Abstracts of the 71st annual meeting of the American Association of Physical Anthropologists Buffalo, New York; April 10-13, 2002

Reprinted from Supplement 34 (March 2002) to American Journal of Physical Anthropology



**Assessment of quantitative characters in the distal humerus among hominids (great apes and hominins).**

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The articular morphology of the distal humerus is known to reflect adaptation to patterns of locomotion in living primates. It has been argued that the more arboreal orangutans are characterized by relatively deep fossae, whereas large-bodied knuckle walkers have relatively larger articular surfaces than smaller-bodied ones. Numerous studies have provided comparisons based on conventional and landmark morphometrics, some of which are restricted to 2D. However, a three dimensional model of the humerus was expected to contain significantly more information about the functional variability of the distal articulation. We collected data with a Cyberware 3D laser surface scanner having a physical resolution of 0.1mm. We sampled articular surfaces of great apes (*Pongo, Pan, Gorilla*), as well as living and fossil humans. These data allow for a comparative analysis of terrestrial versus more arboreal quadrupedal locomotion, as well as the unique bipedal pattern of humans. Ultimately, one of the goals was to assess the morphometric affinities of hominin fossils whose phylogenetic position remains unclear, such as TM 1517 and KNM-ER 739. Area to volume ratios were determined for different functional components and compared across these taxa. Size-related variations, such as sexual dimorphism, were also taken into account for extant taxa. Major differences at the generic level can be seen in the size of the articular surface relative to the entire humerus, and in the relative size of the capitulum. Our results suggest different allometric patterns in chimpanzees compared to australopiths, contradicting previously claimed affinities.



**An interactive database for primate morphometric studies.**

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Preparation, organization, and screening of data is a major task in many conventional and geometric morphometric analyses. In addition, formatting data sets for use in various software packages for statistical and morphometric analysis can be very time consuming.

We have built a database that incorporates diverse formats of morphometric data from our sample of over 5000 measured primate specimens from worldwide collections. These data include linear dimensions collected by calipers on both cranial and postcranial elements, 2 and 3 dimensional landmarks, 3D space curves (connected sets of landmarks), laser-scanned 3D surfaces, photographs and other 2D images, and volumetric data such as CT images. Individual specimens are referenced by taxon, collection data, body part, locality coordinates and other geographic parameters.

The database interface uses an HTML browser to construct Structured Query Language (SQL) queries to the database, allowing subsetting, iterative refining, and assembling of morphometric data sets using forms-based web pages. Subsetted data sets then can be formatted for convenient analysis in morphometric and statistical analysis software packages. A demonstration version of this database is currently available over the world wide web [http://research.amnh.org/nycep]. This work was supported by NSF grants (ACI-9982351 to AMNH and BIR-9602234 for the NYCEP RTG).