

Field Excursion Introduction for IGCP 679 1st International Symposium: Progress in Cretaceous Geology in Shandong Province, China

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Abstract

The non-marine Cretaceous sequences are well developed in the relict basins, *i.e.* the Luxi basin in the west, and the Jiaolai basin in the east of Shandong Province. The Lower Cretaceous Santai Formation (140 - 136 Ma) in the Luxi basin contains aeolian dune deposits, which were formed under the control by westerly. The Cretaceous strata of the Jiaolai basin are divided into three groups: *i.e.* in ascending order, the Laiyang, Qingshan and Wangshi groups. New SHRIMP zircon U-Pb radiometric dating data demonstrated six Cretaceous volcanism episodes. The lower part of the Wangshi Group should be assigned to the upper Lower Cretaceous. An Ir anomaly recovered in the lower Jiaozhou Formation suggests that the Cretaceous/Palaeogene boundary would be in the interval between 537.3 - 537.4 m in the borehole JK1. At last the detailed information about the pre-symposium field excursion was introduced.

Keywords

Cretaceous, Lithostratigraphy, Chronostratigraphy, Shandong Province, China

1. Introduction

The study of Cretaceous geology in Shandong began in the early 1920s. The non-marine Cretaceous strata were originally subdivided into the Santai Serie, Mengyin Serie (including the Laiyang beds, Qingshan beds) and Wangshi Serie,

and were assigned a Jurassic-Cretaceous age. Since then palaeontologists begun to find in the Cretaceous strata abundant fossils, like megaplants, bivalves, gastropods, ostracods, clam shrimps, insects, fish and dinosaurs.. Nowadays, the Cretaceous is divided into the Santai Formation, the Laiyang, Qingshan and Wangshi groups. In recent years, Shandong Province has become a hot research area because of its extremely special geotectonic position. Research interests focus on paleogeography, paleoclimate, paleoecological evolution of the Cretaceous basins, basin forming mechanism, deep dynamic background, subduction of the palaeo-Pacific plate, North China Craton destruction, uplift of the Sulu orogenic belt and tectonic evolution of the Tanlu fault zone [1]. In this paper, we would like to summarise new progress in Cretaceous research in Shandong Province, and to introduce the pre-symposium field excursion.

2. Geological Setting

Shandong Province is located in the east Eurasia and neighbouring the Pacific plate. The Cretaceous continental volcanic-sedimentary relict basins (Luxi basin in the west, Jiaolai basin in the east) straddle the southeast margin of the North China plate, the Tanlu fault zone and the Sulu orogenic belt (**Figure 1**). The Cretaceous strata in the area are continuous, and in contact with the underlain Middle Jurassic and the overlying Eocene with unconformities. They are divided into 22 formations in three groups (**Figure 2**).

3. New Results

The Lower Cretaceous Santai Formation in western Shandong is dated as 140 - 136 Ma, and contains Aeolian dune deposits (similar to that recovered in the

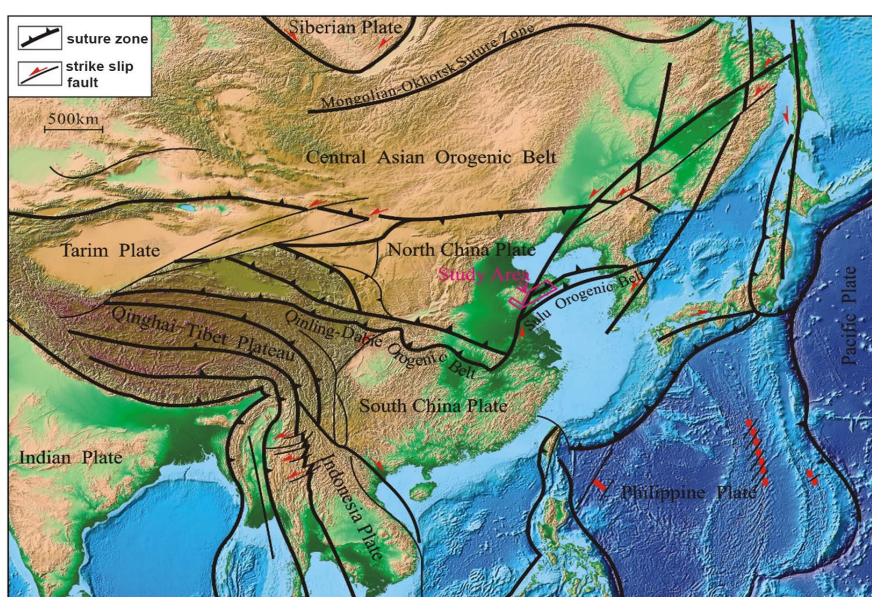


Figure 1. Geotectonic location map of Shandong Province. stratigraphic type sections and well-known fossil sites which would be visited during the pre-symposium field excursion.

