

**THE GENUS *CARPATHIELLA* MISIK, SOTAK & ZIEGLER, 1999 (SERPULIDAE),  
ITS REPRESENTATIVES FROM THE ALPINE PLASSEN FORMATION  
(KIMMERIDGIAN - BERRIASIAN)  
AND DESCRIPTION OF *CARPATHIELLA PLASSENENSIS* N. SP.**

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**Abstract:** Representatives of the genus *Carpathiella* MISIK et al., 1999 (interpreted as serpulid worm tubes) are widespread in the Alpine Plassen Formation (Kimmeridgian-Berriasian). Besides the two species established by MISIK et al., 1999, *C. perforata* and *C. triangulata*, a third new representative is introduced as ***Carpathiella plassenensis*** n. sp. Due to the characteristic cross-sections of two rounded tubes, enclosed by a common outer wall, it can easily be recognized in thin-sections.

**Key words:** *Carpathiella*, Serpulidae, Upper Jurassic, Lower Cretaceous, Alpine Plassen Formation

Serpulids are calcareous tube-dwelling worms living attached to hard substrates. As these are typical suspension feeders, the limiting factor is a constant supply of suspended organic matter which they can filter from the water. In the fossil record serpulids have been described from both, thin-section material (e.g. SENOWBARI-DARYAN, 1997) and isolated specimens (e.g. JÄGER, 1991). Whereas the taxonomy of modern serpulids is based on features of the animal's soft body, the calcareous tubes (arrangement, microstructure, shape, ornamentation) are the main criterion in fossil representatives.

Recently, MISIK, ZIEGLER & SOTAK (1999) established a new genus, *Carpathiella*, with the two species *C. triangulata* and *C. perforata* from Mesozoic limestone pebbles of the Western Carpathians. The taxa in question have been interpreted as calcified serpulid tubes that are up to now only known from their type-localities. These microfossils with a

characteristic light-yellowish to slightly brownish, radial-fibrous calcitic tube structure have now been detected in Jurassic (Plassen Formation) to Cretaceous shallow water limestones of the Northern Calcareous Alps (Lower Cretaceous Urgonian Limestones, Upper Cretaceous Gosau Group). They have been discovered from the Sillenkopf Formation (MISSONI et al., 2001) and the Plassen Formation (PF) of the localities Krahstein, Plassen, Trisselwand, Lärchberghörndl, Dietrichshorn, Litzlkogel, Falkenstein and Untersberg (Tab. 1).

Representatives of *Carpathiella* are ubiquitous microfossils in the PF showing a distinct facies sensitivity occurring almost exclusively in well-agitated external infralittoral environments of outer platform settings (peri-reefal limestones, upper slope deposits). In addition, they are also widespread within the basal parts of the near-shore internal infralittoral Lofer Member that exhibits an abrasive stress biotop. Both paleoenvironments mentioned are characterized by abundant hard substrates for the settlement of *Carpathiellas*. The investigations carried out also yielded a new species, that is going to be introduced as *Carpathiella plassenensis* n. sp.

Locality Species	<i>C. triangulata</i> MISIČ et al.	<i>C. perforata</i> MISIČ et al	<i>Carpathiella</i> sp.	<i>Carpathiella</i> <i>plassenensis</i> n. sp.
Falkenstein	X			X
Hochkranz				X
Krahstein	X	X	X	
Litzlkogel	X			X
Plassen	X	X	X	
Rötelstein		X		
Trisselwand	X		X	X
Untersberg				X
Sillenköpfe	X		X	

Tab. 1: Occurrences of *Carpathiella* species in the Alpine Plassen Formation and the Sillenkopf Formation (Sillenköpfe).

Genus ***Carpathiella*** MISIČ, SOTAK & ZIEGLER, 1999

***Carpathiella plassenensis*** n. sp.

(Fig. 1-2)

**Derivation of the name:** The species name refers to the widespread occurrence in the Alpine Plassen-Formation, where it has been found up to now in 5 different localities.

**Type-locality:** From the different localities where the new species has been detected, the Lärchberghörndl near Lofer has been chosen as type-locality since it can easily be reached (most other localities higher up on the mountains). The marly limestones, where the new species occurs are exposed along the way (called “Konradsweg”) at the southeastern slope of the Lärchberghörndl along the Loferbach. It is located on the topographical Map of Austria: 1: 50000, Lofer ÖK 92. The type-locality of *C. plassenensis* n. sp. corresponds to “profil no. 7” treated by DYA (1992: Fig. 13).

