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THREE NEW SPECIES OF CHAROPHYTA FROM THE UPPER TRIASSIC IN THE CRACOW-SILESIAN REGION (SOUTHERN POLAND)

(Pl. I and 4 Figs.)

Trzy nowe gatunki ramienic z górnego triasu obszaru krakowsko-śląskiego

(Tabl. I i 4 fig.)

Abstract: Three new species of the Charophyta are described from the Upper Triassic sediments of the Cracow-Silesian Region. Auerbachichara rhaetica n. sp. and Auerbachichara polonica n. sp. occur in the Rhaetic sediments of this area. Stellatochara kozuri sp. n. has been found in the Upper Keuper sediments (reed sandstone).

INTRODUCTION

Three new Charophyta species are described from the sediments of the Upper Triassic Cracow-Silesian Monocline. Two of them (*Auerbachichara polonica* n. sp. and *Auerbachichara rhaetica* n. sp.) may be regarded as characteristic of the Rhaetic Cracow-Silesian Region. The third of the species (*Stellatochara kozuri* n. sp.) has been found in the middle part of the Upper Keuper sediments (reed sandstone) of the margin of the Upper Silesian Coal Basin.

The symbols used in this paper are introduced by H. Horn af Rantzien (1956) and also applied by H. Kozur and P. Reinhardt (1969). The spirality index, proposed by V. M. Demin (1967), has also been computed.

Terminology:

L = length of the polar axis of the gyrogonite (with apical beak),
LPA = length of the polar axis of the gyrogonite,
LED = largest equatorial diameter of the gyrogonite,

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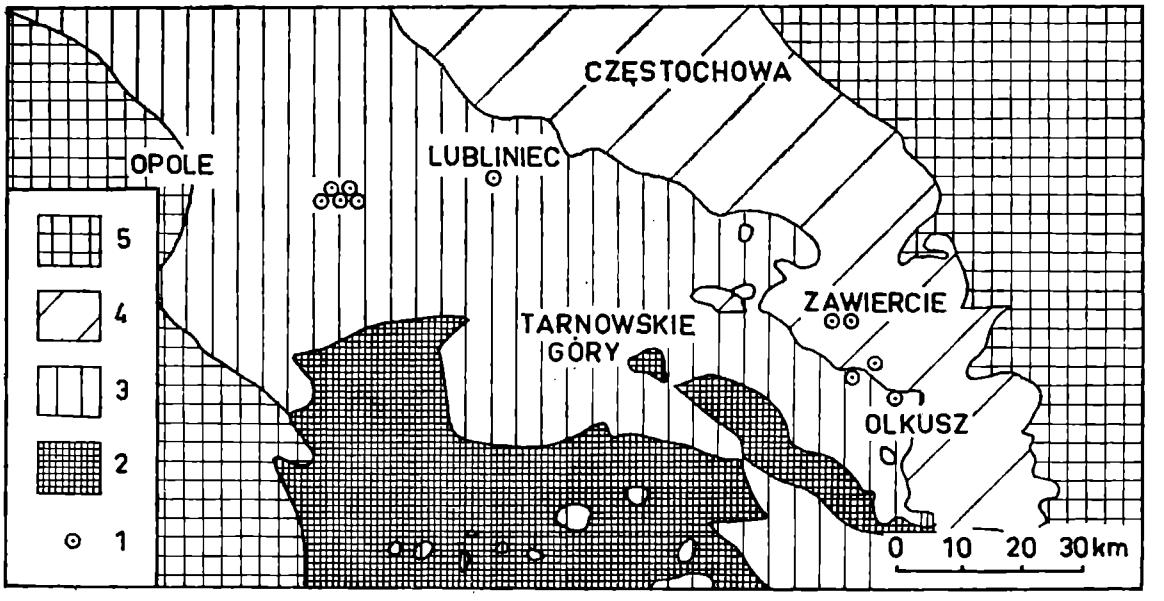

Fig. 1. Localization of borings in which the Charophyta were found. 1 — boring; 2 — Upper Palaeozoic; 3 — Triassic; 4 — Jurassic; 5 — Cretaceous

