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## A new form of Elongatoolithidae, *Undulatoolithus pengi* oogen. et oosp. nov. from Pingxiang, Jiangxi, China

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### Abstract

A new oogenus and oospecies of the Elongatoolithidae, *Undulatoolithus pengi* oogen. et oosp. nov., is described on the basis of specimens from the Upper Cretaceous Zhoutian Formation of the Pingxiang Basin, Jiangxi Province, China. The eggs are slightly asymmetrical, paired, and lay radially-oriented in a circular configuration within the clutch, and most suggestive of *Macroolithus* of the Elongatoolithidae by medium-sized eggs with average polar axis and equatorial diameter of 19.36 and 8.35 cm, and the ornamentation pattern of nodes and ridges on the outer surface. The new oogenus differs from *Macroolithus* in its prominent ridges 0.67 mm in height, about half of the entire eggshell thickness, gradational boundary between the cone layer and the overlying columnar layer, cone layer-to-columnar layer thickness ratio of 1/8 or 1/4. This discovery adds new data on the morphology and diversification of Late Cretaceous elongatoolithid ootaxa.

**Key words:** Elongatoolithidae, Dinosaur eggs, Zhoutian Formation, Upper Cretaceous, Pingxiang, China

### Introduction

Elongatoolithids are elongate, asymmetrical eggs with prominent ornamentation of nodes and ridges on the outer surface, and have an eggshell microstructure referable to the ornithoid-ratite morphology. Eggs within a clutch are paired, and arranged in a circular configuration with the central part about 10 cm in diameter. The Elongatoolithidae is represented by seven oogenera, *Elongatoolithus*, *Macroolithus*, *Nanhsiungoolithus* (Zhao 1975), *Heishanoolithus* (Zhao & Zhao 1999), *Paraelongatoolithus* (Wang et al. 2010), *Trachoolithus* (Mikhailov 1994, 1997), and *Ellipsoolithus* (Mohabey 1998), all of which are known from the Cretaceous of Asia.

Since 2002, dinosaur egg clutches, single eggs, a large number of eggshell fragments and dinosaur bones have been found in the Upper Cretaceous in the Pingxiang Basin, Jiangxi Province, China (Fig. 1). The strata yielding dinosaur bones and egg fossils in the basin are composed of red sandstone, and silty-mudstone with interbedded gypsum layers. According the composition of lithology combination, the stratum which yields dinosaur egg fossils in the Pingxiang Basin can be compared with the Upper Cretaceous Zhoutian Formation (Department of Geology and Mineral Resources of Jiangxi Province 1997; Liu 2003). In this paper, we describe the first clutch of elongatoolithid eggs found in 2002 from the Pingxiang Basin.

### Systematic paleontology

#### Elongatoolithidae Zhao, 1975

**Diagnosis:** Elongate, asymmetrical eggs; paired eggs arranged in a circular clutch; the polar axis length from 10.0 cm–21.0 cm, and equatorial diameter from 5 cm–9 cm, prominent nodes or ridges ornamentation on the outer surface; eggshell composed of the cone layer and the columnar layer, eggshell thickness ranges from 0.30 mm–2.00 mm.

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