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Find More Like This MIDDLE PLEISTOCENE HOMINID CARPAL PROXIMAL PHALANX FROM THE GLADYSVALE SITE, SOUTH AFRICA

Contents

Taxonomic assignment Phalanges are rare in the early hominid fossil record and are unreported from the fossil record of the Middle Pleistocene of Africa. We describe here a proximal phalanx of a hominid from Middle Pleistocene age sediments at the Gladysvale site, South Africa. Specimen GV-4339 is a nearly complete, subadult proximal phalanx, missing only the head. The phalanx was recovered from in situ sediments of the Gladysvale Pink Breccia.[1] during excavations conducted in September 1993. The specimen was catalogued in a previous faunal list[1] as GVH-8, but we have subsequently altered the cataloguing system of Gladysvale to include

hominids in the normal sequential numbering system used for all other fossil animals.

The fauna from the Pink Breccia at Gladysvale is clearly Pleistocene in age and dominated by bovid and equid species that we have previously suggested indicate a Middle Pleistocene age for the deposit.[1] Studies of the fossil micro-mammals from the site by Avery (pers. comm.) also support a probable Middle to Late Middle Pleistocene age for this material. More recent attempts to date the Pink Breccia using the electron spin resonance (ESR) dating technique have resulted in dates on this and the adjoining Stony Breccia of c. 600 000 yr BP (Gmn, in prep.).

The following description uses standard measurements and describes the Gladysvale phalanx in the human anatomical position. Because its head is missing, we are unable to assign its exact position within the ray, nor the side of the specimen.

The basal articular surface is oval in shape when viewed proximally and the articular surface is markedly concave (Fig. 1). There is slight asymmetry to the base with the right facet margin projecting more proximally than the left one. The palmar basal tubercles appear to be asymmetric, but damage to the right tubercle makes further assessment difficult. The right lateral aspect of the base, however, is more robust than the left. The proximal epiphysis is incompletely fused, indicating that the specimen is from a juvenile.

The shaft shows some longitudinal convexity and shaft torsion is very moderate. The midshaft section is semicircular in shape, with a slightly convex ventral surface. The bilateral markings of the flexor sheaths are not ventrally prominent, but are medially and laterally prominent, contributing to the strong, winged appearance of the mid-shaft. The markings of the flexor sheaths extend from the proximal base of the specimen to just below the distal point of damage. The overall effect is a bottle-shaped appearance of the body when viewed anteriorly or posteriorly. Just proximal to the missing distal articular surface there are two moderate depressions that represent the attachment sites for the collateral ligaments.

The maximum length is 30.5 mm; mediolateral diameter at the midshaft is 9.7 mm; anterioposterior diameter at the midshaft is 5.5 mm; mediolateral diameter at the base is 12.0 mm; anterioposterior diameter at the base is c. 9.4 mm.

Taxonomic assignment

The phalanx clearly belongs to a large-bodied primate. Considering the faunal assemblage of Gladysvale, and the known fossil primate assemblages from the Plio-Pleistocene cave sites of southern Africa, it is most likely attributable to a large cercopithecoid or a hominid.

We believe that the Gladysvale phalanx is unlikely to be from a cercopithecoid as GV-4339 presents a hominoid-like morphology of the flexor sheaths. Furthermore, it does not possess an excavated proximodorsal area on the articular surface (Fig. 2). Hayama et al.[2] note that in the digitigrade hand position (comparable to that used by African cercopithecoids), the second to fifth metacarpophalangeal joints are hyperextended with the metacarpi kept vertical. The proximal articular surface of the basal phalanx is therefore excavated proximodorsally. This skeletal specialisation has also been observed in the palmigrade colebus monkey.[2] Proximodorsal excavation of the phalanx was not, however, observed in New World monkeys, apes and humans. This skeletal feature may already be a specialisation in respect of the semi-

terrestrial habits of some cercopithecids and seems to separate the digitigrade, and to a lesser extent the palmigrade, form of locomotion from others. GV-4339 possesses the human/ape form of this morphology (Fig. 2) and it is therefore our opinion that this proximal phalanx is that of a hominid.

Given that the specimen's dimensions are within those of modem humans[3] and considering the probable Middle Pleistocene date of the Pink Breccias, we have tentatively assigned this specimen to the genus Homo sp. indet. It is, however, surprising, given the probable Middle Pleistocene age of the fossil, that the general morphology, and in particular the 'pinched' appearance of the neck of the Gladysvale phalanx, is more reminiscent of that observed in phalanges presently attributed to Australopithecus (Paranthropus) robustus than to modem human phalanges that we have examined. We are unsure at present of the implications of this variation but note that Susman[4] has indicated that the morphologies of Paranthropus carpal bones indicate a human-like level of precision grip.



Fig. 1. Hominid proximal phalanx from Gladysvale. *a*, right lateral, ventral, left lateral view; *b*, proximal articular surface.



Fig. 2. Comparison of the GV-4336 phalanx with that of Papio ursinus (left, ZA 848 male) and of Homo sapiens (right). Note the lack of excavation of the proximodistal area in GV4336 and in the human phalanx as opposed to the excavated appearance of the same area in the baboon.

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