



浙江天台盆地晚白垩世恐龙蛋新类型¹⁾

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摘要:浙江天台盆地上白垩统赖家组 and 赤城山组是我国最重要的恐龙蛋化石产出地层之一。近年来,我们对天台盆地陆相红层中的恐龙蛋化石层位进行了详细厘定,对恐龙蛋类型进行了系统描述,并对前人报道的一些属种进行了分类订正。研究显示,天台恐龙蛋化石群基本上可分为7蛋科、12蛋属和15蛋种,代表了我国晚白垩世早期的恐龙蛋化石组合。本文简要报道了主要产自天台盆地赤城山组的双塘似蜂窝蛋(新蛋属、新修订种)、木鱼山半蜂窝蛋(新蛋属、新蛋种)、国清寺副蜂窝蛋(新修订种)、天台棱柱形蛋(新修订种)和张头槽马赛克蛋(新蛋属、新修订种)等3新蛋属、5新蛋种和修订种的主要鉴定特征,并建立一新蛋科——似蜂窝蛋科。

关键词:浙江天台盆地,晚白垩世,赤城山组,恐龙蛋

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NEW OOTYPES OF DINOSAUR EGGS FROM THE LATE CRETACEOUS IN Tiantai Basin, Zhejiang Province, China

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Key words Tiantai Basin; Zhejiang Province; Late Cretaceous; Chichengshan Formation; dinosaur egg

In the past ten years, a number of dinosaur eggs were found from the Tiantai Basin in Zhejiang Province, and some oospecies were reported by Fang et al. (2000, 2003), Jin et al. (2007) and Qian et al. (2008). In 2010, we described and revised 12 oogenera and 15 oospecies belonging to seven oofamilies in this basin (Wang, 2010), and some new types were reported (Wang et al., 2010a, b; Zhang, 2010). At the same time, we comprehensively surveyed localities and horizons of the dinosaur eggs and compared the dinosaur egg faunas in China (Wang et al., in press). Here we report a few more new ootypes of dinosaur eggs from the Tiantai Basin.

Similifaveoolithidae oofam. nov.

Etymology From *Similifaveoolithus*.

Diagnosis Same as the type and only known oospecies.

Similifaveoolithus oogen. nov.

Etymology *Simili*, Latin, similar or likely; “*Similifaveoolithus*” in reference to the

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microstructure of eggshell similar to that of *Faveoololithus*.

Diagnosis Same as the type and only known oospecies.

***Similifaveoololithus shuangtangensis* (Fang et al., 2003) oogen. et comb. nov.**

Dendroolithus shuang tangensis Fang et al., 2003, p1. I, 11-12; p. 516

Referred specimens Six eggs in which five complete and one crushed (IVPP V 16512. 1-6) (Fig. 1A), and three incomplete eggs tightly connected to each other (TTM5).

Locality and horizon Shuangtang Village (V 16512. 1-6) and Jinguo Hotel (TTM5), Tiantai County, Zhejiang Province; Chichengshan Formation, Upper Cretaceous.

Amended diagnosis Eggs spheroid with an average diameter of 12.4 cm. Eggshell 1.05 ~ 1.27 mm thick. Eggshell is layered of two or three superimposed shell units of irregular shape. These incomplete units do not abut tightly in most cases, but are laterally interlocking each other with some fused near the outer surface of the eggshell (Fig. 1B). In tangential section, pores are irregular, looking as a whole like a honeycomb organization in the middle part of the eggshell (Fig. 1C).

Faveoololithidae Zhao & Ding, 1976

***Hemifaveoololithus* oogen. nov.**

Etymology *hemi*, Latin word, half; "*Hemifaveoololithus*" in reference to the lower part of the eggshell have the honeycomb-like character.

Diagnosis Same as for type and only known oospecies.

***Hemifaveoololithus muyushanensis* oogen. et oosp. nov.**

Etymology Species name in reference to the Muyushan Tunnel, in which the holotype was discovered.

Holotype An incomplete nest composed of ten eggs (TTM28) (Fig. 1D).

Locality and horizon Muyushan Tunnel, Tiantai County, Zhejiang Province; Chichengshan Formation, Upper Cretaceous.

