<<青海湖古气候与古环境>>

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内容概要

《青海湖古气候与古环境（英文版）》以青藏高原东北部六万.0以来的气候与环境演变为主要研究内容，以多学科方法研究获得了青海湖岩芯多项环境指标，并以此为依据，分析和论证了青海湖MIS3、MIS2、末次冰期向全新世过渡时期，以及全新世等各时段的水位与气候变化，及其与东亚季风演变的关联。

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章节摘录

5.3 Holocene lake levels and climate reconstruction Defined by AMS 14C ages and distinct lithostratigraphic character as well as core correlation results （refer to Chapter 6 for details）， the onset of the Holocene occurred at 10 14C ka BP. The beginning of the early Holocene hydro-climate regime is marked by a wet pulse， as evidenced by a distinct lithologic change， negative shifts in both TCC and （Figure 6.1 a-e）. This wet pulse terminated the carbonate playa environment pre-existed at 10.3-10 ka BP （Yu and Kelts， 2002b）. The early Holocene warm and wetter climate conditions are indicated by our multi- proxy records. First， our data of TN， TOC and C/N ratio indicate an abrupt increase in the lakes primary productivity （see Section 5.2.2 ）， that was brought about by abrupt increase of summer temperature （Yu and Kelts， 2002b）. Because Lake Qinghai is located in the cold and semi-arid area of the highland， the water temperature of the lake today is pretty low， around 15 °C in the water column of upper 2 m thick during the warmest months （July-August）. The rate of organic production depends largely on the self-cycling of nutrient within the lake. The abrupt warming near the onset of the Holocene has been documented in a number of lake environmental archives （e.g. Gasse et al.， 1991; Hodell et al.， 1999; Li and Yu， 2002; Xiao et al.， 2004）. In the case of Lake Qinghai， solar radiation exerts strong impact on the highland lake， particularly during the period when solar insolation was close to its summer maximum of the Holocene. We therefore attribute the increase of organic productivity in the paleo-lake during the early-middle Holocene to the Holocene warming associated with the insolation maximum. Second， the highest rate of authigenic carbonates， as indicated by our TCC and carbonate mineral composition， is the consequence of the most enhanced summer evaporation related， to a large extent， to the Holocene insolation maximum as well. Last but not least， the sediment evidence indicates that the paleo-lake was 2-8 m in depth at -10-8 ka BP. This reconstruction is based mainly on the evidence that in-situ dropped Ruppia seeds are well preserved in at least four thin layers of Unit IIIb with the quantity 180 seeds/mE， and that the seeds occasionally present either below or above carbonate nodular layers. It is evident that precipitation from 10 ka BP enhanced if compared with the period of 10.7-10 ka BP when a negative water budget occurred （Yu and Kelts， 2002b）. Our interpretation is that the precipitation during the early Holocene （-10-8 ka BP） was higher than that during any earlier periods of the pre-Holocene. This is simply because the evaporation was most intensive during -10-8 ka BP， but the lake was still deeper than any preceding periods between 14 and 10.7 ka BP when a lower evaporation resulted from a cold climate.

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