ACTA PALAEONTOLOGICA POLONICA

The role of paleontological data in testing homology by congruence

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Acta Palaeontologica Polonica 38 (3-4), 1993: 295-302

With homology being defmed as shared similarity due to common ancestry, any initial perception of similarity (or relative invariance) among organisms may be treated as a conjecture of homology to be tested by congruence. The phylogenetic information content is therefore not with the character itself, but lies in the relation of any one character to all others known. The "principle of total evidence" thus emerges as a logical corollary of the distinction of homology and homoplasy, the most severe test of homology involving all known characters in the search for the globally most congruent pattern. In a study combining fossil and extant organisms, however, the issue of missing characters raises the question of implicit a priori weighting, because some sources for characters (soft anatomy, molecular, physiological, behavioral) remain unknown in fossils. The issue of missing data in fossils requires further study before the potential impact of fossils on a classification based on extant organisms can be properly assessed.

Key words: homology, phylogeny, classification, fossils, buds, mammals.

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