MIGRATION OF THE SUBALPINE WARBLER *Sylvia cantillans* THROUGH MALTA

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Between the years 1966-75 the M.O.S. Ringing Group ringed 1,375 Subalpine Warblers *Sylvia cantillans* trapped on passage through the Maltese Islands. The great majority of these were aged and sexed, measured and weighed. This paper discusses some aspects of Subalpine Warblers' passage through Malta based mainly on the data collected.

Breeding range, winter quarters and passage:

The Subalpine Warbler *Sylvia cantillans* breeds in the Mediterranean basin. Its range extends from the Iberian Peninsula through southern France, most of Italy, Yugoslavia, Albania, Greece, Crete and Western Turkey, on the European side, and from Morocco east to Tunisia in North Africa. It also breeds on the major Mediterranean Islands. Three sub-species are recognised — the nominate *cantillans* in western Europe east of Italy; *albistriata* in SE Europe, from Yugoslavia eastwards; and *inornata* in northern west Africa. The Subalpine Warbler is essentially a summer visitor and after breeding migrates south to winter in the dry scrub zone of West Africa, along the southern borders of the Sahara, from Senegal in the west to eastern Chad in the east. Moreau (1961) discussed the controversial migration of the different populations of this species. On autumn passage the Subalpine Warbler is very scarce on the north-eastern coast of Africa but in spring becomes common and is seen as far east as Cyprus. In autumn, therefore, birds from the eastern Mediterranean breeding population either migrate west south-west across the Mediterranean or overfly the north-east African coast.

Passage through Malta:

The Subalpine Warbler is a spring and autumn migrant through Malta. The main spring passage is from the last week in March to the last week in April with a few in mid-March and May. In autumn it is the first migrant to appear, some arriving in mid-July but with a peak from mid-August to the third week of September. It is much more abundant in autumn than in spring. Table 1 gives the first and last dates in spring and autumn in the years 1968-74, while figures 1a and 1b show the number of Subalpine Warblers in Malta during the ten years 1966-75. They clearly show the relative abundance of the species and the time of migration.

Habitat and food in Malta:

In spring Subalpine Warblers are seen mainly around the coast with only a few moving inland. The available food is made up of insects. The berries of the Ivy *Hedera helix* are abundant in late March, and though these form the staple diet of Blackcaps preparing to move north, they are mostly ignored by the Subalpine Warblers.

In autumn Subalpine Warblers feed almost exclusively on fruit, principally bramble berries, figs, *Myopurum serratum* berries and grapes. Autumn passage, therefore, coincides with substantial 'fruit' food and birds are concentrated mostly in areas with plenty of brambles *Rubus ulmifolius* and figs *Ficus carica*. Only a few are noted in other places, mainly where there is Fennel *Phoeniculum vulgaris*, which hosts many insects.

Spring and autumn weights and retraps:

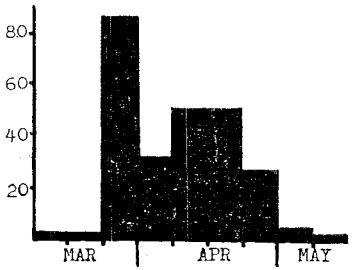
Spring birds have a range in weight of 7.2 to 15.8 gm (mean 10.8), most weighing between 9.0 and 12.9 (231 birds weighed). Autumn birds are much heavier, with a range of 8.4 to 18.9 gm (mean 13.0), most weighing between 10.0 and 15.9 (1,068 weighed) (fig. 2).

The weight of birds in African winter quarters, prior to the spring migration is not known but judging from the light weights of most birds trapped here, Malta might be their first stop after leaving winter quarters, after covering a distance of about 2200 km. Assuming an average winter weight of ca. 11 gm (*), then birds departing with a weight of 16.0 are capable of this crossing (calculated after Nisbet, Drury and Baird — in Mead 1966). It is unlikely that birds stopping to refuel on the North African coast, would stop again in Malta, unless encountering adverse weather. Probably the Subalpine Warblers seen in Malta during spring had intended to make a direct crossing from their winter quarters to the southern shores of Europe but either were too weak to continue, or encountered adverse weather conditions. This theory finds support in the fact that most Subalpine Warblers are seen when weather conditions are: (a) clear skies with moderate to strong headwinds (NE to SE), (b) overcast skies (with or without rain), (c) both conditions. Rushforth (1973) discussed some aspects of the spring migration in Malta of small passerines and one of his tentative suggestions was that small birds appear in Malta after finding themselves too weak to accomplish the flight from south of the Sahara to mainland Europe.

