

# CoForChange

Predicting the effects of global change on forest biodiversity in the Congo Basin

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## Recent disturbances in the Congo Basin: an anthracological contribution to vegetation reconstructions

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### Introduction

In contrast to the well-known vegetation history of the northern hemisphere, few is known about **past vegetation change** in Central Africa. However, recent palaeoecological and biogeographical studies suggest that early **human disturbances** had a substantial influence on Central Africa vegetation patterns (Van Gernerde *et al.* 2003). This interesting hypothesis is the basis of one of the main research questions of the ERA-net BIODIVERSA CoForChange project: what was and is the relationship between human activity and vegetation change?

#### Aim of the study

To identify past species from recent disturbances in the Congo Basin thanks to wood charcoals identification.

### Material & Methods

#### Charcoal fragments

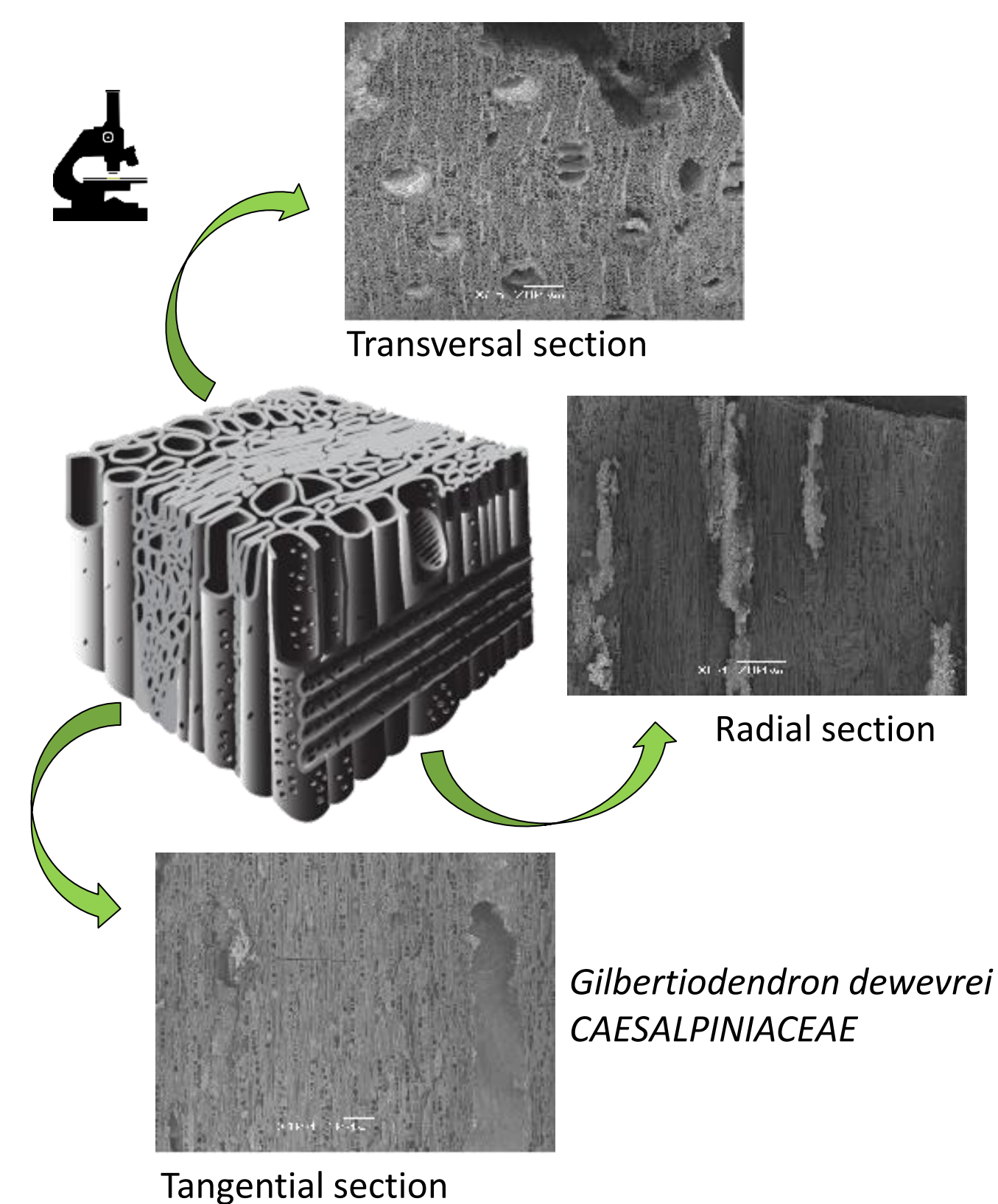
Macro-charcoals were collected from **nine pedoanthracological profiles** in Northern Congo and South-Eastern Cameroon (see map). The sampling is representative of the different forest types. We analyzed charcoals from **levels between 20 and 40 cm depth** corresponding to disturbances. Charcoals or charred seeds were dated with the radiocarbon method.

