

# UPPER CRETACEOUS CALCAREOUS NANNOFOSSILS FROM HATEG AREA (SOUTH CARPATHIANS, ROMANIA)

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**Abstract:** The study of the Upper Cretaceous calcareous nannofossils from the Hateg area (South Carpathians, Romania) pointed out the presence of a marine sedimentation within the Coniacian-Campanian interval. The CC14, CC15, CC16, CC17, CC18-CC19, CC20, CC21 and CC22 Nannozones of Sissingh's Zonation (1977) were identified, within the studied successions. The character of the nannofloras is mainly tethyan and cosmopolitan.

**Key words:** Upper Cretaceous, calcareous nannofossils, South Carpathians, Romania.

## INTRODUCTION

The Hateg area is situated in the western part of the South Carpathians (Fig.1). The zone was studied since the beginning of the 19<sup>th</sup> century (Nopcsa, 1902), being famous for its dinosaur remains. The investigations carried out on the Hateg zone were mainly focussed on the continental sediments, deposited during the Maastrichtian-Paleocene interval (Grigorescu et al., 1985; Grigorescu & Anastasiu, 1990).

The aim of this study is to present the results carried out on the Upper Cretaceous marine sediments of the NW Hateg area, based on calcareous nannofossil analyzes.

## STUDY AREA

The investigated area is situated in the Southern Carpathians (south-western part of Romania). Upper Jurassic-Lower Cretaceous marine deposits overlay the crystalline basement of the Median Dacides. The Upper Cretaceous sediments represent the post-tectonic cover of the Median Dacides and are bordering the Hateg Basin to the SE and NW (Codarcea & Dimitrescu, 1967).

The previous palaeontological studies of the marine deposits were mainly focused on the Upper Cretaceous sediments outcropping in the SE part of the Hateg area (Pop et al., 1972) and less on the NW one (Grigorescu & Melinte, 2002).

The present study is focussed on the Upper Cretaceous marine deposits cropping out in the NW part of the Hateg basin.

Lithological point of view, the investigated deposits are represented by two formations: the Stei Formation conformably overlaid by the Rachitova Formation (Grigorescu and Melinte, 2002). The Stei Formation is a pelagic lithostratigraphic unit, which was divided by the above mentioned authors into two members: the lower one, made up by variegated (red and green) marls and the upper one, represented by gray-greenish marls and calcarenites. The Rachitova Formation, the youngest marine formation from this area is entirely turbiditic as lithology. The lower part is mainly represented by a sandy-shaly flysch, while the uppermost part is made up by a shaly flysch (Grigorescu and Melinte, 2002).

Both Stei and Rachitova Formations were detailed sampled for the calcareous nannofossil studies.

### **CALCAREOUS NANNOFOSSILS**

The calcareous nannofossil investigations were performed by realizing both qualitative and quantitative studies. The quantitative studies were achieved by counting at least 500 specimens in longitudinal transverses, randomly distributed.

The determined calcareous nannofossil assemblages are rich and diversified. The preservation is better in the pelagic sediments, than in the turbiditic ones, which contain also several reworkings.

The calcareous nannofossil assemblages are dominated by *Watznaueria barnesae* as well as by the species of the genera *Cretarhabdus*, *Eiffellithus*, *Prediscosphaera*, *Lucianorhabdus* and *Micula*.

The oldest marine deposits from the studied area were assigned to the Coniacian (CC14, CC15 and part of CC16 Nannozones of Sissingh's Zonation, 1977). The first successive occurrences of the taxa *Lucianorhabdus cayeuxii*, *Orastrum campanensis* and *Aspidolithus parvus constrictus* argue for the presence of the CC16, CC17 and CC18 Nannozones (Upper Coniacian-Santonian in age).

The Campanian was identified based on the presence of the CC19, CC20, CC21 and CC22 (part) Nannozones. The first occurrences of the species *Ceratolithoides aculeus*, *Uniplanarius sissinghi*, *Uniplanarius trifidus* and *Reinhardtites levis* were recorded as significant events in the studied sections.

### **CONCLUSIONS**

The Upper Cretaceous marine deposits from the NW Hateg area (South Carpathians, Romania) were investigated for their calcareous nannofossil content. The studies pointed out the presence of the Coniacian-Campanian marine deposits in the study area. The succession of the Upper Cretaceous

nannofossil events is similar with the ones identified in other zones of the Romanian Carpathians (Melinte, 1999) or in other tethyan areas (Sissingh, 1977, Perch-Nielsen, 1985). The prevailing character of the nannofloras is tethyan, pointed out especially in the Campanian deposits, by the common presence of *Ceratolithoides aculeus*, *C. verbeekii*, *Uiplanarius sissinghi* and *U. trifidus* in the nannofloral assemblages.

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STAGE		LITHOLOGY	FORMATION	NANNO EVENTS	NANNO ZONES
CAMPANIAN	UPPER	[Dotted pattern]	RACHITOVA FORMATION	Shaly Flysch	<i>Uniplanarius trifidus</i> (FO) CC 22
	LOWER			Sandy-Shaly Flysch	<i>Uniplanarius sissinghi</i> (FO) CC 21
SANTONIAN	MIDDLE UPPER	[Dotted pattern]	RACHITOVA FORMATION	Sandy-Shaly Flysch	CC 20
	LOWER			Sandy-Shaly Flysch	<i>Ceratolithoides aculeus</i> (FO) <i>Ceratolithoides verbeekii</i> (FO) CC 18-19
CONIACIAN	UPPER	[Brick pattern]	STEI FORMATION	Marls and calcarenites	<i>Aspidolithus parvus constrictus</i> (FO) CC 17
	MIDDLE			Variagated marls	<i>Calculites obscurus</i> (C) CC 17 <i>Orastrum campanensis</i> (FO) CC 16 <i>Lithastrinus grilii</i> (FO) <i>Lucianorhabdus cayeuxii</i> (FO) CC 15
					CC 14

Figure 1. Litho- and biostratigraphy of the Upper Cretaceous from NW Hateg