

The Silurian igneous rocks from the Santander Massif (Colombia) and its metallogenic significance

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The Santander Massif (SM), located in the Colombian Eastern Cordillera, registers different Phanerozoic magmatic events. Except for the Neogene magmatism (related to porphyry Mo-Cu and epithermal Au-Ag mineralization) no metallogenic potential has been attributed to these rocks.

The mapped 'Durania Granite Unit' (DGU), outcropping in the central part of the SM is a pluton composed by different lithologies: from plagioclase-rich metaluminous to muscovite-garnet-bearing peraluminous granite rocks (associated with high pegmatite dikes formation). The chemistry of these rocks are also variable: from tholeiitic to medium-high potassium calc-alkaline affinities. This wide composition across this pluton is interpreted as related to several magmatic pulses that took place along with a changing tectonic setting: starting with a locally more extensional and finishing with a more compressional environment (continental arc magmatism). The transition towards compressive settings (with a progressive crustal thickening and crustal contamination) favored the formation of more differentiated magmatic rocks (more felsic and more peraluminous granite rocks with enriched light REE relative to heavy REE, based on chondrite normalized plots). The local abundance of tourmaline and greisen-type hydrothermal alteration confined mainly to the pegmatite dikes cutting the metamorphic rocks of the Silgara Schist Unit (Early Ordovician in age; Fammatinian Orogeny) suggests a coeval development of magmatic-hydrothermal processes with a probable metallogenic significance (W-Sn?). The Zircon U-Pb geochronology indicates a GDU' crystallization age of 442.6 Ma \pm 7.4/-6.0 Ma (Early Silurian). Similar Silurian igneous bodies outcropping in the Merida Andes (Venezuela) allows to suggest that the progressive crustal thickening event was a regional episode which affected the Colombia and Venezuela Andes.