Giant theropod dinosaurs from Asia and North America: 
Skulls of *Tarbosaurus bataar* and *Tyrannosaurus rex* compared

Jørn H. Hurum and Karol Sabath

*Acta Palaeontologica Polonica* 48 (2), 2003: 161-190

The skull of a newly prepared *Tarbosaurus bataar* is described bone by bone and compared with a disarticulated skull of *Tyrannosaurus rex*. Both *Tarbosaurus bataar* and *Tyrannosaurus rex* skulls are deep in lateral view. In dorsal view, the skull of *T. rex* is extremely broad posteriorly but narrows towards the snout; in Ta. bataar the skull is narrower (especially in its ventral part: the premaxilla, maxilla, jugal, and the quadrate complex), and the expansion of the posterior half of the skull is less abrupt. The slender snout of *Ta. bataar* is reminiscent of more primitive North American tyrannosaurids. The most obvious difference between *T. rex* and *Ta. bataar* is the doming of the nasal in *Ta. bataar* which is high between the lacrimals and is less attached to the other bones of the skull, than in most tyrannosaurids. This is because of a shift in the handling of the crushing bite in *Ta. bataar*. We propose a paleogeographically based division of the Tyrannosaurinae into the Asiatic forms (*Tarbosaurus* and possibly *Alioramus*) and North American forms (*Daspletosaurus* and *Tyrannosaurus*). The division is supported by differences in anatomy of the two groups: in Asiatic forms the nasal is excluded from the major series of bones participating in deflecting the impact in the upper jaw and the dentary-angular interlocking makes a more rigid lower jaw.

**Key words:** Dinosauria, Theropoda, Tyrannosauridae, Tarbosaurus, Tyrannosaurus, skull, anatomy, Mongolia.

Jørn H. Hurum [j.h.hurum@nhm.uio.no], Paleontologisk Museum, Boks 1172 Blindern, N–0318 Oslo, Norway; Karol Sabath [sabath@twarda.pan.pl], Instytut Paleobiologii PAN, ul. Twarda 51/55, PL–00–818 Warszawa, Poland.

This is an open-access article distributed under the terms of the Creative Commons Attribution License (for details please see creativecommons.org), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.