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SHORT NOTES

# Intraspecific brood parasitism in Barn Swallows *Hirundo rustica* nesting in bunkers

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**Czechowski P., Zduniak P. 2005. Intraspecific brood parasitism in Barn Swallows *Hirundo rustica* nesting in bunkers. Acta Ornithol. 40: 162–164.**

**Abstract.** During a four-year study of the breeding biology and ecology of an atypical population of Barn Swallows nesting in 13 abandoned post-war bomb shelters, the unexpected presence of foreign juveniles in active nests with nestlings was recorded on eight occasions. In five cases, single birds were noted, and in the other three, two foreign individuals were observed. The average age of the nestlings joined by foreign juveniles was 11.6 days (SE = 1.08, range 8-16), while the average age of the latter birds recorded with the nestlings was 23.2 ± 1.02 days (range 20–25). The mean distance between the hatching and parasitised nests was 0.9 ± 0.11 m (range 0.5–1.2). This unusual behaviour in swallows seems to be deliberate and is aimed at choosing a nest with nestlings in order to obtain extra food from experienced adult birds rather than an error caused by the darkness in the shelter.

**Key words:** Barn Swallow, *Hirundo rustica*, intraspecific brood parasitism, shelters, bunkers

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Many untypical behaviours of the Barn Swallow connected with non-parental nest attendance were described, mainly cases of a brood altruism. Cases of an additional individual or individuals, juveniles or adults which helped a pair in feeding nestlings or, rarely, in nest building were described (Skutch 1935, 1961, Meyers & Waller 1977, Shields 1984, Crook & Shields 1987, Medvin et al. 1987, Lorek 1992a). Non-parental nest attendance can be also connected with intraspecific nest parasitism, where a parasite eggs are laid by neighbouring females (Møller 1987, 1989). Moreover, Zieliński & Bańbura (1995) noted two cases of parasitic behaviour within the species. In particular, they recorded the presence of one and six foreign, non-marked, juvenile birds in two active nests with nestlings. The juveniles were suggested to invade foreign nests in order to be fed by non-related adult birds — nest owners. However, Kuźniak (1967) recorded several cases when juveniles from first clutches stayed for a night in family nests and one case of juvenile in foreign nest with nestlings from second brood.

During a four-year study of the breeding biology and ecology of an untypical population of the Barn Swallow nesting in abandoned post-war bomb shelters, some cases of unexpected presence of juvenile birds in active nests were recorded. This paper presents a descriptive and quantitative report of this unusual post-fledging behaviour of young Barn Swallows and an attempt to explain it in the studied population.

The study was carried out in 2001 to 2004 breeding seasons in an area located in Odra valley near Czerwińsk (W Poland, 52°01′N, 15°26′E), where Barn Swallows nest in 13 post-war shelters built in 1939, being a part of Odra war embankment. There are three types of shelters occupied by swallows: type 1 — one entrance and two rooms, type 2 — two entrances and two

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rooms, type 3 — two entrances and tree rooms. The average area of a shelter is 25.2 $m^2$ (SE = 2.04) and ranges from 18 to 35 $m^2$.

The data were collected during 7930 inspections of 130 nests. Shelters were controlled from the end of April to the end of August. The average number of visits during one breeding season was 15.2 ± 2.59 per each shelter, ranging from 9 to 20. In particular shelters, observations took place in different hours. During visits all nests in individual shelters were checked and in every active nest a number of eggs and later a number and age of nestlings were recorded. All nestlings were marked using aluminium rings.

During the study period, there were from 44 to 55 breeding pairs of the Barn Swallow (on average 50.2 ± 2.32) nesting in inspected shelters. In single shelter from 1 to 9 active nests (on average 4.8 ± 0.84) were found. The mean density of active nests on the total area of shelters was 0.16 ± 0.02 and ranged form 0.03 pair/$m^2$ to 0.40 pair/$m^2$.

During the four-year study, eight cases of presence of foreign juvenile (first-year) birds in active nest with nestlings were noted. The described cases happened only in 2003 (4 times on: 23.06.03, 29.07.03, 29.07.03, 06.08.03) and in 2004 (4 times on: 15.06.04, 15.07.04, 23.08.04. 23.08.04). In 2003 two cases concerned the same nests, namely juveniles from 1st brood from the nest X were found on nestlings from 1st brood in the nest Y, and again, during the second brood, juveniles from the nest X stayed on nestlings in the nest Y. However, in 2004, juveniles from the 1st brood from the nest X were found on nestlings from the 1st brood in the nest Y and again, juveniles from the second brood from the nest X were met on second brood nestlings in the nest Z.

The numbers of juveniles recorded in foreign nests was diverse. In five cases, single birds were noted. In each of the three remaining cases two foreign individuals were observed.

The average age of nestlings joined by foreign juveniles was 11.6 ± 1.08 days (range 8–16, n = 8). The nestling period in the Barn Swallow lasts about 19–21 days (Kuźniak 1967, Cramp 1998, Lorek 1992b, Authors' pers. obs.), which means that they were in the half time of their stay in nests. However, the average age of juveniles recorded on nestlings was 23.2 ± 1.02 (n = 5) and ranged between 20 and 26 days, which means that they have left nests 1–6 earlier. All described cases took place only between 5 and 7.50 pm.

