

SIMPLE COMPLEXITY OF TEETH

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INTRODUCTION: Dentitions appear to be more complex in vertebrates that eat plants rather than animals. Increased complexity is especially apparent in herbivorous taxa that eat fibrous plants. For example, specializations to eat bamboo have evolved several times in mammals. At least primates, bears, and muroid rodents have living species that rely largely on a bamboo diet. Whereas phylogeny, size, and life history are highly divergent among these bamboo specialists, their cheek tooth morphology show high overall complexity irrespective of the taxon-specific morphological details. The high complexity values can be related to the high number of tooth crown features, or 'tools', required to process fibrous bamboo. Yet this kind of high dental complexity may require simple developmental changes. For example, the lack of 'developmental individualization' of specific cusps is indicated by experiments in which increasing levels of the same signaling molecules can increase the number of several cusps. Thus, pandas teeth, for example, may be morphologically complex but developmentally simple. This would, of course, also indicate that tooth cusps are not characters as such, but rather character states of different tooth shapes.