

Oldest mephitine cranium and its implications for the origin of skunks

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Acta Palaeontologica Polonica 44 (2), 1999: 223-230

Recent molecular studies have recognized the skunks (Mephitinae) to be the sister taxon of a clade comprising the Procyonidae and Mustelidae. These findings are inconsistent with the traditional placement of the skunks among mustelids, which is based on morphological evidence from extant taxa. This paper reports on a well-preserved cranium of a young individual, recovered from the middle Miocene deposits (MN 7+8, about 11B12 Ma) of Steinheim am Albuch, Germany. The fossil is the holotype of *Palaeomephitis steinheimensis* Jäger, 1839, which is here recognized as a senior subjective synonym of *Trochotherium cyamoides* Fraas, 1870 (consequently, *Palaeomephitis* Jäger, 1839 is a senior subjective synonym of *Trochotherium* Fraas, 1870). The specimen is identified as the oldest and most primitive mephitine cranium known to date, approaching the primitive morphology for the Mephitinae. It exhibits a combination of mephitine (accessory middle-ear chamber, lateral swelling of the squamosal) and mustelid (mustelid suprameatal fossa) synapomorphies, corroborating the view that skunks are derived from a mustelid ancestor. Its auditory bulla shows a slightly inflated and relatively large caudal entotympanic, which indicates that the uninflated and relatively small caudal entotympanics of adult mephitines, as well as their hypertrophied ectotympanics, are not primitive (as hitherto assumed) but derived, providing a synapomorphy that supports a sister-group relationship between the Mephitinae and Lutrinae.

Key words: *Palaeomephitis*, *Trochotherium*, Mephitinae, Mustelidae, Carnivora, phylogeny, taxonomy, morphology.

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