

Robust time estimation reconciles views of the antiquity of placental mammals

April 18 2007

Despite great progress over the past decade, the evolutionary history of placental mammals remains controversial. While a consensus is emerging on the topology of the evolutionary tree, although with occasional disagreement, divergence times remain uncertain.

The age of earlier nodes and in particular the root, remain especially uncertain in the absence of definitive placental fossils deeper into the Cretaceous. Both paleontological and morphological studies suggest that the radiation of placental orders and super orders occurred close to the Cretaceous–Tertiary (K–T) boundary about 65 million years ago (mya). In contrast, molecular studies have suggested markedly older origins for many superordinal groups and that some extant orders diversified before the K–T boundary.

However, this discrepancy may not be real, but rather appear because of the violation of implicit assumptions in the estimation procedures, such as abrupt acceleration of evolutionary rate entangled with gradual variation and large-scale convergent evolution in molecular level.

By their new robust procedure, Dr. Kitazoe and his collaborators identified a strong and short-term acceleration of mitochondrial genome along the lineage leading to Laurasiatheria. The revised time at the root of placental mammals was much younger than the preceding reports, 84 million years ago instead of around 122 million years ago.

As a result, the estimated distribution of molecular divergence times is

broadly consistent with quantitative analysis of the North American fossil record and traditional morphological views. They emphasize the necessity to scrutinize the implicit assumptions adopted by the models of molecular evolution and to develop procedures which rely little on those assumptions.

Citation: Kitazoe Y, Kishino H, Waddell PJ, Nakajima N, Okabayashi T, et al (2007) Robust Time Estimation Reconciles Views of the Antiquity of Placental Mammals. PLoS ONE 2(4): e384.
doi:10.1371/journal.pone.0000384

Source: Public Library of Science

Citation: Robust time estimation reconciles views of the antiquity of placental mammals (2007, April 18) retrieved 11 May 2024 from <https://phys.org/news/2007-04-robust-views-antiquity-placental-mammals.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.