053

HOMINOID MOLAR CROWN MORPHOLOGY AND ENAMEL DISTRIBUTION

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Enamel thickness and distribution of the molar crown has been evaluated 3-dimensionally for the four extant great ape species (*Pan troglodytes*, *Pan paniscus*, *Gorilla gorilla*, and *Pongo pygmaeus*) and modern humans (*Homo sapiens*). The 3-dimensional distribution pattern of enamel within the molar crown has recently been recognized to have significant functional, developmental, and phylogenetic information. A total of 100 molar teeth of five species were micro-CT scanned and segmented so as to digitally extract the shape of the enamel cap. The combined evaluation of enamel thickness patterns and 3-dimensionally based morphometric comparison of occlusal basin size and shape among extant great ape species revealed the contrasting patterns of enamel distribution and occlusal topography between *Pan* and *Pongo* molars. Molars of *Pan troglodytes* and *Pan paniscus* are characterized by relatively thin enamel on the capacious occlusal basins, which can be interpreted as a morphological adaptation to relatively soft-fruit frugivory. On the other hand, *Pongo* molars combine relatively thick enamel and less salient cuspal/occlusal basin topography. This may be an adaptation to withstanding greater occlusal forces and/or the efficient breakdown of hard but brittle foodstuff. *Gorilla* molars are characterized by the most salient cuspal topography and relatively thin enamel both occlusally and laterally. These can be explained as an adaptation to a more folivorous/herbivorous diet. The possible links between morphological characteristics and dietary dependencies shown above in the extant ape species provide important clues in elucidating the diet of extinct species such as fossil hominoids including early hominids.

Keywords: hominoid, molar, morphology, diet