Abstract

The approximately 500 species of the cichlid fish species flock of Lake Victoria, East Africa, have evolved in a record-setting 100 000 years and represent one of the largest adaptive radiations. We examined the population structure of the endangered cichlid species *Xystichromis phytophagus* from Lake Kanyaboli, a satellite lake to Lake Victoria in the Kenyan Yala wetlands. Two sets of molecular markers were analysed — sequences of the mitochondrial control region as well as six microsatellite loci — and revealed surprisingly high levels of genetic variability in this species. Mitochondrial DNA sequences failed to detect population structuring among the three sample populations. A model-based population assignment test based on microsatellite data revealed that the three populations most probably aggregate into a larger panmictic population. However, values of population pairwise F_{ST} indicated moderate levels of genetic differentiation for one population. Eleven distinct mitochondrial haplotypes were found among 205 specimens of *X. phytophagus* , a relatively high number compared to the total number of 54 haplotypes that were recovered from hundreds of specimens of the entire cichlid species flock of Lake Victoria. Most of the *X. phytophagus* mitochondrial DNA haplotypes were absent from the main Lake Victoria, corroborating the putative importance of satellite lakes as refugia for haplochromine cichlids that went extinct from the main lake in the last decades and possibly during the Late Pleistocene desiccation of Lake Victoria.