Band 37 Sonderheft 1993

DIE VOGELWARTE

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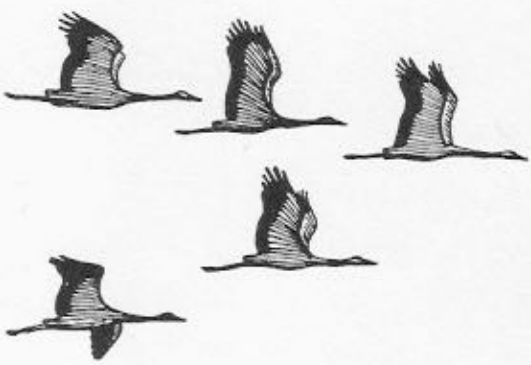

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SPRING MIGRATION ACROSS CENTRAL MEDITERRANEAN: GENERAL RESULTS FROM THE 'PROGETTO PICCOLE ISOLE'

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1. Introduction

Spring migration is one of the main annual events in a migrant's life. Having survived the winter in their African quarters, most Palearctic migrants are due to reach the nesting grounds in time for establishing a territory and mate (Alerstam 1990, Moreau 1972). Birds are therefore urged to migrate quickly, with males moving earlier than females in several species (e. g. Magnani **et al.** 1991, Pettersson **et al.** 1990, Wood 1992).

Spring migrants will be flying over ecological barriers which, in most cases, they have already overcome at least once. For a long-distance, trans-Saharan migrant, the desert crossing in spring is generally harder and more energy demanding than in autumn, due to prevailing head winds; habitat conditions in North Africa are on the contrary much more favourable than in autumn, with blossoming plants, more abundant insect life, and therefore a good potential for refuelling (Alerstam 1990, Moreau 1972).

After having crossed the desert, migrants overcome the other main ecological barrier to continental Europe, represented by the Mediterranean. The sea stretches for more than 3,000 Kms from west to east, with a very variable width of up to 1,000 Kms between North Africa and Apulia. Moreau (1972) suggests a wide front of songbird migration both in autumn and spring, pointing out that there is no apparent concentration of migrants crossing the sea at particular sites.

Within a general context of much less detailed knowledge of spring with respect to autumn migration between the Palearctic and Africa at an international level, the patterns of Mediterranean crossing are possibly the least investigated part of the northward journey. If quite detailed information exists from particular sites within the Mediterranean (e. g. Malta: Sultana and Gauci 1982, Corsica: Thibault 1983, Gibraltar: Finlayson 1992), no attempt has ever been made to plan a coordinated effort to study the spring migration of songbirds through the Mediterranean.

Among its geographical features, Italy has quite a number of small islands, mostly concentrated within the Tyrrhenian Sea and situated at different latitudes and distances from the mainland. These islands constitute a potential network of ringing stations to study how migration progresses through the central Mediterranean.

1.1. General aims of the project

In 1988, the Istituto Nazionale per la Fauna Selvatica (formerly Istituto Nazionale di Biologia della Selvaggina), Italian Ringing Scheme within EURING, started a project to investigate the

patterns of sea crossing by passerine migrants coming from their winter quarters in spring. The main aims of this project, called Progetto Piccole Isole (Small Islands Project, PPI) are:

- to define the seasonal migratory patterns of different species and categories of migrants;
- to study the daily migratory patterns, in order to clarify if a non-stop or intermittent flight strategy is used, with special reference to long-distance migrants;
- to investigate the geographical origin of the birds which migrate through the Mediterranean in spring, and identify the different populations involved;
- to analyse the physical conditions of birds at different stages of sea crossing, and define the rôle played by the small islands as resting areas;
- to identify the main problems the migrants face while crossing the Mediterranean in spring, in terms of habitat and food availability, with special attention to conservation aspects.

The project has been regularly running since 1988 on a constantly increasing number of sites within the Mediterranean (Gruppo Piccole Isole 1991, Spina **et al.** 1991, Massi **et al.** 1992). In this paper we will present some general results which originated from the first two years of the project, and referred to the 4 islands which could fully cover both ringing periods (see below).

Aknowledgments

We are extremely grateful to all ringers who joined the field activities; without their enthusiastic involvement it would have been impossible to plan such an intense ringing effort. For providing permissions to work on the islands, local facilities as well as boat connections, we wish to thank: the Ministry for Agriculture and Forestry (Direzione Generale Economia Montana e Foreste), the Consiglio Nazionale delle Ricerche (Servizio Navi Oceanografiche), the Amministrazione Provinciale di Livorno, the Libero Consorzio di Giannutri, the Taverna del Granduca di Giannutri, the Comune di Ventotene (in the person of B. Verde), the Nuova Compagnia delle Indie, the Axel Munthe Foundation (in the person of L. Erdeos). F. Bairlein and P. Berthold provided useful comments on a first draft of the manuscript.

Results from the Progetto Piccole Isole (I.N.F.S.): paper N. 8.

2. Study periods

The first two years were aimed at a general description of the seasonal migratory patterns of the different categories of migrants through the Mediterranean. We therefore planned to cover two periods, during which migration is particularly intense: April 16th-May 15th 1988 (pentades 22–27, according to Berthold 1973), and March 16th-April 15th 1989 (pentades 16–21) respectively. The two month period sampled provides information on both trans-Saharan migrants and species wintering around the Mediterranean.

3. Study areas

The following islands have been involved in the first two years of the project: Montecristo (42.19N–10.17E), Giannutri (42.15N–11.06E), Capo Caccia (Sardinia, 40.37N-08.09E), Ventotene (40.48N–13.25E), Vivara (40.44N–14.00E), Capri (40.33N–14.15E), San Domino (Tremiti, 42.07N–15.29E). Apart from S. Domino, which belongs to the Tremiti Archipelago in the Adriatic, and Capo Caccia, situated along the northwestern coast of Sardinia, all other sites are in the Tyrrhenian Sea. Only Montecristo, Giannutri, Ventotene and Capri (Fig. 1) could fully cover the two study periods (see below); these stations provided 81.2% of the total amount of ringings.

General information on these four islands is summarized in Tab. 1. For further details on habitat characters, see Anzalone & Caputo (1974–75), Arrigoni & Di Tommaso (1981), Filipello **et al.** (1977), Guadagno (1931–32).

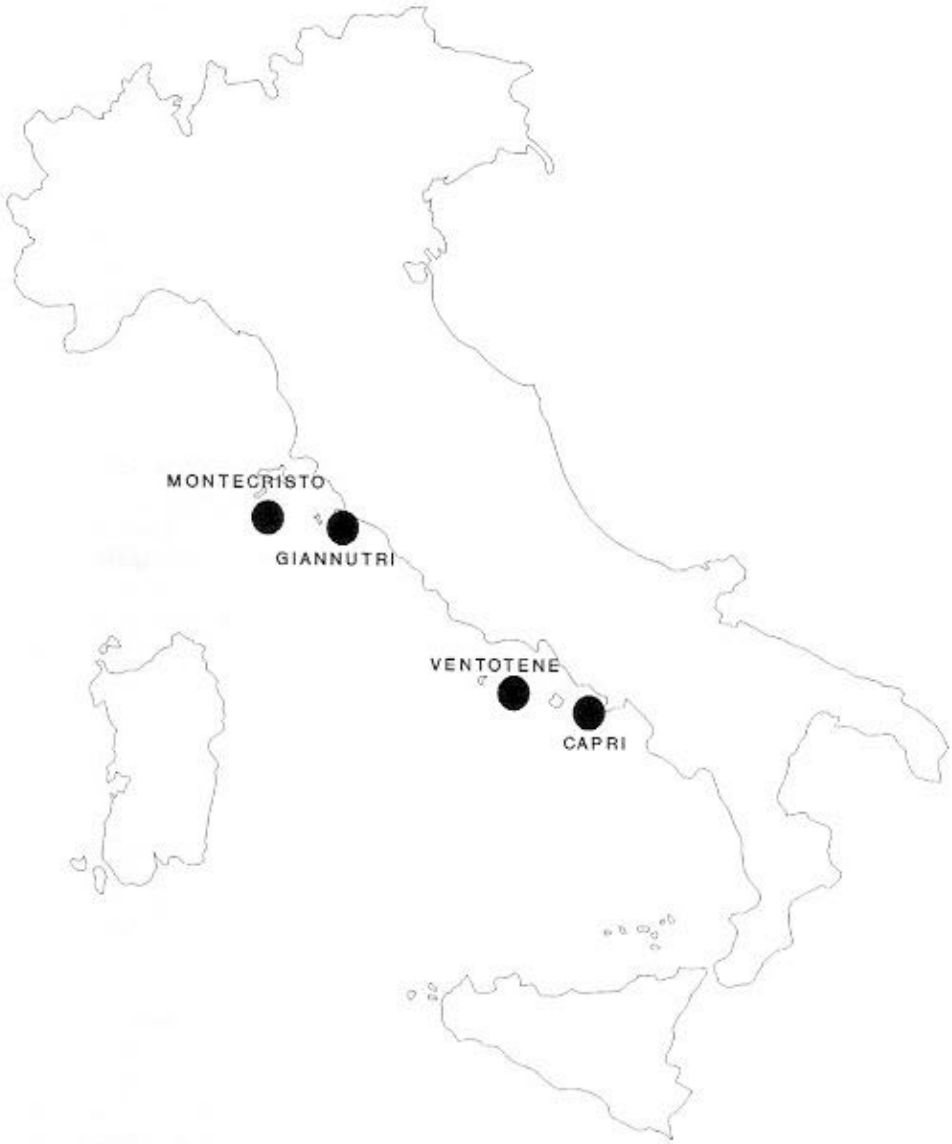


Fig. 1: Location of the four selected islands: Montecristo, Giannutri, Ventotene and Capri.

4. Materials and methods

4.1. Ringing

The project is based on contemporary, continuous and standardized mist-netting in different islands during spring migration. At each site approximately 300 m of 4 shelves mist-nets have been operated from dawn to dusk, only being closed during particularly harsh weather conditions. The total number of people who joined the project was 75 in 1988 and 92 in 1989 respectively; qualified

Island	Coordinates	Km²	Kms from the coast	Vegetation	Inhabitants/ Km²	Permanent water
MONTECRISTO	42.19 N–10.17 E	10.39	80.1	1, 3, 4, 6	0.2	Y
GIANNUTRI	42.15 N–11.06 E	2.62	15.3	4, 3, 5	5	N
VENTOTENE	40.48 N–13.25 E	1.30	59.4	2, 4	700	N
CAPRI	40.33 N–14.15 E	10.36	6.8	5, 6, 2, 4	800	Y

Vegetation: 1 = Bare rocks; 2 = Cultivations; 3 = Garrigue; 4 = Scrubland; 5 = Wooded scrubland; 6 = Woodland.

Tab. 1: General features of the study areas.

ringers have been directly responsible for ringing and data gathering on each station, where all birds were usually measured and aged by a same person.

The main measurements were: wing length (third primary, Berthold & Friedrich 1979, as well as maximum wing chord, Svensson 1984, in all cases when time allowed collecting both), tarsus and bill length (Svensson 1984), fat index (only for Passeriformes, scores 0 to 5, Busse 1974), body mass (at 0.1 g accuracy). Of the two wing measurements, third primary has been used in this analysis for all Passeriformes, on the basis of its higher accuracy (Jenni & Winkler 1989), while maximum wing chord was preferred for non-Passeriformes.

4.2. Presentation of results

A total of 39 species has been selected here, for which brief accounts will be presented. The choice has been based either on numbers of individuals examined, or on the particular interest that even fairly small samples might offer when referred to poorly known species, or species for which spring data are scanty, when not almost absent. For each species data on phenology and biometrics will be reported and briefly commented; the four islands will be referred to as M (Montecristo), G (Giannutri), V (Ventotene) and C (Capri).

Migratory patterns recorded on the four island (here shown from top to bottom with reference to decreasing latitude) are based on standardized 5-day periods (Berthold 1973). The graphs show the percentage of birds ringed in each of the standardized pentades with respect to the total sample collected in the two years from each island. Black bars are referred to the period covered in 1988, dashed ones to the earlier phase of migration investigated in 1989 (see above). For each island the median pentade of passage during the study period for every species has been calculated (black arrows); this should be regarded just as a relative indication, having been derived from data collected in two different years without having, in most cases, fully covered the migratory season of each species. Biometrical data referred to wing length, fat score and body mass are reported in three different tables for each species; mean values, SD and sample size per pentade are shown for the four islands. A brief text will include general information and comments on migratory patterns as well as biometrics; both in the texts and tables, wing length will be expressed in millimeters and body mass in grams.

5. Results and discussion

5.1. Ringing totals

In the two years a total of 25,532 birds has been ringed, belonging to 107 different species, 23 of which (21.49%) were non-Passeriformes and 84 (78.51%) Passeriformes. A complete list of ringings is reported in Appendix 1.

A total sample of more than 1,000 individuals has been collected for 8 species (Robin **Erithacus rubecula**, Subalpine Warbler **Sylvia cantillans**, Whitethroat **S. communis**, Garden Warbler **S. borin**, Wood Warbler **Phylloscopus sibilatrix**, Chiffchaff **P. collybita**, Willow Warbler **P. trochilus**, Pied Flycatcher **Ficedula hypoleuca**). At least 500 birds have been ringed for an additional 6 species (Nightingale **Luscinia megarhynchos**, Redstart **Phoenicurus phoenicurus**, Whinchat **Saxicola rubetra**, Wheatear **Oenanthe oenanthe**, Icterine Warbler **Hippolais icterina**, Blackcap **Sylvia atricapilla**)

Among the less numerous species, interesting samples from these first two years refer to Turtle Dove **Streptopelia turtur** (115), Scops Owl **Otus scops** (89), Bee-eater **Merops apiaster** (44), Hoopoe **Upupa epops** (248), Wryneck **Jynx torquilla** (137).

5.2. Seasonal composition of catches

The different study periods in the first years of the project allowed to describe, in general terms, the main variations in the composition of the flow of birds crossing the Mediterranean in different moments of the spring migration. The earlier and later stages we sampled revealed a seasonal tendency to the increase of the component represented by trans-Saharan migrants. In particular, in the period mid-March/mid-April, long distance migrants represent less than 50% of catches both in terms of percentage of species and individuals, whereas almost an equal percentage of medium- vs long-distance species characterizes the period mid-April/mid-May (Figs. 2a, 2b). The increasingly important rôle of trans-Saharan migrants becomes striking when looking at the percentage of individuals ringed in the different periods, belonging to the two categories considered. Especially in the latest stages of spring migration, birds coming from the Afrotropics exceeded 90% of catches, indicating a very concentrated passage of large numbers of individuals.

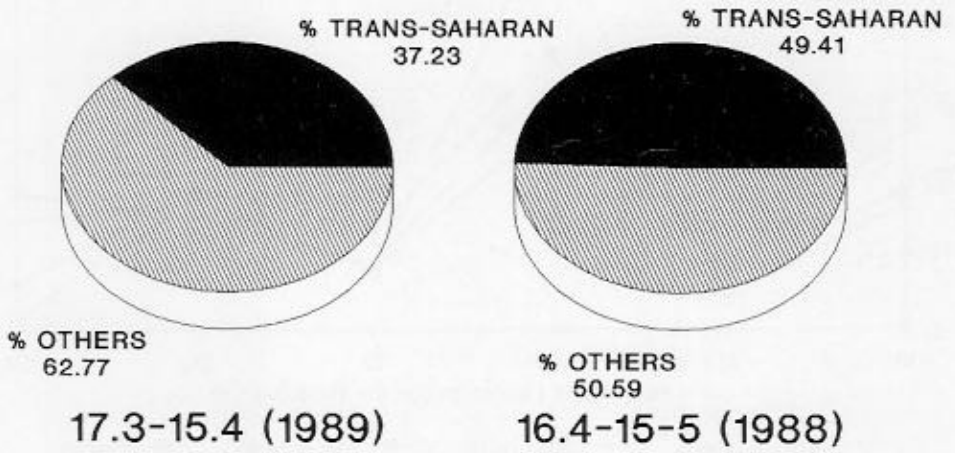


Fig. 2a: Trans-Saharan migrants: total percentage of species ringed in 1988 and 1989 (redrawn from Spina **et al.** 1991).

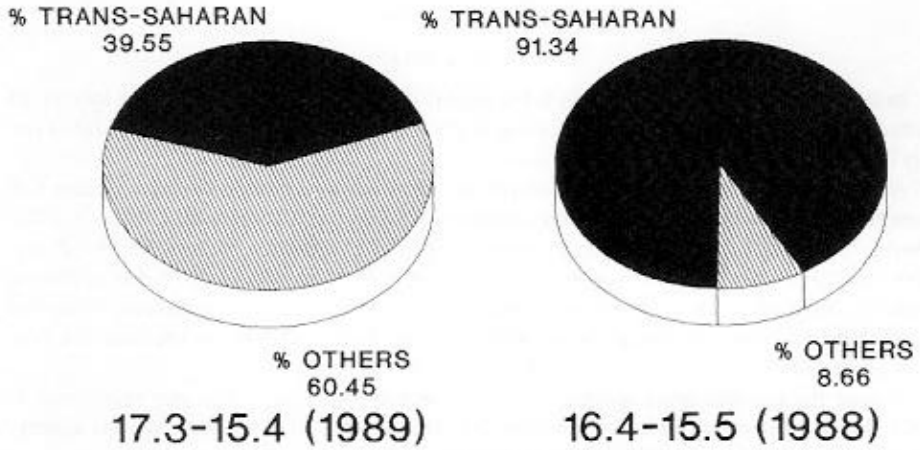


Fig. 2b: Trans-saharan migrants: total percentage of birds ringed in 1988 and 1989 (redrawn from Spina **et al.** 1991).

5.3. General trapping patterns

The general trapping patterns on the four islands are shown in Fig. 3 (a, b), based on percentage of birds trapped in each pentade with respect to the annual total for each island. A very similar pattern of movements at the different latitudes has been observed in both years, with a strong peak on pentade 18 in 1989, and a general tendency to the decrease towards the end of the study period at mid-May in 1988.

