

## Two episodes of eclogite-facies HP metamorphism in Huwan shear zone and its implication for evolution of the western Dabie orogen, central China

XIAO-CHI LIU, YUAN-BAO WU\* AND LAI-SHI ZHAO

State Key Laboratory of Geological Processes and Mineral Resources, Faculty of Earth Sciences, China University of Geosciences, Wuhan 430074, China  
(\*correspondence: yuanbaowu@cug.edu.cn)

The Huwan shear zone in the western Dabie orogen is a key area to investigate the evolution the Qinling-Dabie-Sulu orogenic belt. However, its evolution history has not been well constrained. In this study, we present U-Pb age, trace element and Hf isotope compositions of zircons from HP rocks from the Huwan shear zone. The results are used to constrain the timing and sequence of subduction and exhumation of the Huwan HP rocks and also have implications for the exhumation processes of the whole western Dabie HP-UHP metamorphic terrain.

Two eclogite samples (08HW51 and 07XX10) contain magmatic zircons with formation ages of  $411 \pm 4$  and  $700 \pm 14$  Ma, and  $\epsilon_{\text{Hf}}(t)$  values of +6.4 to +14.7 and -0.7 to +7.7. Their protoliths might be derived from the Paleotethyan oceanic crust and Neoproterozoic juvenile continental crust, respectively. They also have metamorphic zircons with ages of  $306 \pm 7$  and  $310 \pm 2$  Ma. The metamorphic zircons show trace element characteristics of eclogite-facies metamorphic zircons, indicating couple subduction of oceanic and continental rocks during the Carboniferous.

Metamorphic zircons in a quartz vein 08HW05 within schist and an amphibolite 08HW52 yield weighted mean ages of  $241 \pm 1$  and  $243 \pm 4$  Ma, respectively. All of metamorphic zircon domains are characterized by low Th/U ratios, relatively flat HREE patterns, weak negative Eu anomalies, and low  $^{176}\text{Lu}/^{177}\text{Hf}$  ratios. These features suggest that the metamorphic zircons formed under eclogite-facies conditions. This indicates that some rocks in the Huwan shear zone also have experienced a second eclogite-facies metamorphism event at ca. 243 Ma. Available geochronological data suggest HP metamorphism occurred at ca. 227 Ma in the Xinxian UHP zone.

Therefore, the Huwan HP shear zone might have suffered multiple burial-exhumation cycles related to orogen-scale alterations. And the whole western Dabie orogen has experienced diachronous subduction and exhumation during the Triassic.

## Diachronous subduction and exhumation of the Tongbai-Dabie-Sulu HP/UHP metamorphic belt in central China

X. LIU<sup>1,2\*</sup>, B.-M. JAHN<sup>2</sup>, J. CUI<sup>1</sup> AND Y. LOU<sup>1</sup>

<sup>1</sup>Institute of Geomechanics, CAGS, Beijing 100081, China  
(\*correspondence: liuxchqw@yahoo.com.cn)

<sup>2</sup>Institute of Earth Sciences, Academia Sinica, Taipei 11529, Taiwan

Geochronological data suggest diachronous subduction and exhumation of different HP/UHP slices in the Tongbai-Dabie-Sulu orogen. In the Tongbai terrane, retrograded eclogites and their country gneisses from the Tongbai Complex were metamorphosed at ca. 230-220 Ma [1], whereas eclogites from the two HP eclogite zones on both sides of the Tongbai Complex have the peak metamorphic age of ca. 255 Ma and cooling age of ca. 238 Ma [2]. Similarly, in the western Dabie terrane, the UHP slice occurring in the core of the Xinxian antiform were metamorphosed at ca. 227 Ma and cooled at c. 213 Ma [3, 4], whereas the HP slice represented by the Huwan and Hong'an HP eclogite zones on the two limbs of the Xinxian antiform recorded the metamorphic age of ca. 240 Ma and cooling age of ca. 230 Ma [4-6]. In fact, the recent dating has distinguished three and two UHP slices of different ages in the eastern Dabie [7] and Sulu terranes [8], respectively, suggesting that the UHP terrane is also not a single coherent slice. Therefore, diachronous subduction and exhumation might be a major mechanism for the formation and uplifting of the HP/UHP rocks in the Tongbai-Dabie-Sulu orogen. The ca. 255 Ma eclogite zones in the Tongbai terrane should represent an earliest subducted and exhumed HP slice in the orogen.

- [1] Liu X *et al.* (in review) *Lithos*. [2] Liu X *et al.* (2008) *Lithos* **105**, 301–318. [3] Wu *et al.* (2008) *CMP* **155**, 123–133. [4] Liu X *et al.* (2004) *Tectonophysics* **394**, 171–192. [5] Eide *et al.* (1994) *Geology* **22**, 601–604. [6] Cheng *et al.* (2009) *AGU Fall Meeting*. [7] Liu Y *et al.* (2007) *Lithos* **96**, 170–185. [8] Liu F *et al.* (2009) *JMG* **27**, 805–825.