



Palynology of the Cenomanian–Turonian Rehkogelgraben boundary section in the Ultrahelvetic Zone, Eastern Alps, Austria

Палинологички изследвания на границата Ценоман–Турон в разреза Рехкогелграбен, Ултрахелветска зона, Източни Алпи, Австрия

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The Rehkogelgraben section of the “Buntmergelserie”, an Ultrahelvetic unit, comprises the first black-shale bearing Cenomanian–Turonian boundary section from the Eastern Alps so far documented. The succession was deposited on the distal European continental margin of the (Alpine) Tethys. It comprises a 5 m thick succession of Upper Cenomanian marl-limestone cycles overlaid by a black shale interval composed of three black shale layers and carbonate-free claystones, followed by Lower Turonian white to light grey marly limestones with thin marl layers.

The biostratigraphy of the Cenomanian–Turonian boundary interval in the section is defined mainly on the base of calcareous nannofossils with additional information from planktonic foraminifera (Wagreich et al., 2008). Correlations to Oceanic Anoxic Event 2 are possible via the occurrence of black shales. Nannofossil biostratigraphy, planktonic foraminifera events, and $\delta^{13}\text{C}$ chemostratigraphy enable a correlation with several Cenomanian–Turonian boundary sections, notably Gubbio (Italy) and Eastbourne (U. K.). High TOC contents (up to 5%) and predominantly marine organic matter are similar to other OAE2 successions such as the Bonarelli-level in Italy (Wagreich et al., 2008).

The present contribution concentrates on the palynological assemblages and the palynofacies associated with the Cenomanian–Turonian boundary interval. Seven samples from this section have yielded some low diversity but distinctive palynological associations which have both stratigraphic and palaeoenvironmental significance. The sporomorph association is dominated by representatives of the Normapolles

group. Most profuse species are *Atlantopollis microreticulatus* Krutzsch and *Atlantopollis reticulatus* Krutzsch together with *Complexiopollis praeatumescentes* Krutzsch, *Complexiopollis christae* (Ameron) Krutzsch and *Complexiopollis funiculus* Tschudy. They still associate with single grains from the *Tricolpites* genus. The concurrent presence of these pollen species is regarded as characteristic in previously reported latest Cenomanian and especially Early Turonian assemblages from Southern France, Portugal and Bulgaria (Medus et al., 1980; Robaszynski et al., 1982; Pavlishina, Minev, 1996) thus confirming the age assessment of the studied interval. Their calibration to the nannofossil and planktonic foraminiferal successions in the Rehkogelgraben section is of biostratigraphical importance.

A low diversity dinocyst association is identified in the Cenomanian–Turonian boundary interval samples. It is dominated by the *Cyclonephelium compactum* – *Cyclonephelium membraniphorum* complex and *Circulodinium* species. The dinocyst association is encountered in palynofacies rich in marine organic matter of granular amorphous composition considered to be characteristic for deposition in restricted, anoxic conditions. The palaeoenvironmental significance of the low diversity *Cyclonephelium/Eurydinium* association in preparations dominated by granular amorphous marine organic matter was outlined by Marshall and Batten (1988) for the Cenomanian–Turonian black shale sequences of Northern Europe and gives ground for correlations with the Rehkogelgraben section and to other OAE2 successions.

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