



Nature and evolution of the lithospheric mantle beneath the Somoncuro Plateau, Northern Patagonia (Argentina): evidence from mantle xenoliths sampled by alkaline lavas.

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The Somoncuro Plateau located in a back-arc tectonic environment forms the largest basaltic plateau of Patagonia ($>20\,000\text{ km}^2$). Mantle xenoliths have been sampled by Cenozoic ($\sim 25\text{ Ma}$) alkali basalts outcropping from the western part (Cerro del Mojon) to the centre (Estancia Alvarez and Cerro Aznare) and finally to the eastern part (Praguanyieu) of the plateau allowing the study of a W-E profile perpendicular to a subduction zone. A representative suite of mantle xenoliths from the four localities has been selected.

The suite predominantly consists of anhydrous spinel-bearing harzburgites associated to a few samples of spinel lherzolites (anhydrous and hydrous), spinel-free harzburgites, dunites, websterites with or without olivine and clinopyroxenites. Olivine-free websterites mostly occur at Cerro Aznare. The olivines of harzburgites and lherzolites display higher Fo contents (90 to 92) than those of websterites, clinopyroxenites and dunites (~ 85). Clinopyroxenes of the spinel harzburgites from Estancia Alvarez have higher Mg# ($>94\%$) and lower Na_2O - and Al_2O_3 -contents than those of their equivalents from Cerro del Mojon and Praguanyieu. Clinopyroxenes of lherzolites always display REE S-type patterns (Ce_N/Yb_N : 3-8 and Ce_N/Sm_N : 1-1,5) while those of harzburgites show two types of REE patterns: (1) LREE-enriched patterns (Ce_N/Yb_N : 3-6 and Ce_N/Sm_N : 1,7-2) and (2) LREE and MREE-enriched patterns (Ce_N/Yb_N : 25

and Ce_N/Sm_N : 1,7). Finally the REE patterns of the clinopyroxenes of websterites and clinopyroxenite are either flat, convex (Ce_N/Yb_N : 0,6-1,5 and Ce_N/Sm_N : 0,5-1) and of S-type (Ce_N/Yb_N : 2,5-3 and Ce_N/Sm_N :1,5). There is no correlation between localities and the type of patterns. All the clinopyroxenes (peridotitic and pyroxenitic) are characterized by negative HFSE anomalies.

The upper mantle beneath the Somoncura plateau seems to be mostly refractory and completely metasomatised as evidenced by the peridotitic xenoliths. The metasomatic agents are probably carbonate-bearing alkaline mafic silicate melts rather than pure carbonatitic melts. The pyroxenites are mostly cumulates crystallized from similar melts within the upper mantle. Finally it seems that there is no evidence of subduction-related mantle metasomatism beneath the Somoncura plateau.