

Short communication

Geographical distribution of Subalpine Warbler *Sylvia cantillans* subspecies in mainland Italy

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The Subalpine Warbler *Sylvia cantillans* is a polytypic passerine species restricted to the Mediterranean region. At present, four subspecies are recognized: *S. c. cantillans*, which is presently known to breed only in Italy, France and Iberia; *S. c. inornata*, which breeds in southern Spain and northern Africa and is considered to be closely related to the nominate; *S. c. albistriata*, which breeds from Trieste (northeast Italy) to Turkey; and *S. c. moltonii* ('Moltoni's Warbler'), which is known to breed in the Balearic Islands, Corsica and Sardinia in the western Mediterranean (Orlando 1937, 1939, Gargallo 1994, Shirihai *et al.* 2001). In the past, *S. c. moltonii* has been regarded as lying within the range of variation of nominate/*S. c. inornata* (Vaurie 1954), whereas Shirihai *et al.* (2001) treated it as a valid subspecies, and argued that it may warrant allospecies status on the basis of genetic divergence from the nominate form (which they estimated at 3.7% on the basis of the mitochondrial cytochrome *b* gene), clear differences in calls and male plumage, delayed breeding season and particular moult strategy.

Shirihai *et al.* (2001) did not exclude the possibility that *Sylvia cantillans* may be regarded as a superspecies, i.e. a complex of three allospecies, *Sylvia [cantillans] cantillans*, *Sylvia [c.] moltonii* and *Sylvia [c.] albistriata*, and defined these taxa as 'on the verge of speciation'. However, they did not rank them as allospecies because 'their divergence does not clearly exceed the level found between freely intergrading (clinal) forms'. Allospecies are, by definition, entirely allopatric taxa that show a certain degree of divergence, i.e. they are phenotypically divergent, 'but their level of divergence is toward the lower end of the spectrum of differences generally seen between sympatric species' (Helbig *et al.* 2002). It is impossible to predict whether

allospecies represent truly independent evolutionary lineages that would maintain their diversity following secondary contact (Amadon 1966, Short 1969, Shirihai *et al.* 2001, Helbig *et al.* 2002). A superspecies is the smallest monophyletic group of allo- and semispecies that can be assumed never to merge with any other such group (Sibley & Monroe 1990, Helbig *et al.* 2002).

In any case, Shirihai *et al.* (2001) concluded that the differentiation between *S. cantillans* entities is more advanced than between other subspecies of *Sylvia* warblers and that the geographical distribution of *S. c. moltonii* requires further studies to determine its taxonomic status.

In this short communication, we present some new data on the geographical distribution of *S. c. moltonii*, describing its range in mainland Italy, where breeding has recently been reported (Festari *et al.* 2002).

METHODS

During the period 1985–2004, we checked for subspecies occurrence as breeding taxa in mainland Italy at 676 sites (hereafter referred to as survey sites), which were chosen within potentially suitable landscapes in southern (Campania, Molise, Basilicata, Puglia), central (Lazio, Toscana, Marche, Abruzzo) and northern (Piemonte, Lombardia, Emilia-Romagna, Liguria) regions of Italy. As half of these sites were surveyed between 2000 and 2004, our results should reflect the current distribution of these taxa in Italy. All the survey sites were visited during the breeding season (mainly end of May to July), apparently suitable habitats were explored (e.g. Mediterranean matorral, shrubland, broom, juniper thickets), and the subspecies present were recorded. Moreover, during spring 2004, we carried out a detailed census at ten sites (hereafter census sites), which were visited between 7 June and 3 July; at this time, we expected all the territorial Subalpine Warblers in the area to be breeding. Some details of the census sites are described in Table 1. At these sites, we counted all the breeding pairs and/or territories we could locate between 06:00 and 11:00 h, by walking slowly along or within matorral, woodland edges, shrub patches and other suitable habitats, following available trails. We always tried to hear contact calls from both members of a pair. In all the survey and census sites, birds were identified to the subspecific level (i.e. *cantillans* or *moltonii*) on the basis of their contact and/or alarm calls (resembling the Lesser Whitethroat *Sylvia curruca* call in the nominate and the Wren *Troglodytes troglodytes* in the latter). This is the most reliable way to identify these taxa, especially when dealing with females or young; moreover, the males' race was also assessed from the colour of underparts and the submoustachial stripe (Shirihai *et al.* 2001). All the birds uttered only one of the two calls, and so were easily assigned to a given subspecies. It should be noted that 'tec' calls may sometimes be heard from *moltonii* during long alarm series, mainly at the end of (decelerating) 'trrrrr' or 't-t-t-t' sequences, but this call is never

