

<<青海湖古气候与古环境>>

图书基本信息

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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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5.3 Holocene lake levels and climate reconstruction Defined by AMS  $^{14}\text{C}$  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  $^{14}\text{C}$  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 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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