bohemian massif.

Резюме: В предлагаемой работе автор приводит находки новых видов микроскопических ископаемых, которые он относит в группу рода *Colomisphaera* Nowak, 1968 (incertae sedis). Вид *Colomisphaera fortis* n. sp. встречается в тектонических фрагментах известняков типа „biancone" (верхний титон) пробуренных в флишевых слоях магурской единицы. *Colomisphaera varia* n. sp. был описан в осадках кернов песчано-глауконитовой серии (гурон — нижний сенон) комплекса автохтонного мезозоя юго-восточных склонов Чешского массива.

Introduction

In microfacial investigation of Mesozoic sediments, testified by drillings in the substratum of the Carpathian fore-deep, flysch units and the Vienna basin in southern Moravia, two new species of microorganisms were described from thin section, which in morphology and shell structure belong to the genus *Colomisphaera* Nowak, 1968 (incertae sedis):

Colomisphaera fortis n.sp. is found in muddy limestones of "Biancone" type, which form exotic fragments in flysch beds of the Magura unit, submerged below the Miocene of the Vienna basin (borehole Ježov 2). Stratigraphically these limestone blocks are Upper Tithonian — Crassicollaria Zone (J. Řehánek, 1980).

Colomisphaera varia n.sp. occurs in sediments of the Upper Cretaceous sandy-glaucinite series of the autochthonous Mesozoic of the Bohemian massif south-eastern slopes in the substratum of the Zďánice-Subsilesian unit and Miocene filling of the Carpathian fore-deep in boreholes Strachotín 2 and Dunajovice 21 (facial and stratigraphic characterization of sandy-glaucinite series, see J. Řehánek, 1978).

The location of the area of interest and the regional position of the mentioned boreholes are shown in Fig. 1.

* RNDr. J. Řehánek, Geological-Chemical Centre, Moravian Oil Exploitation, concern enterprise, Sadová 4, 695 00 Hodonín.

Colomisphaera Nowak, 1968*Colomisphaera fortis* n. sp.

(Tab. 1, Pl. 1)

Holotype: specimen figured in Tab. 1, Figs. 1—2, deposited in the collections of the Petrography Department of the Geological- Chemical Centre of the Moravian Oil Exploitation, concern enterprise Hodonin. Thin section no. 6864/1, coordinates x — 50.9, y — 16.8.

Derivatio nominis: according to Latin fortis-sturdy.

Stratus typicus: borehole Ježov 2, dpth 1968 — 72 m, interval 2.5—3.6

Locus typicus: borehole Ježov 2, depth 1968 — 72 m, interval 2.5—3.6 m, radiolarian limestone with calpionella.

Material: 19 specimens from limestones of radiolarian-calpionella microfacies of borehole Ježov 2, depth 1961—36 m, 1884—89 m, 1968—72 m.

Diagnostical marks: single-chambered test, slightly oval, formed by uneven short calcite crystals.

Description: slightly oval, more rarely even spherical single-chambered shell with simple, in transmitted light weakly porous light-coloured wall, composed of short, unequally strong calcite crystals. In incident light the shell is yellowishwhite, in polarized light the calcite individuals of the wall with unparallel extinction, without axial cross. The outer margin of shell is straight or almost straight, the distinct inner margin is straight, often stressed by discontinuous, very fine fringe of dark pigment, which sometimes is missing. The chamber is filled up with monocrystalline or aggregate secondary calcite. The majority of studied sections of shells have a moderately variable wall strength at the periphery. The greater diameter of slightly oval shells varies within the range of 70—99 μ , the lesser diameter 65—92 μ , the strength of the walls is 5—10 μ , the mouth was not observed.

Dimensions of holotype: diameter of the shell 89—99 μ , strength of wall 5—7 μ (Tab. 1, serial number 12).

