

# Neogene Paleoclimatic Changes in Response to Tectonism in the Himalayan Gyirong Basin, China

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The Gyirong basin is one of the east-westward extensional basins distributed among the high Himalayas, where a suit of alluvial- and fluvial-lacustrine deposits (Danzengzhukang Formation and Woma Formation), and a Hipparion fauna along with molluscs, ostracods and pollen were found in Neogene sequence. Results of zircon and apatite fission track thermochronology and palaeo-magnetostratigraphic results in this basin bracket the age interval of the section most reasonably between 10 and 1.7 Ma.

Based on lithology, paleo-current of water mass

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and provenance analysis, accompanied by investigation data of palynology, ostracods and clay mineralogy, 3 phases of paleoenvironmental changes are identified, and they include (1) an SE-E paleo-current of alluvial-fan lithofacies (Danzengzhukang Formation, 10–7.4 Ma), with occurrence of warm and humid coniferous- and broad-leaved mixed forests (1 600 to 3 000 m); (2) an SWW paleo-current of the fluvial-lacustrine lithofacies (Lower Woma Formation, 7.4–3.3 Ma), shown by the appearance of cold and arid deciduous coniferous-leaved forests (2 000 to 4 000 m); (3) an SW paleo-current of the lacustrine-fan delta lithofacies (Upper Woma Formation, 3.3–1.7 Ma), going into cool and humid deciduous coniferous- and broad-leaved mixed forests during 2.6–1.7 Ma (2 500 to 4 600 m). We deduce three vivid uplift events are observed at 7.4, 3.3 and 2.6 Ma, respectively. The overall cooling trend since 7.4 Ma is an interplay between tectonism and climatic changes.