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## A new tabulate coral from Upper Carboniferous of Nordenskiöld Land, Svalbard

**ABSTRACT:** *Roemeripora tollinoidea* sp. n. (Anthozoa, Tabulata) is described from Upper Carboniferous strata of SW Nordenskiöld Land (Ingeborgfjellet), Bellsund area in West Spitsbergen (Svalbard). The new species is characteristic for a phacelo-ceroid structure of entire corallum.

**Key words:** Arctic, Svalbard, Carboniferous, Paleontology (Anthozoa, Tabulata).

### Introduction

The paper presents results of morphological studies of *Roemeripora tollinoidea* sp. n. from the Upper Carboniferous limestones of south-eastern region of the Nordenskiöld Land (Ingeborgfjellet), Bellsund area, West Spitsbergen. The material was collected by Dr Andrzej Musiał during the 1993 Spitsbergen Expedition, organized by the Faculty of Geography and Regional Studies of the Warsaw University.

The Upper Carboniferous deposits in the SW Nordenskiöld Land are represented by dark limestones and dolomites with abundant coral fauna (Tabulata, solitary and colonial Rugosa), Bryozoa, Crinoidea and Foraminifera (Fig. 1). The limestones belong to the Permian-Carboniferous series extending in NNW-SSE direction and are attributed to Cadelfjellet Member (= Lower Wordiekammen Limestones of Forbes *et al.*, 1958) of the Orenburgian and partly Gzhelian age (Cutbill and Challinor 1965). The Upper Carboniferous age of the strata is further corroborated by work of Lácika and Musiał (1988).

Almost complete skeletons of three colonies have been examined on the basis of 24 thin sections, 4 polished sections, and two sets of serial thin sections to reveal blastogenesis.

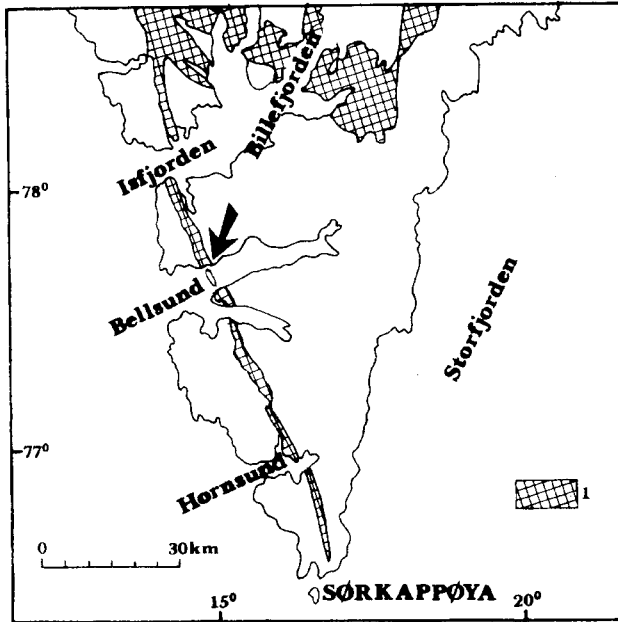


Fig. 1. Location of the coral-bearing strata (arrowed) in south-west Spitsbergen  
1. Permo-Carboniferous marine deposits.

The present work was done in the Institute of Paleobiology of the Polish Academy of Sciences, Warszawa (abbreviated as ZPAL), where the collection is housed.

## Description

Order **Favositida** Sokolov, 1962  
 Suborder **Favositina** Sokolov, 1950  
 Family **Syringolitidae** Waagen *et* Wentzel, 1886  
 Genus **Roemeripora** Kraicz, 1943

Type species: *Roemeria bohémica* Pošta in Barrande, 1902

Diagnosis: Mironova, 1974; *see also* Nowiński, 1991

Remarks and occurrence: Nowiński, 1991

*Roemeripora tollinoides* sp. n.

(Pl. 1, Figs 1–2; Pl. 2, Figs 1–2)

**H o l o t y p e:** specimen ZPAL T. XIV/1; Figs 1A–B; Pl. 1, Figs 1–2; Pl. 2, Figs 1–2.

**T y p e h o r i z o n:** "Lower Wordiekammen Limestones", Upper Carboniferous.

**Type locality:** Ingeborgfiellet, SW Nordenskiöld Land, Bellsund.

**Derivation of the name:** *tollinoides* — because of corallites arranged similarly as in the corallum in genus *Tollina* Sokolov.

