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Parallel adaptive radiations in two major clades of placental mammals

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Abstract

Higher level relationships among placental mammals, as well as the historical biogeography and morphological diversification of this group, remain unclear[1, 2, 3]. Here we analyse independent molecular data sets, having aligned lengths of DNA of 5,708 and 2,947 base pairs, respectively, for all orders of placental mammals. Phylogenetic analyses resolve placental orders into four groups: Xenarthra, Afrotheria, Laurasiatheria, and Euarchonta plus Glires. The first three groups are consistently monophyletic with different methods of analysis. Euarchonta plus Glires is monophyletic or paraphyletic depending on the phylogenetic method. A unique nine-base-pair deletion in exon 11 of the *BRCA1* gene provides additional support for the monophyly of Afrotheria, which includes proboscideans, sirenians, hyracoids, tubulidentates, macroscelideans, chrysochlorids and tenrecids. Laurasiatheria contains cetartiodactyls, perissodactyls, carnivores, pangolins, bats and eulipotyphlan insectivores. Parallel adaptive radiations have occurred within Laurasiatheria and Afrotheria. In each group, there are aquatic, ungulate and insectivore-like forms.

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