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The Condor 90:513–514

EVIDENCE FOR INTRASPECIFIC BROOD PARASITISM IN THE HOUSE WREN[1]

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Key words: Intraspecific brood parasitism; House Wren; first evidence.

Most avian brood parasites reproduce by laying eggs in nests of other species (e.g., Hamilton and Orians 1965, Payne 1977), but some may lay in nests of conspecifics. Intraspecific brood parasitism has been reported for over 50 species of birds, mostly ducks (Yom-Tov 1980). For passerines, however, intraspecific brood parasitism has been reported far less frequently, although several well-documented cases do exist (see Yom-Tov et al. 1974, Manwell and Baker 1975). In this note we provide the first evidence for intraspecific brood parasitism in a small, cavity-nesting passerine, the House Wren, *Troglodytes aedon.*

Between 1984 and 1987 we conducted a study of the House Wren breeding ecology in Presqu'ille Provincial Park (hereafter the Park) and in the Mer Bleue Bog (hereafter the Bog) near Ottawa, Ontario (description of these study sites can be found elsewhere; Belles-Isles and Picman 1986a, Belles-Isles 1987). In the 4 years of this study we have made observations on a total of 123 nests and obtained evidence for five probable cases (about 4% of the total) of intraspecific parasitic egg laying. Because we could find no previous reports of intraspecific brood parasitism for this species, below we provide a description of these cases.

Cases 1, 2, and 3—Appearance of two eggs per day. First, late in June 1985, we found a nest in the Park, where three eggs were laid in two consecutive days. The final clutch laid in this nest consisted of seven eggs and of these six young fledged. Second, in 1986 in the Bog we recorded a case where the first egg was laid on 22 June, and 4 days later (on 26 June) the nest contained six eggs. The further breeding history of this nest is not known. Third, in one House Wren nest that was under observation in the Bog, six eggs were laid between 16 June and 19 June 1987. This nest successfully fledged all six young. Since passerines normally lay only one egg per day, the appearance of more than one egg per day can be used as evidence for parasitic laying (see Yom-Tov 1980).

Case 4—Appearance of a new egg after completion of the clutch. In May/June 1986, we observed the irregular appearance of an egg in a House Wren nest located in the Bog. In this nest seven eggs were laid between 20 and 26 May. During the next visit on 31 May the nest still contained seven eggs. However, on 2 June, we discovered a new egg near the entrance of the nest box. This nest eventually fledged seven young. The irregular time interval between laying of the seventh egg and the last egg, along with an unusual location of the last egg at the box entrance away from the nest depression, strongly suggest that the last egg was laid by a parasitic female.

Case 5—Abnormally large clutch. On 25 June 1987, in one of the boxes used for breeding by House Wrens in the Bog, we found a clutch consisting of nine eggs. Most House Wrens in our study areas, however, laid between four and seven eggs (for 1984 to 1987 mean clutch size $\pm$ 99% CI = 6.1 $\pm$ 0.2; n = 123). The abnormally large clutch in this case thus suggests parasitic laying by another female.

The five above cases provide strong evidence for intraspecific nest parasitism in the House Wren, although this mode of reproduction appears to be infrequent (about 4%) in our wren populations. However,

[1] Received 28 October 1987. Final acceptance 4 January 1988.

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nest boxes were not checked regularly and we could have missed some cases of nest parasitism. Intraspecific brood parasitism in House Wrens could, thus, be more common than our observations suggest. In addition, if parasitic female House Wrens removed one or more eggs from the host's clutch prior to or following laying of their own egg, then our data on the frequency of occurrence of intraspecific brood parasitism could greatly underestimate the importance of this phenomenon. The removal of an egg from the host's clutch appears to be characteristic of some brood parasites such as the Brown-headed Cowbird, *Molothrus ater* (e.g., Mayfield 1977, Smith 1981), and thus it might also be a reasonable strategy in parasitic House Wrens. The five cases of brood parasitism that are described above, however, suggest that the parasitically laying female House Wrens did not remove any of the host eggs. The bias due to egg removal is thus probably unimportant.

Evidence on the House Wren tendency to destroy eggs and kill young of other conspecifics (Belles-Isles and Picman 1986b) appears to be inconsistent with our present observations on intraspecific nest parasitism in this species. Why should a female, after having arrived at a given conspecific nest, lay in it rather than destroy the discovered clutch? This apparent conflict could be explained by our earlier observations that the female wrens ceased pecking eggs when they started laying (Belles-Isles and Picman 1986b). The lack of evidence for removal of any eggs in the five above cases of brood parasitism is thus consistent with data on inhibition of egg-pecking behavior in breeding female House Wrens.

What conditions could lead to the occurrence of intraspecific brood parasitism in House Wrens? Yom-Tov (1980) suggested that a high proportion of unmated females in a breeding population, a shortage of suitable nesting sites, and the loss of a nest during the laying period could all increase chances for the occurrence of intraspecific brood parasitism. The last two situations are applicable to House Wrens. House Wrens normally breed in natural tree cavities but they also readily accept nesting boxes (Kendeigh 1941). Because cavities suitable for nesting are a limiting resource (e.g., Kendeigh 1941, Belles-Isles and Picman 1987), some female House Wrens may find it advantageous to lay parasitically in nests of other conspecifics. This hypothesis is supported by the fact that all cases of brood parasitism that we observed occurred during the peak of House Wren breeding activities, when most nest boxes were occupied (out of 92 boxes available in the Park 90.2% were defended by males and 67.4% were used by females; Belles-Isles and Picman 1986a). However, the final test of this hypothesis will require a detailed study of reproductive strategies of female House Wrens prior to and following a reduction in the availability of suitable nesting cavities. Alternatively, the above cases of intraspecific brood parasitism could have resulted from nest predation during egg laying. Because nest predation in our House Wren populations was moderately high (in the Park, out of 77 nesting attempts 48.1% failed to fledge any young and 81% of all nesting failures were due to predation; Belles-Isles and Picman 1986a), this hypothesis is also plausible. The test of this hypothesis, however, will require that we examine its two major predictions that: (1) the occurrence of intraspecific brood parasitism should increase with increasing nest predation during the laying stage; and (2) the parasitic laying is performed by females from depredated nests. We are continuing to test these predictions.

We thank E. Joss and V. Haentyens for field assistance and Andre Isabelle and Neal G. Smith for constructive comments on the manuscript. The Ontario Ministry of Natural Resources and the National Capital Commission kindly allowed us to conduct this work on their properties. The University of Waterloo provided accommodation at the Park. This work was supported by an NSERC operating grant to J.P., and an NSERC postgraduate scholarship and a University of Ottawa scholarship to J.-C.B.-I.

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