

Pleistocene environmental changes in the Paleo-Kathmandu Lake: comparative studies on fossil diatoms and biogenic silica

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In order to reconstruct changes in Indian monsoonal climate and depositional environments during the middle-late Pleistocene, a 218-m-long RB core was collected from the Kathmandu basin in the southern slope of the Central Himalaya. The core is mainly composed of muddy lacustrine sediments (about 200-m-long). We analyzed the fossil diatom assemblage in the core and measured the content of the biogenic silica in 50cm intervals, respectively.

On the basis of relative abundance and number of major planktonic diatoms, we distinguished eight zones. Zone 8, at the basal part, is characterized by the less number of total diatoms and variety of benthic taxa. Dominant planktonic taxa in this zone are *Cyclostephanos dubius* and *Aulacoseira granulata*, whose habitats are nearshore waters. The ratio of planktonic to benthic diatoms indicates that the water-level was high through zone 7-5, though short-term shallowing events occurred in early period of zone 7, zone 7-6 transition, and zone 6-5 transition, respectively. In zone 7-5, *Puncticulata versiformis* and *Cyclotella Kathmanduensis*, which were endemic species of the Paleo-Kathmandu Lake, were monodominant: their relative abundance are about 80-90%. On the other hand, some planktonic species were dominant in zone 4-2. In these zones, water-level periodically fluctuated. In zone 2, number of benthic taxa, *Staurosira construens* and *Pseudostaurosira brevistriata*, increased. It indicates that fluvial and marsh environments expanded in the periphery of the lake. In zone 1, the water-level rose again, and *Cyclostephanos dubius* became monodominant. Above zone 1, the number of total diatoms drastically reduced. It demonstrates that the lake was drained during a short period after 15 ka.

The scanning electron microscopy revealed that the majority of the biogenic silica of the RB core was derived from diatom valves. The amount of the biogenic silica changes in correspond to the number of total diatoms throughout the RB core. The diatom production (number of total diatoms and amount of biogenic silica) increased in wet periods in the Kathmandu Valley. This was probably caused by increase of both chemical weathering production and nutrient supply into the lake under wet conditions.

It is considered that productivity of freshwater diatoms in large lakes increase in interglacial periods. Thus, the precise age/depth model for lacustrine sediments were proposed based on comparison between the biogenic silica record and the continental ice volume record. In this presentation, we attempt to reconstruct an age/depth model of the RB core during the last 700 ky, based on the record of biogenic silica.