

## Orogenic gold deposits of China

Richard Goldfarb\*, Kun-Feng Qiu

\*China University of Geosciences, Beijing, China, Email: rjgoldfarb@mac.com

China produces about 500 t Au per year and has stated reserves of approximately 10,000 t Au. Orogenic gold, or gold deposits in metamorphic rocks, and associated placer deposits, comprise about 65-75 percent of this endowment, with lodes existing as structurally-hosted vein and (or) disseminated orebodies. The abundance of orogenic gold deposits reflects Paleozoic to Triassic closure of paleo-Tethyan ocean basins between Precambrian blocks derived from Rodinia and Gondwana, as well as late Mesozoic circum-Pacific events and Cenozoic Himalayan orogeny. The deposits range in age from middle Paleozoic to middle Tertiary. The Jiaodong Peninsula contains about one-third of China's overall endowment, and large reserves also characterize East Qinling, West Qinling, and the Youjiang basin. Although gold ores in Jiaodong post-date formation and metamorphism of Precambrian host rocks by billions of years, we nevertheless classify these as orogenic gold ores rather than some unique Jiaodong-type or decratonic-type gold. Similarly, although many workers classify the gold lodes in the Youjiang basin and much of West Qinling as Carlin-type gold, we argue they show significant differences from gold ores in Nevada, USA, and are better defined as epizonal orogenic gold deposits.

Although there are significant exposures of Precambrian rocks in China, there are no significant Precambrian gold deposits. If ancient orogenic gold deposits formed in Archean and Paleoproterozoic rocks, then they now are eroded because these deep crustal rocks that are exposed in China's cratonic blocks have been uplifted from levels too deep for orogenic gold formation to have occurred during ancient orogenies. The oldest gold deposits in China are perhaps those of the Qilian Shan that date back to Silurian tectonism along the present-day southwestern margin of the North China block (NCB). Closure of ocean basins in the outer parts of the Central Asian Orogenic Belt led to Late Carboniferous to Middle Triassic orogenic gold formation in the Tien Shan, Altai, Beishan, and northwestern NCB. Deformation associated with amalgamation of NCB, northern Tibet terranes, South China block, and Indochina, as well as initial paleo-Pacific subduction, can be related to Late Triassic orogenic gold formation in West Qinling, East Kunlun, Youjiang basin, West Jiangnan (Xuefengshan belt), Hainan Island, and Yunkaidashan provinces. In middle Mesozoic continued subduction along the paleo-Pacific margin was associated with gold ores in East and Central Jiangnan, whereas early to middle Mesozoic deformation along the northern NCB formed important orogenic lodes in Precambrian basement (e.g., Jiapigou, Zhangjiakou, Yanshan districts). Continued Yanshanian orogeny in the eastern half of the NCB led to extensive orogenic gold formation during the main period of decratonization and regional extension at ca. 135-120 Ma (e.g., Jiaodong, Liaodong, Chifeng-Chaoyang, Zhangbaling, Taihangshan, East Qinling). At the same time, strike-slip events in central Transbaikalia were associated with orogenic gold formation in both Russia and adjacent northeastern China, which likely are the source for China's most productive placers in upper Heilongjiang basin. China's youngest orogenic gold deposits formed in the Ailaoshan, Lanping basin, Ganze-Litang belt, Daduhe district, and areas south of the Lhasa terrane in Tibet during the Cenozoic.