

Dinaride Lake System vs. Lake Pannon – The Mollusc Perspective

Oleg MANDIC & Mathias HARZHAUSER

The Dinaride Lake System (DLS) was a long-lived, lacustrine-continental environment, which was established during the Miocene along the Dinaric Land on a palaeogeographic barrier between the Paratethys and the proto-Mediterranean seas. Today, the sites bearing these faunas are distributed along the territories of Croatia and Bosnia and Herzegovina in SE Europe.

Extensive literature and collection works have been carried out to obtain the species level diversity of the DLS fauna. That affords, including the taxonomic revision and palaeoecological and palaeobiological interpretations of the assemblages, revealed 190 species level taxa grouped into 36 genera. Among these, the most diverse genera are prososthenid (*Prososthenia*) and melanopsid (*Melanopsis*) gastropods, followed by dreissenid bivalves (*Mytilopsis*). Each of these groups comprises more than 30 species and subspecies.

90% of the species are endemics, which result from an autochthonous evolution within the DLS. The species richness and the dominance of *Mytilopsis* and *Melanopsis* suggest palaeoenvironmental conditions comparable with those of the neighboring, Late Miocene, long-lived Lake Pannon (LP), which displays a similar metacommunity structure during its early phase. The coinciding palaeoenvironmental conditions are also indicated by a spectacular development of “morpho-pairs” (e.g., spitting image patelloid morphologies of the endemic snails *Clivunella* in DLS and *Valenciennius* in LP, which both evolved independently from different freshwater dwelling ancestors).

Although the morphospace analysis suggests similar evolutionary trends in both lacustrine systems, there is almost no sympatry on the species level. Based on the regional geologic and stratigraphic evidence and the partial (stratigraphical) superposition of two lacustrine systems at the southern margin of the Pannonian Basin System, the initial radiation of the DLS molluscs precede the one of the LP by, at least, 5 Ma. Conspicuously, the presence of genera such as the peculiar planorbis snail *Orygoceras*, being endemic to DLS and LP, implies on the other hand some faunistic relation between those lake systems.

Conclusively, the DLS deposits bear the evidence on an exceptional Miocene autochthonous radiation and speciation well comparable to the much better known one of the adjoining Lake Pannon. The study suggests the time-delayed evolutionary sequences evolving under similar regulative palaeoenvironmental conditions.

Acknowledgments

The investigation represents the result of the Austrian FWF Project P18519-B17: “Mollusc evolution of the Miocene Dinaride Lake System”.

Authors address:

Oleg Mandic & Mathias Harzhauser
Natural History Museum Vienna
Geological-Palaeontological Department
Burgring 7
A-1010 Vienna
oleg.mandic@nhm-wien.ac.at