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Review on the MSc thesis entitled:

The Effect of Season and Dominance Hierarchy on Strategic Interaction Among Birds in Mixed-species Aggregation

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Number of pages: **38**

This study investigated the mixed species aggregation of birds on two types of feeders under different seasonal aspects. Data were videotaped and then statistically analyzed.

I like the concept and the large amount of data presented in this work, along with investigating the effect of season on bird behaviour, which was found to be significant, as the author predicted. I have some minor comments on writing and some minor questions/suggestions.

1. The Annotation needs some work prior to this work will be submitted to any international journal. It needs to introduce the reader more broadly to the topic

studied, and it also needs to show major results along with one or two conclusive sentences.

2. p. 8: "The group size was determined for each recording as the total number of participants found at the feeder within a radius of less than 10 m." I am not a native speaker, but I believe "individuals" should be used instead of "participants".
3. In several cases, you need to change the wording. For instance (L. 232-3): Following (Stanley Cramp, Perrins, & Brooks, 1982; S. Cramp, 1988; Isenmann, 1994), the diet of the birds was classified as omnivores, insectivores, primary granivores, and strict granivores. Should be: "The diet of the birds was classified as omnivores, insectivores, primary granivores, and strict granivores following Stanley et al. (1982), Cramp (1988) and Isenmann (1994)"
4. Similarly, on L. 439: "(Newton, 1998; Robb et al., 2008) also showed the importance of bird feeders" should be: "Newton (1998) and Robb et al. (2008) also showed the importance of bird feeders".
5. P. 8-9: " (French & Smith, 2005; Miller et al., 2017; Francis et al., 2018; Moreno-Opo et al., 2020). " – these citations belong to Discussion
6. It is a shame that tree density was no more significant after the effect of the study site (random factor) was included because this variable influences nest defence in many birds. Therefore, I initially expected any significant influence on bird behaviour, especially during the spring.
7. L. 304: The group size of birds visiting the ball feeder is by 0.9 larger than the bottle feeder on average. Given that this difference was significant in winter, is it possible to recommend ball feeders more than bottle feeders to laypeople?

8. L. 449-450: With the increase in the food abundance in the surrounding (Seward et al., 2014; Barras et al., 2022), the species, in general, are also not forced to attend feeders, unlike in winter. Does this mean birds also spend less time on feeders in the spring than in winter? If so, the overall cost of aggressive/agonistic interactions is more significant in winter, particularly among species with a similar dominance rank, because food is scarce and competition for food is more intense, and flocks are greater.
9. L. 460- 461: Moreover, more than one individual can access and feed at the ball feeder, potentially improving the aggregation size, unlike in the bottle feeder, where access to the feeder is limited to only one individual at a given time. Could there be more frequent cooperative behaviours seen on the ball feeder?
10. I assume the food in the ball feeder is more fatty and aggregated, but the food in the bottle feeder contains more grains and no fat. If so, wouldn't it be better (although I am still determining whether technically possible) to try these two types of feeders with identical food? Because these two feeders do differ in food accessibility (bottle feeder is available only for one individual), so purely experimentally, they should be standardized in terms of food quality to control for this potentially confounding factor. Are there any apparent differences in species preferring bottle feeder (e.g., strict granivores) over ball feeder (e.g., omnivores?)?
11. Decreased feeding tendency in Eurasian Jay and Crested Tit in Spring and increased feeding tendency in Great Spotted Woodpecker and Marsh Tit could be supported by differences in foraging preferences in former species and increased territoriality in latter species, as stated. However, unlike the woodpecker, Eurasian Jay is very inconspicuous during the breeding season (cf: Eggers, S., Griesser, M., & Ekman, J.

(2008). Predator-induced reductions in nest visitation rates are modified by forest cover and food availability. *Behavioral Ecology*, 19(5), 1056-1062), perhaps because their nests are more vulnerable to predation (compared with holes of woodpeckers). If so, no diet but behavioural changes during the breeding season could shape Eurasian Jay's lower feeding tendency.

12. L. 546 – I speculate whether phylogenetic closeness between species would at least partly influence cooperative strategies on feeders. What is your opinion according to the results and your own observations?

Overall, I like this MSc thesis because it provides new insights into bird behaviour on bird feeders, is based on excellent sample sizes and is properly statistically analyzed. This work has powerful potential to be published in any serious international journal. I recommend it for the final defence on behalf of the scientific committee of South Bohemia University and recommend its highest evaluation (level A, excellent).

prof. PaedDr. Pavol Prokop, DrSc.

In Bratislava 11.5. 2023