The millennium scale monsoon cycles recorded in a sediment core from alpine Tibetan lake

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Understanding of past environmental and geochemical changes is significant issues to estimate global climate variation. Therefore, these changes have been studied by continuous terrestrial sediments (lake and soil sediments, as well as loess deposits) [1,2]. The high-time resolution past environmental changes, especially monsoon fluctuations, have been reported in previous studies using geochemical signatures in stalagmites from Asian caves [3,4]. However, continuous climate records in Tibetan plateau have not yet been cleared, which a key area to understand mechanism of monsoon fluctuations [5]. In this study, mean grain size and geochemical proxies from lake sediment cores from south Tibetan plateau were used for estimation of past monsoon changes during Holocene. Mean grain size of the sediment cores from Tibetan plateau varied widely, and the fluctuations were coincident with monsoon changes from the stalagmites in caves. Besides, spectral analysis of the mean grain size in the Tibetan lake also indicated 1000-1500 years climate cycles, which might be caused by the changes in solar activities. These monsoon fluctuations based on the mean grain size were also supported by geochemical proxies, such as relative abundance of sodium, potassium, titanium, rubidium and strontium in this study. This work was partly supported by a Grant-in-Aid for Scientific Research (A) from JSPS (FY2013-2016, No. 25247082).

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