

Wintering of the Wallcreeper (*Tichodroma muraria*) in the Devínska Kobyla hills (SW Slovakia), 2012–2016

*Zimovanie murárika červenokrídleho (Tichodroma muraria)
na Devínskej Kobyle (JZ Slovensko) v rokoch 2012 – 2016*

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Abstract. The wallcreeper (*Tichodroma muraria*) is a rare breeder, but also a less explored wintering bird for Slovakia, particularly for winter quarters located further from its breeding grounds. Here I report on the wintering Wallcreeper survey for a lowland site, an abandoned quarry, in the Devínska Kobyla hills (SW Slovakia) during five non-breeding seasons (2011/2012–2015/2016). Wallcreeper was detected at the site each year, though in one season (2014/2015) only during early October. Data on Wallcreeper presence suggests that the species generally winters at the site from late October until early April. Single individuals occupied the quarry over the winter season, but a simultaneous presence of two Wallcreepers was occasionally observed. Of six Wallcreepers detected at the site, five were adult males and one was adult female. Analysis of the photographic material suggests that one of the males wintered at the site during three consecutive years.

Key words: Wallcreeper, winter ecology, sex, age, photographic analysis

The Wallcreeper *Tichodroma muraria* is a rare breeder for Slovakia and the Western Carpathians, which represent the northern limit of the species' breeding distribution (Löhrl & Wilson 2016). In Slovakia, the species breeds in the Tatras, the Fatra Mts., the Chočské vrchy Mts., the Pieniny Mts. and, more rarely, in the Strážovské vrchy Mts. and the Muránska planina Mts. (Saniga 2002). In comparison to its breeding distribution, the species is more widely dispersed across its range during the winter period when it may move several hundred km in all directions from the breeding area (Löhrl & Wilson 2016). During the winter season, the Wallcreeper is regularly recorded in the lower parts of canyons and valleys and in lowland habitats near its breeding grounds, but its winter distribution is affected by actual weather conditions (Saniga 2009; Löhrl & Wilson 2016). The

rocky surface of cliffs, quarries and buildings (castles, cathedrals, churches, factories) represents the substrate where the species is most frequently encountered during the non-breeding season (Harrap & Quinn 1996; Löhrl & Wilson 2016; for Slovakia see Ferienc 1979, Saniga 2002, 2009). While some individuals regularly conduct long-distance movements outside the breeding period, often to the same site (see Cramp & Perrins 1993), juvenile Wallcreepers are thought to be more sedentary and remain at higher altitudes in winter (Löhrl 1976, Harrap & Quinn 1996). Due to irregular winter distribution, winter ecology of the Wallcreeper, especially in low altitude areas further from breeding areas, is relatively less explored.

Here I report on the winter ecology of the Wallcreeper for a lowland site, an abandoned limestone quarry, in the southern slope of



Fig. 1. A view on the Alps from the study site in the Devínska Kobyla hills (SW Slovakia), March 2013.

Obr. 1. Pohľad na Alpy zo sledovanej lokality na Devínskej Kobyle (JZ Slovensko), marec 2013.

the Devínska Kobyla hills (Bratislava, SW Slovakia, 48°11'N 16°59'E, altitude ca. 200 m a.s.l.). The quarry, located within the Devínska Kobyla National Nature Reserve, is one of the traditional Wallcreeper wintering sites known for the Bratislava region (Ferianc 1979, Saniga 2002). The study site is located in the vicinity (ca. 400 m) of the Morava River, approximately 2 km from its confluence with the Danube River. The Devínska Kobyla hills, part of the Lower Carpathians Mountain Range, have a warm temperate climate and provide a suitable environment for a diverse xerothermic fauna and flora. This area comprises extensive parts of exposed soil surfaces, including sandstone and limestone cliffs, and numerous rocky structures, such as quarries, caves, or the ruins of Devín Castle. The nearest known Wallcreeper breeding areas are located ca. 90 km (the Hohe Wand–Rax–Schneeberg area, the Northern Limestone Alps, Austria; Fig. 1) and 130 km (the Strážovské vrchy Mts., Slovakia) from the study site. Wallcreepers wintering in a region along the borders of Austria, Hungary, and the former Czechoslovakia are thought to breed in the Alps (Hauri 1970).