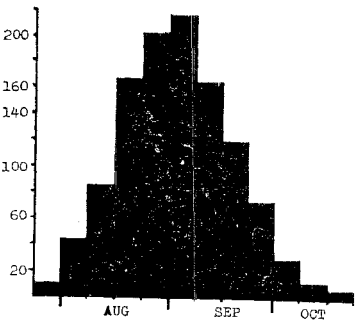
Only 10 out of 251 Subalpine Warblers ringed in spring have been retrapped. The initial weight of these birds ranged from 8.5 to 13.5 gm. After being retrapped within a period of 7 days they showed a mean increase of .34 gm per day; but the pattern of increase was very variable ranging from 0.1 to 0.9 per day.

In autumn the Subalpine Warbler is much more numerous (see fig. 1b). The weather in the central Mediterranean is usually calm and settled in late July, August and also throughout most of September. Most Subalpine Warblers arrive in Malta on clear nights with very light winds (Beaufort 1-2). The weight of these birds indicates that they had accumulated some fat before starting their south-

(*) An overwintering bird in late November weighed 10.9 gm. A month earlier its weight was 13.2. This bird showed no external signs of maladies and seemed perfectly fit. Another bird which weighed 14.0 gm in mid-September (evening weight), retrapped and reported by the ringer to be in heavy moult in mid-October weighed 10.7 (in the morning). Both were first year birds.



Figs. 1a & (below) 1b: Numbers of Subalpine Warblers ringed in spring and autumn with the time of ringing grouped in 'quarter-month' periods.



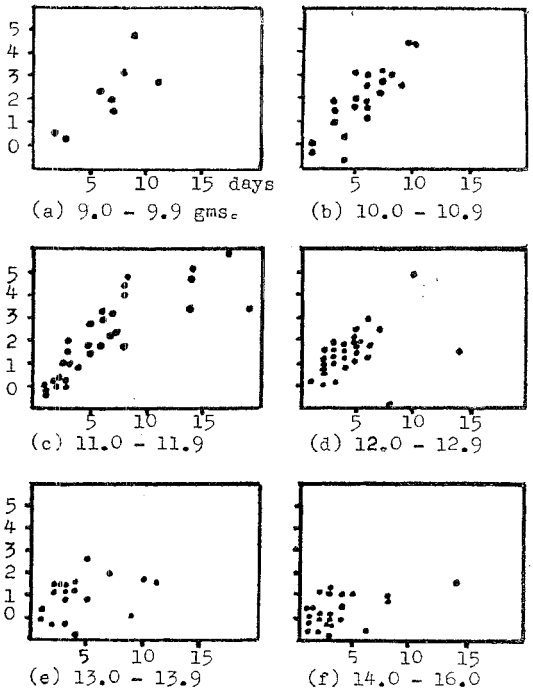


Fig. 3 (a-b): Increase in weight by day of autumn migrants retrapped within a period of 19 days, grouped in different initial weight categories.

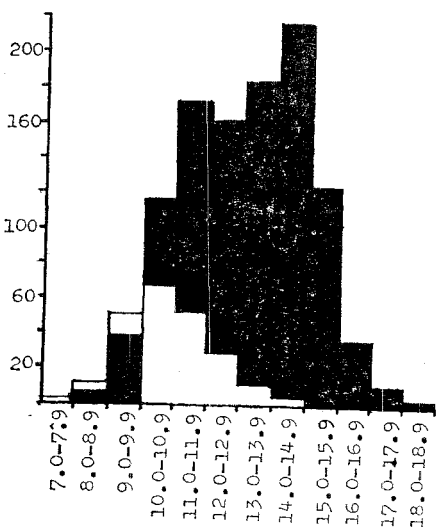


Fig. 2: Spring (blank) and autumn (shaded) weights of Subalpine Warblers.

