Assessing the nature of the spatial and temporal overlap of humans and horses in North America: a radiocarbon, stable isotope, and actualistic analysis of the evidence

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The author's recent work has shown that radiocarbon dates on horse remains from North America indicate that Paleoindian groups and Pleistocene horses overlapped significantly on the landscape at the end of the last ice age. The recent discoveries of horse kill sites at Wally's Beach, Alberta (Kooyman et al. 2006; Waters et al. 2015) and Bluefish Caves, Yukon (Bourgeon and Burke 2021), and the wide-spread presence of horse remains at Paleoindian archaeological sites support this. However, few direct radiocarbon dates on horses from the American southwest are published, creating a significant gap in knowledge on this topic in an area that has been highly significant for archaeologists' understanding of Paleoindian peoples. As part of her dissertation, the author is conducting a widespread radiocarbon effort to date terminal Pleistocene horse remains in the American Southwest, specifically in Arizona and New Mexico. This aims to better understand the overlap (or lack thereof) of humans and horses in this region before the taxon's extirpation from North America.

The author aggregated and analyzed published radiocarbon dates on horse specimens from the terminal Pleistocene in North America. A statistical analysis of these data revealed that numerous radiocarbon dates on horses show significant temporal overlap with humans on the continent. For her dissertation, the author has begun working with local museums and has, as of fall 2024, radiocarbon dated, conducted stable isotope analysis, and amino acid analysis on two horse specimens from New Mexican cave sites. They yielded the following terminal Pleistocene dates: 12,930 ± 30 (15,603-15,306 cal. BP) and 11,740 ± 30 (13,660-13,496 cal. BP), UCIAMS 298793 and UCIAMS 298794.

Based on the stable isotope evidence, the younger dating individual had notably higher stable nitrogen and stable carbon values than the older dating individual. Amino acid analysis on these two specimens and several others of varying degrees of preservation quality showed a clear correlation between the amount of hydroxyproline and the fossil's ability to yield sufficient collagen to date. These preliminary analyses and data show that there is work to be done on fleshing out the radiocarbon record of Pleistocene horses in North America and the wealth of molecular information that can be achieved in this pursuit.

The dates on the horses from Dry Cave and White Mesa Mine do predate the Clovis technocomplex (11,110 ± 40 to 10,820 ± 10 yr BP) and the horse date from Wally's Beach, Alberta (11,410 ± 30). However, they are well in line with other pre-Clovis dates, such as the Gault Site, Texas, at ~16,000 years ago (Williams et al. 2018), and the Page-Ladson site, Florida, at ~14,550 years ago (Halligan et al. 2016). As evidence for Paleoindian peoples in New Mexico dates back to ~21,000 years ago in the White Sands Missile Range, it is plausible to hypothesize a significant temporal overlap between horses and humans in the Southwest.

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