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Strike-slip Faults Related Porphyry Gold Deposits on the Western Margin of Yangtze Craton in Southwest China

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1 Alkaline-rich Porphyries and Relevant Porphyry Gold Deposit Along the Jinshajiang-Honghe Strike-slip Faults Belt

Researches in recent years (Richards, 2003, 2009; Hou et al., 2003; Xu et al., 2006; Richard et al., 2013) allow to understand that large-scaled porphyry Cu (Mo\Au) deposits occur not only in island arc environments, but also in large-scale mantle-cutting strike-slip faults result from blocks side-collision, extrusion and escaping. Tectonically, the Jinshajiang- Honghe strike-slip faults in the “Sanjiang” (the Nujiang river, Lancangjiang river and Jinshajiang river in southwest China) region of the west margin of Yangtze craton in southwest China is located in the side-collision zone of Indian and Eurasian plates (Fig. 1a), where many large-scaled strike-slip faults occur as the result of blocks movement. There are many alkaline-rich porphyries and relevant porphyry gold-polymetallic deposits distributed from north to south along the Jinshajiang- Honghe strike-slip faults belt (Fig. 1b), such as Yulong, Malasongduo, Duoxiasongduo, Bengge, Xifanping, Beiya, Machangqing, Yao'an, Habo, Jinping in China and some in Vietnam, which constitute a huge tectonic-magmatic metallogenic belt on the SE margin of Qinghai-Tibet plateau. Porphyries in this belt show some characteristics of younger age (43.6~35.4Ma, Fig. 1b) and richer alkaline from north to south (Bi et al., 2005; Liang et al., 2009; He et al., 2013). More deposits have been discovered due to the recent studies and explorations in this region.

2 Porphyry Gold-polymetallic Metallogenic System

Beiya alkaline-rich porphyries related porphyry gold-polymetallic metallogenic system is a classic example

which lies in the middle part of the Jinshajiang- Honghe strike-slip faults belt (Fig. 1b). Wide and magnificent porphyry-skarn mineralization occurs with the emplacement of the Beiya alkaline-rich porphyries. To date, the whole mining area has been prospected for a 333 reservation of: 304 tons gold with an average grade at 2.42×10^{-6} , 138 Mt iron (TFe) with an average grade at 33.34%, 0.59 Mt copper with an average grade at 0.48%, accompanied 2.42 Mt lead with an average grade at 1.84%, 0.51 Mt zinc with an average grade at 0.35%, and 7221 tons silver with an average grade at 42.56×10^{-6} . The exploration activities still continue there.

Recent studies, including field works, lithochemical, geochemical and metallogenic studies in Beiya allow us to propose that the Beiya alkaline-rich porphyries are products of mantle source magma emplacement in the sub-fault system near the main large-scaled strike-slip faults belt. Cu (Mo), Cu-Au mineralization in the porphyries, skarn Au-Cu-Fe mineralization in the contact zone and late stage vein-let Au (Cu), Pb-Zn-Ag mineralization in the outer region constitute a porphyry gold-polymetallic metallogenic system (Fig. 2) with the center of Beiya alkaline-rich porphyries. This proposal has been used for guiding the regional mineral exploration effectively.

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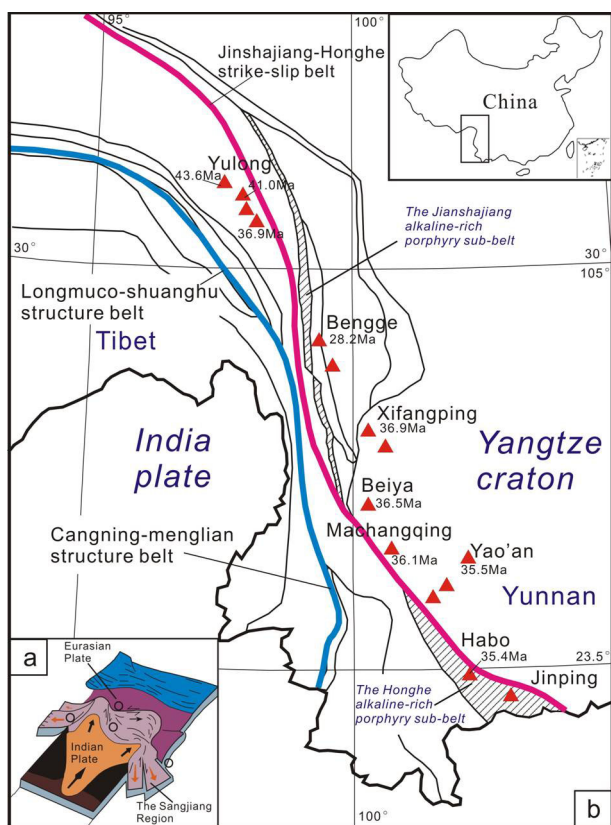


Fig. 1. a) cartoon showing the strike-slip faults forming after the collision and escape of blocks in the background of the Indian-Eurasian plates wedge-shape collision; b) Map showing the tectonic location and characteristic of the Jinshajiang-Honghe alkaline-rich porphyry belt in west Yunnan, SW China.

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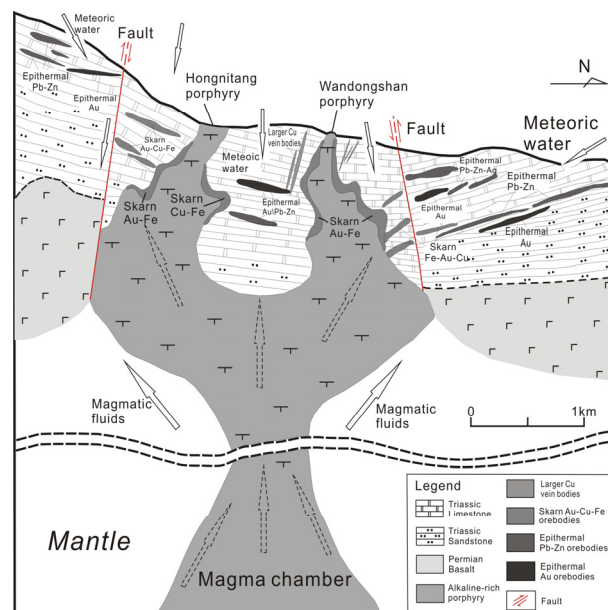


Fig. 2 Model for Beiya alkaline-rich porphyries related porphyry gold-polymetallic metallogenic system

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