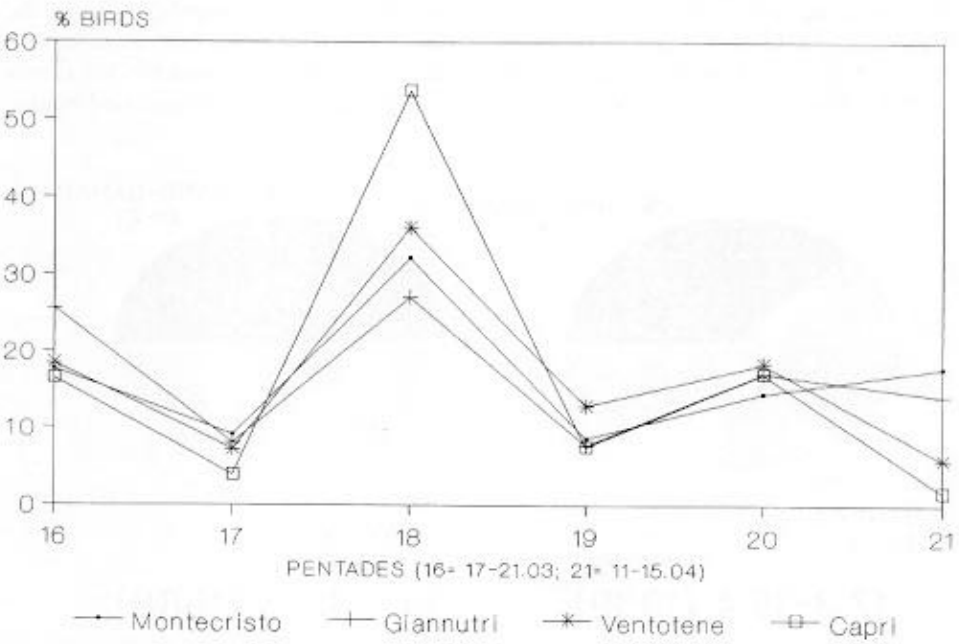


Fig. 3a: General trapping patterns on the four sites based on the percentage of birds ringed in each pentade with respect to the 1989 annual total for each site.

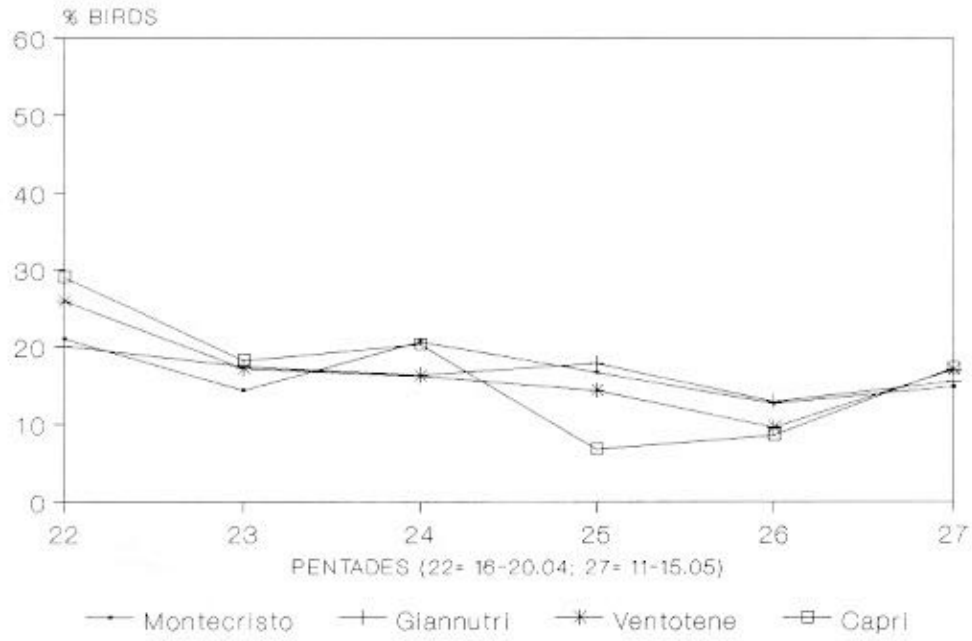
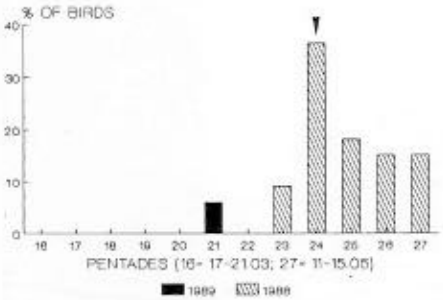


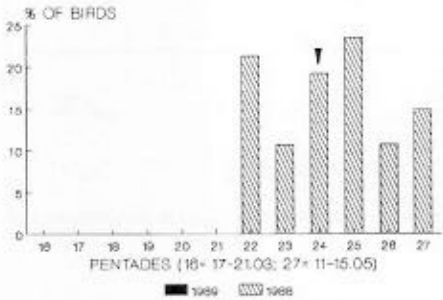
Fig. 3b: General trapping patterns on the four sites based on the percentage of birds ringed in each pentade with respect to the 1988 annual total for each site.

6. Species account

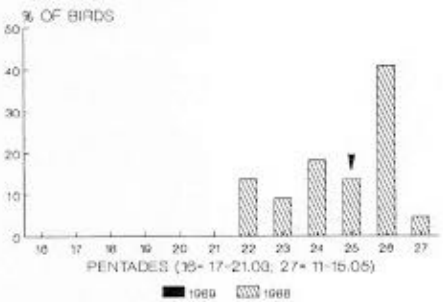
MONTECRISTO (N= 33)



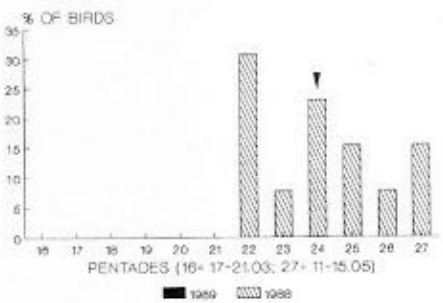
GIANNUTRI (N= 47)



VENTOTENE (N= 22)



CAPRI (N= 13)



TURTLE DOVE (**Streptopelia turtur**)

Long distance migrant, breeding in continental Europe except Scandinavia. Winter quarters south of the Sahara, mainly in western and central Africa and north of the tropical forest belt. (Cramp 1985, Glutz & Bauer 1980, Moreau 1972). Widely distributed all over Italy mostly up to 500–600 m a.s.l. (Brichetti 1985, Meschini & Frugis in press).

Trapping patterns. A total of 115 individuals trapped on the four islands. Passage starts from the second half of April, with good numbers still migrating through at the end of our trapping period, as reported for other sites within the Mediterranean (Cramp 1985, Glutz & Bauer 1980, Sultana & Gauci 1982, Finlayson 1992, Thibault 1983). No sharp peaks are observed. The trapping patterns are quite variable among the four islands. Birds crossing the central Mediterranean in spring are generally directed to central European countries (Sultana & Gauci, 1982).

Wing length. Possibly also in relation to the relatively small numbers ringed, no trends or differences are observed in mean values, between 170.00 and 187.25, among the four stations during the trapping period (range 150.0–193.0).

Body mass. Mean values between 103.29 and 146.50 (range 66.0–200.0, including the lowest value so far recorded for the species, Glutz & Bauer 1980). On average lower values are observed in the same pentade on the northernmost islands (G, M), suggesting a progressive use of fat reserves during sea crossing. Especially on M, body mass means are lower than those referred to other spring samples from the Mediterranean (Glutz & Bauer 1980). Evidence of lean birds had already been reported for the same island (Baccetti **et al.**, 1981).

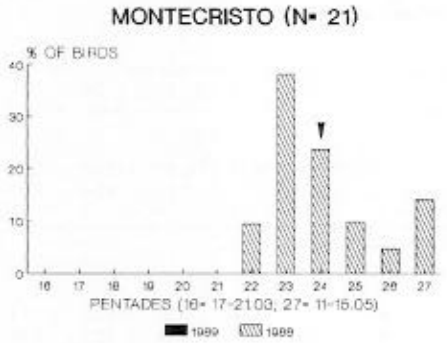
Turtle Dove - **Streptopelia turtur**

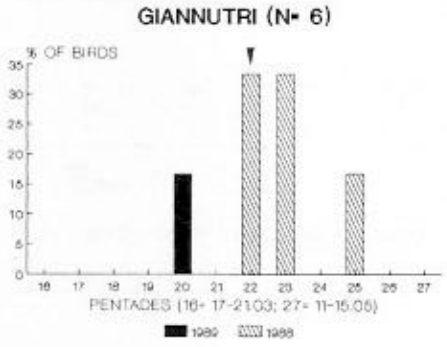
Wing length

Islands	Pentades 16 (March)	17	18	19	20	21 (April)	22	23	24	25	26 (May)	27
MONTECRISTO												
Mean						176.25		175.00	174.21	176.92	173.60	175.20
S. D.						.35		4.36	6.74	2.11	4.34	4.49
N	0	0	0	0	0	2	0	3	12	6	5	5
GIANNUTRI												
Mean							179.20	175.13	177.06	179.64	176.40	177.14
S. D.							11.66	6.81	3.99	4.36	2.38	4.26
N	0	0	0	0	0	0	10	5	9	11	5	7
VENTOTENE												
Mean							179.67	182.75	187.25	180.00	178.72	170.00
S. D.							7.51	10.25	5.44	4.58	5.39	
N	0	0	0	0	0	0	3	2	4	3	9	1
CAPRI												
Mean							177.88	177.00	178.00	173.50	177.00	172.50
S. D.							7.77		1.32	.71		2.50
N	0	0	0	0	0	0	4	1	3	2	1	2

Body mass

Islands	Pentades 16 (March)	17	18	19	20	21 (April)	22	23	24	25	26 (May)	27
MONTECRISTO												
Mean						105.00		108.67	103.29	118.17	115.00	108.20
S. D.						15.56		14.84	9.07	9.13	3.83	4.92
N	0	0	0	0	0	2	0	3	2	6	5	5
GIANNUTRI												
Mean							120.70	135.20	124.72	122.64	123.28	111.79
S. D.							19.37	37.21	15.99	22.87	16.11	10.93
N	0	0	0	0	0	0	10	5	9	11	5	7
VENTOTENE												
Mean							128.67	156.00	143.95	129.00	124.78	136.00
S. D.							17.39		10.34	1.41	13.12	
N	0	0	0	0	0	0	3	1	4	3	9	1
CAPRI												
Mean							133.75	129.00	123.00	146.50		96.00
S. D.							8.22		8.72	9.19		
N	0	0	0	0	0	0	4	1	3	2	0	1





CUCKOO (**Cuculus canorus**)

Long distance migrant; Palearctic populations (two races) breed over most of Europe, north-west Africa and Near East, and winter in Africa south of the equator (Cramp 1985, Glutz & Bauer 1980). Birds belonging to the nominate race are likely to be the only ones to be regularly found in Italy, though Iberian **bangsi** has been recorded on Malta (Sultana & Gauci 1982). The species commonly breeds almost all over the country (also on the main islands) (Meschini & Frugis in press).

Trapping patterns. Ringing total 31 birds, with a single reasonable sample (21 on M) and very poor figures on southern islands (V, C). Early capture in pentade 20 (G: 06.04), followed by a simultaneous start of regular presences on other islands (pentade 22); peak number on M in pentade 23, very close to the median date. Birds on M still present at the end of the study period. Frequent observations of birds escaping from the nets suggest that trapping pattern is not a satisfactory way to describe the species migratory phenology. On Malta the species may be observed as early as mid March (Sultana & Gauci 1982), while on C the trapping pattern over 5 years confirms our data (Petterson et al 1990).

Wing length. Mean values between 213.50 and 235.00 (range: 202.0–238.0). Far too small material to allow any variation being detected, in particular when taking into account the conspicuous sex-related size differences.

Body mass. Mean values 70.33 to 94.50, (range: 59.0–117.0). A selection toward weak birds by our catching method is possible, and would explain the higher number of birds at a more advanced stages of migration (northern sites: M, G) than further south: a tendency to higher values at southern sites is apparent, despite the size variability related to sex and the small sample sizes.

Cuckoo - **Cuculus canorus**

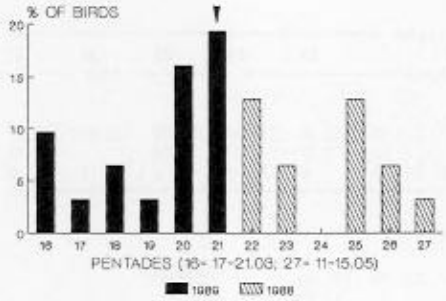
Wing length

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean							213.50	222.56	218.00	235.00	202.00	222.67
S. D.							3.54	7.31	7.78	4.24		9.71
N	0	0	0	0	0	0	2	8	5	2	1	3
GIANNUTRI												
Mean					223.50		222.00	216.00		223.00		
S. D.								12.73				
N	0	0	0	0	1	0	1	2	0	1	0	0
VENTOTENE												
Mean							236.00					
S. D.												
N	0	0	0	0	0	0	1	0	0	0	0	0
CAPRI												
Mean							230.00	217.00				
S. D.								1.41				
N	0	0	0	0	0	0	1	2	0	0	0	0

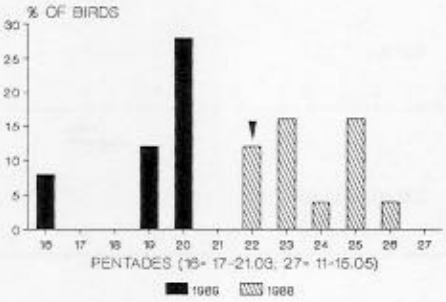
Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean							77.00	83.69	79.70	90.00	59.00	70.33
S. D.							5.66	8.49	12.20	8.49		5.13
N	0	0	0	0	0	0	2	8	5	2	1	3
GIANNUTRI												
Mean					109.00		90.00	76.50		73.00		
S. D.							14.14	.71				
N	0	0	0	0	1	0	2	2	0	1	0	0
VENTOTENE												
Mean							117.00					
S. D.												
N	0	0	0	0	0	0	1	0	0	0	0	0
CAPRI												
Mean							99.00	94.50				
S. D.								.71				
N	0	0	0	0	0	0	1	2	0	0	0	0

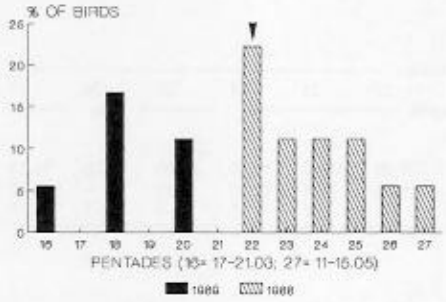
MONTECRISTO (N= 31)



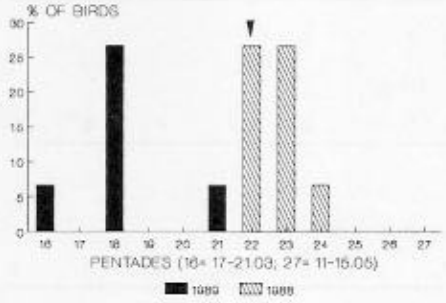
GIANNUTRI (N= 25)



VENTOTENE (N= 18)



CAPRI (N= 15)



SCOPS OWL (**Otus scops**)

Polytypic species; the nominate race, occurring across most southern and eastern Europe, as well as more eastern **pulchellus**, are migratory (usually on long distances); Iberian and east Mediterranean races partially migratory or resident (Cramp 1985, Glutz 1980). Central European birds winter mostly in tropical Africa, though some as far north as the Mediterranean (e. g. regularly on Malta and Sicily: Sultana & Gauci 1982, Iapichino & Massa 1989). A widespread breeder in Italy (cf. Meschini & Frugis in press), occurring at most altitudes on the mainland as well as in Sicily, Sardinia and some smaller islands (e. g. C, M), where it is often particularly abundant; not breeding on G, uncertain status on V.

Trapping patterns. Occurring during the whole study season; 89 birds ringed in total. Reasonable sample sizes at all sites, though larger at northern ones (M, G). Several retraps or previous years controls recorded where breeding (M, C). Median pentades where most birds were presumably migrants in pentades 22 (G, V), otherwise 21 (M) or 22 (C: also in other years, cf. Petterson **et al.** 1990). The first part of passage is not covered by our activities, whereas the final one apparently is. Non-resident birds were trapped in the past well before mid-March (M: Baccetti **et al.** 1981). Catching peaks were not recorded on corresponding dates at different sites.

Wing length. Mean values refer to spread and small samples, hardly representative. Mean value at the main breeding site (M: 160.8) very close to the overall mean (160.4), what might indicate either a prevalence of migrants also among birds trapped on this island, or size homogeneity between migratory and breeding birds. No clear differences in patterns either among islands or among periods. Actual range of recorded values 149.0–173.0.

Body mass. Irregular and rather unclear variation; mean values between 71.67 and 85.67 (range: 61.0–108.0). Sample sizes prevent further comments other then remarking a strong similarity with data from other spring staging sites (e. g. Malta, Libya: Cramp 1985).

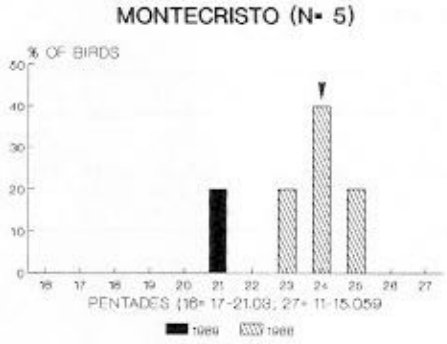
Scops Owl - **Otus scops**

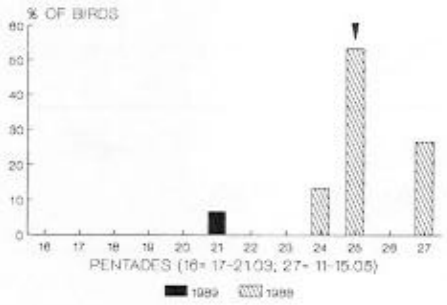
Wing length

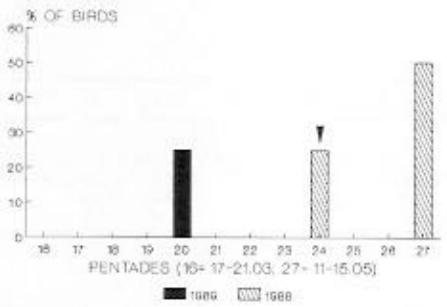
Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
		March				April					May	
MONTECRISTO												
Mean	159.00	161.00	154.00	153.00	164.20	161.00	163.50	161.50		162.00	162.00	151.00
S. D.	1.73		2.83		5.89	3.95	6.45	4.95		4.08	7.07	
N	3	1	2	1	5	6	4	2	0	4	2	1
GIANNUTRI												
Mean	158.50			157.33	162.29		153.67	160.75	159.00	160.13	155.50	
S. D.	4.95			6.35	5.68		2.52	1.89		5.14		
N	2	0	0	3	7	0	3	4	1	4	1	0
VENTOTENE												
Mean	168.00		160.00		164.00		159.00	168.00	158.50	159.75	169.00	163.00
S. D.			2.65		2.83		8.83	2.83	2.12	1.77		
N	1	0	3	0	2	0	4	2	2	2	1	1
CAPRI												
Mean	158.00		158.88			157.00	162.67	159.25	161.00			
S. D.			4.77				.58	5.12				
N	1	0	4	0	0	1	3	4	1	0	0	0

Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
		March				April					May	
MONTECRISTO												
Mean	75.67	88.00	73.00	86.00	82.20	75.17	85.50	76.50		80.75	85.50	63.00
S. D.	2.52		.00		14.67	6.15	2.38	6.36		4.99	9.19	
N	3	1	2	1	5	6	4	2	0	4	2	1
GIANNUTRI												
Mean	79.00			82.50	83.43		77.33	71.67	88.00	78.75	83.00	
S. D.	1.41			12.03	10.80		14.98	10.50		4.57		
N	2	0	0	3	7	0	3	4	1	4	1	0
VENTOTENE												
Mean	78.00		85.67		83.00		79.75	77.00	75.00	83.75	105.00	89.00
S. D.			8.08		18.38		10.59	1.41	2.83	.35		
N	1	0	3	0	2	0	4	2	2	2	1	1
CAPRI												
Mean	70.00		84.00			82.00	83.33	80.75	73.00			
S. D.			9.42				7.23	8.42				
N	1	0	4	0	0	1	3	4	1	0	0	0







NIGHTJAR (**Caprimulgus europaeus**)

Long distance migrant irregularly distributed all over Europe with two ssp., **C. e. europaeus** and **meridionalis** (S-Europe); absent in the northernmost regions (Cramp 1985, Glutz & Bauer 1980). The wintering area of the two European races is mainly constituted by the eastern regions of sub-Saharan Africa, with few records concerning W-Africa (Cramp 1985); a single recovery of a bird ringed on Cyprus and retrapped in Tanzania is reported (Glutz & Bauer 1980). In Italy, the species is scarcely but widely distributed, below 1500 m a.s.l. (Brichetti 1985, Meschini & Frugis in press).

