

## **Insights into the genesis of the Rio Blanco epithermal Au-Ag mineralization in the Occidental Cordillera of southwestern Ecuador: constraints from zircon U-Pb and sericite-Adularia Ar/Ar geochronology**

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The Rio Blanco Au-Ag mineralization in the Cordillera Occidental of southwestern Ecuador is part of the Miocene metallogenic belt that extends from northern Peru into southern Ecuador. The mineralization mainly occurs as ENE-trending brecciated and silicified veins of variable sizes dipping at angles  $>45^\circ$  towards the SE, and which textures and mineralogy are typical of a low-sulfidation epithermal environment. The mineralization is spatially associated with volcanic and intrusive rocks.

In order to assess the temporal and by inference the genetic relationship between the Au-Ag mineralization and the spatially associated magmatic rocks, an investigation that combined zircon U-Pb [chemical abrasion ID-TIMS and laser ablation (LA) ICP-MS] and adularia and sericite  $^{40}\text{Ar}/^{39}\text{Ar}$  geochronology was carried out.

The results obtained indicate that, whereas volcanics range in age from  $37.35\pm 0.30$  Ma to  $33.09\pm 0.20$ , the spatially associated intrusions are of  $35.77\pm 0.19$  to  $36.03\pm 0.19$  Ma and  $15.58\pm 0.04$  Ma. The  $^{40}\text{Ar}/^{39}\text{Ar}$  dates of adularia are between 14.3-14.9 Ma and the sericite  $^{40}\text{Ar}/^{39}\text{Ar}$  weighted plateau age is of  $18.91\pm 0.49$  Ma. These results rule out any temporal link between mineralization and the Late Eocene-Early Oligocene magmatism, but rather favor a possible genetic relationship between the Rio Blanco Au-Ag mineralization and the Miocene intrusion. This is consistent with the established Oligocene-Miocene period of ore deposits in Ecuador.