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Hypsodonty in Pleistocene ground sloths

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Although living sloths (Xenarthra, Tardigrada) are represented by only two genera, their fossil relatives form a large and diverse group. The evolution of hypsodonty, the crown height of a tooth, has traditionally been viewed as a response to dietary shifts toward abrasive vegetation. But recent work indicates that hypsodonty is also due to the higher prevalence of grit and dust in more open environments. The teeth of sloths are both high-crowned and open-rooted, or hypselodont, but distinctions between the selective factors acting to produce differing degrees of hypsodonty have not been rigorously considered. A comparative analysis of hypsodonty was performed in eleven species of Pleistocene sloths. It suggests that differences in hypsodonty may be explained by dietary preferences, habitat and habits. Among mylodontids, morphologic and biomechanical analyses indicate that hypsodonty was unlikely to be due solely to feeding behavior, such as grazing. Some mylodontids (e.g., *Scelidotherium leptocephalum, Lestodon armatus, Glossotherium robustum, Mylodon darwini*) were capable diggers that likely dug for food, and ingestion of abrasive soil particles probably played a considerable role in shaping their dental characteristics. Increased hypsodonty over time in Paramylodon harlani, however, is apparently due to a change in habitat from closed to more open environments. Geographical distributions of the megatheriids Eremotherium and Megatherium indicate differing habitats as possible factors in hypsodonty differences. In summary, among Tardigrada hypsodonty is apparently affected by diet, habitat and habit. The absence of enamel must be responsible for much of the hypsodonty observed in xenarthrans, which obscures the interpretation of contribution of each of the mentioned factors.

Key words: Pleistocene, Xenarthra, Tardigrada, hypsodonty, diet, habits, habitat.

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