Author’s response

I have received the evaluation and comments of the reviewer "B" about  your
manuscript "Evaluating the seed rain in two urban Atlantic Forest fragments
in northeastern Brazil". In this round, the Reviewer "B" recommended decline
publication, if the manuscript is not thoroughly corrected. This is second
unfavorable recommendation of manuscript, because reviewer "A" also
suggested to decline publication (in the first round). I sent your
manuscript to the 3rd reviewer (Reviewer C). His recommendation was
"Revisions Required". The reviewers' comments can be found at the end of
this e-mail.

I did a review of the manuscript. My suggestions are similar to those of the
reviewers. This manuscript addresses a relevant issue linked to ecology seed
rain and biology conservation of in urban Atlantic Forest fragments.
However, the study showed questions that need to be resolved, mainly on
methods biased or not clarified (e.g. "why seed size was measured only for
zoochoric seeds, and what was the exclusion criterion used to not measure
and compare the other seeds  anemochoric and autochoric", Reviewer C) data
analysis (e.g. "the authors did not consider sampling time as a factor"
Revisor B) and discussion ("The authors argue strongly about the issue of
the isolation of the Jardim Botânico. I understand that it is "more
isolated" than Mata do Curado, however, what separates the two fragments is
just a highway. Birds and monkeys can move between areas easily" Revisor B).

Dear Dr. Moura Júnior, many thanks for this new opportunity to review our manuscript. We have revised the manuscript to attend to all comments performed in the text. Concerning biased methods or not clarified, I believe that this case is encompassed in “not clarified”. We have chosen this criterion – use only zoochoric seeds – to understand the role of arboreal or terrestrial mammals in maintaining these areas (deposit of large seeds). Although birds can disperse a lot of seeds, these tend to be smaller when compared to those dispersed by mammals. Also, in this region, there is a high abundance of small birds (Pereira et al. 2011). Furthermore, the negative influence of habitat loss and fragmentation on arboreal and terrestrial mammals can be more pronounced, mainly in those areas inserted in the anthropized matrix (urban areas).

As the considered rainfall level as a driver, we now have tested it – as suggested by the reviewer – and did not verify any variation of this factor between areas (Student t test: t= -0.447, df= 21.656, p= 0.658). Thus, we maintained the discussion on the actual form.

Finally, Reviewer B commented on the question linked to the isolation of the Jardim Botânico. We agree that birds can easily move between areas; however, for arboreal and terrestrial mammals, this is unfeasible due to natural (rivers, for example) or human interventions like highways. When commented that it is “just a highway” and “birds and monkeys can move between areas easily” that divide both areas, the reviewer – perhaps – does not know the impact of this type of structure on the terrestrial and arboreal mastofauna as well as the inability to reach another side. Arboreal (e.g., monkeys) and terrestrial (e.g., paca, agoutis, foxes) cannot cross highways too easily. There are a lot of studies demonstrating such impact (see Forman & Alexander, 1998; Nellemann et al. 2001; Vistnes et al. 2004; Fahrig & Rytwinski, 2009; Lesbarrèsres & Fahrig, 2012). Contrarily, the Mata do Curado is connected with the large forest patch throughout a forested matrix. This is different from that found for Jardim Botânico. Additionally, the BR-232 is a highly-trafficked highway from the capital Recife to different other municipalities; also, It consists of two one-way streets, each with three lanes for vehicles. So, there is an imminent danger to the animals. Our comments on the difficulty of reaching large seeds in the Jardim Botânico via terrestrial or arboreal mammals are extremely robust and pertinent.

Forman, R. T., & Alexander, L. E. (1998). Roads and their major ecological effects. Annual review of ecology and systematics, 207-C2.

Nellemann, C., Vistnes, I., Jordhøy, P., & Strand, O. (2001). Winter distribution of wild reindeer in relation to power lines, roads and resorts. Biological conservation, 101(3), 351-360.

Vistnes, I., Nellemann, C., Jordhøy, P., & Strand, O. (2004). Effects of infrastructure on migration and range use of wild reindeer. The Journal of Wildlife Management, 68(1), 101-108.

Fahrig, L., & Rytwinski, T. (2009). Effects of roads on animal abundance: an empirical review and synthesis. Ecology and society, 14(1).

Pereira, G. A., Periquito, M. C., Brito, M. T., & Menezes, M. (2011). Estrutura trófica da avifauna no Jardim Botânico do Recife, Pernambuco, Brasil. Atualidades Ornitológicas, 164, 57-63.

Lesbarreres, D., & Fahrig, L. (2012). Measures to reduce population fragmentation by roads: what has worked and how do we know?. Trends in ecology & evolution, 27(7), 374-380.

Finally, I also modified the title in order to maintain in accordance with the manuscript.

Reviewer B
1) Does the title adequately reflect the content of the manuscript? \*
Yes

2) Is the manuscript a relevant scientific contribution to ecology? \*
Yes, but need change the data analysis
R= The new analyses were inserted in the manuscript.

