



Nestling feeding and growth rate in the Northern Mockingbird

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Introduction

The reproductive period of all organisms is a critical stage, affecting the fitness of individuals and the viability of populations (Stearns 1992). Among passerine birds, the nesting period is especially important because nestlings are extremely vulnerable and one or both parents are forced to spend approximately two weeks feeding nestlings. Adult behavior during this stage is critical not only for nestling growth but also because trips to and from the nest can draw the attention of predators and reduce the chances of nest success (Skutch 1949, Martin et al. 2000).

The Northern Mockingbird (*Mimus polyglottos*) is distributed throughout North America. The reproductive period in Florida takes place between March and July, both parents build the nest and participate in the nestling care, but only the females incubate. The purpose of this study was to examine the effects of brood size (number of nestlings) and nestling age on feeding rates, the seasonal variation in brood size and its effect on the growth rates of nestlings, and the seasonal variation in ectoparasite load of the nests.

Specifically, I wanted to evaluate if the feeding rates change as brood size increases, and if this had an effect on nestling growth rates. Furthermore, we wanted to assess the variation throughout the breeding season, and between male and female investments.

Methods

I conducted this study on the University of Florida campus during the breeding season of 2006. I systematically searched for nests and monitored nest success. I recorded nestling weights to nearest 0.05g, and conducted direct one hour behavioral observation at each nest every other day. During these observations I quantified feeding rates (trips by parents with food to the nest), and nest sanitation (fecal sacs removed or ingested), among others. I divided the nestling period, which usually last 13 days (Derrickson & Breitwisch 1992), in three days intervals (0-3, 3-6, 6-9 and 9-12). After fledging or depredation I collected the nests to search for ectoparasites (specifically blowflies). Sex of the adults was determined from leg band color combinations and from behavioral patterns (such as incubating nestlings by females only).

References

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Results

- Males made fewer number of trips with food to the nestlings than females (χ^2 , $df = 1$, $p < 0.005$).
- Although the number of trips to the nest increase with brood size, the feeding rate per nestling decreased (F=30.65, $df=3$, $p < 0.001$; Fig. 1).
- The feeding rate increased with chick age, with fewer trips during the first three days of the nestling period (F=5.98, $df=3$, $p < 0.05$; Fig. 2).
- The overall growth rate did not change despite the decreased feeding rate in large broods of multiple nestlings (Fig. 3).
- Overall, females ate or removed more fecal sac (71.6%) than males. Most fecal sacs were consumed during the first three days (48%). Fecal sac ingestion decreased as nestlings developed (Fig.4).
- From the 55 collected nests 14.45 % had blowflies. The highest number of flies per nestling were found in the month of June (mean = 11.33 flies/nestling), and broods of multiple nestlings had more flies in them. The largest proportion of nests were infected in July (21.43%, $n=14$).

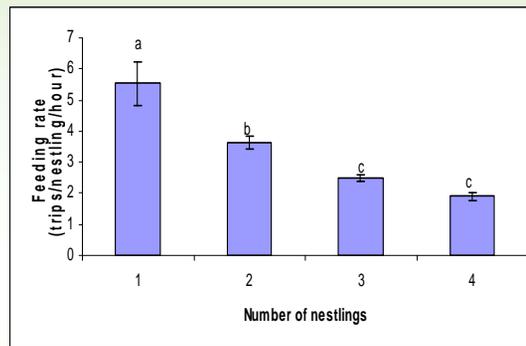


Figure 1. Change in feeding rates as a function of brood size. Nests containing one nestling (n=11), two nestlings (n=39), three nestlings (n=42), and four nestlings (n=23) were compared.

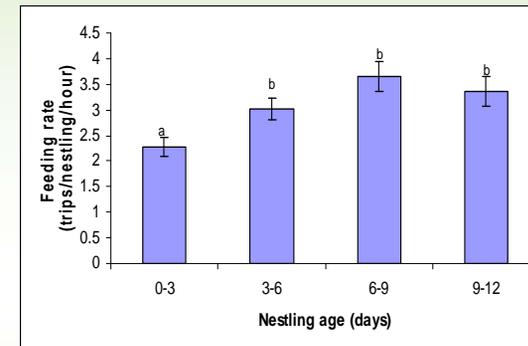


Figure 2. Change in feeding rates during the nestling period. Nests of age groups 0-3 days (n=47), 3-6 days (n=21), 6-9 days (n=12) and 9-12 days (n=7) were compared.

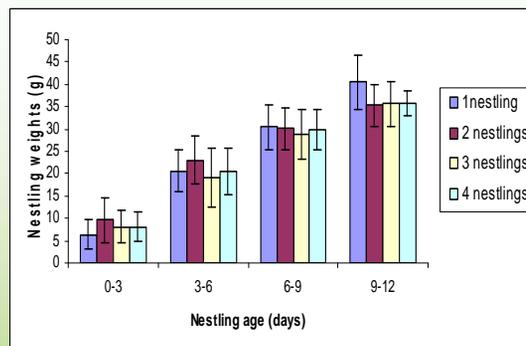


Figure 3. Nestling growth of different size broods during the nestling period. Nests of age groups 0-3 days (n=47), 3-6 days (n=21), 6-9 days (n=12) and 9-12 days (n=7) were compared.

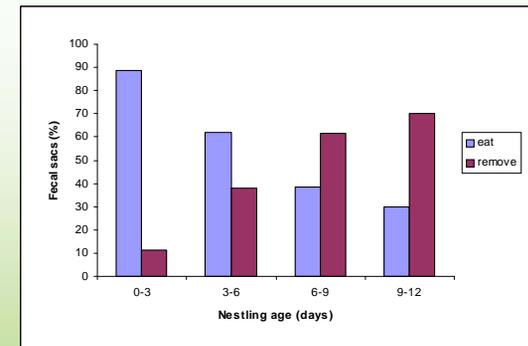


Figure 4. Fecal sac consumption and removal during the nestling period. Nests of age groups 0-3 days (n=11), 3-6 days (n=15), 6-9 days (n=13) and 9-12 days (n=7) were compared.

Summary

Male Mockingbirds do not take equal part in parental care of the nestlings (feeding and sanitation), but this has been reported for other monogamous passerine birds (Lombardo 1991).

Parents should maximize their effort with the brood size enlargement. However, the Northern Mockingbird parental feeding effort does not increase proportionally with an enlarged brood size, therefore decreasing the feeding rate. But surprisingly this has no effect on nestlings' growth rate.

Fecal sac consumption has been reported for other birds, but is not a common behavior. In addition, Northern Mockingbirds seem to have a higher consumption than other species. But further studies are needed to understand the reason of this high consumption.

The ectoparasite load of the nests varies with season, increasing by the end of the breeding season (higher temperatures). Large numbers of blowfly larvae could have detrimental effects on nestlings, which can be one of the reasons why these birds stop nesting in July.

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