**Type stratum:** Fossiliferous marly, partly oncoidal limestones (wacke- to packstones) containing benthic foraminifera in abundances and also dasycladales. The latter are represented by *Clypeina catinula* CAROZZI, *Clypeina sulcata* (ALTH), *Clypeina isabellae* MASSE et al., *Rajkaella* sp. and *Salpingoporella annulata* CAROZZI. Benthic foraminifera include miliolids, *Anchispirocyclus lusitanica* (EGGER), *Trocholina* sp. and others not further determined taxa. Stratigraphy: Middle or Upper Tithonian. The facies of the Lofer Member refers to a typical internal infralittoral environment (e.g. SCHLAGINTWEIT & EBELI, 2000).

**Holotype:** Cross section figured here as fig. 1-1. Locality Konradsweg/Lofer. The thin-sections containing the holotype and the paratype are housed at the “Bayerische Staatssammlung für Paläontologie und historische Geologie” with the number BSP 2002-I-21 and –22.

**Paratype:** Cross section figured here as fig. 1-2; thin-section BSP 2002-I-22 Same locality as holotype.

**Material:** More than thirty variously oriented sections from 5 localities (Tab. 1).

**Diagnosis:** Representative of *Carpathiella* consisting of an U-shaped tube that in cross-sections appears as “two” tubes enclosed by a common outer wall.

Fig. 1: Holotype (1) and paratype (2) of *Carpathiella plassenensis* n. sp., cross-section. Thin-section BSP 2002-I-21 and -22, scale = 1 mm. Locality: Konradsweg near Lofer/Salzburg Calcareous Alps.

**Description:** Relative thick U-shaped calcareous tube, appearing as two oval to ovale elongated separate tubes in cross-sections. The light yellowish to brownish calcification is massive in most cases, reaching thicknesses of up to 0,8 mm. Both sides of the “double-tube” are smooth and more or less parallel. Therefore, the wall thickness attains its greatest thickness in the central part where both “tubes” touch. In the distal parts (towards the opening), both “tubes” are clearly individualized separated by a calcareous wall from each others. Towards the curved part, they become succesively more connected to each others laterally. In this manner, the central massive calcification becomes reduced.

**Dimensions:** Dimensions are given in table 2. Compared with *Carpathiella perforata* (up to 1,92 mm acc. to MISIK et al., 1999) and *Carpathiella triangulata* (up to 1,12 mm), *Carpathiella plassenensis* n. sp. is distinctly larger (Tab. 2). If we only consider “one” tube size, however, *C. plassenensis* n. sp. is comparable to both.

Locality	Thin-section	D	H	Locality	Thin-section	D	H
<b>Die</b>	8	2,48 mm	1,4 mm	<b>Lä</b>	Eis 1	2,3 mm	1,5 mm
	1985/IX 31	2,65 mm	0,85 mm		Eis 8	2,45 mm	1,1 mm
	1985/IX 164	3,1 mm	1,8 mm	<b>Krah</b>	HR 18	2,3 mm	1,2 mm
<b>Fa</b>	A 2570	1,0 mm	0,5 mm	<b>TK</b>	TK 24	2,7 mm	0,9 mm
<b>Si</b>	Ber 31/1/1	1,32 mm	0,68 mm				

Tab. 2: Dimensions of *Carpathiella plassenensis* n. sp. D = “double tube” outer diameter, H = height of “double tube”. Plassen Formation: Die = Dietrichshorn, Fa = Falkenstein, Lä = Lärchberghörndl, Krah = Krahstein, TK = Trisselkogel; Sillenkopf Formation: Si = Sillenköpfe

**Remarks:** Based on all available sections, the tube shape has been reconstructed assuming one U-shaped tube with parallel arrangement (Fig. 2). The initial part is assumed to be closed. One longitudinal section (length up to 5,6 mm) recovered with only one tube could represent the distal ending of the tube. In cross sections it is clearly distinguishable from both, *C. triangulata* and *C. perforata* by its typical shape of two separate tubes (Fig. 3).

Fig. 2: Reconstruction of *Carpathiella plassenensis* n. sp. and cross-section appearances in thin sections (A-A' - D-D')

Fig. 3: Cross-sections of *Carpathiella triangulata* MISIK et al., 1999 (A), *Carpathiella perforata* MISIK et al., 1999 (B), *Carpathiella plassenensis* n. sp. (C)

