

Academic core drilling of the Paleo-Kathmandu Lake and its research results---the first report

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Core drillings in ancient lake sediments of the Kathmandu Valley, central Nepal Himalaya were carried out in order to clarify the past Indian monsoon climate and its linkage to the uplift of the Himalaya. This is the first large-scale drilling project in the valley with full core recovery, and solely dedicated to academic research purpose. The drilling penetrated the whole sequence of 208 m thick Kalimati Clay, newly defined as the Kalimati Formation.

Based on the drill-core study, the sediments are divided into three formations: 1) Bagmati Formation, 2) Kalimati Formation, 3) Patan Formation in ascending order. These formations have very distinct sedimentary characteristics: Bagmati essentially gravelly, Kalimati clayey and Patan sandy. The lower part of the Kalimati Formation, showing marginal lake facies, has been designated as the Basal Lignite Member. Judging from the lithology and sedimentary facies and previous studies on the Lukundol Formation, the Bagmati Formation is interpreted to have been deposited by the Proto-Bagmati River prior to the appearance of the lake before 2 Ma. The clay-predominant Kalimati Formation lying over the Lignite Member was deposited in an open lacustrine environment, which is mainly composed of carbonaceous clay yielding abundant fossil leaves and diatomaceous laminite. The fluvial sand of the Patan Formation rests on the Kalimati clay bed with an marked erosional base. The ^{14}C age of the uppermost part of the Kalimati Formation suggests that the lake water of the Kathmandu Basin was drained out later than 10 kyr B.P. (Fujii and Sakai, 2001a). Based on comparison of the present altitude of the ancient lake floor and topset beds of the lacustrine delta sediments (dated as 29 kyr B.P.), the water-depth of the Paleo-Kathmandu Lake in the central part of the valley is estimated to be about 70 m.