Paradichlophonus: A large-bodied terrestrial pinnon (Cercopoidea) from the Pliocene of western Eurasia.


The fossil mite Paradichlophonus is known from cranial and postcranial remains from Sermin (France). Grashowanum (Romania) and Vatera (Lesvos, Greece), all of late Pliocene age. Partial cranial from Kuruk (Tajikistan) have been reported by S. Mosilov, while fragmentary (often juvenile) remains occur in earlier sites across southern Europe. It is generally thought that this genus is a sister taxon to Macrae, which was strongly adapted to terrestrial life (see brief review by Ting et al.). However, Mochien et al. reviewed the Kuruk fossils and suggested that they may be best placed within genus Parnassius, which would imply an out-of-Africa dispersal. Here we seek to determine the phylogenetic affinities of Paradichlophonus, based on analyses of the entire cranial sample.

Proportions of cranial and dentition were studied using traditional micrometric methods, while geometric morphometrics were applied to cranial morphometry. Although Paradichlophonus is not as well-known as other fossil mammal genera, its morphological diversity is in fact more like that of Macrae, when allometric factors are considered. For example, the small anterior dentition, rounded molar crowns and perhaps the lack of a clear anteroposterior drop in the midline profile all distinguish Paradichlophonus from Macrae. This suggests that it is an even more specialized taxon and that it is a European Macrae, suggesting in situ divergence. The dental size of the earlier Pithone sample is intermediate between that of the late Pithone populations and large macaques and may imply a size trend. The relatively large size of the Senier male cranium (c. 56) compared to males from Grashowanum (c. 3.2 Ma) may also reflect this temporal size increase or indicate a low level of sexual dimorphism. Funding: NSF DEB 9002234 (NYC modal) and ACT 990255 (NYC Morphometrics Group: F.I.C.-CUNY.)

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The Pliocene corsetocephalian Pala- dichlophonus arvensis is best known from Sermin (France). Vatera (Lesvos, Greece) and Vatera (Lesvos, Greece). Of these sites, Grashowanum and Vatera have yielded postcranial elements, assigned to this species that have been shown to be similar to those of Parnassius, while the cranial remains from all sites have suggested a relatedness to Macrae. Description and analysis of the postcranial fossils was conducted to test hypotheses concerning the locomotor behavior and phylogenetic affinities of this fossil monkey. The cranial material as inferred by F. a. arvensis includes partial hornets, ulna, radius, femur, a distal tibia, an astragalus, third metatarsal, and several phalanges. These postcranial are compared to those of extant cercopithecoids using traditional measurements, as well as 3D (out of plane) data. Measurements were analyzed using standard rates and statistical analyses, the coordinate data were analyzed using geometric morphometric techniques.

The results indicate that F. a. arvensis presented a form of terrestrial locomotion similar to that of modern baboons, which is consistent with previous hypotheses and palaeoenvironmental reconstructions suggesting open savannah woodland at both sites. The overall morphology of P. arvensis resembles Parnassius and Oto- dichlophonus, although the implications of this result are still unclear because separating size, phylogeny, and function remains problematic in cercopithecids. The 3D data presented will also be used in future studies to help address this complex issue and hopefully provide more information on the evolutionary history of the Pliocene large bodied cercopithecoid radiation.

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