Layered granitoids; Migmatites and/or granitoids mixing zone?

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In the SW sector of the Ossa-Morena Zone (Iberian Variscides), a structurally complex and lithologically heterogeneous outcrop (Pereira & Silva, 2002) along the Almansor River was studied. This outcrop has been previously considered to represent migmatization. Other works (e.g. Moita *et al*., 2005) in nearby areas have shown that syn-tectonic plutonism and migmatization have been important in the period from 330 to 320 Ma.

In this study, three main lithotypes were identified which together define a strongly layered pattern: diatexites (Dtx), weakly foliated granitoids (WFG) and leucogranitoids (LG). The Dtx are peraluminous monzogranites to quartzo-monzonites [$(^{87}Sr/^{86}Sr)_{323}$ from 0.711621 to 0.712569; εNd_{323} from -9.32 to -8.92]; the WFG are metaluminous to weakly peraluminous tonalites to granodiorites, with [$(^{87}Sr/^{86}Sr)_{323}$ from 0.0707184 to 0.707321]; εNd_{323} from -3.93 to -5.51; LG are metaluminous to weakly peraluminous trondhjemitic rocks with [$(^{87}Sr/^{86}Sr)_{323}$ from 0.707785 to 0.711786 and εNd_{323} from -3.79 to -6.09]. The isotopic signature and multi-element patterns of Dtx are not only internally coherent but also similar to Neoproterozoic metasedimentary rocks suggesting that they represent anatectic magmas. The WFG and LG exhibit more complex multi-element (Moita *et al*., 2006) and isotopic signatures which were interpreted as the result of strong magmatic differentiation from mafic magmas accompannied by interaction with crustal melts.

Therefore, the studied outcrop, rather than testifying *in loco* migmatization seems to correspond to complex mingling/mixing(?) of magmas, evolved through different sources and processes (crustal anatexis and magmatic differentiation), within a shear zone.

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Graphite + apatite in >3.83 Ga ferruginous quartz-pyroxene (supracrustal) rocks from Akilia, southern West Greenland

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Graphite associated with apatite (Fig. 1) is present in magnetite-bearing banded quartz-pyroxene units from an early Archean supracrustal succession preserved on Akilia (island), West Greenland [1]. This observation stands in contrast with some recent reports that graphite was absent in apatite crystals from these same units [2]. Sample (*G91-26*; ref. 1) comes from rocks of sedimentary protolith with ^{12}C-enriched carbon ($\delta^{13}C$ < -30‰ vs. VPDB) in intimate association with apatite and previously presented as evidence for life on Earth before *ca.* 3.83 Ga [3]. Here, we report further examples graphite+apatite in pre-3.78 rocks of sedimentary protolith from other Akilia association enclaves on Innersuartuut island (West Greenland; ref. 4) and metasediments of the pre-3.75 Ga Nuvvuagittuq Supracrustal Belt (northern Québec, Canada; ref. 5).

Since the original description, geochemical evidence has accumulated that significantly bolsters the initial interpretation that that the Akilia rocks were originally chemical sediments deposited before 3.83 Ga, and that they provide information on surface processes and biological activity on the early Earth [6].

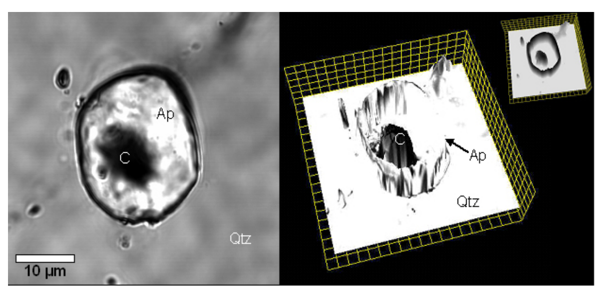

Figure 1. TL micrograph of graphite inclusion in apatite.

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