

# Sr-Nd isotopic composition of gabbronorites from the Miocene Punta Camden Sill in southern Patagonia: petrogenetic and tectonic implications

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The Punta Camden Sill (53°13'S - 71°40'W) is a tabular body of ca. 4x3 km<sup>2</sup>, which intrudes the Paleogene sedimentary successions of the Magallanes foreland basin in the southernmost South America. It is located ca. 60 km to the NE from the eastern limit of the South Patagonian Batholith (SPB) and about 250 km from the trench (present-day coordinates). Their mafic members correspond to medium-grained porphyritic olivine-gabbronorites, with late hornblende and biotite. A whole-rock K-Ar age of ca. 20 Ma was reported in Morello et al. (1) and emplacement depth of about 2 km have been proposed (1). Rocks with SiO<sub>2</sub> contents of ca. 55 wt% and relatively high contents of K<sub>2</sub>O+Na<sub>2</sub>O (ca. 7 wt%) show low (La/Yb)<sub>n</sub> values (ca. 8.0 – 8.2), (Dy/Yb)<sub>n</sub> values (ca. 1.2) and subtle Eu anomalies (Eu/Eu\* ca. 0.8). These features and a marked depletion of Nb when is normalized to primitive mantle, indicate the influence of subduction processes during its formation, as is also reported in the Neogene plutonic rocks of the SPB. Initial Sr and Nd isotopic ratios (calculated at 20 Ma) yielded (<sup>87</sup>Sr/<sup>86</sup>Sr)<sub>t</sub> values of ca. 0.7041 and  $\varepsilon_{Nd_t}$  values of +2.2 to +2.5. A similar isotopic signature with relatively high alkalis was reported for coeval plutonic rocks to East in the SPB (2) and Miocene plutonic rocks from Torres del Paine (51°S), dated at ca. 12.5 Ma ((3),(4)). It is thus considered that primitive basaltic magmas were generated over a wide zone in the mantle wedge (>60 km), at relatively low degrees of partial melting, diachronously precluding the opening of the slab window related to the incoming Chile spreading ridge during Miocene times.

(1) Morello et al. (2001). Anales del Instituto de la Patagonia, Serie Ciencias Humanas 29: 129-148.

(2) Hurtado, (2018). Memoria de Título, Universidad Andrés Bello, 118 p.

(3) Ramírez de Arellano et al. (2021). JSAMES, 110, 103238.

(4) Leuthold, et al. (2012). EPSL, 325-326, 85-92.

(5) Leuthold, et al. (2013). J.Petrol. 54(2), 273-303.

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