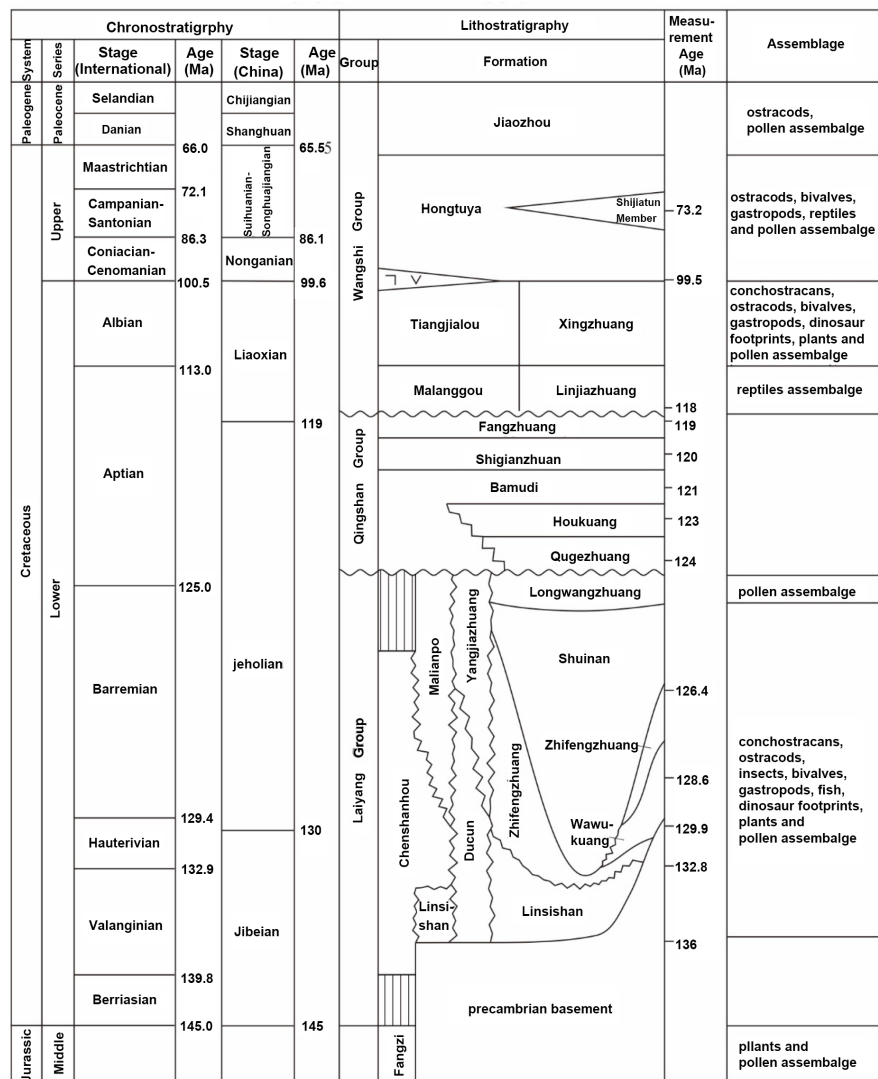


Figure 2. Lithostratigraphic and chronostratigraphic framework of the Jiaolai basin.

Tuchengzi Formation of northern Hebei and the lower Zhidan Group of the Ordos basin), which was formed under arid climate controlled by the westerly. The Qugezhuang Formation is assigned to the Qingshan Group because of its unconformably overlying on the Laiyang Group. The Malanggou and Tianjialou formations are correlated with the Linjiazhuang and Xingezhuang formations of the lower Wangshi Group, and are assigned to the upper Lower Cretaceous (Figure 2). An Ir anomaly with a peak content of 0.37 ng/g in the lower Jiaozhou Formation (borehole JK1 537.3 - 537.4 m) indicates a Cretaceous/Paleogene transition horizon, with abundant Paleocene *Aquilapollenites* species.

4. Pre-Symposium Field Excursion

The field excursion is planned for three days (Figure 3). Day 1: We will first visit the aeolian dune deposits of the Santain Formation exposed in the Red Stone Park of Laicheng district of Jinan city, then go to see the dinosaur footprints of

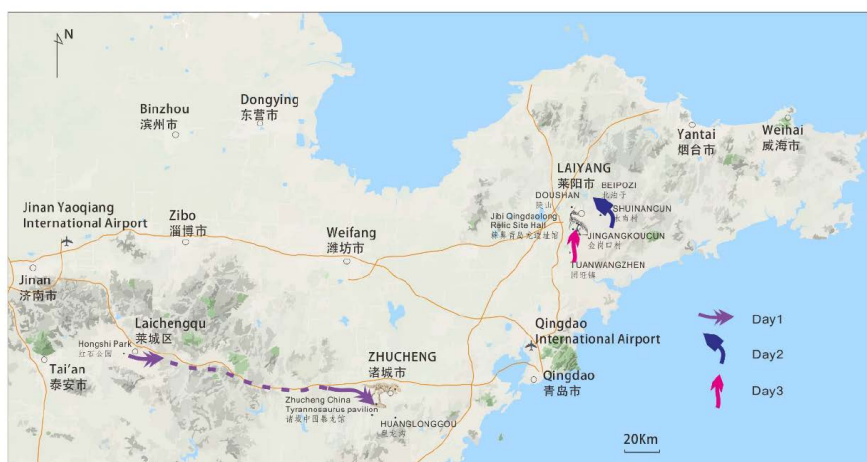


Figure 3. Field excursion route map.

the Yangjiazhuang Formation at Huanglonggou and dinosaur fossils of the lower Hongtuya Formation in Zhucheng. Day 2: fossil insect site of the Shuinan Formation at Tuanwang Zhen, the type section of the Laiyang Group between Zhifengzhuang and Shuinan villages of Longwangzhuang Zhen, and the *Lycop-tera* fish fossil site of the Shuinan Formation at Beipozi of Muyudian Zhen, Laiyang. Day 3: type sections of the Houkuang, Bamudi and Shiqianzhuang formations of the Qingshan Group, and the Linjiazhuang Formation of the Wangshi Group between Pomaikou and west Sunjiakuang, the Hongtuya Formation of the Wangshi Group between Jiangjuding and Jingangkou, and the 2nd dinosaur fossil pit and dinosaur museum of Laiyang.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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