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Biogeosciences Discussions

Interactive comment on "Baseline for ostracod-based northwestern Pacific and Indo-Pacific shallow-marine paleoenvironmental reconstructions: ecological modeling of species distributions" *by* Yuanyuan Hong et al.

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Response to Manuscript Reviewers' Comments

Title: Baseline for ostracod-based northwestern Pacific and Indo-Pacific shallow-marine paleoenvironmental reconstructions: ecological modeling of species distributions

Dear Dr Lazaro, Thank you all for your valuable comments on my manuscript. Please find the relevant excerpts from your report reproduced below, alongside their respective

responses. Yours sincerely, Yuanyuan Hong (email: oocirclr@gmail.com)

1. In order to avoid the iterative descriptions of results for all species it could be useful to underline the stronger correlations of species with environmental parameters (as positive correlations) and on the other hand, the stronger un-correlations of species/parameters (as negative correlations) to evidence the most sensitive species to environmental alterations (anthropogenic, in particular).

To address a reviewer 2's comment and to reduce iterative impression, we divide the results and discussion section into subsections by grouping the species into Widespread, Temperate, Subtropical, Tropical, and Globally Distributed Groups. We hope this works. In addition, the Table 3 already highlights significant correlations in model averaging (that are similar to "stronger correlations" in your sense).

2. Taphonomic status of individuals must be clearly noted, since only autochthonous specimens are valid to ecological modelling. In particular apply this with estuarine species that can be found in deeper waters.

The samples are mostly muddy (indicating deposition under calm condition), and so we think the faunal is mostly autochthonous, except a small percentage of phytal species included in each sample. We added some sentences regarding taphonomic problems in the revised manuscript. Please see line 215Âň–220 "A small percentage of specimens of phytal genera (e.g., Xestoleberis spp., Neonesidea spp.) were contained in each sample, which are basically allochthonous specimens in bottom sediments transported from surrounding phytal environments. The value of allochthonous species to environmental interpretation is limited, however most ostracod specimens in each sample are composed of benthic, muddy sediment dwellers which are considered autochthonous."

3. Minor problems: 212 was strongly correlated with salinity (negative) better: strongly uncorrelated We think the word "uncorrelated" is a bit confusing, because it can mean non-significant correlation instead of significant negative correlation. We also changed

"strongly" to "significantly" for better accuracy.

Text might be somehow simplified by using: correlated (positive) as correlated, and correlated (negative) as uncorrelated. Please refer to answer for 3.

233 Relative abundance of B. bisanensis s.l., better using the complete name of species (Bicornucythere bisanensis) at first mention, and then writing the contracted name (B. bisanensis) in other mentions of this species. This can apply for all species. We agree, that's why we mentioned the complete name at the beginning of 5. Results and discussions. In addition, species names at the beginning of a sentence are not abbreviated.

240 (Bicornucythere bisanensis) we did not see a significant relation between relative abundance and metal concentration, productivity s.l., but in Table 2 it is uncorrelated with MD (-0.23; -0.29) and correlated with Pb (+0.18)

Table 2 shows the best three regression models for the relative abundance of each common species. However, Table 3 is model averaging results (of all regression models) and more conservative regarding significance. So, MD and Pb are significant in some models, but not so overall. Thus, our discussion is mostly based on Table 3 results.

419 to 426 Why all these references there? Deleted.

Fig. 7 Bicornucythere bisanensis s.l. (dot in "l") Revised.

Table 2. R is variable Region. How is it measured the correlation/uncorrelation of different species with this variable? Categorical parameter like geographic region can be included in regression modeling. Correlation is based on species distribution and presence and absence of each region.

Copper (Cu) is included in the performed environmental analyses (Fig. 3; Table 1), but after this it do not appear in any of the results and discussions. I wonder if there is not one correlation with the studied species; if so, please indicate. We explored lin-

ear dependencies by computing variance inflation factors (VIF) (Legendre & Legendre, 1998) and pairwise correlations between predictor variables to assess whether multicollinearity was likely to influence regression results (Yasuhara et al., 2012b). The degree of freedom is more than one for the geographic region variable (see below), thus we computed generalized variance inflation factors (GVIF). For continuous variables, GVIF (Table 4) is the same as VIF, but for categorical variables, GVIF has degrees of freedom (Df) equal to the number of coefficients associated with it (Hendrickx et al., 2004). Thus, we used GVIF1/2df to make GVIF values comparable among those with different Df. VIF >20 is usually indicative of high collinearity (Legendre & Legendre, 1998). Thus we calculated an equivalent threshold of 4.47 (equal to $\sqrt{20}$) for GVIF1/2df to assess collinearity. Also, adjusted R2 >0.8 indicates a strong correlation of variables (Hoffman, 2015). In all datasets, summer temperature (ST) and copper (Cu) were highly correlated (R2=0.8217), and the GVIFs of ST and Cu are >20, indicating that these correlations may influence regression results. Thus, we re-ran the linear regression modeling without ST and Cu. In other words, ST and Cu were removed from our analyses and discussion.

Please also note the supplement to this comment: https://www.biogeosciences-discuss.net/bg-2018-405/bg-2018-405-RC3-supplement.pdf Manuscript has been revised, with the comments in the supp

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