Stratigraphic range: *Colomisphaera fortis* n. sp. is rarely found in the Upper Tithonian (Crassicollaria Zone) in association with radiolarians, *Globochaete alpina* Lombard, *Calpionella alpina* Lorenz, *Calpionella elliptica* Cadisch, *Crassicollaria intermedia* (Durand Delga), *Crassicollaria massutiniara* (Cecm), *Tintinnopsella carpathica* (Murg. et Filip.), *Colomisphaera carpathica* (Borza), *C. lapidosa* (Vogler), *C. sublapidosa* (Vogler), *Cadosina fusca* Wanner, *Cad. semiradiata* Wanner, *Stomiosphaera moluccana* Wanner and *Nannoconus* sp.

Differences: *Colomisphaera fortis* n. sp. differs from *C. lapidosa* (Vogler) in the size of shells, their morphology and the general structural character of the wall. From the species *C. pieniniensis* (Borza) the described species differs distinctly in the size of shells, weakly porous and considerably stronger wall, in the character of the outer margin of the shell section and stratigraphical position.

Remark: the discontinuous, very fine fringe of dark pigment, which accentuates the inner margin of the wall of some shells of *Colomisphaera fortis* n. sp., has nothing in common with their structure. When considered

nearer under great magnification this border is evidently of the character of micritic impurities dispersed in the sediment, which with recrystallization of original muddy filling of the chambers were squeezed out to their walls.

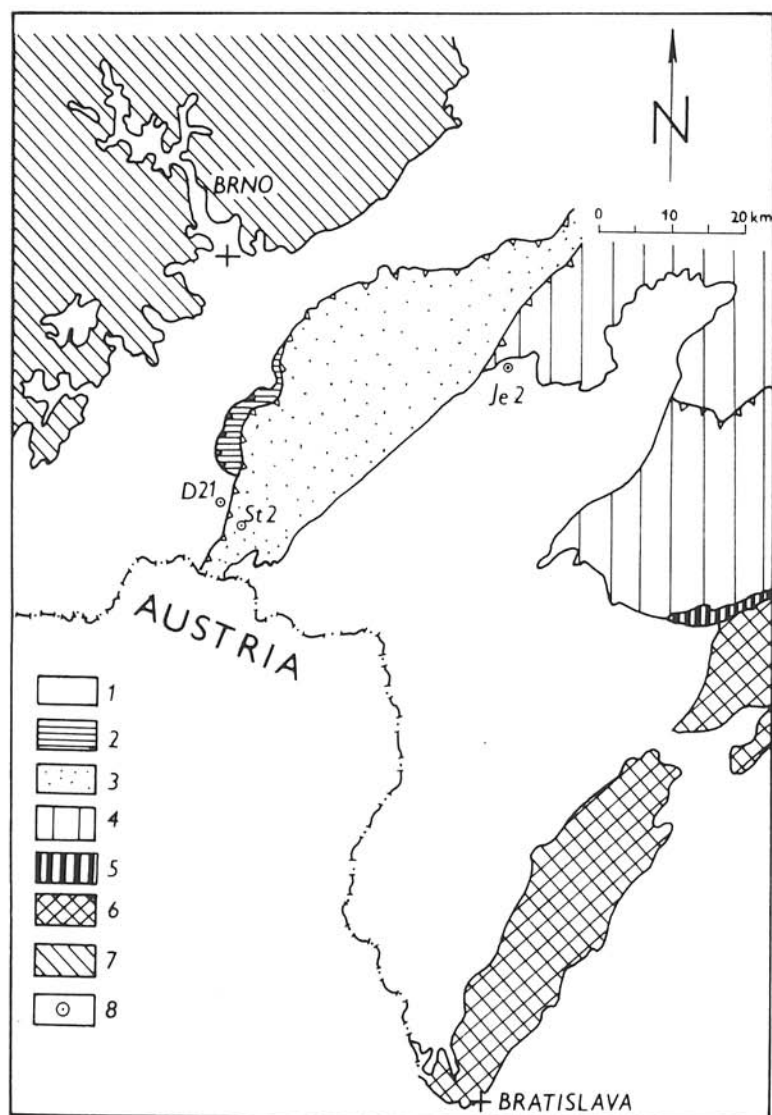


Fig. 1. Schematic regional-geological map of the area with indicated position of the described boreholes (D 21 — Dunajovice 21, St 2 — Strachotin 2, Je 2 — Ježov 2).
Explanations: 1 — Neogene Carpathian fore-deep and intermontane basins, 2, 3, 4 — Carpathian Flysch Belt; 2 — Pouzdrany unit; 3 — Subsilezian — Ždánice unit; 4 — Magura unit; 5 — Klippen Belt; 6 — Inner Carpathians; 7 — Bohemian massif; 8 — position of boreholes.

