Long-term changes of physicochemical parameters and benthos in Lake Qarun (Egypt): Can we make a correct forecast of ecosystem future?

Biotic changes and a salinity increase (from 13 to 40 g.L-1) occurred in Lake Qarun (Egypt) since 1901. Was salinity increasing a cause of observed biotic changes? To answer this question we used benthos as a model group. Benthos and water sampling was conducted in different seasons (2008–2013). Comparing our and literature data, we discuss the long-term trends and possible causes of benthos changes. Salinity reached 3 g.L-1 in middle of 19th century; and biotic changes caused by this were started. From middle 19th century to 1928 a biotic transformation was driven by the salinity increase; after 1928 a regular alien species introduction caused that a marine community formed. In 1970–2000 eutrophication played a main role in species composition changes. In 2014 ctenophore Mnemiopsis leidyi introduced in the lake; eutrophication, chemical pollution, and a population dynamics of this ctenophore may be main drivers of the ecosystem change now. Benthos biomass gradually decreased during interval 1975–2013 without any correlation with salinity change. A variety of other factors than salinity may be significant in determining the structure and dynamics of communities, and we conclude that we have a small chance to make a correct forecast of possible future ecosystem changes in Lake Qarun.

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