Fig. 1. Lokalizacja otworów wiertniczych, w których znaleziono Charophyta. 1 — wiercenie; 2 — górny paleozoik; 3 — trias; 4 — jura; 5 — kreda

AND = distance from the apical pole to the LED as calculated along the polar axis,

$$\text{ISI} = \text{isopolarity index} = 100\,\frac{\text{LPA}}{\text{LED}}\,(\%),$$

$$\text{LDI} = 100\,\frac{\text{L}}{\text{LED}}\,(\%),$$

$$\text{ANI} = \text{anisopolarity index} = 100\,\frac{\text{AND}}{\text{LPA}}\,(\%).$$

The following symbols are used in the descriptions of other diagnostic elements:

WS = widths of the spirals at the equatorial axis of the gyrogonite

$$\text{SPI} = \text{spirality index} = 100\,\frac{\text{LPA}}{\text{WS}}\,(\%),$$

EA = equatorial angle,

DA = diameter of the apical opening,

NS = number of spirals visible in the lateral view of the gyrogonite.

The shape of the gyrogonites was determined by the isopolarity (ISI) and anisopolarity (ANI) indexes, using the terminology given by H. Horn af Rantzien (vide — H. Horn af Rantzien, 1956; V. P. Maslov, 1963; R. E. Peck and G. A. Morales, 1966; H. Kozur and P. Reinhardt, 1969).

In the following descriptions the terms below are omitted:

— quantity of the spiral turns around the gyrogonite — because this

characteristic is a result of the quantity of spirals visible from a lateral view (quantity of spirals is constant-five),
— the situation of the largest equatorial diameter — because this one is expressed by the anisopolarity index ANI.

PALAEONTOLOGICAL DESCRIPTION

Order: Charales
Family: Porocharaceae Grambast, 1962
Subfamily: Stellatocharoideae, Grambast, 1962
Genus: *Stellatochara* Horn af Rantzien, 1954

Stellatochara kozuri n. sp.

Pl. I, figs. 1, 2, text-figs. 1a—d

Holotypus: Nr K9382, Pl. I, figs 1a, b
Locus typicus: Klucze near Olkusz
Stratum typicum: Upper Keuper (reed sandstone — Schilfsandstein)
Derivatio nominis: after the name of Dr Heinz Kozur, Staatliche Museen, Schloss Elisabethenburg, Meiningen.
Material: 30 well preserved specimens.

Table 1

Stellatochara kozuri n. sp.

Nr	L (μm)	LPA (μm)	L-LPA (μm)	LED (μm)	ISI (%)	LDI (%)	AND (μm)	ANI (%)	NS	WS (μm)	SPI (%)	EA	DA (μm)
1	688	614	74	560	110	123	298	48	9	74	829	20	64
2	685	618	67	512	121	134	314	51	8	80	772	13	80
3	640	579	61	483	120	133	301	52	10	80	716	15	58
4	704	602	102	509	118	138	259	43	9	77	782	17	80
5	643	557	86	482	115	133	242	43	9	71	785	18	61

Description: Gyrogonites prolate sphaeroidal to subprolate (ISI = 110—123), ellipsoidal (ANI = 43—52). Apical beak straight, hight is 58—102 μm, width 86—144 μm. L = 570—740 μm, LPA = 502—634 μm, LED = 467—560 μm, LDI = 123—138. In lateral view 8—10 distinctly concave spirals are visible. Width of the spirals at the middle part of the gyrogonite is between 74—86 μm. Interspiral ridges are rather low and sharp, with indistinct sutures. Secondary sutures are not visible on the surface of the gyrogonites. The equatorial angle is 12—20°. Apical opening is pentagonal, 58—83 μm diameter. The basal pole is rounded.
Comparison: The shape of *Stellatochara? thuringica* Kozur et Reinhardt is similar to *Stellatochara kozuri* n. sp. *S.? thuringica*

