

## Endocranium and ecology of *Eurotherium theriodis*, a European hyaenodont mammal from the Lutetian

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Hyaenodonts are extinct placental mammals with a carnivorous diet. Their phylogenetic position among mammals and the relationships within Hyaenodonta are at present partially unresolved. The endocranium is a structure that has rarely been studied in this clade. Using 3D tomography, we studied the endocranium of the European hyaenodont *Eurotherium theriodis*, discovered in Egerkingen (Switzerland, Lutetian, middle Eocene). *Eurotherium theriodis* has an endocranium morphology that supports an increase in size of the cerebrum relative to the cerebellum over time within the Hyaenodontoidea. The endocranium also supports a complexification of the cerebrum (i.e., at least two furrows per cerebral hemisphere) within the Hyaenodontoidea and allows us to envisage an increase of the encephalization quotient (EQ), over time. Based on morphology, we consider that its endocranium does not depart from that of the hyaenodontoids known in the Lutetian, Bartonian, and Priabonian of Europe, being less complex than that of the hypercarnivorous *Hyaenodon*. However, the morphology of its olfactory bulbs and turbinates is similar to that observed in *Hyaenodon*. The large size of the turbinates of *E. theriodis* is regarded to be the result of a possible scavenger ecology and agrees with the meat/bone diet envisaged based on the analysis of the morphology of the skull and teeth.

**Key words:** Mammalia, Hyaenodonta, endocranium, phylogeny, ecology, olfaction, Eocene.

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