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Vegetation history, fire history and lake development recorded for 6300 years by pollen, charcoal, loss on ignition and chironomids at a small lake in southern Kyrgyzstan (Alay Range, Central Asia)

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Author(s) Beer, Ruth; Heiri, Oliver; Tinner, Willy

Author(s) at UniBasel [Heiri, Oliver](#) ;

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Analyses of pollen, microscopic charcoal, loss on ignition (LOI) and chironomids in the sediment of the small sub-alpine lake Kichikol (2541 m a.s.l.; 39 degrees 59'N, 73 degrees 33'E; Alay Range, Kyrgyzstan) provide new data to reconstruct the vegetational and lacustrine history during the past 6300 years. From 6300-5100 calibrated C-14 years BP (cal. yr BP) semi-deserts with Chenopodiaceae and Ephedra and rather open Juniperus stands persisted around the lake. At 5100-4000 cal. yr BP dense Juniperus forest established. Around 4000 cal. yr BP the forest retreated and was probably restricted to north-facing slopes, as is the case today. Changes in the hydrology of Kichikol are inferred from lithological properties, pollen of aquatic plants and remains of aquatic invertebrates. The lacustrine development of Kichikol suggests a step-wise increase in humidity during the mid and late Holocene, with major shifts recorded at 5000 and 4000 cal. yr BP. At the beginning of the record Kichikol was a very shallow, possibly temporary pond. An initial rise in water-table is registered at c. 5000 cal. yr BP, followed by a second rise to near present levels at c. 4000 cal. yr BP. These hydrological shifts could be related to an increase of westerly moisture transport from the Mediterranean region as a consequence of a late-Holocene weakening of the Central Asian High and Indian monsoon systems. Moderate human impact in the region is recorded after 2100 cal. yr BP, as indicated by pollen of Plantago lanceolata-type and a slight increase of charcoal accumulation rates. Considering the general course of climate as well as human impact we conclude that the present forest composition is natural or quasi-natural.

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