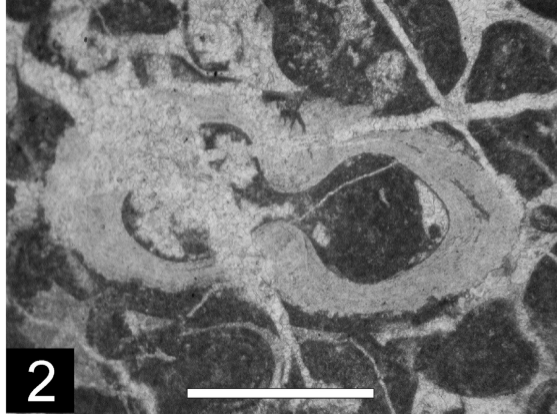
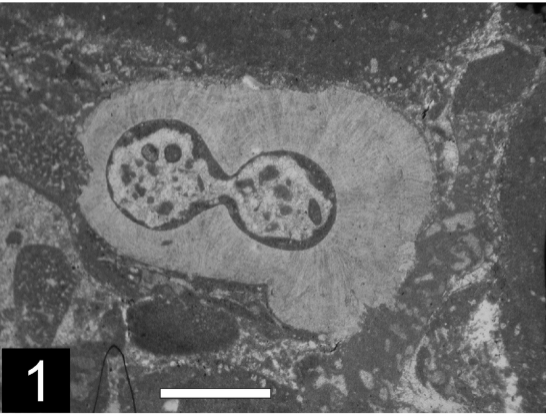
**Stratigraphy:** As concerns biostratigraphy, *C. triangulata* has been reported from Upper Jurassic to Paleogene, *C. perforata* from Barremian to Paleogene strata (MISIK et al., 1999). In the Northern Calcareous Alps, all three representatives of the genus *Carpathiella* have been found in Kimmeridgian to Berriasian strata thus enlarging the so far known stratigraphic range of *C. perforata*. Based on these new data, it is clearly evident, that these microfossils are of little importance for stratigraphic purposes.

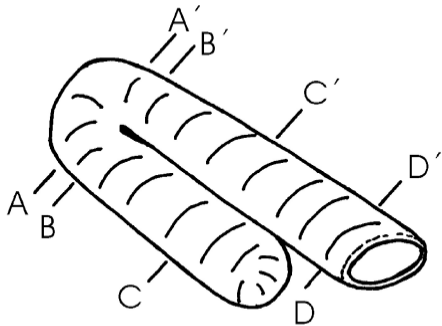
**Facies:** Besides the occurrences in the Lofer Member (see type stratum), *C. plassenensis* n. sp. has been detected in facies of the platform margin (peri-reefal limestones and upper slope deposits, rarely back-reef facies). Here, it is associated with salpingoporellas, echinoids, *Tubiphytes morronensis* CRESCENTI and *Protopenereoplis ultragranulata* (GORBATCIK) in the Lower Berriasian and *P. striata* WEYNSCHENK in the (Upper) Kimmeridgian.

A detailed illustration of the new species *Carpathiella plassenensis* n. sp. will be given in a separate paper (SCHLAGINTWEIT & GAWLICK, in prep.).

## REFERENCES

- DYA, M. (1992): Mikropaläontologische und fazielle Untersuchungen im Oberjura zwischen Salzburg und Lofer. Doct. Thesis Techn. Univ. Berlin, 137 p.
- JÄGER, M. (1991): Serpulidae und Spirordidae (Polychaeta sedentaria) aus dem Alb und der Oberkreide Helgolands der Oberkreide Helgolands (Norddeutschland). Geol. Jb., A **120**, 139-175, Hannover.
- MISIK, M., SOTAK, J. & ZIEGLER, V. (1999): Serpulid worms *Mercierella* Fauvel, *Durandella* DRAGASTAN and *Carpathiella* nov. gen. from the Jurassic, Cretaceous and Paleogene of the Western Carpathians. - Geol. Carpath., **50/4**, 305-312, Bratislava.
- MISSONI, S. SCHLAGINTWEIT, F., SUZUKI, H. & GAWLICK, H.-J. (2001): Die oberjurassische Karbonatplattformentwicklung im Bereich der Berchtesgadener Kalkalpen (Deutschland) – eine Rekonstruktion auf der Basis von Untersuchungen polymikter Brekzienkörper in pelagischen Kieselsedimenten (Sillenkopf-Formation). - Zbl. Geol. Paläont., **2000**, Heft **1/2**: 117-143, Stuttgart.
- SCHLAGINTWEIT, F. & EBELI, O. (2000): Short note on *Clypeina catinula* CAROZZI, 1956 (dasycladale) from the Late Jurassic-Early Cretaceous of the Northern Calcareous Alps (Lofer Member, Austria). - Rev. Paléobiol., **19**(2): 465-473, Geneva.
- SENOWBARI-DARYAN, B. (1997): *Barbafera carnica* SENOWBARI-DARYAN, 1980: A triassic worm-tube. - Facies, **36**: 57-68, Erlangen.





A - A'



B - B'

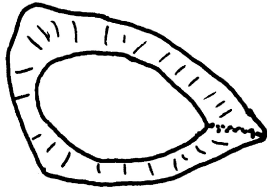


C - C'



D - D'

A



B



C