Trapping patterns. The total number of ringed birds is 26, 58% of which on Giannutri; the median pentade for the only relevant sample is 25. First captures occurred around mid-April, becoming more frequent between April and May, and going on until the end of our study period; this time of passage is in accordance with previously recorded data (Cramp 1985, Glutz & Bauer 1980); earliest record for Corsica 27.04 (Thibault 1983).

Wing length. Single values range from 182.0 to 205.5. The measurements show a very high variability, probably rather linked to the clinal geographical variation in size than to the negligible sexual dimorphism in wing length (Cramp 1985). The presence of higher values during the first half of April cannot be explained only taking into account a possible differential migration between sexes, since only three females were ringed during the whole period, one on 8.05.1988 and two on 13.05.1988; also a possible difference in timing of passage among populations should therefore be considered. Given the small numbers, in this case, larger birds (i.e. those presumably breeding at northern latitudes) would unusually seem to migrate earlier.

Body mass. Single values range from 48.0 to 90.0, in accordance with those previously recorded during spring migration (Cramp 1985, Glutz & Bauer 1980), and without any clear trend during the study period.

Nightjar - **Caprimulgus europaeus**

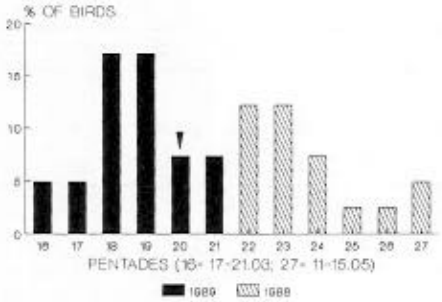
Wing length

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean						202.00		191.00	195.00	185.00		
S. D.									4.24			
N	0	0	0	0	0	1	0	1	2	1	0	0
GIANNUTRI												
Mean						203.00			195.00	194.25		191.75
S. D.										9.38		4.63
N	0	0	0	0	0	1	0	0	1	8	0	4
VENTOTENE												
Mean					205.00			199.00			197.50	
S. D.											2.12	
N	0	0	0	0	1	0	0	1	0	0	2	0
CAPRI												
Mean								199.25				
S. D.								8.44				
N	0	0	0	0	0	0	0	2	0	0	0	0

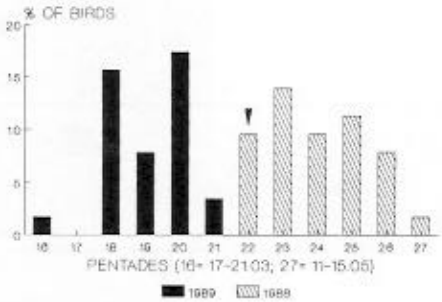
Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean						90.00		68.00	60.00	62.00		
S. D.									4.24			
N	0	0	0	0	0	1	0	1	2	1	0	0
GIANNUTRI												
Mean						63.00			50.50	64.50		61.25
S. D.									3.54	8.93		6.70
N	0	0	0	0	0	1	0	0	2	8	0	4
VENTOTENE												
Mean					71.00			60.50			64.00	
S. D.											4.24	
N	0	0	0	0	1	0	0	1	0	0	2	0
CAPRI												
Mean								69.00				
S. D.								7.07				
N	0	0	0	0	0	0	0	2	0	0	0	0

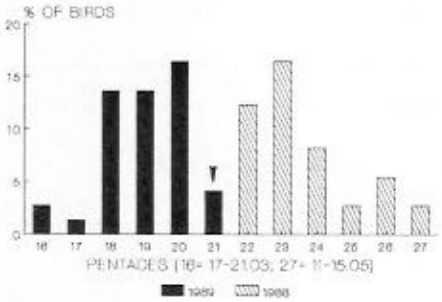
MONTECRISTO (N= 41)



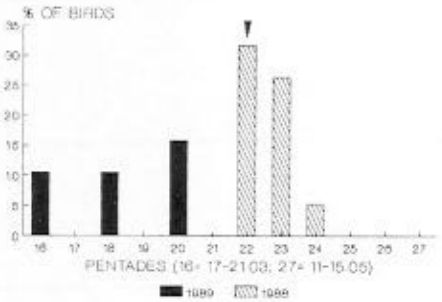
GIANNUTRI (N= 115)



VENTOTENE (N= 73)



CAPRI (N= 19)



HOOPOE (**Upupa epops**)

Medium to long distance migrant distributed all over Europe, as well as the whole Palearctic, with the exception of the northernmost regions (Cramp 1985, Glutz & Bauer 1980). The wide and poorly known wintering area is represented by most part of the Afrotropics; small numbers winter within the Mediterranean basin and in North Africa (Cramp 1985, Iapichino & Massa 1989). Although not very common, widely distributed breeder in Italy, being absent only above 1600 m a.s.l. (Brichetti 1985, Meschini & Frugis in press).

Trapping patterns. The total number of ringed birds is 248, with only few records from C. Captures are distributed all along the study period. Two main peaks, placed at the beginning and at the end of April, are observed; median pentades 20 (M,V), 22 (G,C). The trapping period is appearently well representative of nearly the whole migratory season of this species across the Central Mediterranean, very few birds being trapped at both ends. These data are on the whole in accordance with those previously reported for the Mediterranean (Cramp 1985, Glutz & Bauer 1980, Sultana & Gauci 1982, Thibault 1983).

Wing length. Mean values vary from 140.00 to 151.00 (range: 136.0–160). No clear trends are observed, either during the study period or comparing the four islands. The very high values of SD could be due to the presence of both males and females, which may widely differ in size (Cramp 1985).

Body mass. Mean values between 57.17 and 72.20 (range: 46.0–83.0), are in accordance with those previously recorded during spring migration (Cramp 1985, Glutz & Bauer 1980). No clear trends can be observed, even if the two highest values have been recorded in March and the three lowest in May; high SD values, presumably related to morphological differences between males and females, have also been recorded.

Hoopoe - **Upupa epops**

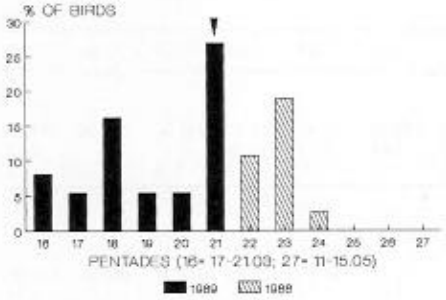
Wing length

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
		March				April					May	
MONTECRISTO												
Mean	146.00	151.00	147.36	149.14	144.50	150.00	148.40	145.40	148.33	145.00	137.50	144.50
S. D.	2.83	1.41	6.65	5.94	4.27	3.12	5.94	3.29	10.26			2.12
N	2	2	7	7	3	3	5	5	3	1	1	2
GIANNUTRI												
Mean	149.50		148.91	149.22	149.38	146.50	147.55	145.88	147.31	146.25	147.06	149.00
S. D.	3.54		6.50	5.17	4.10	6.56	4.03	3.74	4.69	6.08	4.17	6.36
N	2	0	18	9	20	4	11	16	11	13	9	2
VENTOTENE												
Mean	147.75	149.00	147.40	146.05	146.25	146.14	146.86	147.91	144.58	147.25	145.00	149.00
S. D.	5.30		4.43	5.52	4.92	5.62	5.61	5.45	3.44	5.30	4.08	1.41
N	2	1	10	10	12	3	9	12	6	2	4	2
CAPRI												
Mean	147.55				140.00		146.50	144.80	140.00			
S. D.	4.88				1.00		7.07	4.32				
N	2	0	0	0	3	0	6	5	1	0	0	0

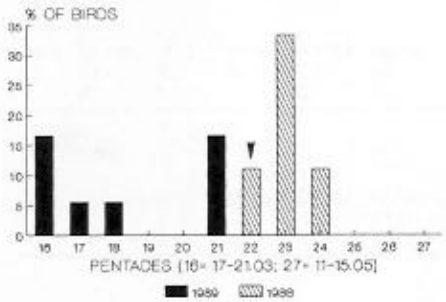
Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
		March				April					May	
MONTECRISTO												
Mean	71.00	68.75	63.14	64.71	62.33	58.67	63.00	62.50	64.33	66.00	51.00	56.50
S. D.		5.30	9.95	10.55	11.55	4.93	6.04	7.05	8.33			2.12
N	1	2	7	7	3	3	5	5	3	1	1	2
GIANNUTRI												
Mean	63.50		64.33	62.56	64.66	61.63	61.07	65.47	65.30	58.17	57.17	62.50
S. D.	3.54		6.67	7.88	4.89	5.62	3.82	8.90	7.71	3.64	6.22	5.66
N	2	0	18	9	20	4	11	16	11	13	9	2
VENTOTENE												
Mean	63.50	72.00	62.30	58.39	62.67	62.33	61.11	61.63	64.83	61.50	60.50	62.75
S. D.	7.78		4.30	6.93	9.79	8.33	7.10	7.54	5.60	4.95	5.20	3.18
N	2	1	10	10	12	3	9	12	6	2	4	2
CAPRI												
Mean	72.20		60.00		59.67		62.67	60.00	55.00			
S. D.	2.40		2.83		.58		5.39	4.64				
N	2	0	2	0	3	0	6	5	1	0	0	0

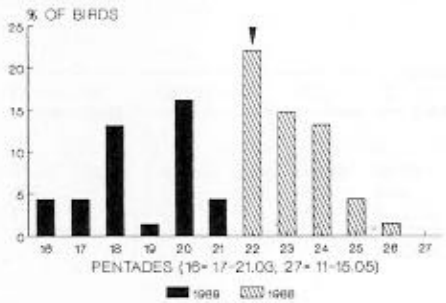
MONTECRISTO (N= 37)



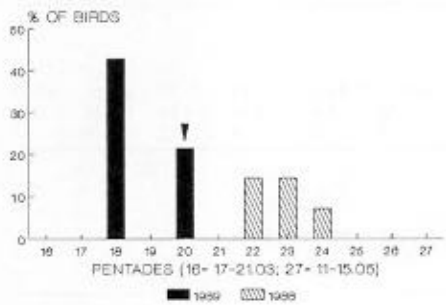
GIANNUTRI (N= 18)



VENTOTENE (N= 68)



CAPRI (N= 14)



WRYNECK (**Jynx torquilla**)

Polytypic species, long distance migrant (nominate race, breeding all over central and eastern Europe) or partial migrant on shorter distances (race **tschusii** from central Mediterranean and other southern races/populations); some populations (e.g. north Africa) are apparently resident (Cramp 1985, Glutz & Bauer 1980). European migrants (including some **tschusii**) winter across tropical Africa, north of the equator. A widespread and common breeder in Italy (**tschusii**), small populations being also recorded (Meschini & Frugis in press) on some small islands (only M among study sites).

Trapping patterns. Occurring during the whole study season; 137 birds ringed in total. Sample sizes satisfactory only at V and M; here, median pentades respectively 22 and 21, the latter possibly slightly biased by local birds. The first part of passage is not covered by our activities, while the final one is. Some migration peaks occur at nicely corresponding dates on different islands. Habitat features of trapping sites may explain at least some differences among respective sample sizes (e. g. between V and C), though at northern islands (M, G) passage is probably less important than further south. Migratory periods agree with departures from tropical winter quarters spread till early May and occupation of European breeding areas varying between mid-March and mid-May according to latitude (Cramp 1985); migrants do however occupy breeding areas in Central Italy starting well before mid-March (Baccetti, pers. obs.).

Wing length. Mean values between 83.33 and 93.17 (range: 81.0–95.0); ranges from skins of **tschusii** and **torquilla**, respectively, 79.0–86.0 and 86.0–93.0 (Cramp 1985). No clear differences in patterns either among islands or among periods, though means seem to indicate a prevalence of short-winged birds before mid-April (M, V); small sample sizes prevent further comments, though an earlier passage of **tschusii** appears quite reasonable, as no significant sex related differences in size are known for this species.

Body mass. Mean values between 28.03 and 36.20 (range: 21.0–39.6). These indicate an irregular variation and no clear trend is discernible. This fact is at least partly determined by the presence of the two different-sized subspecies, which are probably also featured by very different migratory strategies. Spring migrants on Malta indicate a slightly higher mean body mass than most of our subsamples (Cramp 1985).

Wryneck - **Jynx torquilla**

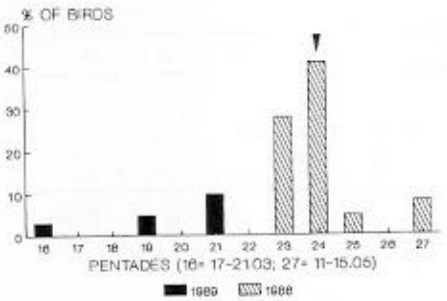
Wing length

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean	86.00	86.50	87.00	90.50	86.50	89.00	85.83	90.07	89.00			
S. D.	2.00	6.36	2.55	.71	7.78	3.73	3.33	1.97				
N	3	2	6	2	2	10	3	7	1	0	0	0
GIANNUTRI												
Mean	91.17	90.00	89.00			88.17	91.00	89.75	89.50			
S. D.	2.02					3.69	.00	3.66	.71			
N	3	1	1	0	0	3	2	6	2	0	0	0
VENTOTENE												
Mean	91.50	83.33	88.81	82.00	89.86	87.00	91.50	89.70	90.78	93.17	82.00	
S. D.	1.32	1.04	3.18		3.11	3.61	3.21	2.82	2.85	1.76		
N	3	3	9	1	11	3	15	10	9	3	1	0
CAPRI												
Mean			88.63		89.00		89.75	91.00	93.00			
S. D.			1.25		2.65		.35	.00				
N	0	0	6	0	3	0	2	2	1	0	0	0

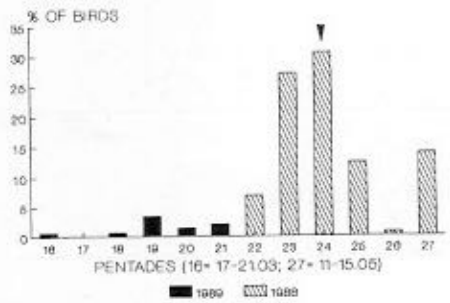
Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean	36.20	31.95	29.55	31.55	33.95	30.87	32.10	30.70	30.20			
S. D.	2.75	2.05	3.13	4.17	6.01	3.50	4.67	3.12				
N	3	2	6	2	2	10	3	7	1	0	0	0
GIANNUTRI												
Mean	30.50	31.20	31.60			30.30	32.80	33.07	34.85			
S. D.	.71					4.26	2.12	4.80	4.74			
N	3	1	1	0	0	3	2	6	2	0	0	0
VENTOTENE												
Mean	28.03	30.30	31.10	25.00	29.65	31.70	28.59	29.77	29.41	29.67	27.00	
S. D.	3.54	4.65	1.97		3.94	5.02	3.10	3.13	3.26	3.21		
N	3	3	9	1	11	3	15	10	9	3	1	0
CAPRI												
Mean			31.17		33.10		33.20	32.20	32.10			
S. D.			4.14		2.36		.28	1.70				
N	0	0	6	0	3	0	2	2	1	0	0	0

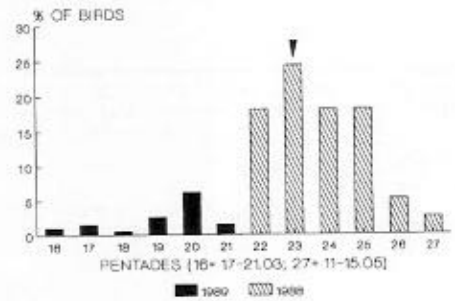
MONTECRISTO (N= 61)



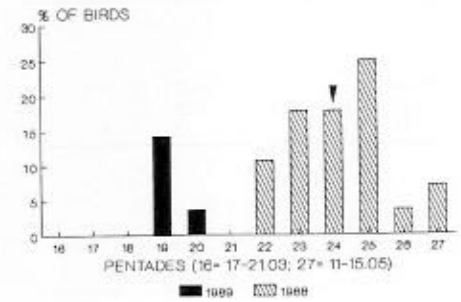
GIANNUTRI (N= 144)



VENTOTENE (N= 193)



CAPRI (N= 28)



SWALLOW (**Hirundo rustica**)

Long distance migrant, with Palearctic populations wintering across most of Africa south of the equator (Cramp 1988, Glutz & Bauer 1985a, Turner & Ross 1989). A widely distributed and common breeder in the Italian mainland, Sicily and Sardinia (Meschini & Frugis in press).

Trapping patterns. Few birds, out of the total of 426 ringed, are moving till the first half of April, while fairly strong peaks are recorded on all islands within the end of the month and still at the beginning of May (pentades 23 to 25). Trapping patterns seem to be consistent on the four stations, with median pentades 23 (V) and 24 (C, G, M), suggesting a fast sea crossing. Timing of passage and peak period confirm what already reported for the Mediterranean (Cramp 1985, Glutz & Bauer 1985a, Finlayson 1992, Thibault 1983).

Third primary. Mean values between 94.50 and 98.00 (range: 86.5–103.0). On the two islands with larger samples, a slight increase in wing lenght during the trapping period is observed for V, though an opposite trend has been recorded on G. Wing lenghts generally above 96 have been collected in northern Italy in autumn (August – September, Spina unpubl.).

