

HOLOCENE PALEOENVIRONMENTAL AND PALEOCLIMATIC CHANGES FROM THE NGAOUNDABA PEAT DEPOSIT (NORTH CAMEROON)

VALENTINE SCHAAFF¹, MATTHEW MAKOU²,
VINCENT GROSSI³, SALOMÉ ANSANAY-ALEX², INGRID
ANTHEAUME², PIERRE DESCHAMPS⁴, BRUNO
HAMELIN⁴, YANNICK GARCIN⁵, DAVID SEBAG⁶,
BENJAMIN NGOUNOU NGATCHA⁷ AND GUILLEMETTE
MÉNOT²

¹Laboratoire de Géologie de Lyon, Univ Lyon

²LGLTPE, Univ Lyon, ENS de Lyon, Université Lyon 1, CNRS

³LGLTPE,

⁴CEREGE, Aix Marseille Univ, CNRS, IRD, INRAE, Coll
France

⁵CEREGE, Aix Marseille Univ, CNRS, IRD, INRAE, Coll
France, CEREGE UMR 7330

⁶IFP Energies Nouvelles, Direction Sciences de la Terre et
Technologies de l'Environnement, 1 et 4 avenue de Bois-Préau
92852 Rueil-Malmaison

⁷LAMISE, University of NGaoundéré, NGaoundéré

Presenting Author: valentine.schaaff@ens-lyon.fr

Peat deposits have a high potential for paleoclimate and paleoenvironmental reconstruction, as these organic-rich sediments may preserve a high abundance and great diversity of organic matter such as pollen, plant macrofossils or biomarkers. In this study, we investigate a 6-meter peat core from the NGaoundaba peatland (Northeastern Cameroon) over the last 10 ka by using a large panel of lipid biomarkers [Isoprenoid and branched glycerol-dialkyl-glycerol-tetraethers (isoGDGT and brGDGT respectively), *n*-alkanes, hopanoids and degradation products of plants]. This work provides a new paleoenvironmental and paleoclimatic record for tropical Africa over the Holocene covering the end of the African Humid Period. Furthermore, this multi-biomarker study will provide an opportunity to compare different recently developed peat-based proxies and to evaluate their applicability in reconstructing abrupt climatic variations in the tropics.

A diverse assemblage of lipid biomarkers was detected: C₁₉ to C₃₇ *n*-alkanes, C₂₇ to C₃₁ hopanes and hopenes, both regular and H-GDGTs (both brGDGT and iso-GDGT), among others. These lipid biomarkers present distinct distribution and concentration variations over depth. *n*-alkane-based indexes present interesting variations, which may be related to changes in peatland vegetation and hydrology. In the NGaoundaba peat deposit, the highest P_{aq} (ratio of aquatic to terrestrial plant inputs) values, indicating a significant contribution from submerged and/or floating macrophytes [1], can be found around 8ka, which is consistent with the wetter conditions that peaked during the middle of the African Humid Period. Recent peat-specific temperature and pH calibrations based on brGDGTs [2] were applied to the NGaoundaba peatland stratigraphic record.

GDGT-based temperature and pH are coherent with insolation variation and with pollen-based records from Lake MBalang [3], situated 20 km to the north of NGaoundaba. $\delta^{13}\text{C}_{\text{n-alk}}$, $\delta\text{D}_{\text{n-alk}}$ and $\delta^{13}\text{C}$ of hopanoids will complement this work and provide indications of past variations in vegetation, palaeohydrology and methanotrophy, respectively.

[1] Ficken et al. (2000) *Organic Geochemistry* 31, 745–749.

[2] Naafs et al. (2017) *Geochimica et Cosmochimica Acta* 208, 285 - 301.

[3] Vincens et al. (2010) *Clim. Past* 6, 281- 294.