

A QUANTITATIVE ANALYSIS OF THE DISTAL TIBIA OF *HOMO HABILIS*

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Abstract

The locomotor affinities of early *Homo* remain controversial. Some researchers argue that postcranial remains from Olduvai Gorge and Koobi Fora assigned to *H. habilis* show all the hallmarks of modern striding bipeds. Others posit that *H. habilis* was more mosaic in its locomotor repertoire, sharing a number of more primitive features with the South African *A. africanus*. The OH 35 tibia is central to this debate, yet complex 3D analysis of its distal articular surface has yet to be conducted. This study adds to this debate by using 3D geometric morphometric techniques on the distal tibiae of fossil hominins and a comparative extant sample.

Homologous landmarks were designed to accurately reflect the shape of the distal articular surface. Data were collected using a Microscribe digitiser and the landmarks were registered and analyzed using the software *morphologika*. The comparative extant sample consists of 92 humans, 27 gorillas, and 15 chimpanzees. The fossil hominin sample consists of AL 288-1ar, OH 35, KNM-ER 1481C, and KNM-KP 29285B.

PCA of the registered data reveals very distinct separation between all extant species with no significant overlap between *Homo*, *Gorilla*, and *Pan*. When the fossil sample was considered, both AL 288-1ar and KNM-KP 29285B fall well within the human sample, while OH 35 and KNM-ER 1481C consistently fell outside of it. This analysis indicates that in terms of the talar articulation of the tibia, the temporally earlier australopithecines share more shape similarities with fully bipedal modern humans than later species of hominin included in the genus *Homo*.