Colomisphaera varia n. sp.

(Tab. 2, Pl. 2)

Holotype: specimen figured in Tab. 2, Figs. 1—2, deposited in the collections of the Petrography Department of the Geological-Chemical Centre of the Moravian Oil Exploitation, concern enterprise Hodonin. Thin section no. 7598, coordinates x — 53.0, y — 8.9.

Derivatio nominis: according to Latin varius-variegated, spotted. **Stratum typicum:** Turonian — Lower Senonian.

Locus typicus: sandy glauconite sponge claystone in borehole Dunajovice 21, depth 1170—1175 m.

Material: 38 specimens (25 specimens in the borehole Dunajovice 21, 13 specimens in the borehole Strachotin 2).

Diagnostical marks: spherical or slightly oval single-chambered shell, formed by very fine, densely radially ordered calcite filaments. A feature characteristic of the species is the coloured shading of shell sections from yellowish-grey to brownish-grey, under lesser magnification with a greenish tinge. Typical are dark-brown irregularly dispersed pigmented spots.

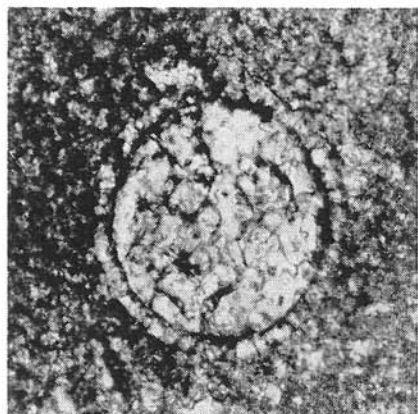
Description: spherical to slightly oval single-chambered shell, its wall is formed by very fine fibrous, radially ordered calcite. The inner margin of the shell wall is straight or almost straight in sections, the outer margin is distinct, slightly corroded. In transmitted light, when using common white light filter, the individual sections have characteristic yellowishgrey to brownishgrey colouring, to which under lesser microscopical magnification a weak greenish tinge joins. For the most studied sections uneven-dispersed spots of dark—brown pigment are characteristic, which, however, can be missing in isolated cases. In incident light the sections of shells are whitishgrey, in polarized light no axial cross was observed. The chambre is filled out with secondary calcite or pyrite. The greater diameter of slightly oval shells varies within the range 54 — 102 μ , the lesser diameter 54—78 μ . The measured strength of the shell walls is generally 10—24 μ , with the difference of the greatest and least measured value at the periphery of one section up to 7 μ . The mouth of the shells has not been observed.

Dimensions of holotype: maximum diameter of the shell 65 μ , minimum diameter of the shell 61 μ , maximum strength of wall 13 μ , minimum strength of wall 10 μ (Tab. 2, serial number 5).

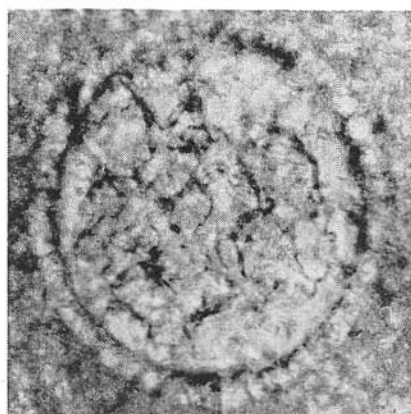
Plate 1

Figs. 1—8. *Colomisphaera fortis* n. sp.

