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.

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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Gabon is a major center of plant diversity, currently under threat due to anthropogenic pressure. It is therefore important to document impacts of human activities on ecosystems. The paper wants to document how human disturbance affects rattans population (i.e. a group of palms). Three sites are sampled in one region; the three sites apparently have contrasting levels of human disturbance. At each site, 3 plots are surveyed; palms are identified and counted, and a few demographic parameters are examined, including regeneration and dieback.

The language of the paper is quite poor and needs considerable editing.

The paper suffers from a number of major weaknesses.

First, no specific working hypotheses are tested. What do they expect?

Second , sampling intensity is quite low (3 plots / site), and the three sites are chosen in the same region; therefore, it is quite doubtful that the results can be generalized.

Third, no statistical test is applied to the data. The data set should be analysed by community analysis methods.

Fourth, apart from rattans, no other data on plant community structure is collected, and no ecological factor is assessed. This seriously hampers any ecological interpretation of the data.

The paper is much too long and descriptive, and should be cut by 50%.

Other comments

1. Ttile should incorporate “Arecaceae, subfamily Calamoideae”; or: “Palmae, subfam. Calamoideae”;
2. Key literature references are missing, in particular the Flore du Gabon (vol 53) and the Flore d’Afrique centrale (Mbandu P. et alii), both of which have recently dealt with Palmae;

3. Plant names are often not written according to international rules; please revise all names (e.g.: "*Oncocalamus macrospathus* (Burret, Notizbl.), *Laccosperma secundiflorum* (P.Beauv.), *Eremospatha haullevilleana* (De Wild), *Oncocalamus mannii* (H.Wendl.), *Laccosperma opacum* (G.Mann & H.Wendl.), *Eremospatha macrocarpa* (G.Mann & H.Wendl.) and *Laccosperma robustum* (Burret) J.Dransf.Tags": none of these names is correctly written!).

Introduction

The introduction is much too long and poorly focused. It pays too much attention to Asia, while the paper concerns Africa. The literature on Asia should be presented in a more concise way.

Several sentences in the introduction need revision.

"*The available studies assessed the distribution, structure and composition of rattan species along an elevation gradient. These studies suggest that rattan species diversity tends to vary across forest types, elevation gradients (Hamid and Suratman, 2010) and gradients of disturbance or degradation in Southeast Asia. "*

This sentence is not very informative: please indicate **how** rattan diversity varies along those gradients (i.e. direction and magnitude of variation).

"This is true for some taxa such as *Oncocalamus* which is often considered to be the first colonizers of heavily disturbed areas. On the other hand, *Calamus deërratus G. Mann & H. Wendl.* often grows in permanently or seasonally flooded forests or swamps, while other species, such as *Laccosperma secundiflorum (P.Beauv.) Küntze* and *Laccosperma laeve (G. Mann & H. Wendl.) Kuntze*, are very shade-tolerant and prefer to grow under the forest canopy."

Is it useful to pay attention to particular species in the introduction? Instead, try to explain what ecological traits are shared by all (or most rattans), and what other traits vary depending on species.

Among the few studies that have assessed the diversity, population distribution, and dynamics of rattan stands in the forests of Southwest Asia is that of Watanabe and Suzuki (2008) which found in four forest types in Borneo and Java (representing six plots of 4.82 ha in total) that there was a significant positive correlation between rattan stands and trees in the diversity of rattan plants. species and that the correlation decreased for mixed dipterocarp forests (for rattans with the Shannon-Wiener diversity index, H' = 2.87-3.34) to alluvial forests (1.96), lowland forests (1.43) to peat marsh forests (1.34). The density of rattan stems (ha-1) decreased from the low mountain (5,997), mixed dipterocarp (598-992), alluvium (592), to peat marsh forests (162).

Similarly, Ruppert et al. (2017) found that rattan (family Calamoideae) was more abundant in all marsh patches. However, rattan diversity (H') was highest in the dipterocarp plot (D: H' (2011)1,79; H' (2013)1,84) in the Segari Melintang Forest Reserve (Peninsular Malaysia). The Bray-Curtis indices of rattan abundance with the highest similarity in the swamp during the years 2011 and 2013: parcel BC (2011) 0.484, BC (2013) 0.262).

