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**Paper review**

# Indo-Pacific affinities of the Paratethys contested

**Szczechura, J. 1995. The ostracode genus *Xylocythere* Maddocks & Steineck, 1987, from the Middle Miocene of the Fore-Carpathian depression, southern Poland (Central Paratethys), and its biogeographic significance. *Acta Geologica Polonica* 45, 27–40, 1 text-fig., 3 plates.**

The European Neogene paleobiogeography has been described in details by Rögl & Steininger 1984, 1984, and Steininger *et al.* 1985 (Fig. 1). In the south there was the Tethys basin encompassing the present Mediterranean Sea and its surrounding regions. It was widely opened both toward the east to the the Indo-Pacific and west to the Atlantic. In the Oligocene, to the north of the main Tethys seaway a new, separate branch of a complex system of basins (encompassing the Alpine and Carpathian foredeeps, Pannonian Basin, present day Black Sea, Caspian Sea and Caucasus region) originated which is called Paratethys. The western and northern coasts of Europe were invaded by shallow seas from the Atlantic–Boreal region. Communication between these three bioprovinces, especially during the Miocene was rather restricted and executed often through narrow straits. In some periods there was no connection at all between some of them. The Tethys and Atlantic were connected by a strait between Iberia and Africa. In the Late Miocene, when as a result of plates collision the connection with the Indo-Pacific was cut-off, this way was also temporarily closed leading to the famous Messinian salinity crisis which resulted in the extinction of most marine fauna and deposition of thick beds of gypsum and salt. In effect, todays fauna of the Mediterranean is composed mostly of immigrants from the Atlantic, as there was no connection between the Mediterranean (including the Paratethys), and the Indo-Pacific regions after the salinity crisis. The connection of the Paratethys with the Mediterranean was due to the presence of the Alpine and Carpathian foredeeps. Later a corridor between the Dinarides and the Alps in the Triest area developed. During the early Badenian there were strong Mediterranean influences in the Central Paratethys. In the Middle Badenian it was cut off from the Indo-Pacific, and only very restricted connection with the Mediterranean existed, leading to another salinity crisis and deposition of evaporites. Starting from the Late Badenian all the connections with the Mediterranean were cut off and the subsequent flooding came from the Indo-Pacific region, as shown both by the deposits distribution, and faunal affinities. Later on, during the late Miocene this eastern connection became restricted, and finally ceased to exist leading to the gradual disappearance of this large basin. Today the only remnant of the vast Paratethys province are the Caspian and Aral seas (in fact the Aral Sea is rapidly disappearing today, as an effect of human activity — an example of one of the biggest ecological catastrophes).

This rather well established paleobiogeographic picture, reviewed above, has been recently challenged by Szczechura (1995). She has found in the Middle Miocene

