On the breeding behaviour of leucistic birds: case study in the Blackbird (*Turdus merula*)

*K hniezdnemu správaniu leucistov: prípadová štúdia u drozda čierneho (*Turdus merula*)*

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Abstract: *The breeding behaviour of leucistic birds is poorly known. The Blackbird is the species in which leucism occurs most frequently in Europe. In Slovakia, a total of 35 records of leucistic individuals with different range of white coloration have been published in Slovakia, while complete leucists are rare. In the urban environment of Žilina (NW Slovakia), we studied the breeding behaviour and breeding success of a completely leucistic female, which is the first known case of such a female breeding in this species. From April 20, to September 7, 2024, her behaviour, nesting attempts, nesting success and causes of nesting failure were monitored on the university campus of the University of Žilina with a park-like habitat (for a total of 148 hours during 36 days). Observations were made between 5 and 15 hours CET and documented by photo. The individual moved during the research in a polygon of 17 ha (530 × 320 m). Altogether six copulations (4–12 m from the nest) and five nesting attempts were registered (findings of individual nests on 20. 4., 14. 5., 20. 5., 27. 5., 1. 6.), but none of the nesting attempts were successful. The most likely causes of nest failure were nest predators (2), weather (2) and park management (1). Direct predation was observed in one case by a magpie during egg incubation. Individual nests were located 330, 360, 390 and 410 m apart (distances from the first detected nest), on trees and shrubs at a height of 2–3.5 m, at a distance of 4–7 m from the edge of the stand, 2–25 m from the nearest building, 5–15 m from the nearest sidewalk or road.*

Key words: *aberrant coloration, passerines, breeding success, urban ecology*

Introduction

Leucism in birds is a well-known phenomenon and has been found in nearly 70 species in Europe alone (van Grouw 2018, 2021). The most common (37%, N= 4533 individuals) was recorded in the Blackbird (*Turdus merula*) (van Grouw 2018, 2021). The breeding success of leucistic birds is poorly known and it is assumed that pronounced leucists will be less successful than normally pigmented birds due to their striking coloration (Møller et al. 2013, Colombo et al. 2018 for *Turdus rufiventris*, Zitani et al. 2019 for *Turdus migratorius*, and Hernandez et al. 2020 for *Turdus grayi*).

In Slovakia, leucism is also quite common in birds, and in the Blackbird alone, a total of 35 records of leucistic individuals in various categories of the range of white coloration have been published so far, while complete leucists are rare (Jasso 2006, Korňan et al. 2024). Moreover, in previous analyses of leucism in the species *T. merul*a, the males significantly predominated (Clement & Hathway 2000, Chytil 2019, Korňan et al. 2024). From January to July 2024, a completely leucistic female was observed in the urban environment of Žilina (NW Slovakia), which was the first known case of complete female leucism in this species, apart

from the unknown sex ratio in complete leucists of *T. merul*a (Jasso 2006). Therefore, we focused on studying its breeding behaviour in the urban environment, the number of breeding attempts, nest location, and breeding success using regular visits and monitoring.

Methods and material

The studied female (100% white plumage, yellow beak and yellow legs), we classified as a complet leucist and not as a bird with progressive greying, because during common random observations in nature the colour differences in phenotype are not possible to distinguish by eye (van Grouw 2018). The study area was located in the SE part of Žilina (80 thousand inhabitants, Wikipedia 2024), on the university campus of the University of Žilina with a park-like habitat (Fig. 1).The study site (GPS coordinates of the site center 49.2096100N, 18.7554739E, 360 m asl) has an area of about 25 ha and the habitats are represented by the library buildings and the university canteen, lawns, playgrounds, park dispersed trees and on the southern edge a forest (with a predominance of deciduous trees and pine) and an adjacent meadow. The locality was monitored for a total 148 hours during 36 days (the 1st record of this bird was in January 16, 2024, A. Makuka, in litt., the 1st photodocument was made by February 16, 2024 by I. Bartko, birding.sk). The individual moved during the research in a polygon of 17 ha (530 × 320 m), while the location of nests and individual nesting attempts changed during the season (the female flew max. 120 m from the nest during nesting attempts). The individual was monitored from a safe distance so that minimally disturbed its natural behaviour, as well as the behaviour of other individuals of the species or other species and potential predators. Observations were made between 5 and 15 h CET with binoculars and documented by photo and video. Ringing, respectively individual marking of individuals was not performed in order not to disturb the leucistic female or potential partners.

