

Mio-Pliocene Variations of the Indian monsoon recorded in the Bengal Fan (IODP Exp354)

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We present a multi-proxy study of the marine sediments of the Bengal Fan recovered during IODP expedition 354. In turbiditic sediments of Himalayan origin, the late Miocene C4 expansion was found in all three long records recovered during expedition 354 based on stable carbon isotope composition of bulk organic carbon and terrestrial leaf-wax compounds. Cores from site U1455 provide the highest resolution record of the C4 transition, which appears to occur abruptly within a relatively continuous series of turbiditic sequences. The hydrogen isotopic composition of the same leaf-wax compounds reveals a surprisingly small (on the order of 10 ‰) isotopic shift associated with the late Miocene C4 expansion. In contrast, the hydrogen isotope composition shift observed across the last deglaciation is far greater (ca. 40‰; Hein et al., submitted). Cores from site U1451, provide a low resolution record across at least the last 26 Myr and appear to indicate a long term hydrological change from ca. 11Ma to ca. 7Ma, as inferred from progressive D enrichment in the biomarker records. These compound specific hydrogen isotope data will be discussed in the context of changing erosion patterns and attendant variations in the strength of the Indian summer monsoon as well as with respect to the mechanisms that led to the C4 expansion.