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Geochemical and Pb isotopic investigations in peat bogs from Southern Chile: Identification of particles supplies and possible paleoclimate record

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Recent studies have demonstrated that ombrotrophic peat (*i.e.* exclusively fed by atmospheric deposition) constitutes a sensitive record of atmospheric Pb flux evolution throughout the Holocene [1,2]. However, uncertainties persist on the ability of mineral particle-rich peat bogs to record the paleo-atmospheric signal. Cores from particle-rich peat bogs of the Chilean Lake District (PB1-38°S, PB2-40°S) are investigated for mineral source identification and paleoclimatic reconstruction using ICP-AES, ICP-MS and Nu-plasma MC-ICP-MS. The Lake District peat bogs are close to Andean volcanic chain and collect punctual volcanic falls. Moreover, soft ash-derived Andosoils (*i.e. Trumaos*) provide a continuous particle rain input.

Significant shifts in particle fluxes, Pb enrichment factors (Pb E.F.), Pb and $^{147}Sm/^{144}Nd$ isotopic ratios reflect relatively short-time high fluxes of particles from various origins. Those high dust deposition events imply periods of increase in wind forces and dryness (particle flux up to 158 $g/m^2/yr$) or long range crustal dust supplies ($2 < Pb\ E.F. < 6$ and $^{147}Sm/^{144}Nd <$ 0.105 to 0.115). Moreover, anthropogenic aerosols supplies (Pb E.F. > 5 and up to 793, $^{206}Pb/^{207}Pb < 1.160$) are also recorded. Some of these events, preliminary considered as local, could be correlated with other paleoclimatic records in the Southern Hemisphere (e.g. data from [3]). These events become therefore of regional extend. For this reason, a more detailed investigation in such volcanogenic particle-rich peat bogs could reveal some important features of the Holocene paleoclimate in the Southern Hemisphere.

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$\delta^{44/40}Ca$ in the planktonic foraminifer *N. pachyderma* (sin.): A new proxy for the reconstruction of past sea surface temperatures

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The use of $\delta^{18}O$ as a proxy for past sea surface temperatures (SST) is restricted. Changes in precipitation and evaporation patterns, variations in ocean circulation or meltwater peaks may control the $\delta^{18}O$ signature and make it very difficult to identify the amplitude of the temperature signal. Previous investigations have shown a temperature dependence of Ca isotope fractionation that allows us to overcome these problems with the introduction of calcium isotope ratios [$\delta^{44/40}Ca = ((^{44}Ca/^{40}Ca)_{sample}/(^{44}Ca/^{40}Ca)_{standard})$-1)*1000] as a new SST-proxy. The polar foraminifer *N. pachyderma* sin. has turned out as a sensitive recorder of the $\delta^{44/40}Ca$ temperature signal ($\delta^{44/40}Ca = 0.21*SST(°C)-2.15$). Here we present a $\delta^{44/40}Ca$ record of *N. pachyderma* sin. from a site near the southern outlet of the Denmark Strait (core 23519, 64.7973°N, 29.5958°W, 1893 m water depths). The core section analysed (0-75 cm) covers the last 18000 years, spanning the time interval from the last deglaciation to the Late Holocene. Ca isotope measurements were carried out by multiple collector ICP-MS in cool plasma conditions as well as thermal ionisation mass spectrometry (TIMS) using a ^{43}Ca-^{48}Ca double spike technique. A multi-proxy approach comprising $\delta^{44/40}Ca$, $\delta^{18}O$ and foraminiferal transfer function is used to investigate the relationships of SST and salinity. Results suggest that $\delta^{44/40}Ca$ in foraminiferal shells grown in subpolar to polar watermasses is indeed widely unaffected by salinity changes. Furthermore, $\delta^{44/40}Ca$ ratios offer the possibility to resolve the amplitude of SST changes as well as absolute SST estimates.

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