

Research Advances

First Report of Osteoglossiform Fish *Huashia* from the Cretaceous of Eastern Liaoning, China

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Objective

The Mesozoic strata in eastern Liaoning and southern Jilin are relatively well developed. Liu et al. (1963) studied *Lycoptera* in North China, and they mentioned the fossils of south Jilin, but they were not included in the study due to the lack of specimens and poor preservation. Ma and Sun (1988) studied fish fossils from the Sankeyushu section in Tonghua, Jilin, and laid the foundation for the study of fish fossils in this area. Later, paleontologists came to eastern Liaoning and southern Jilin to investigate fish fossils; Su (1992) collected and studied fish fossils in the Suzihe Basin (Nanzamu, Xinmin Manchu Autonomous County) in eastern Liaoning. The research level in eastern Liaoning and southern Jilin is also very low, but the composition of fossil faunas is different, and they are very important for fish evolution and zoogeographic significance. We have carried out fossil fish surveys in eastern Liaoning and discovered fossils of the freshwater fish *Huashia* in the Xiaowenzhigou area.

Huashia fossils are distributed in Zhejiang (NIMRF, 2015a), Gansu (NIMRF, 2012), Ningxia (NIMRF, 2015b), Jilin and other regions in China (Ma and Sun, 1988). In western Liaoning, *Huashia* only appears in the Jiufotang Formation (Fm.) in Binggou Village, Jianchang County. Species of *Huashia* are unique to East Asia in the Late Mesozoic (Zhang, 2002). *Huashia* is different from *Lycoptera* in its stage of development and evolution, because its dentofacial structure tends to be teleost-like, the parasphenoid bone is toothless, and the notochord perforation is small. *Huashia* is a member of the later fish group of the Jehol Biota (Ma and Sun, 1988). Therefore, the *Huashia* fossils of eastern Liaoning are of great significance for studying the migration and evolution of Jehol biota. At the same time, the large number of beds with *Huashia* are significantly higher than the concentration of *Lycoptera*, which can be used as an important basis for Mesozoic stratigraphic division and comparison.

Geological Setting

The fossils were discovered in Wenzhigou Village, Hualai Town, Huanren County, Benxi City, Liaoning Province, China (GPS: 125°8'13"E, 41°28'43"N, Fig. 1). The studied area is mainly composed of Mesozoic and Pre-Mesozoic granite intrusions and sedimentary caprocks; the strata are composed of Pre-Paleozoic, Paleozoic, Mesozoic and Cenozoic beds. The fossiliferous horizons are part of the Cretaceous Lishugou Fm. More than 50 fossil specimens, including the arthropod *Yanjiestheria* (Li and Wu, 2021) and the fish fossils were found in a section of beds comprising a yellow-green tuff siltstone, yellow-green silt mudstone, and dark gray siltstone within the Lishugou Fm. There are nine specimens of *Huashia* come from yellow-green tuff siltstone in our collection and those relatively well preserved are illustrated in this paper (Fig. 2). Fossils are stored in Liaoning Provincial Institute of Geological Exploration Co., Ltd. (LN-HR), Dalian, China.

Results

Order Osteoglossiformes

Suborder **Huashioidae** Zhang, 1990

Family **Huashiidae** Chang and Chou, 1977

Genus ***Huashia*** Chang and Chou, 1977

Species ***Huashia* sp.**

Material: Nine specimens, of which five are illustrated (Fig. 2). Their catalog numbers are LN-HR-022S10 (Fig. 2a), LN-HR-022S08 (Fig. 2b), LN-HR-022S01 (Fig. 2c), and LN-HR-022S06 (Fig. 2d), and LN-HR-022S05 (Fig. 2e): Lishugou Fm. of Albion Stage (Early Cretaceous).

