

Simultaneous roosting of two Eurasian Nuthatches (*Sitta europaea*) in a nest box

Spoločné nocovanie dvoch brhlíkov lesných (Sitta europaea) v búde

Martin Matejka, Kristína Abrahámovičová & Zlatica Országhová

Department of Zoology, Faculty of Natural Sciences, Comenius University in Bratislava, Ilkovičova 6, SK-842 15 Bratislava, Slovak Republic; c10matejka@gmail.com, kristina.abrahamovicova@fmed.uniba.sk, zlatica.orszaghova@uniba.sk

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During the winter, Eurasian Nuthatches (*Sitta europaea*) roost in tree cavities or nest boxes strictly individually. During the night check of nest boxes conducted on 5 October 2021 in an oak-locust-hornbeam stand in the city of Bratislava (W Slovakia), two individuals of the Eurasian Nuthatch were found roosting together. A female and a male were sleeping in the left and right corners by the back wall of the nest box. On the same night, nest boxes in the neighbourhood (within ca. 150 m) were empty. Birds occupied totally 16% of available nest boxes ($n = 50$). Both individuals were ringed, but none of them was recorded later. In the literature we have found only one report of two Eurasian Nuthatches roosting together. In our case, frequency of simultaneous roosting was 1.1% from all recorded roosting events of Eurasian Nuthatches.

Počas zimy nocujú brhlíky lesné (Sitta europaea) v dutinách stromov či vtáčích búdkach vždy individuálne. Počas nočnej kontroly vtáčích búdok dňa 5. októbra 2021 v dubovo-agátovo-hrabovom lese v meste Bratislava (Z Slovensko) nocovali dva jedince brhlíka lesného v búde spolu. Samec a samica spali v pravom a ľavom zadnom rohu búdky. Okolité búdky boli prázdne, pričom v tú noc obsadili vtáky 16 % dostupných búdok ($n = 50$). Obidva jedince boli okružkované, avšak žiadny z nich nebol zaznamenaný aj neskôr. V literatúre sme našli len jeden prípad, kedy dva brhlíky lesné nocovali v búde spoločne. Frekvencia spoločného nocovania tvorila v našom prípade 1,1 % zo všetkých zaznamenaných nocovaní brhlíkov.

Key words: Eurasian Nuthatch, night checks, Slovakia

Resident species of hole-nesting birds in the temperate or boreal zone use the cavities as roosting sites during the winter. Some species, such as the Great Tit (*Parus major*) or Blue Tit (*Cyanistes caeruleus*), spend winter nights in cavities strictly individually. In other species, such as the European Wren (*Troglodytes troglodytes*; Stiefel 1976), Pygmy Nuthatch (*Sitta pygmaea*; Sydeman & Güntert

1983), Treecreepers (*Certhia brachydactyla*, *C. familiaris*; Löhrl 1955) or Tree Sparrow (*Passer montanus*; Ilenko & Zagorodnjaja 1961, Busse & Olech 1968, Blaschke 1969, Juškaitis 1986, Winkel & Hudde 1988), communal roosting is typical. For example, up to 167 individuals of the Pygmy Nuthatch were found roosting together in a large tree cavity in Arizona (Sydeman & Güntert 1983).

The Eurasian Nuthatch (*Sitta europaea*) belongs to common bird species that use nest boxes or various tree cavities for wintertime roosting (Stiefel 1973, Cramp et al. 1993). Most of the studies on roosting of the Eurasian Nuthatch during the nonbreeding season from different parts of Europe report that the birds roost individually (Creutz 1960, Czarnecki 1960, Busse & Olech 1968, Blaschke 1969, Juškaitis 1986, Winkel & Hudde 1988, Krištín et al. 2001, Adamík 2008, Zang & Kunze 2009). Simultaneous roosting with another individual is very rare. A case when two individuals of the European Nuthatch roosted together in the same nest box is captured in the photograph in the work by Stiefel (1973). Another rare case was recorded in November 2007 in a floodplain forest near Olomouc (Czech Republic), where a female Great Tit and a male European Nuthatch roosted together in one nest box (Tyller 2009).

