



Preliminary results about the Campanian/Maastrichtian boundary in Reselets Section (Western Fore-Balkan), based on inoceramid bivalves, ammonites and dinoflagellate cysts

Предварителни данни за границата Кампан/Мастрихт в разреза при с. Реселец (Западен Предбалкан), на базата на иноцерамидни бивалвии, амонити и динофлагелатни цисти

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In the area of the Western Fore-Balkan, integrated biostratigraphic studies based on inoceramids, ammonites and dinoflagellate cysts, have never previously been carried-out to date. The present study is the first attempt to draw the Campanian/Maastrichtian boundary by using these fossil groups into a newly discovered section near Reselets village.

Jolkičev (1982) described the Upper Cretaceous sedimentary sequences cropping-out at the vicinity of Reselets village in two sections: first along the Beliloto River, and second east from the train station of the village of Reselets. Sedimentary sequences in both sections have been dated as Santonian–Maastrichtian, based on listed inoceramids, belemnites, rare ammonites and foraminifers. However, this author did not provide any information about the position of the stage boundaries in the described sediments. Unfortunately, at the present, the sections of Jolkičev (1982) are not available for reinvestigation. This study reports a quite new sedimentary succession, cropping out south-western from the village of Reselets, recently recognized by L. Metodiev and D. Dochev. The new section Reselets contains the best inoceramid record in Western Fore-Balkan and provides good opportunity to fix the Campanian/Maastrichtian boundary, based on inoceramid bivalves (Dochev, Metodiev, 2015).

The new section was precisely described and measured, in regard to an integrated biostratigraphic study, with direct calibration of macrofossils and palynological data. The sedimentary sequence in the section consists of glauconitic sandstones to glauconitic limestones (Darmantsi Formation), clayey limestones with rare marlstone interbeds (Kunino Formation), and micritic limestones with grey to black cherty concre-

tions (Mezdra Formation). This succession was sampled for palynomorphs (with emphasis on the dinoflagellate cysts), and a small collection of inoceramids and ammonites was obtained from different levels.

The macro fauna from the Darmantsi Formation consists of sparse inoceramid bivalves and very rare ammonites. The inoceramid specimens are limited in number, but taxonomically rich and of high stratigraphic value. From the lowermost part of section, two inoceramid taxa were collected: “*Inoceramus*” *oblongus* Meek, 1871 and “*Inoceramus*” *wyomingensis* Walaszczyk, Cobban and Harries, 2001. The only ammonite specimen obtained from this level was defined as *Pseudokosmaticeras brandti* (Redtenbacher, 1873). The inoceramid assemblage collected from the uppermost part of the Darmantsi Formation is very rich in species, and composed of *Cataceramus oviformis* Walaszczyk, Cobban and Harries 2001, *Cataceramus palliseri* (Douglas, 1942) and *Endocotaea typica* Whitfield, 1880.

“*Inoceramus*” *wyomingensis* Walaszczyk, Cobban and Harries, 2001 is a typical taxon for the uppermost Campanian “*Inoceramus*” *redbirdensis* Zone (Walaszczyk et al., 2001). In addition, the discovery of “*Inoceramus*” *oblongus* Meek, 1871 and the Upper Campanian marker *Pseudokosmaticeras brandti* (Redtenbacher, 1873), allowed us to presume a latest-most Campanian age of the very base of the section. The first appearance of *Endocotaea typica* Whitfield 1880, the index taxon of the eponymous inoceramid zone is very good marker for the Maastrichtian stage (Walaszczyk et al., 2001, 2002). The first occurrence of *E. typica*, with the associated forms of *C. oviformis* and *C. palliseri*, directly above the inoceramid and the

ammonite data from the base of the section allowed us to draw the Campanian/Maastrichtian boundary in the middle part of the Darmantsi Formation.

The dinoflagellate cysts displayed a continuous record through the sampled interval. Chorata gonyaulacoid dinocysts and especially the members of the genera *Spiniferites*, *Achomosphaera*, *Sulculosphaeridium*, *Tanyosphaeridium* and *Pterodinium* dominate the assemblages. Peridinioid dinocysts are rare. With regard to the Campanian/Maastrichtian boundary, two dinocyst occurrences are of special interest: 1) the presence of *Microdinium* cf. *carpentierae* Slimani, 1994 in the upper part of the Darmantsi Fm.; 2) the presence of the age diagnostic species *Odontochitina operculata* (Wetzel, 1933) Deflandre & Cookson, 1955 in the lowermost part of the Kunino Formation. The FO of the former species is considered to represent a potential marker for the Campanian/Maastrichtian boundary at its type section at Tercis, France (Schioler, Wilson, 2001). The highest occurrence of *Odontochitina* is accepted as a cosmopolitan key biostratigraphic event reported in the proximity of the Campanian/Maastrichtian boundary. Its last occurrence is documented in the Uppermost Campanian in the type Campanian/Maastrichtian boundary section at Tercis (France) and Zumaia, Northern Spain (Schioler, Wilson, 2001; Radmacher et al., 2014), but also higher, in the lowermost Maastrichtian of France, Western Carpathians and other sections of the Southern Hemisphere (Williams et al., 2004; Skupien, Mohamed, 2008). The calibration to the inoceramid and the ammonite finds in the present study gives valuable information about the ranges of these taxa around the Campanian/Maastrichtian boundary.

The dinoflagellate cysts assemblages are consistent in their generic and species composition to published records from widely separated regions. The encountered low P/G ratio values, as well as the marked domination of thin-walled chorata gonyaulacoid dinocysts is considered to indicate stable low-energy conditions, with normal marine productivity and nutrient availability in the basin during the studied time interval.

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