

Public Abstract

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Determining the relations between canine crown height, crown and root basal diameters and root length: Implications for the hominin fossil record

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Canine reduction appears to be one of the first unique characters to appear in human evolution. In most primates, canine crown size is larger in males than females. This variation is linked to sexual selection, and so can be used to reconstruct social behavior in fossil taxa. However, many canine teeth broken or missing in the early hominin fossil record. This thesis investigates the ability of maxillary canine root length and crown and root basal dimensions to predict crown height in humans, chimpanzees and gorillas. Results showed that no dimension was a strong predictor, although mesiodistal basal diameters were the most precise. This variation underscores the separate developmental and selective influences on canine tooth dimensions. This thesis also explored shape relationships among canine dimensions. Humans and chimpanzees have similar crown heights relative to root length, which fails to support the hypothesis that humans have relatively longer canine roots than do apes. Gorillas have different relations between root length and crown height than do chimpanzees or humans. Chimpanzee canine crowns are taller and thinner relative to basal diameters than are those of gorillas. This research highlights the need for a more detailed understanding of the observed variation in crown and root proportions in primates, and suggests that caution is necessary when linking variation in facial or jaw structure to canine crown size in extant or fossil taxa.