Fat score. Median scores generally indicate fairly low levels of subcutaneous fat on all sites, and especially at G and M.

Body mass. Mean values between 15.51 and 19.80 , with most cases within 16 and 18 (range: 10.3–22.4). No clear seasonal trend, nor significant differences among islands. Such low body mass values are similar to other spring samples from the Mediterranean (Cramp 1985, Glutz & Bauer 1985a; on M, 17 inds. ringed in former springs averaged 14.1, Baccetti **et al.**, 1981).

Swallow - **Hirundo rustica**

Third primary

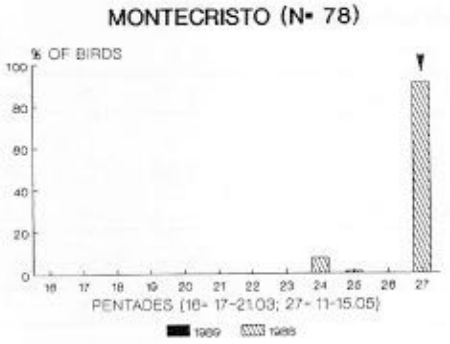
Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean	97.25			96.67		94.92		95.72	95.78	97.17		96.40
S. D.	.35			4.04		2.62		2.90	2.60	2.75		1.82
N	2	0	0	3	0	6	0	17	25	3	0	5
GIANNUTRI												
Mean	98.80		96.00	95.90	97.75	95.60	94.50	95.34	95.85	95.71	91.00	94.75
S. D.				2.16	1.06	2.16	2.72	2.39	2.35	2.08		2.84
N	1	0	1	5	2	3	10	39	44	18	1	20
VENTOTENE												
Mean	94.85	96.00	94.00	94.90	95.33	95.67	96.06	96.57	95.80	96.92	97.15	97.50
S. D.	2.33	1.80		1.34	2.89	1.53	2.50	2.31	2.09	2.58	2.46	2.00
N	2	3	1	5	12	3	35	47	35	35	10	5
CAPRI												
Mean				96.73	96.80		97.17	94.54	95.58	96.29	92.00	98.00
S. D.				1.19			1.26	1.36	2.16	3.36		1.41
N	0	0	0	4	1	0	3	5	5	7	1	2

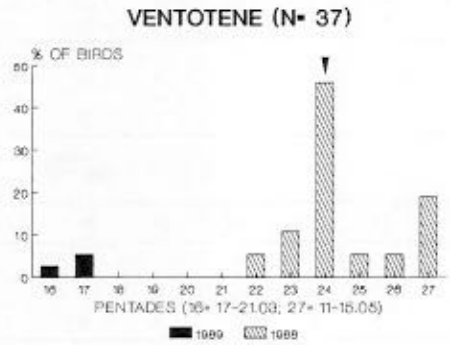
Fat score

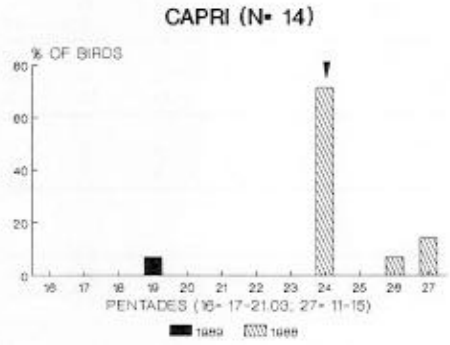
Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Median	1			0		0		3	1	4		0
N	2	0	0	3	0	6	0	17	25	3	0	5
GIANNUTRI												
Median	5		0	0	1	0	2	0	3	2	0	1
N	1	0	1	5	2	3	10	39	44	18	1	20
VENTOTENE												
Median	2	2	5	1	2	0	1	3	2	1	1	3
N	2	3	1	5	12	3	35	47	35	35	10	5
CAPRI												
Median				2	2		3	2	2	3	5	2
N	0	0	0	4	1	0	3	5	5	7	1	2

Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean	15.75			16.30		15.83		19.22	15.60	19.80		15.64
S. D.	1.34			1.39		1.75		2.04	1.84	1.77		1.87
N	2	0	0	3	0	6	0	17	25	3	0	5
GIANNUTRI												
Mean	20.40		18.00	15.56	15.65	16.63	16.58	17.54	17.06	17.88	12.00	15.92
S. D.				2.08	1.20	1.37	1.55	1.62	1.90	1.54		2.46
N	1	0	1	5	2	3	10	39	44	18	1	20
VENTOTENE												
Mean	17.05	16.97	18.60	16.52	16.94	15.70	15.51	16.94	16.52	15.96	17.07	17.94
S. D.	2.47	.93		2.11	1.61	.98	1.42	1.80	1.43	.97	1.89	1.85
N	2	3	1	5	12	3	35	47	35	35	10	5
CAPRI												
Mean				17.02	17.50		17.23	16.68	16.82	16.11	21.10	16.80
S. D.				.37			1.44	.75	1.53	2.91		1.56
N	0	0	0	4	1	0	3	5	5	7	1	2







HOUSE MARTIN (**Delichon urbica**)

Long distance migrant, breeding with the nominate race all over Europe, North Africa and east to Siberia. Winters in tropical and Southern Africa (Cramp 1985, Curry-Lindahl 1981, Glutz & Bauer 1985a). A very common and widespread breeder, up to high altitudes, in Italian mainland and main islands (Meschini & Frugis in press).

Trapping patterns. Very few birds present in March and till mid-April. For the 134 birds ringed (only 5 on G), median pentade of passage 24 (C, V) and 27 (M). An intersting similarity in trapping peaks on the two southernmost stations (C, V). Main movements between mid-April and mid-May reported also from other Mediterranean sites (Cramp 1985, Glutz & Bauer 1985a).

Third primary. Mean values between 81.58 and 85.50 (range: 76.8–91.0). A tendency to the increase during the trapping period might suggest later passage of more northern, larger birds (Cramp 1985, Glutz & Bauer 1985a).

Fat score. Median fat scores are generally low. Given the scattered samples, relatively higher – scored birds are trapped in the two southern sites (C, V).

Body mass. Mean values between 13.65 and 17.15 (range: 12.3–19.1). These surely indicate lean birds, confirming a first indication of 13.2 from a small sample on M in former years (Baccetti **et al.**, 1981). Such data are even lower than those reported from other Mediterranean sites in spring (Cramp 1985).

House Martin - **Delichon urbica**

Third primary

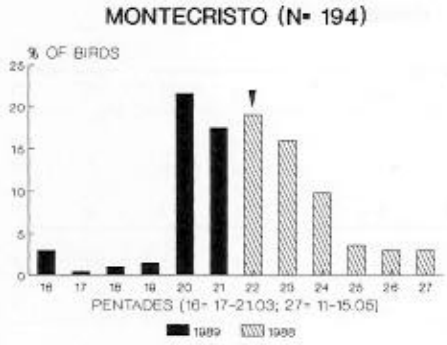
Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean									81.58	85.50		84.99
S. D.									1.02			2.49
N	0	0	0	0	0	0	0	0	6	1	0	71
GIANNUTRI												
Mean							85.00		81.00		85.00	82.00
S. D.												4.24
N	0	0	0	0	0	0	1	0	1	0	1	2
VENTOTENE												
Mean	76.80	81.80					83.10	82.58	83.44	85.50	84.00	84.17
S. D.		1.84					2.97	4.62	2.65	.71	2.83	1.55
N	1	2	0	0	0	0	2	4	17	2	2	7
CAPRI												
Mean				79.00					83.64		82.00	83.75
S. D.									2.00			1.06
N	0	0	0	1	0	0	0	0	10	0	1	2

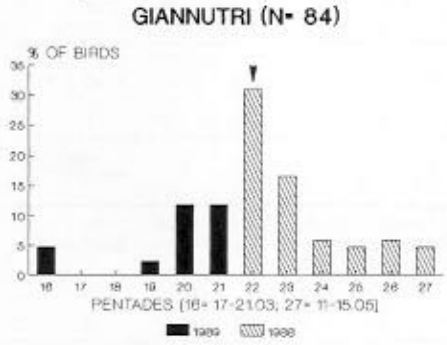
Fat score

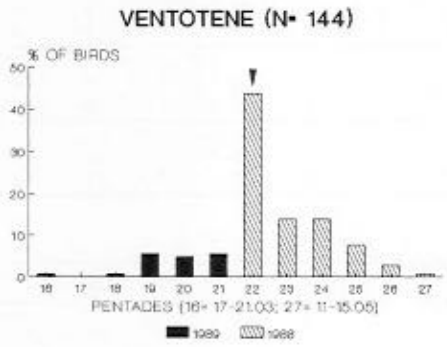
Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Median									2	0		0
N	0	0	0	0	0	0	0	0	6	1	0	71
GIANNUTRI												
Median							0		5		3	0
N	0	0	0	0	0	0	1	0	1	0	1	2
VENTOTENE												
Median	1	3					1	3	2	2	1	0
N	1	2	0	0	0	0	2	4	17	2	2	7
CAPRI												
Median				0					3		4	2
N	0	0	0	1	0	0	0	0	10	0	1	2

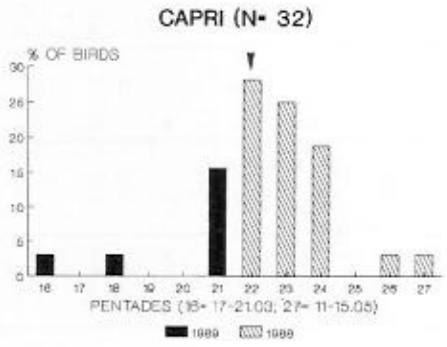
Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean									15.33	12.80		14.30
S. D.									1.17			1.25
N	0	0	0	0	0	0	0	0	6	1	0	71
GIANNUTRI												
Mean							13.90		17.40		18.50	13.65
S. D.												.78
N	0	0	0	0	0	0	1	0	1	0	1	2
VENTOTENE												
Mean	16.60	16.50					14.10	15.23	14.85	15.65	15.55	14.70
S. D.		.57					.71	1.18	1.16	1.06	1.48	.52
N	1	2	0	0	0	0	2	4	17	2	2	7
CAPRI												
Mean				14.00					15.77		17.90	17.15
S. D.									1.56			.35
N	0	0	0	1	0	0	0	0	10	0	1	2









TREE PIPIT (**Anthus trivialis**)

Long distance migrant widely distributed all over Europe, with gaps around Mediterranean basin (Cramp 1988, Glutz & Bauer 1985b). Apart from limited areas inside Mediterranean region (e. g. Aegean Isles, Pantelleria, Crete: Cramp 1988) where the species irregularly winters, the wintering area is composed by the sub-Saharan regions north of the equator and, in East Africa, southern regions as far as Natal and Transvaal. Retraps of European birds are mostly concentrated in west Africa (Zink 1987). The Italian population is distributed all along the Alps and the Apennines (Meschini & Frugis, in press).

Trapping patterns. The total number of ringed birds is 454, mostly concentrated around mid-April in all four islands (median pentades: 21 (M), 22 (G,V,C)); starting from these two central pentades a marked decrease in the percentage of captures actually occurs in both directions. This general pattern is confirmed by data already reported for spring migration (Glutz & Bauer 1985b, Thibault 1983, Sultana & Gauci 1982); a peak at the end of April has been observed at Gibraltar (Finlayson 1992). In each pentade of March and May values of only 5%, or even less, of the total amount are recorded.

Third primary. Mean values vary from 65.99 to 69.49 (range: 61.0–77.0). No clear trends are observed, either during the study period or among the four islands.

Fat score. Median values are on the whole very low, often equal to 0; generally median values of southern islands, C and V, exceed those of G and M.

Body mass. Mean values vary from 16.25 to 22.94 (range: 11.9–27.1), hence including the lowest values so far recorded for this species; anyway, data are on the whole in accordance with those previously recorded during spring migration (Cramp 1988, Glutz & Bauer 1985b). A decreasing tendency of body mass values while going northwards can be observed; the five highest mean values have all been recorded in C and V, the two southernmost islands.

Tree Pipit - **Anthus trivialis**

Third primary

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
Islands												
MONTECRISTO												
Mean	67.08	68.00	67.50	69.17	68.60	67.18	68.26	68.06	66.51	66.94	67.88	66.03
S. D.	.20		2.12	2.36	1.89	2.25	2.63	2.07	1.95	2.32	1.40	1.77
N	6	1	2	3	42	34	37	31	19	7	6	6
GIANNUTRI												
Mean	69.40			68.50	68.30	69.49	67.92	66.96	65.80	65.25	66.10	67.75
S. D.	2.16			.00	2.08	1.79	2.21	2.50	1.40	.65	1.14	3.40
N	4	0	0	2	10	10	26	14	5	4	5	4
VENTOTENE												
Mean	67.50		70.00	67.96	68.79	68.60	68.11	67.78	65.99	67.86	66.08	66.00
S. D.				2.75	1.50	2.31	2.16	2.69	2.37	2.77	2.01	
N	1	0	1	8	7	8	63	20	20	11	4	1
CAPRI												
Mean	69.70		71.20			67.60	67.41	68.28	66.85		64.00	66.00
S. D.						.83	2.00	2.18	2.23			
N	1	0	1	0	0	5	9	8	6	0	1	1

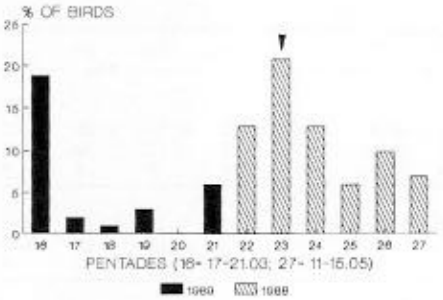
Fat score

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
Islands												
MONTECRISTO												
Median	0	0	0	0	0	0	0	0	0	0	0	1
N	6	1	2	3	42	34	37	31	19	7	6	6
GIANNUTRI												
Median	0			0	0	0	0	0	0	3	0	2
N	4	0	0	2	10	10	26	14	5	4	5	4
VENTOTENE												
Median	0		1	0	2	2	0	0	0	0	0	0
N	1	0	1	8	7	8	63	20	20	11	4	1
CAPRI												
Median	3		3			4	2	2	3		5	3
N	1	0	1	0	0	5	9	8	6	0	1	1

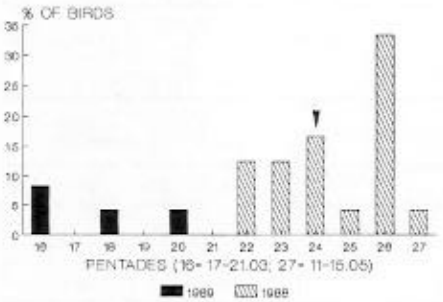
Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
Islands												
MONTECRISTO												
Mean	16.74	15.80	16.25	17.80	16.79	17.06	17.47	17.57	17.30	17.99	17.83	17.72
S. D.	.83		.35	1.70	1.31	1.49	1.23	1.37	1.48	2.40	3.90	1.80
N	6	1	2	3	42	34	37	31	19	7	6	6
GIANNUTRI												
Mean	18.38			17.10	16.51	17.38	19.00	17.30	16.88	18.30	17.20	18.02
S. D.	.85			1.27	1.23	1.30	3.01	.73	.82	1.23	.81	1.32
N	4	0	0	2	10	10	26	14	5	4	5	4
VENTOTENE												
Mean	18.10		20.80	18.45	19.33	20.98	18.64	18.03	17.95	18.29	17.85	14.90
S. D.				1.45	1.57	2.36	1.66	2.26	2.18	1.63	.69	
N	1	0	1	8	7	8	63	20	20	11	4	1
CAPRI												
Mean	19.50		20.00			22.94	18.60	19.20	21.73		21.20	19.30
S.D.						3.76	2.42	2.46	1.29			
N	1	0	1	0	0	5	9	8	6	0	1	1

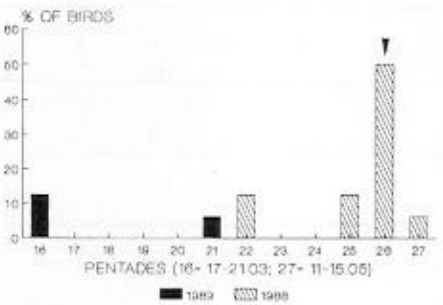
MONTECRISTO (N= 101)



GIANNUTRI (N= 24)



VENTOTENE (N= 16)



YELLOW WAGTAIL (**Motacilla flava**)

Long distance migrant widely distributed, with several subspecies, in most parts of the Palearctic (Cramp 1988, Glutz & Bauer 1986). The different subspecies are partly segregated within the wintering areas, which cover most of the Afrotropics (Cramp 1988, Glutz & Bauer 1985b). European populations seem to winter almost exclusively in West Africa (Zink 1987). The various races have also fairly different departure times from the wintering quarters towards the breeding areas (Curry-Lindhal 1981, Glutz & Bauer 1985b, Magnani **et al.** 1991). In Italy the species is widely distributed (Meschini & Frugis, in press), **M. f. cinereocapilla** being the most widespread breeding race.

Trapping patterns. The total number of ringed birds is 141, 72% of which on M, while no captures occurred at C; median pentades 23 (M) and 26 (G,V). Birds are already moving through the Central Mediterranean at mid-March; after a sudden decrease, a resumption is recorded about mid-April, then migration seems to continue at least until the end of our survey. These data are in accordance with what previously recorded for the Mediterranean (Sultana & Gauci 1982, Thibault 1983). Further analysis will be performed in order to provide information about different timing of passage for the various subspecies (Curry-Lindhal 1981).

Third primary. Mean values vary from 59.67 to 63.47 (range: 56.0–67.0). The presence of both males and females, which are considerably different in wing length (Cramp 1988, Glutz & Bauer 1985b), as well as the differential ratial migration, can account for the high values of SD. However, when looking at the larger samples, birds ringed in March show higher values with respect to those captured in April, supported by a higher percentage of males at the early stages of spring migration.

Fat score. Median values of fat score are only seldom different from zero, confirming the very low levels of visible energy reserves which characterize birds crossing the central Mediterranean.

Body mass. Mean values vary from 12.66 to 15.60 (range: 11.5–18.5), in accordance with those previously recorded during spring migration (Cramp 1988, Glutz & Bauer 1985b). They remain rather stable, with low SD values, all along the study period.

