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The behavioral analysis of Jungle crow (*Corvus macrorhynchos*) in a botanical garden

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1. Introduction

Animals living in groups tend to increase their efficiency of feeding or other beneficial behaviors such as self-maintenance, as group size increases. Previous studies also suggested that animals in groups tend to take higher risks than solitary individual. Many eyes for predator detection and dilution of predation risk have been considered to generate these tendencies through decreasing individual predation risk in groups. However, the effects of group size are known to decrease or even disappear when animals are free from predation risk. There is a very tight association between the effects of group size and predation risk, which usually differs by behavior types. Thus, comparison among multiple behaviors is needed for better understanding of the effects of group size.

2. Methods

In the present study, I conducted behavioral observation of jungle crow (*Corvus macrorhynchos*) at a pond in botanical garden of Hokkaido University, from July to August, 2019, with video cameras. Individual behavioral records for bathing and beak-dipping were collected. The effects of group size and other factors (date and time) on frequencies of each behavior were analyzed using negative binominal regression models. Logistic regression models were carried out to analyze the effects of group size on occurrence rates of bathing and beak-dipping.

3. Results and Discussion

I collected behavioral data of 184 individuals of jungle crow. Group size ranged from 1 to 13, with median of 3 individuals. Negative binominal regression models revealed that group size marginally significantly ($p = 0.08$) related to bathing frequency but did not relate significantly to beak-dipping frequency. Logistic regression models revealed that group size increased bathing occurrence rate, but did not increased beak-dipping occurrence rate. Differences of the effect of group size between two behavior types indicate that individuals doing different behaviors do not equally gain benefits from increased group size. Given the bathing is higher risk than beak-dipping, detection of the effects of group size only on bathing indicates that high risk behavior is more sensitive to group size. The positive relationship between group size and bathing behavior indicates that grouping is still beneficial for jungle crows. Although there are few predators for jungle crow in urban environment, the effect of group size still exists.

4. Conclusion

Studies on animal behaviors in groups are very important in understanding and managing social animals. Here, I showed evidence that the effects of group size are different among behavior types, suggesting that differences of behavior type and its risk should be take into account when we estimate the effects of group size because they can change conclusions. My study also demonstrated the presence of positive effects of group size on population of jungle crow living in urban area despite the absence of predators.