**Diagnosis.** — Large, phacelo-cerioid corallum with tollinoidal structure. Corallites long, polygonal in cross-section, measuring 1.0–1.8 mm in diameter when regular or 1.6–1.8 by 1.6–2.2 mm when elongated. The corallite walls 0.02–0.05 mm thick. Connecting pores rare, about 0.2 mm in diameter. Connecting tubes very short and large scarce. The tabulae numerous, very thin, funnelshaped and bent, oblique, form single-layered vesicular tissue peripherally. No septal spines.

**Material.** — Large fragments of three coralla (ZPAL T. XIV/1–3) from Upper Carboniferous of Nordenskiöld Land (Ingeborgfiellet).

**Description.** — Large, phacelo-cerioid tabular coralla, about 30 cm thick, built of very long, straight or slightly bent corallites, parallel to each other. In cross-section the corallites show a loose, tollinoidal arrangement pattern: several (usually 4–5) corallites contact with neighbours by walls and encircle polygonal, circular, oval or irregular empty spaces. The spaces are similar or slightly wider than the adjacent corallites. In some areas of the corallum, the corallites form short, undulating and merging *Halysites* — like palisade chains. Longitudinal section through the corallum reveals that the thecal contacts between the corallites are limited to shorter or larger parts of their height. The corallites never contact along their whole length. In cross-section the corallites are irregularly polygonal (pentagonal to heptagonal)

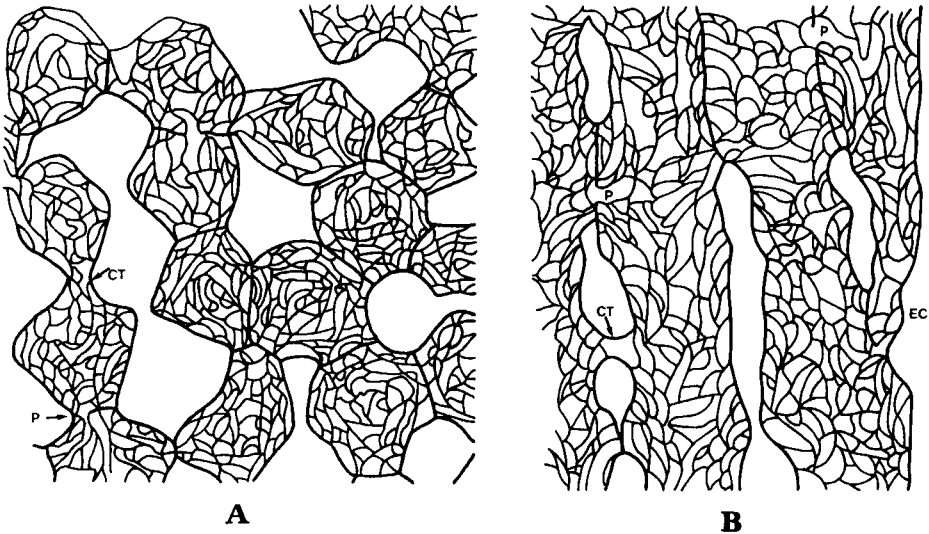


Fig. 2. *Roemeripora tollinoides* sp. n., holotype (ZPAL T. XIV/1): A — transverse section, B — longitudinal section,  $\times 10$ ; CT — connecting tube, EC — ephebic corallite, P — connecting pore. Ingeborgfiellet, Nordenskiöld Land, Bellsund. "Lower Wordiekammen Limestones", Upper Carboniferous.

with sharp or rounded corners, with 1.4–2.0 mm (usually 1.6–1.8 mm) diameter, or less often, oval or irregular, measuring 1.4–2.0 by 1.6–2.4 mm, usually 1.6–1.8 by 1.6–2.2 mm (Fig. 2A–B). Corallite walls very thin 0.02–0.05 mm is thickness (very rarely up to 0.08 mm), uneven, with illegible microstructure. Median line very thin, dark, rather poorly developed. Connecting elements of two kinds: 1 — very rare and irregularly spaced, round pores, about 0.2 mm in diameter, located usually near the corners of the corallites; 2 — very short and thick, rare and irregularly spaced connecting tubes (with connecting canals) slightly wider or of similar diameter as the connecting pores. The tabulae numerous, very thin, funnel-shaped and bent, strongly oblique, form a single-layered vesicular tissue in the peripheral part of corallites. The tabulae do not form bundles near the pores nor the connecting canals which are typical for *Roemeripora*. There is no axial canal. Septal spines absent. There is no spines in the tabulae.

