

Report on the project:

Systematics of West African poorly known palms (Arecaceae): case of the genera *Borassus* L., *Hyphaene* Gaertn. and *Phoenix* L.

Funded by: The International Association for Plant Taxonomy (IAPT)

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Introduction

On the framework of a study targeting West African palms, we requested a grant from IAPT for a field work in Ivory Coast during 2012 and 2013. The aim of this work was to collect herbarium and DNA samples of three poorly known palm genera: *Borassus*, *Phoenix* and *Hyphaene*. The study was undertaken in two regions of the country (**Fig. 1**). The first region (travel 1) corresponds to the coastal area in the south. In this region we collected specimens of *Phoenix reclinata*. The second region (travel 2) corresponds to the North-East. In this place region we collected specimens of the savanna palms *Borassus aethiopum*, *Phoenix reclinata* and *Hyphaene thebaica*.

Details on the use of the amount granted by the IAPT and some significant points that will be developed in future publications are provided in this report. The pictures shown in this report will also be sent separately.

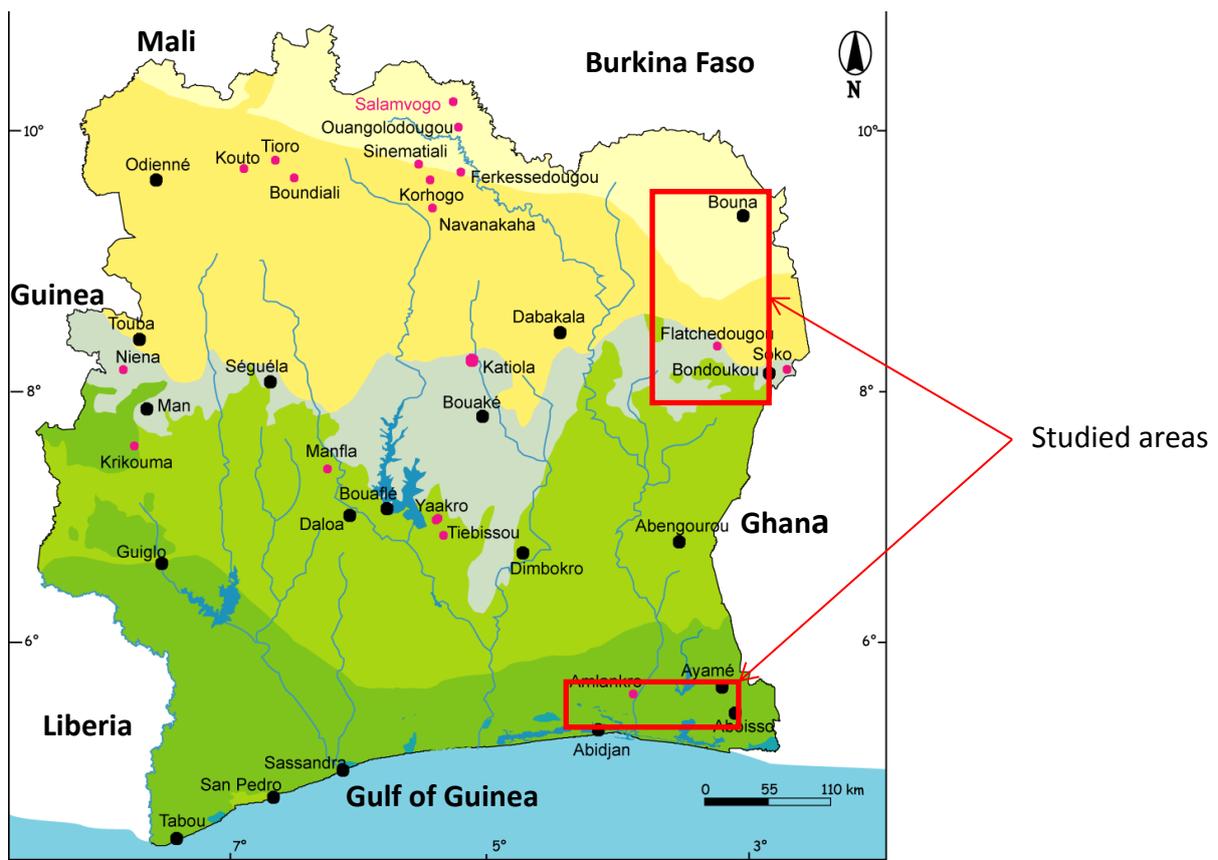


Fig.1. Map of Ivory Coast indicating the studied areas

1. Financial report

The grant (1000 USD) was employed to carry out visits (two travels) to the two studied regions of Ivory Coast as indicated on the table.

