Title:	Vegetation History in a Peat Succession Over the Past 8,000 years in the ISM-Controlled Kedarnath Region, Garhwal Himalaya: Reconstruction Using Molecular Fossils
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Abstract:	The Holocene epoch has witnessed several natural climate variations and these are well encoded in various geological archives. The present biomarker investigation in conjunction with previously published multi-proxy records was applied to reconstruct organic matter (OM) sources forming the peat succession spanning the last 8000 cal yr BP and shift in hydrological conditions from the Kedarnath region, Garhwal Himalaya. Intensified monsoon prevailed from ~7515 until ~2300 cal yr BP but with reversal to transient arid period particularly between ~5200 and ~3600 cal yr BP as revealed by the variability in n-C23/n-C31, ACL (average chain length of n-alkanes) and Paq (P-aqueous) values. A prolonged arid phase is recognizable during the interval between ~2200 and ~370 cal yr BP suggested by the n-alkane proxies. Regional scale heterogeneity in the monsoonal pattern is known in the studied temporal range of mid to late Holocene across the Indian subcontinent that is probably a result of complex climate dynamics, sensitivity of proxies and impact of teleconnections. The biomarker signatures deduced from gas chromatography mass spectrometry (GCMS) analysis are suggestive of a mixed biotic input that includes prokaryotes, Sphagnum spp. and gymnosperm flora. The mid chain alkanes viz. n-C23 and n-C25 denote the presence of typical peat forming Sphagnum moss that preferentially grows in humid and waterlogged conditions. Diterpane marker such as ent-kaurane indicates contribution of gymnosperms, whereas the hopanes are signatures of microbial input. The preservation of organic matter is attributed to little microbial degradation in a largely suboxic depositional environment. Our study strengthens the applicability of organic geochemical proxies for the reconstruction of past climate history and indicates their suitability for use on longer timescales given the high preservation potential of the molecular remains.
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