

## Short Communication

# Is the European stonechat (*Saxicola rubicola*) a fully resident species in Italy? Observations on its phenology along the altitudinal gradient in central Italy

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**Abstract** - Here, I present the results of detailed field observations on two distinct populations of European stonechat *Saxicola rubicola* in central Italy, which challenge the view that stonechats are entirely resident in Italy. My findings exclude weather-induced altitudinal movements and strongly suggest that a portion of the Italian stonechat population exhibits obligate full or partial migration, even if wintering within Italy's borders. In central Italy, the resident-to-migrant ratio decreases from 100 at sea level to 0 in high mountain areas at 1600 m asl, with intermediate values in the hills and low mountains. To avoid potential misinterpretations, it is important to distinguish between geographical residency and residency as an intrinsic phenological trait of birds.

**Key words:** stonechat, residency, phenology, altitudinal movements, migration.

**Riassunto** - Il saltimpalo europeo (*Saxicola rubicola*) è una specie completamente residente in Italia? Osservazioni sulla sua fenologia lungo il gradiente altitudinale nell'Italia centrale.

Qui presento i risultati di dettagliate osservazioni sul campo condotte su due distinte popolazioni di Saltimpalo *Saxicola rubicola* nell'Italia centrale, che mettono in discussione l'opinione secondo cui il saltimpalo sia completamente residente in Italia. I miei risultati suggeriscono fortemente che una parte della popolazione italiana di saltimpalo sia migratoria, in modo totale o parziale, anche se sverna all'interno dei confini italiani. In Italia centrale il rapporto tra residente e migratore decresce da 100 a livello del mare a 0 in alta montagna a 1600 m slm, con valori intermedi in collina e bassa montagna. Per evitare possibili fraintendimenti, è importante distinguere tra residenza geografica e residenza come caratteristica fenologica intrinseca degli uccelli.

**Parole chiave:** saltimpalo, residenza, fenologia, movimenti altitudinali, migrazione.

The European stonechat *Saxicola rubicola* in Europe is a short-distance partial migrant passerine bird, with

northern breeding populations being mainly migratory, others partially resident in France and Spain or fully resident in Italy (Urquhart & Bowley, 2002). Helm *et al.* (2006), exploring all ring recoveries known at the time, concluded the stonechat to be obligate migratory in central European countries, a partial migrant in Britain, France, and Spain, but fully resident in Italy. The latter conclusion was based on the absence of ring recoveries abroad from stonechat ringed as adult breeders or nestlings in Italy.

Unfortunately, ringing activity in Italy is mainly concentrated during the migratory periods of autumn and spring, involving adult or young birds of unknown origin at their stopover sites. During the breeding season, ringing primarily focuses on lowland breeders along the coast or in the Po Plain, which are likely resident birds. Nonetheless, a bird ringed during its breeding period in northern Italy and recovered the following year in Tunisia in February (Zink, 1973; not reported by Helm *et al.*, 2006) suggests that the stonechat was partially migratory at the time.

On the other hand, in later publications, Bricchetti & Fracasso (2008, 2023) consider the stonechat partially resident in Italy, suggesting putative altitudinal movements of birds breeding at high elevations, although this has never been demonstrated by local ringing recoveries. Without extensive ringing of nestlings and/or adults at the breeding sites, also at different elevations (Callion, 2015), migration routes and wintering sites will remain unknown. Nevertheless, careful field observations can still reveal important aspects of its phenology.

The autumn migration of a stonechat population, triggered by endogenous mechanisms (Helm *et al.*, 2009; Newton, 2023), starts at roughly the same time each year, independent of habitat or weather conditions. In contrast, altitudinal movements in autumn typically occur only in years with unfavorable weather or feeding conditions (Newton, 2012).

Thus, weekly monitoring of different populations from the breeding season until the beginning of winter should reveal if, when, and in what proportion breeding territories are abandoned. In this way, altitudinal movements can be excluded in high elevation populations if migration starts also when weather and trophic conditions could permit a longer stay of the birds. Moreover, daily

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monitoring of nearby populations at lower elevation should reveal at least some arrivals of altitudinal migrants originating from the nearby mountains. Finally, yet importantly, two populations breeding at different altitudes, in different habitats with different climate characteristics, should show different ‘altitudinal movements’ at different times. Conversely, the same nearby populations should respond in a similar way to the time window for the start of migration, determined by the local photoperiod (Coppack & Pulido, 2004; Newton, 2012, 2023).

To disentangle the described question, I monitored regularly, in 3 subsequent years, a stonechat population A in the central Apennines at an elevation of 700 asl and a nearby population B (40 km northeast) at 1600 m asl (Huetting & Santucci, 2024). Population A breeds in a traditionally managed agricultural habitat at 700 m asl, with seasonal crop rotation practices. Here, the study area comprised 250 ha of suitable habitat. Population B in-

habits an area of 80 ha of natural high mountain habitat dominated by Juniper dwarf shrub (*Juniper communis* ssp. *alpine*) and alpine grassland at 1600 m asl. Using the territory mapping method (Bibby *et al.*, 2000; Gregory *et al.*, 2004; Huetting & Santucci, 2024), all breeding territories in both study areas were identified and monitored regularly from the end of summer until the beginning of November. Maximum and minimum day temperatures in the same study period were provided by 3BMeteo (<https://www.3bmeteo.com>).

