



HAL
open science

Paleomagnetic dating of ferricretes in New Caledonia. Preliminary results

Brice Sevin, Caroline Ricordel-Prognon, Florence Quesnel, Dominique Cluzel,
Pierre Maurizot, Bernard Robineau

► **To cite this version:**

Brice Sevin, Caroline Ricordel-Prognon, Florence Quesnel, Dominique Cluzel, Pierre Maurizot, et al..
Paleomagnetic dating of ferricretes in New Caledonia. Preliminary results. EGU General Assembly
2010, May 2010, Vienne, Austria. pp.1. hal-00540741

HAL Id: hal-00540741

<https://hal-brgm.archives-ouvertes.fr/hal-00540741>

Submitted on 29 Nov 2010

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Paleomagnetic dating of ferricretes in New Caledonia. Preliminary results.

Brice Sevin (2), Caroline Ricordel-Prognon (1), Florence Quesnel (1), Dominique Cluzel (3), Pierre Maurizot (4), and Bernard Robineau (5)

(1) BRGM, Regolith and Reservoirs Unit, 3, avenue C. Guillemin, BP 36009, 45060 Orléans Cedex 2, France, (c.prognon@brgm.fr, f.quesnel@brgm.fr), (2) Geological Survey of New Caledonia, Department of Industry, Mines and Energy of New Caledonia, 1 Ter rue Unger, BP 465, 98845 Nouméa, New Caledonia, (brice.sevin@gouv.nc), (3) Pôle Pluridisciplinaire de la Matière et de l'Environnement, University of Nouméa, BPR4, 98851 Nouméa Cedex, New Caledonia, (dominique.cluzel@univ-nc.nc), (4) BRGM New Caledonia, 1 Ter rue Unger, BP 465, 98845 Nouméa, New Caledonia, (maurizot@canl.nc), (5) Centre National de Recherche Technologique « Nickel et son Environnement », 101 Promenade Roger Laroque, 98857 Nouméa Cedex, New Caledonia, (bernard.robineau@cnrt.nc)

Although the description of the emplacement (Cluzel et al., 2001) and the weathering (Trescases, 1975; Latham, 1986; Chevillotte et al., 2006) of the New Caledonia peridotites is well documented in the literature, the knowledge and the age of formation of the landsurfaces formed upon the ultrabasic massifs are poorly documented. Several surfaces have been recognised along the island but no reliable ages could be attributed to the associated regolith. In fact, the overthrust of the Ophiolitic Nappe in the South is stratigraphically constrained by a younger autochthonous olistostrom dated by Late Priabonian pelagic foraminifera (Cluzel et al., 1998). The supergene weathering being still active, the beginning of the ferruginisation of the various plateaux is not well constrained and estimated to have occurred between 34 Ma and Actual.

The processes of absolute dating are not relevant to these weathering profiles (K-Mn oxides are poorly concentrated). Ferricretes and various ferruginous materials have the potential to record the ancient geomagnetic field providing means of age determination. In tropical soils, most of the primary remanence carrying minerals are dissolved during weathering and secondary magnetic minerals, such as goethite and haematite, are formed in situ acquiring a crystallisation (or chemical) remanent magnetization (CRM). The paleomagnetic pole recovered by demagnetizing the CRMs are plotted on the local apparent polar wandering (APWP) reference curve providing an age for the different parts of the paleoweathering profiles.

The data and interpretations we present here are based on paleomagnetic analysis of ferricretes of Goro and Tiebaghi. The preliminary results suggest, for the first time ever, well constrained ages between 20 and 25 Ma of major ferruginisation stages of the peridotites of New Caledonia.

References

Chevillotte V., Chardon D., Beauvais A, Maurizot P. & Colin F. (2006). Long-term tropical morphogenesis of New Caledonia (Southwest Pacific): Importance of positive epeirogeny and climate change, *Geomorphology*, 81, 361–375

Cluzel D., Chiron D., Courme M.D., 1998, Discordance de l'Eocène supérieur et évènements pré-obduction en Nouvelle-Calédonie. *Comptes Rendus de l'Académie des Sciences, Série II. Sciences de la Terre et des Planètes*. 327; 7, 485-491.

Cluzel D., Aitchison J.C., Picard C., 2001, Tectonic accretion and underplating of mafic terranes in the Late Eocene intraoceanic fore-arc of New Caledonia (Southwest Pacific) : geodynamic implications, *Tectonophysics*, 340, pp. 23-59.

Latham M. (1986). Altération et pédogenèse sur roches ultrabasiques en Nouvelle-Calédonie. DG: Doctoral DI: Univ. Dijon. Dijon, France. 331 p.

Trescases J.J. (1975) L'évolution géochimique supergène des roches ultrabasiques en zonetropicale; Formation des gisements nickelifères de Nouvelle-Calédonie, Mémoires ORSTOM. 78.