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Ships of the Desert: Reconstructing camel husbandry regimes in Southwest Asia using carbon and nitrogen stable isotope analysis

Abstract

The camel (*Camelus* sp.) is famously nicknamed the *Ship of the Desert* owing to their adaptations to said environment and historic exploitation as pack animals. However, how camels were managed across these variable environments has been neglected in archaeology. Within this context, this dissertation provides a novel biomolecular investigation of camel husbandry using bulk collagen carbon ($\delta^{13}\text{C}$) and nitrogen ($\delta^{15}\text{N}$) stable isotope analysis and Zooarchaeology by Mass Spectrometry (ZooMS).

Specifically, this focuses on Mamluk (1250-1517 CE) Tell Abu Sarbut, Jordan, a domestic/industrial settlement that intensively cultivated, processed, and exported the cash crop sugar cane. Here, 13 camel and 18 other animal specimens (e.g., cattle, equid) were sampled for stable isotope analysis ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) and ZooMS. $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ results suggest that camels, unlike other domestic animals, were subject to diverse husbandry regimes, consuming varying proportions of C_3 -plants and C_4 -plants. This is associated with their exploitation as pack animals, transporting cane sugar across diverse environments. As an aside, ZooMS analysis provided the first physical identification in Jordan of another neglected animal in archaeology: water buffalo (*Bubalus bubalis*). Finally, comparison of these camel husbandry regimes to additional sites analysed in this study or collated from the available literature emphasised that an absence of stable isotope results currently limits broader investigations of camel husbandry regimes.