#### Anthracological types

We described the **anatomy of charcoal fragments** using the IAWA reference list of 163 anatomical criteria (1989). Then, we put together charcoals whose anatomies were identical by **anthracological types** (*i.e.* taxa).

#### Identification protocol

We used a **recently developed protocol** for the identification of Central African charcoal fragments (Hubau *et al.* *In press*). After the criteria had been encoded, the protocol calculated the possible matching species. Finally, so as to have a **final identification**, we compared the anatomy of the species selected and the anatomy of the anthracological types.



The anatomical sections of wood with one example of charcoal identification

### Results

On **48 taxa described**, we **identified three** down to species level.

First, we found numerous fragments of *Gilbertiodendron dewevrei* under a current monodominant forest of *G. dewevrei* (see map: GIB1, 40 cm depth, 1421-1327 *cal.* BP). This seems to confirm the presumption that monodominant forests of *G. dewevrei*, shade-bearer species, are relatively stable.

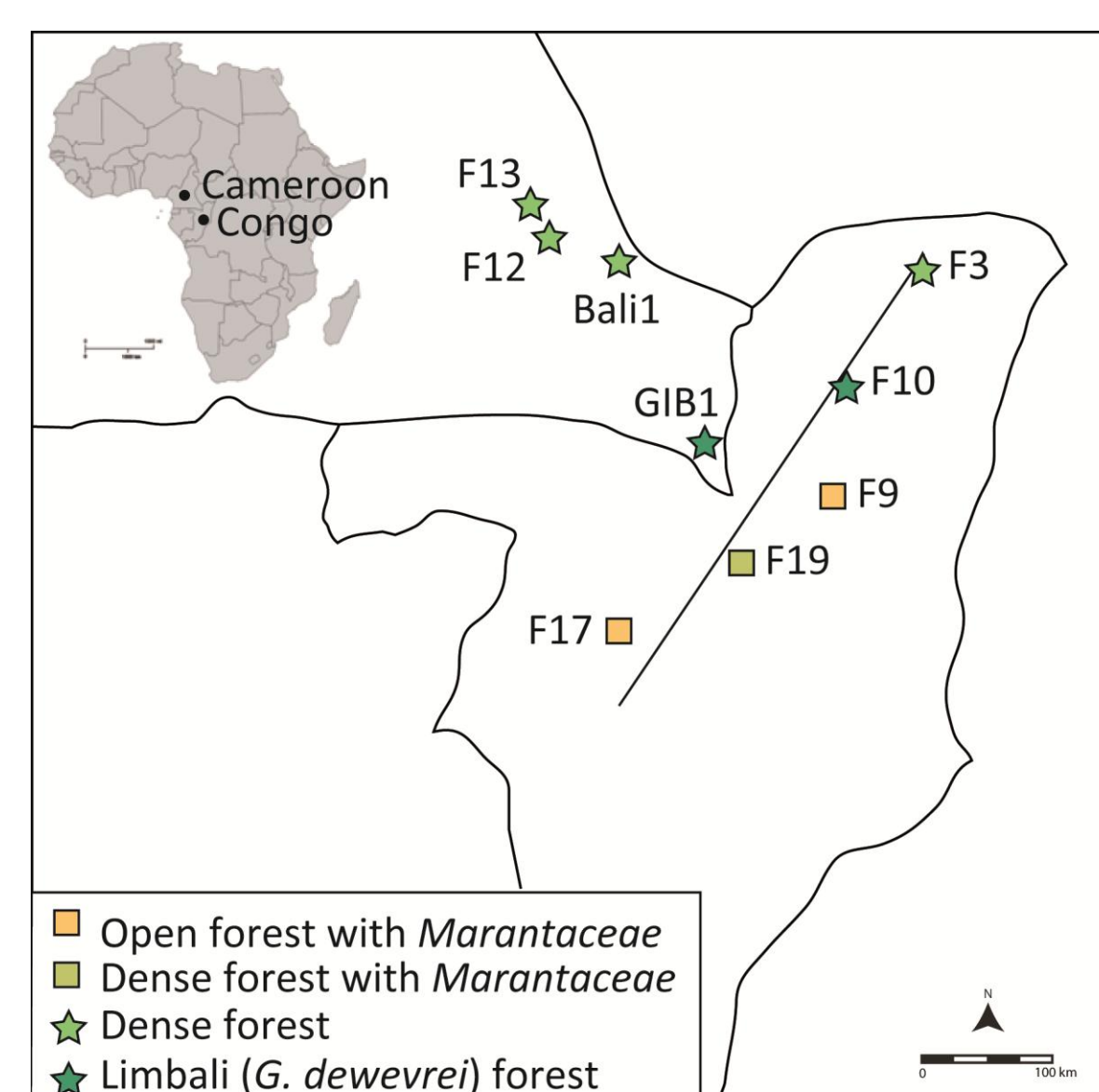
Second, we evidenced the **lack of *Triplochiton scleroxylon*** charcoals under a *T. scleroxylon* stand (map: F12), which could confirm the hypothesis of the recent nature of those stands.

