Late Cretaceous Foraminiferal Biostratigraphy in Gongza, Tingri, Southern Tibet

LI Qi1,2, LI Guobiao1,2,*, LI Xinfa1,2, WANG Tieyang1,2, LI Yuewei1,2, ZHANG Wen Yuan1,2, XIE Dan1, Li Xingpeng4, MA Xuesong1,2, SHI Wei2 and GUO Baojie1,2

1 State Key Laboratory of Environmental Geology and Biogeology, China University of Geosciences, Beijing 100083, China
2 School of Earth Sciences and Resources, China University of Geosciences, Beijing 100083, China
3 Institute of Vertebral Paleontology and Paleoanthropology, Chinese Academy of Sciences, Beijing 100044, China
4 Fourth Geological Team of Guangxi, Nanning 530033, China


* Corresponding author. E-mail: liguobiao@cugb.edu.cn

1 Introduction

During the Cretaceous the northern margin of the Indian Plate was part of a continental slope and shelf that faced northwards towards an ocean now subducted along the line of the Yarlung Zangbo Suture. Southern Tibet was a part of this Tethys-Himalayan Sea in which a variety of gravity-flow sandy strata and pelagic sediments accumulated along with volcanic and siliciclastic deposits (Wan et al., 2005). The most complete marine Cretaceous-Paleogene deposits in China are preserved in southern Tibet, which well records the evolution of the Neo-Tethyan Ocean and the collision characteristics of the Eurasian and Indian plates (Willems and Zhang, 1993; Wan et al., 2005; Li et al., 2005, 2007, 2009, 2011a). This study concerns the planktic biostratigraphy of Late Cretaceous in the Gongza, Tingri, southern Tibet.

2 Materials and methods

The Gongza section is located in ~15km west to the Tingri town, southern Tibet, which was defined as deposited on the Greater Indian passive continental margin. The Gambacunkou Formation and the Zongshan Formation of this section are respectively mainly composed of micofossil-bearing shale (bedded with some limestone) and limestone, which represented the southern Tethyan passive margin succession. 68 samples were taken for study on the planktonic foraminifer biostratigraphy of upper Gambacunkou Fm and lower Zongshan Fm in the Gongza section. The extraction and identification of the planktonic foraminifera were carried out in the Micropalaeontology Laboratory of the China University of Geosciences (Beijing). To
free the foraminifer fossils from the rocks (mainly shale), the following procedures were followed: samples were broken into the pieces with the particle size of 0.6-1 cm and placed in beakers. A diluted (10–15%) anhydrous sulfate solution was added to cover the rocks for about two weeks. The samples were wet sieved using 20 and 250 mesh sieves and the residual samples were dried and examined. Representatives of each species were measured, gold-coated and imaged using a Scanning Electron Microscope (SEM).

3 Planktic foraminiferal biostratigraphy

The detailed study has been carried out on the planktonic foraminiferal biostratigraphy of the upper Gambacunkou Formation and lower Zongshan Formation in the Gongza section and 22 species of 8 foraminifer genera were identified, the important elements (Fig.1) of which include Dicarinella concavata, D. imbriticata, D. asymetrica, Globotruncanina linneiana, G. lapparenti, G. arca, G. ventricosa, G. falsostuari, Globotruncanita elevata, G. stuartiformis, G. stuari, Heterohelix cordites, and Radotruncanita calcarea etc. Four planktonic foraminiferal biozones were recognized as follows (in ascending order):

3.1 Dicarinella asymetrica zone

The important elements of this zone are D. asymetrica, D. concavata, D. imbriticata, G. linneiana, G. lapparenti, and G. arca etc. The age of this zone belongs to Santonian of Late Cretaceous.

3.2 Globotruncanita elevata zone

The important elements of this zone are G. elevata, G. linneiana, G. lapparenti, and G. arca, etc. The age of this zone belongs to Early Campanian of Late Cretaceous.

3.3 Globotruncanina ventricosa zone

The important elements of this zone are G. ventricosa, G. linneiana, G. lapparenti, G. arca, G. elevata, G. stuartiformis, and H. cordites etc. The age of this zone belongs to Middle Campanian of Late Cretaceous.

3.4 Radotruncanita calcarata zone

The important elements of this zone are R. calcarata, G. linneiana, G. lapparenti, G. arca, G. elevata, G. stuartiformis and G. stuart etc. The age of this zone belongs to Middle Campanian of Late Cretaceous.

4 Conclusions

4.1 The Gambacunkou and Zongshan formations in Gongza section record an abundant and well-preserved planktic foraminiferal fauna that can be assigned to four late Cretaceous planktic foraminiferal zones, including D. asymetrica, G. elevata, G. ventricosa and R. calcarata zones.

4.2 The planktonic foraminiferal assemblage from the start of upper Gambacunkou and lower Zongshan formations in Gongza section gives it an age of Santonian to Middle Campanian of late Cretaceous.

Key words: planktonic foraminifera, Late Cretaceous, Gambacunkou Formation, Zongshan Formation, Gongza, Tingri

Acknowledgments: This work is granted by the National Natural Science Foundation of China (Grant No. 41272030), the IGCP679, and the National Basic Research Program of China (Grant No. 2012CB822001).

References


About the first author

LI Qi, male, born in 1995 in Huining County, Gansu Province; master student in China University of Geosciences (Beijing). He is now interested in the study on Cretaceous and Paleogene palaeontology and stratigraphy. Email: 1228509438@qq.com; phone: +86 15000609914.

About the corresponding author

LI Guobiao, male, born in 1968 in Wugang City, Hunan Province; PhD; graduated from China University of Geosciences (Beijing); professor at the school of Earth Sciences and Resources, China University of Geosciences. He is now interested in the study on palaeontology and stratigraphy. Email: liguobiao@cugb.edu.cn; phone: +86 13552818921.