OCEANIC ALKALINE VOLCANIC RING COMPLEX, KERGUELEN ISLANDS (INDIAN OCEAN), AS A PRODUCT OF HYDROTHERMALLY ALTERED OCEANIC CRUST.

1Gagnevin D., 1Cottin, J-Y., 1Bowden, P., 1Gerbe M-C., 1Tourpin, S., 2Bonin B., 3Feraud G., 1Michon, G., 1Moine B.N., and 1Giret, A. 1 Université Jean Monnet, Saint-Etienne , France; 2Université de Paris sud, Orsay, France; 3UMR Nice, France

Post-glacial eruptive activity, partly obscured by the ice cap in the Rallier-du-Baty peninsula, represents the youngest magmatic event recorded in the northern Kerguelen Islands archipelago. It consists of three nested calderas with the youngest yielding a preliminary Ar/Ar age of 0.26Ma +/-0.03 years, obtained on sandine from trachytic obsidian. However, modelling of the petrogenetic history of this oceanic alkaline ring complex is complicated with the recognition of hydrothermal (seawater) signatures in the felsic products. Such an evolution contrasts with that found for continental alkaline ring complexes.Volcanic rocks are mainly pyroclastic deposits associated with trachytes, minor basaltic lavas and rhyolites. A subvolcanic cupola at the base of the caldera has been recognised from detritus dredged by the Carva glacier. The cupola contains several succesive ring-dykes of mildly alkaline quartz-syenite. Trace element signatures (Ba, Sr, Ni, Y, Zn) and fractional crystallisation modelling for the youngest caldera show that the magmatic evolution cannot be solely explained by a single stage process of low-pressure fractionation in an upper crustal (closed system) reservoir derived from a basaltic parent generated from an upper mantle source. Radiogenic isotopic ratios (Rb/Sr and Sm/Nd) show that seawater penetrated the shallow level magma reservoir and modified the composition of the felsic volcanic rocks, whereas basalts and syenites were not affected, nor were their plume signatures. Thus, in an oceanic setting, alkaline ring complexes may have been influenced by hydrothermally-altered oceanic crust. This protolith is totally different from that envisaged for continental alkaline igneous complexes.