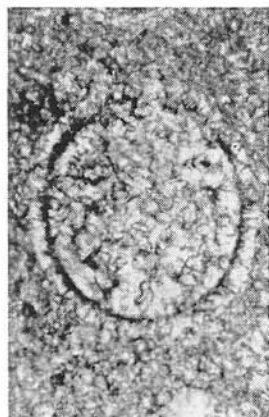
All photographs are from whitish to yellowishwhite muddy microorganogenic limestones with cherts (radiolarian-calcipionella microfacies) from tectonic fragments in the Magura flysch unit. Figs. 1—2, 4—6. Ježov 2, depth 1968 — 72 m, interval 3.50—3.60 m, Figs. 1—2, 4, 6 thin section no. 6864/1, Fig. 5 thin section no. 6864/1 a. In Figs. 1, 4 — 6 magnification 378 x, in Fig. 2 540 x. Fig. 3. Ježov 2, depth 1884 — 89 m, interval 1.60—1.70 m, thin section no. 6890/1. Magnification 378 x. Fig. 7. Ježov 2, depth 1968 — 72 m, interval 2.50—2.70 m, thin section no. 7610. Magnification 378 x. Fig. 8. Ježov 2, depth 1631 — 36 m, interval 2.70—2.80 m, thin section no. 6825. Magnification 378 x. Photo by J. Řehánek.



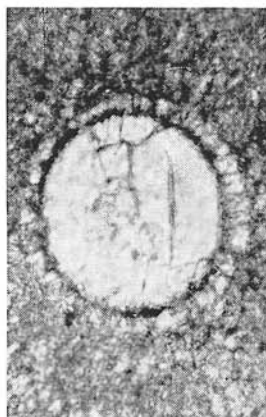
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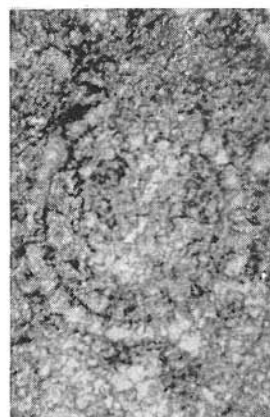
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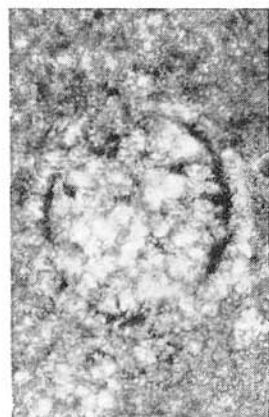
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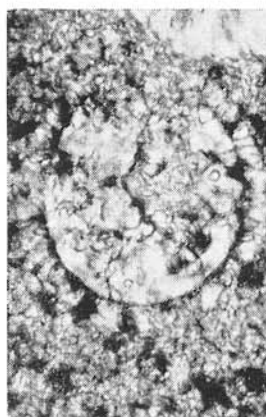
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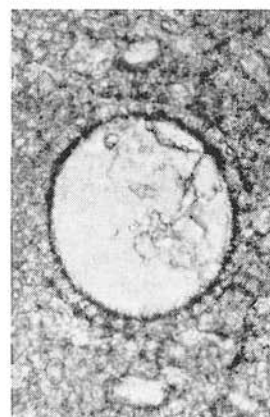
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Stratigraphic range: in sandy-glaucinite series of the autochthonous Mesozoic of the southeastern slopes of the Bohemian massif (Turonian — Lower Senonian) in the microfacies of sponge claystones, seldom in the microfacies of *Pithonella* marlstones, in association with *Pithonella ovalis* (Kaufmann), *P. multicava* Borza, *Calcisphaerula innominata* Bonet, *Caldosina fusca* Wanner, with radiolarians, silicisponges, with *Hedbergella* gr. *deflandrini* Porthault, *H. delrioensis* Carsey, *Heterohelix globulosa* (Ehrenberg), *Praeglobotruncana* cf. *turbinata* Reichel, *P. crassa* Bolli, *P. cf. helvetica* Bolli, *Globigerinelloides aspera* (Ehrenberg), *Globotruncana imbricata* Mornod, *Arenobulimina presli* Reuss, *Pernerina* cf. *depressa* Perner etc.

