

Mangrove Ecosystem Changes during the Holocene from Chilka Lagoon, East Coast, India

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The Chilka Lagoon is the largest open lagoon of Asia and lies on the eastern coast of India between 19°28' to 19°54' N latitudes and 85°05' to 85°38' E longitudes. It has been declared as a Ramsar Site under the convention on "Wetlands of International Importance" in 1981. It is well known for its floral and faunal diversity. During the present times it is under threat due to anthropogenic impact.

In the present study, palynological investigations of surface and core sediments have been undertaken, to decipher the mangrove dynamics and palaeoclimatic interpretations during the Holocene. Surface samples were collected from the different locations within the lagoon, in order to define the composition of modern pollen rain. The pollen spectra recovered from the surface sediments were found to be compatible with the present day vegetation in the area. Apart from this, palynological analysis of a sediment core, supported by ¹⁴C dates were undertaken. The study reveals that mangrove development was initiated in the area around 11,000 yrs B.P. Mangroves began expanding around 8,000 yrs B.P. and reached their optimum about 5,000 yrs B.P., suggesting a warm and humid phase and a concurrent rise in relative sea-level. Since then, a gradual decline in mangroves has been observed between 4,000-2,000 yrs B.P., which can be attributed to the prevalence of dry climate. Since 2,000 yrs B.P. till the present, midland taxa have been replaced the mangroves. The palynological record demonstrates changing patterns of the mangrove vegetation during the Holocene. It also suggests possible extinction of mangrove vegetation in the studied areas and/or displacement of mangroves to other geographical locales. This can be related to fluctuations in the climate and concomitant sea-level rise and fall coupled with anthropogenic activities during Late Holocene.

The present investigation strongly recommends restoration and regeneration of mangroves in and around the Chilka Lagoon, since there was a history of mangrove depletion during Late Holocene. This requires competent managerial practices to restore lost glory of mangrove history on East Coast.

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