It is pointless to go into the details of those studies by citing diversity index values. Simplify all of this; delete diversity values.

“In the Guinea-Congo forests of Central Africa, a variety of rattan species is also found and has the highest level of endemism of rattan species.“

This sentence makes no sense; please reformulate/ what do you mean?

“The rattan species of the genus: Eremospatha, Laccosperma and Oncocalamus, are considered endemic, and therefore restricted to this forest (Vorontsova et al ., 2016)”

Reformulate, e.g. several genera are endemic to tropical Africa (*Eremospatha, Laccosperma and Oncocalamus).*

“Approximately twenty-two (22) rattan species have already been inventoried in the West and Central African regions so far (Sunderland, 2001; 2012) and of which 19 of these species are found only in Cameroon (Gonmadje et al., 2018).”

This sentence is obviously wrong, because it implies that only 3 species are found out of Cameroon!

“Compared to Asian countries, the diversity of rattans in the Guinea-Congo forests of Central Africa is very low.”

This sentence needs to be substantiated by evidence! Give number of genera, number of species for Asia and Africa.

“Rattan can grow in a variety of conditions and its growth rate varies depending on species, environmental conditions, and management strategies (Razali *et al*., 1992; Sunderland, 2001; Sunderland *et al*., 2012; Titi and Prameswari, 2018; Gonmadje *et al*., 2018).”

This sentence is somewhat trivial; try to make it more informative; do all references apply to Africa?

“Rattan species are found in a wide range of environments. This is the case for the species *L. secundiflorum* and *Eremospatha macrocarpa (G. Mann & H. Wendl.) H. Wendl.* from Liberia to Angola. On the contrary, *C. deërratus* is widely distributed and is found in The Gambia, Kenya, and southern Zambia.”

It is unclear why you focus here on those three species in particular.

“*The highest distribution of rattan species*” = do you mean diversity?

“*there was a significant positive correlation between rattan stands and trees in the diversity of rattan plants species*”: please clarify

Materials and methods

The study was performed I only one locality; therefore, are the results generalizable to the whole country?

What evidence that the vegetation of the three sites was the same before human influence?

How is disturbance level assessed?

The map is unclear; what represents the green areas vs. the yellow areas?

Sampling design is unclear; can you provide a figure?

Habitat or environment? « *the 3 different media*": Please be consistent!

Tuft or clump ?

"*According to a disturbance gradient (Low-disturbance, Highly Disturbed and Highly Disturbed)*,": revise sentence.

Results

All the figures are of very poor quality.

Ant text on the figures should be in English.

All the legends need to be expanded.

"A total of 683 rattan stems belonging to 7 species and 3 genera": please cite them!

Figure 2: difficult to understand; not useful, transform into text.

Compare stem density

All Figure captions should be expanded; e.g. in Fig 3 give plot size and number.

95 seedlings, 69 buds and 04 pods.: what is this?

NO statistical test is reported.

Discussion

Much of it is not a discussion of the results, and should be moved to the introduction!

e.g. "In Africa, there are approximately sixteen (16) species of rattan, grouped into four (04) genera. Taxa Laccosperma, Eremospatha. and Oncocalamus are considered endemic to this continent with a morphology that is clearly different from those of Asia. The genus Calamus, on the other hand, is home to more than 370 species distributed in Asia, of which only one (C. deërratu) is found in southern and eastern Africa with a heterogeneous distribution (Uhl and Dransfiield, 1987; Sunderland, 2001; Sinmenou, 2019)."

"The taxonomic differences observed between our two studies could be explained by the low sampling effort during our surveys and the methods of species identification"

This casts some doubt on the whole exercise!!

The discussion is weak because no specific hypothesis is tested.

The methodological shortcomings should be acknowledged in the discussion.

Do all the species respond in the same way to disturbance? If not, is this related to differences in the ecological niche of the species? or in the regeneration mechanisms?