*Acta Geologica Sinica* (English Edition), 2019, 93(supp.2): 191–192

# Magmatism in the Chongzuo-Jingxi Area, South China: Evidence for the Development of a Permian to Triassic Back-arc Basin

LI Zhenglin[1], LIU Xijun[1, 2, *], SHI Yu[1], WANG Baohua[1], LIU Lei[1], HU Rongguo[1], LIAO Shuai[1], QIN Xianzhu[1] and DING Shanshan[1]

[1] *Guangxi Key Laboratory of Hidden Metallic Ore Deposits Exploration and Guangxi Collaborative Innovation Centre of Hidden Non–ferrous Metallic Ore Deposits Exploration and Development of Materials, Guilin University of Technology, Guilin 541004, Guangxi, China*

[2] *Xinjiang Research Center for Mineral Resources, Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences, Urumqi 830011,China*

Citation: Li et al., 2019. Magmatism in the Chongzuo-Jingxi area, South China: Evidence for the development of a Permian to Triassic back-arc basin. *Acta Geologica Sinica* (English Edition), 93(supp.2): 191–192.

**Abstract:** The South China Block has experienced three major tectonic events since it formed during the Neoproterozoic, namely: the Kwangsian (middle Paleozoic) Event, the Indosinian (Triassic) Event and the Yanshanian (Jurassic-Cretaceous) Event (e.g., Li and Li, 2007; Shu et al., 2008; Wang et al., 2003, 2011). Of these, the most significant impact on the southwestern margin of south China occurred during the Indosinian Event. However, lack of precise geochronology, and systematic petrology and geochemistry of those magmatic rocks has limited our understanding of the tectonic history of Paleo-Tethys and collision between the South China and Indochina blocks.This paper focus on the Triassic-aged arc-like mafic igneous rocks from the Chongzuo-Jingxi area of the South China Block in western Guangxi, and report new bulk-rock geochemical and isotopic data, and U-Pb zircon ages. Our results provide the first robust geochronological, petrological and geochemical evidence for northwards subduction of Paleo-Tethys beneath the South China Block.

Permian to Triassic magmatic rocks that crop out along the border between China and Vietnam offer insights into the tectonic evolution of Paleo-Tethys and of China-Indochina continent-continent collision. Geochemical and Sr-Nd-Hf isotopic analyses of gabbros and basaltic andesites from the Chongzuo-Jingxi area establish that the magmatic rocks originated from the partial melting of subduction-modified lithospheric mantle. LA-ICP-MS U-Pb zircon analyses yield ages of 246-244 Ma for basaltic andesites and dacites, and ages of ~250 Ma for gabbro from the Chongzuo area. When combined with geological evidence from other magmatic rocks and from the stratigraphic record, our analyses establish an Early-Middle Triassic age for north-directed subduction of Paleo-Tethys, and that the 250-244 Ma gabbros and basaltic andesites and other volcanic rocks are late-stage magmatic products generated by that event. Late Permian to Middle Triassic magmatic rocks with similar geochemical signatures and isotopic ages have been identified along the Song Hien zone in northeastern Vietnam, whereas associated tectonothermal events have also been documented from rocks at Napo in the Funing area of south China and in the Song Da area of northwestern Vietnam. Combined magmatic, stratigraphic and tectonothermal relationships suggest that a back-arc basin developed along the Song Hien-Chongzuo zone. Furthermore, they suggest that Paleo -Tethys between the South China Block and the Indochina Block closed after the Middle Triassic, and that collision and amalgamation of the two blocks along the Song Ma-Song Chay suture probably occurred following complete subduction of Paleo-Tethys.

**Key words:** magmatic rocks, Paleo-Tethys, Chongzuo-Jingxi area, back-arc basin

**Acknowledgements:** This work is granted by the Guangxi Natural Science Fund for Distinguished Young Scholars (Grant No.2018GXNSFFA281009), National Natural Science Foudation of China (Grant No.41562005; 41862003), CAS “Light of West China” Program (2018-XBYJRC-003), Guangxi Postgradute Innovation Project (Grant No. YCSW2019155) and Bagui Scholar Innovation Project of Guangxi Province (to XU Ji-feng)

**References**

Sun, S.s. and McDonough, W.F., 1989. Chemical and Isotopic Systematics of Oceanic Basalts: Implications for Mantle Composition and Processes. Geological Society, London, *Special Publications*, 42(1): 313–345.

Shu, L.S., Faure, M., Wang, B., Zhou, X.M., Song, B., 2008. Late Paleozoic–Early Mesozoic geological features of South China: response to the Indosinian collision events in Southeast Asia. *Comptes Rendus Geoscience*, 340(2–3): 151–165.

Shinjo, R., Petrochemistry And Tectonic Significance of the Emerged Late Cenozoic Basalts Behind The Okinawa Troughs Ryukyu Arc System. Jour. volcanol. *geotherm. research*, 1998, 80(97): 39–53.

Thanh, N.X., Hai, T.T., Hoang, N., Lan, V.Q., Kwon, S., Itaya, T. and Santosh, M., 2014. Backarc Mafic–Ultramafic Magmatism in Northeastern Vietnam and Its Regional Tectonic Significance. *Journal of Asian Earth Sciences*, 90: 45–60.

