

## INTEGRATED NANNOFOSSIL, PLANKTONIC FORAMINIFERA AND AMMONITE STRATIGRAPHY OF SOME EUROPEAN KEY SECTIONS: SANTONIAN-CAMPANIAN AND CAMPANIAN-MAASTRICHTIAN BOUNDARIES

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Several sections in Austria, Hungary and northern Spain were investigated for an integration of nannofossil, planktonic foraminifera and ammonite zonations across the Santonian-Campanian and the Campanian-Maastrichtian boundaries. All these sections are situated along the northern margin of the Tethyan realm.

Although the proposed boundary criterion, the LO of *Marsupites testudinarius*, due to the lack of the species can not be applied in Austria, ammonite data allow a recognition of the S/C-boundary interval in the Gosau area. There, *Placenticeras* cf. *bidorsatum*, used as a lower Campanian marker succeeds Late Santonian ammonites such as *Boehmoceras* and *Placenticeras polyopsis*. Nannofossil data indicate, that the S/C-boundary lies within the *Calculites obscurus* zone (CC17) above the FO of curved *Lucianorhabdus cayerxii* (subzone CC17b). *Broinsonia (Aspidolithus) parca*, defining the base of CC18, has its FO about 20 metres above the LOs of Santonian ammonites, at about the same level as the LO of the planktonic foraminifera genus *Dicarinella*. *Globotruncanita elevata* appears for the first time a few meters above this level. Correlation to magnetostratigraphy has been achieved within the Hungarian borehole Bakonyjákó 528, where the base of the reversed chron C33r was found within nannofossil subzone CC17b. Sections in northern Spain provide some additional data for the S/C-boundary. In the Sarasate section (Navarra) the FO of the ammonite *Scaphites hippocrepis* III, an Early Campanian index species, lies also within nannofossil subzone CC17b.

In northern Spain, the taken boundary marker for the base of the Maastrichtian, the FO of the ammonite *Pachydiscus neubergicus*, was found at Erro, succeeding a Late Campanian *Nostoceras* bed in the *Nostoceras hyatti* Zone. Both events are within nannofossil subzone CC23a, characterized by the presence of *Ceratholithoides aculeus*, *Broinsonia (A.) parca constricta* and *Quadrum (Uniplanarius) trifidum* and the absence of both *Reinhardtites anthophorus* and *Eiffellithus eximius*. Data from other Spanish sections (Imiscoz, Juandehaco I and Erice II) indicate that the FO of *P. neubergicus* can be correlated consistently to a level within subzone CC23a. However, correlations to other European sections indicate considerable diachroneity in local first occurrences of *P. neubergicus*. Within its type locality near Neuberg (Austria), *P. neubergicus* appears in a transgressive series as late as CC25b, suggesting a Late Maastrichtian age. Occurrences of *P. neubergicus* within the Ukrainian Nagoryany area were correlated to nannofossil subzone CC23b. Compared to Tethyan planktonic foraminiferal zonations the LO of *Globotruncanita calcarata* is considerably older than the base of the Maastrichtian defined by *P. neubergicus*. As a consequence of the rather long range of *P. neubergicus* a calibration of local FOs of *P. neubergicus* against other fossil groups, e.g. calcareous nannoplankton, seems to be necessary.