

# New tabulate corals from the Tournaisian of the Cracow area, Poland

MIKOŁAJ K. ZAPALSKI

Faculty of Geology, Warsaw University, Al. Żwirki i Wigury 93, PL-02-089 Warsaw, Poland.  
E-mail: palaeo@poczta.onet.pl

## ABSTRACT:

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The paper presents the results of investigations of tabulate corals from the Lower Carboniferous (Upper Tournaisian, *Gnathodus cuneiformis* Zone) from several exposures in the Dębnik Anticline (Silesia-Cracow Upland, southern Poland). Two taxa representing the Favositida, *Roemeripora nowinskii* sp. nov. and *Roemeripora* sp., and one species representing the Syringoporida, *Pleurosiphonella* cf. *virginica* (NELSON), are described. The presence of *Michelinia tenuisepta* (PHILLIPS) is noted. The genus *Pleurosiphonella* TCHUDINOVA is recognised in the Carboniferous of Europe for the first time.

**Key-words:** Tabulata, Tournaisian, Moravia – Silesia Basin, Dębnik Anticline.

## INTRODUCTION

The paper presents the results of investigations of tabulate corals from the Upper Tournaisian (*Gnathodus cuneiformis* Zone, Lower *Caninia* Subzone), collected from several exposures in the region of Dębnik (Silesia-Cracow Upland). The material has been donated for investigation by Professor Aleksander NOWIŃSKI.

The exposures, from which the analysed fauna was collected (Marmurowa Góra, Czatkowice Quarry) are located ca. 30 km northwest of Cracow in the vicinity of Krzeszowice (Text-fig. 1). Very thick (ca. 1000 m) carbonate platform deposits, accumulated in this area from the Eifelian to the end of the Viséan in a basin that formed the eastern part of the Moravia – Silesia Basin. Most of the Carboniferous deposits of this platform represent lagoonal or intertidal environments; only one lithological unit represents intra-shelf deposits. The latter are represented by spiculitic limestones, included in the Przy Granicy

Quarry Formation. They overlie pelitic and fine-grained limestones with caliches, emersion surfaces, fenestral structures and clastics in the highest part (Pstrągarnia Formation). The spiculitic limestones belong to the *G. cuneiformis* Zone. They are represented by alternating calcilutites and calcarenites up to 30 m thick. The upper and lower parts of the section are characterised by thick-bedded, pale-coloured limestones, whereas the middle part is thin-bedded and dark-coloured. These latter strata contain numerous bryozoans, corals, brachiopods and crinoids. The investigated fauna comes from this part of the section. A metre-thick pyroclastic bed occurs in the lower part of the section. The uppermost part is not well defined (APPELT 1998).

SIEDLECKI (1954) presented a detailed geological setting of the region, and PASZKOWSKI (1988) supplied data on the Dinantian palaeogeography in the Krzeszowice area.

The tabulate fauna was already described in detail (NOWIŃSKI 1976, NOWIŃSKI & ZAPALSKI 1999) and com-

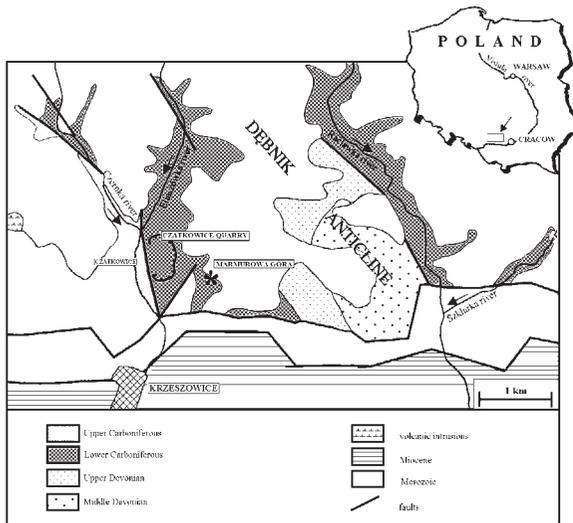


Fig. 1. Source localities on a simplified geological map of the Krzeszowice area (from APPELT, 1998, after DOKTOROWICZ-HREBNICKI, 1954)

pared to other coeval assemblages (NOWIŃSKI 1976). The specimens described here, however, represent genera previously unknown from Poland. Beside the here described taxa, four well-preserved colonies of *Michelinia tenuisepta* (PHILLIPS), a species that was hitherto unknown from the area, have been found in the Czatkowice Quarry. Although the described and reported taxa are not the dominant elements within the assemblage, they contribute significantly to the palaeobiodiversity.

