ACTA PALAEONTOLOGICA POLONICA

Reconstruction of Oligocene and Neogene freshwater fish faunas - an actualistic study on cypriniform otoliths

Tanja Schulz-Mirbach and Bettina Reichenbacher
Acta Palaeontologica Polonica 51 (2), 2006: 283-304

Fossil utricular otoliths (= lapilli) from cypriniform fishes have long been recorded from European Oligocene and Neogene freshwater and oligohaline sediments. Until now, their determination was limited to the family level owing to the lack of morphological investigations on lapilli of Recent cypriniforms. The present study introduces a terminology for the lapillus morphology that is based on the lapilli of 134 specimens of 20 cyprinid and one balitorid species. It is demonstrated that the lapillus has valuable characters for taxonomic classification. As a result, fossil lapilli from Oligocene and Miocene continental deposits from the western Mediterranean, the Swiss and the South German Molasse Basin, the Mainz Basin, and additionally from Anatolia could be determined. Nine species were identified: aff. *Abramis* sp. vel aff. *Alburnus* sp., aff. *Alburnoides* sp., aff. *Barbus* sp., cf. *Leuciscus* sp., *Palaeoleuciscus* sp., *Palaeotinca moeddeni* sp. nov., *Palaeotinca* sp. 1, aff. *Phoxinus* sp., and aff. *Rutilus* sp. vel aff. *Scardinius* sp. Our study includes the oldest record of a *Phoxinus*-related and a *Palaeotinca* species from Europe. Additionally, aff. *Abramis* sp. vel aff. *Alburnus* sp. and aff. Alburnoides have been identified as fossils for the first time. The determination of the fossil lapilli has been supported by means of pharyngeal teeth, with the exception of aff. *Abramis* sp. vel aff. *Alburnus* sp., whose lapilli were found together with pharyngeal teeth of *Palaeocarassius* sp. It is suggested that these so-called *Palaeocarassius* pharyngeal teeth do not belong to an ancestor of the *Carassius* lineage, but to a forerunner of the *Abramis* or *Alburnus* lineage. Our results support the previously described turnover in the Paratethys freshwater fish fauna about 17-18 Ma ago, when *Palaeotinca* spp. became extinct and the first appearance of *Palaeoleuciscus* sp. and *Palaeocarassius* sp. (= aff. *Abramis* sp. vel aff. *Alburnus* sp.) occurred. The Oligocene and Miocene cypriniform fishes did not evolve any provincialism from southern France throughout the Molasse Basin to the Mainz Basin.

Key words: Cypriniforms, utricular otoliths, lapillus, morphology, Recent, Oligocene, Miocene.

Tanja Schulz-Mirbach [t.schulz-mirbach@lrz.uni-muenchen.de],
Bettina Reichenbacher [b.reichenbacher@lrz.uni-muenchen.de], Ludwig-Maximilians-Universität, GeoBio-Center & Department für Geo- und Umweltwissenschaften, Sektion Paläontologie, Richard-Wagner-Str. 10, D-80333 München, Germany.

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 (1,169.4 kB)