Preliminary geochemical characteristics of Variscan granitoids from Apuseni Mountains (Romania)

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The Tisia Composite Terrane [TCT] is built up from Variscan metamorphic series and granitoids. The TCT forms the basement of South Hungary, NE Croatia, N Serbia and W Romania and it is surrounded by mobile zones and fault lines.

In order of correlation studies between granitoid suits from the Tisia Composite Terrane, an extended field survey is being carried out in the Apuseni Mountains (Romania). The Apuseni Mountains consist of four Alpine tectonic units: the Bihor Unit, the Codru Nappe System, the Biharia Nappe System and the Mureş zone. Its basement is built up from three pre-Alpine Godwanan terranes: Someş, Biharia and Baia de Arieş. These units are built up by metamorphic sequences, most of them contain Variscan granitoid intrusions. The present study focuses on different granitoid occurrences from the Someş Terrane: Şiria granitoid [SG] (presumably the same age as CG), Codru granitoid [CG] (372 Ma), Codru migmatite [CM] (516 Ma), Muntele Mare granitoid [MMG] (both main pluton and satellite branches) (297-291 Ma).

The composition of the suits is more or less heterogenic, many structural and compositional variations are present within a group. The MMG suite contains: equigranular two mica granitoids, biotite granitoids, k-feldspar megacryst bearing granitoids, leucogranites, leucogranites with gneissic texture. The CM suite is mostly metatexite, where both paleosome (~70%) and neosome are present (~30%). The SG and CG are two mica granites with or without feldspar megacrysts.

Petrogenetic and geotectonic interpretations were elaborated based on whole rock geochemical compositions (major and trace elements). Modal and geochemical classifications show granodiorite to monzogranite compositions for MMG, granitic (monzo- and syeno-) for CG and SG, and granodiorite to tonalite for CM.

The studied samples have a calc-alcaline and moderately peraluminous character. The only exceptions are framed by the CM, which are calcic. The samples from MMG, CG and SG show syn-collison and post orogenic origin, while the CM samples are mantle fractionates.

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Sr-Nd isotope evidence for mixing in the mafic rocks from the Reguengos de Monsaraz Variscan Pluton (Ossa Morena Zone, Portugal)

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The late-post-kinematic Reguengos de Monsaraz pluton is located in the Ossa Morena Zone, one of the major geotectonic units of the Iberian Variscan Belt. At the presently exposed level, the intrusion is dominated by tonalite-granodiorite rocks, spatially associated with minor bodies of gabbro-diorite composition, particularly in the central part of the area. Field evidence shows that the different intrusive facies define mixing/mingling contact relationships, suggesting a coeval emplacement for mafic and felsic magmas. The Rb-Sr age obtained for the pair amphibole-feldspar in one granodiorite sample (297.5 ± 2.9 Ma, initial $^{87/86}$ Sr = 0.70766 ± 0.00011) provides a minimum estimate for the time of original crystallization [1].

Petrographic and geochemical studies reveal that the different members of the suite have compositions ranging from metaluminous to slightly peraluminous and a distinctive calc-alkaline signature. Furthermore, the occurrence of systematic rectilinear correlations in Harker variation diagrams supports a mixed provenance for this sequence [1].

The εSr_{300}-εNd_{300} co-variation displayed by the least evolved members of the suite indicates that these rocks do no longer represent the mafic mixing end-member. Their relatively low εNd_{300} values [εNd_{300}=-5.1 to -7.8; $^{87}Sr/^{86}Sr_{300}$= 0.70871 to 0.71037] point to a significant interaction with time-integrated LREE-enriched upper crustal source components, comparable to the Late Proterozoic metasediments of the "Série Negra" (Fig. 1).

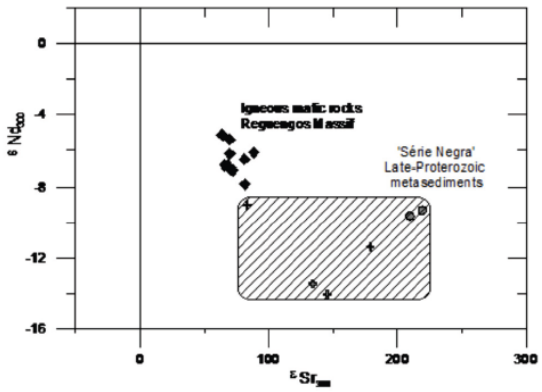

Fig. 1: εSr300-εNd300 diagram for the mafic rocks of the Reguengos de Monsaraz intrusion. Sr-Nd compositions of the "Série Negra" metasediments from Schäfer (1990) [2] and Beetsma (1995) [3].

A scenario where the gabbro-diorite magmas from Reguengos de Monsaraz correspond to contaminated basic liquids is therefore proposed. Further hybridization of mafic magmas with anatectic crustal melts would have generated the entire range of granitoid types present in the massif.

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