Yellow Wagtail - **Motacilla flava**

Third primary

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
Islands												
MONTECRISTO												
Mean	63.47	63.00	59.00	59.67		61.92	61.46	61.46	61.50	61.52	60.10	61.00
S. D.	2.20	1.41		3.21		2.11	1.70	2.38	1.17	1.52	2.14	1.71
N	19	2	1	3	0	6	13	21	13	6	10	7
GIANNUTRI												
Mean	62.25		63.00		60.00		65.83	61.50	60.38	63.00	59.63	60.50
S. D.	1.77						1.26	2.78	1.80		1.75	
N	2	0	1	0	1	0	3	3	4	1	8	1
VENTOTENE												
Mean	63.00					65.00	62.60			63.15	60.53	63.00
S. D.	2.83						2.26			1.20	2.29	
N	2	0	0	0	0	1	2	0	0	2	8	1
CAPRI												
Mean												
S. D.												
N	0	0	0	0	0	0	0	0	0	0	0	0

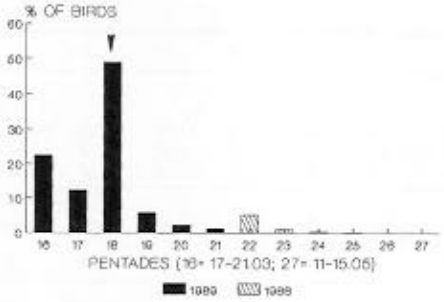
Fat score

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
Islands												
MONTECRISTO												
Median	0	0	0	0		0	0	0	0	0	0	0
N	19	2	1	3	0	6	13	21	13	6	10	7
GIANNUTRI												
Median	0		0		2		0	2	0	1	2	2
N	2	0	1	0	1	0	3	3	4	1	8	1
VENTOTENE												
Median	0					0	1			0	1	2
N	2	0	0	0	0	1	2	0	0	2	8	1
CAPRI												
Median												
N	0	0	0	0	0	0	0	0	0	0	0	0

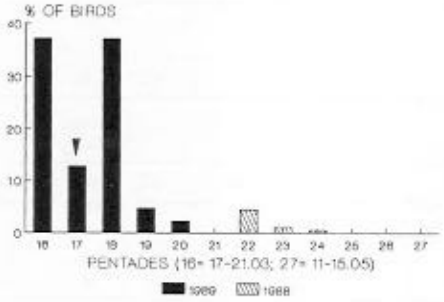
Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
Islands												
MONTECRISTO												
Mean	14.32	14.25	13.40	13.47		14.05	14.18	13.78	13.47	14.82	13.47	13.43
S. D.	.96	.35		.92		.96	.86	.93	1.57	1.95	1.03	1.02
N	19	2	1	3	0	6	13	21	13	6	10	7
GIANNUTRI												
Mean	13.75		15.20		14.30		14.27	15.60	13.00	13.10	12.66	14.50
S. D.	1.06						.55	.66	1.22		.82	
N	2	0	1	0	1	0	3	3	4	1	8	1
VENTOTENE												
Mean	15.50					15.00	14.80			14.15	14.05	14.40
S. D.	.28						.28			1.06	1.41	
N	2	0	0	0	0	1	2	0	0	2	8	1
CAPRI												
Mean												
S. D.												
N	0	0	0	0	0	0	0	0	0	0	0	0

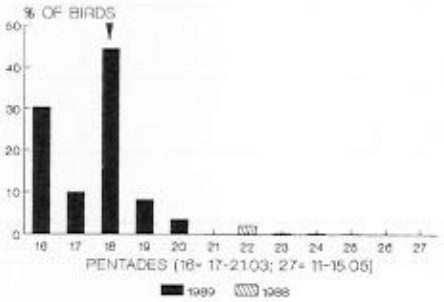
MONTECRISTO (N= 928)



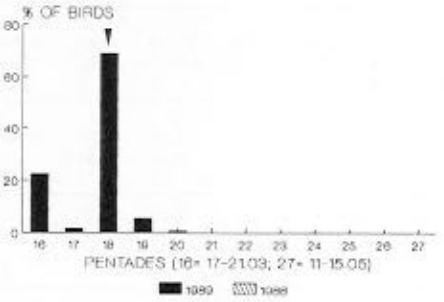
GIANNUTRI (N= 452)



VENTOTENE (N= 816)



CAPRI (N= 195)



ROBIN (**Erithacus rubecula**)

Breeding all over Europe, wintering mostly in north western Africa and the Middle East (Cramp 1988, Glutz & Bauer 1988a). A common breeding and wintering species in Italy (Meschini & Frugis in press).

Trapping patterns. Well represented in all four sites with a total of 2391 trapped birds. Captures are distributed from mid-March till mid-April, being particularly concentrated in the second half of March, with most birds being trapped between pentade 16 and 18 (median pentade of passage is 17 on G and 18 on the remaining islands). The peak of spring passage in March across the Mediterranean is already documented (see Cramp 1988 and Glutz & Bauer 1988a). A very clear similarity can be observed in all four islands, with two marked influxes on pentades 16 and 18 respectively.

Third primary. Mean values vary from 51.60 to 55.25 (range: 44.5–59.0). A tendency to the decrease can be observed on all four stations during the first part of the study period, probably related to a differential migration of sexes (shorter winged females (Glutz & Bauer 1988a) passing later). Starting from pentade 23 the tendency seems to invert, with long winged individuals trapped later in the season. Despite to the very low number of captures during the last part of the study period, it could be hypothesized that these late individuals belong to the larger northern populations (see Cramp 1988 and Glutz & Bauer 1988a).

Fat score. Median values are fairly high, the majority of captures scoring 2 or 3. A decrease in fat scores parallel to the latitudinal gradient is observed in the first pentades (when most birds are captured), suggesting a progressive use of fat reserves at different stages of sea crossing.

Body mass. Mean values vary from 13.85 to 16.43 (range: 11.0–19.5). These values are generally lower than those recorded in spring on different Mediterranean sites (Finlayson 1981, Cramp 1988, Gustin 1989). A general slight tendency to the decrease can be observed in the first part of the study period. Mean body mass values on C are generally higher than on the other islands.

Robin - **Erithacus rubecula**

Third primary

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
		March				April					May	
MONTECRISTO												
Mean	54.27	54.50	53.74	54.00	53.40	53.18	53.77	53.83	55.25	55.00		
S. D.	1.77	1.40	1.48	1.64	1.13	1.83	1.61	1.06	.29	.00		
N	209	115	455	54	20	11	49	9	4	2	0	0
GIANNUTRI												
Mean	54.66	54.51	53.75	53.96	53.27		52.60	51.60	53.25			
S. D.	1.55	1.62	1.54	1.25	.69		1.82	.55	1.06			
N	168	58	168	21	10	0	20	5	2	0	0	0
VENTOTENE												
Mean	54.15	54.33	53.84	53.60	53.67		52.88	52.00	53.50		55.00	
S. D.	1.66	1.65	1.58	1.53	1.18		1.51	.82	.71			
N	249	82	363	67	30	0	17	4	2	0	1	0
CAPRI												
Mean	53.42	54.10	53.35	53.14	54.00							
S. D.	1.80	.87	1.40	1.60	2.12							
N	44	3	135	11	2	0	0	0	0	0	0	0

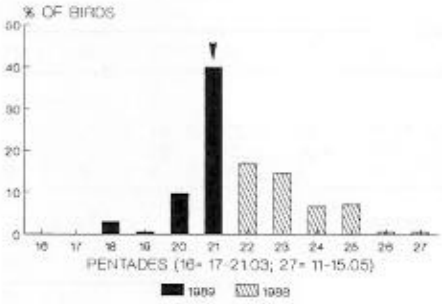
Fat score

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
		March				April					May	
MONTECRISTO												
Median	1	1	1	0	2	1	1	2	2	1		
N	209	115	455	54	20	11	49	9	4	2	0	0
GIANNUTRI												
Median	0	0	0	1	3		2	4	1			
N	168	58	168	21	10	0	20	5	2	0	0	0
VENTOTENE												
Median	2	2	2	1	2		2	2	3		3	
N	249	82	363	67	30	0	17	4	2	0	1	0
CAPRI												
Median	2	2	3	2	3							
N	44	3	135	11	2	0	0	0	0	0	0	0

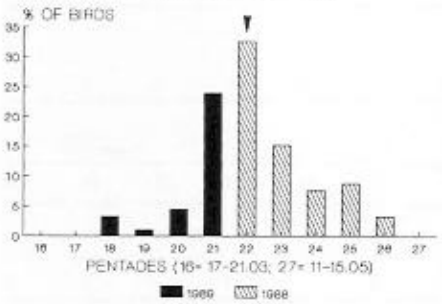
Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
		March				April					May	
MONTECRISTO												
Mean	14.47	14.76	14.18	14.08	14.54	14.05	14.25	14.43	15.75	14.35		
S. D.	1.46	1.34	1.42	1.20	1.38	.96	1.12	1.04	1.45	2.76		
N	209	115	455	54	20	11	49	9	4	2	0	0
GIANNUTRI												
Mean	14.43	14.66	13.89	14.10	15.12		14.77	14.90	15.45			
S. D.	1.49	1.42	1.26	1.01	.89		1.67	.99	.49			
N	168	58	168	21	10	0	20	5	2	0	0	0
VENTOTENE												
Mean	15.05	14.75	14.63	14.21	14.46		14.28	14.30	15.75		14.60	
S. D.	1.30	1.31	1.23	1.22	1.02		1.18	1.04	1.34			
N	249	82	363	67	30	0	17	4	2	0	1	0
CAPRI												
Mean	14.42	16.43	15.54	13.85	14.35							
S. D.	1.17	.46	1.16	1.07	1.63							
N	44	3	135	11	2	0	0	0	0	0	0	0

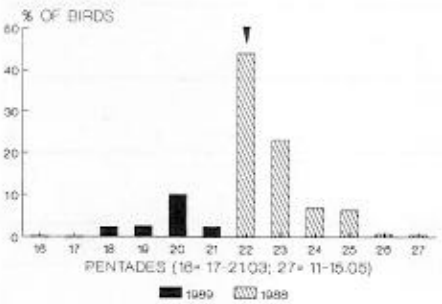
MONTECRISTO (N= 165)



GIANNUTRI (N= 92)



VENTOTENE (N= 343)



NIGHTINGALE (**Luscinia megarhynchos**)

Long distance migrant, breeding with the nominate race in Eurasia east to Crimea, western Turkey and northern Africa (Cramp 1988, Glutz & Bauer 1988b). Winter quarters stretch across Africa, between the Sahara and the tropical forest belt (Moreau 1972, Curry-Lindahl 1981). A very widespread and common breeder in Italy at low and median altitudes, lacking however on our study islands (Brichetti 1985, Meschini & Frugis in press).

Trapping patterns. A total of 608 birds ringed on the 4 islands, with reasonable samples for V, G and M. Very few birds present by half of March; more sensible movements start at the beginning of April and are almost over by the end of the month, which fits with data collected on C also in former years (Pettersson **et al.**, 1990). Median pentades 21 (M) and 22 (V, G). Very similar trapping patterns are observed on all stations, suggesting a fast sea crossing (Cramp 1988). Migratory periods between mid-March and mid-May are reported from other sites within the Mediterranean (Cramp 1988, Glutz & Bauer 1988b, Finlayson 1992, Thibault 1983).

Third primary. Mean values between 62.33 and 67.59, with most cases ranging 64–67 (range: 56.0–77.5). Lower values are reported from central Europe in autumn (Berthold **et al.**, 1991). Both on V and G a tendency is observed for a progressive decrease in wing length during the study period, suggesting a differential migration of sexes, also reported from the breeding quarters.

Fat score. In most cases median scores range between 1 to 3, indicating fairly low levels of fat accumulation on all islands. No differences can actually be observed among the four stations.

Body mass. Mean values 16.90 to 21.26 , with most cases between 18 to 20 on all islands (range:13.4–24.8). A tendency to the increase along the period is observed on the northern islands (G and M) which surprisingly have, on average, higher values than V. In general terms, our samples indicate slightly lower values than those reported from other Mediterranean sites (Cramp 1988, Glutz & Bauer 1988b), including the lowest value so far recorded for the species (Glutz & Bauer 1988b).

Nightingale - **Luscinia megarhynchos**

Third primary

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean			67.00	64.00	65.69	65.54	64.76	65.65	65.33	64.40	66.00	65.00
S. D.			1.73		2.06	1.74	2.40	1.98	2.04	1.69		
N	0	0	5	1	16	66	28	24	11	12	1	1
GIANNUTRI												
Mean			67.43	63.00	66.30	65.33	65.47	65.07	65.57	64.50	62.50	
S. D.			1.83		2.27	1.50	2.59	1.89	1.27	2.79	1.32	
N	0	0	3	1	4	22	30	14	7	8	3	0
VENTOTENE												
Mean	66.00	64.50	67.59	66.97	65.60	67.46	65.81	65.42	65.25	63.95	62.33	65.80
S. D.			2.23	1.77	2.05	4.19	2.15	2.29	2.20	2.58	.58	.99
N	1	1	8	9	35	8	151	79	24	22	3	2
CAPRI												
Mean					66.50			67.00	66.73			
S. D.					.87			2.83	.64			
N	0	0	0	0	3	0	0	2	3	0	0	0

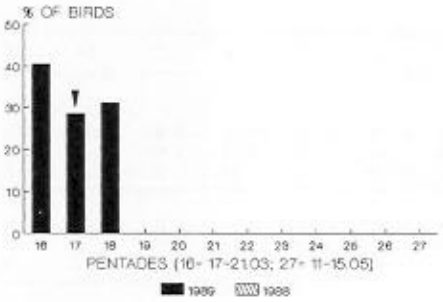
Fat score

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Median			4	3	2	3	2	2	2	3	3	3
N	0	0	5	1	16	66	28	24	11	12	1	1
GIANNUTRI												
Median			0	3	2	2	0	2	2	4	2	
N	0	0	3	1	4	22	30	14	7	8	3	0
VENTOTENE												
Median	0	1	3	3	2	1	1	2	2	2	3	1
N	1	1	8	9	35	8	151	79	24	22	3	2
CAPRI												
Median					3			2	1			
N	0	0	0	0	3	0	0	2	3	0	0	0

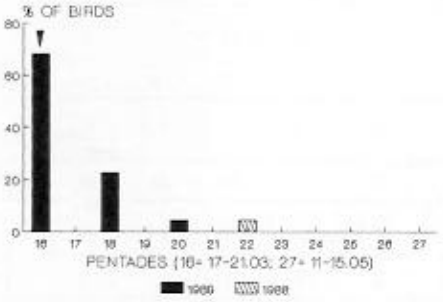
Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean			20.12	20.90	19.06	19.21	19.41	19.66	20.04	19.99	21.60	22.00
S. D.			.81		2.28	1.48	2.06	1.94	1.85	1.56		
N	0	0	5	1	16	66	28	24	11	12	1	1
GIANNUTRI												
Mean			20.03	18.30	19.15	19.40	19.04	20.03	19.53	21.26	19.43	
S. D.			1.61		1.16	1.66	1.84	1.64	1.65	1.80	.21	
N	0	0	3	1	4	22	30	14	7	8	3	0
VENTOTENE												
Mean	18.70	17.30	19.76	20.11	19.21	18.70	18.56	19.41	19.79	19.23	19.07	20.05
S. D.			2.02	1.29	1.89	1.40	1.63	2.33	1.56	1.88	1.27	.78
N	1	1	8	9	35	8	151	79	24	22	3	2
CAPRI												
Mean					20.50			19.45	16.90			
S. D.					2.40			2.90	1.40			
N	0	0	0	0	3	0	0	2	3	0	0	0

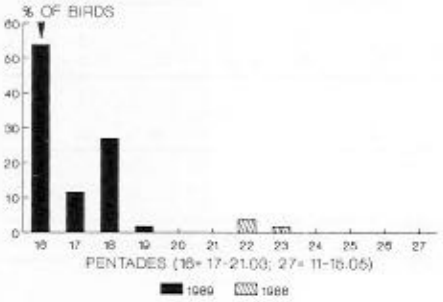
MONTECRISTO (N= 42)



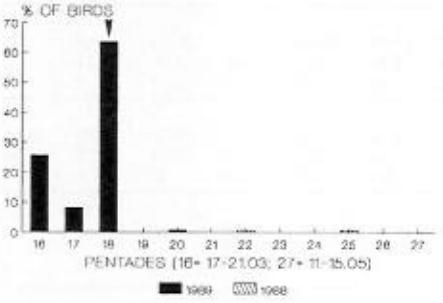
GIANNUTRI (N= 22)



VENTOTENE (N= 52)



CAPRI (N= 121)



BLACK REDSTART (**Phoenicurus ochruros**)

Short to medium distance migrant widely distributed all over Europe, with the exception of the northernmost regions (Cramp 1988, Glutz & Bauer 1988a). Winters mainly within the Mediterranean basin, including coastal and inland areas of north Africa and, with small populations, on all our four study islands. Only few records south of the Sahara have been reported (Cramp 1988, Zink 1987). The Italian population is widely distributed, mainly along the Alps and the Apennines (Meschini & Frugis, in press).

Trapping patterns. The total number of ringed birds is 237, 51% of which on Capri. Captures are concentrated almost exclusively in the second half of March, i.e. at the beginning of our study period. Median pentades 16 (G,V), 17 (M) and 18 (C). The strong presence of the species at mid-March has been confirmed by further observations (Giannutri, 16–17.03.91), confirming what already reported for the Mediterranean (Finlayson 1992, Glutz & Bauer 1988a, Thibault 1983). Very few birds have been ringed in April and May.

Third primary. Mean values vary from 62.88 to 67.05 (range: 59.0–69.0). No clear trends are observed, either during the study period or comparing the four islands. The rather high values of SD could be due to the presence of both males and females, considerably different in wing length (Svensson 1984). The lack of a decreasing trend in mean values along the study period could suggest the bulk of population crossing the Tyrrhenian Sea during the first half of March.

Fat score. Median values are higher in southernmost islands than in northernmost ones, confirming the trend observed for mean body mass values (see below).

Body mass. Mean values vary from 13.66 to 15.82 (range: 11.7–21.9), hence including the lowest values so far recorded for this species; anyway, data are in accordance with those previously recorded during spring migration (Cramp 1988, Glutz & Bauer 1988a). In all pentades with more than 10 birds ringed (16–17–18), mean values constantly decrease moving from south to north. This fact could suggest that also short-medium distance migrants wintering in southernmost areas cross the Tyrrhenian Sea rapidly.

