

Bantug Lithocap, Negros Island, Philippines: Mineralogy, Textures, and Chemistry

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Negros is a volcanic island located in Central Visayas, Philippines. The geology of Negros comprises Cretaceous to Quaternary volcanic and sedimentary sequences. Active volcanism occurs in the north and south of the island, with active geothermal activity associated with volcanism in the southern area. The Bantug area is located in the central-east portion of the island, ~17 km west of Tayasan. Advanced argillic mineral assemblages and silicic alteration crop out over an area of ~7 km by ~8 km and have overprinted rocks from the Pleistocene-Holocene Canlaon Volcanic Complex (CVC; 1.82 ± 0.11 Ma to 1.71 ± 0.16 Ma, LA-ICP-MS U-Pb on zircon). Advanced argillic alteration at Bantug, constrained using SWIR spectroscopy and SEM, consists of alunite, natroalunite, diaspore, pyrophyllite, APS minerals, and zunyite. Advanced argillic-altered rocks are characterised by patchy-wormy or gusano texture, and silicic-altered rocks are characterised by massive and vuggy textures. A natroalunite-cemented hydrothermal breccia body cuts the advanced-argillic altered rocks. The lithocap is truncated by the Pleistocene Bantug Intrusive Complex (BIC; 1.37 ± 0.10 Ma to 1.24 ± 0.05 Ma, LA-ICP-MS U-Pb on zircon). The BIC comprises at least three phyllic and propylitic-altered porphyritic diorites, some of which display miarolitic cavities filled with epidote and quartz. The oldest intrusion, a diorite porphyry, displays incipient, millimetre-thick, wavy, quartz-pyrite veins. Base and precious metal results from whole rock geochemical analyses along and across the lithocap are below detection limit. However, REE, Sr, and TiO₂ define anomalies which coincide with the occurrence of high temperature minerals (i.e., pyrophyllite, diaspore, zunyite) identified using SWIR spectroscopy and SEM. This information, coupled with LA-ICP-MS mineral chemistry from alunite, pyrite, epidote, chlorite, and magnetite, have helped to locate heat sources and potential zones of magmatic-hydrothermal mineralisation in the lithocap at Bantug.