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uttered alone, without the typical calls (Shirihai *et al.* 2001, Brambilla & Guidali 2005). We never observed mixed pairs or apparently hybrid/intermediate individuals (which we expected to utter both calls and to show intermediate plumage traits if males). The subspecific attribution of males, based on plumage features (see above), always agreed with identification based on contact/alarm calls. We could not take into account the possible occurrence of another sub-

species (*inornata*), which is diagnosable neither by contact call (identical to nominate) nor by its plumage, which shows no strong differences in the male (Shirihai *et al.* 2001).

RESULTS AND DISCUSSION

The results of our surveys are summarized in Figure 1: *S. c. moltonii* breeds in central-northern Italy, where it is

Table 1. Number of pairs/territories of *Sylvia cantillans cantillans* and *S. c. moltonii* in ten census sites in central-northern Italy, 7 June to 3 July 2004 (see text for details and Fig. 1 for geographical location). The approximate extent of the census sites is also given.

Code	Site name	Main habitats	Area (ha)	<i>cantillans</i>	<i>moltonii</i>
1	Val Staffora	woodland, shrubland, fields	30	0	16
2	Val Tidone	pastures, shrubland and woodland	15	0	10
3	Fiume Trebbia	riverine shrubland	15	0	11
4	Parcellara	woodlands, fields, shrubland, rocks	200	2	95
5	Sillaro	pastures, shrubland, woodland	20	0	18
6	Monterenzio	pastures and shrubland	25	0	14
7	Settefonti	pastures and calanques	25	1	20
8	Migliarino	matorral, pine woodland	15	3	10
9	Livorno hills	matorral, perennial crops	15	0	10
10	Costa etrusca	matorral and woodland	30	0	23