The site (ca. 4 ha) was systematically visited for the wintering Wallcreeper survey between October and April from February 2012 until April 2016. Thus, the survey covers five consecutive winter seasons. I visited the study site during 3, 9, 11, 9, and 11 different days over the

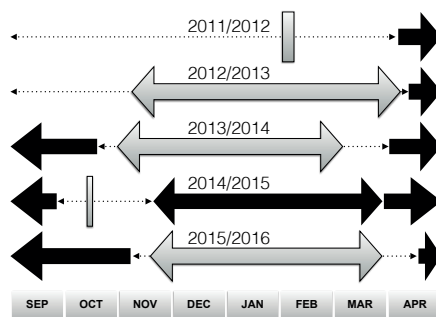


Fig. 2. The period of Wallcreeper *Tichodroma muraria* presence at the study site in the Devínska Kobyla hills (SW Slovakia) between September and April during five non-breeding seasons. Grey arrowed rectangles indicate periods when Wallcreeper was observed at the site; grey rectangles without arrows mean that Wallcreeper presence was observed (2011/2012) or detected (2014/2015) only for a short period. Black arrowed rectangles indicate periods when Wallcreeper was not detected at the site. Dotted lines with arrows refer to periods when the site was not visited.

Obr. 2. Diagram znázorňujúci výskyt murárika červenokrídeľého (*Tichodroma muraria*) na študovanej lokalite na Devínskej Kobyle (JZ Slovensko) v období od septembra do apríla počas piatich mimohniezdných sezón. Šedé obdĺžniky so šípkami znázorňujú obdobie počas ktorého bol murárik pozorovaný na lokalite; šedé obdĺžniky bez šípek znamenajú, že murárik bol pozorovaný alebo zaregistrovaný iba počas krátkeho obdobia (sezóny 2011/2012 a 2014/2015). Čierne obdĺžniky so šípkami znázorňujú obdobie počas ktorého nebol murárik pozorovaný na lokalite. Prerušované čiary so šípkami vyznačujú obdobie, kedy lokalita nebola navštívená.

2011/2012, 2012/2013, 2013/2014, 2014/2015, and 2015/2016 winter seasons, respectively. The site was most frequently visited during October and November (total number of visits during September, October, November, December, January, February, March, and April: 2, 8, 8, 5, 3, 6, 6, and 5 days). At least one Wallcreeper was recorded during 51% (22/43) of visits. I spent at the site at least three hours during each visit. Hence, Wallcreeper absence means that no bird was detected at the quarry within three hours after arrival.

At least one Wallcreeper was observed at the study site during each of five non-breeding seasons. The survey suggests that Wallcreepers usually arrive at the site during late October/early November and leave during late March/early April (Fig. 2). An exception was observed in the non-breeding season 2014/2015 when one Wallcreeper was observed in early October (October 11, 2014). The latter season also



Fig. 3. ▲► Photographs of six Wallcreepers *Tichodroma muraria* detected at the study site in the Devínska Kobyla hills (SW Slovakia), 2012–2016. The photographs show traits that were used for individual identification of Wallcreeper for a given winter season and for the determination of Wallcreeper sex and age. Photographs show Male-1 (A) from 2011/2012, Male-2 (B) and Male-3 (C) from 2012/2013, Male-4 (D) from 2013/2014, Female-1 (E) from 2014/2015, and Male-5 (F) from 2015/2016. These Wallcreeper codes correspond with those from Table 2. Dates of photographs are as follows: A1, A2 – February 5, 2012; B1 – November 11, 2012, B2, B3 – April 7, 2013; C1, C2 – November 25, 2012; D1 – October 28, 2013, D2 – January 6, 2014, D3 – March 8, 2014; E1, E2 – October 11, 2014; F1 – November 16, 2015, F2 – February 26, 2016, F3 – March 27, 2016. Foto: autor.

