The geographic position of the Xiongcun district is situated at latitude 29°22.5′N and Longitude 88°25.5′E in Rongma township, Xietongmen county of Shigatse, Tibet, approximately 300 km west of the Lhasa (Fig. 1). The regional geological setting is located in the south margin of the Gangdese belt; its south side adjoining the Xigaze fore-arc basin (Fig.1). The No.1, No.II and No.III large to super-large copper-gold deposits as well as a number of mineralization anomalies have been discovered in the Xiongcun district. The No.II deposit was firstly discovered by Tang et al. when they carried geological survey in 2004; Starting from 2004, Tibet Tianyuan Minerals Exploration LTD., Chengdu University of Technology and Institute of Mineral Resources of Chinese Academy of Geological Sciences have carried out systematic geological exploration on the Xiongcun district. The No.II deposit was completed exploration work in July 2012, and 15,936.2 meters of core were obtained from 34 diamond drill holes. The No.II deposit has resources of over 311 M tonnes (measured and indicated) at 0.35% copper, 0.22g/t gold and 1.33g/t silver. At the time of writing this thesis, mineralization of No. II deposit still remain opened in all lateral directions.

Most rock types in the Xiongcun district are believed to have formed in Jurassic time (Fig. 1). The main rock types are volcanic and volcano-sedimentary strata assigned to the Xiongcun formation, which consists of tuff, sandstone, siltstone, argillite and minor limestone. Tuffs are the mainly mineralized wall rock that dating back to 171~199.6 Ma.

The district contains Jurassic and Paleocene magmatic rocks (Fig. 1). The Jurassic magmatic rocks include hornblende quartz diorite porphyry, early hornblende quartz diorite porphyry with big quartz eyes, late hornblende quartz diorite porphyry with big quartz eyes, quartz diorite porphyry, diabase dyke and basalt-andesite dyke; The Paleocene magmatic rocks are biotite granodiorite batholith, quartz diorite, granitic aplite dyke and lamprophyre dyke. The tow ore-bearing porphyries have been identified: 1) the early one is the hornblende quartz diorite porphyry, emplaced during 170~184 Ma, this porphyry is the ore-bearing porphyry of the No.II and No.III deposit, the phenocrysts are mainly plagioclase (content of 35~45%), hornblende (content of 15%) and quartz (content less than 10% and sized less than 1cm) (Fig. 2a, 2b, Fig. 3); 2) the late one is late hornblende quartz diorite porphyry with big quartz eyes, emplaced during 162.4~172.9 Ma, this porphyry is the ore-bearing porphyry of the No. I deposit, the phenocrysts are mainly quartz (content of 10~15%, sometimes more than 15%, and sized 1~1.5 cm) and hornblende (content of 10%).

The Xiongcun No.II deposit occurs in the ore-bearing porphyry (hornblende quartz diorite porphyry) and only little amount in the thermally metamorphosed tuffs surrounding the porphyry. The orebody is a northwest-elongated, tabular body which dips about 35~55° to the northeast. According to completing drilling holes, the orebody seated in altitude 4211 to 5050m, extends about 900m along its strike and about 500m along its inclination with the thickness of 200 to 500m (Fig. 1, Fig. 3).

The alteration is extremely intense in Xiongcun No.II deposit, the alteration types include potassic alteration (Fig. 2b, 2c, 2d, 2e), sodic-calcic alteration, phyllic alteration (Fig. 3e) and propylitic alteration. The ore-bearing alteration type is mainly potassic alteration. The mineralization is typically veinlets-disseminated in

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**Geological Characteristics and Exploration Potential of The No.II deposit in The Xiongcun district, South Gangdese belt, Tibet**

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Fig. 1. Summary geological map of the Xiongcun district
Fig. 2. Photos of rock hand specimens and polarizing microscopes from the Xiongcun No.II deposit
a-hornblende quartz diorite porphyry, weakly potassic alteration, observing many gray plagioclase phenocrysts; b-hornblende quartz diorite porphyry, plagioclase phenocrysts (grey, euhedral tabular crystal), matrix occurs strong biotite alteration (sandy beige); c-stong potassic alteration overprinted by weak quartz-sericite alteration, observing chlorite-sulfide veins; d-strong potassic alteration, observing many early quartz-sulfide veins; e-potassic alteration overprinted by late quartz-sericite alteration, observing many chlorite-sulfide veins. Abbreviations: 1=chlorite-sulfide vein; 2=early quartz-sulfide vein; Br=biotite; Pl=plagioclase.

Fig. 3. C-D geological section of Xiongcun NO.II deposit (location of the section see Fig.1)
Xiongcun No.II deposit, the veins include early quartz-sulfide Veins (Fig. 2d), Chlorite-sulfide veins (Fig. 2c, 2e), Pyrite Veins, quartz-molybdenite veins, actinolite Veins, biotite-magnetite-sulfide veins, anhydrite veins and pyrite-chlcopyrite veins. The mineralizing veins are mainly quartz-sulfide veins and chlorite-sulfide veins.

Studies on the occurrence, vein characteristics and alteration of the Xiongcun No.II deposit have indicated that the mineralization occurs in the ore-bearing porphyry where the ore contains typical veinlet-disseminated structures and typical alteration of a porphyry deposit, we assume that the Xiongcun No. II deposit should be a porphyry copper-gold deposit controlled by the early Jurassic hornblende quartz driotite porphyry, and it should be the products of the north-warding subduction of the Neo-Tethys Ocean in early Jurassic.

The Xiongcun No.II deposit remains open to expansion in all lateral directions. In the surface, hydrothermal alteration and strong geochemical response in soils and rock chips are widespread across district and comprise excellent targets for further drill exploration; at the deep parts, most of drilling holes have not controlled the footwall of deposit (Fig. 3). So, a major program of surface and drill exploration needs to further delineate the No.II deposit and to evaluate other prospective zones in the Xiongcun district.

**Key words:** Xiongcun, Tibet, Gangdese, porphyry deposit, Exploration

**References**


