CoForChange

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

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What can Palms tell us about vegetation history in Central Africa?

The case of *Phoenix reclinata* Jacq. within the African palms

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Many studies have shown that, during past drier climatic periods, the **African rainforests** were affected and **subject to changes**. The Sangha River interval (SRI), separating Lower Guinea and Congolian forests, and the forest-savanna mosaic along the Atlantic Ocean, may have been less favorable for evergreen rainforests, which would have allowed more or less wooded savannas or other secondary and semi-evergreen forests types to expand (Letouzey 1968, White 1979, Maley 2001, Maley & Willis 2010).

Within the Guineo-Congolian floristic region, several sub-centers of endemism have been identified. These sub-centers are separated by more or less impoverished "intervals", such as the SRI, the Dahomey Gap and the V Baoulé in Ivory Coast (White 1979). **Palms** (*Arecaceae*), which are a characteristic tropical rainforest family (Couvreur et al. 2011), can bring new insights in the **history of African rainforests**.

Goal of the study

To test "forest refuges" and "forest openings" hypothesis in relation with Palms - notably *Phoenix reclinata* - ecology and distribution in the Guineo-Congolian region.

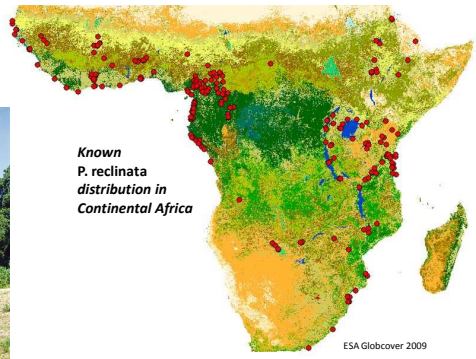
Material & Methods

Data

Data on African palms ecology and distribution have been taken from original field data, from the bibliography and open access data bases (notably GBIF and African Plant Database).

Analysis

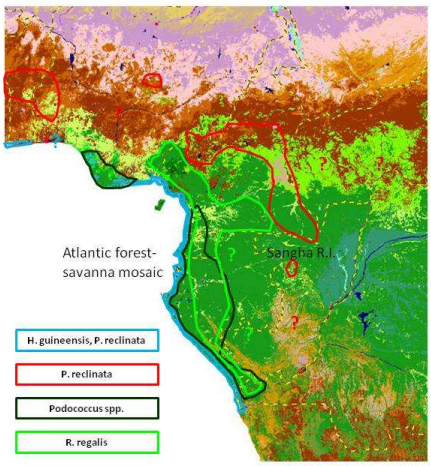
Mapping and climate modelling using ArcGis and DivaGis softwares.



Results

Rainforest and rainforest-savanna ecotone palms

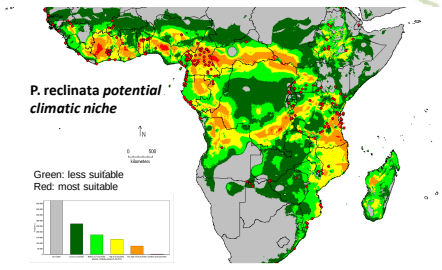
Podococcus and *Sclerosperma* are the only genera adapted to understory environments; all other forest palms are more or less light demanding, including *Elaeis guineensis*.
A number of species, and notably all *Raphia* species but one (*R. regalis*) and all *Sclerosperma* species, are restricted to lowland swampy or periodically inundated soils.
Actual ***Sclerosperma* and *R. regalis* distributions match with supposed past forest refuges locations** (Maley 1996).



Distribution area of some palms in Atlantic Central Africa

Phoenix reclinata

This palm is **normally absent from rain forests** and mostly present in savannas on wet soils. It nevertheless **occur in the SRI**, in swamp clearings and near rivers. It is absent from equivalent environments in the rest of the rainforest block, apart from the forest-savanna mosaic along the Atlantic Ocean (where occur also *Hyphaene guineensis*, the only species of this otherwise savanna genera).



Potential rain forest refuges (Maley 1996)

Conclusion

The relative scarcity of palms in African rain forests compared to America and Asia (Richards 1973, Letouzey 1978), the abundance of African light demanding palm species, the obvious adaptation of numerous palm species to swamp soils and the presence of species of savanna and forest-savanna ecotone in the forest zone, could possibly be linked to the **greater impacts of past drier periods on African rain forests, compared to their equivalents in the Neotropics and Asia**.

The actual **presence of *P. reclinata* in relict sites tends to corroborate the hypothesis of a past opening of the rainforest block in the SRI**. This palm is still widely used in Eastern Africa and the role of human mediated dispersal should also be considered in its present distribution. Linguistic studies might provide useful insights in confirming these findings. Phylogenetic and phylogeographic studies should also be undertaken to test the taxonomic status of the various "forms" of *P. reclinata* and their evolutionary history.

Literature

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