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Tectonic significance of mafic-ultramafic intrusions in the Neoproterozoic Xixano Nappe Complex of northern Mozambique

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The Cabo Delgado Nappe Complex in northern Mozambique includes several distinct structural units that were overthrust and metamorphosed at upper amphibolite to granulite facies during the period 631 - 607 Ma. The Xixano Nappe Complex (XNC) is the largest of these units and is representative of the others. Recent geological mapping and geochemical surveying has shown that supracrustal rocks are dominant and are divided into three domains: Eastern and Western granulites (mafic and minor felsic); and Central marble, quartzite and graphitic gneiss. These are interpreted as mafic and felsic volcanic rocks and shallow to deeper water sediments.

Mafic-ultramafic intrusive rocks of the XNC are small to medium-sized differentiated bodies hosted within both metasedimentary and metavolcanic supracrustal rocks. They range from olivine cumulates (dunite, lherzolite) to plagioclase-pyroxene(-olivine) cumulates (gabbronorite, troctolite, anorthosite). Many of the smaller intrusions contain weak to moderate Ni-Cu sulphide mineralization of varying metal tenors (metal in 100% sulphides) and ratios, and some show visual evidence of wall-rock assimilation.

Five of the intrusions of the XNC have been studied in greater detail and show a variety of textures and characteristic minerals indicating their emplacement at both an early pretectonic and at a late tectonic stage. The pretectonic intrusions are only found in the metavolcanic terrane and are characterized by granular non-magmatic textures and the presence of green spinel and Na-Al rich pyroxenes. They are weakly mineralized with finely-disseminated sulphides. The late tectonic intrusions have largely preserved their primary magmatic textures and are characterized by a partial amphibolite to greenschist facies retrogressive overprint. Some of these intrusions contain Na-Al rich clinopyroxenes and amphiboles, suggesting emplacement at depth. Their geochemistry and style of mineralization suggests emplacement in a continental setting rather than in a juvenile arc setting.

Mots-Clés : Ni-Cu sulfide mineralization, mafic-ultramafic intrusion, Neoproterozoic, Xixano Complex, Mozambique

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