

## The implications of *Oreopithecus* for the origins of bipedalism

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An important initial step in attempts to elucidate the structural, functional and ecological factors underlying the origins of bipedalism is the careful and detailed reconstruction of the ancestral large hominoid (great ape/human) postcranial morphotype. Previous attempts at morphotype construction have relied heavily on the use of particular species of great apes as possible models of "proto-human" morphology and locomotion. However, comparative anatomical and behavioral studies suggest that the extant large hominoids are individually too specialized in their modes of locomotion, and too autapomorphic in their postcranial morphology, to serve as realistic ancestral morphotypes. In addition, the fossil record provides increasing evidence that the living large hominoids are merely relictual representatives of a much larger Neogene radiation. It is this unfortunate combination of a few, highly specialized modern species that makes the extrapolation of a composite ancestral large hominoid morphotype extremely problematic.

*Oreopithecus bambolii* from the late Miocene (8-9 Ma) of Italy contributes an important new perspective to this debate. Several recent studies have confirmed that *Oreopithecus* is a member of the great ape/human clade. Moreover, the availability of an almost complete skeleton, as well as a wealth of largely undescribed postcranial remains, makes *Oreopithecus* by far the best known Miocene representative of the group. The addition of *Oreopithecus* to the morphotype analysis, which has been based previously on only a few extant forms, therefore provides improved resolution of character analyses and inferred morphocline polarities. A study of the *Oreopithecus* postcranial material has revealed several important new implications for the interpretation of the origins of bipedalism: (1) *Oreopithecus* essentially retains a phylogenetically conservative and functionally generalized postcranial morphology, that conforms in most details to the ancestral large hominoid morphotype (although cranio-dentally it is undoubtedly highly derived). In a simple heuristic sense, *Oreopithecus* provides a close approximation to a model from which the more specialized postcranial patterns of extant great apes and hominids were derived. (2) With a clearer impression of the ancestral large hominoid morphotype, it becomes evident that the morphological transformation to the ancestral hominid morphotype (as seen in *Australopithecus afarensis*, for example) may be much less dramatic than previously suspected.