

Abstract ID: 238

Title: THE VMS DEPOSITS OF MEXICO

Student: No

Topic: Economic Geology

Medium: Invited Oral Presentation

Author 1 (CONTACT AUTHOR)

Name: Miguel Angel Miranda-Gasca

Org: Linear Gold Corporation

Country: Mexico

Keywords: VMS Mexico kuroko besshi, Guerrero Sierra-Madre terrane Cretaceous Jurassic Island arcs sulfide deformation

Abstract: The metallic content, morphology, age, deformation, and metamorphism of more than 70 VMS (volcanogenic massive sulfide) deposits of Mexico are associated with the tectonostratigraphic terrane where they occur. Only some of these deposits have produced significant amounts of precious and base metals. The largest VMS are San Nicolás and Francisco I. Madero. San Nicolás contains 99.5 Mt with 24 g/t Ag, 0.41 g/t Au, 0.15% Pb, 1.64% Zn 1.36 % Cu and Francisco I. Madero >40 Mt 31 g/t Ag, 0.9% Pb, 5.0% Zn, 0.11% Cu. The vast majority of the Mexican VMS deposits are hosted in Jurassic and Cretaceous rocks of the Guerrero terrane, located along western Mexico. Only one VMS deposit has been identified in similar island-arc Cretaceous rocks of the Parral terrane. Two VMS deposits are hosted in Paleozoic island-arc rocks of Sierra Madre and Mixteco terranes.

Similar types of the Mexican VMS deposits are found in terranes or subterranes that share similar geological characteristics. So, each terrane is considered a metallogenic province. The Paleozoic deposits of Teziutlán, Puebla State, are hosted in mafic volcanic rocks of a poorly documented island arc. They contain Zn-Cu and are probably Besshi type. The Guerrero terrane VMS are Zn-Pb-Cu type. The Teloloapan and Zihuatanejo Guerrero subterrane are Kuroko type associated with evolved island arcs where rhyolites are locally more abundant than andesites and basalts.

The Zacatecas-Guanajuato VMS deposits contain Zn-Cu, and are deficient in Pb. They are hosted in rocks of primitive island arcs with larger amounts of basalts and andesites than rhyolites. San Nicolás and Francisco I. Madero are located in this Guerrero subterrane.

The Zihuatanejo Guerrero subterrane VMS deposits have not suffered deformation. The Paleozoic and the Jurassic-Cretaceous Teloloapan and Zacatecas-Guanajuato VMS deposits are the more deformed and metamorphosed. The massive sulfide lenses have been elongated, the basal stockworks have been compressed and elongated against the main massive sulfide lenses, and have been fragmented, and dispersed in less competent rocks as shales and tuffs.

The VMS deposits associated to sea floor like the Baja California deposits, contain more Au than the VMS of more evolved arcs.

The metallic content, deformation, metamorphism, and source of sulfur are related to the lithology, tectonic and magmatic evolution, and original sources of Jurassic-Cretaceous sea-water $\delta^{34}\text{S}$ where they are present.