

Earth Syst. Sci. Data Discuss., author comment AC1
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Reply on RC1

Agustín Sarquis et al.

Author comment on "*Aridec*: an open database of litter mass loss from aridlands worldwide with recommendations on suitable model applications" by Agustín Sarquis et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2022-54-AC1>, 2022

Comment 1: In the entry of Almagro et al., 2017, "organic matter remaining%" is shown in the database, but it's "Ash-free dry mass remaining%" in the article;

Answer: We considered ash-free dry mass and organic matter remaining as equal in the database. This is because the ash-free dry mass correction assumes that ash is inorganic matter and thus ash-free mass is equivalent to organic matter for the purposes of these studies. Although we can see that this might generate some confusion, we did not change this in the database entry. Nevertheless we made the following changes in lines 172-175: "Litter mass loss units should be expressed either in (dry) mass remaining, organic matter remaining, or C remaining. Organic matter remaining is in our database a synonym of ash-free dry mass remaining. This is because the ash-free dry mass correction assumes that ash is inorganic matter and thus ash-free mass is equivalent to organic matter for the purpose of this database (Harmon et al. 1999).".

Comment 2: In the entry of Tian et al., 2007, "organic matter remaining%" is shown in the database, but it's "mass remaining" in the article;

Answer: Although in the original figure they report "mass remaining", in Methods the authors clarified that they did an ash-free correction (page 220). As such, similar to Comment 1, we considered this to be organic matter remaining and did not change the entry.

Comment 3: In the entry of DiedhiouSall et al., 2013, the litter initial C/N ratio value seems to be inconformity with the article;

Answer: Thank you for pointing out this incongruity, which we observed as well. The C:N data in the article is inexplicably high and does not coincide with the calculation of C to N values reported in the manuscript. Thus, we decided to do this division ourselves and realized there must be a typographic error in the article. All values in the article are approximately 10 times higher than the calculated values, so we divided them by 10 and used these values instead. We clarified this in the entryNote of the metadata.yaml file: "C:N data must be wrong in the paper, we divided values by 10 in initConditions.csv".

Comment 4: In the entry of Levi et al., 2020, "starting month" is January in the database, but it's July in the article;

Answer: Thank you for this observation. We corrected this accordingly in the entry.

Comment 5: Figure 2, it will be better to show the distinction of sites by ecosystem type;

Answer: Thank you for this suggestion. We included this modification in Figure 2 and added the following in the figure description: "Points represent study sites in the aridec database. Colors represent different ecosystems as reported in the original publications".

Comment 6: Line 319, "According to the GAI()...", delete the " ()".

Answer: We corrected this accordingly in the manuscript.

Comment 7: Figure 4.(a)(b), the ordinate axis title "number of pubblication", should be "number of publication " .

Answer: We corrected this accordingly in Figure 4.

Comment 8: Figure 7, there are 8 data points in (c), but 7 data points in (a) and (b). For a representation of the same data set for comparison, please check the raw data.

Answer: Thank you very much for this observation. There was one missing point in figures 7a and b. We corrected this accordingly.

Comment 9: In discussion section 4.2, it would be useful to summarize the results of model fitting/model selection for different ecosystem types or GAI classification groups.

Answer: Thank you for this suggestion, which inspired the following modifications in lines 476-485: "Again, interconnection between datasets like *aridec* and others like TRY (Kattge et al., 2020) is a key workaround to the collinearity problem by providing data for parameter restriction (Sierra et al., 2015). We recognize limitations in data available from field studies ultimately restrict our capability to fit more complex models (Brun et al., 2001). This limitation can have further implications if we consider the proportion of identifiable data sets per ecosystem type or level of aridity. For example, semi-arid and dry sub-humid ecosystems show the lowest proportion of identifiable data sets for a two-pool parallel model with all parameters (data not shown). This would lead to an under-representation of some aridlands because of a lack of suitable data available. Moving forward, new decomposition studies should consider making more measurements and including data on litter initial chemical quality, as well as expanding studies to less represented climates and ecosystems. This will allow for the detection and modeling of finer-scaled dynamics of organic matter (see Appendix A)."