Results and Discussion

From April to June 2024, altogether five nesting attempts were registered (nest building findings on April 20, May 14, May 20, May 27, June 1) and

Fig. 1. Study area in Žilina city and position of five nests at the University campus.
Obr. 1. *Študované územie v Žiline a lokalizácia piatich hniezd v univerzitnom kampuse.*

Fig. 2. Copulation of leucistic Blackbird female April 20, 2024 (photo by J Kočí).
Obr. 2. *Kopulácia leucistickej samice* T. merula*, 20.4.2024 (foto: J. Kočí).*

Fig. 3. Incubating leucistic female *T. merula*, May 27, 2024 (photo by J. Kočí).
Obr. 3. *Inkubujúca leucistická samica* T. merula*, 27.5.2024 (foto: J. Kočí).*

six copulations (April 20, May 9, May 26, June 1, June 8 and 9), apparently related to all five nests. The observed copulations took place 4–12 m from the respective nest, namely: 1) on the roof of an adjacent house (4 m from the nest, Fig. 2), 2) on the ground, on a branch covered with moss (12 m from the nest), 3) on the ground in a nettle thicket (6 m from the nest), 4) on the ground in a grassy stand (3 m from the nest), 5 and 6 copulations) in a pile of branches and leaves (9 m from the nest). Individual nests were located 330, 360, 390 and 410 m apart (distances from the 1st detected nest), on shrubs and trees at a height of 2–3.5 m (Fig. 3), at a distance of 4–7 m from the edge of the stand, 2–25 m from the nearest building, 5–15 m from the nearest sidewalk or road. The nest was built mostly by bulks of grasses and frequently by plastic pieces (Fig. 4a, b).

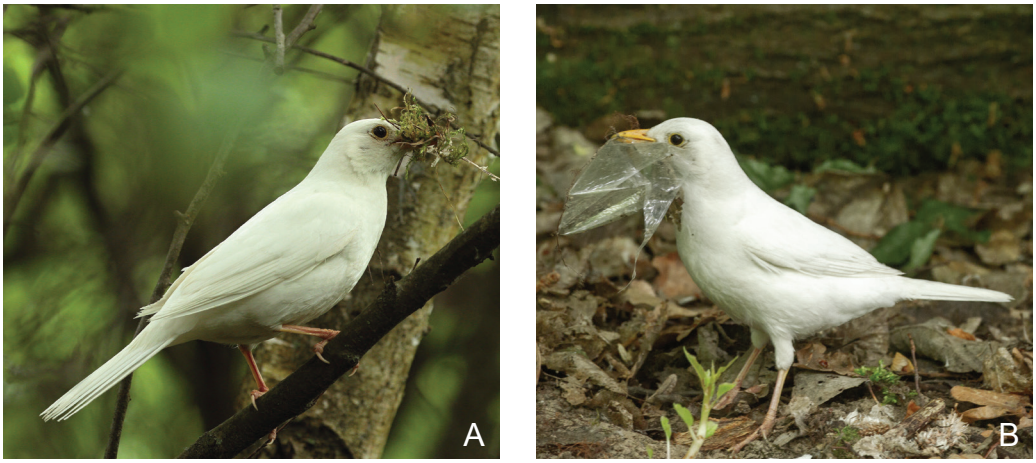

Fig. 4. Leucistic female *T. merula* during collection of nest material (a – with moos and grass, b – with a plastic piece) (photo by J. Kočí).
Obr. 4. *Leucistická samica* T. merula *pri zbere hniezdneho materiálu (a – s machom a trávou, b – s kúskom plastu) (foto: J. Kočí).*

