



DRY SEASON SPECTRAL SIGNATURE OF *MAURITIA FLEXUOSA* CANOPIES DERIVED FROM UAV RGB IMAGERY

Vagner Santiago do Vale^{1*}, João Paulo Costa², Maria Eduarda Corrêa da Silva³, Erikson Leonardo Santos de Miranda¹, Luis Henrique Mantovani de Farias¹, Alcione Borges Purcina⁴, Lucas Robson de Oliveira⁵; Patrick Thomaz de Aquino Martins⁵, Pedro Paulo Ferreira Silva⁶, William Jeronimo Araujo Nascimento¹

¹ Laboratory of Forest Inventory and Ecology, State University of Goiás, Ipameri – Goiás, Brazil.

² Laboratory of Morphology, Microscopy, and Imaging, Federal University of Uberlândia, Uberlândia, Minas Gerais, Brazil.

³ Faculty of Computing, Federal University of Uberlândia, Monte Carmelo, Minas Gerais, Brazil.

⁴ Institute of Agricultural Sciences (IACAS/UEG), State University of Goiás, Ipameri – Goiás, Brazil.

⁵ Laboratory of Pedogeomorphological Studies, State University of Goiás, Formosa, Goiás, Brazil.

⁶ Federal Institute of Triângulo Mineiro, Uberlândia, Minas Gerais, Brazil.

*Autor correspondente: vagner.vale@ueg.br

This study aimed to identify and describe the spectral signature of *Mauritia flexuosa* (Buriti) canopies using RGB images acquired by an unmanned aerial vehicle. Data collection was carried out in June 2024 in a wetland (vereda) area located at Itororó Park Club, using a DJI Air 2S. From the flights, a high-resolution orthomosaic was generated and used for manual delineation of 30 individual buriti canopies in QGIS. Based on the segmented canopies, valid pixels (excluding null values) were extracted, and 13 vegetation indices derived from RGB imagery were computed. An initial screening step was performed using Spearman's rank correlation and discriminatory performance to reduce redundancy and identify indices capable of representing the spectral response of the species. Five indices were retained for subsequent analyses due to their non-redundant behavior: ExG, NGRDI, ExR, ExGR, and GCC. For each index, descriptive statistics were calculated at the canopy level, and spectral stability was assessed using intra- and inter-canopy coefficients of variation. Additionally, kernel density estimation (KDE) was applied with robust normalization based on the median and interquartile range, allowing the characterization of the full distributional behavior of spectral responses. Mean spectral distributions with 95% confidence intervals were obtained via bootstrap resampling. The GCC (Green Chromatic Coordinate) index showed the best performance, presenting low variability and high spectral consistency. Its central tendency was approximately 0.38, with values concentrated within a narrow range (0.37–0.39), indicating a predominance of the green component relative to total RGB reflectance, consistent with dense and physiologically active canopies. These findings demonstrate the potential of GCC as a robust spectral descriptor for *Mauritia flexuosa*, supporting its application in automated mapping and species identification using high-resolution imagery. Funding: Pro-Projects Water Security SEI: 202300020023365, FAPEG 21/2024 SEI: 202510267000454.

Palavras-chave: *Buriti; Drone; Green chromatic coordinate; Savanna wetlands; Vegetation indices.*