

OCCURRENCE OF MACROCYCLIC ALKANES IN HURLEG LAKE, NORTHWEST CHINA

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Most of the hydrocarbon biomarkers detected in sediments and crude oil are acyclic or based on cyclic carbon skeletons. These cyclic carbon skeletons are generally considered to be derived from natural products such as triterpenoids, and usually based on 5- or 6-membered rings. However, larger single-carbon ring series, ie, macrocyclic alkanes (MCAs), are rarely reported in nature. MCAs refer to cyclic hydrocarbons without branch chains, with the chemical formula C_nH_{2n} . They were first detected by Red'kina et al., (1989) in a plant called *Empetrum nigrum*. In earlier years, our team first detected the MCAs and their methylated homologues in modern Chinese soils from tropical to arid zones, in particular, the MCAs showing a strong even carbon number preference, as the forest transitioned to dessert, the number of main peak carbons of the MCAs increased (Wang et al., 2006). In this study, we detected MCAs in the surface sediments of different lakes in Northwest China and the core sediments of Hurleg lake. In all those samples, MCAs showing a even carbon advantage, but main peak (C_{max}) are differ in different lakes, except for Hurleg and Toson lake, may be due to they are connected. This suggests that the distribution of MCAs also influenced by organic matter input. In addition, the parameters of MCAs (C_{max} , average chain lengths and relative content of $C_{18}/C_{20}/C_{22}$ macrocyclic alkanes) are compared with other climatic proxies ($ACL_{alkanes}$, C/N ratio, bGDGTs-pH, and bGDGTs-MAT) of core sediments in Hurleg lake to explore their environmental significance. The results show that the average chain length values of MCAs and alkanes have a negative correlation, but $C_{18}\%$ has a good positive correlation with $ACL_{alkanes}$, indicating they have similar biological precursors, or similar biosynthetic pathways. Besides, the C_{max} and ACL of MCAs has a very good correlation with temperature (bGDGTs-MAT). This study further confirmed that macrocyclic alkanes can indicate changes in climate and environment. However, before widely used, multi-proxies analysis is still needed to verify its dependability.