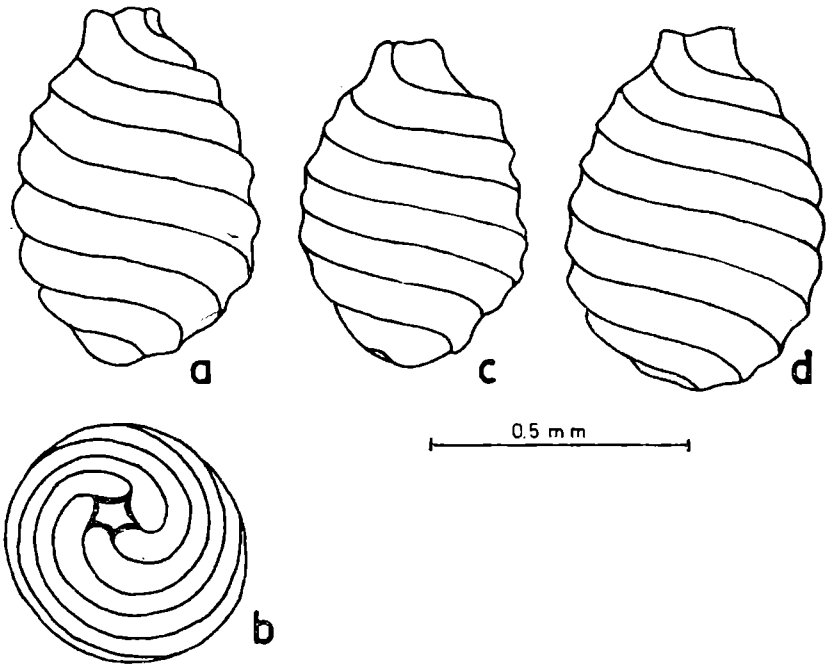

Fig. 2. *Stellatochara kozuri* n. sp. a, c, d — lateral view (widok z boku); b — apical view (widok apikalny)

differs from *S. kozuri* since it has a smaller size (LPA = 450—540 μm, LED = 340—375 μm), and has indistinct apical beak.

Occurrence: Upper Keuper (reed sandstone) in the Cracow-Silesian Region.

Subfamily: Stomocharoideae Saidakovsky, 1968
Genus: *Auerbachichara* Kisielevsky et Saidakovsky, 1967

Auerbachichara rhaetica n. sp.
Pl. I figs 3a—b, text-figs 3a—d

Holotypus: Nr P62 231, Pl. I, figs 3a, b
Locus typicus: Siewierz near Zawiercie
Stratum typicum: Rhaetic
Derivatio nominis: rhaetica, from the Rhaetic
Material: above 100 specimens

Table 2

Auerbachichara rhaetica n. sp.

Nr	LPA (μm)	LED (μm)	ISI (%)	AND (μm)	ANI (%)	NS	WS (μm)	SPI (%)	EA	DA (μm)
1	327	254	129	182	56	7	51	641	25	45
2	298	250	119	179	60	8	48	621	18	54
3	320	250	128	179	56	7	48	667	20	60
4	322	256	126	162	50	8	45	715	25	40
5	323	243	133	169	52	8	48	673	15	48

Description: Gyrogonites subprolate (ISI = 117—133), ellipsoidal to subovoidal (ANI = 50—60), LPA = 275—327 μm, LED = 230—256 μm. In the lateral view 7—8 slightly concave to flat spirals are visible, 41—51 μm width (SPI = 570—715). Short and relatively wide interspiral ridges, with distinct secondary sutures. The equatorial angle is 15—25°. On the apical pole the ends of spirals produce five short teeth. The apical opening has the shape of an irregular star. The basal pole may be very broadly rounded, or almost flat to rounded.