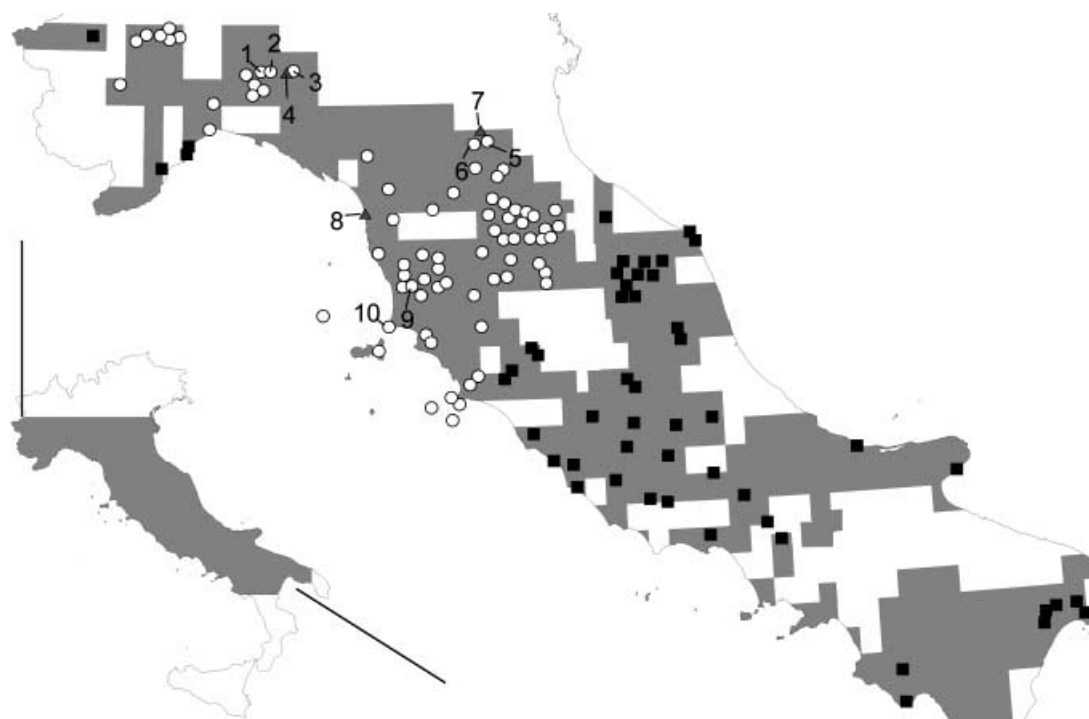


Figure 1. Distribution of *Sylvia cantillans cantillans* and *S. c. moltonii* in mainland Italy. Each symbol represents a single site or a group of sites (several survey sites were grouped when they were less than 4 km apart). Census sites are numbered 1–10 (see Methods and Table 1 for details). Black squares represent *S. c. cantillans* sites, open circles *S. c. moltonii* sites and grey triangles the sites where the two were breeding in syntopy (sites 4, 7 and 8). The overall distribution of *S. cantillans* in Italy (excluding *S. c. albistriata*) is also shown (shaded area; redrawn from Boano 1993). Note that higher density of circles does not mean higher density of Subalpine Warblers, but higher numbers of sample sites.

widespread and locally abundant. In the north-western corner of the species' Italian range, *cantillans* and *moltonii* seem to be separated by the Po plain. In warm, dry areas in the western Alps, in the scattered sites occupied by the species on the northern side of the river valley (Piemonte) and in Valle d'Aosta (Bocca & Maffei 2000), *cantillans* is the common breeding taxon, while from the Po river southward *moltonii* is currently the most widespread breeding taxon. The latter therefore occupies a large area, from Piemonte southwards to southern Lombardia, Emilia-Romagna and Toscana, including the islands of the Tuscan Archipelago and also at least the eastern part of coastal Liguria (see Fig. 1), whereas in central-southern and southern Italy (roughly from Lazio and Marche southwards) breeding Subalpine Warblers seem to belong to the nominate/*inornata* group, as previously reported (Shirihai *et al.* 2001).

The two forms were syntopic at three out of ten census sites within the main range of *moltonii* (one in north-central Toscana and two in western and central Emilia-Romagna). At these sites, we obtained contact calls from both males and females (and from fledglings when found) of all the *cantillans* pairs (both the partners of these *cantillans* pairs always belonged to this form) and from most of *moltonii* territories (when we contacted both, the two partners were always *moltonii*), and checked for the effective settlement of extra limital pairs (pairs of the nominate form settled in the range of the other race) by visiting the sites 2 weeks after the first observation. All these pairs were re-observed during the subsequent visits. Therefore, *cantillans* breeds in central-northern Italy, but it is much rarer than *moltonii*; in syntopy, *moltonii* was always the more abundant form (see Table 1).

In central Italy, the transition between the main range of the two forms seems to be sharp. In fact, there are no consistent gaps in the distribution of *S. cantillans* in central Italy (Boano 1993, see also Fig. 1) and we have found breeding populations of the two taxa a few tens of kilometres apart, on both the Tyrrhenian (western) and the Adriatic (eastern) coasts. However, the transition zone between the main range of the two forms is characterized by a band with a relatively scattered presence of breeding populations (see Fig. 1; cf. Boano 1993). Further studies on the respective range boundaries are required. In northwestern Italy (western Piemonte), the two forms are separated by the Po river, which is surrounded by unsuitable lowland habitats (highly urbanized and intensively cultivated areas). Moreover, at present we have little information on the boundary between *moltonii* and *cantillans* in western Italy (Liguria and southern Piemonte). However, at least on the coast, the transition from the former to the latter seems to occur between the towns of Genoa and Savona (see Fig. 1).

The distribution pattern of these taxa may be considered as parapatric (Helbig *et al.* 2002), but further work is required to assess the extent of range overlap. Shirihai *et al.* (2001)

refer to some museum specimens of *moltonii* from mainland northern and central Italy, but regard these as overshooting migrants, or the result of recent attempts of mainland colonization by this race, which they consider to be an insular form. However, during the first half of the 19th century, birds of this race (contact call strongly reminiscent of Wren) were commonly found in mainland Toscana (Savi 1828), although some descriptions of male plumage given in the same work are greatly reminiscent of *cantillans*, and Savi was unsure if one or more species/races were present. Therefore, it is likely that both forms bred sympatrically in the region almost 200 years ago. It should be noted that many sites in Toscana have only recently been colonized by the species (G.T.F. unpubl. data); in all these cases, *moltonii* is the race involved, and probably is still extending its range. In particular, the Apennine foothills seem to have been occupied recently, e.g. in eastern Emilia-Romagna, where the Subalpine Warbler was a rare migrant during the last century but is now a widespread breeder (Ceccarelli 1987). At present, *cantillans* breeds almost all around the range of *moltonii*, and may occur regularly at a low density at scattered sites throughout the range of the latter. From central Italy to northern Africa, through southern Italy and Sicily, *cantillans* and *inornata* may intergrade, as reported for Iberia (Shirihai *et al.* 2001); this hypothesis requires further study, focusing on the Subalpine Warbler populations of southern Italy and Sicily.

