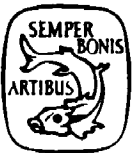


Sonderdruck aus:

Biology of Tarsiers

Edited by
Carsten Niemitz

259 Figures and 18 Tables



Gustav Fischer Verlag · Stuttgart · New York · 1984

3. Paleobiology of tarsiiiform primates

Philip D. Gingerich

Museum of Paleontology, The University of Michigan, Ann Arbor, Michigan USA

Introduction

Fossil tarsiiiform primates have been known for more than 100 years. These were first found in Eocene strata in Europe and shortly afterwards in North America. It is now clear that during the Eocene there was a major radiation of fossil Tarsiiformes in North America and a lesser one in Europe. Recent work in Mongolia and in Pakistan indicate that tarsier-like primates inhabited Asia during the Eocene as well, but Asian micromammalian faunas are not yet sufficiently well sampled to give a reliable indication of diversity on that continent.

All of the known fossil tarsiiiform primates are included in one family, Omomyidae, which is generally divided into three subfamilies: Anaptomorphinae, a cosmopolitan primitive stem group with 12 genera; Omomyinae, a North American endemic group with 13 genera; and Microchoerinae, a European endemic group with 4 genera. No Omomyidae have been found in Africa, South America, Australia, or Antarctica. An outline classification of Omomyidae is presented in Tab. 3-1.

Previous studies of Omomyidae have been concerned almost exclusively with the systematic relationships of species and genera. In recent years much has been learned about the functional morphology, ecology, and behaviour of living primates, and it is now possible to apply behavioural and ecological generalizations derived from living primates in interpreting the paleobiology of Omomyidae. The reader is referred to Gazin (1958), Simons (1961a), Louis and Sudre (1975), Szalay (1976), Krishtalka (1978), and Bown (1979) for detailed systematic treatment of Omomyidae. The relationships of Omomyidae to other primates are discussed by Simons (1961a, 1961b, 1972), Szalay (1976), Cartmill and Kay (1978), Gingerich and Schoeninger (1977), Gingerich (1978, 1981), and Krishtalka and Schwartz (1978). There is a general consensus that Omomyidae are closely related to *Tarsius*, but as yet little agreement on their relationships to more primitive plesiadapiform and more advanced simiiform primates. In this chapter I would like to outline evidence bearing on the dietary, sensory, locomotor, and social adaptations of Omomyidae.

Dietary adaptations

There is a close relationship between tooth size and body size in living primates (Kay, 1975; Gingerich *et al.*, 1981), and with few exceptions tooth size can be used to give a reliable estimate of body size in fossil primates. This relationship is illustrated in fig. 3-1, where the correlation between tooth size and body size is 0.976 and the principal axis accounts for 99% of the observed variance. For purposes of

Tab. 3-1: Outline classification of fossil tarsiiform primates (Omomyidae), including all genera, number of species currently recognized in each genus, age, geographic distribution, and estimated body size (from Gingerich, 1981).

Genera and number of species	Age	Geographic distribution	Body weight (gm)
Omomyidae Trouessart, 1879			
Anaptomorphinae Cope, 1883			
<i>Altanius</i> Dashzeveg & McKenna, 1977 (1 sp.)	Early Eocene	Asia	10
<i>Teilhardina</i> Simpson, 1940 (2 sp.)	Early Eocene	Eur.-N. Am.	35
<i>Tetonoides</i> Gazin, 1962 (2 sp.)	Early Eocene	N. Am.	30–40
<i>Tetonius</i> Matthew, 1915 (2 sp.)	Early Eocene	N. Am.	80–85
<i>Absarokius</i> Matthew, 1915 (3 sp.)	Early Eocene	N. Am.	75
<i>Anemorhysis</i> Gazin, 1958 (1 sp.)	Early Eocene	N. Am.	20
<i>Uintalacus</i> Gazin, 1958 (1 sp.)	Early Eocene	N. Am.	30
<i>Chlororhysis</i> Gazin, 1958 (1 sp.)	Early Eocene	N. Am.	50
<i>Uintanius</i> Matthew, 1915 (2 sp.)	Middle Eocene	N. Am.	40–45
<i>Anaptomorphus</i> Cope, 1872 (4 sp.)	Middle Eocene	N. Am.	45–120
<i>Trogolemur</i> Matthew, 1909 (1 sp.)	Middle Eocene	N. Am.	25
Anaptomorphinae (?)			
<i>Kohatius</i> Russell & Gingerich, 1980 (1 sp.)	E.-M. Eocene	Asia	55
Omomyinae			
<i>Arapahovius</i> Savage & Waters, 1978 (1 sp.)	Early Eocene	N. Am.	80
<i>Loveina</i> Simpson, 1940 (1 sp.)	Early Eocene	N. Am.	50
<i>Shoshonius</i> Ganger, 1910 (1 sp.)	Early Eocene	N. Am.	45
<i>Omomy</i> Leidy, 1869 (5 sp.)	E.-M. Eocene	N. Am.	30–85
<i>Utahia</i> Gazin, 1958 (1 sp.)	Middle Eocene	N. Am.	30
<i>Washakius</i> Leidy, 1873 (2 sp.)	Middle Eocene	N. Am.	40–50
<i>Hemiacodon</i> Marsh, 1872 (1 sp.)	Middle Eocene	N. Am.	240
<i>Stockia</i> Gazin, 1958 (1 sp.)	Late Eocene	N. Am.	125
<i>Ourayia</i> Gazin, 1958 (2 sp.)	Late Eocene	N. Am.	270–480
<i>Chumashius</i> Stock, 1933 (1 sp.)	Late Eocene	N. Am.	80
<i>Dyseolemur</i> Stock, 1934 (1 sp.)	Late Eocene	N. Am.	50
<i>Macrotarsius</i> Clark, 1941 (2 sp.)	Late Eocene	N. Am.	370–550
<i>Rooneyia</i> Wilson, 1966 (1 sp.)	E. Oligocene	N. Am.	340
<i>Ekgmowechashala</i> McDonald, 1963, (1 sp.)	L. Oligocene	N. Am.	420
Microchoerinae			
<i>Nannopithec</i> Stehlin, 1916 (3 sp.)	M. Eocene	Eur.	40–50
<i>Pseudoloris</i> Stehlin, 1916 (4 sp.)	M.-L. Eocene	Eur.	15–35
<i>Necrolemur</i> Filhol, 1873 (2 sp.)	L. Eocene	Eur.	80–85
<i>Microchoerus</i> Wood, 1844 (3 sp.)	L. Eoc.-E. Olig.	Eur.	225–400

the discussion here, it is important to note that *Tarsius* does not follow the normal body size/tooth size relationship in primates, but it has teeth significantly larger than one would predict given its body size. Or conversely, predictions of body size from tooth size in *Tarsius* will significantly overestimate the former. In the analysis presented here, a tarsioid regression axis has been constructed parallel to the general primate regression in such a way that it passes through the two points representing *Tarsius*. This new line yields predicted weights that are consistent for *Tarsius*, but significantly less than those predicted using the general primate regression.

Body weights for species of Omomyidae predicted from the tarsioid regression are listed in the right hand column of Table 3–1, and these values are shown graphically for all species of each subfamily in fig. 3-2. Note that Omomyidae range from an estimated body weight of about 10 g (*Altanius*) to an estimated body weight of about 550 g (*Macrotarsius*). Anaptomorphines have a modal body weight of