Finally, our results suggest that **taxonomic diversity** of charcoal findings in open canopy *Marantaceae* forests is greater than in dense forests. *Pterocarpus soyauxii* and *Millettia drastica* have been found under an open *Marantaceae* forest at 40 cm depth (map: F9, 1184-1055 *cal.* BP). The abundance of the non pioneer light-demanding species *P. soyauxii* appears to be decreasing over time (levels 20 to 40 cm depth) to the benefit of giant herbs.

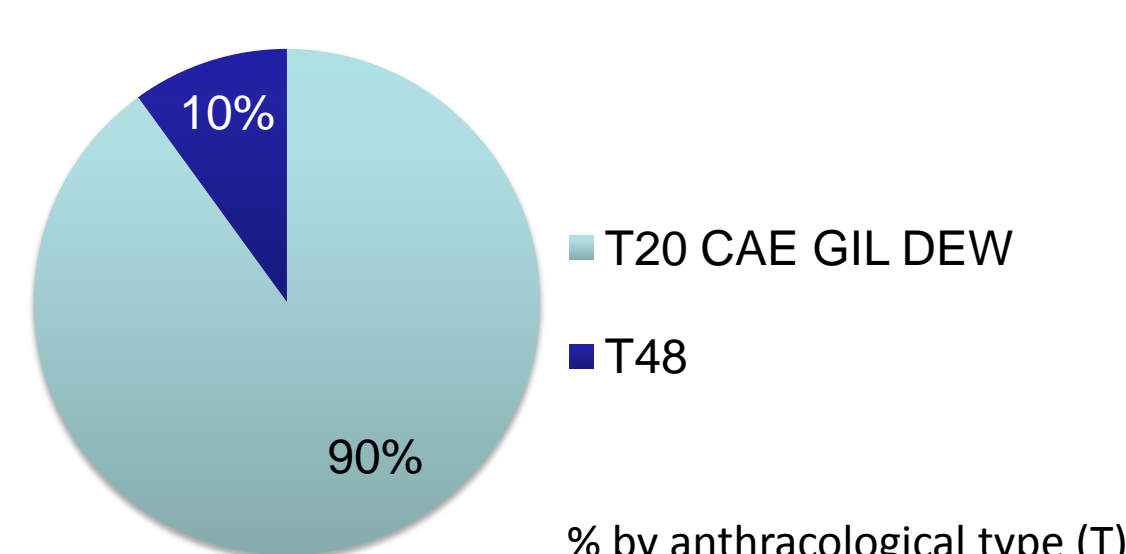
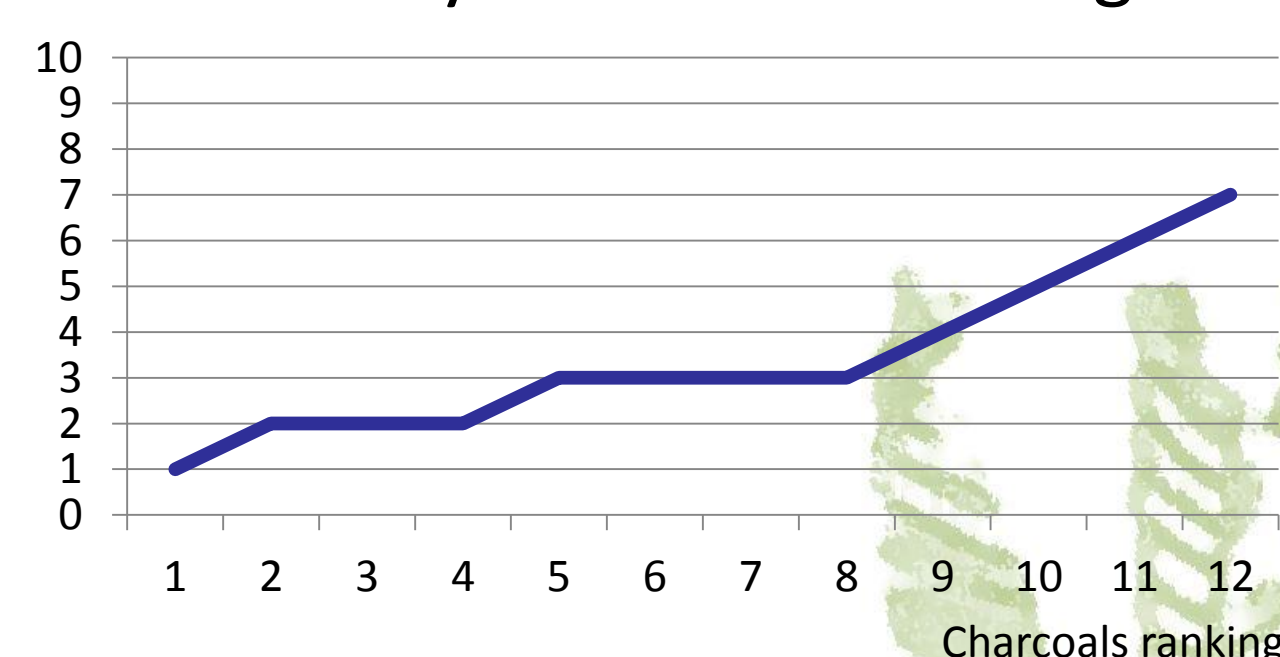
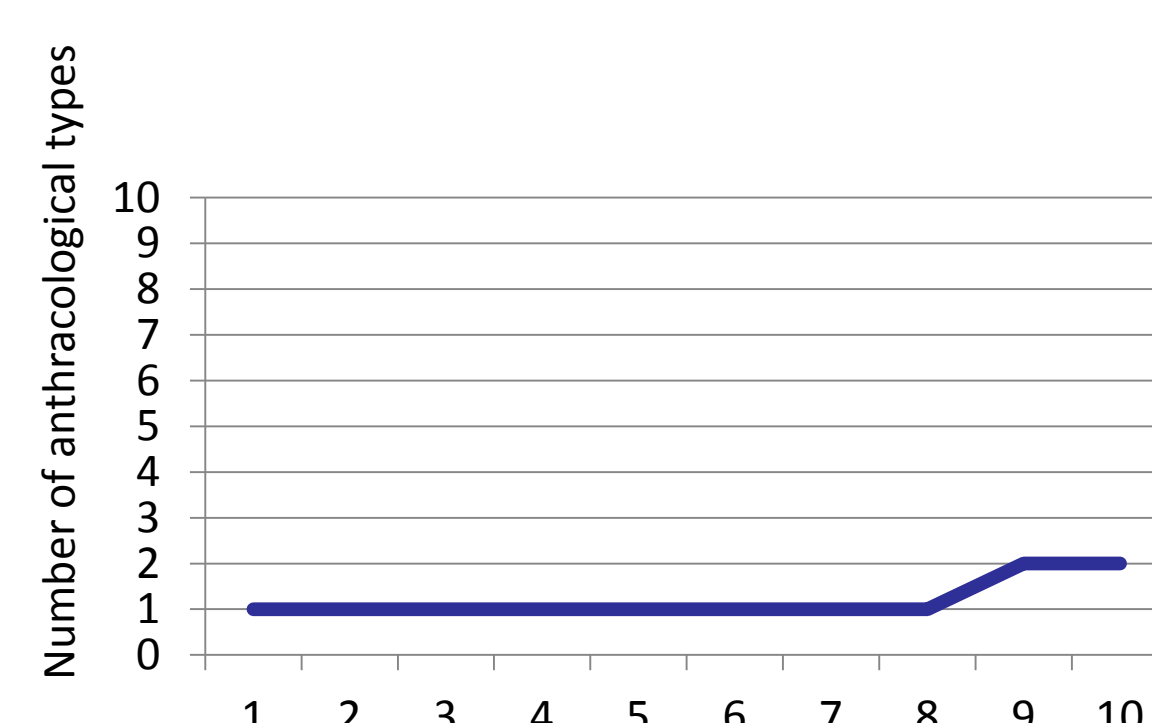
### Perspectives