In the vicinity of these nests, only nests of *Curruca curruca* and *Phylloscopus collybita* were found within 30 m of the Blackbird nest. As potential predators, *Pica pica*, *Garrulus glandarius*, *Corvus cornix* and *Accipiter nisus* were found in the Blackbird breeding territory, but the direct predation was observed in one case only by a magpie during egg incubation. The most likely causes of nest failure were therefore nest predators (2), weather (2) and park management (1). Nevertheless, the leucistic female was tolerant of passers-by and the escape distance was extremely short, and photo- and videodocumentation could be made even from a distance of 3–4 m. The escape distance depended on the type of activity (e.g. mechanical mowing, when engine noise caused an escape distance of >10 m or more. The last observation of this fully leucistic female was on July 5, 2024, despite five inspections of the site and the wider area until September 7, 2024.

Complete leucism has been known only rarely in the Blackbird, e.g. only 3 out of 204 individuals (1.5%) in Chytil (2019), 10/52 ind. (19.2%) in Jasso (2006), resp. 1/35 ind. (2.9%) in Korňan et al. (2024). Moreover, the sex ratio of complete leucists is missing in these papers. There are different opinions in the literature on the sex ratio of partial leucistic individuals, in most works males predominate in the results (cf. Izquierdo et al. 2018), but some works state insignificant differences in leucism by sex, at least in other species (Møller and Mousseau 2001), or the differences correlate with the methodology of obtaining data on such individuals (Izquierdo et al. 2018). Successful breeding has been demonstrated in several species of leucistically colored thrushes, e.g. this was the case in the fully leucistic South American thrush species *Turdus rufiventris* (sex unidentified) (Colombo et al. 2018), as well as in the male of the partially leucistic and most common American thrush *Turdus migratorius* (Zittani et al. 2019). However, it is not clear from these works whether and to what extent leucism was inherited in the next generation. The nesting of a fully leucistic female in Žilina described in this study is therefore the first known case of several nesting attempts by such an individual in the Blackbird.

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Súhrn

Hniezdne správanie leucistických jedincov vtákov je málo známe. Druhom, u ktorého sa v Európe najčastejšie vyskytuje leucizmus je drozd čierny. Na Slovensku bolo zatiaľ publikovaných u neho celkom 35 záznamov leucistických jedincov v rôznych kategóriách rozsahu bieleho sfarbenia, pričom úplní leucisti sú vzácni. V urbánnom prostredí Žiliny (SZ Slovensko) sme študovali hniezdne správanie a hniezdnu úspešnosť úplne leucistickej samice, čo je asi prvý prípad hniezdenia takejto samice u tohto druhu. V dňoch 20. 4. – 7. 9. 2024 počas celkove 36 dní a spolu 148 hodín sa sledovalo jej správanie, hniezdne pokusy, hniezdna úspešnosť a príčiny hniezdnej neúspešnosti v univerzitnom kampuse Žilinskej univerzity s parkovým charakterom biotopu. Pozorovania boli robené medzi 5 a 15 h SEČ a fotodokumentované. Jedinec sa pohyboval počas výskumu v polygóne 17 ha (530 × 320 m). Registrovalo sa celkom 6 kopulácii (4 – 12 m od hniezda) a 5 hniezdnych pokusov (nálezy stavby jednotlivých hniezd 20.4., 14.5., 20.5., 27.5., 1.6.), no ani jedno hniezdenie nebolo úspešné. Najpravdepodobnejšie príčiny hniezdneho neúspechu boli hniezdni predátori (2), počasie (2) a parkové úpravy (1). Priama predácia bola pozorovaná v jednom prípade strakou počas inkubácie vajec. Jednotlivé hniezda boli situované od seba 330, 360, 390 a 410 m (vzdialenosti od 1. zisteného hniezda), a to na kroch a stromoch vo výške 2 – 3,5 m, vo vzdialenosti 4 – 7 m od okraja porastu, 2 – 25 m od najbližšej budovy, 5 – 15 m od najbližšieho chodníka, či cestnej komunikácie.

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