

# Current *Pericopsis elata* (Fabaceae) patches in southeastern Cameroon: remnants of a long and rich Human-rainforest relationship?

N. BOURLAND<sup>1</sup>, F. CERISIER<sup>1</sup>, A. LIVINGSTONE SMITH<sup>5</sup>, W. HUBAU<sup>6,7</sup>, H. BEECKMAN<sup>6</sup>, Y. BROSTAUX<sup>2</sup>, F. FETEKE<sup>1,4</sup>, P. LEJEUNE<sup>3</sup>, E. NTOUDE TIBA<sup>8</sup> & J.-L. DOUCET<sup>1</sup>

University of Liege, Gembloux Agro-Bio Tech (Gembloux, Belgium):

- 1 Unit of Forest & Nature Management, Laboratory of Tropical & Subtropical Forestry
- 2 Unit of Applied Statistics, Computer Science & Mathematics
- 3 Unit of Forest & Nature Management
- 4 Pallisco SARL (Douala, Cameroon)

Royal Museum for Central Africa (Tervuren, Belgium):

- 5 Section of Prehistory & Archaeology
- 6 Laboratory for Wood Biology & Xylarium
- 7 Ghent University, Faculty of Bioscience Engineering, Department of Forest & Water Management, Laboratory of Wood Technology (Gent, Belgium)
- 8 Nature Plus ASBL (Walhain-Saint-Paul, Belgium)

## ➤ Context and objective

*Pericopsis elata* (Fabaceae; assamela, afrormosia) is an African moist semi-evergreen forests species. Logged since the 50s, this light-demanding tree suffers from important regeneration problems. Thus, it is recorded in both IUCN Red List and CITES Appendix II listing. To ensure the sustainability of logging activities, it is important to understand the origins of forest stands characterized by this clustered species. The main goal of our study was to investigate passed and current conditions favorable to viable regeneration: pedological, ecological, and anthropogenic factors were specifically analyzed.

## ➤ Materials and methods

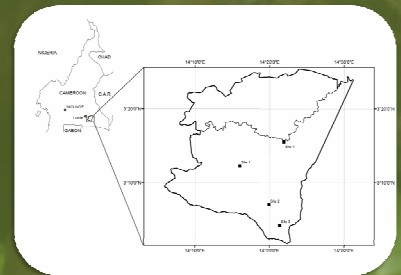
Pedological surveys, botanical inventories and anthracological excavations were conducted in four different sites located in a forest concession (ca 118,000 ha) in southeastern Cameroon. Patches (3-15 ha) characterized by a high density of *P. elata* ("in") were investigated and compared to their close surrounding vegetation ("out").

## ➤ Results

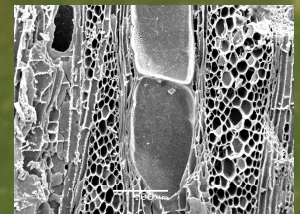
Apart from one site (swamp), no statistical differences were observed between the results of botanical inventories conducted inside and outside the patches (Morisita-Horn indices ranged from 0.61 to 0.77). "In" and "out" soils showed different levels of Fe (ANOVA;  $p < 0.001$ ) for 2 sites while no other significant differences in soil descriptions could be observed. Charcoal samples were more abundant in soils hosting a high density of *P. elata* (ANOVA;  $p = 0.010$ ) compared to the surrounding environment. Charcoal radiocarbon dating (2,150 to 195 yr BP) was consistent with decoration techniques of archaeological materials discovered in study sites. In addition, the average age of some patches present in the study area coincides with important fire events in a region where natural ones rarely occur.



Fragment of pottery collected inside a patch in an anthracological pit (roulette decoration technique applied in Cameroon between 1,000 years ago and the present time)



Location of the 118,022 ha study area, southeastern Cameroon



View of a tangential section of a piece of charcoal collected inside a patch (Scanning Electron Microscopy; *Erythrophleum* spp.)

## ➤ Conclusion

In southeastern Cameroon, some light demanding wind dispersed tall trees play major ecological and economic roles, especially *P. elata*. This species occurs in patches together with an important density of other long lived light demanding species. Our study showed that charcoal is widespread and abundant in those forests, mainly inside *P. elata*'s patches. The multi-disciplinary approach that we applied gave us the chance to discover fragments of pottery, irrefutable evidence of past human activities. Further studies should now target pragmatic management procedures that could secure the future of the species.