The collection, abbreviated ZPAL, is housed in the Institute of Paleobiology, Polish Academy of Sciences in Warsaw.

## SYSTEMATIC PALAEOONTOLOGY

### Class Anthozoa

Subclass Tabulata MILNE-EDWARDS *et* HAIME, 1850

Order Favositida WEDEKIND, 1937

Superfamily Favositoidea DANA, 1846

Family Syringolitidae WAAGEN *et* WENZEL, 1886

### *Roemeripora* KRAICZ, 1934

**TYPE SPECIES:** *Roemeripora bohémica* (POČTA *in* BARRANDE, 1902), Lower Devonian of Bohemia (Czech Republic).

**REMARKS:** 32 species of the genus have been described to date, from the Lower Devonian to the Permian. A diagnosis of the genus was given by MIRONOVA (1974).

The genus was compared with related genera, the diagnosis was extended and stratigraphic and geographic ranges were given by NOWIŃSKI (1991). Species most similar to those described below were described from Carboniferous of Novaya Zemlya by SMIRNOVA (1957).

### *Roemeripora nowinskii* sp.nov.

(Pl. 1, Fig. 1a, b; 2a, b)

**DERIVATION OF NAME:** In honour of Professor Aleksander NOWIŃSKI.

**TYPE LOCALITY:** Czatkowice Quarry, Silesia-Cracow Upland, Poland.

**TYPE HORIZON:** Upper Tournaisian, *G. cuneiformis* Zone, Lower *Caninia* Subzone, Przy Granicy Quarry Formation.

**HOLOTYPE:** ZPAL T.XXII/3.

**MATERIAL:** One incomplete, otherwise very well preserved colony from the Czatkowice Quarry.

**DIAGNOSIS:** Small discoidal or hemispherical colony, about 50 mm in diameter. Corallum subcerioidal. Corallites circular and polygonal in cross-section, 1.7-2.3 mm in diameter. Connecting pores 0.12-0.18 mm in diameter. Wall thickness 0.13-0.18 mm. Thickness of epitheca 0.03-0.04 mm. Septal spines short, conical, distributed in rows, densely packed. Funnel-shaped tabulae, densely packed; tabular spines not present.

**DESCRIPTION:** Corallites in cross-section circular, in some cases polygonal, generally 1.7-2.3 mm in diameter, sporadically somewhat smaller or larger (largest diameter 2.5 mm). Corallites rather regularly distributed, contacting with rare connecting pores, 0.12-0.18 mm in diameter. Septal spines short, conical, inserted in wall stereoplasma, distributed in rows. Tabular spines not present. Strongly bent funnel-shaped tabulae, distributed every 0.12-0.6 mm, in bunches near connecting pores. Walls even 0.13-0.18 mm thick. Epitheca visible as a dark line, 0.03-0.04 mm thick. Radial-fibrous wall microstructure. 100 cm<sup>2</sup> of corallum cross-section contains 22-26 corallites.

**REMARKS:** The described species differs from *R. arctica* SMIRNOVA in larger corallite diameters (in *R. arctica* the diameters are 1.4-1.7 mm), very regular distribution of numerous massive septal spines and funnel-shaped tabulae. The new species differs from *R. fenitima* SMIRNOVA in

the smaller diameters of corallites (in the latter species diameters are 1.5-3.0 mm) and funnel-shaped tabulae. The described species has corallites larger in diameter than *R. terra-novae* SMIRNOVA (1.2-1.8 mm). The latter species in addition to pores has short connecting tubes and the septal spines are less numerous and finer.

*Roemeripora* sp.

(Pl. 1, fig. 3 a, b; Pl. 2, Fig. 1 a, b)

**MATERIAL:** Two rather poorly preserved coralla, ZPAL T.XXII/4, 5 from the Czatkowice Quarry.

**DESCRIPTION:** Colonies discoidal, about 30 mm in diameter. Corallites polygonal in cross-section, with rounded angles, 1.3-1.7 mm in diameter, in some cases slightly elongated, 1.3×1.7 mm in measurement. Septal spines not present. Corallite walls very uneven, 0.03-0.12 mm thick, most commonly 0.06-0.09 mm thick. Axial canal very irregular, discontinuous. Epithecæ invisible. Tabulae very strongly bent, funnel-shaped, often incomplete; very densely distributed. Tabular spines not present. Density of corallites on corallum cross-section estimated at 40-45 corallites/100 cm<sup>2</sup>.

