



Tropentag, September 15-17, 2021, hybrid conference

“Towards shifting paradigms in agriculture
for a healthy and sustainable future”

Flowering in the Oilseed Palm *Acrocomia*: Rachillae Morphology in Various Ecotypes

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Abstract

The oilseed palm *Acrocomia*, endemic to South-America, is a promising sustainable alternative to the African oil palm due to its drought tolerance and adaptability to a wide range of soils and climatic conditions. *Acrocomia* palms produce several inflorescences for the one-time flowering during the first months of the rainy season. The inflorescences are panicles with first order branching consisting of a main rachis with several hundred short rachillae. Those rachillae bear the female and male flowers at the basal and apical end, respectively.

Even though the general morphological structure of the rachillae is well described, differences between various *Acrocomia* species and ecotypes from differing regions of origin are not accounted for up to now.

This study aimed to assess the variability in the rachillae morphology of various ecotypes of the widespread species *A. totai* and *A. aculeata*.

The study was conducted at the *Acrocomia* Active Germplasm Bank of the Universidade Federal de Viçosa in Araponga, MG, Brazil. During the flowering season 2019, each inflorescence of five *Acrocomia* ecotypes was assessed at its day of opening. Nine rachillae along the inflorescences were sampled. The length of the rachillae, as also of the basal and apical parts, were measured. The sequence of floral structures was recorded from the basal to the apical end of the rachillae.

Most rachillae followed the general structure of solitary female flowers at the basal end, followed by pairs of male flowers and the male cluster at the apex. However, some uncommon structures were recorded. The most surprising one was the occurrence of branched rachillae, as it was not described up to now, and making the inflorescence a panicle with second order branching. Those second-order branches were found, in particular, in two ecotypes of *A. totai*. Female flowers were rarely found on those secondary branches. Furthermore, rachillae without female flowers were present in all ecotypes especially with increasing occurrence from the base to the apical end of the inflorescences. Inflorescences show a high morphological variability reflecting their ecotypes, useful for genetic improvement. Additionally new traits were discovered underlining the complexity of *Acrocomia*'s inflorescences.

Keywords: *Acrocomia aculeata*, *Acrocomia totai*, Brazil, Oilseed palms, rachillae morphology