In both populations, the number of occupied territories decreased at about the same rate from half of September until the end of October. Then, all territories of population B had been abandoned, while at the same time population A stabilized at wintering territory numbers, as the number of occupied territories did not change between the end of October and the beginning of winter, the first of December (Tab. 1).

Tab. 1 – Decrease of occupied Stonechat territories in two mountain populations at 700 m asl (A) and 1600 m asl. (B) in the central Apennines during the autumn of 3 subsequent years. / Diminuzione del numero di territori occupati di saltimpalo in due popolazioni montane a 700 m s.l.m. (A) e 1600 m s.l.m. (B) negli Appennini centrali durante l'autunno di 3 anni consecutivi.

Date	Population A, 700 m asl			Population B, 1600 m asl		
	N <sub>T</sub> 2022	N <sub>T</sub> 2023	N <sub>T</sub> 2024	N <sub>T</sub> 2022	N <sub>T</sub> 2023	N <sub>T</sub> 2024
Summer	30	35	46	13	13	16
13 September					13	
18 September	29					
20 September			45			
21 September						16
23 September			44			
27 September	28					
29 September			43		11	
30 September			42			
1 October						13
2 October		30	41			
7 October				10		
10 October			40			
11 October						12
14 October	26					
16 October						5
17 October		29		3		
18 October	25				3	
20 October	23		39			
22 October		28	38			
24 October	20				0	
25 October				3		5
27 October	19					
28 October	17					
31 October				0		3
2 November				0	0	
6 November						1
1 December	17	28	38	0	0	0

NT, number of occupied territories.

As shown in Tab. 2, autumn temperature ranges did not differ significantly between years and were much higher than those in April in both study areas, where both populations had already started the breeding season and survived snow showers at the end of March (Fig. 1).

Moreover, in both study areas during the same study period, visual observation showed insects to be still abundant (Lepidoptera, Arachnida, Orthoptera).

Thus, harsh weather or lack of food can be excluded as drivers of altitudinal movements. As shown in Tab. 1, the

pattern of territory abandonment in both study areas confirms this conclusion and aligns with migration triggered by photoperiod.

The results strongly suggest that population B is fully obligate migratory, while population A is partially obligate migratory (Newton, 2023). Thus, although migratory distances and destinations are unknown, at least part of the Italian stonechat population should be considered migratory and not resident. Even if all stonechats monitored in this study migrated within Italian borders, some winter-

Tab. 2 – Minimum and maximum temperature range (°C) during autumn 2022, 2023, and 2024 at the study areas A, at 700 m asl, and B at 1600 m asl. / Intervallo di temperatura minima e massima (°C) durante l'autunno 2022, 2023 e 2024 nelle aree di studio A, a 700 m s.l.m., e B, a 1600 m s.l.m.

Data	Year	Area A, 700 m asl			Area B, 1600 m asl		
		T Min	T Max	Rain, mm	T Min	T Max	Rain, mm
16/9 - 30/9	2022	+4 to +14	+17 to +23	85	-4 to +11	+8 to +19	65
	2023	+6 to +15	+19 to +29	2	0 to +13	+11 to +24	35
	2024	+2 to +9	+15 to +26	25	-3 to +12	+7 to +19	20
1/10 - 31/10	2022	+3 to +9	+18 to +24	6	-4 to +5	+10 to +20	10
	2023	+3 to +11	+17 to +28	60	-3 to +12	+11 to +21	70
	2024	+2 to +13	+15 to +24	120	-5 to +11	+9 to +19	100



Fig. 1 – Male stonechat observed on 28 March 2023 at 1600 m asl with 5 cm of snow cover (photograph by Steven Hueting). / Maschio di saltimpalo osservato il 28 marzo 2023 a 1600 m s.l.m. con 5 cm di copertura nevosa (fotografia di Steven Hueting).

ing 80 km southwest on the Tyrrhenian coast near Rome, others 600 km south in Sicily, considering them resident in Italy seems more like a geographical classification than an intrinsic property of the bird population. Additionally, the hundreds of autumn stonechat passages on the Isle of Linosa, halfway between Sicily and Tunisia (www.ornitho.it), make it difficult to exclude the possibility that at least some Italian breeders regularly winter in north Africa.

For completeness, in the lowlands of central Italy near sea level, the stonechat was likely entirely resident. For example, in the city of Rome, located 70 km WSW of study area A, as reported in the Atlas of Wintering Birds of the City of Rome (Cardillo *et al.*, 2023), covering the years 2007-2011, was nearly identical to its breeding distribution in the same area during 1991-1995 (Cignini & Zapparoli, 1996), suggesting complete residency.

Consequently, the stonechat population, lacking a migratory portion, was vulnerable to extreme weather events in winter. Thus, in February 2012, an exceptional cold spell that covered the city and its surroundings with 20 cm of snow for approximately 5 days led to the near-total extinction of its population. The absence of rapid recovery in subsequent years further supports the assumption that the population lacked a migratory component capable of compensating for the loss of all wintering individuals.

Today, 13 years later, the distribution remains scattered and far from its former extent (www.Ornitho.it). These data confirm that, before 2012, the stonechat population in Rome was entirely resident, or nearly so.

In summary, based on field data, in central Italy, the stonechat can be considered fully resident at sea level, partially migratory in the hills and low mountains, and entirely migratory in high mountain areas above 1500 m a.s.l.

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