Table 1

Dimensions of the studied specimens of *Colomisphaera fortis* n. sp. in borehole Ježov 2 in μ

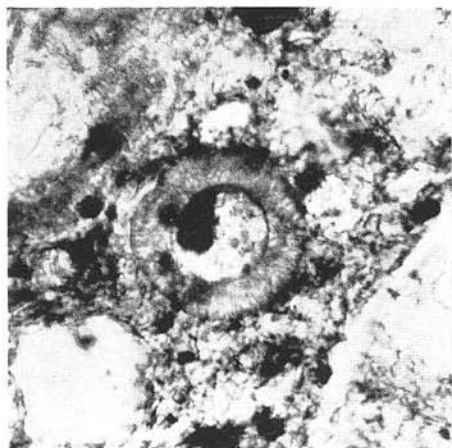
Number	Depth m	Interval m	Thin section	A	B	C	D
1.	1631—36	0.2—0.3	8311/1	72	68	9	5
2.	1631—36	0.2—0.3	8311/1	72	65	7	5
3.	1631—36	0.2—0.3	8311/1	68	—	7	5
4.	1631—36	0.2—0.3	8311/1	75	68	10	5
5.	1631—36	0.2—0.3	8311/1	75	72	7	5
6.	1631—36	2.7—2.8	6825	82	75	7	5
7.	1631—36	2.7—2.8	6825	70	68	5	—
8.	1631—36	2.7—2.8	6825	79	—	5	—
9.	1884—89	1.6—1.7	6890/1	92	82	7	5
10.	1884—89	1.6—1.7	6890/1	99	82	7	5
11.	1968—72	2.5—2.7	7610/1	96	92	10	7
12.	1968—72	3.5—3.6	6864/1	99	89	7	5
13.	1968—72	3.5—3.6	6864/1	86	82	10	5
14.	1968—72	3.5—3.6	6864/1a	92	79	10	7
15.	1968—72	3.5—3.6	6864/1a	86	79	10	7

Explanations: A — greater diameter of oval shells, B — lesser diameter of oval shells, C — maximum strength of the wall of section, D — minimum strength of the wall of section.

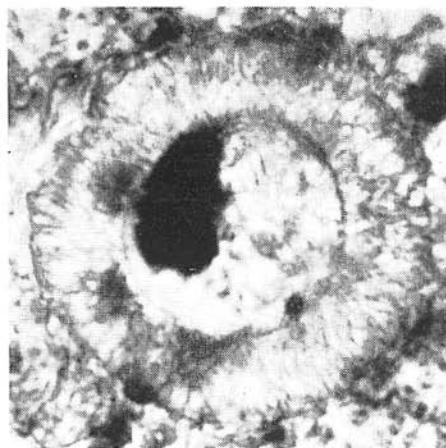
Plate 2

Figs. 1—9. *Colomisphaera varia* n. sp.

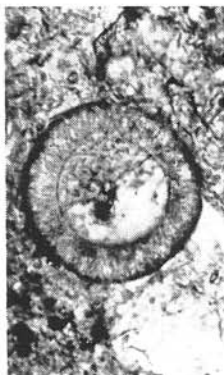
All photographs are from sandy-glaucinite series of autochthonous Mesozoic of the southeastern slopes of the Bohemian massif. Figs. 1—2, 4—5, 8—9. Microfacies of sponge claystones in borehole Dunajovice 21, depth 1170 — 75 m, interval 0.20—0.30 m, thin section no. 7598. In Figs. 1, 4—5, 8—9 magnification 378 x. Fig. 2 magnification 850 x. Figs. 3, 6. Microfacies of sponge claystones in borehole Dunajovice 21, depth 1170 — 75 m, interval 0.30—0.35 m, thin section no. 7357. Magnification 378 x. Fig. 7. Microfacies of *Pithonella* marlstones in borehole Strachotín 2, depth 1694 — 97 m, interval 2.10—2.20 m, thin section no. 5569. Magnification 378 x. Photo by J. Řehánek.