Anthracology in Central Africa is on the rise and the first results of the CoForChange project are promising. More identifications will follow, resulting in a better understanding of the evolution of Central African forests.

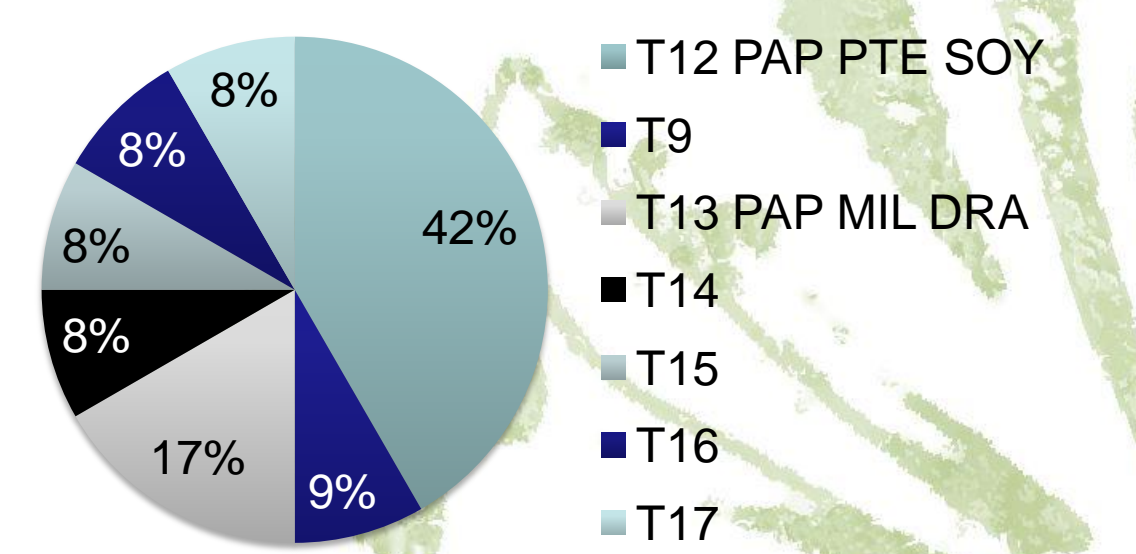
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Pedoanthracological profiles and forest types



GIB1 profile 40 cm depth  
Identification of *Gilbertiodendron dewevrei*



F9 profile, 40 cm depth  
Identification of *Pterocarpus soyauxii* and *Millettia drastica*

#### Literature cited

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