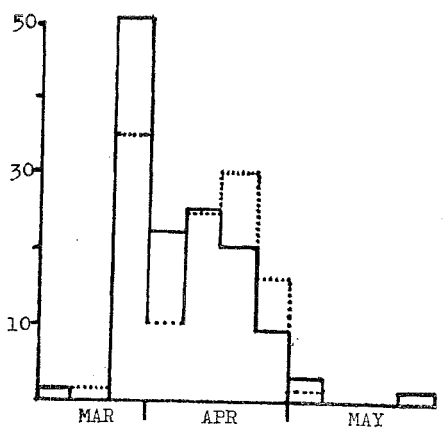


Fig. 4: Distribution of sexes in spring. Solid lines = males; dotted lines = females.

ward migration. Malta, where fat-producing food is abundant at this time of the year, appears to be a refuelling centre for a large number of Subalpines. These birds would then presumably make one direct flight from Malta to the southern edge of the Sahara; at least they have enough fat reserves to undertake the flight. (A first year bird trapped on 3.9.72 at Buskett was retrapped in the same locality the following year, on 25.8.73, and identified as an adult male).

Out of a total of 1,124 ringed in autumn 131 (i.e. 11.65%) have been retrapped. The number of birds retrapped does not represent the true number of birds staying to refuel in Malta because (a) with the exception of one place, other areas are not visited regularly by ringers and (b) birds tend to get used to the position of the nets and avoid them. As suggested earlier the weights of autumn birds show that they have enough fat-fuel to make one direct flight to winter quarters. Birds with a low weight at trapping time are therefore likely to stay longer than those with higher weight. Fig. 3 (a-f) shows the length of stay and increase in weight of birds of various weight categories. In general most retraps show an increase in weight, though decreases of up to 1.0 gm were registered in a few cases. Birds were retrapped up to 19 days after ringing. Those whose initial weight was between 9.0 and 12.9 show a more or less uniform increase in weight with a mean increase per day of 0.33, 0.37, 0.34 and 0.32 respectively. Birds whose initial weight was between 13.0 and 16.0 gain less weight though they may linger here for up to fourteen days. As already stated the weather at this time of year is usually settled so there is no question of birds lingering due to weather conditions.

Ratio of males and females in spring:

The number of Subalpines sexed in spring amounts to 249. Of these 131 were males and 118 females. As is the rule with most summer visitors to Europe, males arrive a little earlier than females (see figure 4). During the main migration period, i.e. last week of March to end of April, males predominate during the first two weeks, females during the last two. In the week in between, the sexes are equally represented. Approximate ratios for these five weeks are (males: females) — 10:7; 2:1; 1:1; 2:3; and 1:2. Of the four birds ringed in May three were males and one female.

Composition of ages in birds trapped in autumn:

In autumn birds can be aged according to the amount of white on the tail feathers. In first year birds, only the outermost pair shows white and this is sullied with brown. Adults show clear white on the three outermost feathers. Adult males show a very variable amount of pinkish-brown on the breast and only very rarely are they colourful as in spring. In most cases first year birds cannot be sexed in late July — early October, but it is possible to sex some males on account of the grey coming out on the upperparts and traces of pink on the breast.

As expected first year birds are more numerous than adults in autumn. Of 1,005 birds aged during the years 1969-75, 621 were birds of the year and 384 adults giving a ratio of 2.07:1.28. Most birds handled in mid-July to mid-August are first year birds; adults showing a sharp increase after mid-August and reaching a peak in early September (see figure 5). Adults have a complete

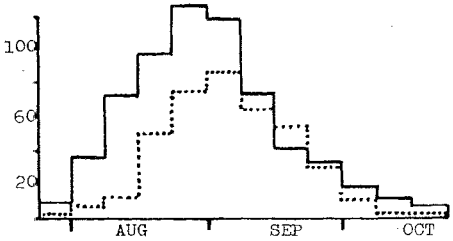


Fig. 5: Numbers of first year (solid lines) and adult (dotted lines) Subalpine Warblers trapped in autumn.