Obr. 3. ▲► Fotografie šiestich murárikov červenokrídlych (*Tichodroma muraria*), zaregistrovaných na sledovanej lokalite na Devínskej Kobyle (JZ Slovensko) v rokoch 2012–2016. Fotografie znázorňujú znaky, ktoré boli použité na individuálnu identifikáciu murárikov ako aj na určenie ich pohlavia a veku. Známené je Samec-1 (A) zo sezóny 2011/2012, Samec-2 (B) a Samec-3 (C) zo sezóny 2012/2013, Samec-4 (D) zo sezóny 2013/2014, Samica-1 (E) zo sezóny 2014/2015, a Samec-5 (F) zo sezóny 2015/2016. Uvedené kódy korešpondujú s kódmi uvedenými v tab. 2. Dátumy pre tieto fotografie sú nasledovné: A1, A2 – 5. 2. 2012; B1 – 11. 11. 2012, B2, B3 – 7. 4. 2013; C1, C2 – 25. 11. 2012; D1 – 28. 10. 2013, D2 – 6. 1. 2014, D3 – 8. 3. 2014; E1, E2 – 11. 10. 2014; F1 – 16. 11. 2015, F2 – 26. 2. 2016, F3 – 27. 3. 2016. Photo by the author.

was exceptional in that the Wallcreeper was observed only during a single day, after which the site remained un-occupied by the species (Fig. 2). Average temperature for the period of October to March was above the long-term average for the region (Bratislava-Airport) for all five non-breeding seasons (range: 0.28–2.9 °C above the long-term average). The earliest (October 11, 2014) and latest (April 7, 2013) observations of the species correspond with the years of warmest (2.2 °C above the long-term average) and coldest (–2 °C below the long-term average) temperatures detected in October and March, respectively.

Wallcreeper identity was determined based on variation in the natural wing-spot pattern, namely, the number, size, colour and distribution of pale spots on the primaries and secondaries (see Fig. 3). By means of digital photography analysis, I was able to unambiguously determine the Wallcreeper identity of all birds within the seasons. Consequently, the analysis of photographic documentation revealed that single birds occupied (resided in) the quarry during four of five winter seasons. During one of the non-breeding seasons (2012/2013), two different Wallcreepers were observed singly at the quarry. Specifically, one bird was observed at the quarry November 4 and 25, whereas the



Fig. 3. Continued.
Obr. 3. Pokračovanie.

other bird was observed at the quarry November 10 and from February 2 until April 7. I did not detect a simultaneous occupancy of the quarry by these or other Wallcreepers in any of the winter seasons. Yet, I detected a short simultaneous presence of two Wallcreepers at the site during two seasons (2011/2013: March 2, 2013; 2015/2016: December 29, 2015, January 30, 2016, and February 26, 2016). In all these cases, an unidentified Wallcreeper was chased away by the resident bird immediately after appearing at the quarry. Thus, multiple Wallcreepers appear to reside in the Devínska

Kobyly hills during winter seasons. In fact, during the winter season 2011/2012 (February 2, 2012) and 2012/2013 (March 16, 2013), I detected distinct Wallcreepers in the ruins of Devín Castle. Moreover, even the birds residing in the study site did not spend the whole time at the quarry; in many instances I waited up to 2–3 hours until the resident bird arrived at the quarry from the outside. It is likely that Wallcreepers in the Devínska Kobyly hills regularly prospect neighbouring sites for food, conspecifics, or both over the winter season.

Table 1. Diagnostic traits for sex and age discrimination in Wallcreeper *Tichodroma muraria*. Traits in grey boxes are suggested as suitable for sex and age discrimination during the non-breeding season.

Tab. 1. Diagnostické znaky na určovanie pohlavia a veku murárika červenokrídleho (*Tichodroma muraria*). Znaky v šedých poliach sú navrhované ako vhodné na určovanie pohlavia a veku murárika v mimohniezdnom období.

