



## Brain cast of a Miocene dolphin

**Stefaniak, K. 1993. Natural endocranial cast of a delphinid (Cetacea, Delphinidae) from the Pińczów Limestones (Middle Miocene; Holy Cross Mountains, Central Poland). *Acta Geologica Polonica* 43, 1-2, 115-119, 3 plates.**

Adaptations to a completely aquatic way of life make the evolutionary trends of the phylogeny of whales very distinct. Particularly so are the transformations of skull, such as the migration of nares towards the top of the skull roof and associated telescoping and progressing asymmetry of skull bones, as well as the specializations of ear structures, adaptation to under-water hearing, and development of capacity for echolocations in toothed whales, as well as deficiency of olfaction. Whereas the locomotor apparatus of whales became highly adapted to life in the water by the Middle Eocene, becoming more or less modern by the Oligocene, the transformation of the skull characters proceeded at various rates, and parallel in particular phylogenetic lines beginning with the Early Eocene on to the modern times.

Most skull novelties bear on the form of encephalon which corresponds to the volume and sculpture of the brain case. The correspondence is less exact in whales than in the majority of mammals owing to the thickness of the meninges, which cover the fissures of the cortex surface and to hypertrophy of the retia mirabilia of blood capillaries associated with diving capacity, that obscures the outlines of particular brain regions.

The whale encephalon described in the paper may still be assigned to the whale family on the basis of the proportions and shape of its particular parts. Any more exact assignment is impossible to the best of our present knowledge, owing to a lack of generic characters in this kind of material. Nor are, any more sophisticated conclusions on the brain activity of this whale possible due to the state of preservation of the cast.

Less advanced than the extant delphinids with respect to relative development of sense centers and brain capacity, and more than the known Oligocene genera, the proprietor of this brain may be recognized as a fairly typical representative of the Miocene medium-sized whales.

From among 25 genera belonging to the family Delphinidae (one of 13 families of the Odontoceti), 18 genera come from the Miocene and five of them are known from European sea deposits.

With this paper, we are dealing with one record more of the Delphinidae from the Miocene sea deposits of Poland which raises the number of Polish whale records to five and adds just a tiny percent age to a huge record of whales from the Miocene, a period of great radiation of this mammalian order.

The paper supports the opinion that whales, and particularly the Odontoceti, were quite common in the Miocene waters of Paratethys.

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