

# Contribution of new radiocarbon dates to track the impact of past anthropogenic disturbances on current vegetation in Central Africa

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## Introduction

Understanding **current Central Africa vegetation patterns** faces the scarcity of data about their past evolution. However, a growing hypothesis suggests that **past human activities** could have had a substantial influence on vegetation (Van Gernerden *et al.* 2003, Brncic *et al.* 2009). Indeed, by creating large openings (**fig. 1**), they might have triggered the **expansion of light-demanding species** currently suffering from a lack of regeneration. This lack of saplings could have been caused by the change in land use since colonization with the sedentarization of shifting cultivators.



Fig. 1 A large disturbance in the forest

**Aim of the study:** To investigate the potential relationship between past anthropogenic disturbances and present vegetation.

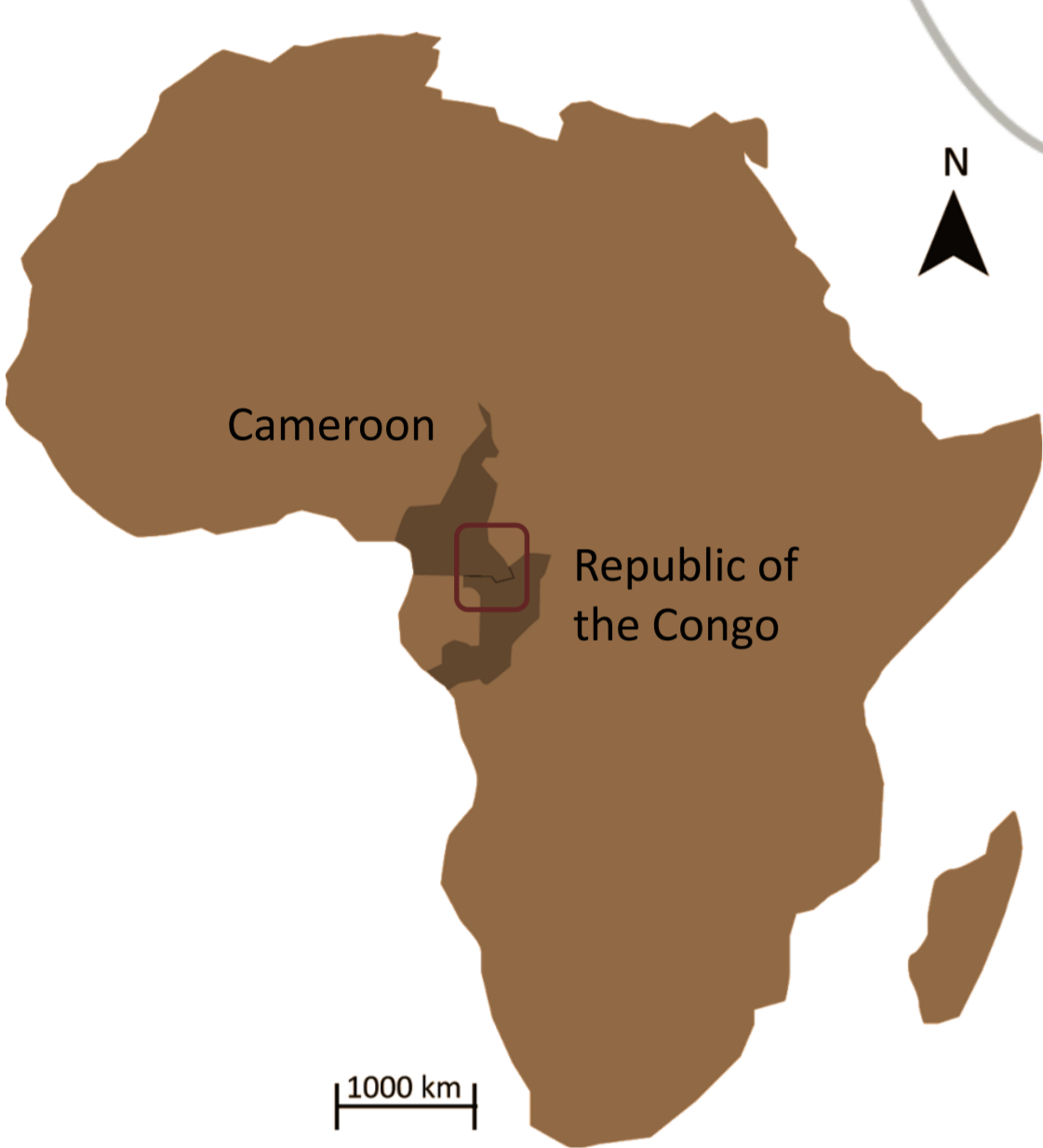


Fig. 2 Study area

## Material & methods

**Fieldworks** combining anthracological and ecological approaches have been undertaken in Northern Congo and South-Eastern Cameroon (**fig. 2**).

