Late Triassic bimodal magmatism in the Lesser Xing'an-Zhangguangcai Range, NE China: Constraints on the timing of transformation of Paleo-Asian ocean into circum-Pacific ocean tectonic systems

F. WANG, W.L. XU *, E. MENG, F.H. GAO AND H.H. CAO

College of Earth Sciences, Jilin University, Changchun 130061, China (jlu-wangfeng@sohu.com; *correspondence: xuwl@jlu.edu.cn)

The Lesser Xing'an-Zhangguangcai Range, NE China, is located in the eastern section of Central Asian Orogenic Belt (CAOB) [1]. Geochronological and geochemical data of Triassic igneous rocks from the region provide constraints on the timing of the transformation of the Paleo-Asian tectonic system into the circum-Pacific system. LA-ICP-MS and SIMS zircon U-Pb dating results for two basalts, one gabbro, two rhyolites, and one dacite indicate that they formed during the Late Triassic (208-228 Ma). The mafic rocks have SiO_2 = 48.97-51.89 wt.%, TFe_2O_3 = 7.86-10.13 wt.%, K_2O = 1.05-1.72 wt.%, Mg# [Mg/(Mg+Fe^{2+})] = 0.54-0.63, Cr=107-405 ppm, Ni=44-102 ppm, whereas felsic rocks have SiO_2 = 73.60-75.69 wt.%, TFe_2O_3 = 0.69-1.19 wt.%, K_2O = 4.10-4.36 wt.%, Mg# = 0.05-0.23, suggesting a typical bimodal igneous association. In addition, these mafic rocks are characterized by enrichment in LREEs and LILEs, depletion in HREEs and HFSEs (such as Nb, Ta, Ti), and weak Eu anomalies (0.87-1.05), whereas felsic rocks exhibit strongly depletion in Sr, P, Ti, enrichment in Th, U, K, and relatively obvious negative Eu anomalies (0.61-0.65). The above findings, combined with the coeval A-type rhyolites in eastern Heilongjiang and Jilin provinces [2], imply that they formed under a post-collisional extensional envirnment related to the final collision between the North China Craon and the Siberia Craton in the Late Permian and/or Early Triassic. Meanwhile, this finding also suggests that the subduction of the Paleo-Pacific plate beneath the Eurasian continent could took place after the Late Triassic.

This research was financially supported by research grants from the Natural Science Foundation of China (Grant 41072038) and the Geological Survey of China (Grants 1212010070301 and 1212010611806).

[1] Sengör *et al*. (1993) *Nature* **364**, 299–307. [2] Xu *et al*. (2009) *J. Asian Earth Sci*. **34**, 392–402.

Genetic and functional properties of uncultivated Miscellaneous Crenarchaeota Group (MCG): Implication from the metagenome analysis

FENGPING WANG[1]*, JUN MENG[2], YANPING ZHENG[1,2], DAN QIN[2,], JUN XU[1] AND XIANG XIAO[1],

[1]State Key Laboratory of Microbial Metabolism and State Key Laboratory of Ocean Engineering, Shanghai JiaoTong University, Shanghai, 200240, People's Republic of China (*correspondence: fengpingw@sjtu.edu.cn)

[2]The School of life science, Xiamen University, 361005, People's Republic of China

The MCG Archaea is one of the most predominant Archaeal groups in various environments. Till present, no member of MCG has been cultivated or characterized, and its ecological roles and evolutionary position remain obscure. Within this study, the genetic potential and physiology of MCG and its evolutionary relationship with other archaeal members were analyzed and inferred based on metagenomic analysis. Comparisons of gene organizations and similarities around the 16S rRNA genes of available MCG Fosmid and Cosmid clones found completely no synteny, demonstrated big genetic variations within groups of MCG. A topoisomerases IB gene (TopIB) was found in a MCG Fosmid genome fragment, TopIB phylogenetic analysis placed MCG within the newly postulated archaeal Phylum-Thaumarchaeota. Functions of some genes on the genome fragment were tested by in-vitro expression. Gene involved in protocatechuate degradation and chemotaxis were found in a genome fragment, suggesting a role of this group of archaea in protocatechuate degradation. The up-expression of 4-carboxymuconolactone decarboxylases was observed when the sediment was amended with protocatechuate, further supporting the idea of MCG group as protocatechuate degrader.