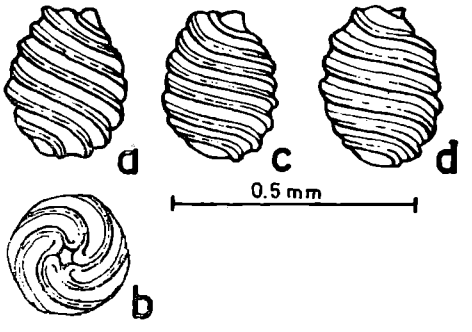

Fig. 3

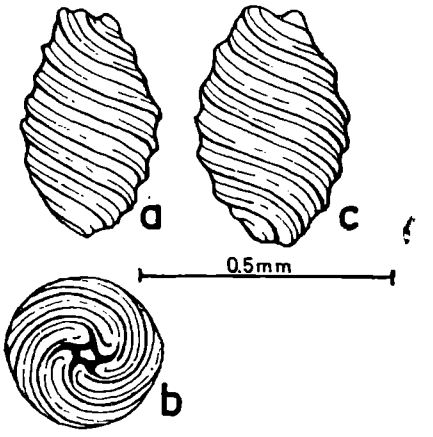

Fig. 4

Fig. 3. *Auerbachichara rhaetica* n. sp. a, c, d — lateral view (widok z boku); b — apical view (widok apikalny)

Fig. 4. *Auerbachichara polonica* n. sp. a, c — lateral view (widok z boku); b — apical view (widok apikalny)

Comparison: The described species differs from *Auerbachichara baskuntschakiensis* Kisielevsky, 1967 in shape, and has smaller dimensions of the gyrogonite.

Occurrence: Rhaetic in the Cracow-Silesian Region.

Auerbachichara polonica n. sp.

Pl. I, figs 4 a, b, text-figs 4 a—c

Holotypus: Nr Z73781, Pl. I, figs 4a, b

Locus typicus: Zawiercie

Stratum typicum: Rhaetic

Derivatio nominis: polonica, from Poland

Material: 35 specimens

Description: Gyrogonites prolate (ISI = 150—170), ellipsoidal (ANI = 45—54). LPA = 435—550 μm, LED = 272—326 μm. In the lateral view 8—9 flat or slightly concave spirals are visible. The width of the spirals at the middle part of the gyrogonite is between 58—64 μm (SPI = 709—859). The interspiral ridges are short and wide, with distinct secondary sutures. The equatorial angle is 24—30°. On the top of the gyrogonite the ends of spirals produce five short teeth. The shape of

Table 3

Auerbachichara polonica n. sp.

Nr	LPA (μm)	LED (μm)	ISI (%)	AND (μm)	ANI (%)	NS	WS (μm)	SPI (%)	EA	DA (μm)
1	454	272	167	227	50	9	64	710	28	51
2	493	320	154	224	45	9	59	709	30	61
3	550	326	169	278	50	8	64	859	28	64
4	473	304	156	256	54	9	61	775	30	50
5	435	290	150	224	51	8	58	750	24	61

apical opening is an irregular star, or pentagonal 50—65 μm in diameter. The basal pole is conical very protruding or rounded.

Comparison: *Auerbachichara collacerata* Saidakovsky, 1968 differs from the described species in having a flat base and the quantity of spirals visible in lateral view. *A. baskuntchakiensis* Kisielevsky, 1967 differs from *A. polonica* n. sp. by its dimensions (LPA = 316—414 μm; LED = 240—285 μm).

Occurrence: Rhaetic in the Cracow-Silesian Region.

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STRESZCZENIE

Przedstawiono opisy trzech nowych gatunków ramienic pochodzących z osadów górnego triasu monokliny śląsko-krakowskiej. Dwa spośród opisanych gatunków (*Auerbachichara rhaetica* n. sp. i *Auerbachichara polonica* n. sp.) można uważać za charakterystyczne dla retyku obszaru śląsko-krakowskiego. Trzeci z opisanych gatunków (*Stellatochara kozuri* n. sp.) został stwierdzony w osadach środkowej części górnego kajpru (piaskowiec trzcinowy), obrzeżenia Górnośląskiego Zagłębia Węglowego.

