Title:	Carbon and Oxygen Isotope Analysis of Modern Cattle (Bos indicus) Molars from the Central Narmada Valley, India
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Abstract:	The carbon and oxygen isotopic composition of tooth enamel is connected to the diet and environment in which it develops. Enamel is invariably preserved for a long time and hence provides the best material for chemical analysis. Teeth are known to reflect a record of dietary and environmental changes taking place during their growth. This paper presents the results of intra-tooth oxygen and carbon isotope values (δ18O,δ13C) of first, second and third molars obtained from five modern cattle collected from two locations: Dhansi and Hathnora from the Central Narmada Valley, India. The specimens chosen for this study are individuals presumed to have died naturally and/or disposed of by local farmers. The isotopic analysis of tooth enamel is broadly indicative of a C3 diet with values of δ13C (enamel bioapatite) ranging from –6.4‰ VPDB to –27.31‰ VPDB with an average of –16.68‰ VPDB. The δ18O values measured in the enamel samples range between of 1.76‰ to 25.15‰ with a mean value of 22.17‰ VSMOW. These present day dental enamel values of modern cattle were compared against the published enamel isotope values of Bos namadicus, that occupied this region during the Pleistocene era, in order to understand the possible shift in diet and environment and their inter-relationship between the modern and the Pleistocene Era. The fossil sample produced enriched values of carbon isotopes compared to the modern taxa, indicating a C4 rich diet, while the diet of the modern cattle is extensively dominated by C3 type vegetation. We also observed an enriched oxygen isotope values for the fossil sample compared to the modern samples, indicating a possible effect of diagenesis and/or a shift in the temperature and rainfall.
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