

Hylander, "More on the Evolutionary Significance of Canine Height Reduction in Hominins: Functional Links Between Jaw Mechanics and Canine Height in Catarrhines"

Recently, Hylander and Vinyard (2006) hypothesized a functional link between canine height and jaw gape in catarrhines, as well as a proximate explanation for canine height reduction in hominins. It was suggested that in early hominins, selection pressures for increased bite force exceeded those selection pressures for maintaining large gape linked to long canines. Thus, canine height reduction is a necessary functional outcome to minimize canine height interference associated with decreased gape and increased postcanine bite force. The main purpose of this paper is to report on recently collected gape data in siamangs, gibbons and orangs, as well as certain other catarrhines. Following an analysis of maximum jaw gape in sedated primates during routine physical exams, the data indicate that relative to mandibular length, adult male catarrhines usually have much larger gape than do females. The exceptions to this generalization are restricted to hylobatids and humans in that these primates exhibit little or no dimorphism in jaw gape. Also, the data clearly indicate that there are considerable interspecific differences in the amount of gape relative to mandibular length. For example, long-tailed, lion-tailed and pig-tailed macaques have much larger relative gape than do rhesus and Japanese macaques. Moreover, chimpanzees, orangs and gorillas usually have less relative gape than do cercopithecines, but more relative gape than humans. Hylobatids, however, have similar amounts of relative gape as do male cercopithecines. Finally, and most importantly, those catarrhines with relatively larger (or smaller) gape have relatively longer (or shorter) canines. In conclusion, the data indicate that there are functional links between canine height and jaw gape. Catarrhines with highly dimorphic canine heights (e.g., patas, baboons, long-tailed macaques) have highly dimorphic amounts of gape. Conversely, those with no dimorphism in canine height (gibbons, siamangs and humans) have little or no dimorphism in amounts of gape.

Jeusel and Mafart, "Morphological Evolution of the Bony Palate of Hominid Fossils"

The bony palate is the lone anatomical structure used for producing the articulated language that is often preserved during fossilization. Our purpose was to study the morphological variation of this anatomical structure during human evolution. Material and method: The sample was composed of skulls and cast of great apes, fossil hominids and modern men. Twelve non-metric traits were studied. For the metric measurements, the palates were moulded with silicone. Several specific landmarks were defined and localized with a 3D digitizer. A morphometric 3D analysis was done using Procrustes and PCA methods. Results : Some non metric traits show a diachronic evolution. The morphometric study showed a clear gap between apes and australopithecinae on one side and *Homo*. The bony palate of *Homo* has a growing complexity. A morphologically modern bony palate seems to be present from *Homo heidelbergensis* in Europe. However, many anatomical and physiological functions contributing to the language production are absent on fossils remains. Therefore it is not possible to know on the basis of the lone morphology of the bony palate if these hominids had an articulated language or if they had one, what was its level of complexity.

Kaifu et al., "Evolutionary History of Javanese *Homo erectus*: An Examination Based on Revised and New Cranial Measurements"

This study aims at accurately describing cranial morphological changes of *H. erectus* in Java, using refined measurements carefully taken from 15 adult and 4 subadult crania from Sangiran (the Bapang Formation above the Grenzbank zone [Bapang-AG] levels), Sambungmacan and Ngandong. The identification of some obscure landmarks was aided by using micro-CT imaging, and the obtained measurements were compared with previously published estimates to further reduce possible errors. While recent studies tend to emphasize evolutionary conservatism in Javanese *H. erectus*, our results reinforce the theory that the chronologically later groups experienced distinct morphological changes in a number of cranial traits. Some of these changes, particularly those related to the brain size expansion, can be compared to the general evolutionary trend of *Homo* worldwide, whereas others are apparently unique specializations restricted to Javanese *H. erectus*. Such morphological specializations in Java includes previously undescribed anteroposterior lengthening of the midcranial base, and the anterior shift of the posterior temporal muscle that might have influenced the morphology of the angular torus and supramastoid sulcus. Analyses of morphological variation indicate the presence of various intermediate forms between the chronologically earlier and later morphotypes of Javanese *H. erectus*, particularly in the crania from Sambungmacan. This strongly suggests the continuous, gradual morphological evolution of Javanese *H. erectus* from the Bapang-AG to Ngandong periods. In addition, we test the dual ancestry model of Aboriginal Australians by examining whether the variation structure within the Pleistocene Australians can be reasonably explained by hybridization of the model's supposed two ancestors: Javanese *H. erectus* and migrating groups of *H. sapiens* arriving from Africa. Our results contradict the model's expectations, and support the hypothesis that the Javanese lineage of *H. erectus* went extinct without making significant contributions to the ancestry of modern humans.