Black Redstart - **Phoenicurus ochruros**

Third primary

	Pentades												
	16	17	18	19	20	21	22	23	24	25	26	27	
Islands	March			April						May			
MONTECRISTO													
Mean	64.24	63.50	64.15										
S. D.	1.58	2.45	1.14										
N	17	12	13	0	0	0	0	0	0	0	0	0	
GIANNUTRI													
Mean	65.09		64.06		65.20		65.00						
S. D.	1.75		1.56										
N	15	0	5	0	1	0	1	0	0	0	0	0	
VENTOTENE													
Mean	64.72	63.72	63.71	67.00			67.05	65.00					
S. D.	1.76	1.13	1.78				,07						
N	28	6	14	1	0	0	2	1	0	0	0	0	
CAPRI													
Mean	63.77	64.32	62.88		63.00		65.90			63.00			
S. D.	2.30	2.24	1.77										
N	31	10	77	0	1	0	1	0	0	1	0	0	

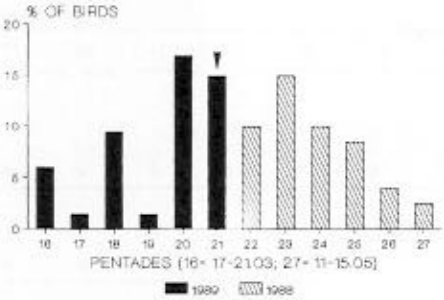
Fat score

	Pentades												
	16	17	18	19	20	21	22	23	24	25	26	27	
Islands	March			April						May			
MONTECRISTO													
Median	0	2	2										
N	17	12	13	0	0	0	0	0	0	0	0	0	
GIANNUTRI													
Median	0		0		2		3						
N	15	0	5	0	1	0	1	0	0	0	0	0	
VENTOTENE													
Median	2	4	3	0			2	4					
N	28	6	14	1	0	0	2	1	0	0	0	0	
CAPRI													
Median	3	2	3		2		2			3			
N	31	10	77	0	1	0	1	0	0	1	0	0	

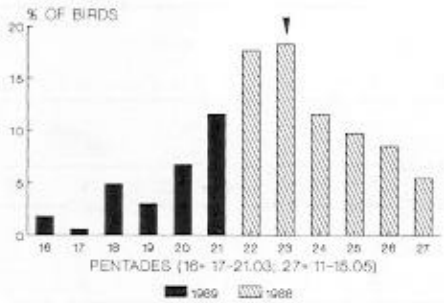
Body mass

	Pentades												
	16	17	18	19	20	21	22	23	24	25	26	27	
Islands	March			April						May			
MONTECRISTO													
Mean	13.66	14.59	14.39										
S. D.	1.29	1.14	1.15										
N	17	12	13	0	0	0	0	0	0	0	0	0	
GIANNUTRI													
Mean	14.00		14.40		15.50		15.60						
S. D.	1.12		1.61										
N	15	0	5	0	1	0	1	0	0	0	0	0	
VENTOTENE													
Mean	14.72	15.38	14.84	13.20			15.10	16.50					
S. D.	1.25	1.60	1.32				1.27						
N	28	6	14	1	0	0	2	1	0	0	0	0	
CAPRI													
Mean	15.57	15.51	15.82		14.70		15.50			14.70			
S. D.	1.91	1.56	1.41										
N	31	10	77	0	1	0	1	0	0	1	0	0	

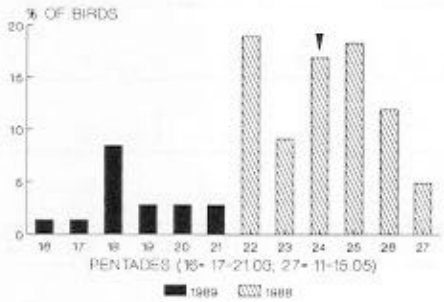
MONTECRISTO (N= 201)



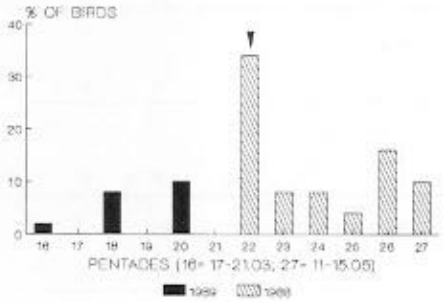
GIANNUTRI (N= 164)



VENTOTENE (N= 142)



CAPRI (N= 50)



REDSTART (**Phoenicurus phoenicurus**)

Long distance migrant widely distributed all over Europe, except in areas with typical Mediterranean vegetation (Cramp 1988, Glutz & Bauer 1988a) The main wintering region is constituted by the sub-Saharan savanna; recoveries of ringed birds are mostly concentrated in west Africa (Dowsett **et al.** 1988), but retraps also occur in the equatorial zone (Zink 1987) and even in Arabic peninsula. The Italian population is evenly distributed everywhere, with the exception of some southernmost areas and Sardinia (Meschini & Frugis, in press).

Trapping patterns. The total number of ringed birds is 557. Median pentades are 21 (M), 22 (C), 23 (G,V). The passage does not seem to be much concentrated, if compared with the migration patterns of many other species; at the beginning of the study period (March 15th) low percentages of trappings are already recorded; later on, the percentage of captures remains fairly high in the whole April, gradually decreasing in May. Timing of passage and peak period confirm what already reported for the Mediterranean (Glutz & Bauer 1988, Finlayson 1992, Thibault 1983, Sultana & Gauci 1982).

Third primary. Mean values vary from 59.50 to 62.53 (range: 55.0–67.5). No clear trends are observed, either during the study period or comparing the four islands. Further analyses taking into account sexual dimorphism could clarify the predictable asynchronous passage of males and females.

Fat score. Median values show large and apparently fortuitous variability. This could be due to the fact that redstarts can rest on the islands for the whole day, and even more; this is demonstrated by the fairly high number of daily recaptures. The variability of body mass values due to the different trapping hour could in this case be considerable.

Body mass. Mean values vary from 12.24 to 15.44 (range: 9.9–18.0), i.e. very low, some of them being therefore equal to lethal body mass values (Glutz & Bauer 1988a); they are anyway in accordance with those previously recorded during spring migration (Cramp 1988, Glutz & Bauer 1988a, Pettersson **et al.** 1990). The five highest mean values have all been recorded in C.

Redstart - **Phoenicurus phoenicurus**

Third primary

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
		March				April					May	
MONTECRISTO												
Mean	61.04	62.33	61.37	62.17	62.01	61.67	61.66	62.53	62.07	61.39	60.91	62.24
S. D.	1.56	4.51	1.96	.29	1.70	2.40	1.72	1.60	1.97	1.59	2.00	1.30
N	12	3	19	3	34	30	20	30	20	17	8	5
GIANNUTRI												
Mean	62.33	64.50	62.24	61.30	62.07	61.78	60.70	60.77	61.76	60.72	60.14	60.94
S. D.	1.89		1.91	1.44	1.50	2.20	2.11	1.72	1.97	1.14	1.59	2.13
N	3	1	8	5	11	19	29	30	19	16	14	9
VENTOTENE												
Mean	61.50	62.90	62.08	60.00	61.22	61.25	61.82	62.14	61.60	62.03	61.02	61.10
S. D.	2.12		1.45	2.16	.92	1.71	1.69	1.73	1.77	2.01	1.48	.73
N	2	1	12	4	4	4	27	13	24	26	17	7
CAPRI												
Mean	62.20		61.25		61.30		60.91	61.47	61.78	59.60	59.50	61.40
S. D.			2.18		2.49		1.93	1.76	1.41	.85	1.34	1.82
N	1	0	4	0	5	0	17	4	4	2	8	5

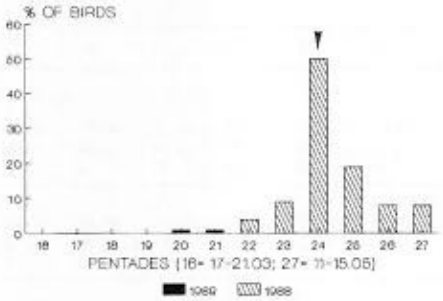
Fat score

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
		March				April					May	
MONTECRISTO												
Median	1	2	1	1	1	0	1	1	2	2	0	2
N	12	3	19	3	34	30	20	30	20	17	8	5
GIANNUTRI												
Median	2	0	3	3	2	1	2	3	3	3	2	3
N	3	1	8	5	11	19	29	30	19	16	14	9
VENTOTENE												
Median	2	1	3	1	3	2	2	3	1	1	1	3
N	2	2	12	4	4	4	27	13	24	26	17	7
CAPRI												
Median	3		3		4		3	3	3	2	3	4
N	1	0	4	0	5	0	17	4	4	2	8	5

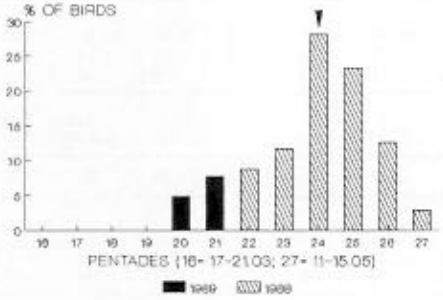
Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
		March				April					May	
MONTECRISTO												
Mean	12.56	12.53	13.50	12.97	12.81	12.27	12.94	12.85	12.86	12.89	12.24	12.80
S. D.	.92	1.04	1.73	.45	1.35	1.20	1.17	1.18	1.27	.92	.93	.78
N	12	3	19	3	34	30	20	30	20	17	8	5
GIANNUTRI												
Mean	12.93	12.20	13.65	14.20	12.84	12.81	13.44	13.42	14.18	14.21	12.45	13.37
S. D.	1.17		1.49	.94	1.40	1.46	1.23	1.01	1.41	1.06	1.13	1.11
N	3	1	8	5	11	19	29	30	19	16	14	9
VENTOTENE												
Mean	12.55	12.85	14.25	12.83	13.30	13.73	13.33	13.82	13.21	13.11	12.84	13.79
S. D.	.21	.49	1.32	1.20	1.31	1.43	1.01	1.35	.99	1.06	.86	1.09
N	2	2	12	4	4	4	27	13	24	26	17	7
CAPRI												
Mean	15.00		14.15		15.44		14.41	14.58	14.93	13.55	12.87	14.38
S. D.			1.09		.97		.82	1.28	1.45	1.63	1.00	.80
N	1	0	4	0	5	0	17	4	4	2	8	5

MONTECRISTO (N= 99)



GIANNUTRI (N= 102)



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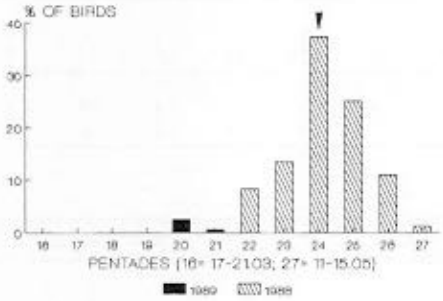
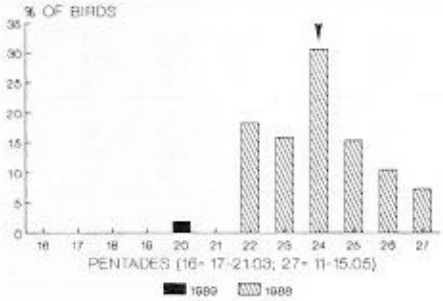


CAPRI (N= 162)



WHINCHAT (**Saxicola rubetra**)

Long distance migrant, wintering south of the Sahara, breeding all over central and northern Europe, with a more scattered distribution in the Mediterranean region (Cramp 1988, Glutz & Bauer 1988a). In Italy breeds in the Alps and in the mountains of the Centre and South (Meschini & Frugis in press).

Trapping patterns. Well represented on all islands, with a total of 518 inds. Captures are distributed from the second pentade of April till mid-May, being concentrated in last days of April and the beginning of May; the same seasonal pattern has been reported from Malta (Sultana and Gauci 1982). The passage goes on, with a clear tendency to the decrease, well after the end of our study period (Pettersson **et al.** 1990, Finlayson 1992). A clear similarity can be observed on all four islands, with a peak of captures in pentade 24, which is also the median pentade of passage on all islands. Median date recorded on C May 7th (Pettersson **et al.** 1990)).

Third primary. Mean values vary from 55.29 to 59.28 (range: 45.0–65.0). A very clear tendency to the decrease can be observed on all four islands, with shorter winged birds trapped at the end of the study period. This is also related to the different timing of passage of sexes and age classes across the Mediterranean (Pettersson **et al.** 1990, Spina **et al.** 1991). Similar mean values of third primary are reported from central Europe in summer and autumn (Berthold **et al.**, 1991).

Fat score. Median scores on all the islands range between 0 and 4. A slight decrease during the peak pentade 24 can be observed almost in all stations, with a general opposite tendency later in the period, more evident in C and G. Birds trapped on C show higher fat reserves, and the very slight increase in median scores after the median date of the passage seem to be confirmed in this station, at least for adult birds (Pettersson **et al.** 1990).

Body mass. Mean values vary from 12.45 to 16.17 (range: 10.2–19.6). Higher values have been recorded in Malta and Gibraltar during spring migration (Sultana and Gauci in Cramp 1988, Finlayson 1981), and our lowest value is very close to that so far reported for exhausted birds (Cramp 1988). A tendency to the decrease along the trapping season can be observed on all four islands. As also for third primary and fat score, an increase is shown by birds ringed on C and G during the last pentade.

Whinchat - **Saxicola rubetra**

Third primary

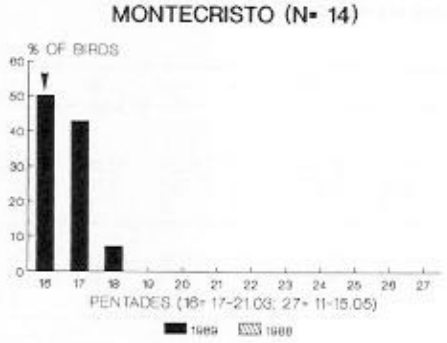
Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
MONTECRISTO												
Mean						60.00	58.38	59.28	57.78	57.23	57.90	56.94
S. D.							3.20	2.27	2.12	2.01	2.04	1.27
N	0	0	0	0	0	1	4	9	50	19	8	8
GIANNUTRI												
Mean					57.85	59.06	56.78	57.58	57.72	56.88	56.12	57.17
S. D.					.85	1.67	2.59	3.04	1.83	1.71	2.48	1.89
N	0	0	0	0	4	8	9	12	29	24	13	3
VENTOTENE												
Mean					59.20	58.00	59.00	58.21	58.02	58.22	56.99	56.75
S. D.					.79		2.53	3.52	1.84	1.67	.99	1.06
N	0	0	0	0	4	1	13	21	58	39	17	2
CAPRI												
Mean					57.55		58.91	58.44	58.28	56.74	55.29	55.46
S. D.					.64		2.17	1.34	1.87	2.00	1.59	1.50
N	0	0	0	0	2	0	30	26	50	25	17	12

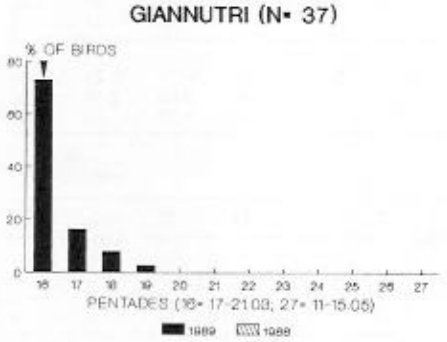
Fat score

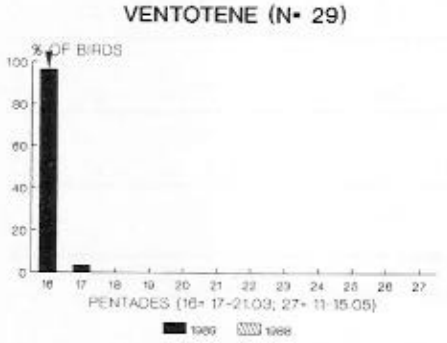
Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
MONTECRISTO												
Median						2	3	3	0	2	0	1
N	0	0	0	0	0	1	4	9	50	19	8	8
GIANNUTRI												
Median					1	3	0	2	2	2	2	3
N	0	0	0	0	4	8	9	12	29	24	13	3
VENTOTENE												
Median					3	3	1	3	1	1	1	1
N	0	0	0	0	4	1	13	21	58	39	17	2
CAPRI												
Median					3		3	3	2	3	3	4
N	0	0	0	0	2	0	30	26	50	25	17	12

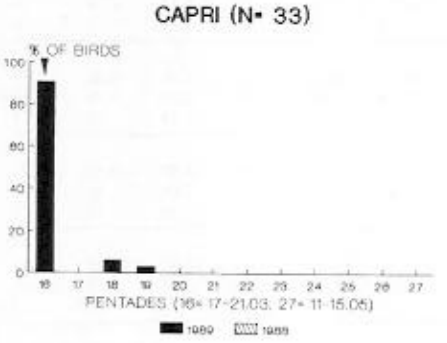
Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
MONTECRISTO												
Mean						14.60	15.00	16.17	13.20	13.43	13.21	12.45
S. D.							2.45	1.75	1.36	1.15	1.24	1.19
N	0	0	0	0	0	1	4	9	50	19	8	8
GIANNUTRI												
Mean					14.35	15.15	14.62	15.02	14.22	14.80	13.66	14.50
S. D.					2.08	1.25	1.24	1.65	1.39	1.09	1.39	.10
N	0	0	0	0	4	8	9	12	29	24	13	3
VENTOTENE												
Mean					14.95	15.90	14.48	15.04	13.87	14.40	13.36	12.70
S. D.					1.13		1.42	2.11	1.38	1.64	1.10	2.40
N	0	0	0	0	4	1	13	21	58	39	17	2
CAPRI												
Mean					14.80		15.13	15.48	15.57	14.72	13.89	15.46
S. D.					2.26		.96	1.02	1.32	1.46	1.20	1.66
N	0	0	0	0	2	0	30	26	50	25	17	12









STONECHAT (**Saxicola torquata**)

Migratory to resident in different parts of range; breeds all over the Mediterranean and in central Europe, wintering north of the Sahara (Cramp 1988, Glutz & Bauer 1988a). In Italy common all over the country, with probably resident populations (Meschini & Frugis in press, Cramp 1988).

Trapping patterns. Represented in all four sites, but in low numbers; the total of trapped birds amounts to 113 inds. The captures are concentrated in March, with only very few birds trapped during the first pentade of April and none later. Data obtained from other southern European stations confirm the early spring passage of migrating populations (see Glutz & Bauer 1988a, Finlayson 1992). A clear similarity is evident on all four islands. In all stations a peak can be observed on pentade 16, when more than 70 % of birds are trapped.

Third primary. Mean values vary from 46.70 to 49.29 (range: 44.5–51.5). A tendency to the decrease is generally observed from pentade 16 to pentade 18, and is possibly related to the differential passage of sexes (see Cramp 1988). On pentade 16, very similar mean values are recorded on all islands (range between 48.59 and 49.29).

Fat score. No clear tendencies can be observed. During pentades 16–17 birds trapped on southern islands, C and V, have usually higher fat reserves than birds trapped more to the north. Birds resting on M seem to have totally depleted their fat reserves; this fact could suggest a progressive use of fat reserves at different stages of sea crossing, without any real refuelling.

Body mass. Mean values vary between 12.10 and 14.83 (range: 10.4–16.1), with the lowest being reported from C. During the first two pentades a slight general decrease in body mass values parallel to the latitudinal gradient is observed. Considering the similarity of trapping patterns and wing lenghts in all four sites during the same period (see above), it could be hypothized that the birds trapped in all islands belong to the same front of migration, fastly crossing central Mediterranean (see Spina **et al.** 1991).

