

Alteration Mineralogy of the Mapula Porphyry Copper Prospect In Maco Mine, Eastern Mindanao, Philippines

J.A.V Amoroso^{1*}, J.A Gabo-Ratio¹, M.Y.R Garcia¹, M.A Barrientos¹, D.E Riguer², and R. Mendaje²

¹Rushurgent Working Group, National Institute of Geological Sciences, College of Science, University of the Philippines, Diliman, Quezon City, Philippines

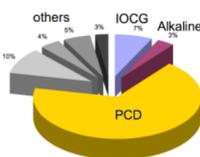
²Apex Mining Company Incorporated, 3304-B West Tower, Tektite Towers, Ortigas Center, Pasig City, Philippines

*Corresponding Author: amorosojav@gmail.com

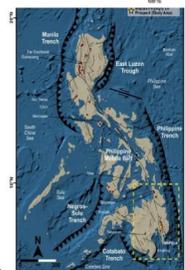
Overview



Porphyry copper deposits are formed from hydrothermal fluids related to magmatic intrusions. It is characterized by its distinct alteration zonation and mineralogy.



Porphyry copper deposits supply three-quarters of the world's copper.



This study will investigate the alteration mineral assemblage of the Mapula Porphyry Copper Prospect in the Masara Gold District, Eastern Mindanao.

Objectives

This study aims to characterize the ore mineralization and alteration of the Mapula porphyry copper prospect. Specifically, this study will:

1. Identify the alteration types associated with mineralization

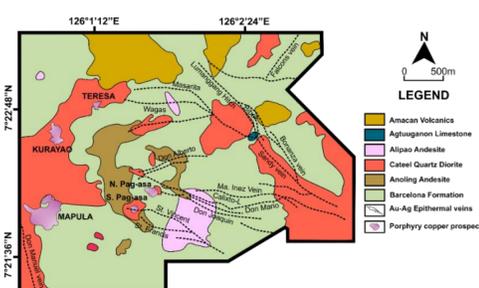
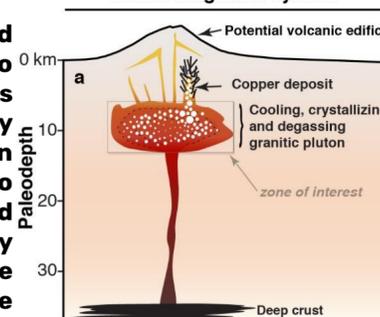
Background

Porphyry copper deposits are formed from hydrothermal fluids related to magmatic intrusions. One of the areas with potential for further porphyry copper deposit exploration is Eastern Mindanao. The interest of this study is to investigate the ore mineralogy and alteration zoning in the Mapula porphyry copper prospect to provide data on the porphyry copper mineralization in the Masara Gold District.

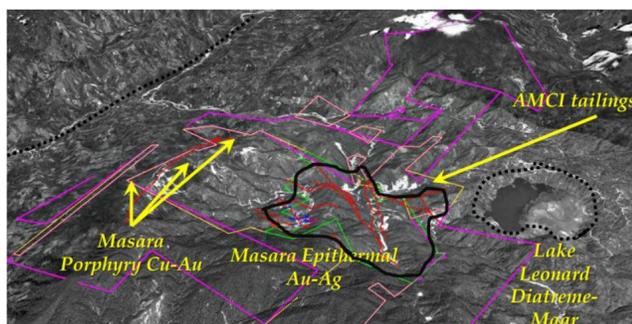
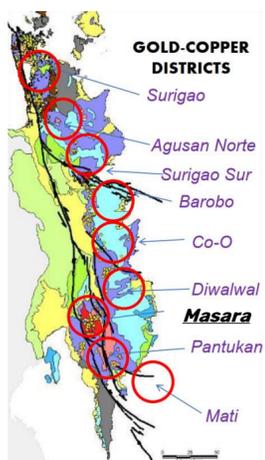
Methodology



Active magmatic system



Discussion and Conclusion



Porphyry copper deposits are typically formed from calc-alkaline magmatism in arcs, such as in the Philippines, which contain abundant porphyry copper deposits. As shown here, it is without a doubt that southeastern Mindanao is one of the most productive areas in terms of hydrothermal mineralization, evident of which are several copper-gold districts that lie within this region. Some of the most notable are the Surigao, Co, Diwalwal, Pantukan and the Masara Gold District. Moreover, this figure represents the distribution of deposits within the Masara Gold District.

Despite decades of exploration activities and numerous academic works there are still aspects of the district that are yet to be investigated in detail.

On the eastern portion of the tenement, we see the distribution of the epithermal Au-Ag veins which has been the focus of mining production. However, the district is also host to several porphyry copper prospects which is located on the western portion of the tenement, such as the Teresa, Kurayao, Mapula and Pagasa. The Apex Mining Company is now considering the production of copper in addition to gold, which has led to exploration work being recently focused in the porphyry prospects.

The focus of this study will be the Mapula porphyry copper prospect which is considered the largest porphyry prospect in the area.

Based on the reconnaissance mapping and core logging of two available drill holes, five alteration types were classified:

- A. Potassic alteration is signified by secondary biotite-magnetite with association of A, B and M veins.
- B. Propylitic alteration signified by epi-chl which replaces mafic minerals.
- C. Argillic alteration which was megascopically identified as kaolinite due to its soapy texture.
- D. White sericite alteration which appears to be strongly oxidized signifying abundant sulfide zoning. It is associated by A, B and D veins.
- E. Green sericite alteration which has a mineral assemblage of green ser (phengite?) - Qtz-cpy-py with association of criss-crossing D-veins

References

- Blundy, J., Mavrogenes, J., Tattitch, B., and Sparks, S., 2015. Generation of porphyry copper deposits by gas-brine reaction in volcanic arcs. *Nature Geoscience*, 8, 235-240.
- Rose, A., 1970. Zonal Alterations of wallrock alteration and sulfide deposit distribution at porphyry copper deposits. *Economic Geology*, 65, 920-936.
- Sillitoe, R.H., 2010. Porphyry Copper Systems. *Economic Geology*, 105, 3-41.

Summary

1. The Mapula porphyry copper prospect shows complete alteration zonation which might be indicative that it still has great potential underneath

Acknowledgement

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