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The Altamira Granite Unit, Eastern Cordillera of Colombian Andes: preliminary petrologic insights

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Granite magmatism is widespread in the Eastern Cordillera of Colombia, but there are no detailed studies up to now and such rocks are poorly known. In the Garzon area (the so-called "Garzon Massif"), a large number of granite and related dioritic intrusions built several granite units with Jurassic ages which intrude Permo-Carboniferous metamorphic sequences. A volcano-sedimentary sequence made up of tuffs, agglomerates, porphyritic rhyolitic lavas interlayered with siltstones and mudstones (Saldaña Formation), appears to be largely coeval with the granite magmatism. Most of these intrusions as well as the volcano-sedimentary rocks are fault-limited to the east with the Garzon Metamorphic Complex, made up of older Meso- to NeoProterozoic metamorphic and igneous rocks.

As a part of our ongoing research on the Eastern Cordillera granite magmatism, we present preliminary petrographic and geochemical data for the Altamira Granite Unit, one of the smallest intrusive units that crops out in the "Garzon Massif". This unit covers a larger elongated area (ca. 35 vs. 8 km) with the major axis oriented SW-NE and is probably made up of discrete unmapped plutons.

Two main metaluminous granitic and one dioritic petrographic facies were recognized in the Altamira Granite Unit. The granitic facies are mainly made of massive equigranular to slightly inequigranular biotite monzogranites (largely predominant) and biotite-hornblende granodiorites, which contain apatite, zircon, titanite ± allanite, magnetite ± ilmenite as the main accessory phases. Porphyritic microgranites with plagioclase and quartz fenocrysts embedded in a granopyric-like quartz-feldspatic matrix occur as dikes and minor intrusions cross-cutting the granitic rocks. Massive equigranular dioritic rocks (mainly hornblende monzodiorites, with apatite, zircon, titanite and magnetite ± ilmenite as accessory minerals) form small coeval occurrences. Younger basic dikes cross cut most plutonic rocks. A late hydrothermal alteration inprint is widespread in all the Altamira rocks and the younger dikes, given way to the development of hydrothermal mineral assemblages dominated by chlorite- and epidote-group minerals.

Available geochemical data points to a high-K calc-alkaline signature for the Altamira intrusive rocks. REE patterns depict a high fractionation degree among the LREE and of the LRRE over the HREE and moderate Eu negative anomalies. Multi element trace diagrams point to evidence significant relative enrichements in LILE (as K, Rb, Sr) and depletions in Ti and HFSE (as Nb and Ta), features usually supporting a subduction componente in the source.

Our preliminary data suggest that the granites from the Altamira Granitic Unit could be generated and emplaced in a continental arc-like setting, and the parental magmas had contributions from both the mantle wedge and the overlaying continental crust. Magmatic crystallization occurred in a moderate oxidizing environment.