

Elucidating the Host Rock Petrogenesis of the Masara Gold District, Eastern Mindanao, Philippines: Implications for Metallogenesis

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The Masara gold district located in Eastern Mindanao, Philippines, is one of the most promising gold provinces in the Philippines. However, studies on the geology and metallogenesis in the district are limited despite its long history of gold production. This work describes the Masara gold district in terms of host rock geology, geochemistry, and geochronology in order to supplement our understanding on the magmatic evolution of the district and its link to mineralization.

The gold district is primarily hosted in andesitic volcanic rocks and multiple stocks of diorite and porphyritic andesite. New U-Pb and whole rock K-Ar dates of these host rocks constrained several magmatic suites formed from different pulses during the Eocene, Early to Late Miocene, and Plio-Pleistocene. A new lithologic unit is also proposed to describe the Late Miocene diorite phase associated with epithermal gold mineralization. Major and trace element geochemistry of the host rocks reveals that the Eocene magmatic suite is tholeiitic, whereas the diorite and porphyritic andesite pulses formed during the Miocene are calc-alkaline. Adakitic rocks are also reported to have been emplaced during the Late Miocene and Plio-Pleistocene in the district.

On a more regional scale, mineralization in Eastern Mindanao is associated with multiple intrusive events from the Oligocene to Pliocene. The majority of these mineralizing events is related to calc-alkaline magmatism. Based on this study, epithermal mineralization in the Masara gold district is closely related to the different phases of Late Miocene magmatic rocks that exhibit calc-alkaline and adakitic signatures.