



Microsedimentological investigations in lacustrine sediments from a maar lake: implications for palaeoenvironmental reconstructions

Guillaume Jouve (1,2), Pierre Francus (1,2), Arnaud De Coninck (1,2), Frédéric Bouchard (1,3), and the PASADO Science Team

(1) Institut National de la Recherche Scientifique, Eau Terre Environnement, Québec, Canada, (2) GEOTOP Research Centre, Montréal, Canada, (3) Centre d'étude Nordique, Université Laval, Québec, Canada, (4) Members of the PASADO Science Team are listed at http://www.icdp-online.org/front_content.php?idcat=1494

Twenty two thin sections from Laguna Potrok Aike (Santa Cruz province, Patagonia, Argentina) sediments were analyzed in high resolution using μ -XRF, SEM-EDS and grain size determination using image analysis, focusing on an interval spanning the last Glacial interval. The aim of this work was to improve our understanding and identification of all sedimentary facies and their geochemical signature in order to strengthen the paleoenvironmental reconstruction made from this record.

High Ca, Ca/Ti and Ca/Si values are revealing coarse sediments during the Last Glacial. Previous studies showed that these ratios were also related to (1) the occurrence of a calcitic lorica green algae *Phacotus lenticularis* during the Late Glacial and (2) autochthonous calcite precipitations during the Holocene. Potassium revealed clays or turbidites. High Fe content pointed to high (1) clay, or (2) silt, or (3) vivianite content, or (4) to low micropumices content. Peaks of Fe/Ti were rather related to (1) high clay content (2) high micropumices content and (3) sand events. Concomitant Fe, Mn, Mn/Ti and Fe/Ti peaks revealed (1) dissolution of volcanic rocks, (2) vivianite concretions, (3) redox mobilization in sediments, or (4) redeposited layers. Finally, Si and Ti revealed sand and silt respectively, but only if sediments are not rich in micropumices.

Consequently, identical geochemical signatures are indicative of many different sedimentary facies in this sedimentary sequence, so that the use of proxies for the whole sedimentary sequence is virtually impossible. This work cautions against the use of many μ -XRF proxies for an entire long lacustrine sedimentary sequence, and obviously warns about their use from one site to another.