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The study of Sedimentary Characteristic and Tectonic Setting on the Devonian, Eastern Qinling Orogenic Belt, China

Jiang Xiaojun^{1,2} & Ren Jisun²

1. Department of Earth Sciences, Kunming University of Science and Technology, Kunming, China;

2. Institute of Geology, Chinese Academy of Geological Sciences, Beijing, China;

The Qinling belt belongs to the eastern part of the Kunlun-Qinling giant orogenic belt, and is also the suture zone of the Sino-Korean and Yangtze plates. The research on the Qinling orogenic belt reveals the relationship between the Dabie and Kunlun-Qilian orogenic belts, and is also of great significance to the study of Chinese and East Asian continental crust's formation and evolution (Fig.1). Focus is integrated on the Devonian sedimentary basin whose sedimentary environment and tectonic setting is controversial.

It was found that the contact relationship between the Devonian and its underlying Caledonian folded basement is an angular unconformity and the fold orogeny occurs in the South Qinling belt. The angular unconformity, deformation difference, strata hiatus and Devonian sedimentary sequence show that the Devonian basin is a new continental extensional basin on the Caledonian folded basement growing in the Late Paleozoic but not the successor of Early Paleozoic Qinling ocean basin. The sediment in the Devonian basin may derive from the recycled orogenic belt and are likely the passive continental margin with moderate to advanced maturity sediments. The sedimentary environment of the Devonian basin in eastern Qinling is the normal shallow sea platform to shelf facies based on the comprehensive analysis of the sedimentary structures, paleocurrent, rock assemblages and sedimentary facies. From south to north, west to east, it is a process of overlap transgressive sequence during the Early to Late Devonian. The Devonian Liuling group formed in the coastal and shallow sea environment but not the deep-water flysch deposition according to some previous research. The Nianyuzui-Hetaoyuan fault experienced two stages of tectonic movements which were the extrusion thrust shearing from north to south at the early stage, with sinistral strike-slip ductile shearing at the late stage. The Fengzhen-Shanyang fault was firstly a thrust fault from north to south, while during the Late Yanshan period, it was a normal faulting with south inverted to north, which controls the Shanyang basin formation. The Fengzhen-Shanyang fault has the left-lateral slip features on the local scale. The N-S compressional folding dominates the deformation of the Devonian formation in the East Qinling belt. The rocks from the Qinling group, Wuguan group and Silurian strata yield the metamorphic events' age of the Early and Late Caledonian. Combined with the previous work, the eastern Qinling belt has experienced multicycle orogeny, among which the Caledonian and Indosinian are especially important, followed by the Variscan. Finally, the Qinling ocean closed and Sino-Korean and Yangtze plates collided together in the late Early Paleozoic, the continental crust was subducted, the Paleotethys shallow sea basin has deposited during late Paleozoic to early Mesozoic (D1-T2).