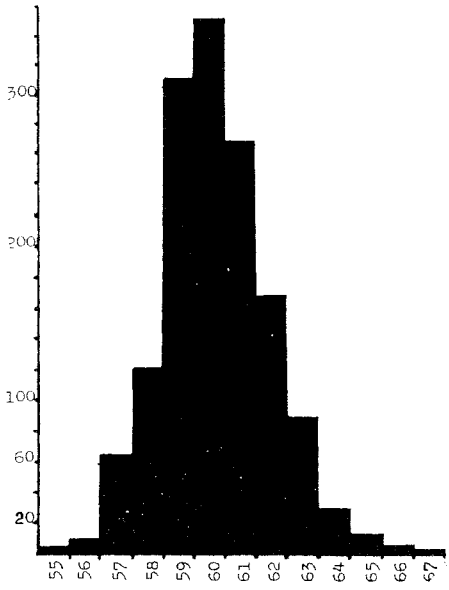


Fig. 6: Distribution of wing-lengths (in mm.) of Subalpine Warblers (both sexes).

post-nuptial moult and therefore cannot leave their breeding grounds before this is complete. In spring many Subalpines show a clear mixture of old juvenile remiges and newly moulted ones. This suggests that many first year birds have a partial moult in winter, in a similar way to Sardinian Warbler *Sylvia melanocephala* (Sultana and Gauci *in prep.*).

Wing-length:

Williamson (1968) gives the wing-length for both sexes of the nominate *cantillans* as 53-62 mm (mostly 57-60), and for *albistriata* as 56-65 (mostly 59-63). Svensson (1975) gives 54-65 without mentioning the races. 1,371 (both sexes) measured (max. chord) in Malta give a range of 55-67 mm, mostly 59-62 (see figure 6). During the past ten years no attempt has been made to determine the races of Subalpine Warblers passing through Malta on plumage characteristics. In all past literature of the Maltese avifauna the nominate *cantillans* has been listed as the race occurring in Malta and the only references made to *albistriata* were of two specimens obtained on 4th September 1914 (Wardlaw Ramsay 1923) and 'a few others' trapped for ringing in both spring and autumn since 1965 (Sultana, Gauci, Beaman 1975). If wing measurement is a reliable criterion in separating these two races, then *albistriata* must occur at least as frequently as the nominate *cantillans*.

Summary

The number of Subalpines ringed during the years 1966-75 shows that this

species is much more abundant in autumn than in spring. In spring Subalpines are more in evidence around the coast while in autumn they are found mostly inland where they feed on fat-producing fruit-food. Spring and autumn weights and retraps are discussed.

It seems probable that many Subalpines seen in spring are those which had failed to make a direct crossing from their wintering quarters to the southern shores of Europe. On the other hand it appears that in autumn many Subalpines use Malta as a refuelling centre from where they presumably make a direct flight to the southern edge of the Sahara.

Males in spring predominate during the earlier part of the main migration period while females are more in evidence during the latter half. First year birds are more numerous than adults in autumn.

In spring many birds show a mixture of juvenile remiges and newly moulted ones suggesting that many first year birds have only a partial moult in winter.

Albistriata occurs at least as frequently as the nominate *cantillans* if wing-lengths given by Williamson are a reliable criterion to separate these races.

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Table 1

	Spring Passage		Autumn Passage	
	first date	*last date*	*first date*	*last date*
1968	10 March	21 April	5 August	10 October
1969	15 March	5 May	27 July (*)	13 October
1970	12 March	24 April	31 July	19 October
1971	21 March	6 May	9 July	10 October
1972	18 March	24 May	9 July	14 October
1973	21 March	27 April	29 July	24 October
1974	20 March	25 April	13 July	26 October (**)

(*) One was seen on 24th July on the boat 'Tirrenia' leaving towards Malta when ca. 4 miles offshore.

(**) One stayed at Xemxija till 24th November.