The upper Ottnangian Calcite Minimum Interval: A solution to many problems?

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The lower Miocene stratigraphy constitutes a major challenge for Paratethys research. Old geographic borders (such as the Iron Curtain) and insufficient biostratigraphic resolution resulted in different, contradictory concepts. Further on, regional Paratethys stages such as the Eggenburgian, Ottnangian and Karpatian pose a high geochronological resolution. If concepts such as lower/middle/upper Ottnangian/Karpatian are taken into account, the resolution lies in the order of 0.1 Ma.

Recent work demonstrated, that much of these concepts and models for the Molasse and Vienna Basin and therefore the age of these strata must be revised. But important fossils needed for an explicit allocation to certain regional stages are often absent. Therefore, additional tools for a detailed stratigraphic correlation are needed.

We recently demonstrated the existence of an interval of sediments with reduced calcite and pyrite contents. These sediments are barren in micro- and nannofossils and correspond to the Traisen Formation and its deep distal continuation, the newly defined Wildendürnbach Formation. According to the calcareous nannofossil-content of over- and underlying strata, these deposits fall into the calcareous nannofossil zone NN4.

It is known, that the Traisen Formation was deposited in brackish waters which are attributed to the upper Ottnangian Rzehakia Lake System. It can be assumed, that the CMI is the biostratigraphical, mineralogical and chemical expression of the Rzehakia Lake System. The upper Ottnangian is usually assigned as the time of brackish lakes in the Paratethys realm. Therefore, the CMI as expression of this environmental conditions constitutes a valuable tool for an exact localization of the very short (ca. 0.2 Ma) time span of the upper Ottnangian with its mostly fossil-free deposits in Lower Austria. This allows the detailed definition and correlation of lithostratigraphic units throughout the lower Austrian Molasse Basin, to the Vienna Basin and to the continuation of the Molasse Basin in the Czech Republic.

The improved border-crossing correlation of lithostratigraphic units solves additional problems. Since years, a discussion is going on whether the “Oncophora Sands” (defined as Traisen Formation south of the Danube) were deposited under marine or brackish conditions. It can be shown, that the CMI clearly underlies the “marine Oncophora Sands” around Wildendürnbach. These sands are of Karpatian age and belong to the Laa Formation.