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Tectonic-Magmatic-Metallogenic System of Deqen-Yangla Area within the Jinshajiang Orogen

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Deqen-Yangla area belongs to a part of the Jinshajiang orogenic belt in the eastern part of the Tethys-Himalayan tectonic domain.

The Jinshajiang orogenic belt is located on the west edge of the Yangtze continental block basement in the eastern section of Tibetan Plateau. After stretching, rift-depression, subduction, collision and basin-mountain conversion for several times, produced a series of trench-arc-basin structure, among which, the Jinshajiang orogenic belt also contain a trench-arc-basin system, the remnant by subduction of Jinshajiang paleo-ocean. The Deqn-Yangla ore concentration area is a part of the trench-arc-basin system within the Jinshajiang orogenic belt, including three suborder tectonic units, the Jinshajiang ophiolite-melange (trench), the Yeri volcanic arc, and Luchun-Hongpo back-arc basin from east to west. It is believed that the tectonic evolution of the Jinshajiang Paleotethys Ocean experienced the stages as following:

Late Devonian rifting from western margin of the Yangtze Block; Carboniferous-Permian ocean expanding; Early Permian subduction along the eastern margin of Qamdo-Lanping Block to form the Yeri continental marginal arc (plus the Weixi-Deqen continental marginal arc along the western edge of the Qamdo-Lanping Block to make up the paired Andean type subduction structure); Early Triassic Luchun-Hongpo back-arc rifting with bimodal volcanic rocks distributed within the back-arc extensional basin; Middle-Late Triassic subduction and continental-continental collision symbolized by Baimaxueshan-Jiaren orogenic type granites and molasses sediments. Such a Wilson cycle represents a complete opening and closing process of the Jinshajiang orogenic belt in the eastern part of the Tethyan-Himalayan tectonic domain. It resulted in the volcanic rocks with evident eruptive cycles, forming corresponding rift-type and active continental marginal type volcanic sedimentary formation with frequent magmatic activities, showing several tectono-magmatic belts producing the various stages, different types of copper polymetallic ore deposit belts.

Tectonic evolution of the trench-arc-basin system for the Jinshajiang Orogenic Belt and the corresponding minerals are: (1) marginal rifting of the Yangtze Platform during Devonian (D_{2-3}), the most important metallogenic period in Yangla area, and the associated minerals covering the bedded and lenticular massive sulfides usually occurred around hydrolyzed basalts or exhalites (metamorphosed chlorite slates), therefore, the bedded ore deposits belong to volcanogenic massive sulfide deposits (VMS). (2) Spreading stage of the Jinshajiang Ocean Basin during Early Carboniferous to Early Permian(C_1 - P_1). Associated minerals in the Jinshajiang suture zone usually are small-sized chromite ore deposits occurred in Sulu, Guanyong, etc. in the metamorphosed ultrabasic rocks. (3) Oceanic Crust Subduction Period during late Permian (P_1^2 - P_2), so far, no significant porphyry-type copper deposit documented yet. (4) Back-arc basin rifting (T_1) : to Early Triassic, because of the influence of the subduction, back-arc extension produced in the side of the Qamdo-Lanping Block from Luchun to Hongponiuchang, forming the bimodal volcanic rocks of

rhyolites plus basalts (altered into spilites), acidic member is called the Pantiange Formation (T_1p), the basic member called the Cuiyibi Formation (T_1c). Kuroko-type massive sulfide deposits occurred in Luchun, Hongponiuchang, etc. (5) Collision closure (T_3): to late Triassic, the Jinshajiang ocean basin had been gradually subducted and closed, the Qamdo-Lanping-Simao Block collided with the Zhongza massif, forming the S-type granites Ludian and Jiaren; further collision and crustal thickening, and the "S" type granites expanded westwards to the Baimaxueshan Mt, accompanying skarn type deposit formed at the contact zone， such as the Lunong skarn type deposits.