Diagnosis Egg spheroid, 13.0 ~ 13.7 cm in diameter. Eggshell 1.60 mm thick. The eggshell is composed of four or five superimposed, irregular shell units. These units in most cases do not abut tightly in lower part of the eggshell, but are laterally interlocking in the upper part of the eggshell (Fig. 1E). In tangential section through the middle-lower part of the eggshell, the pores are extremely numerous, looking as a whole like a honeycomb (Fig. 1F).

***Parafaveoololithus* Zhang, 2010**

***Parafaveoololithus guoqingsiensis* (Fang et al., 2000) comb. nov.**

Dendroolithus guoqingsiensis Fang et al., 2000, p1. I, 21-22; p. 109

Referred specimens An incomplete nest composed of ten eggs (TTM12) (Fig. 1G).

Locality and horizon Muyushan Tunnel, Tiantai County, Zhejiang Province; Chichengshan Formation, Upper Cretaceous.

Amended diagnosis Spheroid eggs with an average diameter of 18.7 cm. Eggshell about 1.40 ~ 1.50 mm thick. The shell units in most cases are laterally interlocking near the outer surface of the eggshell (Fig. 1H). The pores are numerous, looking as a whole like a honeycomb in tangential section (Fig. 1I).

Prismatoolithidae Hirseh, 1994

***Prismatoolithus* Zhao, 1993**

***Prismatoolithus tiantaiensis* (Fang et al., 2000) comb. nov.**

Elongatoolithus tiantaiensis Fang et al., 2000, p1. I, 6-8; p. 108

Prismatoolithus oosp. Qian et al., 2008, figs. 1-6; p. 251

Referred specimens An incomplete nest composed of seven dinosaur eggs (IVPP V 16515. 1-2) (Fig. 1J), an incomplete nest composed of nine dinosaur eggs (TTM1) (Fig. 1K), and one fairly complete elongated egg with part of the sharp end missing (TTM30).