Stonechat - **Saxicola torquata**

Third primary

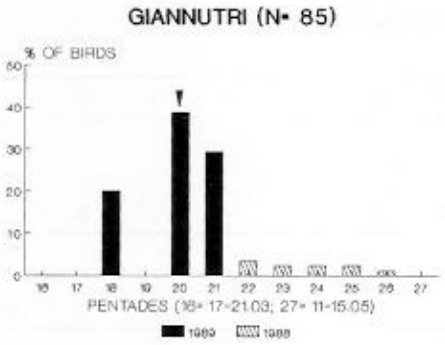
Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean	49.29	47.67	45.00									
S. D.	1.07	.88										
N	7	6	1	0	0	0	0	0	0	0	0	0
GIANNUTRI												
Mean	48.97	47.50	48.90	51.00								
S. D.	1.01	1.61	1.28									
N	27	6	3	1	0	0	0	0	0	0	0	0
VENTOTENE												
Mean	48.59	48.50										
S. D.	1.30											
N	28	1	0	0	0	0	0	0	0	0	0	0
CAPRI												
Mean	48.69		46.70	45.20								
S. D.	1.00		.71									
N	30	0	2	1	0	0	0	0	0	0	0	0

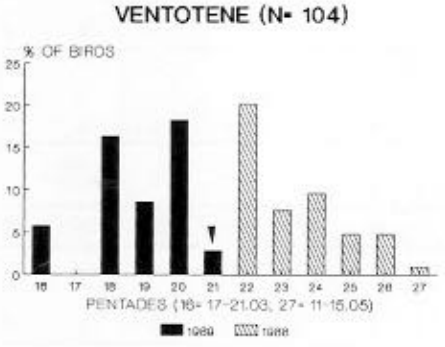
Fat score

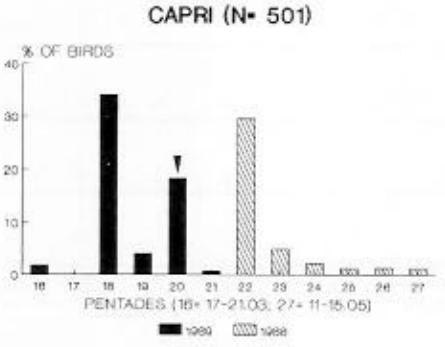
Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Median	0	0	1									
N	7	6	1	0	0	0	0	0	0	0	0	0
GIANNUTRI												
Median	0	2	5	2								
N	27	6	3	1	0	0	0	0	0	0	0	0
VENTOTENE												
Median	2	3										
N	28	1	0	0	0	0	0	0	0	0	0	0
CAPRI												
Median	3		3	2								
N	30	0	2	1	0	0	0	0	0	0	0	0

Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean	12.10	12.18	11.50									
S. D.	.52	1.12										
N	7	6	1	0	0	0	0	0	0	0	0	0
GIANNUTRI												
Mean	13.44	13.25	14.83	13.40								
S. D.	1.41	1.06	1.42									
N	27	6	3	1	0	0	0	0	0	0	0	0
VENTOTENE												
Mean	13.31	13.90										
S. D.	1.20											
N	28	1	0	0	0	0	0	0	0	0	0	0
CAPRI												
Mean	14.07		14.20	12.70								
S. D.	.89		2.40									
N	30	0	2	1	0	0	0	0	0	0	0	0







WHEATEAR (**Oenanthe oenanthe**)

Trans-Saharan migrant, breeding all over Europe and wintering in a broad belt north of the equator (Cramp 1988, Glutz & Bauer 1988a). In Italy breeds quite commonly, mostly on mountains (Meschini & Frugis in press).

Trapping patterns. Mainly represented on C, less on V and G, with only two individuals trapped on M, and a total of 692 inds. Captures are distributed all along the study period, being concentrated in April (median pentades of passage 20 on G and C, 21 on V), strongly decreasing then by the end of the study period. Main spring passage in March-May reported also from other Mediterranean sites (see Cramp 1988, Glutz & Bauer 1988a, Pettersson **et al.** 1990, Finlayson 1992, Thibault 1983). A similarity in migratory pattern can be observed between C and V, with three peaks in pentades 18, 20 and 22 respectively.

Third primary. Mean values vary from 68.86 to 73.27 (range: 64.0–78.5). No marked tendencies can be observed apart from a slight seasonal decrease in C and G. No real differences in wing length between birds trapped before and after the median date of trapping (April 18th, Pettersson **et al.** 1990) reported from other samples collected on C.

Fat score. Median scores on C, V and G are generally fairly high (score 3). A clear similarity can be observed among the samples collected on these three islands, with birds showing a rather constant fat scoring from the beginning of the study period to pentade 23, when more than 90 % of birds are trapped. Constancy in fat reserves during spring passage seems confirmed in C (Pettersson **et al.** 1990).

Body mass. Mean values vary from 20.15 to 25.40 (range: 15.0–29.6), in accordance with similar studies on spring passage across the Mediterranean, although the extreme minimum value seems to be the lowest so far recorded for the species (see Cramp 1988, Pettersson **et al.** 1990). A general tendency to the decrease can be observed in the three islands. Birds resting on C show mean values generally higher than those found on V and G.

Wheatear - **Oenanthe oenanthe**

Third primary

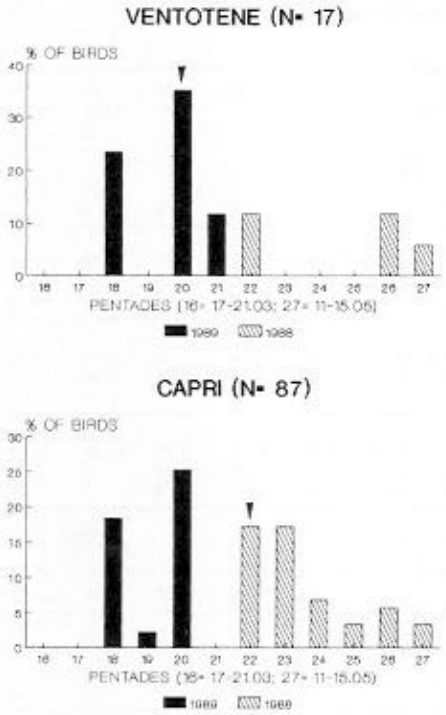
	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
Islands												
MONTECRISTO												
Mean					69.00		74.50					
S. D.												
N	0	0	0	0	1	0	1	0	0	0	0	0
GIANNUTRI												
Mean			72.68		71.15	71.67	71.33	72.50	70.75	71.25	70.00	
S. D.			2.30		2.12	3.22	3.06	4.95	1.77	4.60		
N	0	0	17	0	33	25	3	2	2	2	1	0
VENTOTENE												
Mean	73.27		71.78	70.44	71.05	72.33	70.19	70.71	72.66	73.00	70.40	73.50
S. D.	3.38		2.02	1.26	1.86	1.15	2.37	2.93	2.37	3.24	3.76	
N	6	0	17	9	19	3	21	8	10	5	5	1
CAPRI												
Mean	72.99		71.97	71.07	69.99	70.55	71.24	71.01	70.55	70.97	68.86	69.73
S. D.	2.61		2.31	1.65	2.01	1.41	2.00	2.57	2.46	1.44	1.35	3.01
N	9	0	171	21	92	4	149	25	11	6	7	6

Fat score

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
Islands												
MONTECRISTO												
Median					3		0					
N	0	0	0	0	1	0	1	0	0	0	0	0
GIANNUTRI												
Median			3		3	3	3	4	1	0	3	
N	0	0	17	0	33	25	3	2	2	2	1	0
VENTOTENE												
Median	3		3	3	3	2	3	2	3	3	2	4
N	6	0	17	9	19	3	21	8	10	5	5	1
CAPRI												
Median	3		3	3	3	3	3	3	3	4	4	4
N	9	0	171	21	92	4	149	25	11	6	7	6

Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
Islands												
MONTECRISTO												
Mean					22.00		20.30					
S. D.												
N	0	0	0	0	1	0	1	0	0	0	0	0
GIANNUTRI												
Mean			22.86		23.48	23.50	22.90	24.50	20.15	22.20	23.60	
S. D.			2.11		1.29	2.63	2.84	.71	1.91	3.11		
N	0	0	17	0	33	25	3	2	2	2	1	0
VENTOTENE												
Mean	24.40		23.51	24.03	23.28	23.33	21.25	22.22	22.48	21.68	21.18	22.70
S. D.	2.49		2.70	3.10	2.04	1.21	2.20	2.96	3.65	3.76	4.29	
N	6	0	17	9	19	3	21	8	10	5	5	1
CAPRI												
Mean	25.40		23.83	22.81	23.58	23.42	22.74	22.71	22.91	22.93	21.30	21.62
S. D.	1.60		1.98	1.96	2.33	2.34	1.91	1.60	2.39	2.53	1.62	2.19
N	9	0	171	21	92	4	149	25	11	6	7	6



BLACK-EARED WHEATEAR (**Oenanthe hispanica**)

Long distance migrant, breeding within the Mediterranean area south of the Alps, and wintering in a large belt just south of the Sahara, stretching from Senegal to Ethiopia (Cramp 1988). The two subspecies (**O. h. hispanica** and **O. h. melanoleuca**) breed in Italy along the Tyrrhenian coast and in the South (Cramp 1988, Meschini & Frugis in press).

Trapping patterns. Represented mainly on C, much less on V and with only very few birds being trapped in the other stations for a total of 110 ringed inds. Captures are distributed from the end of March till the end of the study period, being concentrated in April, with 22 as the median pentade on C. A similarity between the two representative islands, C and V, can be observed, with a peak in pentade 20 (also recorded on G). Few birds are still crossing by the end of our study period. Spring migration seems to continue till the end of May, according to other studies (see Cramp 1988, Glutz & Bauer 1988a and Pettersson **et al.** 1990).

Third primary. Mean values vary from 66.00 to 70.88 (range: 64.00–74.9). A similarity can be observed between the two representative islands, although the increase registered on V during the second part of the study period seems to be somehow shifted later. Two peaks in measurements can be stressed out: the first at the beginning of the passage (pentade 18) and the second in pentade 24 (C) and 26 (V). Despite the low number of trapped birds, this could be a consequence of a different transit of sexes, age classes and populations across the Mediterranean (see Cramp 1988, Glutz & Bauer 1988a) (both subspecies being trapped on C and V).

Fat score. In C median scores are quite high and constant, between 2 and 3, with a tendency to the increase at the end of the period. On the opposite no tendency can be observed in V, where values are lower, apart from a decrease after pentade 22. The very few individuals trapped in G show a clear decrease from pentade 20 to pentade 22.

Body mass. Mean values vary from 15.65 to 18.87 in three islands (C, V and G) (range: 14.2–22.5), according to similar studies (see Cramp 1988). No clear tendencies or similarities can be observed on C and V, apart from a general decrease on both islands towards the end of the period. Mean values on C are usually higher, also according to median fat score.

Black-eared Wheatear - **Oenanthe hispanica**

Third primary

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean									72.50			
S. D.												
N	0	0	0	0	0	0	0	0	1	0	0	0
GIANNUTRI												
Mean					68.75		65.00					
S. D.					1.71							
N	0	0	0	0	4	0	1	0	0	0	0	0
VENTOTENE												
Mean			71.22		69.50	66.90	67.50				68.25	65.00
S. D.			1.84		1.89	2.69	.71				.35	
N	0	0	4	0	6	2	2	0	0	0	2	1
CAPRI												
Mean			70.46	69.25	68.07		69.44	69.74	70.88	68.33	66.30	66.00
S. D.			1.49	5.30	1.52		3.21	2.08	1.26	3.18	1.92	1.00
N	0	0	16	2	22	0	15	15	6	3	5	3

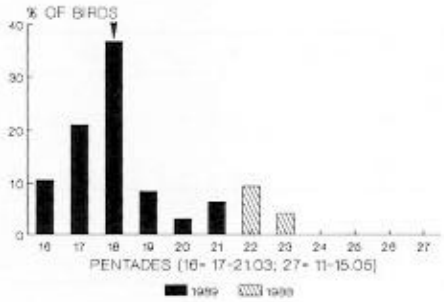
Fat score

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Median									0			
N	0	0	0	0	0	0	0	0	1	0	0	0
GIANNUTRI												
Median					4		0					
N	0	0	0	0	4	0	1	0	0	0	0	0
VENTOTENE												
Median			0		4	1	2				1	0
N	0	0	4	0	6	2	2	0	0	0	2	1
CAPRI												
Median			3	3	3		3	3	3	2	3	4
N	0	0	16	2	22	0	15	15	6	3	5	3

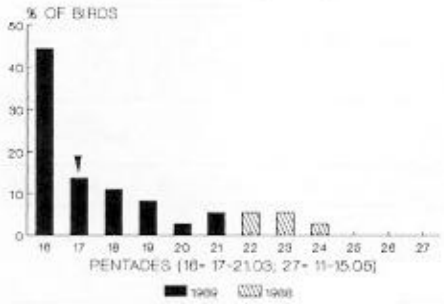
Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean									15.10			
S. D.												
N	0	0	0	0	0	0	0	0	1	0	0	0
GIANNUTRI												
Mean					18.87		14.80					
S. D.					1.02							
N	0	0	0	0	4	0	1	0	0	0	0	0
VENTOTENE												
Mean			16.00		18.78	15.65	14.50				15.75	16.50
S. D.			1.05		2.10	2.05					.35	
N	0	0	4	0	6	2	1	0	0	0	2	1
CAPRI												
Mean			17.04	18.75	18.05		18.27	17.31	18.18	17.07	16.14	17.53
S. D.			1.39	1.77	1.11		1.89	1.37	1.14	1.05	.67	.47
N	0	0	16	2	22	0	15	15	6	3	5	3

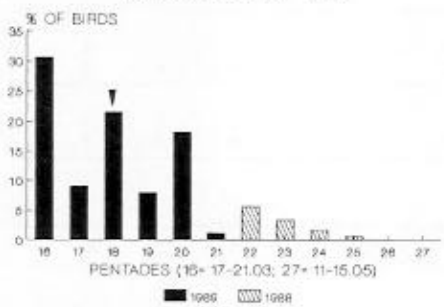
MONTECRISTO (N= 95)



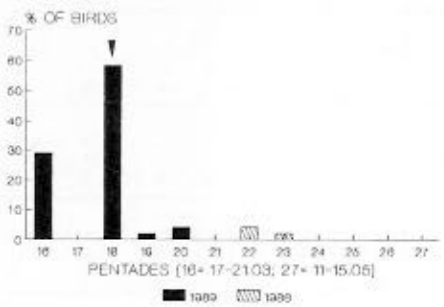
GIANNUTRI (N= 36)



VENTOTENE (N= 176)



CAPRI (N= 48)



SONG THRUSH (**Turdus philomelos**)

Mostly resident, with nothern populations partially or entirely migratory, breeding all over Europe and wintering within the Mediterranean (Cramp 1988, Glutz & Bauer 1988b). In Italy breeds on the Alps and the Apennines (Meschini & Frugis in press).

Trapping patterns. Represented on all islands, with a total of 355 trapped birds. Captures are distributed from mid-March to the end of April (only one bird trapped in May), being mostly concentrated in March, when more than 70% of birds have been ringed (median pentade 17 on G and 18 on the other islands). Other studies confirm the spring passage across the Mediterranean in the same period (see Thibault 1983, Glutz & Bauer 1988b, Cramp 1988, Pettersson **et al.** 1990, Finlayson 1992). No real similarity can be observed among the four islands, apart from a general tendency to the decrease towards the end of April.

Third primary. Mean values vary between 86.05 and 90.50 (range: 84.2–96.5). No clear tendencies can be observed. Mean values of third primary in central Europe in summer and autumn seem to be generally similar (Berthold **et al.** 1991). The range of variation for birds ringed in March within our sample is more restricted on all four islands: from 88.50 to 90.20, becoming wider later on.

Fat score. Median scores on all the stations are generally very low, only few birds showing scores higher than 3. On C and V, the southern stations, birds show higher fat reserves than on G and M, where they have nearly no visible fat at all, which could suggest a progressive use of energy reserves. From mid April, fat scores tend to decrease in the two southern islands.

Body mass. Mean values vary from 52.50 and 65.03 (range: 41.5–80.0); if compared with those formerly gathered in the Camargue during the same period, they seem to be generally very low, close to the minimum values obtained in that station (see Glutz & Bauer 1988b). A general decrease in body mass parallel to the latitudinal gradient is observed till mid-April (pentade 20), with a clear similarity on the four islands.

Song Thrush - **Turdus philomelos**

Third primary

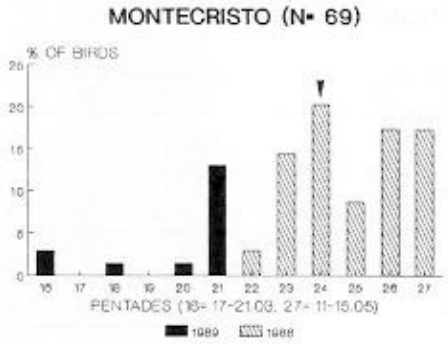
Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
MONTECRISTO												
Mean	88.20	88.93	88.87	88.88	90.50	89.58	89.72	87.63				
S. D.	1.84	1.62	1.90	1.98	2.29	2.08	1.62	1.89				
N	10	20	35	8	3	6	9	4	0	0	0	0
GIANNUTRI												
Mean	90.20	89.25	90.13	89.93	87.00	88.65	86.50	87.25	88.00			
S. D.	2.35	.65	2.78	1.62		1.20	2.12	.35				
N	16	5	4	3	1	2	2	2	1	0	0	0
VENTOTENE												
Mean	89.63	89.37	89.06	89.65	88.63	89.50	88.06	90.42	89.00	88.00		
S. D.	2.19	1.54	2.04	1.94	2.48	2.12	2.05	1.69	1.00			
N	54	16	38	14	32	2	10	6	3	1	0	0
CAPRI												
Mean	89.06		88.31	87.00	86.05		88.45	88.50				
S. D.	2.32		2.20		.07		2.05					
N	14	0	28	1	2	0	2	1	0	0	0	0

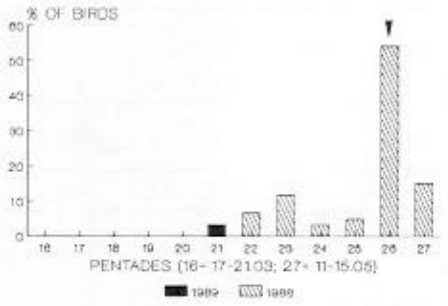
Fat score

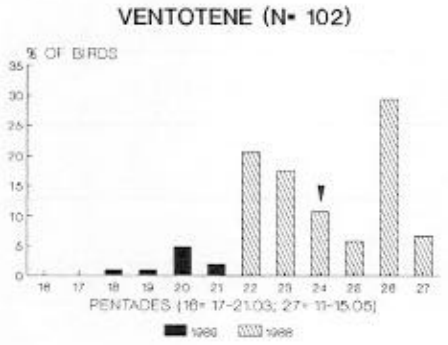
Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
MONTECRISTO												
Median	0	0	0	0	1	0	0	0				
N	10	20	35	8	3	6	9	4	0	0	0	0
GIANNUTRI												
Median	0	0	0	0	0	0	0	0	1			
N	16	5	4	3	1	2	2	2	1	0	0	0
VENTOTENE												
Median	3	1	2	2	2	2	0	0	1	0		
N	54	16	38	14	32	2	10	6	3	1	0	0
CAPRI												
Median	2		2	2	3		2	1				
N	14	0	28	1	2	0	2	1	0	0	0	0

Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
MONTECRISTO												
Mean	57.40	54.48	54.13	55.69	58.67	60.42	55.17	54.38				
S. D.	4.93	6.91	5.75	5.09	7.57	2.94	4.00	3.90				
N	10	20	35	8	3	6	9	4	0	0	0	0
GIANNUTRI												
Mean	58.37	59.76	55.75	57.33	55.00	64.25	52.50	54.00	63.50			
S. D.	5.56	6.82	4.11	10.07		6.01	6.36	1.41				
N	16	5	4	3	1	2	2	2	1	0	0	0
VENTOTENE												
Mean	65.03	60.13	59.22	60.50	61.09	63.50	60.54	60.92	62.33	55.00		
S. D.	6.08	5.27	4.89	4.07	5.53	6.36	5.37	4.05	6.03			
N	54	16	38	14	32	2	10	6	3	1	0	0
CAPRI												
Mean	64.17		62.18	63.00	65.00		58.50	51.00				
S. D.	4.46		4.56		4.24		4.95					
N	14	0	28	1	2	0	2	1	0	0	0	0







SEDGE WARBLER (**Acrocephalus schoenobaenus**)

Trans-Saharan migrant with a wide breeding range in Eurasia, and vast winter quarters from the Sahelian area to tropical and southern Africa (Glutz & Bauer 1991b, Dowsett **et al.** 1988). A very localized breeder in northern Italy (Meschini & Frugis in press).