The distribution pattern reported here, together with the occurrence of syntopic pairs of the two forms and the (apparent) absence of mixed pairs at three different sites, suggests that these forms may have diverged more than is expected for subspecies, as is also suggested by genetic analyses (Shirihai *et al.* 2001). However, further studies are required to clarify this, analysing potential pre-mating barriers, such as song differentiation, breeding biology and ecological needs, and patterns of genetic variation across the range of *S. cantillans*.

NOMENCLATURE PROBLEMS

In light of a possible future elevation of *S. c. moltonii* to specific status, nomenclature problems may arise. This is because the first description of *Sylvia cantillans* was based on specimens originating from mainland Italy, which may belong to *moltonii* (see Orlando 1937, 1939, C.S. Roselaar in Shirihai *et al.* 2001, N. Baccetti in AERC TAC 2003). The distribution of *moltonii* reported here strengthens these concerns. We therefore suggest that a further investigation on historical museum material should be undertaken in order to clarify the origin and form identity of type specimens.

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REFERENCES

- AERC TAC.** 2003. *AERC Tac's Taxonomic Recommendations*. Online version: <http://www.aerc.be>.
- Amadon, G.** 1966. The superspecies concept. *Syst. Zool.* **15**: 245–249.
- Boano, G.** 1993. Sterpazzolina *Sylvia cantillans*. In Meschini, E. & Frugis, S. (eds) *Atlante degli uccelli nidificanti in Italia. Suppl. Ric. Biol. Selvaggina* **20**: 217.
- Bocca, M. & Maffei, G.** 2000. Nidification de la Fauvette passerinette, *Sylvia cantillans*, en Vallée d'Aoste (Alpes Occidentales Italiennes). *Riv. Ital. Orn.* **70**: 115–120.
- Brambilla, M. & Guidali, F.** 2005. Quando la voce è tutto: l'identificazione delle sottospecie di sterpazzolina *Sylvia cantillans*. *Avocetta* **29**: 154.
- Ceccarelli, P.** 1987. Sterpazzolina *Sylvia cantillans*. In Foschi, U.F. & Gellini, S. (eds) *Atlante degli uccelli nidificanti in provincia di Forlì*: 113. Rimini: Maggioli.
- Festari, I., Janni, O. & Rubolini, D.** 2002. Moltoni's Warbler *Sylvia (cantillans) moltonii* breeding in mainland Italy. *Dutch Birding* **24**: 88–90.
- Gargallo, G.** 1994. On the taxonomy of the western Mediterranean islands populations of Subalpine Warbler *Sylvia cantillans*. *Bull. B.O.C.* **114**: 31–36.
- Helbig, A.J., Knox, A.G., Parkin, T.D., Sangster, G. & Collinson, M.** 2002. Guidelines for assigning species rank. *Ibis* **144**: 518–525.
- Orlando, C.** 1937. Nuove forme della regione italiana. *Riv. Ital. Orn.* **77**: 213.
- Orlando, C.** 1939. *Sylvia cantillans*, Pallas (1764). *Riv. Ital. Orn.* **9**: 147–177.
- Savi, P.** 1828. *Ornitologia Toscana*. Pisa: Nistri.
- Shirihai, H., Gargallo, G. & Helbig, A.J.** 2001. *Sylvia Warblers*. London: Helm.
- Short, L.L.** 1969. Taxonomic aspects of avian hybridisation. *Auk* **86**: 84–105.
- Sibley, C.G. & Monroe, B.L.** 1990. *Distribution and Taxonomy of Birds of the World*. New Haven: Yale University Press.
- Vaurie, C.** 1954. Systematic notes on Palearctic birds, 11. *Sylviinae: the genus Sylvia*. *Am. Mus. Novit.* **1692**: 1–17.

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