We excavated **thirty 150-200 cm deep pits under different forest covers** and vegetation types to identify evidences of past human presence (*i.e.* potsherds, **fig. 3**, slags from metallurgy, anthropogenic pieces of charcoals and anthropophilous charred seeds). **Charcoals and seeds** (oil palm *Elaeis guineensis*, **fig. 4**, *Canarium schweinfurthii*) in combination with artifacts have been dated.



Fig. 3 Potsherds found in Cameroon dated by an associated seed of *Canarium schweinfurthii* at 1630 ± 25 BP

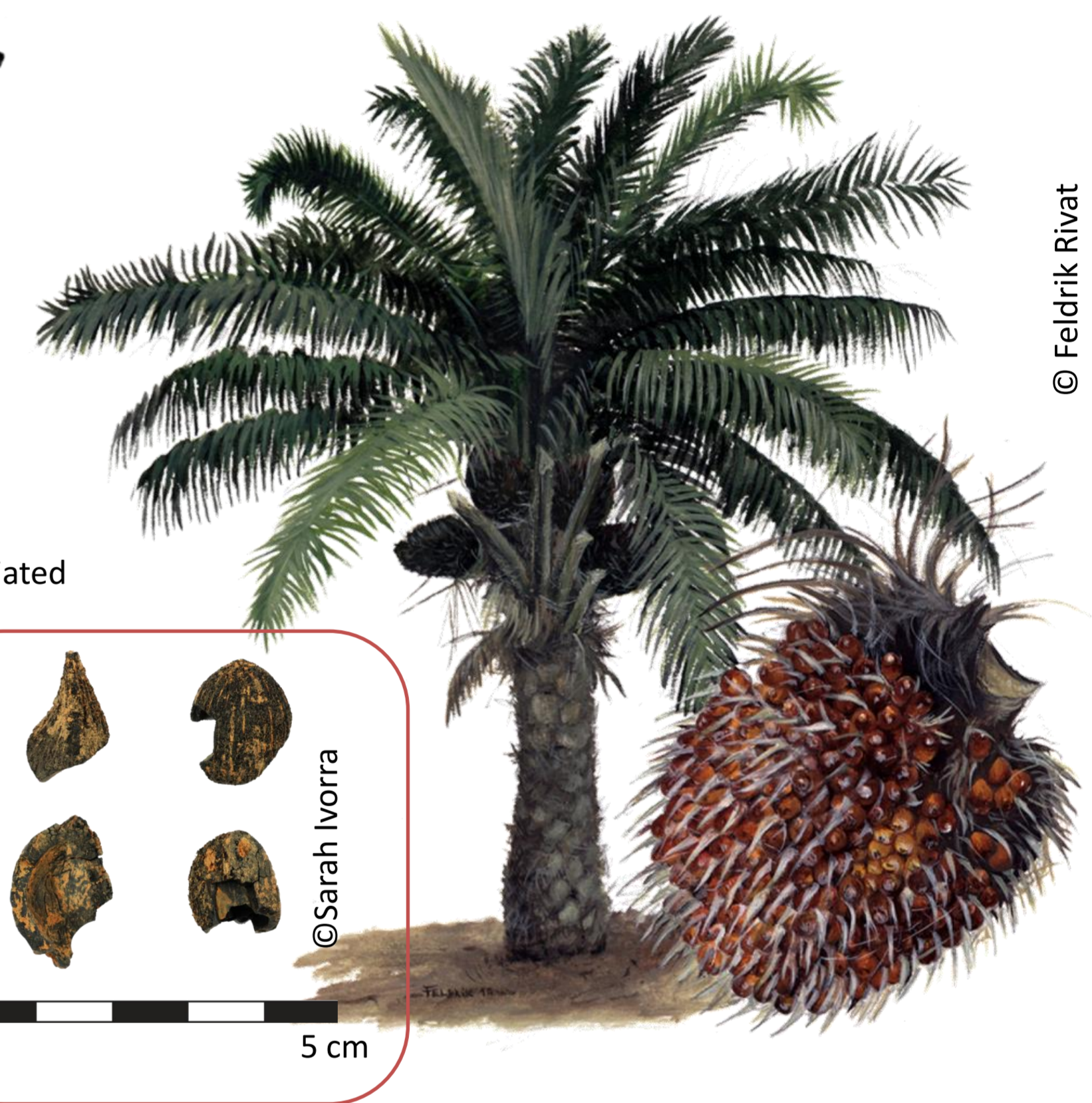


Fig. 4 Oil palm *Elaeis guineensis* and charred nuts

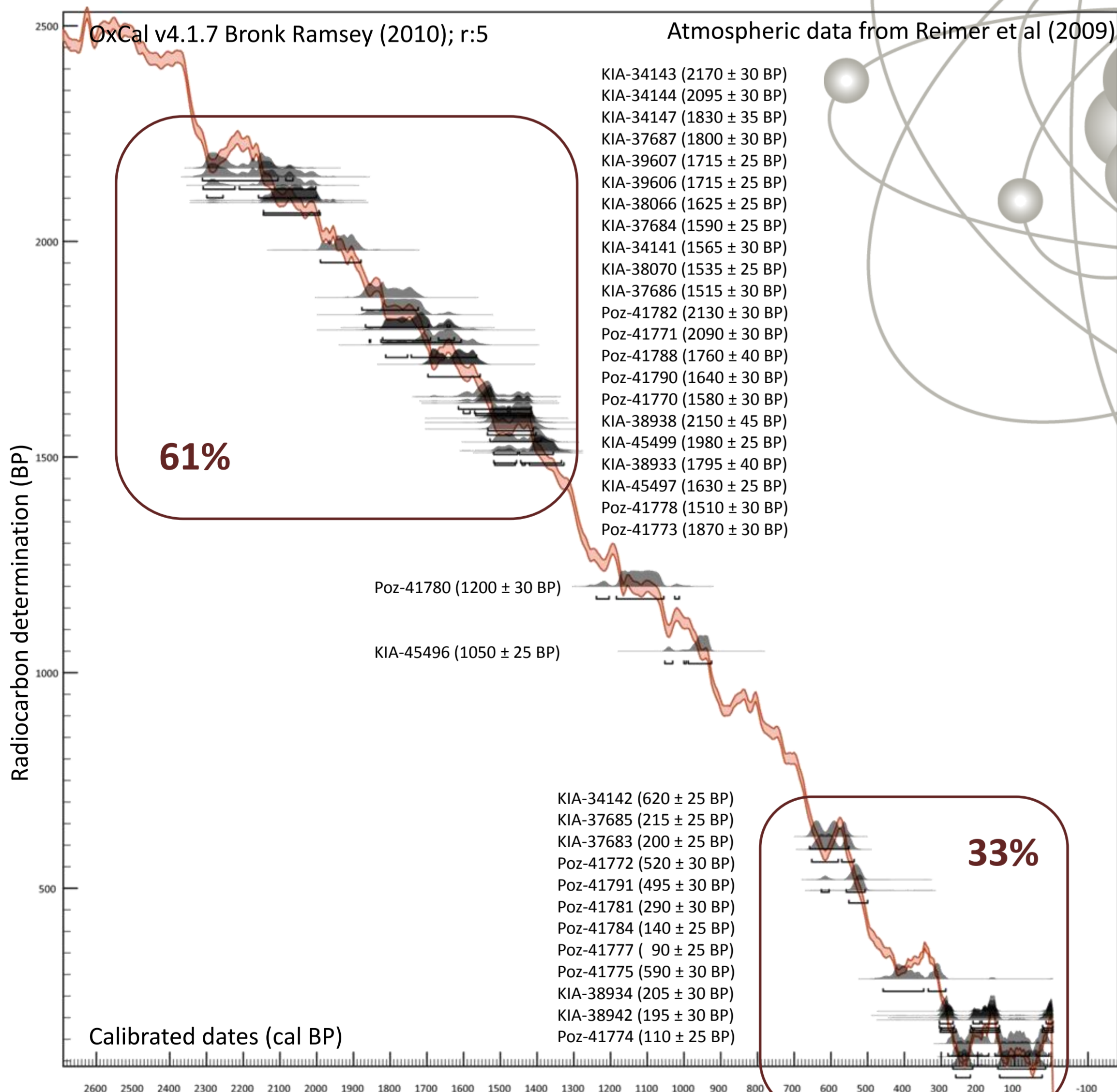


Fig. 5 Calibration curve representing the 36 dates between 2,300 cal BP and present time

## Results

A set of **38 new radiocarbon dates ranging from 15,200 cal BP to present time** have been obtained. They confirm the existence of important past fire events in a region where natural ones seldom occur. Together with artifacts, our findings support the few already available dates documenting evidences of past human activities in Central African rainforests. On the 36 most recent dates (**fig. 5**), **the majority belongs to the 2,300-1,400 cal BP period (61%)**. The whole semi-deciduous forest zone is concerned by this period of intense disturbances with a high rate of fragmentation. **It follows the last great arid phase ca. 2,500 cal BP and might be linked to the iron workers expansion**. Another **pool of dates between 650 and 250 cal BP (33%)** associated with potsherds might be **correlated to a dry phase contemporary to the Little Ice Age** in Europe. That last group of dates points out the potential positive **impact of anthropogenic disturbances connected to a dry climatic event on light-demanding species populations**. Indeed, this is consistent with the fact that most of current light-demanding trees have a higher number of stems around 100 cm dbh.

## Conclusion

Our multidisciplinary approach allowed new insights into the **link between human history and vegetation dynamics** in Central Africa. Further investigations should be conducted to go deeper into **the understanding of the evolution of Central African rainforests** and to improve the **management of currently logged light-demanding species resulting from the LIA period**. Thirty new dates from sixteen soil profiles are forthcoming.

## References

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