INITIAL DESCRIPTION AND IDENTIFICATION OF LARGEST KNOWN LONGNOSE GAR, *LEPISOSTEUS BEMISI*, FROM THE GREEN RIVER FORMATION OF WYOMING, U.S.A

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ABSTRACT

The lower Eocene Green River Formation (48.5-53.5 Ma) of Fossil Lake in southwest Wyoming was a tropical/subtropical freshwater paleoenvironment in a volcanically active area. Within the Green River Formation, the Fossil Butte Member (52 Ma) is a layer of rock famous for an abundance and variety of exceptionally preserved fossils. Among the largest organisms found in the Green River are gar (Lepisosteiformes). Four species of gar have been described from the Fossil Butte Member sediments of the Green River Formation: Masillosteus janei, Atractosteus atrox, Atractosteus simplex, and Lepisosteus bemisi. The specimen we examined is currently housed at the Wyoming Dinosaur Center (Specimen ID JJSF-2012-001) and is an example of the excellent preservation common to the Split Fish layer of the Fossil Butte Member in which it was discovered. Based on the locality of the specimen and numerous diagnostic features; the size, elongated jaw, number of caudal rays, the pointed build of the teeth, and lack of a supraoccipital bone, we identify specimen JJSF-2012-001 as a specimen of Lepisosteus bemisi, commonly referred to as the Green River longnose gar. The quality of preservation and the detail of preparation of this specimen will allow for considerable future research that will enrich our understanding of L. bemisi and related gar. Specimen JJSF-2012-001 is also the largest L. bemisi specimen described to date, with a total length (TL) of 1655 mm, 45 mm longer than the largest previously known specimen.

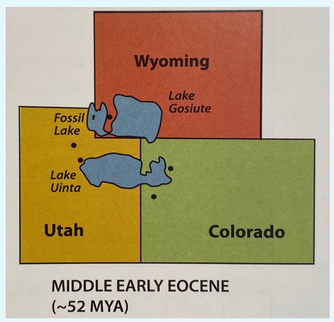
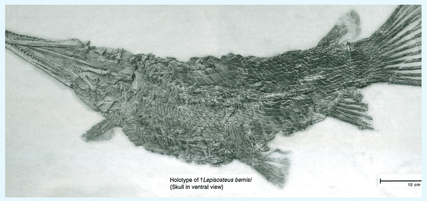
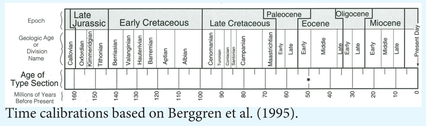


Photo taken from Grande (2013)



Holotype of Lepisosteus bemisi, the "Green River longnose"



Time calibrations based on Berggren et al. (1995).

LOCALITY

Specimen JJSF-2012-001 was found in the Green River Formation of south-western Wyoming. The specimen was collected from the Split Fish layer of the Fossil Butte Member, which is known for a variety of well-preserved prehistoric life. There are four other gar species that have been found in the Fossil Butte Member of the Green River Formation. During the Eocene Epoch there was an intricate lake system, now found in the states of Wyoming, Colorado, and Utah (Ferber and Wells 1995, Grande 2013). Within that lake system, Specimen JJSF-2012-001 was found in what is now known as Fossil Lake, a tropical/subtropical paleoenvironment and the youngest of the major lakes in the Green River Formation. The eco-environment of Fossil Lake consisted of many different species of lacustrine vertebrates typical of the time. Specimens of Lepisosteus bemisi are most common in the mid-lake and the nearshore sandwich beds (Grande 2013).

13+ caudal rays of JJSF-2012-001

Head and Jaw of Specimen JJSF-2012-001

A: Relatively Elongated Head B: Pointed Teeth
C: Lack of Supraoccipital Bone D: 13+ Caudal Rays

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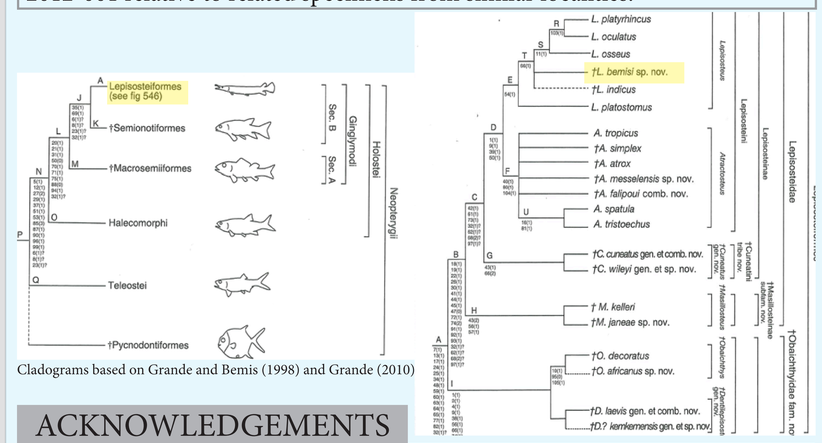
METHODS

We first began by identifying the species of specimen JJSF-2012-001. Because Our goal in this study was to identify a previously undetermined specimen of fossil gar from the Eocene sediments of Fossil Lake. At the time of this study, this specimen is house at the Wyoming Dinosaur Center (WDC) as JJSF-2012-001. The staff at the WDC has been integral to facilitating our study with access to the specimen. We took measurements, observations, and photographs of the specimen, which we were then able to compare to the extensive literature on fossil gar specimens (Grande 2010).

CONCLUSION

Our analysis of specimen JJSF-2012-001 has led us to identify it as a member of *Lepisosteus bemisi*. Though physically similar to Atractosteus atrox gars, also common in Fossil Lake sediments (Grande 2010, 2013), *L. bemisi* has a clearly diagnosable character of 13 or more caudal rays, clearly visible in specimen JJSF-2012-001. The specimen also has an elongate head, and a longer preorbital length relative to its postorbital length, which are also diagnostic of *L. bemisi* (Grande 2010). As the evidence directed us to the appropriate identification, we revisited our measurements of specimen JJSF-2012-001. Upon doing so, we realized that in addition to identifying this specimen, that we had also been analyzing the largest known specimen of *L. bemisi*. The previously described largest specimen, TY-G1, has a total length of 1610mm. JJSF-2012-001, by comparison, has a total length of 1655mm, making the WDC specimen the largest example of *L. bemisi* currently described by 45mm. We hope to continue our study of this specimen by visiting collections, such as those housed at the Field Museum in Chicago, to better appraise the characteristics of JJSF-2012-001 relative to related specimens from similar localities.



Cladograms based on Grande and Bemis (1998) and Grande (2010)

ACKNOWLEDGEMENTS

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