Diagnostic trait / <i>Diagnostický znak</i>	Sex / <i>Pohlavie</i>	Age / <i>Vek</i>	References / <i>Literatúra</i>
1. Throat patch (summer/ end of winter)	Male: larger and darker black patch spans across breast, throat, chin and face Female: smaller and lighter black throat patch surrounded by whitish margin – dark patch does not reach the bill	Juvenile: throat of similar colour to underparts First adult female: dark throat patch may be absent in 2nd calendar year	Löhrl (1967a), Cramp & Perrins (1993), Saniga (1995, 2000)
2. Wing and tail pale spots		Adult: white spots on outer primaries and outer tail feathers larger	Harrap & Quinn (1996), Hayman & Hume (2007), but see Löhrl (1976)
3. Wing pale spots	Female: pale spots present on inner primaries (p1 to p4) Male / older female: pale spots absent on inner primaries	Adult: number of primaries and secondaries with pale spots may decrease with age	Löhrl (1967b), de Gabriel et al. (2012)
4. Wing and tail dark colouration	Male: darker black Female: brown-black		Cramp & Perrins (1993), Saniga (1995, 2000)
5. Body colouration	Male: underparts and upperparts darker grey Female: underparts and upperparts paler grey		
6. Wing red colouration (winter)	Male: remiges and coverts carmine; red patch to remiges and wing coverts larger Female: remiges and coverts orange-carmine; red patch to remiges and wing coverts smaller	Juvenile: red patch to (unmoulted) primary coverts smaller	Saniga (1995, 2000)
7. Wing red colouration (summer)	Same as above for #6	Juvenile: red patch to primary, median, and lesser coverts smaller	Saniga (1995, 2000)
8. Tips to primaries (summer)		Juvenile: pale tips to primaries Adult: worn tips to primaries before post-breeding moult	Saniga (1995), Harrap & Quinn (1996)
9. Tips to primaries (winter)		Juvenile: pale tips to primaries worn faster Adult: pale tips to primaries worn slower	Cramp & Perrins (1993)
10. Bill	Male (adult): bill thicker Female (adult): bill thinner	Juvenile: bill shorter and straighter	Cramp & Perrins (1993), Hayman & Hume (2007), Löhrl & Wilson (2016)

Based on breast colouration (following Löhrl 1967a, Saniga 1995, see Table 1), I was able to unambiguously determine the sex for four Wallcreepers occurring at the site during the time of active prenuptial moult (Table 2, Fig. 3A, B, D, and F). As of February, these birds started to develop distinct black throat and breast colouration and were determined as males. This determination was corroborated by the presence of a deeper red (carmine) colouration on the upper-wing and a contrasting colouration of the wing (Löhrl 1967b, Saniga 1995). Two Wallcreepers were observed at the site only at the onset of the winter season (November 2012, October 2014). While the contrasting dark wing and a carmine colouration

of the bird from 2012 suggests male (Fig. 3C), the paler wing and a red-orange colouration on the upper-wing of the bird from 2014 indicates female (Fig. 3E). The female sex of the latter bird also is supported by the presence of a pale spot on p4 (Fig. 3E), a feature not occurring in males, at least those of adult age (de Gabriel et al. 2012).

Following the post-juvenile moult, immatures highly resemble adults in non-breeding plumage during the winter season (Cramp & Perrins 1993). Yet, apart from less contrasting wings and a slightly paler red colouration (Saniga 1995), immature birds also show a distinctly smaller white tips on the outermost tail feathers (Harrap & Quinn 1996, Hayman

Table 2. The wing-spot pattern for six Wallcreepers *Tichodroma muraria* detected at the study site in the Devínska Kobyla hills (SW Slovakia), 2012–2016. The identity of flight feathers (remiges) refers to the primary (p) and secondary (s) numbers. Primaries were numbered descendantly (i.e. from inside towards the wing tip) and secondaries ascendantly. The presence of a pale spot on the feather is indicated by value 1, asterisk indicates that the spot was faintly pale. Two rows for each bird were used to indicate the part of the respective feather – upper and lower rows indicate distal and proximal parts of the feather, respectively. **Tab. 2.** Vzorec bledých škvŕn na letkách šiestich murárikov červenokrídlych (*Tichodroma muraria*), zaregistrovaných na sledovanej lokalite na Devínskej Kobyle (JZ Slovensko) v rokoch 2012–2016 (male = samec, female = samica). Identita ručných pier (remiges) je označená číslom primárnych (p) a sekundárnych (s) pier. Primárne ručné perá sú číslované zostupne (t.j. zvnútra krídla k jeho špičke) a sekundárne perá vzostupne. Prítomnosť bledej škvŕny na pere je indikované číslom 1. Ak bola škvŕna menej jasná, takéto škvŕny sú označené hviezdíčkou. Pre každé pero a jedinca v danom roku sa uvádzajú dva riadky na odlišenie časti pera – horné riadky indikujú distálnu časť pera a dolné riadky proximálnu časť.

