ACTA PALAEONTOLOGICA POLONICA

Conflicting developmental and paleontological data: the case of the bird manus

Max K. Hecht and Bessie M. Hecht
Acta Palaeontologica Polonica 38 (3-4), 1993: 329-338

Phylogenetic inference is based on the distribution of characters across taxa. Characters and their states should be described in all of their complexity. The entire development of a structure should be considered to determine its significance in the search for homology and synapomorphy and for the determination of homoplasy. Simplistic description of characters often leads to comparisons of homoplasies. The pattern of development of the manus of living amniotes demonstrates a basic plan that has been retained in living birds but has been modified in theropod dinosaurs. The primitive pattern of digital and metacarpal reduction in buds (2-3-4) and other living amniotes is contrasted with manus reduction pattern of the theropods (1-2-3) based on comparative morphology. Neither digital pattern reducton is derivable from the other. The recent discovery of early dinosaurs with primitive stages of the derived reduction patterns indicates an earlier origin for buds than previously postulated. This study demonstrates the use of developmental data in distinguishing homologous structures from homoplastic structures which is important in cladistic analysis.

Key words: homology, homoplasy, amniote manus, avian manus, theropod manus, digital reduction pattern.

This is an open-access article distributed under the terms of the Creative Commons Attribution License (for details please see creativecommons.org), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Full text (210.7 kB)