

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

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Potential competing interests: No potential competing interests to declare.

Revision of: "Ecological diversity, structure and exploitation of rattan stands..." by [Nzengue et al.](#)

This study is very valuable in terms of subject matter, objectives, sampling design and data collected. However, the introductory section, the analysis of the data and the presentation of the results should be improved. I hope to contribute to these improvements in the next detailed review of each section of the paper.

## Abstract

The abstract, as it appears, comprises five sections of the study (study area, objectives, methods, results and conclusions). Therefore, it is very important to add two very important sections: the background (to make clear why the study is important among other issues) and the discussion (to briefly compare it with other studies; which can be added in part of the reported results). The methods, results and especially the conclusion of the study should make explicit the word "disturbance". Is it the artisanal exploitation that establishes the disturbance gradient? This should be clear in the abstract.

**Keywords:** It is advisable to use words other than those used in the title of the study. For example, replace "Rattan" with "Palms", "Gabon" with "Central Africa", "disturbance" with "artisanal exploitation", etc.

## Introduction

- Paras. 1-5: Consider reducing the length of paragraphs 1 to 5 to focus on Central Africa instead of Southeast Asia. For example, the first paragraph could be summarized in one sentence as follows: "Rattan palms (family Arecaceae, subfamily Calamoideae) comprehends more than 600 species, belonging to 13 genera; represent about one-fifth of the palm species in tropical forest regions and being an important component of the vegetation of primary and secondary

forests in Southeast Asia (Uhl and Dransfield, 1987, Dransfield et al., 2008)". Order the two citations according to the rules of the journal.

- Para 5:  $H'$  is Shannon's alpha diversity index? If so, make explicit what logarithmic basis the Ruppert et al. (2017) study employed. I mention this because the Shannon index has been used with log base 2, log base 10 and log base e. Therefore, it can be confusing for comparative purposes if the logarithmic base used is not made explicit.
- Para 6: replace the last sentence with the following: "Approximately twenty-two (22) rattan species have been reported for West and Central African regions so far (Sunderland, 2001; 2012). Nine teen of these species are found only in Cameroon (Gonmadje *et al.*, 2018)."
- Para 8: Delete "The" in te first sentence. // Sentence 2 is written in poorly used English.
- Paras 9, 10, 11, 12: revise the English writing.
- Para. 13:

In the first objective, there seems to be a major confusion by referring to diversity, composition and abundance as separate issues. To explain this I need to define 3 terms:

Composition refers to the set of identified species; Richness refers to the number of species; Abundance refers to the number of individuals. In ecology, species diversity has two components: on the one hand, richness (number of identified species) and on the other hand, relative abundance per species. There are many ways to measure species diversity in order to relate richness and abundance. One widely used way is through diversity indices, e.g., the Shannon index from the study by Ruppert et al. (2017) cited in the introduction.

After reading the results section, it is necessary to say that species diversity has not been addressed in the present manuscript. Note that this was not due to a lack of data, since the 2 components (richness and relative abundance) were measured. Rather, it was due to the failure to relate the 2 components in the data analysis, e.g., through the calculation of a diversity index such as  $H'$ .

In fact, in the results section there is no mention of the term "ecological diversity" or "diversity" which is very striking given the title of this manuscript. It must be said that diversity is mentioned in the discussion, e.g. when referring to the paper by Baker et al. (2016). Precisely, here is evident how the confusion of terms does not contribute to the clarity of the manuscript given that these authors use 2 alpha-diversity indices (Shannon and Fisher), i.e., something that was not calculated in the present manuscript.

For all these reasons, I kindly recommend to calculate a diversity index if you want to mention the concept of species diversity or ecological diversity. Otherwise, I recommend mentioning only species composition, species richness and abundance, i.e., not mentioning "diversity", "species diversity" or "ecological diversity".

## Presentation of The Study Area // **Consider replacing the section title with "Study area".**

Para. 2: consider using semicolons instead of commas within the parentheses in the first sentence.

Para. 3: add comma after "Gilg".

Choice of Study Sites // **Consider deleting the title of this section as its content belongs in the "Study area" section.**

Para. 1:

- The first paragraph does not make sense for this section. Consider deleting it or adding it to another section where it is relevant.
- What does the acronym NTFP stand for? In the references I found that it stands for "Non-Timber Forest Products" but that should be made clear at least the first time it is mentioned.

