Response letter on the manuscript Classification and characterization of anthropogenic plant communities at the ecoregion level (2nd revision)

Co-ordinating Editor Comments to Author:

Dear authors, your work has improved consistently. However, in this round, I involved one additional referee, Zdenka Lososová, who pointed attention to some critical points of discussion. Please revise the manuscript according to her requests.

Thank you for a new chance to improve our manuscript. We have implemented all the changes required by the new reviewer, as well as the change requested by reviewer 2 regarding the synoptic table.

Referee: 1

I consider the paper has been improved and the flaws were seen in the first review have been corrected

Thank you again for your contribution to improving our manuscript.

Referee: 3

The manuscript provides a detailed overview of anthropogenic vegetation types in the northwestern Iberian Peninsula. The authors assembled a robust dataset of plots. These plots were classified using semi-supervised classification methods and assigned to 25 alliances. The primary characteristics of these alliances are given using proportions of species with different origins, traits, and indicator values. I appreciate the way the classification procedure is described. I also appreciate the nice form of all of the figures. I read the manuscript with all the supplements and the response letter, and I see that the authors highly improved the manuscript. I did not review the manuscript in the first round. However, I have some serious comments which should be discussed.

Thank you for your kind words and your advice to improve the manuscript.

The class Galio-Urticetea is not included as it also includes native communities. However, the same is true for Bidentetea, and this class is included. Explain!

The class Galio-Urticetea is included in the manuscript. However, we are following the vegetation classification by Mucina et al. (https://doi.org/10.1111/avsc.12257) which includes Galio-Urticetea within the class Epilobietea angustifolii. We have modified the text (page 7, line 11-12) to make this clear.

Hemicryptophytes are the most numerous group of species in the dataset. This fact is repeatedly mentioned in the text of results and discussion. However, hemicryptophytes are not shown in Fig. 4. It is confusing and not logical. I would strongly suggest redrawing the figure and replacing the geophytes with hemicryptophytes (or merging them into one category of perennial herbs). / p. 12, l. 20. I mentioned above, this is not good decision. It is shown that the hemicryptophytes are the most common life form!

We have done as requested, and included hemicryptophytes in Figure 4. We have kept geophytes as a separate category in Figure 4 because they are an important part of the definition of the alliance Allion triquetri.

A flow diagram (or table) showing the translation between alliances obtained by different classification schemes and EUNIS types would be helpful for the readers.

The translation between alliances and EUNIS types is provided in Appendix S3, we have revised the text (page 13, line 8) to make this clearer.

I am not comfortable with the use of Central European historical data for the Iberian peninsula, as described in the introduction. A lot of Central European weed species originate in South Europe, not only in the Near East, and the spread of archaeophytes was here probably earlier. It should be at least mentioned. (p. 3, l. 9-16) / p. 12, l. 12 Chytrý et al. 2021? Is it an appropriate source for the Iberian peninsula? I doubt it. The delimitation of alien species in CZ could hardly work for other regions. Moreover, the authors of Catalogue of alien species in CZ is Pyšek et al. – the newest version was published in Preslia in 2022.

Applying the concept of archaeophyte in southern Europe is problematic. However, we wanted to consider this category, solely for the purpose of comparison with similar studies in other European regions. Unfortunately, historical vegetation data is not as available in the Iberian Atlantic territories as it is in other parts of Europe, and this is the reason why we used the catalogues for the Czech Republic and Britain. We must clarify that we did not take those catalogues at face value. We used them to create a starting list of archaeophyte candidates. Then, we revised this list using Flora iberica, to remove species that are considered native in the Mediterranean part of the Iberian Peninsula. We classified the remaining species as putative archaeophytes in the study region, and only for the purposes of comparison. We have revised the text (page 11 line 19 to page 12 line 5) to better explain this, and to further stress that the classification must be interpreted with care (page 12, line 5-10). We have also updated the reference for the Czech catalogue.

Neophytes could originate from all the continents, not only from America, Africa, and Asia (p. 3, l. 19)

We have removed this sentence.

P5, l. 18, 19 the format of references is not in appropriate format

We are using a reference manager with AVS's official style template. After some time trying, we have not been able to fix these specific references. We will fix them manually if the manuscript is accepted.

p. 6, l. 11-12 the mix of two different taxonomic concepts is not the best option

We agree in principle, however, in this case the taxa revised with POWO were a few non-European introduced taxa, therefore, this has not affected in any way the classification and the results of the article.

p. 10, l. 9-16. this part of the text belongs to the results and not to the methodological part

We have moved the text to results as requested (page 13 line 10-17).

p. 14, l. 8. It would be helpful to explain in the methods which taxa are those problematic ones that are merged to some aggregates.

Thank you for spotting this. The vegetation dataset that we use in this manuscript is part of a wider vegetation dataset for the whole Iberian Atlantic region (including all vegetation types, not just synanthropic). When we cleaned and curated the whole dataset, we did create some taxa aggregates. However, we have checked the plots and the taxa included in this manuscript and, for this subset, each aggregate can only correspond to one plant species. Therefore, all mentions to "taxa aggregates" can be changed to "species". We have done so in the text.

Do all of the plots include bryophytes? It is not described in the methods. Bryophytes are highly rare in the annual vegetation of disturbed sites.

The SIVIM database does not provide consistent information on whether bryophytes had been recorded or not, but it is very likely that they were not in many cases. We have revised the manuscript to include this information (page 16, line 3). Bryophytes are rare in most synanthropic vegetation types, but they were relatively frequent and abundant in the vegetation of mesic trampled sites, i.e. Saginion procumbentis with Bryum argenteum.

p. 14, l. 12-13 The comparison of species numbers per plot of different sizes is inappropriate. The authors minimize the variance of the plot sizes, but still, could we be sure that the low number of species is not a result of lower plot sizes?

We have revised the calculation to use only those plots that had the same and most frequent size value (= 20 m2) and recalculated the numbers of species accordingly.

References. Please fix the correct form of some authors' names in the references. / Němec, R., Lososová, Z., Dřevojan, P & Žáková, K. / Šilc U. / Šilc et al. – check all the names / Simonová D. / Tabasevic et al. – check / Zaliberova – check.

Thank you very much for revising the spelling of the names. We have corrected them.

Appendix S5. Please add a header to the table with a short description and explanation of what the numbers in the table show. Define the phi value for diagnostic taxa and explain the meaning of the different colors used. Please note that the phi value is a number between 0 and 1. The table probably does not include the complete list of species. Some explanation is needed.

We have added a header explaining all the requested points.

Referee: 2

I couldn't find a Response Letter. If the authors haven't submitted one, I would ask them to do so. However, from the track-changes file I see that the authors addressed most of my previous points. The only remaining issue is the synoptic table: The authors included such a table as Appendix S5, but it only shows the phi values. In my opinion, a synoptic table should show the percentage frequency, and phi values reaching a certain threshold should be indicated by shading.

We are sorry that the reviewer couldn't access the response letter. We have revised the synoptic table following the reviewer's specifications.