Branchiopoda and Copepoda (Crustacea) in Mongolian Saline Lakes

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Abstract

This paper presents a very complete inventory of the branchiopods and copepods that inhabit the salt lakes (salinity >3‰) of Mongolia. The inventory was based on samples collected from 108 salt lakes over the course of seven limnological expeditions in most of the Mongolian territory between 2005 and 2009. The salinity of the lakes ranged from 3.4 to 76‰ S. A total of 43 taxa were identified: 7 Anostraca, 1 Spinicaudata, 1 Notostraca, 1 Leptodoridae, 1 Ctenopoda, 15 Anomopoda and 17 Copepoda. Thirteen taxa are limited to the Asiatic portion and the rest are known throughout the Palearctic region. One taxon, *Phallocryptus* sp. has not yet been described in scientific literature. The taxonomic position of *Artemia* sp. in Mongolia has still not been clarified. All of the species are eurysaline and, except for *Artemia* sp. and *Cletocamptus retrogressus*, which are the most halophile, they can live in waters with less than 10‰ S. Thirty-three species appear only in mesosaline waters (3–20‰ S), five do not exceed the mesosaline level (50‰ S) and five can live in hypersaline waters (>50‰ S).

Key words: branchiopoda, copepoda, saline lakes, Mongolia

Introduction

Planktonic and meiobenthic crustaceans spend their entire life cycle in lakes, making these organisms excellent indicators of both water quality and the ecological status of the lacustrine environment in general. Crustaceans are very old in terms of evolutionary history and have a great capacity for dispersion, allowing them to achieve an extremely high level of planetary diversification, which has been configured over time following biogeographical and ecological patterns.

Salinity is one of the factors with the greatest capacity for segregating organisms. In the aquatic environment, Hammer (1986) defined athalassic saline waters as having salinities equal to or greater than 3‰ S and established a classification system that is reflected in the biota: hyposaline waters (3–20‰ S), mesosaline waters (20–50‰ S); hypersaline waters (< 50‰ S). Many species tolerate a wide range of salinities (euryhalines), while others are limited to narrower ranges and can be assigned to specific salinity categories (stenosalines).

Branchiopods and copepods show great sensitivity to salinity which have been studied in previous researchs (Williams, 1990; Alonso, 1990; Hammer, 1993). In general, the organisms most resistant to salinity are the euryhalines, which can live in environments ranging from hyposaline to hypersaline, which is understandable given that the hypersaline environments generally display an evolution in salinity in accordance with the phases of their hydrologic cycle. Nevertheless, freshwater branchiopods and copepods are not typically found in saltwater lakes. This estenoic aspect also makes them very good ecological indicators and they can be used as sensors of medium and long-term changes. Cladocerans in particular, which leave behind permanent remains in the sediment, are very useful for paleolimnological analysis in studies of global change. (Paterson, 1994; Bredesen *et al*., 2002; Sarmaja-Korjonen, 2003).

This paper describes the branchiopod and copepod fauna in the saltwater lakes (over 3‰ S) of Mongolia, a country that is rich in lakes despite its relatively high aridity. The Tserensodnom catalog (2002) includes 3,060 permanent lakes of over 10 ha, but this number could increase considerably if temporary lakes are also considered. And, more importantly, the majority of these lakes are well preserved, which reduces the sources of variability in studies such as this one, which is designed to establish species-habitat relationships. Many of the Mongolian lakes are saline; two types of saline lakes can be established in Mongolia: 1) large deep permanent hyposaline-