In this paper we report a case of simultaneous roosting of two individuals of the Eurasian Nuthatch. As this observation comes from the regular night checks of nest boxes, we estimate the frequency of this phenomenon.

Our research of bird roosting in nest boxes was conducted in the 50-year-old broad-leaved forest stand dominated by Oaks (*Quercus robur* and *Q. petraea*), Black Locust (*Robinia pseudoacacia*) and Hornbeam (*Carpinus betulus*) in the Bratislava ZOO (W Slovakia; 48° 10'N; 17° 3.85' E; 260 m a. s. l.), in an 11 ha area inaccessible to the public. In total, 50 wooden nest boxes of three size categories (Lambrechts et al. 2010) were situated on the tree trunks from 1.5 to 2.1 m above ground (mean height = 1.9 m) – 29 nest boxes were with entrance diameter from 32 to 38 mm and internal dimensions 12 × 12 × 22.5 cm, 18 with entrance diameter from 46 to 50 mm and internal

dimensions 15 × 15 × 37.5 cm, and three with entrance diameter 28 mm and internal dimensions 12 × 12 × 22.5 cm. Distances between the nest boxes were not uniform, the shortest distance was 2 m, the longest distance was 200 m, but mostly they were from 15 to 30 m apart. Nest box entrances mostly faced SW and SE.

The study was conducted during five consecutive winters since 2017/2018. Nest boxes were checked from the beginning of November in the winter 2017/2018 and from the beginning of October during the remaining years. Except the winter 2020/2021 when the season was interrupted in December due to COVID-19 restrictions (ZOO was closed), checks lasted until the end of February. In total, we performed 86 night checks, 17 in 2017/2018, 22 in 2018/2019, 20 in 2019/2020 and 2021/2022 and only seven visits in 2020/2021. Checks started 15 min after sunset. Roosting birds were taken out from the nest box, sexed, aged (if possible), ringed and then returned into the nest box. Our research was primarily focused on roosting site fidelity of the Great Tit, which was the most common roosting species at this site (data not presented here). That was the reason of the frequent checks and handling of the birds in the nest boxes. Except the dominant Great Tit and Eurasian Nuthatch, only once we found a roosting Blue Tit, while in another case a dead Blue Tit was found in the nest box.

On 5 October 2021, we found a male and a female of the Eurasian Nuthatch roosting together in one nest box. The birds were positioned by the back wall of the nest box in the opposite corners. Both individuals were ringed and then returned into the nest box, but none of them was re-trapped at the same locality in the winter 2021/2022 or later. In the

following week we did not find any dead birds in the same nest box, so we assume that both birds survived and left the nest box. The surrounding four nest boxes within 150 m were empty and the closest occupied nest box (by the Great Tit) was 495 m away. Total nest box occupancy on the same night was 16%. The weather was mild on that night; at the beginning of the check (15 min after the sunset), the cloud coverage reached 40% and there was a light wind. The temperature in the study area was +18°C. In the winter 2021/2022 we found roosting birds (Eurasian Nuthatch and Great Tit) in the particular nest box during six (of 20) checks.

As the present observation comes from the regular night checks of nest boxes, we tried to estimate the possible frequency of the cases of simultaneous roosting. In all seasons pooled, we performed 4 403 nest box checks. During them we found (alive) roosting birds 626 times (14.2%), while the Eurasian Nuthatch was found 94 times (2.1% from all nest box checks). Estimated frequency of simultaneous roosting was 1.1% from all records of the Eurasian Nuthatch, and 0.2% from all recorded roosting events regardless the species.

Simultaneous roosting of two individuals of the Eurasian Nuthatch is a rare phenomenon, and in the literature, we have found only one report of such an event (Stiefel 1973). The same applies for other individually roosting species, the Great Tit (Zonov 2017) or the Blue Tit (Stiefel 1976). Estimated frequency of simultaneous roosting is 1.1% from all records of the Eurasian Nuthatch, and 0.2% from all recorded roosting events (the present study). For comparison, the case of simultaneous roosting of the Great Tit and Eurasian Nuthatch in a nest box in a floodplain forest in the Czech Republic

made up 0.05% from all nest box checks (Tyller 2009).

