Early Eocene leaves of northwestern India and their response to climate change

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Abstract

Today the existence of tropical rainforests in the Indian subcontinent is restricted to the fringes of the Western Ghats, greater Assam region and some small places in Odisha. However, the palaeovegetation reconstruction in this study illustrates the existence of equatorial tropical forest in northwestern India (Bikaner, Rajasthan) during the early Eocene. Fossil leaves, described here, were collected from the Gurha lignite mine of Bikaner and showed affinities with *Holigarna grahamii* (Anacardiaceae), *Pterygota alata* (Malvaceae), *Syzygium* spp. (*S. fruticosum* and *S. cumini*) (Myrtaceae), and *Gardenia* spp. (*G. lucida* and *G. gummiefra*) (Rubiaceae). Contrary to the present-day dry and desertic conditions, the fossil records provide strong evidence of humid tropical and paratropical evergreen forest with monsoon seasonality existing in and around the study area during the depositional period. Any shift in climatic conditions has drastic effects on the vegetation cover of a region in time and space. This drastic change in climate has led to the extinction of tropical rain forest from this region. This might be due to the northward movement of the Indian subcontinent (away from the equator), formation of the Himalayas and monsoon or changes in monsoon pattern.

Keywords: Early Eocene; Climate change; Fossil leaf; Bikaner