

Toward sustainable conservation of Baracoffea: endemic and drought-tolerant species in Madagascar

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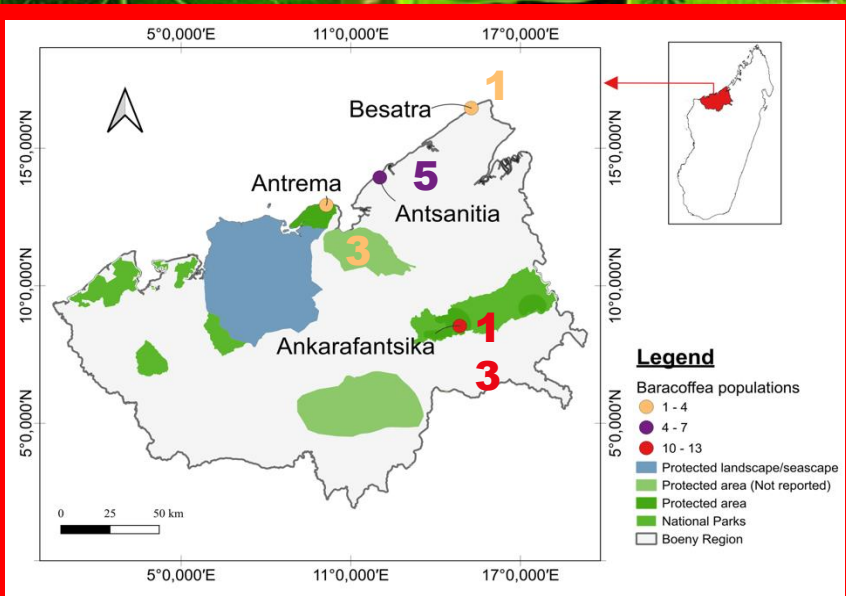
<https://www.baracoffea.org/>

Introduction

The Baracoffea group, which includes nine species endemic to western Madagascar, such as *Coffea ambongensis*, *C. bissetiae* and *C. boinensis*, is adapted to hot and dry conditions and has atypical architecture and phenology¹. Despite their genetic value for understanding adaptation mechanisms, these species are poorly studied and threatened (IUCN Red List). This project involves monitoring populations *in-situ*, testing seed germination and developing an *ex-situ* collection at the Ranjamalala Educational Botanical Garden at the University of Mahajanga.

Methods

- Surveys were conducted (2020-2023) in the Boeny region (Mahajanga) to identify populations.
- Monthly monitoring of growth and phenology is ongoing in Antsanitia and Ankarafantsika (2024-2025) during both dry and rainy seasons.
- Ripe fruits from various populations were collected, prepared, and sown to establish the *ex-situ* collection.



Map 1: Distribution map of the Baracoffea group in Boeny Region²

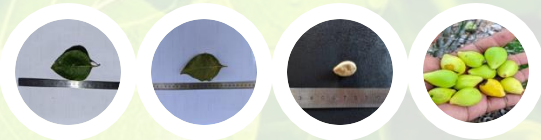
Preliminary results

Population survey: 22 populations of *C. ambongensis*, *C. bissetiae*, and *C. boinensis* were recorded in Ankarafantsika National Park, Antsanitia Forest, the Antrema biocultural site, and Besatra village.

Growth and phenology: Growth monitoring reveals rhythmic and monocyclic development. The flowering/fruiting phase only occurs during the rainy season and lasts for about a month.

Germination trials: Four germination beds (450 pots each) were established at the Botanical Garden of the University of Mahajanga. In 2025, 1,400 seeds and 330 fruits were sown.

Seed germination: Germination continues for all species and pre-treatments, including seeds sown *in-situ* by local guides in Ankarafantsika and Antsanitia. After 7 to 8 months, only one control fruit has germinated (*Coffea boinensis*, September 2025).



Conclusion & Perspectives

These species exhibit a very short life cycle (~1 month) with a single annual growth flush, providing new insights into the architecture and biology of *Baracoffea*. Ongoing germination tests reveal major challenges in breaking seed dormancy; we hypothesize that these species may possess orthodox seeds—a rarity within Rubiaceae and even more exceptional among *Coffea*. The creation of the first dedicated conservation collection for *Baracoffea* marks a significant milestone for conservation, research, and the valorization of this genetic resource. Meanwhile, genomic sequencing (ANR BRIDGES_COFFEA project) is underway and will shed light on their evolutionary history and gene content.

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