

Paleovegetation and paleoclimate in the Kathmandu Valley and Lake Baikal during the Late Quaternary

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The Lake Baikal sediment is one of the best archives which records the Late Quaternary paleoclimatic changes at high-latitude inland of Asian continent. On the other hand, basin-fill sediment of the Kathmandu Valley is ideal for studying the history of Indian monsoon activities. We tried to reconstruct paleovegetation and paleoclimate changes in both regions during Late Quaternary based on palynological studies.

Samples and pollen record of Lake Baikal

We carried out pollen analysis on the BDP99 core, which is 300 m long and taken from Posolskaya Bank in Lake Baikal by the Baikal Drilling Project. The upper part of the core consists of diatomaceous silty clay, and lower part is mainly silty clay (Williams et al. 2001). We took samples at 40 cm interval from 0 to 120 m depth. The pollen assemblage is characterized by dominance of *Pinus*, *Artemisia* and Gramineae. The percentage of forest-tree taxa, such as *Pinus*, *Alnus* and *Betula* shows high value during a period when the total amount of pollen grains are large. The percentages of grassland taxa such as *Artemisia*, Chenopodiaceae shows high value during a period when the total amount of pollen grains are small.

The amount of pollen grains are noticeably large between 14-21 m, 34-42 m, 50.5-52 m, and below 61 m. These intervals are interpreted to indicate dense vegetation during warm periods, and they are correlated to marine oxygen isotope stages (MIS) 5, MIS 7, MIS 9 and MIS 11, respectively.

Samples and pollen record of Kathmandu Valley

A continuous 218-m-long core (RB core) was obtained in the western part of the Kathmandu Valley by Paleo-Kathmandu Lake Project in 2000. The RB core is lithologically divided into three parts: basal sand and gravel dominant beds of 38 m, 170 m-thick muddy lacustrine beds and overlying fluvial sandy beds. We took samples at 1 m interval from 218 to 30 m, and at 10 cm interval from 30 to 0 m in depth. Based on the paleomagnetic study, the RB core covers in age from ca. 750 to 10 kyr.

The pollen assemblage of the RB core is characterized by dominance of *Quercus* and *Pinus*. *Picea* and *Castanopsis* occasionally increase during short periods. *Alnus* and Gramineae show cyclic repetition of increase and decrease.

We recognized nine cycles of warm – wet and cold – dry period during ca. 750 kyr, based on the following changes of relative abundance of five genera: *Quercus*, *Castanopsis* as warm climate, *Pinus* as cold climate, *Alnus* as wet climate, and Gramineae as dry climate. The fluctuation of percentage of total arboreal pollen indicates cyclic climatic changes, which correspond to MIS 5-19.

On the basis of two climatic records in Lake Baikal and Kathmandu Valley, we discuss regional differences of vegetational responses to glacial/interglacial climate changes in representative areas in Asia. Furthermore, we refer to environmental changes during the mid- Pleistocene transition.