

Calcareous nannofossil and stable isotope stratigraphy of the Upper Campanian–Maastrichtian in NW Bulgaria (SE Europe): Preliminary results

Georgi Grančovski, Kristalina Stoykova

Bulgarian Academy of Sciences, Geological Institute, 1113 Sofia, Bulgaria; georgi2801@geology.bas.bg, stoykova@geology.bas.bg

Clemens V. Ullmann

University of Exeter, Camborne School of Mines and Environment and Sustainability Institute, Penryn TR10 9FE, UK; C.Ullmann@exeter.ac.uk

Shallow-marine sediments of Late Cretaceous–Paleogene age are exposed at Kladorub (NW Bulgaria). These Upper Campanian–Ypresian strata consist of silty to fine-sandy marlstones, occasionally interbedded with marly limestones and sandstones, and they encompass the well-known K–Pg boundary and the PETM in a previously understudied region. In order to establish an improved, integrated stratigraphic context for this section, a detailed investigation of the calcareous nannoplankton assemblages, and the carbon and oxygen isotope ratios based on benthic foraminifera, was carried out. The studied 123-m-thick succession spans the Upper Campanian to lowermost Danian and correspond to parts of nannofossil Zones UC15d^{TP} to NP1. A total of 164 samples were analysed for both nannofossils and stable C and O isotope ratios at a 50-cm resolution. Owing to poor exposure, the sampling resolution was decreased to 1 m for the lowermost portion of the section, and there were some limited intervals of non-exposure in UC15e^{TP}, UC16a^{TP}, UC16b^{TP} and around the K–Pg boundary interval.

The nannofossil assemblages were abundant, moderately well preserved and taxonomically rich, allowing 31 datums to be recognised. Based on scanning electron microscope analyses, the foraminifera showed no evidence of significant test dissolution, recrystallisation or overgrowth. In addition, the carbon and oxygen isotope co-variation was weak, raising confidence that primary environmental information was retained in their tests, at least for the carbon isotope ratios. Indeed, several previously-established carbon isotope excursions were identified. Due to the incompleteness of the isotope record at Kladorub, particularly around the base and top of the Maastrichtian, further investigations are planned to discriminate between the distinct isotopic events.

This work was carried out through the National Science Program's 'Environmental Protection and Reduction of Risks of Adverse Events and Natural Disasters' No. 577/17.08.2018 and supported by the MES of Bulgaria, Agreement No. D01-230/06.12.2018.