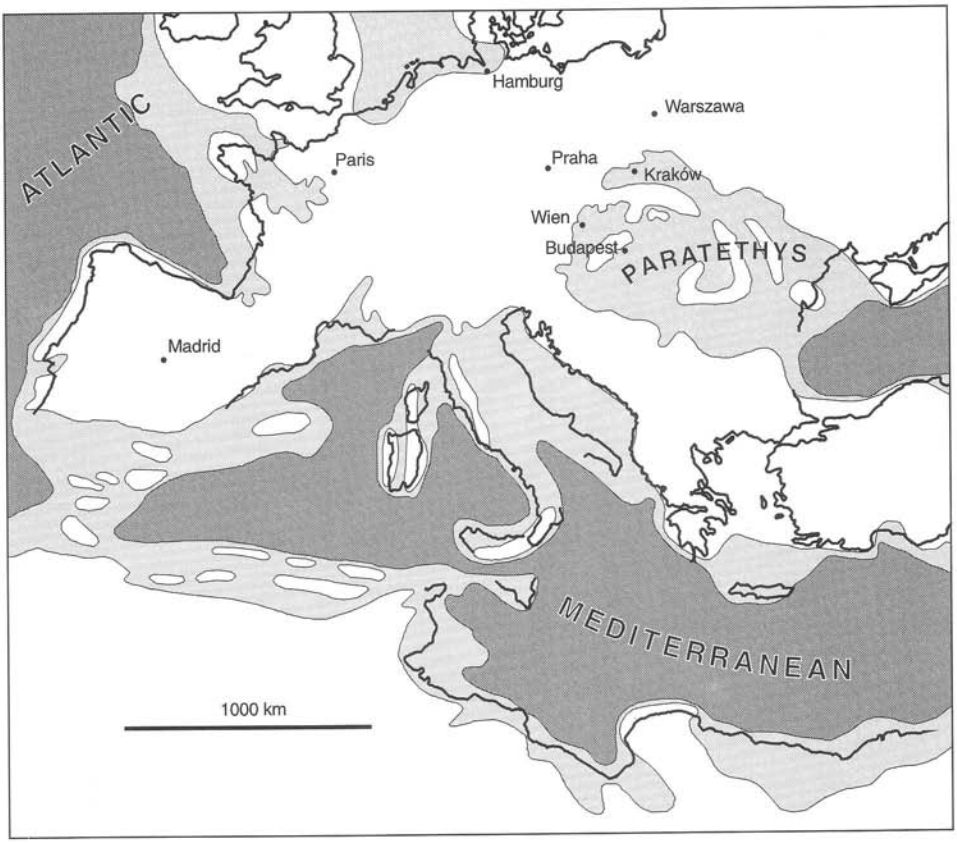


Fig. 1. Paleogeography of southern and central Europe in the Late Badenian (modified after Rögl & Steininger 1983, 1984; and Steninger *et al.* 1985).

of southern Poland (Central Paratethys), above the evaporitic horizon, a new species of ostracode *Xylocythere*. Associated fauna of ostracodes and foraminifers is also described and their ecology and biogeographical connections discussed in the reviewed paper. The Recent species of *Xylocythere* are deep, and cold water forms known from the Western Atlantic, Gulf of Mexico, Indonesian region (Coral Sea) and the Pacific around the north-west coast of South America. Fossil representatives of the genus are known from the Upper Oligocene and Upper Miocene deposits of the north-east Atlantic, Early Miocene of south-west Pacific, and the Late Miocene and Early Pleistocene of the Mediterranean region. Generally it is a rather rare ostracode, occurring always in small number of specimens. According to Szczechura (1995), the 'spatiotemporal distribution of the studied microfossil assemblages', makes it possible to introduce these ostracodes into the Central Paratethys only from Atlantic via Mediterranean Sea and the peri-Alpine depression. She excludes the possibility of their migration (as well as the foram *Uvigerina peregrina*) from the Indo-Pacific, which is known to have been connected with the Paratethys during this period, because in her opinion this connection 'was rather poor and allowed a migration mostly of the shallow-water forms'. This is a rather surprising statement as it is generally accepted that late Badenian radiolarians in the Central Paratethys,

definitely deep-water organisms, have clearly Indo-Pacific affinities (Rögl & Steininger 1984). Of such affinities are also other planktonic organisms known from the late Badenian of this region.

Unfortunately, no evidence is given by Szczechura for her rather revolutionary ideas on Miocene paleogeography. Her reasoning remains unclear as even in her paper it is stated that the only connections with the Central Paratethys which existed then were with the Indo-Pacific. She indicated also that *Xylocythere* occurred in the Indo-Pacific since the Early Miocene, and thus can be easily a source of *Xylocythere* in the Paratethys. Thus there is no problem with assuming its migration to the Central Paratethys from the Indopacific. Until unequivocal evidence of the paleogeographic pattern proposed by Szczechura (1995) is presented, it should be regarded merely as a speculation and treated with an appropriate caution.

**References**

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