

# **Unraveling the geodynamic evolution of a Cretaceous convergent margin: serpentinites from the Romeral Suture Zone, Colombia (NW South America)**

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A long belt of dispersed serpentinite bodies mark a suture zone in NW South America (Colombia) that is interpreted as a remnant of a Cretaceous subduction zone. The suture zone is represented by a metapelite-matrix melange (Arquíá Complex) with kilometer to meter scale lenses/blocks of serpentinitized and partially serpentinitized ultramafic rocks, gabbro, high pressure metapelitic rocks, eclogite and blueschist. The matrix in the melange consists of low to medium grade (pelitic to mafic) schist, amphibolite, quartzite and marble. Blocks and lenses are interpreted to have been mixed in a descending-plate driven flow and near the surface by the interaction with an array of crustal scale faults within the melange. Thermobarometry and thermodynamic modelling indicate peak pressures of 17 to 18 kbar in high pressure rocks. Serpentinites show evidence of three serpentinitization events: (i) serpentinitization during seafloor hydration, (ii) breakdown of lizardite to antigorite, and (iii) retrograde serpentinitization during exhumation. Most eclogites and blueschists geochemical signature indicates N-MORB-type protoliths with a few samples showing oceanic islands basalts protoliths. Serpentinites from Arquía Complex have orthopyroxene with very low Al<sub>2</sub>O<sub>3</sub> (0.12-0.18 wt%), Cr<sub>2</sub>O<sub>3</sub> (0.08-0.13 wt%) and TiO<sub>2</sub> (0.02-0.06 wt%) contents reflecting a protolith that underwent high degrees of partial melting, observation consistent with high Cr# (0.84-0.90) and low Mg# (0.17-0.25) of spinel cores in these serpentinites (indicative of spinel formed in fore-arc peridotites). Therefore, we proposed that a large portion of serpentinites from Arquía Complex represent mantle wedge fragments. Petrology in serpentinites, blueschists and eclogites from Arquía Complex indicates that mantle wedge and oceanic crust fragments were mixed in the subduction channel below the proposed Early Cretaceous Quebradagrande Arc in NW South America.