**REMARKS:** The described taxon is closest to *R. arctica* SMIRNOVA, from which it differs in the shape of the tabulae, which in the latter taxon are meniscately concave. The shape of the tabulae resembles those of *R. nowinskii* sp. nov., from which it differs in the absence of septal spines and the smaller diameter of corallites.

**OCCURENCE:** Late Tournaisian, *G. cuneiformis* Zone, Poland: Dębnik Anticline, Silesia-Cracow Upland (Czatkowice Quarry).

Order Sringoporida SOKOLOV, 1962

Family Syringoporidae DE FROMENTEL, 1861

*Pleurosiphonella* TCHUDINOVA, 1970

**TYPE SPECIES:** *Pleurosiphonella crustosa* TCHUDINOVA, 1970, Tournaisian of the Transcaucasian region.

**REMARKS:** This genus is rather poorly recognised, with only six species described to date: *P. crustosa* TCHUDINOVA, *P. magnussoni* (NELSON), *P. mira* TCHUDINOVA, *P. pachythea* (PICKETT), *P. recta* (TCHUDINOVA) and *P. virginica* (NELSON). A diagnosis of the genus was given by TCHUDINOVA (1986).

**OCCURENCE:** Upper Tournaisian: Poland (*G. cuneiformis* Zone: Silesia-Cracow Upland, Czatkowice Quarry); Viséan: USA, Western Canada and New England, Central Ural Mts., Australia; Lower Namurian: USA.

*Pleurosiphonella* cf. *virginica* (NELSON, 1962)

(Pl. 2, Figs 2 a-c)

**MATERIAL:** One fragment of a very well preserved colony; ZPAL T.XXII/6, from Marmurowa Góra near Czatkowice.

**DESCRIPTION:** Corallum fascicular. Corallites irregularly cylindrical and cylindrical-prismatic, 1.5×1.5 mm to 2.2×3.7 mm in diameter, typically 1.5×1.6 – 1.8×2.3 mm. Corallites irregularly distributed, every 0.4 to 1.9 mm, connected by rare connecting tubes. Connecting tubes 0.2-0.3 mm in diameter. Septal spines not present. Axial canal bent, generally along the internal surface of the corallite wall. Tabulae typically strongly bent, occasionally incomplete, adhering to the wall; rarely horizontal, dividing the entire corallite. Tabulae without spines. Wall thickness 0.1-0.2 mm. Radial wall microstructure. Density of corallites on corallum cross-section estimated at ca. 10-11 corallites/100 cm<sup>2</sup>.

**REMARKS:** The described specimen is closest to *P. virginica* (NELSON), from which it differs in slightly larger corallite diameters. The differences in the corallum structure may result from the fact that the described fragment is small and may represent a peripheral part of the corallum, where the corallites are rather dispersed. From *P. crustosa* TCHUDINOVA from the Upper Tournaisian of the Transcaucasian region the specimen differs in a larger variability of corallite diameter and in corallites characterised by thinner walls. From *P. mira* TCHUDINOVA from the Viséan of the Ural Mts. it differs in larger corallite diameters and thinner walls.