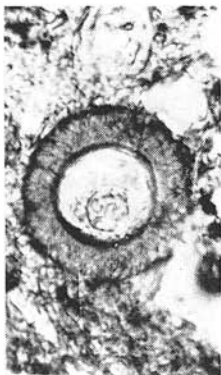
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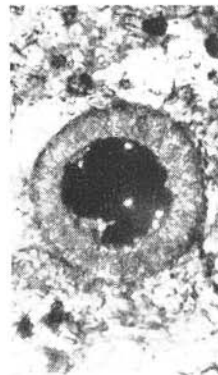
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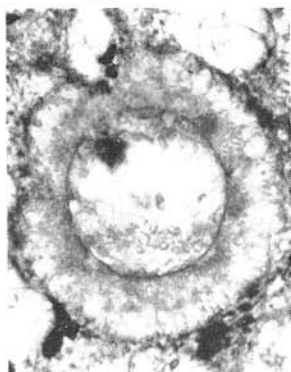
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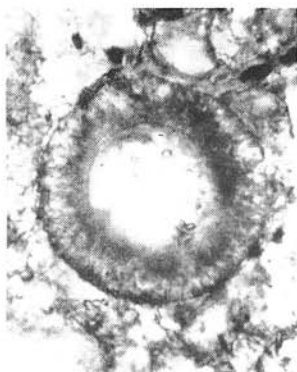
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Differences: *Colomisphaera varia* n. sp. differs from *C. heliosphaera* (Vogler) in colouring of the sections, parameters and morphology of the shells, finer structure of their walls and stratigraphical position. From *C. vogleri* (Borza) the described species differs in detailed structure, strength and colouring of the wall and stratigraphic position.

Remark: With the study of thin sections it was not possible to establish whether the colour shading and pigmentation of *Colomisphaera varia* n. sp.