Description: All specimens are incomplete. In some, the dorsal and caudal fins are poorly preserved (Fig. 2a); others preserve only the head and part of the trunk (Figs. 2b, d). Some have only caudal peduncle and caudal fins (Fig. 2c). One specimen preserves only the trunk and ventral fins (Fig. 2e). The body of the fish is spindle-shaped with a total length of about 6–7 cm. Length and depth of skull are 1.2–1.5 cm. Length of skull almost

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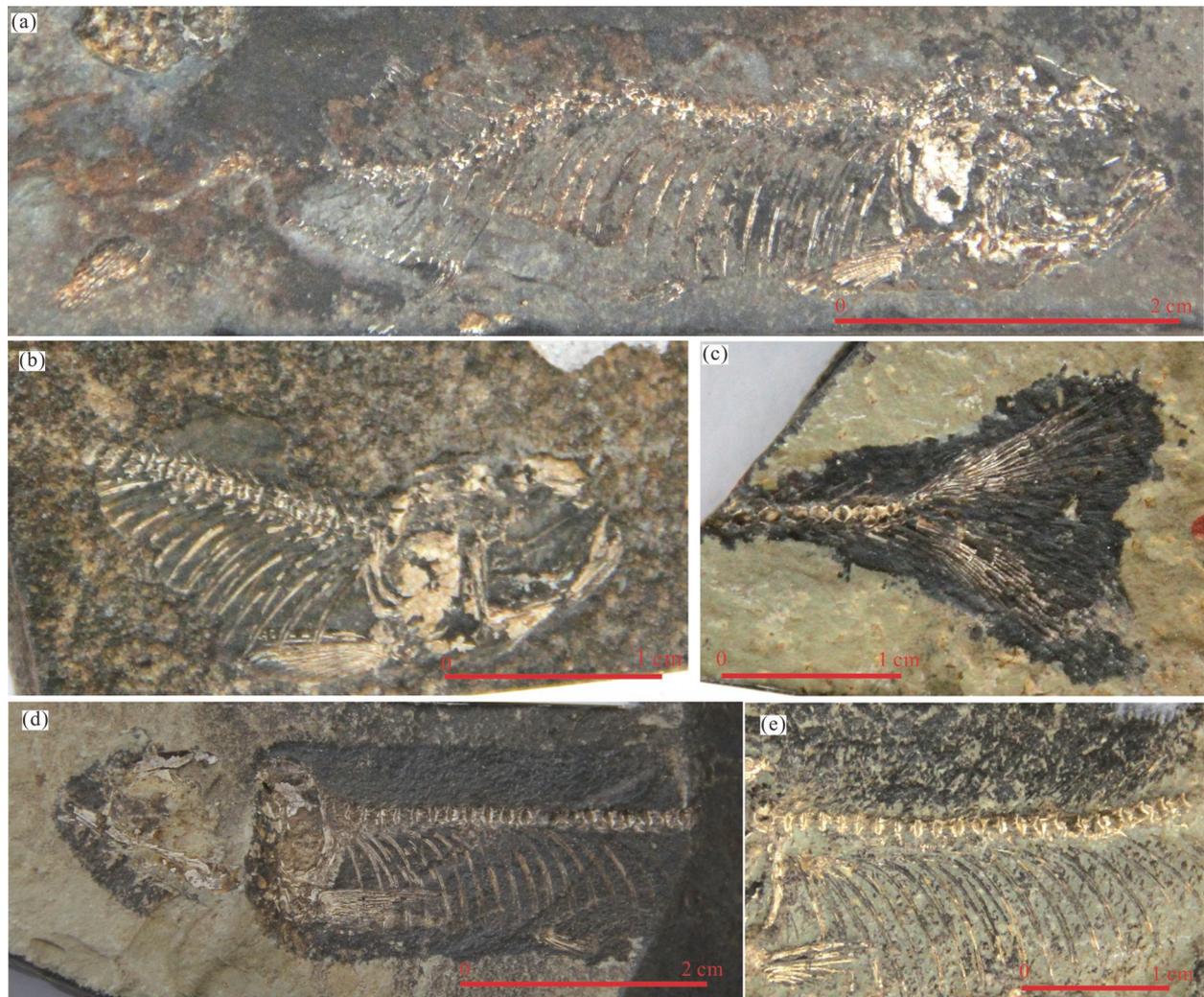


Fig. 2. Photographs of *Huashia* sp. fossils from the Lishugou Formation in the Wenzhigou area of eastern Liaoning Province. (a) LN-HR-022S10 showing articulated skeleton except tail; (b) LN-HR-022S08 showing head to anterior vertebrae only; (c) LN-HR-022S01 showing tail and caudal vertebrae; (d) LN-HR-022S06 showing head to mid-body; (e) LN-HR-022S05 showing pectoral fin and mid-body vertebrae.

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