Season / Sezóna Bird / Vták	The identity of flight feathers / Identita ručných pier														
	p10	p9	p8	p7	p6	p5	p4	p3	s1	s2	s3	s4	s5		
2011/2012		1	1	1	1	1*									
Male-1		1	1	1	1	1*			1	1	1	1	1		
2012/2013		1	1	1	1										
Male-2		1	1	1	1*				1*	1*	1*	1*			
2012/2013		1	1	1	1										
Male-3		1	1	1	1	1			1	1	1	1	1		
2013/2014		1	1	1	1										
Male-4		1	1	1	1*										
2014/2015		1	1	1	1										
Female-1		1	1	1	1	1	1*		1	1	1	1	1		
2015/2016		1	1	1	1	1*									
Male-5		1	1	1	1	1			1	1	1	1	1		

& Hume 2007, c.f. de Gabriel et al. 2012, see Table 1). Also, work by de Gabriel et al. (2012) suggests that the number of pale wing spots in the inner flight feathers decreases with age (c.f. Löhrl 1976). Such fine details are difficult to distinguish in the field but can be discerned by means of photography. None of the birds photographed at the study site displayed traits typical for immatures (birds in their 1st winter) and, therefore, all the birds were determined as adult Wallcreepers (see Fig. 3).

Intriguingly, the examination of photographic documentation from different seasons brings about speculation about the identity of resident Wallcreepers observed at the site during the first three winter seasons (2011/2012–2013/2014). Namely, the wing-mark pattern and the gradual loss of the pale spots on the secondaries (Fig. 3A, B, and D) suggest that the same male Wallcreeper occupied the quarry during the three consecutive seasons. Further work is needed to verify whether the size and number of pale spots on the flight and tail feathers varies with age and sex in Wallcreeper.

Finally, my observations on the behaviour of Wallcreeper corroborate findings reported exhaustively in previous works (Cramp & Perrins 1993, Saniga 1999). With respect to the inter-specific interactions, the encounter rate

with birds of prey, mainly with Sparrowhawk *Accipiter nisus* was highest during the peak raptor migration period (October–November). Interestingly, Wallcreeper did not take cover following aerial attacks, but instead continued flying while rapidly manoeuvring to avoid repeated attacks (c.f. Hauri 1970, Löhrl 1970). In contrast, Wallcreeper ceased moving and leaned against the rock under the presence of non-attacking birds such as Raven *Corvus corax*. Wallcreeper did not seem to alter its activity towards tourists frequenting the site for recreation, but retreated to a quieter part of the quarry once people remained near the cliff wall for prolonged periods (e.g. picnics around the campfire). During the last winter season, when the frequency and length of visits by bird photographers increased at the site, the resident bird was gradually becoming more timid and agitated during feeding bouts.

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Súhrn

Murárik červenokrídly (*Tichodroma muraria*) je vzácny hniezdíč a významný zimujúci druh našej krajiny. Jeho rozšírenie a ekológia počas zimného obdobia sú najmä pre lokality vzdialenejšie od tradičných hniezdných území relatívne málo známe. V tomto príspevku opisujem zimovanie murárika na lokalite Devínskej Kobyly (JZ Slovensko) v období rokov 2012 – 2016. Druh bol na lokalite registrovaný každú sezónu. Aj keď bola na lokalite počas niekoľkých dní zaregistrovaná krátka prítomnosť dvoch jedincov, na lokalite vždy zimoval iba jeden jedinec. Pozorovania naznačujú, že druh na lokalite zvyčajne zimuje od konca októbra do začiatku apríla. Zo šiestich murárikov zaregistrovaných na lokalite bolo päť samcov a jedna samica, pričom vo všetkých prípadoch išlo o dospelých jedincov. Vzorec bledých škvŕn na letkách a dynamika redukcie veľkosti škvŕn na vnútorných letkách (sekundárne perá) naznačuje, že počas troch sezón (2012 – 2014) zimoval na lokalite rovnaký jedinec. V okolí skúmanej lokality zimovalo počas daného obdobia viacero jedincov, pričom okrem svojej centrálnej lokality sa pravdepodobne bežne pohybovali aj po širšom okolí. Aj keď náhodná turistická aktivita nemala očividný vplyv na dennú aktivitu murárika, cielená a dlhotrvajúca ľudská aktivita (napr. fotografovanie) mala tendenciu skracovať dĺžku fázy kŕmenia murárika medzi jednotlivými preletmi.

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