U-Pb AND Sr-Nd ISOTOPES OF THE MAGMATIC ROCKS FROM THE NORTHERN PORTIONS OF THE NEUQUÉN PRECORDILLERA: TIMING AND SOURCES OF THE MAGMATISM.

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In the Cordillera del Viento, Argentina, plutonic rocks related with three main periods of magmatism in the Permian, Jurassic, and Cretaceous, are exposed. To characterize the Cretaceous magmatism in terms of ages and geochemistry and to evaluate the timing of flare-ups for the Andean Arc, some Cretaceous tonalites and their host rocks were analyzed by U-Pb geochronological analysis on zircon, geochemistry, and with Sr-Nd isotopes.

The Huingancó Granite has a shoshonitic signature. This intrusion represents the oldest magmatism in the region, with a Permian age. Sr-Nd isotopic analyses obtained on these gave values of $^{87}Sr/^{86}Sr$ of 0.72470 and 0.71700 and ε_{Nd} of -2.18 and -4.59. The latter corresponds to a Mesoproterozoic T_{DM} of 1.07 and 1.23 Ga, respectively.

The Jurassic Host Rock body around the Cretaceous intrusions is a low peraluminous granite of high-K calc-alkaline composition, with a crystallization age of 184 ± 3 Ma.

The Varvarco Tonalite is composed of metaluminous tonalites with medium-K calc-alkaline signature; it is intruded by dioritic and granitic dikes. The Butalon Tonalite is metaluminous to peraluminous, and has a low to medium-K calc-alkaline signature. U-Pb data on zircon (by LA-ICP-MS) indicate that the Varvarco and Butalon tonalites crystalized at 67 ± 1 Ma, and a dioritic dike crystallized at 65 ± 1 Ma. The $^{87}Sr/^{86}Sr$ values for the Varvarco and Butalon tonalites are 0.70460 and 0.70728; these rocks have ε_{Nd} values of -0.78 and +0.53 and Neoproterozoic T_{DM} ages of 0.76 and 0.75 Ga. The dioritic dike has a low $^{87}Sr/^{86}Sr$ value of 0.70460 and strongly positive ε_{Nd} of +10.77.

The Varvarco and Butalon tonalites of the Cordillera del Viento represent the main Cretaceous magmatism with an important mantle component. In contrast, the Jurassic Host Rocks granites and the Huingancó Granite have a strong crustal signature. The Sr-Nd isotopic data indicate that the parental magmas for the Varvarco and Butalon tonalites probably assimilated part of the Jurassic and Permian crust that is represented in the area by the Jurassic Host Rocks Granites and the Huingancó Granite.

For the Andean Arc, specifically the western Peninsular Ranges Batholith (wPRB), the Peruvian Coastal Batholith (PCB), and the Chilean Coastal Batholith (CCB), Martínez Ardila et al. (2019) defined a flare-up between 90 and 110 Ma. This flare-up episode is not identified at the Cordillera del Viento. Instead, the Varvarco and Butalón tonalites show peak magmatism between 65 and 70 Ma that could be correlated with the youngest age populations identified for the PCB and CCB. The rocks of the CCB show less variation in Sr-Nd isotopes and an enhanced mantle character, whereas the PCB rocks

have lower $^{143}Nd/^{144}Nd$ ratios and more radiogenic $^{87}Sr/^{86}Sr(t)$ ratios. Could the Varvarco and Butalon tonalites represent a lull stage in comparison with the flare-up magmatism from the wPRB, PCB and CCB? And why is this extended flare-up phase between 90 and 110 Ma not identified in the study area? Geochemical data, U-Pb and Hf on zircon, and Sr-Nd analysis for the Naunauco (Naunauco Group and Cayanta Andesite) and Ñorquinco-Villa Pehuenia (Paso de Icalma Granodiorite and Moquehue Granite) areas in the southern Neuquén Province are being obtained to further elucidate the sources and timing of magmatism linked with the evolution of the Andean Arc. Some of these additional data will be discussed at the conference.

Martínez Ardila, A.M. et al. (2019). Lithos, 326–327, 19–27.