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Preliminary results on distribution and origin of magnesite crusts in New Caledonia.

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Along the west coast of New Caledonia, a major structural basalt formation is outcropping from the southern Boghen valley to the northern Koumac area. The origin of such a volcanic complex, called as the extrusion of Poya, is controversy in the literature: allochthonous upper mantle of the peridotite or paleogene flows in a sedimentary basin affected by the tangential alpine tectonic. The basalts chemistry, intermediate between a tholeitic serie and a calco-alcaline one, would be attributed to an island arc volcanism of back arc or piggy back type.

Large outcrops of magnesite ($MgCO_3$) occur frequently along the West Coast, north of 21^{st} south parallel, associated to the basalts and the peridotites. Such occurrence is rare and rather few data are published on similar formations. Some of the larger outcrops (over few hundred meters) form crusts of metric thicknesses at the base of the ultrabasic massifs. But magnesite occurs also as infillings of fissures in the serpentinites, basalts or peridotites. A large sampling from Bourail, south, to Poum, north, was collected.

Magnesite outcrops mainly in the dryer area of New Caledonia and are associated to some facies of the ophiolitic complex. These observations suggest both climatic and lithologic controls of the process of formation. For instance, it is not clear if one of the two is dominant. In the literature, ^{14}C dates between 17000 and 27000 y B.P. for allochthonous nodules of magnesite in brown soils and vertisols, in the southern part of New Caledonia, are correlated to an arid period related to the last glacial event.

Geomorphological and petrological descriptions associated to mineralogy and major

and trace element geochemistry analysis indicate a close association of magnesite with serpentinous facies and silicification phenomena which are frequently related with Mg accumulations. The formation of the magnesite is studied in relation to the intensity and nature of those alterations and their micromorphology. Cathodo-luminescence observations, traces elements geochemistry and $\delta^{18}0/\delta^{13}C$ first results indicate different types of magnesite. Detailed mineralogy and microgeochemistry corroborate to the micromorphogy study is in process. The characterisation of the paragenese of the crusts (associated secondary minerals: smectites, calcite) and their substratum will refine the different magnesite types and provide information on their conditions of formation.

Weathering processes are probably dominant for the formation of the large magnesite crusts, but when occurring as infillings in fissure veins, a hydrothermal process is discussed for the magnesite.