

190 Plenary Lecture

THE SIGNIFICANCE OF *ARDIPITHECUS RAMIDUS* IN UNDERSTANDING HOMINID DIVERGENCE.

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The ~4.5 Ma *Ardipithecus ramidus* is represented by well over 100 specimens from more than 30 to 60 individuals recovered from the Middle Awash and Gona research areas, Ethiopia. These fossils include a partial skeleton of *Ar. ramidus* from Aramis, as well as other informative postcranial and dentognathic remains, such as over 20 canines almost certainly from different individuals. Recent analyses of the *Ar. ramidus* fossils, published in October 2009, indicate that *Ar. ramidus* was phylogenetically ancestral to, or the immediate out-group of, the *Australopithecus anamensis/afarensis* lineage, and combined substantial arboreal capabilities with an *Australopithecus*-like upper pelvic balance mechanism for bipedal locomotion. The generalized forelimb and foot morphologies of *Ar. ramidus* suggest that it did not share a suspensory, advanced vertical climbing, and/or knuckle walking heritage with modern African apes. The *Ar. ramidus* dentition indicates loss of functional male canine honing by 6 to 4.4 Ma. Its incisal/postcanine morphology, wear and enamel isotopics suggest a predominantly woodland-based frugivorous/omnivorous diet, lacking specializations seen in *Gorilla*, *Pan* or *Australopithecus*. The *Ar. ramidus* cranium shares with that of *Sahelanthropus* a short basicranium and a lack of morphologies associated with heavy chewing. The *Ar. ramidus* skull was absolutely and relatively small, in keeping with its reduced male canine size, and inferred weak sexual dimorphism in cranial and body size. Comparisons suggest enhanced canine size and facial prognathism in *Pan troglodytes*, a general facial and dental size reduction in *Pan paniscus*, and exaggerated sexual dimorphism and allometric and/or dietary effects in the *Gorilla* cranium. Considerable specializations involving dietary, locomotor, and social behaviors are inferred in each of the modern African ape species. Both the *Ar. ramidus* and Miocene ape evidence supports the hypothesis of extensive parallel evolution of modern-ape like suspensory adaptations, suggesting a *Pongo*-African ape divergence deep in the early Miocene. This in turn conforms to *Pan* and *Gorilla* divergences of ~8 and ~11 Ma, respectively, from the human lineage.