COMBINING TROPICAL PALEOECOLOGY AND TREE RINGS TO RECONSTRUCT PAST ECOLOGICAL DISTURBANCES

Daniele Colombaroli[1,2], Dirk Verschuren[2], Hans Beeckman[3]

[1]Institute of Plant Sciences and OCCR, Bern, CH, daniele.colombaroli@ips.unibe.ch
[2]Ghent University, Gent, BE
[3]Royal Museum for Central Africa, Tervuren, BE

Ecological disturbances such as fire, grazing and human impact are important drivers of ecosystem dynamics in tropical regions. Fire is considered a key ecological process at the savanna-forest ecotone, with long-term fire variability largely responding to the centennial scale variations in the moisture balance. The extent to which prehistoric human impact left a legacy on present tropical ecosystems is instead still highly debated. Short (tree rings) and long-term (paleoecology) records can provide unique insights into the range of variability of disturbance regimes at both low and high frequency, together with the relative drivers of change.

Dendroecology approaches (tree rings measurements and stable isotopes) can provide high resolution, spatially detailed disturbance histories and stand scale dynamics of tropical forest, together with climate reconstructions. Charcoal records from lake sediments instead can offer a longer-term perspective over ecosystem dynamic, identify past ecosystem thresholds, how ecological processes interacted over time. Methodological approaches combining such different temporal perspectives can provide new insights for tropical disturbance ecology, and be informative for future biodiversity conservation and post-fire management in tropical areas.