Geophysical Research Abstracts
Vol. 16, EGU2014-13614, 2014
EGU General Assembly 2014

Petrographic and geochemical characterization of the Triassic and Jurassic magmatic and volcanic rocks of southeastern Ecuador

Fabián Villares (1), Arturo Eguez (2), and Ernesto Yanez (2)

(1) Instituto Nacional de Investigación Geológico, Minero, Metalúrgico (Ecuador), Geología, Quito, Ecuador., (2) Escuela Politécnica Nacional, Departamento de Geología (Quito - Ecuador)

Formely, the subandean zone in the southeastern Ecuador involved large volcanic and magmatic rocks included in the Misahualli Formation and Zamora batholith, both as expression of the Jurassic cal-alcaline volcanic arc. The aim of the project carried out by the INIGEMM (Instituto Nacional de Investigación Geológico Minero Metalúrgico) was discriminate the volcanic products including a continuous set going from basalts to ryolithes and volcanoclastic rocks. Geochemical characterization was done using representative 16 whole – rock chemical analysis.

The oldest rocks of the investigated area called Pachicutza Unit, include greenish to black, massive basalts and basaltic andesites, locally showing pillows structures. The texture is aphanitic to microporphyritic with slight crystal growth of plagioclase and pyroxenes. The Unit include also local pyroclastic breccias and tuffs showing variable skarnification related to the intrusion of the jurassic Zamora Batholith. Two samples of basalts show tholeiitic affinity, corresponding to an N- MORB, probably representing an early stage in opening of a regional Triassic rift reported since Colombia to Peru in the Andes. These geochemical characteristics are similar to the amphibolites of Monte Olivo Unit in the Real Cordillera.

The Jurassic large volcanic assembly of the Misahualli Formation was also differenciated. Basal volcanics include green, subporphyritic andesites and volcanic breccias possibly generated at an early stage of the volcanic arc, caused by a change of extensive to compressive regime. Continental volcano sedimentary and sedimentary rock were discriminate as Nueva Esperanza and Suarez Units, respectively. The volcanosedimentary sequence include massive to laminate tuffs and tuffites of intermediate composition. The sediments of the Suarez Unit include dominant conglomerats and sandstones of fluvial domain. The regional volcanic sequence is completed by the Las Peñas Unit that includes aphanitic to porphyritic andesites and coarse volcanic breccias. Three geochemical analysis of the lavas show andesitic composition, have medium to high-K calc-alkaline and represent the products of a subduction zone.

All intrusions in the area were mapped as Zamora Batholith. Nevetheless, the field observations confirm a large Jurassic batholith but also other significant minor intrusion that intrudes the cretaceous sedimentary formations of the area. Thus, magmatic rocks in the area are named as Zamora batholithic complex.

Petrography of the Zamora Batholith ranges from tonalite to monzo-granite with the same qualitative mineralogy. Rocks are composed by different proportions of plagioclase, amphibole, K-feldspar, quartz, biotite, opaques and epidote, as accessory minerals has zircon, sphene and apatite. Zamora Granitoids ranged from dioritic to granitic compositions (60.09 - . 73.6 wt % SiO_2).

The Zamora Granitoids have medium to high-K calc-alkaline and represent the products of a subduction zone. Products are generated within a magmatic arc in normal conditions of maturity. The Zamora Granitoids are I - type intrusions.