

## **Petrosal and cranial vascular system of the early Eocene palaeoryctid mammal *Eoryctes melanus* from northwestern Wyoming, USA**

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*Acta Palaeontologica Polonica* 67 (1), 2022: 203–220 doi:<https://doi.org/10.4202/app.00916.2021>

The petrosal and neighboring bones of the early Eocene palaeoryctid mammal *Eoryctes melanus* are described in tympanic and endocranial views based on CT scan data of the holotype. A second cranium of *E. melanus* has fragments of an osseous bulla, which have been interpreted as possibly formed by an independent entotympanic. The CT scans of the holotype reveal that the medial bullar wall is formed by an expanded rostral tympanic process of the petrosal, but the element(s) in the bullar floor remain unknown. The CT scans also allow for a comprehensive reconstruction of the cranial arterial and venous system. The arterial pattern differs from that in early eutherians by the absence of the arteria diploëtica magna and the bifurcation of the end branches of the stapedia artery dorsal to the tympanic roof. The venous pattern includes a large frontal diploic vein arising from the dorsal sagittal sinus on the midline and running through the frontal bone in a canal. Comparisons are made with other palaeoryctids, various Paleogene mammals (pantolestids, leptictids, apternodontids, apatemyids, and cimolestids) and the extant lipotyphlan *Solenodon paradoxus*. For the last taxon, the structure of the piriform fenestra and associated arteries is detailed. Cranial features support the monophyly of palaeoryctids and suggest possible lipotyphlan affinities.

**Key words:** Mammalia, Lipotyphla, *Solenodon*, entotympanic, facial nerve, frontal diploic vein, piriform fenestra, stapedia artery, tympanohyal, zygoma.

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