Mate choice in house wrens: nest cavities trump male characteristics

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Summary
When male birds defend all-purpose breeding territories, females may select mates based on indicators of male or territory quality, or both. However, in non-experimental studies, it can be difficult to determine which traits females prefer because measures of male and territory quality frequently covary. We conducted a series of studies to investigate the traits female house wrens (Troglodytes aedon) use to select a social mate when each male is provided with nest sites of equal quality (i.e., nestboxes). We first compared the phenotypic and territory vegetation traits of males with the time it took them to secure a social mate after returning from the wintering grounds. Male arrival and pairing date were positively correlated and early-arriving males were in better condition and occupied territories in more preferred vegetation than late-arriving males. To test the hypothesis that early-arriving males possessed phenotypic or territory traits that led to their pairing more quickly than late-arriving males, we removed all females after pairs had been established and determined male success in attracting new mates. Male settlement and pairing date with replacement females were not correlated as had been male settlement and pairing date with original females, and male time-to-pairing was not correlated with male song rate, condition index, or territory vegetation. When we manipulated the abundance of nest sites on territories, after males settled but before females arrived, male time-to-pairing, independent of male condition index or territory vegetation, was negatively related to the number of nest sites on a male’s territory. These results suggest that under natural conditions females rely on nest-site quantity and, likely, quality when selecting a social mate.

Keywords: Troglodytes aedon, male settlement, female mate choice, female settlement, territory quality, nest-site quality, nestboxes.

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Introduction

In species of birds in which males acquire and defend breeding territories and nest sites, females may select mates based on their evaluation of male phenotypic traits or nest-site and territory characteristics, or all three (Orians, 1969; Yasukawa & Searcy, 1986; Kirkpatrick & Ryan, 1991). Male mating success often correlates with the size and colour of male plumage ornaments (Møller, 1988; Hill, 1990), the frequency and variability of male vocal displays (Reid et al., 2004), the elaborateness of male courtship displays (Borgia, 1985), and the characteristics of male territories (Reid & Weatherhead, 1990; Johnson & Searcy, 1993; Milks & Picman, 1994; Buchanan & Catchpole, 1997; Wolfenbarger, 1999). However, characteristics of males and their territories often covary (Howard, 1974; Alatalo et al., 1986; Catchpole, 1986; Slagsvold & Lifjeld, 1988; Hill, 1989; Bensch & Hasselquist, 1991; Møller, 1994; Hoileitner et al., 1995; Hasselquist, 1998; Evans & Goldsmith, 2000), making it difficult in non-experimental studies to identify the specific traits that females use during mate selection. Experiments that disrupt the correlation between male phenotypic and territory quality traits are needed to identify the traits females evaluate when choosing a mate (Alatalo et al., 1986). House wrens (Troglodytes aedon), small, migratory songbirds, are ideal for such experiments because they readily accept nestboxes as nest sites, making it possible to manipulate aspects of territory quality independently of male phenotypic traits (Johnson & Searcy, 1993).

We conducted descriptive and experimental studies that compared the time required by male house wrens to acquire a mate (time-to-pairing) with measures of male and territory quality. In a descriptive study, we compared male settlement and pairing dates, as well as male time-to-pairing and male condition and territory vegetation. We disrupted the relationship between male phenotypic traits and territory vegetation in the first experiment, and controlled nest-site quantity and quality because some aspect of the nest site may influence female choice in secondary cavity-nesting species (Johnson & Searcy, 1993). Once all males were paired we removed their original mates (following Alatalo et al., 1986) and compared how long it took them to obtain a new, replacement mate relative to their condition, song rate, and territory’s vegetation. In the second experiment, after males settled but before they obtained a mate, we manipulated nestbox number while controlling the quality of nestboxes on each territory. Each territory initially had only one