

Late Cretaceous mammals

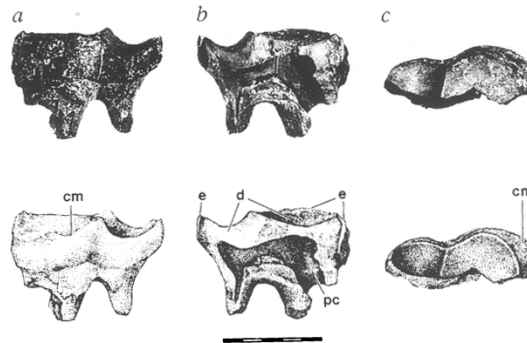
SIR — Despite Madagascar's renowned subfossil fauna, and with the sole exceptions of a Miocene dugong¹ and an isolated, poorly dated Plio-Pleistocene faunule², this island-continent has until now yielded no confirmed pre-Holocene mammal fossils. We report here the discovery of a Late Cretaceous mammal from the Mahajanga (Majunga) Basin of northwestern Madagascar.

Late Cretaceous mammals from the Southern Hemisphere are known only from the Indian subcontinent³, which at that time lay adjacent to Madagascar and South America⁴; none has previously been recovered from Africa, Australia or Antarctica. The 30 or more million years of the Late Cretaceous is the interval during which the nontherian Multituberculata flourished and the diversification of marsupials and placentals began. However, despite the good record of Late Cretaceous mammals on northern continents⁵, the origins of many of the modern orders of placentals remain obscure; at least some probably originated on southern, Gondwanan-derived landmasses⁶.

In addition to numerous new records of lower vertebrates and invertebrates, we discovered a single specimen of a mammalian lower(?) cheektooth during a 1993 expedition to the Mahajanga Basin. The fossiliferous beds are believed to be of Campanian age⁷ and previously yielded only a moderately diverse assemblage of lower vertebrates, including dinosaurs⁸. We found the mammal specimen just east of Berivotra village, in a white unit at the top of the Maevarano Sandstone, below the succeeding Maastrichtian transgression. The specimen is incomplete and exhibits heavy premortem wear, but it is clearly that of a mammal as indicated by the presence of two roots, enamel that does not grade smoothly onto the root but terminates abruptly at the base of the crown, inflation of the crown beyond the dimensions of the roots, and the presence of a cingulum toward the mesial(?) end (see figure). The incomplete and worn nature of the tooth, as well as the paucity of knowledge of contemporaneous mammals from southern continents, precludes a precise identification. The most salient feature of the tooth is its size; it measures 7.55 mm in its longest dimension and is thus from one of the largest known Cretaceous mammals.

We think this specimen is a harbinger of things to come. Future discoveries of Late Cretaceous mammals in Madagascar will undoubtedly provide significant insights into the evolutionary history of mammals on southern continents and, specifically, of the highly endemic, imbalanced Malagasy fauna itself. The biographical origins of the biota of Madagascar, which started separating from the east coast of Africa in the middle Jurassic and reached its current position relative to the continent by the Early Cretaceous⁹, is one of the greatest unsolved mysteries of natural history.

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Fragmentary mammalian left (?) lower (?) cheektooth from the Upper Cretaceous Maevarano Sandstone, Mahajanga Basin, northwestern Madagascar in *a*, buccal view; *b*, lingual view of naturally fractured longitudinal section; and *c*, occlusal view. If a left lower tooth, mesial (anterior) is to the left in *a* and to the right in *b* and *c*. Abbreviations: cm, cingulum; d, dentine; e, enamel; pc, pulp cavity. Scale bar, 5 mm.

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