Vegetative reproduction by calicular, intravisceral budding. The bud appeared in any corner of the parent calice, within the visceral chamber.

**R e m a r k s.** — *Roemeripora tollinoides* sp. n. differs from other species of the genus by the phacelo-cerioid structure of its corallum, with loosely arranged corallites resembling in that feature *Tollina* Sokolov (Sokolov 1955, 1962; Hill 1981). Such an arrangement can be observed in other members of the genus *Roemeripora*, especially in Lower Permian from Hornsund area of Spitsbergen (Nowiński 1982, 1991), but only occasionally and in the most peripheral parts of the corallum. In *Roemeripora tollinoides* sp. n., the whole corallum is of a uniformly loose structure.

The new species is closest to *Roemeripora minor* Heritsch (= *R. wimani minor* Heritsch) known from Lower Permian of Spitsbergen: Isfiorden area (Heritsch 1939) and Hornsund area (Fedorowski 1967, Nowiński 1991). The similarities are expressed in the general shape of the corallum, length and morphology of the corallites as well as in the morphology and spatial arrangement of the tabulae. The new species differs however by tollinoid structure of corallum, slightly lesser diameters of corallites and thinner walls, much rare and more irregularly spaced connecting pores, by the presence of connecting tubes, as well as by the absence of septal spines nor bundles of tabulae near the pores and connecting canals.

**O c c u r r e n c e.** — Upper Carboniferous: West Spitsbergen, Bellsund (SW, Nordenskiöld Land, Ingeborgfiellet).

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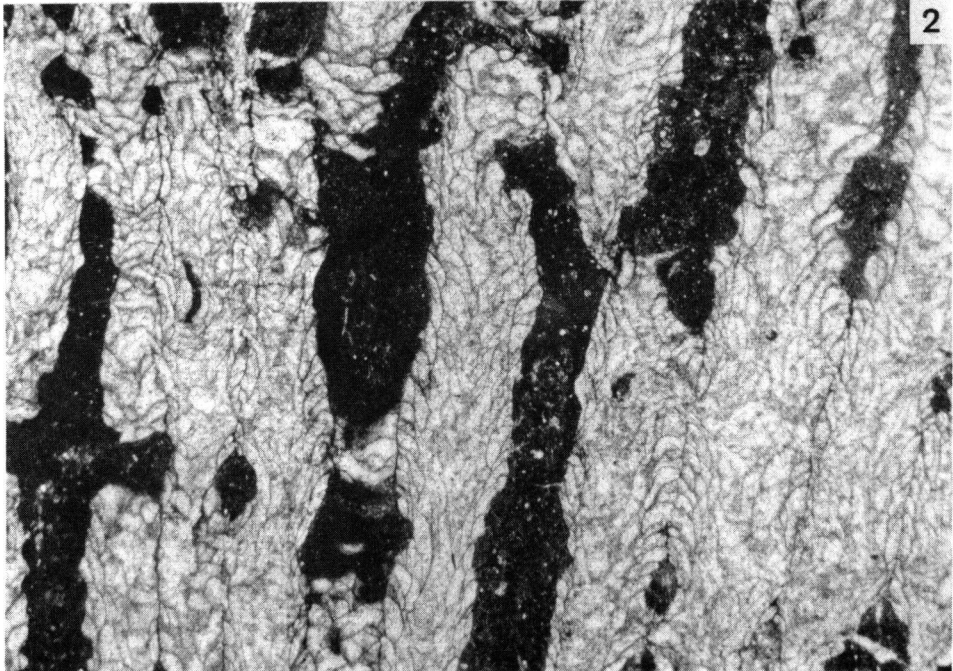
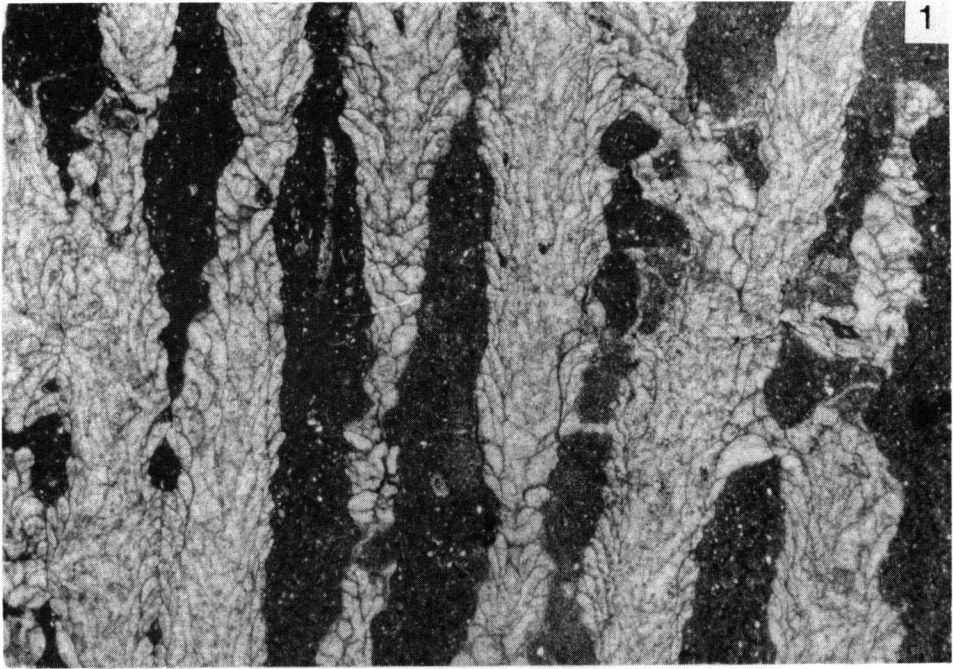
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## Streszczenie