In five cases we managed to catch juveniles that were staying on nestlings and, using rings, to establish from which nests they came from. In each case, birds came from the nest placed in the same room of the shelter. In all visited rooms 41.2% (n = 14) of nest contained nestlings, 17.6% (n = 6) eggs and 42.2% (n = 14) were empty. We did not record a difference in the proportion of various kinds of accessible nest between analysed rooms in individual shelters ($\chi^2$ = 11.1, df = 8, p = 0.20). The mean probability of possible mistaking a foreign nest for their own nest by young birds, estimated per individual room in a shelter, was 0.60 ± 0.08. Moreover, the mean distance between the nest of hatch and the nest where juveniles were noted was 0.9 ± 0.11 m (range 0.5–1.2) and was marginally shorter than the mean distance between the nest of hatch and other accessible nests in the room (1.12 ± 0.04 m; Wilcoxon matched-pairs test, Z = 2.02, p = 0.043).

One of the possible causes of such an unusual swallow behaviour could be a shortage of food, which, in this type of species, is strongly related to weather conditions. Under such circumstances, one of the possibilities to keep a good condition, or even to survive, is to get food brought by adult, experienced individuals. Such a situation probably occurred in the studied population, where cases of untypical behaviour were noted only in seasons 2003–2004, which both were characterized by significantly lower overall breeding output (expressed as a mean number of fledglings per an active nest) than it was recorded in seasons 2001–2002 (Kruskal-Wallis ANOVA, $H_3$ = 16.04, n = 366, p = 0.001; mean values in the following years: 2001 — 3.94 ± 0.19, n = 87; 2002 — 4.04 ± 0.20, n = 74; 2003 — 3.23 ± 0.17, n = 111; 2004 — 3.38 ± 0.18, n = 94). Breeding failure in the Barn Swallow populations caused by bad weather conditions and, thereby, a low access to food, were also recorded by other authors (Nitecki 1964, Kuźniak 1967, Lorek 1992b). Zieliński & Bańbura (1995) recorded similar cases of parasitic behaviour in the Barn Swallow, which also took place during rainy periods and, thereby, poor feeding conditions.

After leaving the nest, juvenile Barn Swallows usually return to its place of birth for several days (Kuźniak 1967, Authors' pers. obs). Therefore, the observed behaviour may be connected with nesting of the studied population in dim shelters with poor visibility. In such conditions young, inexperienced birds may easily make mistakes and sit

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down on foreign nest. The untypical behaviour of juvenile swallows was observed a few days after leaving the nest. Also short distance between the nests (0.5–1.2 m) in the shelters may enlarge the possibility of a mistake. However, an access to all nests in the room where the nest of birth was located was easy, which makes the probability of a mistake high. Nevertheless, in all cases foreign juveniles selected nests with nestlings. Moreover, the mean distance between the nest of hatch and the nest where juveniles were noted only marginally differed from the mean distance between the nests of hatch and remaining accessible nests in the room. Thus, observed behaviour of young swallows seem to be deliberate and aimed at choosing the nest with hungry, around two-weeks-old nestlings, than a mistake caused by the darkness inside the shelter.

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## STRESZCZENIE

**[Wewnątrzgatunkowe pasożytnictwo lęgowe u dymówki gniazdującej w bunkrach]**

W latach 2001–2004 prowadzono badania nad biologią i ekologią nietypowej populacji dymówki gniazdującej w 13 opuszczonych bunkrach w dolinie Odry koło Czerwieńska (woj. lubuskie). Bunkry te charakteryzują się niewielkimi rozmiarami (średnia powierzchnia 25.2 $m^2$), słabą widocznością panującą wewnątrz oraz stałym występowaniem wody w części pomieszczeń. W czasie badań gniazdowało tam od 44 do 55 par jaskółek, z czego w pojedynczym bunkrze stwierdzono od 1 do 9 czynnych jednocześnie gniazd.

W roku 2003 i 2004 odnotowano 8 przypadków (po 4 w roku) przebywania od 1 do 2 juwenilnych, lotnych młodych ptaków na znajdujących się w gniazdach pisklętach w wieku 8–16 dni. W pięciu przypadkach udało się schwytać nietypowo zachowujące się osobniki i dzięki zaobrączkowaniu wszystkich młodych ptaków w badanej populacji ustalić ich wiek (20–26 dni) oraz z jakich gniazd pochodzą. We wszystkich przypadkach ptaki pochodziły z tych samych bunkrów, z sąsiednich gniazd (odległość między miedzy nimi zawierała się między 0.5 a 1.2 m).

Najbardziej prawdopodobną przyczyną przebywania młodych, lotnych jaskółek w gniazdach z niespokrewnionymi pisklętami było zdobywanie pokarmu od dorosłych ptaków karmiących swoje potomstwo. Takie zachowanie najprawdopodobniej ujawniało się w trakcie niekorzystnych warunków pokarmowych, które zmuszały młode, niedoświadczone w zdobywaniu pokarmu ptaki do zachowań pasożytniczych. Potwierdzeniem słabej dostępności pokarmu, jako przyczyny obserwowanego zachowania, może być różnica w produkcji młodych między sezonami, gdy obserwowano przypadki nietypowego zachowywania się ptaków a sezonami, kiedy takowe nie zostały odnotowane.

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