Para. 2: consider replacing "the" with "an" in the first sentence.

Paras 3, 4, 5: revise the English writing.

**Figure 1:**

- Consider adding an image with the location of the study sites within the Guinea-Congo forests of Central Africa.
- Use English words in the image, e.g. replace "peu perturbé" with "The undisturbed habitat".

## Data Collection Methodology

Para. 1. Consider:

- replacing "transect of five (05) hundred meters." with "transect of 500m."
- replacing the last two sentences with "The transects were parallel to each other and perpendicular to the general orientation of the river flow\* to better consider the ecological variability of the environment" if that summarizes the message of the two sentences. \*use flow if applicable.

Para. 2. Consider:

- adding the herbarium code of the National Herbarium of Gabon following the Index Herbariorum (<https://sweetgum.nybg.org/science/ih/>) if applicable.
- replacing "following table" with "table 1".

**Table 1.** Consider revising the English in the title.

## Data Analysis and Processing

Para. 1.

- Consider replacing the first sentence with: "The exploratory analysis was carried out via Excel 2007".
- Cite R, for example: "R Core Team (2021). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>."
- Was an R package used? Cite it if so.

Para. 2.

- The parenthesis is misspelled: the intermediate disturbance site should be added.
- Por lo dicho en objetivos, calculen un índice de diversidad o usen la expresión "riqueza de especies".
- Use the expression "species composition" for clarity.
- Add the parameter abundance (number of stems) instead of distribution (since distribution is an ambiguous word).
- The parameter "farm status (growth)" or simply "growth" is not used in the results. Clarify it where appropriate or delete it from this section. In case this parameter refers to another word used in results, clarify it here. I.e. use only one expression for consistency.
- In this section, the scale of values used for the parameter "health" should be clarified.
- For the inferential analysis, has an ANOVA with Tukey's comparison been performed? If so, mention the word "ANOVA".
- For the appropriate use of ANOVA it is necessary to fulfill 3 assumptions: i) the response variables for each factor level have a normal population distribution; ii) these distributions have the same variance; iii) the data are independent. The first of these assumptions was verified with the normality test. However, the second assumption must be verified with an homoscedasticity test. Also, the third assumption of independence can be checked by exploring graphically if it is previously assumed that the sampling design was adequate.

Of the following sections (Results, Discussion, Conclusions), I will present only a brief review since many issues in the manuscript were considered in the previous sections.

## Results

Distribution of abundance of rattan stems according to the environments surveyed

Consider replacing the last sentence with the following: "There was no significant difference in mean rattan stem abundances". When the differences are not significant there is no need to add the p-value.

**Figure 2.** Use English words in the image, e.g. replace "Milieu peu perturbé" with "The undisturbed habitat". Consider

replacing “according to the enviroments surveyed” with “accross the disturbance gradient”.

## Distribution of abundance of rattan species as a function of habitats

Para. 5. Consider replacing “compartments” with “enviroment”.

**Figure 3.** Idem Fig. 2.

## Rattan Cutting Pressure Level in Different Media

**Figure 4.** Idem Fig. 2 and 3.

## Regeneration of rattan stands in different environments

Para. 1. Consider deleting "In the study area" because the results always refer to the study area.

**Table 2.** What does "as a function of media" mean? does it refer to the disturbance gradient or different enviroments? If so, it is necessary to be consistent in all tables.

Para. 2. idem para. 1.

**Figure 5.** Idem Fig. 2, 3 and 4.

## Vegetative state of rattan stands in different habitats

**Table 3.** Idem Table 2.

## Discussion

In the 2 sub-sections of the dicussion it is possible to see how diversity is not addressed (as previously stated) so that the title of this manuscript (among other aspects) should be modified regarding the use of "ecological diversity".

## Vegetative state and regeneration of rattan stands

Consider adding other theoretical references on the hypothesis of intermediate dirt in addition to the work of Connel (1978).

As previously stated, this manuscript does not address species diversity but its 2 components (richness and abundance).

## Conclusion

The conclusion about the low impact of local populations on rattan stands contradicts what was shown in the discussion about intermediate disturbance. That is, based on what was said in the conclusion, it could be interpreted that disturbances (no matter their level) do not affect regeneration when the results and discussion showed otherwise. This should be reviewed.