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EXPLANATION OF PLATE
OBJAŚNIENIE TABLICY

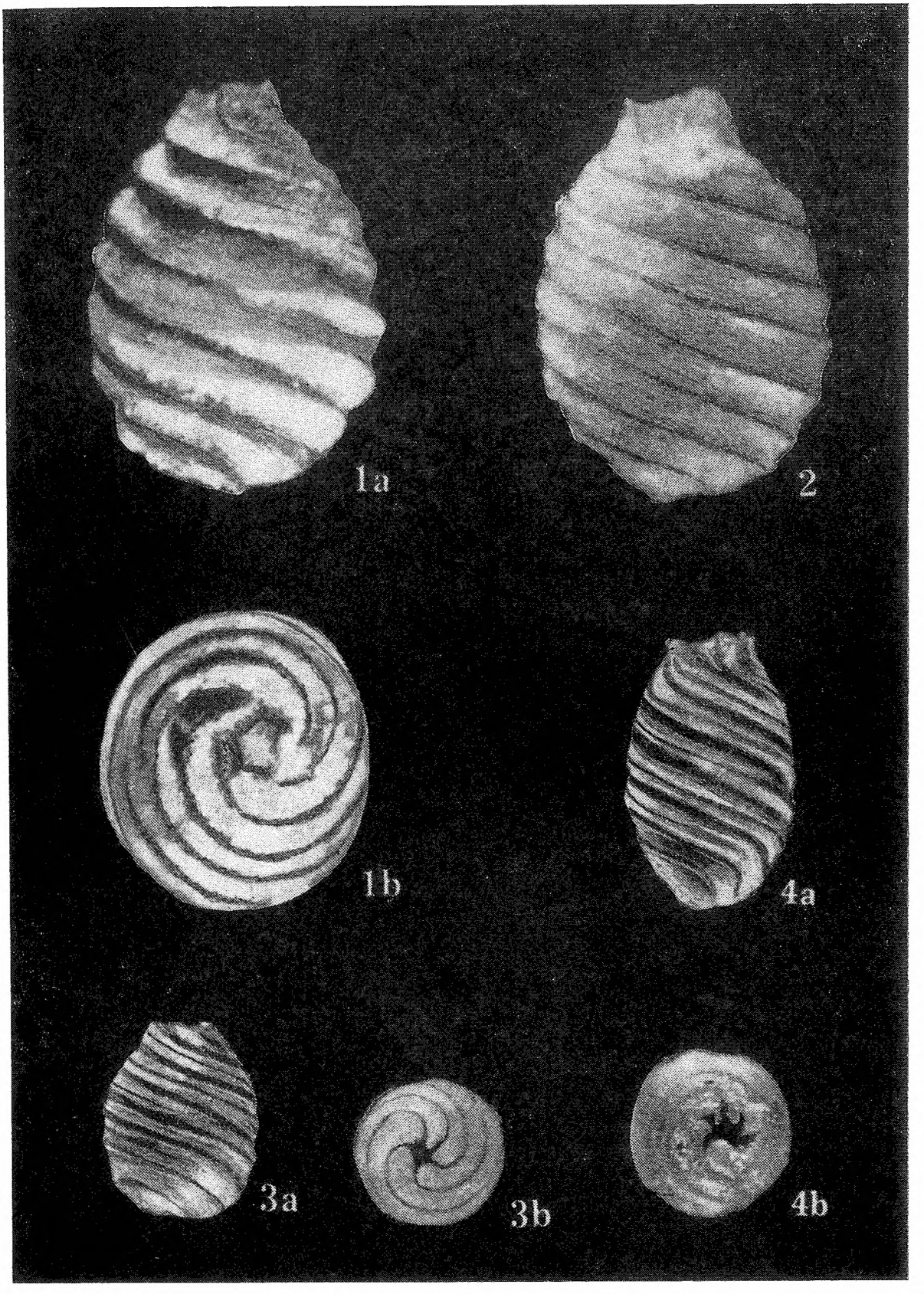
Plate — Tablica I

Fig. 1. *Stellatochara kozuri* n. sp., specimen (okaz) Nr. K9382 (holotype); a — lateral view (widok boczny); b — apical view (widok apikalny), × 86

Fig. 2. *Stellatochara kozuri* n. sp., specimen (okaz) Nr B12637 (paratype), lateral view (widok boczny), × 86

Fig. 3. *Auerbachichara rhaetica* n. sp., specimen (okaz) Nr. P62231 (holotype); a — lateral view (widok boczny); b — apical view (widok apikalny), × 86

Fig. 4. *Auerbachichara polonica* n. sp., specimen (okaz) Nr Z73781 (holotype); a — lateral view; b — apical view, × 86



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