

# Organic Geochemical Study of Paleoclimate and Paleoenvironment in Kathmandu Valley, central Himalaya

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The reconstruction of paleoclimate records in the southern Asia have been reported based on the many studies of Indian Ocean sediments such as ODP drillings and long piston cores, however, the paleoclimatic changes in the land area under the influence of indian monsoon have reported only a few data. In this study, we analyzed concentrations of total organic carbon (TOC) and total nitrogen (TN) and isotopic composition of bulk organic carbon ( $\delta^{13}\text{C}$ ) in the long continuous core obtained from the central part of Kathmandu Basin, south slope of Himalaya and reconstruct the paleoclimatic and paleoenvironmental changes in that area. The core sample was drilled at Rabibhawan district, so called RB core, and it was penetrated over 200m thick of lacustrine sediment, which was deposited in Paleo-Kathmandu Lake.

At first the muddy section of the core was divided into fourteen zones based on the cyclic low and high changes of  $\delta^{13}\text{C}$  values of organic matter. In the case of Quaternary lacustrine sediments, the  $\delta^{13}\text{C}$  values of organic matter tend to higher in the glacial periods than in the interglacial periods. According that observation, the zones showing relatively high  $\delta^{13}\text{C}$  values may be decided to form under cold climate.

The low  $\delta^{13}\text{C}$  zones were the zone 2 (176-166 m below the land surface), zone 4 (155-142 m), zone 6 (135-116 m), zone 8 (108-89 m), zone 10 (77-61 m), zone 12 (59-56 m), zone 14 (51-10 m), these zones were considered plausibly to deposit under cold climate relative to the other zones. The cold climate zones was the corresponding sections represented by the dry and cold assemblage of pollen analysis proposed previously (Fujii and sakai, 2002). The pollen analysis indicated that the major vegetation of those plausible cold periods was predominated by a herbaceous plant, therefore, the high  $\delta^{13}\text{C}$  values of organic matter in those periods could be caused by increasing of the C4 herbaceous plant.

On the other hand, warm climate periods corresponding to zone1 (180-176m), 3 (166-155m), 5 (142-135m), 7 (116-108m), 9 (83-77m), 11 (61-59m), and 13 (56-51m), show high TOC and C/N ratios, suggesting that supply of the organic matter from the land was high during these periods. Since the major part of the organic matter from the land is mainly supplied by the river flow, the high contents of terrigenous organic matter was suggested in these periods were higher than that of the other periods. The results are consistent with the wet climate and it is considered that C3 plants are predominant in these periods.

By comparing with the SPECMAP stack, it is found that the cyclic changes of the paleoclimate in the Kathmandu area are in good agreement on the global climate changes.