W pracy opisano i zilustrowano nowy gatunek koralu kolonijnego (Tabulata) *Roemeripora tollinoides* z utworów górnego karbonu południowo-zachodniej części Nordenskiöld Land (Ingebo-rgfiellet) północnego rejonu fiordu Bellsund na Spitsbergenie (fig. 1). *Roemeripora tollinoides* sp. n. (pl. 1–2; fig. 1A-B) różni się od znanych dotychczas gatunków tego rodzaju facelo-ceriodalną strukturą szkieletu kolonii, charakteryzującą się ażurowym układem koralitów, podobnym do przedstawicieli rodzaju *Tollina* Sokolov. Taka struktura szkieletu u rodzaju *Roemeripora* praktycznie nie występuje. Niekiedy można ją obserwować u niektórych permjskich przedstawicieli tego rodzaju w najbardziej marginalnej strefie koralowiny. Nowy gatunek wykazuje pewne analogie do *Roemeripora minor* Heritsch, powszechnie występującego w permo-karbonie Spitsbergenu.

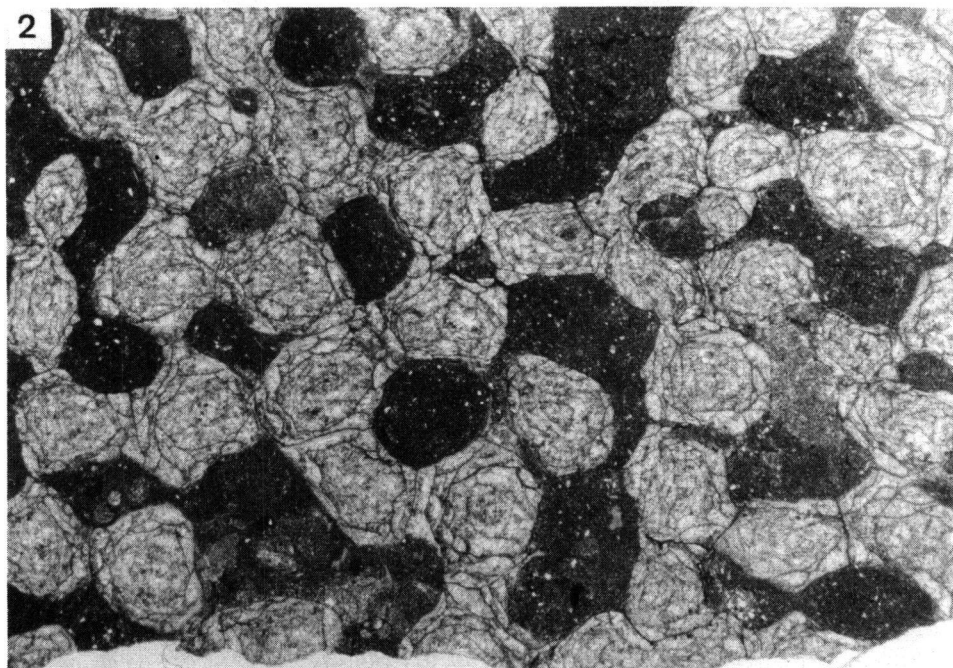
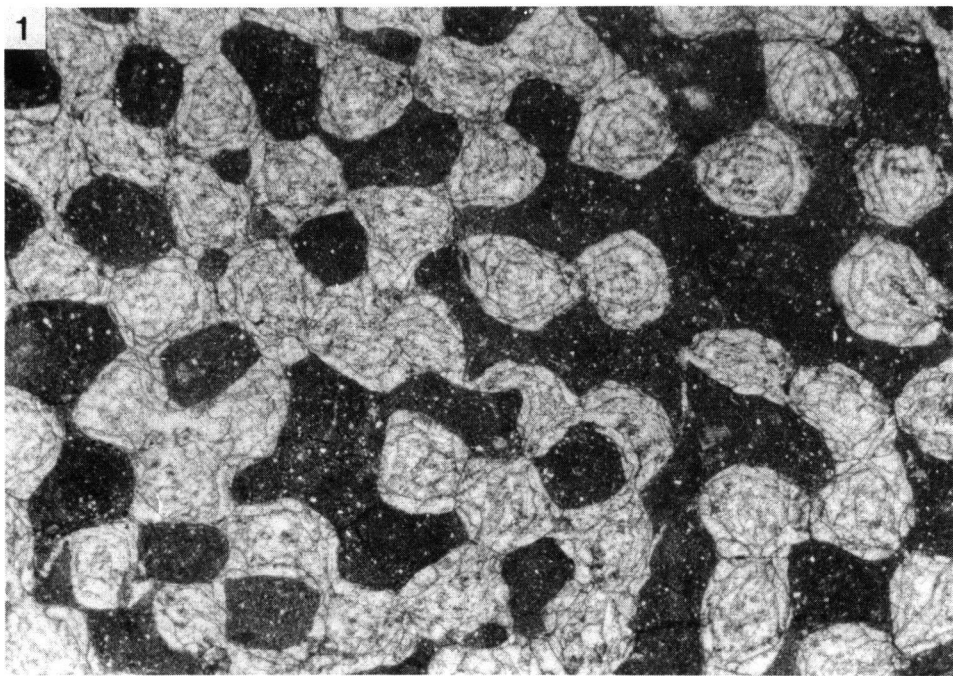


*Roemeripora tollinoides* sp. n., holotype (ZPAL T. XIV/1)

1–2. Longitudinal sections,  $\times 5$

Upper Carboniferous

Ingeborgfiellet, SW Nordenskiöld Land, Bellsund



*Roemeripora tollinoides* sp. n., holotype (ZPAL T. XIV/1)

1–2. Transverse sections,  $\times 5$

Upper Carboniferous

Ingeborgfiellet, SW Nordenskiöld Land, Bellsund

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## Septal neck-siphuncular complex in *Stolleyites* (Ammonoidea), Triassic, Svalbard

**ABSTRACT:** Septal neck-siphuncular complex has been redescribed in Triassic (Carnian) *Stolleyites tenuis* (Stolley). Ammonites whose septal necks change orientation from retrochoanitic through intermediate to prochoanitic may be divided into two categories: dorsoproggressive