

Cryptic diversity in ancient lakes: The *Cytherissa* flock (Crustacea, Ostracoda) in Lake Baikal (Siberia)

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Lake Baikal, situated in the Great Eastern Siberian Rift, is the largest and the deepest of all extant ancient lakes. These lakes are natural laboratories for evolutionary research, because of their exceptionally high biodiversity, the large number of endemics, and the fact that most species are still found in the cradle where they first originated. The speciosity, and the variability in phenotypes and niche diversity of endemic species flocks in ancient lakes are spectacular. Such species flocks have often originated through explosive and adaptive radiations. However, also lacustrine radiations without apparent niche diversification and with putative non-adaptive components have been described. In recent non-marine ostracods, ancient lakes contain one quarter of all known species.

The *Cytherissa*-radiation (Ostracoda, Cytherideidae) from Lake Baikal is one of the richest species flocks and contains 47 (sub-) species. Preliminary results on genetic diversity, however, indicate that some of the

Cytherissa morphospecies are not monophyletic and might thus contain cryptic species.

Here, we describe our research on cryptic species in the Baikalian *Cytherissa* species flock which started at the end of 2010. The examined material was sampled during several expeditions, namely, in 1997, 1999, 2007, 2009 and 2011. Samples were taken randomly from boats by Ekman and PONAR grabs and Reineck boxcorers, and with hand nets during SCUBA diving.

Mazepova (1990) is still the only publication available to identify ostracods from Lake Baikal. Valves are routinely used to identify recent and fossil ostracods, while differences in hemipenis structure, which are subjected to sexual selection, can indicate reproductive isolation of recent species. New morphological data of *Cytherissa* species have been acquired by Scanning Electronic Microscopy (SEM) of valves and soft parts (especially hemipenis and chaetotaxy), the latter with 'critical point drying'. In addition, soft parts, and in particular the hemipenises have been drawn in detail with camera lucida.

The genetic identification of cryptic species is now in progress. New mitochondrial (COI and 16S) and nuclear (LSU) markers with higher resolution have been developed. DNA has been extracted from 100 individual ostracods and the nuclear LSU region and the mitochondrial markers COI and 16S are currently amplified by PCR and sequenced.

The obtained DNA sequence data will be used to estimate genetic diversities and phylogenetic relationships at the intra- and supraspecific level of selected morpho-species and these data will allow us to test whether there are indeed cryptic species in Baikalian *Cytherissa*.

Reference

Mazepova, G.F.1990. Rakuschkovye ratschki (Ostracoda) Baikala [Ostracoda of Lake Baikal]. Nauka, Novosibirsk, 470 pp (in Russian).