There are several possible explanations why birds decide to roost together (Busse & Olech 1968, Löhrl 1988, Tyller 2009). It seems that our data are not in agreement with the hypothesis of communal roosting due to high nest box occupancy in the vicinity, as assumed by Löhrl (1988), because the neighbouring nest boxes were empty and the overall occupancy during the check reached only 16%. Similarly, the climatic effects seem unlikely as the weather during the check was quite favourable. However, in other species and in cold weather situations, the energy savings through communal roosting may be relevant (Busse & Olech 1968, Sydeman & Güntert 1983). On the contrary, coincidence or preference for the specific nest box, as assumed by Tyller (2009), seems to be likely in this case. The nest box where the two Nuthatches roosted together in the present study was one of the more frequently occupied nest boxes in the winter 2021/2022. Moreover, the birds could have been members of a pair that defended the winter territory together (Löhrl 1988) and they might have shared the nest box for this reason. Such “couple roosting” was recorded in the Eurasian Rock Nuthatch (*Sitta neumayer*), where the members of one pair spend the winter nights together in a nest situated in the slight concavity in the rock wall (Cramp et al. 1993).

Another potential explanation may be the disturbance by previous night checks. As found by Tyller et al. (2012), the re-use rate of the individual nest boxes was lower when the invasive method of night checks of the nest boxes (capturing the sleeping birds) was applied than in the non-invasive methods of night nest box inspection. Birds avoided nest boxes in which they were disturbed and so

they switched among nest boxes more than those in which they were not disturbed. This may increase the chance of entering the nest box already occupied by another individual. However, disturbance during the previous check surely did not play a role in the present case, because the check in which the two Nuthatches were found in one nest box was the first one carried out during that winter. During the breeding season, no night check was conducted. However, the disturbance in our study plot may have caused the linear intra-seasonal decrease of the Eurasian Nuthatch numbers recorded in all of the winters (Matejka et al. 2022). The same pattern was found by Tyller et al. (2012).

Many factors affect bird roosting behaviour and their decisions how and where to roost. Our finding of the simultaneous roosting of two Eurasian Nuthatches, a species with quite well-known roosting behaviour, in one nest box during the nonbreeding period brings not only the report of this rare behaviour, but thanks to data available from several winters we are able to estimate the frequency of this phenomenon.

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REFERENCES

- Adamík P. 2008: Zimní nocování sýkory koňadry (*Parus major*) a brhlíka lesního (*Sitta europaea*) v hnízdních budkách na Sovinecku, Nízký Jeseník. *Zprávy Vlastivědného muzea v Olomouci* 58: 81–84.
- Blaschke W. 1969: Schlafgewohnheiten der Vögel in Nistkästen. *Der Falke* 16: 64–66.
- Busse P. & Olech P. 1968: Niektóre problemy związane z nocowaniem ptaków w skrzynkach lęgowych. *Acta Ornithologica* 11: 1–26.
- Creutz G. 1960: Die Nüchtingungsweise von Höhlenbrütern in künstlichen Nistgeräten. *Der Falke* 7: 121–125.
- Cramp S., Perrins C. M., Brooks D. J., Dunn E., Gllmor R., Hall-Craggs J., Hillcoat B., Hollom P. A. D., Nicholson E. M., Roselaar C. S., Seale W. T. C., Sellar P. J., Simmons K. E. L., Snow D. W., Vincent D., Voous K. H., Wallace D. I. M. & Wilson M. G. 1993: *Handbook of the Birds of Europe the Middle East and North Africa, The Birds of the Western Palearctic vol. 7*. Oxford university press, Oxford.
- Czarnecki Z. 1960: Obserwacje nad nocowaniem sikor bogatek (*Parus major* L.) w zimie. *Ekologia Polska B* 6: 191–197.
- Ilenko A. I. & Zagorodnjaja G. J. 1961: Značeniej iskusstvennyh gnezdovij dlja nočevok nekotorych ptic-duplognezdnikov zimoj. *Zoologičeskij žurnal* 11: 1736–1738.
- Juškaitis R. 1986: Nočevka ptic v isskustvennyh gnezdovjach v poslegnezdnoj period. In: *Ekologia ptic, Litovskoj SSR, 3*. Antropogennoje vozdejsťvije na ornitofaunu i jeje ochrana: 150–159.
- Krištín A., Mihál I. & Urban P. 2001: Roosting of the Great Tit, *Parus major* and the Nuthatch *Sitta europaea* in nest boxes in an oak-hornbeam forest. *Folia Zoologica* 50: 43–53.
- Lambrechts M. M., Adriaensen F., Ardia D. R., Artemyev A. V., Atiénzar F., Bañbura J., Barba E., Bouvier J.-C., Camprodon J., Cooper C. B., Dawson R. D., Eens M., Eeva T., Faivre B., Garamszegi L. Z., Goodenough A. E., Gosler A. G., Grégoire A., Griffith S. C., Gustafsson L., Johnson L. S., Kania W., Keišs O., Llambias P. E., Mainwaring M. C., Mänd R., Massa B., Mazgajski T. D., Møller A. P., Moreno J., Naef-Daenzer B., Nilsson J.-Å., Norte A. C., Orell M., Otter K. A., Park Ch. R., Perrins Ch. M., Pinowski J., Porkert J., Potti J., Remeš V., Richner H., Rytkönen S., Shiao M.-T., Silverin B., Slagsvold T., Smith H. G., Sorace A., Stenning M. J., Stewart I., Thompson Ch. F., Török J., Tryjanowski P., van Noordwijk A. J., Winkler D. W. & Ziane N. 2010: The design of artificial nestboxes for the study of secondary hole-nesting birds: a review

