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The Genetic Types of Mineral Deposits of Xiongcun District, Gangdese Porphyry Copper Belt, Tibet, PRC

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The Xiongcun district is the breakthrough of Jurassic mineralization in the Gangdese porphyry copper belt (GPCB)，located in the middle of the GPCB. Its southern margin is Xigaze forearc basin (Lang, et al., 2012a). Three main Cu-Au deposits (No.I, No.II, No.III deposit) and many mineralized bodies have been found in this district. Three main Cu-Au deposits are NW-striking. Dongga gold deposit is located about 2 km northwest of No.I deposit and 0.5 km southwest of No.II deposit. It is the first gold deposit have been found in the GPCB.

The genetic type of mineral deposits in Xiongcun district has a large controversy in the last decade. In the early exploration stage, understanding of the genesis of No.I deposit mainly have the following kinds：epithermal deposit (Ding，2004), porphyry deposit (Lang et al.,2007) and porphyry-epithermal deposit (Xu et al.,2006). Along with the large-scale exploration work, Lang (2007) and Tang et al. (2010) established this deposit is a porphyry copper-gold deposit，which has been widely accepted. In island arc porphyry copper-gold deposit theory as the guidance, comprehensive information of geology, geophysics, geochemistry and remote sension, we gradually found No.II, No.III deposit and many mineralized bodies in the peripheral areas. mineralization characteristics of the No.II, No.III copper gold deposits are similar, but have significant difference compared with No.I deposit. Lang (2012b)for the first time put forward that No.I deposit is reduced porphyry copper-gold deposit (RPCD) and No.II, No.III deposits are oxidized porphyry copper-gold deposit (OPCD). In addition, there are mainly two kinds of views about the genetic type of Dongga gold deposit: meso-epithermal structure altered rock type gold deposit（Xing et al., 2003）and epithermal gold deposit (Cao et al.,1996;Lang, 2007）.

Deposit genetic types have many disputes because insufficient understanding of metallogenic features. There are at least two epoches of porphyry copper-gold mineralization in Xiongcun district and typical representative is No.I, No.II deposit. At No.I deposit, predominant ilmenite over magnetite suggest that the granitoids related to mineralization are ilmenite-series I-type granitoids (Rowins et al., 2000; cao et al., 2014). Rowins (2000) argues that RPCD is closely related with ilmenite-series I-type granitoids. The No.I deposit is characterized by widely developed pyrrhotite and ilmenite, which have similar mineral assemblages to the RPCDs, such as 17 mile Hill, San Anton, Madeleine (Rowins et al., 1997；Randall et al., 1994；Ague and Brimhall, 1988）. Xu et al. (2006) have indicated that the ore-forming fluid of No.I deposit is a immiscible CO_2-CH_4-N_2 system. Takagi and Tsukimura (1997) suggested when the magma is buffered by CH_4-CO_2，no magnetie will be formed throughout the course of crystallization. The No.II deposit is characterized by widely developed magnetite and anhydrite, which have similar mineral assemblages to the OPCDs (Rowins，2000).

The shallow gold mineralization of Dongga gold deposit controlled by northwest fracture systems and deep mineralization controlled by hidden explosive breccia in the contact alteration zone (Cao et al., 1996). The mineralization is closely related to silicification and sericitization. The silicification locally manifested as quartz-sulfide vein. Characteristics of fluid inclusions suggest that the mineralization temperature and pressure are low (Ding，2004；Cao et al., 1996). The ore-forming fluid is given priority to with atmospheric precipitation（Lang,2007）. The above characteristics indicate that the deposit is similar to typical epithermal gold deposit. In recent decades, many scholars study epithermal deposit related to porphyry deposits metallogenic system（Eaton et al., 1993；Hedenquist et al., 1998；Sillitoe et al., 1999; Sillitoe et al., 2003；Richards et al., 2006）. Abundant pyrrhotite have been found at Dongga gold deposit. Gaseous composition of ore-forming fluid also appear a

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large number of reducing gas such as CH_4, CO, H_2S (Xing et al., 2003). Dongga epithermal gold deposit ore-forming system may be relate to reduced porphyry copper-gold metallogenic system (No.I deposit). So, The Xiongcun district has great potential in search of epithermal gold deposit.

As above, OPCDs and RPCDs coexist in Xiongcun distict, is a natural laboratory to study mineralization characteristics of OPCDs and RPCDs. The understanding of the epithermal metallogenic system is closely related to Porphyry metallogenic system provides a new ore prospecting direction in the Xiongcun district.

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