

Rockmagnetic characteristics of the Kathmandu valley sediments: potential for correlation and paleoenvironmental reconstruction

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The detrital sediments filling the Kathmandu intermontane basin consists of : (i) older (mostly more than 0.78 myr; Pre-Brunhes), primarily lacustrine and fluvial deposits occupying the central and southern parts, and (ii) younger (mostly less than 50 kyr), commonly fluvio-deltaic and terrace deposits extensively distributed in the basin margins, especially in the northern part. The former has now well-constrained magnetic polarity record to which geoscientific observations can be given a time scale. For the latter, however, lack of index fossils, consistent normal polarity behavior, except for several short duration polarity excursions or events, of the geomagnetic field during the deposition of the younger deposits, and large dispersions/uncertainties in the ^{14}C dates reported so far, have prevented from assigning any reasonable chronology to a multitude of data (pollens, clay minerals, isotope-derived data etc.), gathered from surface as well borehole observations. This obvious lack of reliable chronology gives rise to large uncertainties in interpretation of the numerous data in terms of past changes in tectonic, environment and climate regimes.

Recent advances in rockmagnetic studies, especially in the environmental magnetism, reveal that natural materials, including the rocks and sediments, can be characterized in terms of a few magnetic properties (magnetic susceptibility, saturation isothermal remanent magnetization, magnetic granulometry, and magnetic mineralogy) which offer reasonable variability in lateral as well as vertical directions. Although rockmagnetic characterization is not a substitute for a detailed chronology, it assists better correlation of the sections and their interpretation in terms of past changes in several variables such as climate (temperature, rainfall), tectonics, source-sink relationship etc.

This communication will focus on obvious cycles in the susceptibility record and consistency in rockmagnetic parameters over relatively short distances in two sections: Thimi and Arubari/Besigaon, and explore the integration of pollen and other sedimentological data aiming at better deciphering the past environment and climate in the Kathmandu valley.