

Abstract

The biodiversity of saline lakes is a topic of increasing interest among biologists, ecologists and conservation managers in East Africa. In spite of their extreme conditions and remote locations, East African saline lakes (EASL) support fish populations of considerable ecological, economic and biological importance. Among these are several endemic fish species that are highly specialized to survive in their individual lakes. Although there is growing concern that increasing human activities and projected adverse climatic conditions in the region may decimate these unique species, information on the status of individual fish populations remains scarce. In recognition of the important ecosystem services they provide, the EASL have been designated as World Heritage Sites (WHS) and protected by the Ramsar Convention. To complement these conservation efforts regarding EASL and to ensure full realization of the potential of their fisheries, there is need for up-to-date information on their fish population status. We present therefore an overview of the status of fish populations in EASL with special emphasis on the Magadi tilapia *Alcolapia grahami*, a teleost fish thriving in extreme hypersaline alkaline water conditions that would kill other fish in a matter of minutes. We show how several decades of research on this small cichlid fish inhabiting Lake Magadi, Kenya, reveal astonishing “snapshots” on how fish can survive under challenging environmental conditions, which, in this rare instance, are actually close to their physiological optima. As climatic models predict a decline in freshwater sources and an increment in adverse water conditions, studies on fish inhabiting saline lakes could aid scientists in modelling how species may evolve to adapt to extreme conditions in their changing habitats. We highlight conservation challenges facing the long-term existence of EASL fish populations. Finally, an integrated multidisciplinary approach is recommended to ensure the preservation and sustainable management of EASL fish populations and fisheries.