3) Does the summary present the main idea of the manuscript and its
objectives and main results and conclusions? \*
Yes

4) Are the keywords pertinent and different from the words used in the
manuscript title? \*
Yes

5) Does the introduction present the theoretical/empirical content in which
the manuscript topic is inserted? \*
Yes

6) Are the methods adequate and clearly presented?  \*
Some points still bother me in the text. But my concern is that the authors
did not consider sampling time as a factor. The collections were made in
different periods. We know that interannual variations affect seed rain
dynamics. Could it be that the results were not influenced by precipitation
or wind speed?
I suggest the authors consider these abiotic variables. My recommendation
is: first test whether there is a difference between the study periods with
a parametric t test or one-way ANOVA. If the biotic variables do not show
differences, I strongly suggest considering this data in the material and
methods and inserting a table in the supplementary material. If there is a
difference between the years, my suggestion is to carry out a regression
test to test the effect of variables on seed richness and abundance. Only
then can it be considered that the areas are really different, without the
climatic variables considered as regulatory factors.

R= Now, we have performed a statistical test (as suggested) to verify a potential difference in the rainfall level between areas. The result demonstrated that the rainfall level between areas is similar (Student t test: t= -0.447, df= 21.656, p= 0.658). So, there is no influence on this parameter on the seed rain in the study areas.

Further exploratory analyzes such as an NMDS would allow us to see if
species composition varies between sites. It would be an interesting result.

R= We have inserted an NMDS analysis to verify the variation in the species composition between areas.

The authors argue strongly about the issue of the isolation of the Jardim
Botânico. I understand that it is "more isolated" than Mata do Curado,
however, what separates the two fragments is just a highway. Birds and
monkeys can move between areas easily. Maybe for mammals it's a little more
difficult, but they still manage to cross and disperse. So, I consider that
one should be cautious in discussing based only on the criterion of
isolation. I also recommend putting in the models/regression the distance
between the fragments in relation to the closest conserved fragment.

R= We could agree with you specifically about birds. On the other hand, for terrestrial and arboreal mammals, this is extremely hard. Additionally, our discussion on the absence of connectivity is based on the arrival of large seeds. Large seeds are, more often, dispersed by terrestrial and arboreal mammals instead of small birds (there are no large birds in this region to do this function). Also, due to the lack of influence of rainfall level in the areas, the regression was not performed. More details on this were inserted above.

7) Are the results, discussion and conclusion clearly presented and do they
correctly address the objectives of the study? \*
In lines 335-336 the authors mention "different variables appear to be
acting on the composition of seed rain", but do not mention which variables.
I believe that these variables could be cited and explained that they were
not evaluated. Or if they were, because they didn't enter the analyses.

R= The text was corrected to improve the understanding of the sentence.

8) Are all the figures and tables essential and self-explanatory? \*
Yes

9)  Are the references pertinent and up-to-date? \*
Yes

10) Final Considerations:
With the changes made so far, the text became clearer and more objective.
However, the analyzes must be improved to show the effect of interannual
variation so that the effect of isolation is the main issue. As long as this
is not considered in the text, I suggest rejecting the article

R= In this revised version, we have included the analysis comparing the rainfall level between study areas, which showed to be similar. Thus, the effect of isolation appears to be the main issue.

Reviewer C
1) Does the title adequately reflect the content of the manuscript? \*
Yes

2) Is the manuscript a relevant scientific contribution to ecology? \*
Yes

3) Does the summary present the main idea of the manuscript and its
objectives and main results and conclusions? \*
Yes

4) Are the keywords pertinent and different from the words used in the
manuscript title? \*
Yes

5) Does the introduction present the theoretical/empirical content in which
the manuscript topic is inserted? \*
Yes. The evaluation of the characteristics of seed rain from urban forests
fragments is a relevant theme to the ecology studies. The manuscript brings
a perspective on the influence of forest restoration programs implemented in
one of the study areas, and shows a interesting result on the presence of
larger seeds in urban forest fragments.

6) Are the methods adequate and clearly presented?  \*
Partially. A point that could be made more clear is precisely why seed size
was measured only for zoochoric seeds, and what was the exclusion criterion
used to not measure and compare the other seeds (anemochoric and
autochoric). So, the authors can make it clearer, both in the introduction
and in the methods, why they considered it more appropriate to evaluate the
potential of terrestrial mammals in seed rain.

R= In the revised version, we approached the motivation to work only with zoochoric seeds. The main issue is that these seeds are dispersed only by animals, and associating with the effect of habitat loss and fragmentation (isolation) is important. It has become more pronounced when considering dispersers, such as arboreal and terrestrial mammals inserted in a modified landscape (e.g., urban matrix).

7) Are the results, discussion and conclusion clearly presented and do they
correctly address the objectives of the study? \*

Partially. The number of species sampled and identified was very low.
Identifying the species through their respective seeds is really not an easy
job. But it is a pity that seed germination was not an evaluated step to try
to identify a larger amount of morphotypes, which would probably add a lot
to the study. Due to this, I think the manuscript could benefit from a more
in depth interpretation of the results and discussion.

R= Yes, we agree with it. Unfortunately, it was not possible to identify all the seeds collected. In the previous version, we inserted some lines about it in the text (see lines 388-390).

8) Are all the figures and tables essential and self-explanatory? \*
Yes

9)  Are the references pertinent and up-to-date? \*
Yes

10) Final Considerations:
The reviewer is relatively positive about the paper. However, there are
several shortcomings in the methods and discussion, and lack of details in
the manuscript, as explained in the minor comments in the text. Therefore, I
recommend accepting the study for publication, if all recommendations are
met.

R= Many thanks for the suggestions in the manuscript. We have adopted all comments and suggestions. We hope now the manuscript is ready to be accepted to publication in the Oecologia Australis.