Wang, Y.J., Fan, W.M., Guo, F., Peng, T.P., Li, C.W., 2003. Geochemistry of Mesozoic mafic rocks around the Chenzhou-Linwu fault in South China: implication for the lithospheric

* Corresponding author. E-mail: xijunliu@gmail.com

© 2019 Geological Society of China
http://www.geojournals.cn/dzxbcn/ch/index.aspx; https://onlinelibrary.wiley.com/journal/17556724

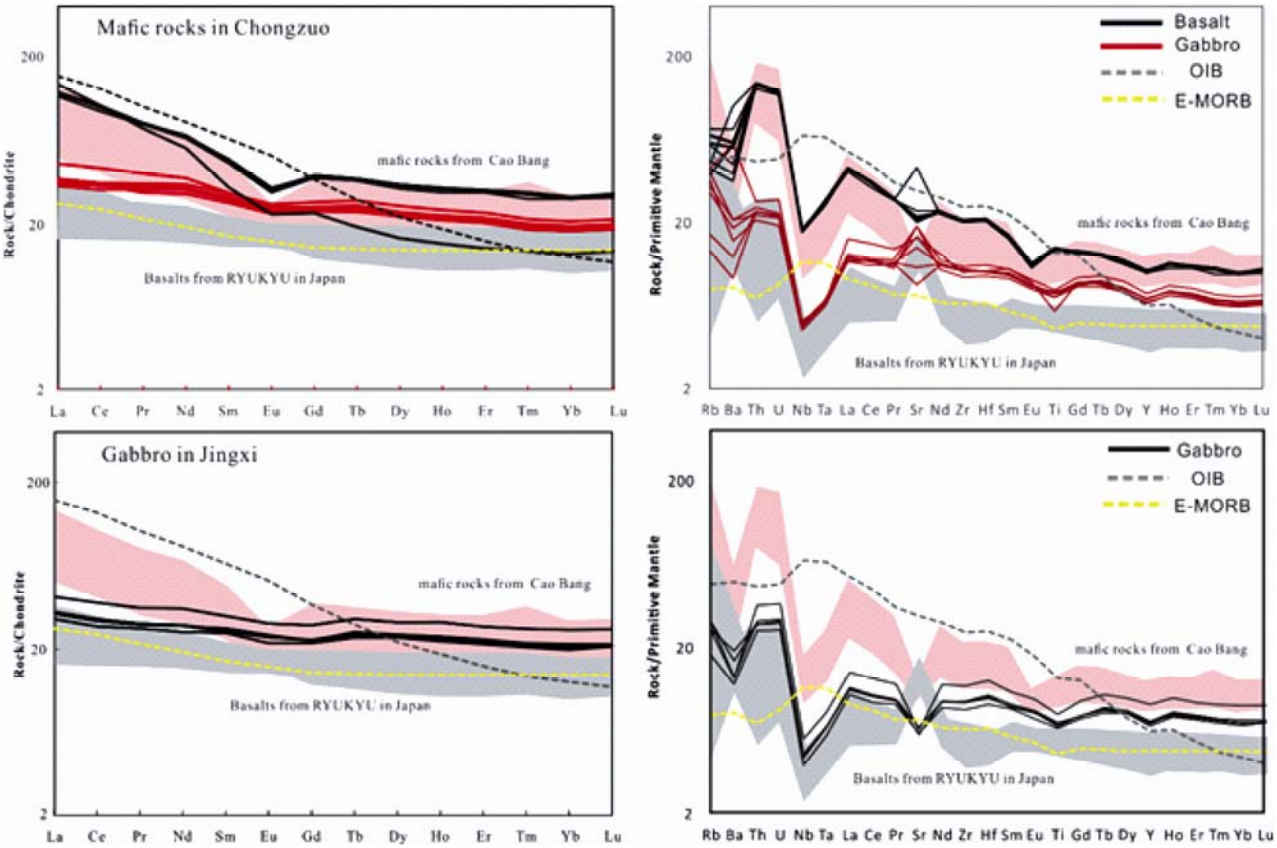


Fig. 1. Chondrite-normalized REE patterns and primitive mantle-normalized trace element patterns for the samples of basaltic andesite and gabbro from the Chongzuo and Jingxi areas (Chrondrite normalizing values, primitive mantle values, OIB value are from Sun and McDonough (1989)). The data of RYUKYU and Cao Bang are from Shinjo (1998) and Thanh et al. (2014).

boundary between the Yangtze and the Cathaysia Blocks. *International Geology Review*, 45(3): 263–286.

Wang, Y.J., Zhang, A.M., Fan, W.M., Zhao, G.C., Zhang, G.W., Zhang, Y.Z., Zhang, F.F., Li, S.Z., 2011. Crustal anatexis in an intracontinental regime: Geochemical, zircon U–Pb geochronological and Hf isotopic fingerprints from the middle Paleozoic (Kwangsian) gneissoid granites in the eastern South China Block. *Lithos*, 127: 239–260.

## About the first author

LI Zhenglin, male, born in 1989 in Wuzhou City, Guangxi Province; master; graduated from Guilin university of technology; research experimenter of the college of geoscience, Guilin University of Technology. He is now interested in the study of isotope geochemistry. Email: lizhenglin@glut.edu.cn; phone:18777398685.

## About the corresponding author

LIU Xijun, male, born in 1980 in Zhangye City, Gansu Province; Ph.D; graduated from Guangzhou Institute of Geochemistry, professor of Guilin University of Technology. He is now interested in the study of isotope geochemistry, Email: xijunliu_sio@qq.com; phone: 15277395399.