

The tectonic and metallogenic evolution of the Arasbaran Magmatic Belt, NW Iran

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This study reviews the tectonic and metallogenic evolution of the Arasbaran belt in northwestern Iran that is part of the Tethyan orogenic collage. The Arasbaran Magmatic Belt (AMB) straddles the border between Armenia-Azerbaijan and Iran (Figs. 1, 2). The AMB was formed as a Cenozoic magmatic arc near the southern margin of the Lesser Caucasus and is the second-largest copper porphyry belt in Iran. The AMB is associated with Late Oligocene to Early Miocene magmatism and is a subdivision of the Tethyan Metallogenic Belt (TMB). Some of the world's major porphyry systems in the Eurasian continent, besides those hosted by the dominantly Paleozoic Altaids (syn. Central Asian Orogenic Belt), sandwiched between Tarim, Siberia, and East European cratons, are part of the Mesozoic-Cenozoic TMB, extending across central and southeast Europe to Turkey, Iran, Pakistan, and Southeast Asia. The TMB hosts many Cu–Mo–Au porphyry, base-metal skarn, and precious metal epithermal deposits. These include the world-class Sungun porphyry Cu-Mo deposit and the nearby Haftcheshmeh Cu-Mo-Au deposit and other large porphyry deposits including Kighal and Niaz, skarn-type deposits including Sungun, Mazraeh, Anjerd and Ghowdal, and epithermal deposits including Sharafabad, Sarikhanlou, Safikhanlou, and Doostbaiglou. Contemporaneous porphyry deposits discovered in AMB of Armenia comprise Agarak, Kadjaran, and Dastakert. The available data suggest that all deposits in the Arasbaran belt are related to the temporal evolution of the Tethyan arc magmatism and closure of the Neo-Tethys Ocean and post-collision of the Central Iranian Block and the Eurasian plate. Tectonomagmatic zonation, petrological, and isotope features of crustal architecture as well as geophysical signatures and distribution of seismic activity reflect a complex pattern of microplate assemblage controlling magma fertility and mineral potential of the distinct crustal blocks.

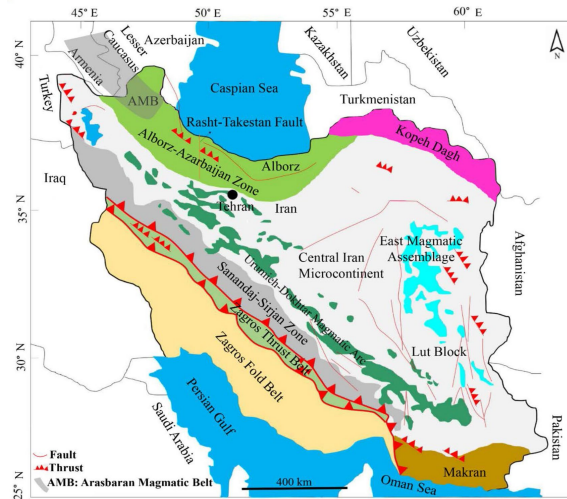


Fig. 1. Schematic geology map of Iran with structural zones and Arasbaran Magmatic Belt (AMB).

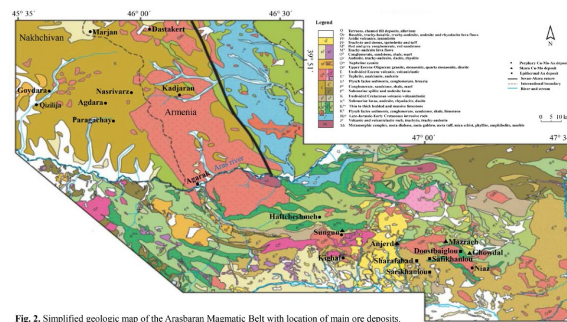


Fig. 2. Simplified geologic map of the Arasbaran Magmatic Belt with location of main ore deposits.