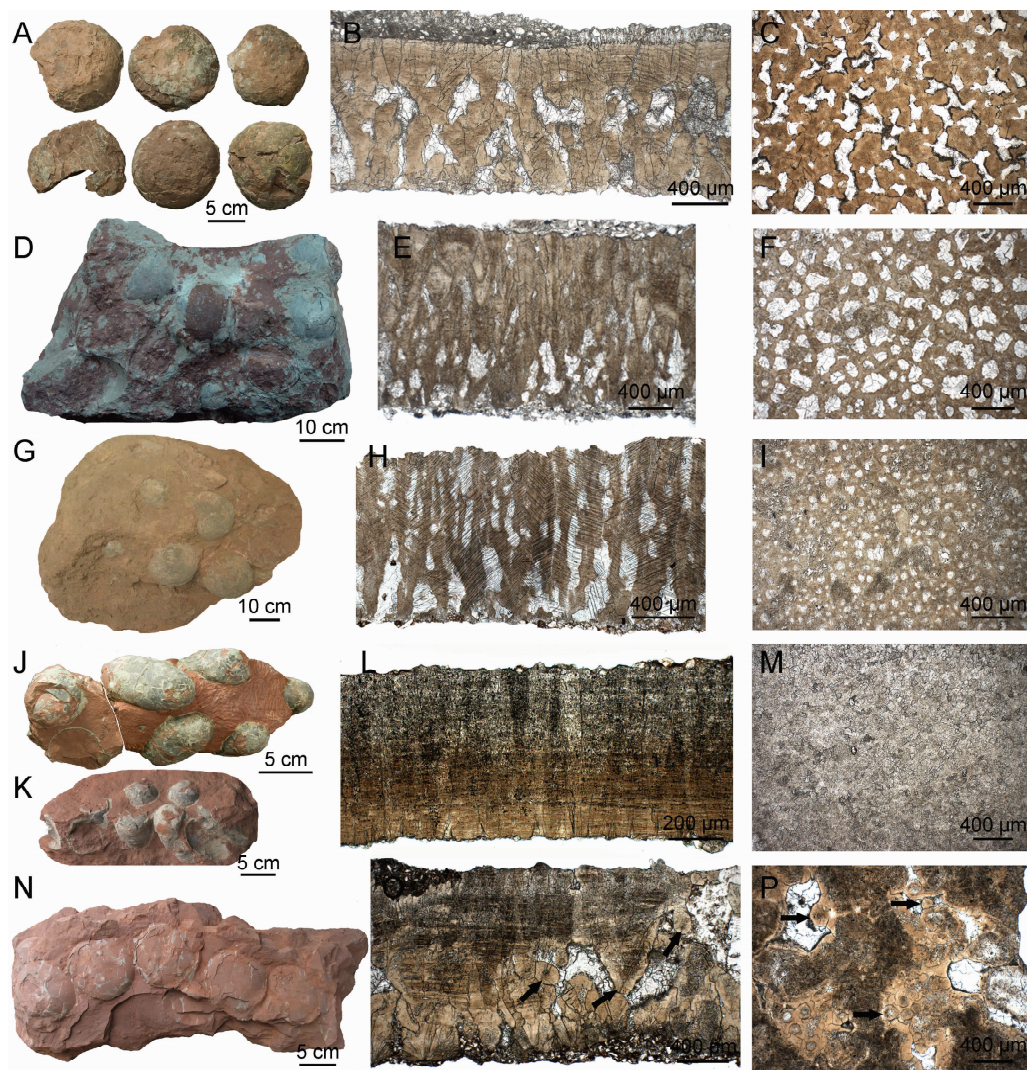


Fig. 1 Dinosaur eggs and the eggshell structure from the Late Cretaceous in Tiantai Basin, Zhejiang Province
 A-C. *Similifaveoololithus shuangtangensis*, A. Six more or less complete and crashed eggs (IVPP V 16512. 1-6); B. Radial section of eggshell showing the irregular eggshell units and irregular pore canals; C. Tangential section through the middle part of the eggshell showing an irregular honeycomb organization of pores; D-F. *Hemifaveoololithus muyushanensis* oogen. et oosp. nov., D. An incomplete nest composed of ten eggs (Holotype, TTM28); E. Radial section of eggshell showing the irregular eggshell units and pore canals; F. Tangential section through the middle part of the eggshell showing a honeycomb-like organization; G-I. *Parafaveoololithus guoqingsiensis*, G. An incomplete nest composed of ten eggs (TTM12); H. Radial section of eggshell showing the irregular eggshell units; I. Tangential section of the middle part of the eggshell showing a honeycomb-like organization; J-M. *Prismatoolithus tiantaiensis*, J. An incomplete nest composed of seven eggs (IVPP V 16515. 1-2); K. An incomplete nest composed of nine eggs (TTM1); L. Radial section of eggshell showing the prismatic eggshell units with prisms; M. Tangential section of the middle part of the eggshell showing the tightly packed shell units, only a few pores; N-P. *Mosaicoolithus zhangtocaensis*, N. An incomplete nest composed of six eggs (TTM6); O. Radial section of eggshell showing the irregular eggshell units, pore canals and secondary eggshell units (arrows) in some pore canals; P. Tangential section through the middle part of the eggshell, showing the irregular pores and the secondary eggshell units (arrows)

Locality and horizon Qiaoxia (IVPP V 16515.1-2), Tiantai Brewery (TTM1, TTM30), Tiantai County, Zhejiang Province; Chichengshan Formation, Upper Cretaceous.

Amended diagnosis The eggs are elongated ovoids (about 9.7 cm long), and stand vertically and somewhat obliquely in the nest. Shell thickness 0.4 ~ 0.6 mm. The shell layer consists of slender interlocking shell units with prisms (Fig. 1L, M). Cone layer thin, about one seventh of the eggshell thickness.

Oofamily indet.

Mosaicoolithus oogen. nov.

Etymology *Mosaicus*, Latin, meaning inlay, in reference to the feature that the eggshell units inlay each other in tangential section.

Diagnosis Same as for type and only know oospecies.

Mosaicoolithus zhangtoucaoensis (Fang et al., 2000) *oogen. et comb. nov.*

Spheroolithus zhangtoucaoensis Fang et al., 2000, p. 1, 15-17; p. 109-110

Spheroolithus jincunensis Fang et al., 2003, p. 1, 1-2; p. 517

Referred specimens An incomplete nest composed of six eggs (TTM6) (Fig. 1N), and ten eggshell fragments.

Locality and horizon Chiyi Village (TTM6) and Shuangliwan Village, Tiantai County, Zhejiang Province; Laijia Formation and Chichengshan Formation, Upper Cretaceous.

Amended diagnosis Eggs spheroids with an average diameter of 8.8 cm. Shell thickness is 1.50 ~ 1.55 mm. The eggshell units are irregular and inlay each other. Pore canals are irregular in shape (Fig. 1O). In tangential section, some pore canals are filled by the secondary eggshell units (Fig. 1P).

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