An opponent review on the master thesis of Agnishikhe Munipapa entitled "The effect of season and dominance hierarchy on strategic interaction among birds in mixed-species aggregation"

The topic on mixed flocks is currently solved topic. Therefore, I appreciate the topic choice as well as the intention to compare different feeder types. The study design is suitable to solve the proposed aims and the amount of fieldwork is sufficient for consequent statistical analyses. I wish the student to publish these results soon in some international journal. There are some minor issues that can be improved before sending the ms to journal (i.e. missing spaces in Results within brackets with results of statistical test or other minor typing mistakes). I have following questions and recommendations that will lead to more smooth publication process:

1) Introduction – This part sufficiently introduced me into the solved topic. The author is also depicting fulfilling the gap in knowledge of proposed topic. For the publication, I recommend shortening some parts of the introduction (e.g. the last paragraph), which can be more clear even when using less sentences. I also recommend moving the research aims to the end of Introduction as usual for publications. Formally, I lack the chapter aims since they are included in the middle of Introduction.

2) Statistical analyses – I found the methods suitable and comprehensive. The proposed Elo-rating is relatively new method used for such interactions. Since the methods are elaborate, I would appreciate some diagram or table to summarize used methods for each topic (i.e. dependent variable). It would be also useful to include in this table/diagram all tested independent variables. This would save the space in the publication and would it make clearer at first look. My final question is whether after this procedure will be the student able to repeat all the steps without any help?

3) Results – Figure 2 – The author used Spearman rank correlation. For these analyses, there is no clear which variable is dependent and independent. Consequently, the author used a kind of regression to visualize the relationship. In my opinion, the variables in the graph should be interchanged since body size can more probably affect the ranking than vice versa.

4) Results – Tables – Legend to tables is not always ending with the dot. Please, be consistent. For Table 3, I am not sure if the author used ANOVA as a traditional tool (using Statistica 14 software) or "anova" function in R. I suggest that the latter is true ("add1" function is mentioned in Methods). Please clarify this issue to me. I also did not find in methods mention how was performed Tukey test. I would also appreciate to involving the information about the dataset size in the bracket. Please note that legends should be self-explanatory.

5) Results – Fig. 4 – I am a bit confused with these boxplots. Since feeding tendency and dominance ranking are continuous variables, there is a possibility to perform regression analysis, where feeding guilds are shown also by different colours of dots. Then You can directly test the strength of the relationship between these two variables. Please explain the main reason for using this approach. The same can be applied also for Fig. 5 and there will be visible if there is difference between spring and winter. Or the main problem was non-linear curve during the winter?

6) Results – Strategic interaction – I did not find in methods how exactly was measured the rank difference. Can You please make it more clear during the defence? Anyway, I like the main results in the Fig. 7 showing no cooperative tendencies at bottle feeders compared to ball feeders.

7) Discussion – I found this chapter well written with many logical implications. Especially, I appreciate the ability of the student to uncover these complex relationships in unknown environment. The student showed that is able to think properly on these relationships for which the knowledge on species ecology was needed. I have just few recommendations that maybe useful. I would not mention P values again in the Discussion. Regarding the increased feeding tendency of Marsh tit, I can agree with the author conclusions. During my long-term field work in Bohemian Forest, I found that its abundance is increasing from spring to summer that is opposite to other species (probably due to singing juveniles in late summer, Riegert 2022: Journal of Vertebrate Biology). During the spring, I also suggest higher territoriality in this species.

In conclusion, I found the thesis interesting and most of results well discussed. The author was able to correctly recognize new species and put the results in the right context. I believe that the

results will be soon published after minor changes that are needed before submission. Therefore, I recommend the thesis for the defence and suggest the evaluation “výborně”

In České Budějovice, 16.5. 2023

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