

Current events

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Mammalian order Proprimates—response to Beard

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I recently placed Plesiadapiformes in a new order Proprimates and wrote the following (Gingerich, 1989: 23, quoted verbatim):

“It is not possible to demonstrate a close phyletic connection between archaic plesiadapiform primates (Microsyopoidea and Plesiadapoidea) and primates of modern aspect (Tarsioidea, Lemuroidea, Ceboidea, etc.). Archaic Microsyopoidea and Plesiadapoidea represent a much more primitive grade. The gap between Proprimates and true Primates is similar to that separating primates of prosimian grade from primates of simian or anthropoid grade. Recognition of Proprimates (including Plesiadapiformes) as a new archaic order with no living members parallels recognition of a separate archaic order Condylarthra distinct from Artiodactyla, Perissodactyla, etc.: both are likely to be paraphyletic in that they may have given rise to more advanced groups that are not classified within the same orders. The taxon Proprimates is compositionally equivalent to what I formerly called Praesimii (Gingerich, 1984), but Proprimates is more appropriate as a name in contrasting included forms with all Primates of modern aspect (Prosimii plus Anthroipoidea [or Simii]), not just Simii. Proprimates is appropriate too in that the name implies removal of the group from the order Primates. Proprimates includes Plesiadapiformes as a suborder or infraorder, with Plesiadapoidea and Microsyopoidea as superfamilies, and it may include Tupaiiformes and other quasi-primates as well (e.g., Apatemyidae, and possibly Plagiomenidae). Paromomyiformes of Szalay (1973) and Peneprimates of Hofstetter (1978) are equivalent in composition to the group here called Plesiadapoidea.”

This seems clear enough, but I add the following in response to Beard's comments in this journal:

1. The order Proprimates includes Plesiadapiformes and it *may* include Tupaiiformes and other quasiprimates as well (e.g., Apatemyidae, and possibly Plagiomenidae). Uncertainty is common in study of the past. As it stands the order includes no living members, but if expanded to include Tupaiiformes this would obviously no longer be true.
2. No morphological characters are listed because *groups* are defined by what they contain and the characteristics of Proprimates are the characteristics of its constituents. Characteristics of Plesiadapoidea and Microsyopoidea are as yet only partially known (see for example Gingerich, 1976, and Gunnell, 1989). The objective in classification is to recognize groups of similar organisms produced by evolution without forcing these to fit definitions and character lists preconceived from prior (and necessarily more limited) knowledge.
3. Proprimates is probably a natural *monophyletic* group, but it may not be *holophyletic* in that

it may not include all its descendants (e.g., Primates and Dermoptera, if either or both prove to be descendants). All groups that leave descendants are paraphyletic. Cladists approach systematics as if modern diversity is the product of a single evolutionary radiation, but the fossil record indicates there have been many successive radiations and many groups have given rise to others.

4. Romer's Plesiadapoidea, Simons and Tattersall's Plesiadapiformes, Szalay's Paromomyiformes, Hofstetter's Peneprimates, and my Praesimii are all taxa *within* Primates: Proprimates differs in being a taxon *outside* Primates. Beard evidently agrees that Plesiadapiformes should be removed from Primates, and takes this farther in arguing that some belong in Dermoptera (Beard, reference cited as 1990 [not seen]).

5. I am not interested in defining away the problem of identifying the closest relatives of Primates, but rather recognize that we are poorly informed on the subject: the gap between Plesiadapiformes and true Primates has widened as we have learned more about their respective morphologies and their distributions in time and space. I still think Plesiadapiformes should be compared with Primates, and vice versa, but evidence to justify inclusion of Plesiadapiformes in any modern order is weak and I prefer to classify this broad evolutionary radiation in an order of its own.

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