**Year :** 2009 **Name :** Osamu Mitamura

THE UNIVERSITY OF SHIGA PREFECTURE

## Journal

The Japanese Society of Limnology, (2010) 11:17–30

## Title

Comparative investigation of chemical and biological characteristics in waters and trophic state of Mongolian lakes

## Author

Osamu Mitamura[1], Darijav Khadbaatar[1], Noriko Ishida[2]

## Affiliation

1 Limnological Laboratory, School of Environmental Science, University of Shiga Prefecture, Hikone, Shiga, 522-0057, Japan

2 Faculty of Literature, Nagoya Women's University, Nagoya 468-8507, Japan

## Abstract

The objective of this study is to describe the biogeochemical characteristics in the waters of Mongolian lakes, particularly those related to parameters limiting phytoplankton growth and the trophic state. Investigations into the distribution of chemical and biological parameters were carried out in the following 18 lakes: Har Us, Har, Hovsgol, Achit, Dalai, Bayan, Tolbo, Holboo, Bust, Sangiyn Dalai, Tunamal, Dorgon, Uureg, Telmen, Hyargas, Uvs, Erkhel and Oygon, all of which showed a wide range of salinity between 0.16 and 24.9 g l-1. Lake water was classified into four types: six fresh (less than 0.5 g l-1 salinity), three subsaline (0.5–3 g l-1), seven hyposaline (3–20 g l-1) and two mesosaline (20–50 g l-1) lakes. Predominant cations and anions in the order of dominance were Ca, Mg[Na[K and HCO3[SO4, Cl in freshwater lakes, Na[Mg[Ca, K and HCO3, Cl[SO4 in subsaline lakes, and Na[Mg[K, Ca and Cl, SO4[HCO3 in hyposaline and mesosaline lakes. Nitrogenous and phosphorus nutrients in the waters were low, seemingly caused by the low loads from their watersheds, where the ground was free of vegetation with an extremely low level of human activity. The present investigations revealed some 234 taxa of phytoplankton and 38 of zooplankton. The PC:PN:PP stoichiometric ratio by weight was (22–202):(3–27):1. Phosphorus was assessed as the potential limiting parameter in eight lakes, nitrogen in six and both nutrients

in four others. Twelve lakes showed an oligotrophic character, while six were mesotrophic type. The six oligotrophic lakes seemed to be subject to phosphorus limiting phytoplankton growth, four to nitrogen and two to both limitations. In the mesotrophic lakes, on the other hand, phosphorus limitation was verified in two lakes, nitrogen in two others and both in two lakes.

**Key words**

Chemical and biological characteristics, Limiting parameter, Trophic state, Mongolian lakes