Items	Travel 1 cost (USD)	Travel 2 cost (USD)
Car rental and driver salary	150	250
Fuel	50	100
Accommodation	75	75
Living costs	100	100
Local field assistant salary	50	50
Total	425	575

2. Preliminary results

2.1. The occurrence of *Phoenix reclinata* in North-eastern Ivory Coast

Before our field work there was no herbarium specimen in any national herbarium attesting the occurrence of *Phoenix reclinata* in the North-East of Ivory Coast. In our study we found several populations of this species. Herbarium and DNA samples were collected (**Fig. 2**). We share these DNA samples with Dr. Frédérique Aberlenc, head of the Laboratory of Palm Evolution of the IRD in Montpellier (France), which is currently undertaking phylogenetic studies on the palm genus *Phoenix*.



Fig. 2.Collecting a leaf fragment for phylogenetic studies in *Phoenix reclinata* (North-Eastern Ivory Coast).

2.2. Morphological differences (cryptic species?) in *Phoenix reclinata* Jacq.

The genus *Phoenix* is constituted of 14 species and only *Phoenix reclinata* is supposed to thrive naturally in continental West African countries (Barrow, 1998). Thus, all the herbarium specimens of Ivory Coast are systematically labelled as *Phoenix reclinata*. Comparing individuals of the species collected in the coastal region with those present in the North-East, we found high morphological differences in the growth habit. Indeed, dwarf populations from the coastal savannas present significant different features with the populations localized in the North-East. The **Fig. 3** shows one of these dwarf individuals.



Fig. 3. Dwarf individual of *Phoenix reclinata* from the coastal area of Ivory Coast (road Abidjan – Grand Bassam).

2. 3. Localization of wild threatened populations of *Hyphaene thebaica*

Hyphaene thebaica has been traditionally regarded as a sahelian plant. In the frame of our study we found that this species thrive naturally (**Fig 4**) in North-Eastern Ivory Coast (village of Koflandé). These data were useful to complement information associated to the distribution of *Hyphaene thebaica* in the frame of the recent treatment of the palms of Africa (Stauffer *et al.*, 2014). Unfortunately, besides the reports of distribution of wild populations in this species we also identified that the species is in general highly threatened by human activities in this area (massive crop settlements, rapid increase of urban areas).



Fig. 4. Juveniles of *Hyphaene thebaica* in a threatened population in the North-Eastern Ivory Coast

2. 4. Report of a new ethnobotanical use of *Borassus aethiopum*

In the frame of our work we have recorded ethnobotanical data from the species studied. Among these data, one utilization of *Borassus aethiopum* was recorded for the first time by us (Fig.5). Furthermore we did not notice before this utilization in any of the publications linked to ethnobotanical use of Ivory Coast native plants. This new information is critical for the current inventory that we are undertaking on the native palms of Ivory Coast, including data on their uses and common names.



Fig. 5. *Borassus aethiopum*: A. Growth habit, B. Fruits, C. Fruits being cooked, D. Extraction of the juice from cooked fruits, E. Juice mixed with cooked corn (ready to be eaten).

3. Ongoing study and perspectives on the species

In order to improve our current knowledge on the taxonomy and phylogenetic of the studied genera, we are undertaking extensive DNA sampling. A paper is now in preparation to highlight the morphological difference within different populations of *Phoenix reclinata*. We expect that in the near future results that will be based on DNA analyses will enable to bring some light to know whether what we are currently calling *Phoenix reclinata* constitutes in fact two or several cryptic species.

Aspects on *Borassus* and *Hyphaene* will be treated in a complete publication on the palms of Ivory Coast. In the two sites of the study we did not find *Borassus akeassi* Bayton, Ouédraogo & Guinko. Bayton (2006) attested the presence of this species in Ivory Coast. Further research will be conducted in other regions of the country in order to localize populations of this species.

Conclusion

This study funded by IAPT was extremely useful for us in order to improve our comprehension of these species. Data recorded will help to get soon accurate taxonomical information of the species, based on morphological and molecular data.

Acknowledgments

We would like to thanks IAPT for having funded this study.

References cited

- BARROW, S. (1998).** A Monograph of *Phoenix* L. (Palmae: Coryphoideae). *Kew Bull.* 53: 513-575.
- BAYTON, R. P., A. OUÉDRAOGO & S. GUINKO (2006).** The genus *Borassus* (Arecaceae) in West Africa, with a description of a new species from Burkina Faso. *Bot. J. Linn. Soc.* 150: 419-427.
- STAUFFER, F. W., D. OUATTARA & A. L. STORK (2014).** Palmae. Pages 326-354 in Lebrun, J.-P. & A. L. Stork (eds.). *Tropical African Flowering Plants: Monocotyledons 2*, vol. 8. Conservatoire et Jardin botaniques de la Ville de Genève, Switzerland.