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RESEARCH & KNOWLEDGE

Research Article

A new well-preserved sturgeon (Chondrostei: Acipenseridae) from the Late Cretaceous of Alberta, Canada

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Abstract - In June 2016, the remains of an articulated fish was discovered during field work in Dinosaur Provincial Park, in southern Alberta, Canada. Articulated remains of fishes are very rare in the park, so this specimen was carefully collected and prepared. The new specimen represents a new species of sturgeon that differs from those previously reported from the Cretaceous of North America by the ornamentation patterns of the dermal skull elements. We believe that the radiating ridges forming the ornamentation on the dermal skull bones of the new Dinosaur Park specimen is indicative of it being a different species from that represented by any of the scutes or other articulated material previously named.

Keywords: Acipenseriformes, Campanian, Dinosaur Park Formation

1. Introduction

In June 2016, the first author discovered the remains of an articulated fish during field work in Dinosaur Provincial Park, in southern Alberta, Canada. Articulated remains of fishes are very rare in the park, so this specimen was carefully collected and prepared over the late summer and autumn of 2016. The specimen proved to be the anterior part of a sturgeon (Acipenseridae).

There are few articulated sturgeon fossils known from the Cretaceous of North America. Most named Cretaceous sturgeon material is based on isolated scutes and pectoral fin spines. Two species based on articulated specimens have previously been named, *Priscosturion longipinnis* and *Protoscaphirhynchus squamosus*. The type specimen of *Priscosturion longipinnis* (originally named in the preoccupied genus *Psammorhynchus* by Grande and Hilton 2006; see Grande and Hilton 2009 for the replacement name) is from the Judith River Formation of Montana, USA. The specimen is very well preserved and complete (Grande and Hilton, 2006), which allows a great deal of information to be gleaned. A second specimen from similarly aged deposits on the Canadian side of the border in Alberta was assigned to the same taxon; it is less complete and crushed, obscuring details (Grande and Hilton, 2009).

Protoscaphirhyncus squamosus is not as well preserved and is incomplete, lacking much of the head (Wilimovsky, 1956). Hilton and Grande (2006) indicated that the specimen might not have any diagnostic characters; however, they felt it should be considered a valid taxon until conclusively shown otherwise.

There are several other partial articulated sturgeon specimens known. Currently the oldest acipenserid is represented by an articulated parasphenoid and parietal bones from Cenomanian deposits of northern Alberta (Vavrek *et al*., 2014). This specimen was not formally named. Also unnamed are two partial, articulated series of scutes from younger Upper Cretaceous deposits of southern Alberta in the collections of the Royal Tyrrell Museum of Palaeontology (catalogue numbers TMP 94.360.1 and TMP 96.150.01); these specimens have yet to be formally studied. A partial body, lacking head and tail, is also known from the Maastrichtian of Montana (Hilton and Grande 2006).

Although there are a number of partial articulated sturgeon specimens, few are well enough preserved or diagnostic enough to be named. The anterior portion of the articulated sturgeon collected from Dinosaur Provincial Park in 2016 is well preserved, and can be clearly diagnosed as a new species.

2. Materials and methods

When the specimen was discovered, a portion of the left lateral side was visible. The specimen was prepared on this side using hand tools and an air scribe to remove the matrix, exposing the dorsolateral part of the skull and the left lateral anterior body. A removable jacket was then made of the exposed side, and the specimen was flipped to prepare it from the other side. Because of the distortion of the specimen, this other side preserved the ventral part of the head, including the jaws and part of the branchial region. The bones on this side were not fully prepared, to prevent the complete disarticulation of the specimen.

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3. Results

The new specimen represents a new species of sturgeon that differs from those previously reported from the Cretaceous of North America by the ornamentation patterns of the dermal skull elements. These consist of thin ridges and grooves that radiate from the centre of each bone. The expanded dorsal and lateral scutes that develop median spines, and the extensive covering of smaller dermal scales on the flank, also distinguish it from the named articulated remains as well as from isolated scutes found in Cretaceous deposits.

4. Discussions and conclusions

There is remarkable variability in modern sturgeons in terms of the dermal skull bones. As documented by Hilton *et al*. (2011) for the extant *Acipenser brevirostrum*, the skull bones may be assymmetrical, and the pattern and numbers of bones may vary among individuals of the same species. However, the actual pattern of ornamentation appears to be more constant, with, for example, specimens of *A. brevirostrum* having an ornamentation of pits and bumps (e.g., Hilton *et al*., 2011: fig. 24) and *A. fulvescens* being formed of ridges and grooves (pers. Observ., HS, OV, AMM). For this reason, we believe that the radiating ridges forming the ornamentation on the dermal skull bones of the new Dinosaur Park specimen is indicative of it being a different species from that represented by any of the scutes or other articulated material previously named.

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