



Dendrology and isotopic composition of trees in Guinea

Context:

The soils of Fouta-Djalón in Guinea are shallow and rest on a hard lateritic crust. Together with a climate characterized by alternating dry and rainy seasons, this confines large trees to the vicinity of watercourses while other species must find strategies to grow under harsher conditions. However, the hydrographic network in this region, known as the 'water tower' of West Africa, is highly complex, and the water sources used by the trees are not well understood but are likely diverse, which could explain the repartition of trees in the landscape. In a dry tropical climate, where the seasonal alternation may not necessarily correspond to visible tree rings, traditional dendrology becomes challenging. Still, it can be complemented by isotope analyses to help define cyclicity in water sources, precipitation patterns and tree growth.

Aim of the study:

The wood and leaf samples of approximately seventy tree and shrub species were collected in the Moyon-Bafing National Park in Guinea. These samples may enable us to trace back 5-10 years in the life of these trees. A detailed analysis of selected species would help establish if cyclic patterns and tree rings align and are related to distinct water sources used by woody species, highlighting potential variations among them. The aim would therefore be to investigate the growth of the trees in relation to the water resources in the area based on the isotopic composition of wood cellulose.

Requested skills:

Interest in biogeochemistry, environmental changes, and interdisciplinary approaches is essential. Knowledge in dendrology and familiarity with isotopic analyses and related calculations are welcomed.

Collaboration:

The analyses will be realized in collaboration with Camille Rieder, PhD student, and Prof. Dr. Torsten Vennemann.

Keywords: tree growth, hydrology, dendrology, stable isotopes, West-African trees.

Working place: Analyses to be done in the laboratories at the University of Lausanne.

References:

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Contact:

Camille Rieder, Université de Lausanne, IDYST, rieder@wildchimps.org
 Torsten Vennemann, Université de Lausanne, IDYST Torsten.Vennemann@unil.ch; 021 692 44 64
 Pascal Vittoz, Université de Lausanne, IDYST, Pascal.Vittoz@unil.ch; 021 692 43 67