

Phylogeny, palaeoecology, and invasion of non-marine waters by the late Miocene hemicytherid ostracod *Tyrrhenocythere* from Lake Pannon

Radovan Pipík

Acta Palaeontologica Polonica 52 (2), 2007: 351-368

Species of the ostracod genus *Tyrrhenocythere* were found in sediments at the western margin of the Danube Basin, dated as Pannonian zone MN9/MN10 of the late Miocene, together with the euryhaline ostracods *Euxinocythere*, *Loxoconcha*, *Cyprideis*, *Hemicytheria*, *Amplocypris*, and Paratethyan Candoninae. Sandy and clayey deposits intercalated with lignite seams, as well as the ostracod assemblages, reflect oscillations of Lake Pannon water level and salinity, from freshwater to pliohaline. *Tyrrhenocythere* most probably evolved by phyletic transformation from *Hemicytheria*. The hinge and the central muscle scars of *Tyrrhenocythere* are plesiomorphic characters and the two genera differ in the arrangement of the marginal pore canals (MPC). The transformation of simple, straight and thin MPC in *Hemicytheria* to polyfurcate MPC in *Tyrrhenocythere* can be observed in sympatric and contemporaneous populations in Lake Pannon. On the basis of ornamentation, *T. pezinokensis* with heavily calcified valves bearing distinct ornamentation could be a descendent of ribbed and heavily calcified *Hemicytheria* and possibly represents an extinct lineage, while the lightly calcified *T. transitivum* sp. nov., *T. rastislavi* sp. nov., and *T. sp. 1*, and *T. sp. 2* are possibly related to reticulated and punctate *Hemicytheria*. This model assumes that more than one *Hemicytheria* lineage transformed their arrangement of MPC, and suggests that *Tyrrhenocythere* is a polyphyletic genus. After the retreat of Lake Pannon, *Tyrrhenocythere* species immigrated, together with other ostracod and molluscan fauna, into the Dacian Basin and Eastern Paratethys. Later, in the uppermost Messinian, they colonised the western Mediterranean. Late Miocene and Pliocene *Tyrrhenocythere* are found in brackish or mixed brackish/freshwater taphocoenoses, but the Pleistocene examples also adapted to freshwater/oligohaline lacustrine environment (Griffiths et al. 2002: 252). While salinity ranges of *Tyrrhenocythere* have shifted, toward freshwater since the late Miocene, temperature preference did not change. The mean annual air temperature of the Pannonian (15.6-21.7°C) is close to the temperature preference of living *Tyrrhenocythere*, with mean annual temperature 12 to 16°C. Two new species, *T. rastislavi*, and *T. transitivum* are described.

Key words: Ostracoda, Hemicytherinae, *Tyrrhenocythere*, marginal pore canals, Miocene, Lake Pannon, phylogeny.

Radovan Pipík pipik@savbb.sk, Geologický ústav, Slovenská akadémia vied, Severná 5, SK-974 01 Banská Bystrica, Slovakia.

This is an open-access article distributed under the terms of the Creative Commons Attribution License (for details please see creativecommons.org), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

 [Full text \(2,646.3 kB\)](#)