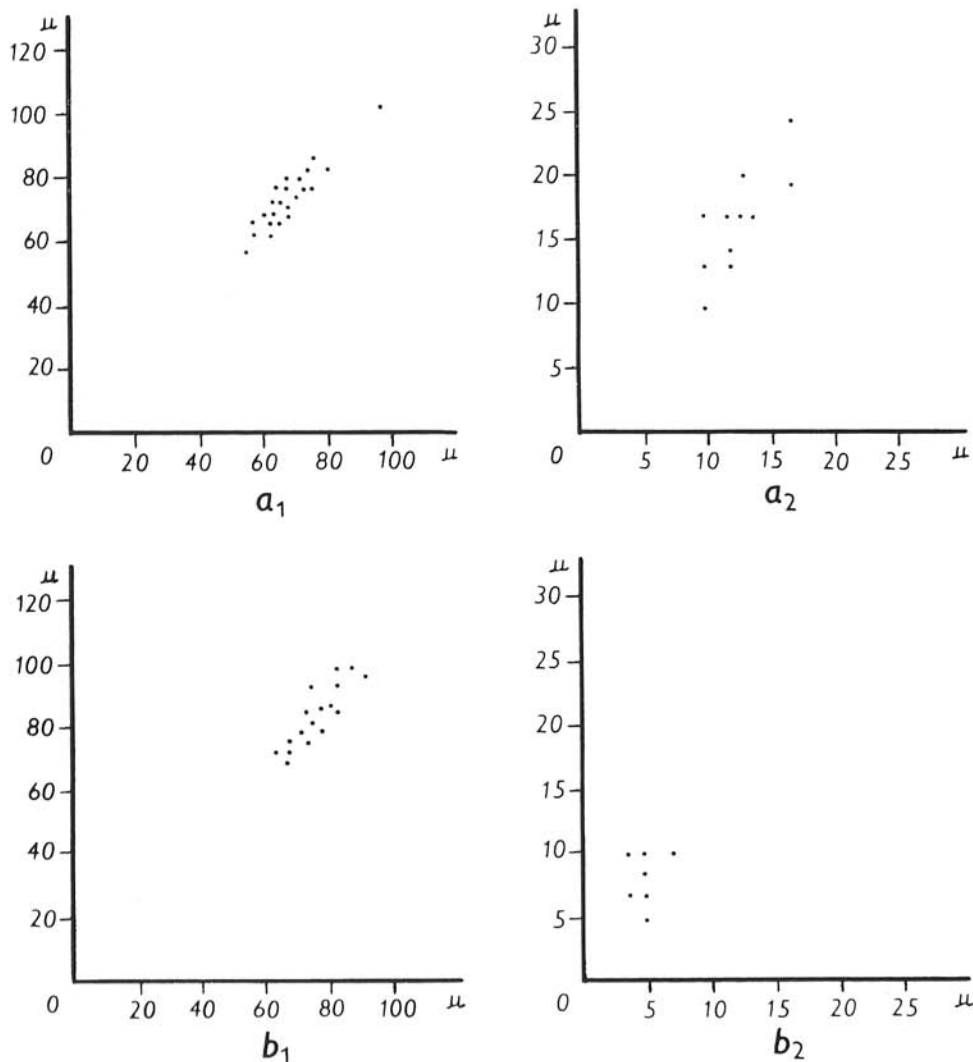


Fig. 2. a_1 — diameters of shells of *Colomisphaera varia* n. sp., a_2 — strength of wall of *Colomisphaera varia* n. sp. shells; b_1 — diameters of shells of *Colomisphaera fortis* n. sp.; b_2 — strength of wall of *Colomisphaera fortis* n. sp. shells.

Table 2

Dimensions of the studied specimens of *Colomisphaera varia* n. sp. in boreholes Dunajovice 21 and Strachotín 2 in μ

Number	Depth m	Interval m	Thin section	A	B	C	D
1.	1170—75	0.2—0.3	7598	76	72	21	14
2.	1170—75	0.2—0.3	7598	72	65	14	12
3.	1170—75	0.2—0.3	7598	79	72	17	14
4.	1170—75	0.2—0.3	7598	82	—	21	14
5.	1170—75	0.2—0.3	7598	65	61	13	10
6.	1170—75	0.2—0.3	7598	68	65	17	12
7.	1170—75	0.3—0.35	7357/A	54	—	10	—
8.	1170—75	0.3—0.35	7357/A	75	65	17	13
9.	1170—75	0.3—0.35	7357/A	75	—	19	17
10.	1170—75	0.3—0.35	7357/A	65	58	13	10
11.	1170—75	0.3—0.35	7357/B	68	65	17	10
12.	1170—75	0.3—0.35	7357/B	68	63	17	10
13.	1170—75	0.3—0.35	7357/B	65	—	13	10
14.	1170—75	0.3—0.35	7357/B	77	72	17	10
15.	1170—75	0.3—0.35	7357/B	75	68	17	10
16.	1694—97	0.1—0.2	6194	82	75	17	10
17.	1694—97	2.1—2.2	5569	102	98	24	17
18.	1791—97	2.2—2.3	6200	68	—	17	13
19.	1791—97	2.5—2.7	6206	85	78	14	12
20.	1791—97	3.5—3.6	6211	78	68	21	14

Explanations: A — greater diameter of slightly oval shells, B — lesser diameter of slightly oval shells, C — maximum strength of the wall of section, D — minimum strength of the wall of section. Serial numbers 1—15 specimens from borehole Dunajovice 21, numbers 16—20 specimens from borehole Strachotín 2.

wall is not influenced by the sedimentation environment. These marks were always proved in the majority of cases, so in the specimens from the facies of the sponge claystones, also in specimens in the facies of *Pithonella* marlstones. The shells of the described species, composed of fine fibrous calcite, are brittle also when the wall is relatively strong enough and were easily undergoing deformations by pressure to complete destruction with compaction of sediment.

Translated by J. Pevný

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Review by K. BORZA

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