SIZE VARIATION IN CRANIAL MORPHOLOGY OF LATE CRETAEOUS TOXOCHELYS (TESTUDINES; CHELONIIDAE) OF SOUTH DAKOTA

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ABSTRACT

In 1988, five species belonging to the genus *Toxochelys* were reexamined. As a result, only two species were considered valid, *T. latiremis* Cope and *T. moorevillensis* Zangerl. *T. browni* (Hay), *T. weaksi* Collins, and *T. barberi* (Schmidt) were designated as junior synonyms of *Toxochelys latiremis* (Nicholls 1988). Prior to the reinvestigation, *T. browni* was a species defined by its broader size limits and distinct premaxillary region. Nicholls dismissed these characters as natural variations within a species, attributing them to temporal factors. *T. browni* was also temporally restricted, only being found in the lower Pierre Shale, a unit that had not been known to yield *T. latiremis*. Eleven undescribed toxochelid skulls from the Pierre Shale of South Dakota have been studied and all exhibit sizes that are less than or greater than the size range specified for *T. latiremis*. Furthermore, all of the toxochelids retaining an anterior cranial region display the characteristic sigmoidally-curved lateral margins of the premaxilla and maxilla. This character is not observed in *T. latiremis*. It is a possibility that *T. browni* may have been incorrectly assigned junior synonym status. In order to examine this uncertainty, a preliminary study has been conducted to determine if the systematics of *Toxochelys* needs to be readdressed. 46 characters of the skull and lower jaw were measured on the group of eleven Pierre Shale toxochelids and on a separate group of turtles belonging to *T. latiremis*. Measurements were first compared within each group to establish generalities. This and the original data were then used to compare proportionality of the various measurements and to compare the average growth rate between the two groups. Differing proportions between the two groups in both morphology and growth rate indicate the possibility of an error in the synonymization. Further research is recommended to clarify this uncertainty.