**OCCURENCE:** Late Tournaisian, *G. cuneiformis* Zone, Poland: Dębnik Anticline, Silesia-Cracow Upland (Marmurowa Góra)

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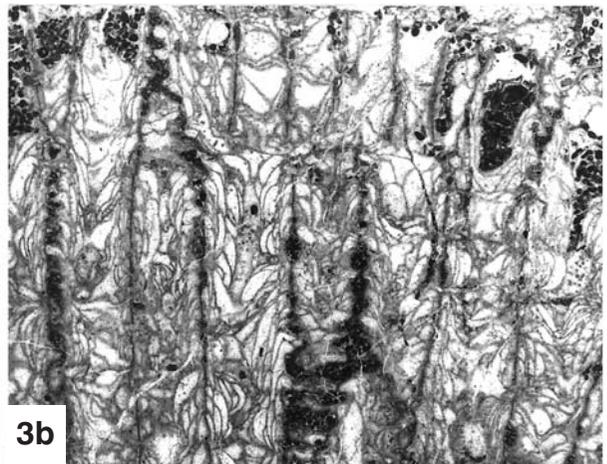
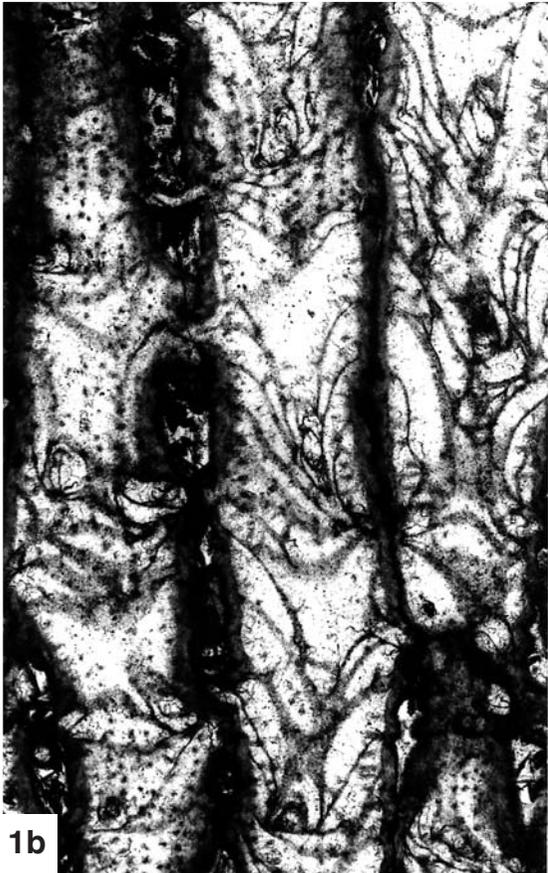
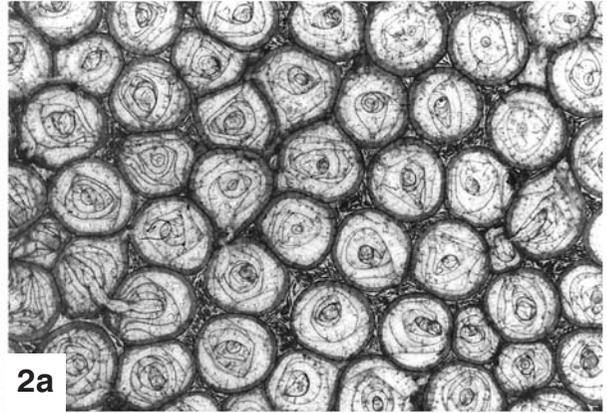
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PLATES 1-2

## PLATE 1

- 1 – *Roemeripora nowinskii* sp. nov., holotype ZPAL T.XXI/3. Czatkowice, Silesia-Cracow Upland, Poland. Upper Tournaisian, *Gnathodus cuneiformis* Zone, Lower *Caninia* Subzone, Przy Granicy Quarry Formation; a – transverse section, b – longitudinal section, both  $\times 10$
- 2 – *Roemeripora nowinskii* sp. nov, holotype ZPAL T.XXI/3. Czatkowice, Silesia-Cracow Upland, Poland. Upper Tournaisian, *Gnathodus cuneiformis* Zone, Lower *Caninia* Subzone, Przy Granicy Quarry Formation; a – transverse section, b – longitudinal section, both  $\times 5$
- 3 – *Roemeripora* sp., ZPAL T. XXII/5. Czatkowice, Silesia-Cracow Upland, Poland. Upper Tournaisian, *Gnathodus cuneiformis* Zone, Lower *Caninia* Subzone, Przy Granicy Quarry Formation; a – transverse section, b – longitudinal section, both  $\times 5$



## PLATE 2

- 1 – *Roemeripora* sp., ZPAL T. XXII/4. Czatkowice, Silesia-Cracow Upland, Poland. Upper Tournaisian, *Gnathodus cuneiformis* Zone, Lower *Caninia* Subzone, Przy Granicy Quarry Formation; a – transverse section, b – longitudinal section, both  $\times 10$
- 2 – *Pleurosiphonella* cf. *virginica* (NELSON), ZPAL T. XXII/6. Marmurowa Góra, Silesia-Cracow Upland, Poland. Upper Tournaisian, *Gnathodus cuneiformis* Zone, Lower *Caninia* Subzone, Przy Granicy Quarry Formation; a – transverse section  $\times 5$ , b – longitudinal section  $\times 5$ , c – longitudinal section  $\times 10$

