

Preface

# Cretaceous Earth Dynamics and Climate in Asia

Gang Li<sup>1\*</sup>, Kemin Xu<sup>2</sup>, Zhenguo Ning<sup>2</sup>, Petr Schnabl<sup>3</sup>, Xin Li<sup>1</sup>, Zhigang Zhang<sup>2</sup>, Jie Qin<sup>2</sup>, Yongbo Huang<sup>2</sup>, Jing Guo<sup>2</sup>

<sup>1</sup>State Key Laboratory of Palaeobiology and Stratigraphy, Center for Excellence in Life and Palaeoenvironment, Nanjing Institute of Geology and Palaeontology, Nanjing, China

<sup>2</sup>Institute of Geology, Shandong Institute of Geological Survey, Jinan, China

<sup>3</sup>Institute of Geology, Czech Academy of Sciences, Prague, Czech Republic

Email: \*gangli@nigpas.ac.cn

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Since the industrial revolution, the increasing usage of fossil energy by humans has led to a continuous increase in atmospheric CO<sub>2</sub> emissions, thereby disrupting and unbalancing the global carbon cycle [1]. The direct result is a very rapid global warming. We are now experiencing its likely effects, such as the waning of pole ice caps, rising sea levels, regional changes in precipitation, acidification of the ocean, more frequently extreme weather events (such as heat waves), and expansion of deserts. The development of human civilization urgently requires us to acquire a deeper understanding of the development trend of this rapid climate change and its environmental effects, a topic that in recent years has become a hot issue of common concern from the general public to the scientific community [2] [3].

The Asian continent offers unique opportunities for studying the Cretaceous greenhouse climate and ecosystems. A variety of environments resulted in diverse ecosystems on land and in the oceans. Cretaceous marine strata of the eastern Tethys (India and Tibet of China) and the western Pacific (Japan, South Korea, China and Russia) open an indispensable window for the study of the oceanic anoxic events, oceanic oxygen-rich events and rapid climate changes [4] [5] [6]. Cretaceous continental deposits in Asia [7] [8] [9] [10] contain abundant terrestrial organisms that witness the ecosystem evolution and significant rapid climate changes [11] [12] [13].

Various Cretaceous terrestrial lithologic records and large igneous provinces in Asia bear witness to the environmental changes and ecosystem evolution [14] [15]. Cretaceous pedogenic carbonates of paleosols and fossil leaf stomatal index quantitatively depicted the fluctuation and evolutionary trends of the atmospheric CO<sub>2</sub> levels [16]. Desert deposits in the interior regions of the continent (Mongolia, China, and Thailand) reveal the shift of subtropical high-pressure belt and dramatic changes in climatic zonation pattern in Asia [17].

In this special issue, there are 50 short research papers covering a broad spectrum of fields reflecting many facets of biodiversity, palaeoenvironment, palaeogeography and palaeoclimate from the marine and non-marine Cretaceous sequences in Asia. The special issue is divided into four sections: 1) new research results on fossil records in the marine Cretaceous deposits in Asia provide important taphonomic [18], palaeogeographic and palaeoecological information which are useful for inter-continental, marine and non-marine biostratigraphic correlation [19] [20], and palaeoceanographic and palaeoenvironmental reconstruction; 2) new research results on Cretaceous non-marine fossil records provide the information of the palaeogeography, palaeoecology and palaeoclimate on land in Asia and South America, including a discussion on the origin of angiosperm [21], the turnover of fossil flora and faunas, and the description of new dinosaur taxa; 3) the overview of progress in the Cretaceous stratigraphy in China, Malaysia, Pakistan, the Far East of Russia, Thailand and Vietnam, especially including a discussion on the new stratigraphic framework in Shandong province [22], and the new progress on the Jurassic/Cretaceous and Cretaceous/Paleogene boundaries in China; 4) Cretaceous palaeoclimate reconstruction based on evidence from fossil records, special lithology and palaeo-weathering index. The Late Cretaceous floral turn-over in the Indian subcontinent indicates a latitudinal shifting of the Indian plate from sub-tropical to tropical zone during the Maastrichtian [23]. A palaeoweathering analysis of claystone samples intercalated within the mid-Cretaceous aeolian sandstone indicates that an alternate pluvial/arid paleoclimate controls the Sichuan basin during the mid-Cretaceous [24]. Aeolian deposits documented in the Santai Formation in the Mengyin Basin may indicate a change in palaeowind regime during the Late Jurassic to Early Cretaceous time interval [25]. The four sections of the special issue are topically overlapping and closely linked. They demonstrate a new exciting start of the UNESCO-IUGS IGCP Project 679.

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### **Conflicts of Interest**

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

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