

**RE-DESCRIPTION OF *THALASSOMEDON HANINGTONI* – AN ELASMOSAURID FROM THE  
CENOMANIAN OF NORTH AMERICA**

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*Thalassomedon haningtoni* is one of the most thoroughly documented elasmosaurids. The type specimen, a nearly complete skeleton representing an osteologically mature individual with a well preserved postcranium (but damaged skull) was found in Cenomanian strata of the Graneros Shale in Colorado, USA. The only comprehensive description of this specimen produced so far is that of Welles (1943); however, his interpretations are contentious and require substantial updating relative to subsequent elasmosaurid discoveries. A second specimen of *T. haningtoni* is also known from the Cenomanian Graneros Shale of Nebraska, USA. This skeleton comprises a well preserved skull and articulated series of cervical, pectoral and a few dorsal vertebrae. Welles (1970) briefly mentioned the Nebraska *T. haningtoni* material in a newspaper article, and both Carpenter (1999) and Sato (2002) provided an interpretation of its skull. The osteologically immature elasmosaurid remains of *Alzadasaurus riggsi*, found likewise in Cenomanian strata of the Belle Fourche Formation in Montana, USA, was referred to *T. haningtoni* by Carpenter (1999); however, most of these remains are fragmentary and heavily distorted and they are insufficient for a confident diagnosis. It

therefore cannot be referred to *Thalassomedon* with certainty and is best considered a *nomen dubium*.

Since Welles' (1943) original documentation of *T. haningtoni* is flawed, and a detailed account of the Nebraska specimen has not yet emerged, we reassessed the material first-hand in order to interpret its character states and phylogenetic implications. The postcranial elements of both, the Colorado holotype and Nebraska specimen, are virtually undistorted, and reveal classical elasmosaurid traits, including a convex ventrolateral edge of the orbit, a ventral notch and longitudinal lateral ridge on the craniad cervicals, and transversally narrow cervical ribs (see Sachs & Kear, 2015). The teeth, which bear fine apicobasal enamel striations, are pristinely preserved in the Nebraska specimen. Salient cranial features include a prominent dorsomedian ridge on the premaxilla, ventromedian crest on the mandibular symphysis, dome-shaped parietals, and circular external nares. Moreover, the co-ossified atlas-axis complex (which is better preserved in the Nebraska specimen), bears a prominent hypophyseal ridge, and the craniad cervical centra are amphicoelous. The interclavicle is also fused with the clavicles and bears a prominent midline keel, the propodials are of near equal length but the femur is more slender than the humerus. Finally, a prominent craniolateral cornu is present on the pubis whereas a pelvic bar is absent.

In conclusion, the superb preservation of the Colorado holotype and referred Nebraska specimen of *T. haningtoni* establish a morphological benchmark for this taxon that will be applied for determination of the contentious phylogeny of elasmosaurids and their clade boundaries. Insights into biomechanics and palaeobiology of these quintessential Cretaceous plesiosaurians are also underway.

## References

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**A REASSESSMENT OF HISTORICAL PLESIOSAURIAN SPECIMENS  
FROM THE TURONIAN (LOWER UPPER CRETACEOUS) OF THE OPOLE AREA,  
SOUTHWEST POLAND**

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