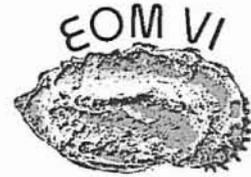


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**ABSTRACT VOLUME**

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## High-resolution ostracod logs as a tool to detect small-scale cycles in Lake Pannon (Austria; Styrian Basin; Upper Miocene)

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### Abstract

At the Middle/Upper Miocene boundary (regional stages Sarmatian/Pannonian) an extensive regression is recorded in the Pannonian Basin System, which is supposed to be related to a global sea-level fall. Due to the isolation of the Central Paratethys area from the Eastern Paratethys the so-called Lake Pannon developed subsequently. Pannonian deposits form the bulk of the exposed sediments in the eastern part of the Styrian Basin. One of the best outcrops of Lower Pannonian sediments (*Mytilopsis ornithopsis* Zone) in the Styrian Basin is the clay pit Mataschen (ca. 40km SE Graz). Results of an earlier multidisciplinary research project have shown that the lowermost sandy deposits of the ca.30m thick succession contain only a scarce freshwater to oligohaline ostracod fauna (darwinulids, candonids, ilyocyprinids). This part of the section is referred to the basal Pannonian lowstand systems tract. Brackish ostracod faunas (cytherideids, hemicytherids, loxoconchids) as well as calcareous nannoplankton, dinoflagellates, molluscs and geochemical data from the over-lying pelites indicate a rapid rise of the lake-level and an increase of salinity (transgressive systems tract). Above these about 4 m thick basal lake deposits an overall coarsening upward trend with pelite/fine sand alternations, topped by large-scale cross bedded sands, reflects the transition from pro-deltaic to delta front/fluvial environment (highstand systems tract). This sedimentary cycle of 4<sup>th</sup> order is interpreted as part of a 3<sup>rd</sup> order lowstand systems tract, which can be correlated well with sequences in other parts of the Pannonian Basin. Astronomical eccentricity and/or obliquity cycles are discussed to force these lake level oscillations. To detect cycles on a much smaller scale we continue our investigations with a gamma-ray analysis of the entire section and a high-resolution ostracod-analysis around the maximum flooding surface (1.5 m section; sample intervall 5 mm). The continuous gamma-log shows a distinct cyclic sedimentation for the section as a whole. First micropalaeontological results indicate that the total specimen number displays significant oscillations in distances of 5-10 mm. Quantitative variations of the predominant groups (cytherideids, hemicytherids, loxoconchids, candonids) follow the same cyclicity, independent of their systematic position. The overall increase in specimen number from the lower to the upper part of the studied 1.5 m thick high-resolution intervall depends chiefly on the rise of *Cyprideis*, especially the increase of juvenile valves. As shown in previous studies, salinity increased in this part of the section, reflected by an overall increase of specimens and taxa. The differentiation of two *Cyprideis* "species" (*C. cf. obesa*, *C. macrostigma*) remains a matter of debate due to the great variability of this genus. Their separation, however, turned out to be very significant because *C. macrostigma* appears more or less suddenly. The reason for the distinct increase of juveniles and abrupt occurrence of another *Cyprideis* "species" remains hitherto unexplained and is up for discussion. Based on biostratigraphical and regional geological implications the whole section of about 30 m possibly comprises a time span of approximately 300,000 years. In a very simple approach, the 5-10 mm oscillations observed in the ostracod logs could reflect a cyclicity of 50-200 years. This would range within the interval of the solar band.