

ABSTRACT

The Population Ecology of *Mauritia flexuosa* L. f. in the Aripo Savannas
Environmentally Sensitive Area, Trinidad, West Indies

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The population dynamics of the palm tree *Mauritia flexuosa* L. f. (Arecaceae: Calamoideae) on the island of Trinidad have not been previously investigated. Hence, there is a rising concern regarding whether populations are stable, especially within the Aripo Savannas Environmentally Sensitive Area (ASESA). The life-history parameters of *M. flexuosa* were investigated within the different margin environments of the ASESA. Reproductive output was found to be significantly higher in fire-impacted margins, and there was a marked trade-off in reproductive output, with palms producing more numerous lightweight fruit in fire-impacted margins compared to non fire-impacted margins. In all margins, *M. flexuosa* stands formed a typical inverse J-shaped size-class distribution, indicating a stable population structure. Reduced canopy coverage as an outcome of sporadic fires was associated with greater fruit-fall density and a larger seedling bank. The timing of fruit-fall, and the survival of seedlings may be a result of these fires. More fruit were secondarily dispersed in closed canopies, and fruit were dispersed the furthest during the dry season. *Dasyprocta leporina* L. was recorded as an effective secondary disperser of *M. flexuosa* seeds for the first time in Trinidad, whereas, *Cuniculus paca* L. was the main secondary disperser in Guyana. Seasonality and habitat types seem to be parameters that influence vertebrate secondary dispersal vectors and seed predators during food shortages. A matrix analysis demonstrated that even though an inverse J-shaped size-class distribution was appropriate for the ASESA palm populations and proportionately represents each margin, the dataset did not represent a stable stage population. The average density of adult palms within all margins was 27 trees/km², which indicated that population growth rate was decreasing ($\lambda = 0.97$). Western margin (fire-impacted) populations were the only populations to have a positive intrinsic growth rate (0.07% annually). The matrix elements P_{adults} exhibited the largest values for sensitivity and elasticity analyses, demonstrating that population stability was governed by the survival rates of adult palms; ecological managers should pay close attention to these individuals.

Keywords: Arecaceae; matrix modelling; palm distribution; population dynamics; reproductive output; seed dispersal; seed predation; stand structure; wild-fires