and ventroproggressive. In the former category, the initial changes in the direction of septal necks orientation occur dorsally; in the latter, the ventral side exhibits more progressive changes. Among forms with siphuncular complex adjacent to the ventral wall, *i.e.*, without a septum between the neck and ventral wall in the medial plane, the changes towards prochoanitic septal neck may begin in the ventrolateral part. The circum-siphonal invagination in those forms did not include the ventral part and their proper interpretation cannot rely on the medial plane only. Primary lamination and primary fibrous structure of the siphuncular tube had been described, as well as the microstructure of the distal tip of cuff and auxiliary deposit.

**Key words:** Arctic, Edgeöya, Triassic, paleontology (Ammonoidea).

### Introduction

The trend towards ontogenetic replacement of initially retrochoanitic septal necks by prochoanitic ones, observed in various ammonite groups has been gaining interest from ammonitologists, because of its not fully understood functional significance. Spatial relations between septal necks and siphuncular complex undergo radical changes during this transformation. While in the retrochoanitic condition the wall of the siphuncular tube is formed as a continuation of the interlamellar organic membranes of septal neck, in the prochoanitic condition the tip of septal neck is more or less independent from the siphuncular tube, and the relevant part of the siphuncular tube is connected with the internal surface of the neck by means of a cuff (= auxiliary posterior deposit of Kulicki 1979). Intermediate stages between the retro- and pro-