- of methodological inconsistencies and potential biases. *Acta Ornithologica* 45: 1–26.
- Löhrl H. 1955: Schlafgewohnheiten der Baumläufer und anderer Kleinvögel in kalten Winternächten. *Die Vogelwarte* 18: 71–77.
- Löhrl H. 1988: *Etho-Ökologische Untersuchungen an verschiedenen Klieberarten (Sittidae)*. Zoologisches Forschungsinstitut und Museum Alexander Koenig Bonn, Bonn.
- Matejka M., Abrahámovičová K., Šnegoňová K., Demková D., Gátová J. & Országhová Z. 2022: Nocovanie brhlíka lesného (*Sitta europaea*, Linnaeus, 1758) v ZOO Bratislava počas zimy. In: Klvaňová A. (ed.): *Ptáci a svět v pohybu*. Sborník abstraktů Ornitologické konference, 23.–25. září 2022, Mikulov: 95.
- Stiefel A. 1973: *Ruhe und Schlaf bei Vögeln*. A. Ziemsen Verlag, Wittenberg-Lutherstadt.
- Sydeman W. J. & Güntert M. 1983: Winter communal roosting in the Pygmy Nuthatch. In: Davis J. W., Goodwin G. A. & Ockenfels R. A. (eds): *Snag habitat management: Proceedings of the symposium, June 7 – 9 1983, Flagstaff, Arizona*. Rocky Mountain Forest and range experimental station, Fort Collins (Colorado): 121–124.
- Tyller Z. 2009: Společné nocování sýkorky koňadry (*Parus major*) a brhlíka lesního (*Sitta europaea*). *Sylvia* 45: 238–241.
- Tyller Z., Paclík M. & Remeš V. 2012: Winter night inspections of nest boxes affect their occupancy and reuse for roosting by cavity nesting birds. *Acta Ornithologica* 47: 79–85.
- Winkel W. & Hudde H. 1988: Über das Nächtigen von Vögeln in künstlichen Nisthöhlen während des Winters. *Die Vogelwarte* 34: 174–188.
- Zang H. & Kunze P. 2009: Zum Nächtigen von Kohlmeise *Parus major*, Blaumeise *P. caeruleus* und Kleiber *Sitta europaea* in den Wintern 1982/38 bis 2006/07 in Nistkasten-untersuchungsflächen im Harz. *Ornithologische Jahresberichte des Museum Heineanum* 27: 43–60.
- Zonov G. B. 2017: O zimnich nočevkach sinic v Predbajkale. *Ruskij Ornitologičeskij Žurnal* 26: 2748–2753.

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