Review of: "Ecological diversity, structure and exploitation of rattan stands according to a disturbance gradient around the Nkoltang forest, Estuary province of Gabon"

Kelvin Appiah-Badu[1]

1 Kwame Nkrumah University of Science and Technology

Potential competing interests: No potential competing interests to declare.

Introduction

The manuscript comprehensive overview of rattan palms, particularly focusing on their diversity, distribution, and ecological significance in Southeast Asia and Central Africa. The review discusses various aspects, including the number of rattan species, their distribution across different forest types and elevations, the impact of harvesting on tropical rainforests, and the commercial importance of rattan in the global market. Additionally, the text highlights the scarcity of knowledge regarding the ecological diversity, distribution, and abundance of rattan species along a disturbance or degradation gradient in certain regions, emphasizing the need for more research and sustainable management practices.

Methodology

The study provides a comprehensive overview of the distribution, growth, and health of various rattan stands over a three-month period from February to April 2017. The methodology employed is robust and well-detailed, ensuring a thorough and representative assessment of the rattan inventory.

The use of three-square plots in each environment, arranged along a transect of 500 meters with regular equidistance, is a systematic approach that enhances the reliability of the collected data. The decision to have parallel transects perpendicular to the river system's general orientation is commendable, as it helps capture the ecological variability of the environment.

The detailed process of sampling rattan tufts, including labeling, numbering, and georeferencing with GPS, demonstrates a meticulous effort to prevent errors and ensure accurate data collection. The use of determination keys and reference to various authors for rattan species identification adds credibility to the study. The inclusion of photographs and, for challenging cases, samples for verification at the National Herbarium of Gabon further strengthens the reliability of species identification.

The quantification of stand size and regeneration by counting mature stems, seedlings, and buds within clumps, as well as the assessment of harvesting pressure, provides a comprehensive understanding of rattan ecology. The consideration of

the vegetative state of each clump through the percentage of stem desiccation adds an additional layer of information to assess the health of rattan stands.

Data Analyses

It's mentioned that Excel 2007 was used for processing the collected information. While Excel is a widely used tool, specifying the version might be unnecessary unless there are specific functionalities or features crucial to the analysis that are unique to that version.

Ri386 version 3.4.0 was used for statistical processing. It would be helpful to provide a brief description or context about this software for readers who may not be familiar with it. What specific statistical methods or tests does Ri386 facilitate?

The inclusion of a normality test is a good practice, especially in statistical analyses. However, it would be beneficial to mention the specific normality test used (e.g., Shapiro-Wilk, Kolmogorov-Smirnov) and any specific criteria or significance levels employed.

The parameters chosen for comparison (ecological diversity, composition, distribution, farm status, and health) seem comprehensive and relevant. It's good to clarify how these parameters were measured or defined, ensuring consistency and understanding among readers.

The choice of the Tukey multiple comparison test is appropriate for comparing means across different disturbance gradients. However, it's important to elaborate on why this test was chosen, considering the nature of the data and the research objectives.

It's mentioned that the Tukey test was applied when the null hypothesis was rejected at the 5% level ($p<0.05$). This is standard practice, but it's essential to emphasize the importance of adhering to the chosen significance level and the potential implications of Type I errors.

The statement about testing the normality of the data beforehand is crucial. However, providing information on how normality was assessed (e.g., visual inspection, statistical tests) would enhance transparency.

Results

The manuscript is generally well-organized, with clear sections that discuss different aspects of the study (abundance, species distribution, cutting pressure, regeneration, and vegetative state).

The use of statistical analysis, such as one-way analysis of variances (ANOVA), adds scientific rigor to the study. However, the absence of specific p-values for the ANOVA tests makes it challenging to assess the significance of some findings.

The study acknowledges potential challenges in species identification due to morphological similarities, and it rightly suggests the need for further studies to provide more accurate information on stem diameters. This is a valid consideration for future research.

The study identifies *O. macrospathus* and *L. opacum* as the most abundant species across all environments, which aligns with ecological niche theory. The detailed breakdown of species abundance in different habitats provides valuable insights.

The observation that cutting pressure decreases with increasing disturbance levels is an interesting finding. The analysis of cutting pressure in relation to specific species and habitats adds depth to the understanding of rattan exploitation.

The study effectively explores the regeneration of rattan stands in different environments. The connection between disturbance levels and species regeneration aligns with ecological theories, contributing to a comprehensive understanding of rattan ecology.

The use of stem desiccation as an indicator of the vegetative state is appropriate. The text effectively communicates the health and age structure of rattan stands in different environments.

The study highlights the potential implications of its findings for the management of Non-Timber Forest Products in Gabon. The call for further studies and the consideration of exploitability diameters are reasonable recommendations.

The text is generally clear, but there are some instances of repetitive phrases that could be streamlined for improved readability. Additionally, a few sentences are complex, which might make it challenging for some readers to follow.

Conclusion

The study provides valuable insights into the ecology and exploitation of rattan stands in Gabon. It effectively combines field observations with statistical analyses, contributing to the scientific understanding of these valuable resources.