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## Tectonics of the Qinling (Central China): tectonostratigraphy, geochronology, and deformation history

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### Abstract

The Qinling orogen preserves a record of late mid-Proterozoic to Cenozoic tectonism in central China. High-pressure metamorphism and ophiolite emplacement (Songshugou ophiolite) assembled the Yangtze craton, including the lower Qinling unit, into Rodinia during the  $\sim 1.0$  Ga Grenvillian orogeny. The lower Qinling unit then rifted from the Yangtze craton at  $\sim 0.7$  Ga. Subsequent intra-oceanic arc formation at  $\sim 470$ – $490$  Ma was followed by accretion of the lower Qinling unit first to the intra-oceanic arc and then to the Sino-Korea craton. Subduction then imprinted a  $\sim 400$  Ma Andean-type magmatic arc onto all units north of the northern Liuling unit. Oblique subduction created Silurian–Devonian WNW-trending, sinistral transpressive wrench zones (e.g., Lo-Nan, Shang-Dan), and Late Permian–Early Triassic subduction reactivated them in dextral transpression (Lo-Nan, Shang-Xiang, Shang-Dan) and subducted the northern edge of the Yangtze craton. Exhumation of the cratonal edge formed the Wudang metamorphic core complex during dominantly pure shear crustal extension at  $\sim 230$ – $235$  Ma. Post-collisional south-directed shortening continued through the Early Jurassic. Cretaceous reactivation of the Qinling orogen started with NW–SE sinistral transtension, coeval with large-scale Early Cretaceous crustal extension and sinistral transtension in the northern Dabie Shan; it presumably resulted from the combined effects of the Siberia–Mongolia–Sino-Korean and Lhasa–West Burma–Qiangtang–Indochina collisions and Pacific subduction. Regional dextral wrenching was active within a NE–SW extensional regime between  $\sim 60$  and  $100$  Ma. An Early Cretaceous Andean-type continental magmatic arc, with widespread Early Cretaceous magmatism and back-arc extension, was overprinted by shortening related to the collision of Yangtze–Indochina Block with the West Philippines Block. Strike-slip and normal faults associated with Eocene half-graben basins record Paleogene NNE–SSW contraction and WNW–ESE extension. The Neogene(?) is characterized by normal faults and NNE-trending sub-horizontal extension. Pleistocene(?)–Quaternary NW–SE extension and

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