Trapping patterns. Reasonable samples collected only on three islands (M, G, V), with a total of 231 individuals ringed. Few birds are present already by mid-March, but most catches take place within the second half of April and the first half of May; median passage dates in pentades 24 (M, V) and 26 (G). Migratory period similar to that reported from Malta (Sultana & Gauci, 1982).

Third primary. Values ranging from 49.80 and 53.50, with most cases between 51 and 53 (range: 48.0–56.0), without any seasonal tendency. These values are well within the limits reported during autumn migration in other sites in northern Italy (Spina e Bezzi, 1990) and central Europe (Berthold **et al.**, 1991).

Fat score. A general tendency can be observed for birds trapped on island V to have higher median values if compared to the northernmost sites G and M, indicating a progressive use of energetic reserves during sea crossing. Most pentade samples show that birds still show some amount of subcutaneous fat on all islands, with rather few cases scoring 0.

Body mass. Mean values between 9.57 and 12.20 (range: 8.1 – 14.9). Again, as indicated also by fat score, birds sampled at lower latitudes (V) generally show relatively higher body masses with respect to later stages of sea crossing (G, M). Our mean values are comparable to those reported by other authors from different Mediterranean sites in spring (Flint & Stewart 1983, Sultana & Gauci 1982).

Sedge Warbler - **Acrocephalus schoenobaenus**

Third primary

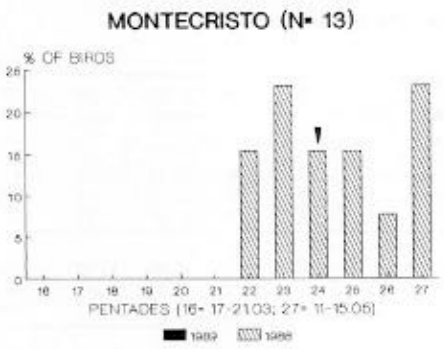
	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean	53.50		53.00		52.50	51.28	51.50	51.22	52.09	52.18	52.35	51.67
S. D.	2.12					1.68	.71	.89	1.42	2.10	1.44	1.97
N	2	0	1	0	1	9	2	10	14	6	12	12
GIANNUTRI												
Mean						52.25	51.13	51.07	51.50	52.00	51.39	51.22
S. D.						1.77	1.31	1.10	.71	2.29	1.67	1.66
N	0	0	0	0	0	2	4	7	2	3	32	9
VENTOTENE												
Mean			52.50	49.80	52.70	51.50	52.18	52.01	51.64	51.62	52.27	51.96
S. D.					2.11	1.41	1.78	1.35	1.55	1.56	1.67	1.04
N	0	0	1	1	5	2	21	18	11	6	30	7
CAPRI												
Mean												54.00
S. D.												
N	0	0	0	0	0	0	0	0	0	0	0	1

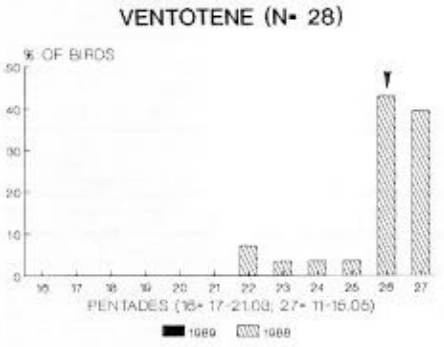
Fat score

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Median	3		3		2	0	4	2	1	4	0	1
N	2	0	1	0	1	9	2	10	14	6	12	12
GIANNUTRI												
Median						2	0	3	2	2	2	4
N	0	0	0	0	0	2	4	7	2	3	32	9
VENTOTENE												
Median			5	2	2	3	4	4	5	3	2	5
N	0	0	1	1	5	2	21	18	11	6	30	7
CAPRI												
Median												5
N	0	0	0	0	0	0	0	0	0	0	0	1

Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean	11.20		11.50		10.20	9.57	12.20	10.54	10.38	11.77	9.74	10.48
S. D.	.99					.87	.28	1.39	.93	1.65	.87	1.47
N	2	0	1	0	1	9	2	10	14	6	12	12
GIANNUTRI												
Mean						9.65	9.80	10.68	11.55	10.60	9.72	11.46
S. D.						1.20	.55	.77	1.91	.85	.76	1.97
N	0	0	0	0	0	2	4	7	2	3	32	9
VENTOTENE												
Mean			10.70	9.00	10.06	9.95	11.56	11.46	11.13	11.82	10.45	11.97
S. D.					.79	.64	1.40	1.51	3.87	2.08	.88	1.12
N	0	0	1	1	5	2	21	18	11	6	30	7
CAPRI												
Mean												12.80
S. D.												
N	0	0	0	0	0	0	0	0	0	0	0	1





REED WARBLER (**Acrocephalus scirpaceus**)

Long distance migrant widely distributed all over Europe, with the exception of the northernmost regions as well as scattered areas within the Mediterranean basin (Glutz & Bauer 1991a). European populations winter almost exclusively in sub-Saharan savannas of west Africa (Dowsett **et al.** 1988), with only a single record from the South-East (Zink 1987), where eastern races regularly occur. A widely distributed breeder in Italy, also with important local populations, usually below 500 m a.s.l. (Brichetti 1985, Meschini & Frugis in press).

Trapping patterns. The total number of ringed birds is 44, 64% of which on V; no captures occurred at C, and only 3 at G. All birds were ringed in 1988, therefore after mid-April; median pentades for the larger samples are 25 (M) and 26 (V). The first sightings in continental Europe may occur from the end of March (Glutz & Bauer 1991a); this difference, together with the rather low number of captures, also recorded for Malta (Sultana & Gauci 1982), suggest that the central Mediterranean flyway could be only a minor migratory route for this species.

Third primary. Mean values vary from 50.15 to 54.00 (range: 49.0–54.8). No clear trends are observed, either during the study period or comparing the four islands.

Fat score. A remarkable variability in median values is observed (from 0 to 4) within the however rather small samples.

Body mass. Mean values vary from 9.50 to 10.98 (range: 8.1–12.5), in accordance with those previously recorded elsewhere during spring migration (Glutz & Bauer 1991a). No clear trends can be observed, what could also be related to the very small number of birds ringed on almost all pentades.

Reed Warbler - **Acrocephalus scirpaceus**

Third primary

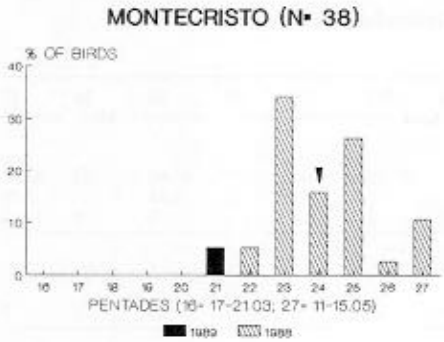
	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean							51.50	54.00	51.75	50.65	53.00	50.17
S. D.							.71	.50	.35	1.63		1.26
N	0	0	0	0	0	0	2	3	2	2	1	3
GIANNUTRI												
Mean									52.00		53.00	
S. D.									.71			
N	0	0	0	0	0	0	0	0	2	0	1	0
VENTOTENE												
Mean							50.15	51.50	51.00	52.00	52.32	52.05
S. D.							.07				1.32	1.06
N	0	0	0	0	0	0	2	1	1	1	12	11
CAPRI												
Mean												
S. D.												
N	0	0	0	0	0	0	0	0	0	0	0	0

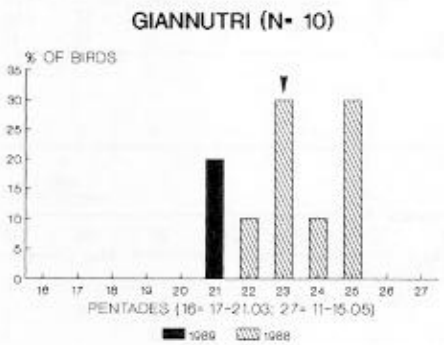
Fat score

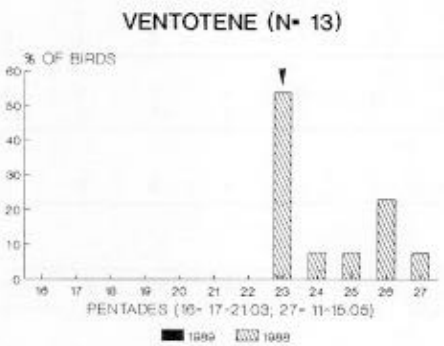
	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Median							3	2	4	2	3	1
N	0	0	0	0	0	0	2	3	2	2	1	3
GIANNUTRI												
Median									4		2	
N	0	0	0	0	0	0	0	0	2	0	1	0
VENTOTENE												
Median							1	0	4	1	1	3
N	0	0	0	0	0	0	2	1	1	1	12	11
CAPRI												
Median												
N	0	0	0	0	0	0	0	0	0	0	0	0

Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean							10.65	11.17	11.30	9.50	11.80	9.47
S. D.							.92	1.10	.99	.71		.15
N	0	0	0	0	0	0	2	3	2	2	1	3
GIANNUTRI												
Mean									9.80		11.20	
S. D.									2.40			
N	0	0	0	0	0	0	0	0	2	0	1	0
VENTOTENE												
Mean							9.70	9.60	10.60	10.90	10.18	10.98
S. D.							.42				.92	.91
N	0	0	0	0	0	0	2	1	1	1	12	11
CAPRI												
Mean												
S. D.												
N	0	0	0	0	0	0	0	0	0	0	0	0







GREAT REED WARBLER (**Acrocephalus arundinaceus**)

Polytypic species whose nominate race breeds across southern and central Europe as far north as the Baltic coasts (Glutz & Bauer 1991a). This population winters in sub-Saharan Africa, with recoveries of central European birds concentrated on the Atlantic side (Zink 1987). On the Italian mainland it is a common and widespread breeder in all suitable habitats (Meschini & Frugis in press).

Trapping patterns. Ringing total 61 birds, with most captures on northernmost island (M: 38). Here, first presences in pentade 21; median pentades 23 (G, V) and 24 (M). No captures occurred at C. Passage almost over at the end of the study period. More sensible captures on M may partly be due to particular habitat features (presence of a stream with sedge stands). The species is usually recorded on Malta during a longer season (late March to mid June: Sultana & Gauci 1982), though main period similar to ours.

Third primary. Mean values between 73.63 and 75.50 (range: 67.1–81.8). No apparent differences among islands, nor among best represented pentades.

Fat score. Median scores at northern islands (M,G) most often 1 or 2, i.e. not particularly low and not different from those recorded much further south (V). This might indicate one reason more to explain the higher number of captures at relatively northern sites: birds would not normally stopover on islands above a given reserve threshold, leaner birds becoming progressively more frequent as the latitude increases.

Body mass. Mean values 22.88 to 30.00 (range: 19.5–35.0), with neglectable differences among sites and periods which would confirm the points discussed above. Little comparison material from the spring season: in the Camargue, in April 30.5± 2.52 , in May 29.2 ± 3.12 (all values from morning hours) (Glutz & Bauer 1991a), indicating already some extent of refuelling.

Great Reed Warbler - **Acrocephalus arundinaceus**

Third primary

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean						75.50	74.50	74.62	73.63	73.78	71.00	74.55
S. D.						2.12	6.36	1.79	1.42	2.79		.53
N	0	0	0	0	0	2	2	13	6	10	1	4
GIANNUTRI												
Mean						79.90	77.00	74.50	72.00	73.83		
S. D.						2.69		3.04		.76		
N	0	0	0	0	0	2	1	3	1	3	0	0
VENTOTENE												
Mean								75.22	75.00	75.00	74.33	72.50
S. D.								1.44			1.33	
N	0	0	0	0	0	0	0	7	1	1	3	1
CAPRI												
Mean												
S. D.												
N	0	0	0	0	0	0	0	0	0	0	0	0

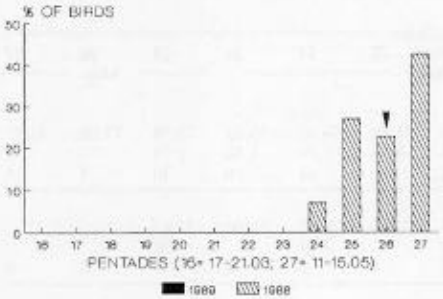
Fat score

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Median						2	1	2	0	2	0	1
N	0	0	0	0	0	2	2	13	6	10	1	4
GIANNUTRI												
Median						3	0	1	4	2		
N	0	0	0	0	0	2	1	3	1	3	0	0
VENTOTENE												
Median								2	2	4	0	0
N	0	0	0	0	0	0	0	7	1	1	3	1
CAPRI												
Median												
N	0	0	0	0	0	0	0	0	0	0	0	0

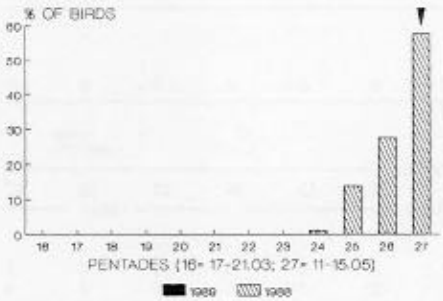
Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean						27.30	24.55	28.11	22.88	27.29	24.00	25.03
S. D.						1.27	4.88	2.49	2.68	3.37		2.95
N	0	0	0	0	0	2	2	13	6	10	1	4
GIANNUTRI												
Mean						30.00	24.40	25.93	32.90	26.80		
S. D.						4.24		1.50		1.18		
N	0	0	0	0	0	2	1	3	1	3	0	0
VENTOTENE												
Mean								27.21	27.80	35.00	23.67	24.80
S. D.								2.53			3.49	
N	0	0	0	0	0	0	0	7	1	1	3	1
CAPRI												
Mean												
S. D.												
N	0	0	0	0	0	0	0	0	0	0	0	0

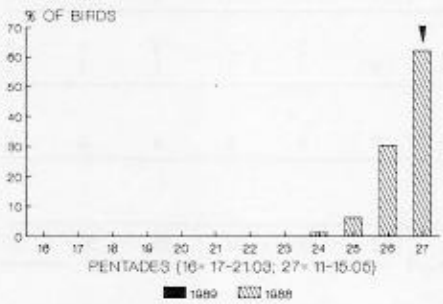
MONTECRISTO (N= 70)



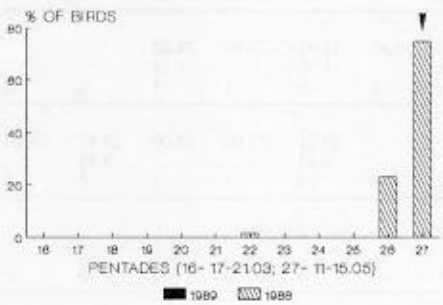
GIANNUTRI (N= 87)



VENTOTENE (N= 306)



CAPRI (N= 52)



ICTERINE WARBLER (**Hippolais icterina**)

Long distance migrant wintering south of the Sahara, breeding in central and northeastern Europe (Glutz & Bauer 1991a). Not breeding in Italy (Meschini & Frugis in press).

Trapping patterns. Well represented on all four islands, the total of trapped birds amounting to 515 inds. Captures are concentrated in the first half of May, almost no birds being trapped before pentade 24. The median pentade of the passage is 26 on M, 27 on the other islands. Spring migration seems to continue till well after the end of our study period, as reported also for C by Pettersson **et al.** (1990), who recorded the median date on May 16th. No peaks can be observed on the four islands, though a tendency to increase is well evident till the last pentade on all four sites.

Third primary. Mean values vary from 59.83 to 62.11 on all sites (range: 55.0–72.5). No marked tendencies can be observed, apart from a slight peak on islands G and M during pentade 26 and on island V during pentade 25. On island C the mean values of third primary seem to increase at the end of the study period, while the tendency is opposite on the other sites.

Fat score. Median scores on all islands are generally low. Apart from island G, where the median scores do not change during the last three pentades, a general decrease in scores parallel to the latitudinal gradient can be observed, starting from pentade 26. This might be related to the progressive use of reserves by birds at different stages of sea crossing. The median fat scores of island C are very similar to those found on a very close island site (Scebba **et al.** 1985).

Body mass. Mean values vary from 11.31 to 12.47 (range: 7.5–17.7), in accordance with other spring samples (see Glutz & Bauer 1991a), although the extreme minimum value seems to be the lowest so far recorded for the species. Mean values are higher on island C than on the other sites, which do not show strong differences (range between 11.31 and 12.10); moreover on island C the progress in body mass values is very similar to that observed for third primary. A very slight tendency to the increase is also observed for the islands C, V and G in the last pentade.

Icterine Warbler - **Hippolais icterina**

Third primary

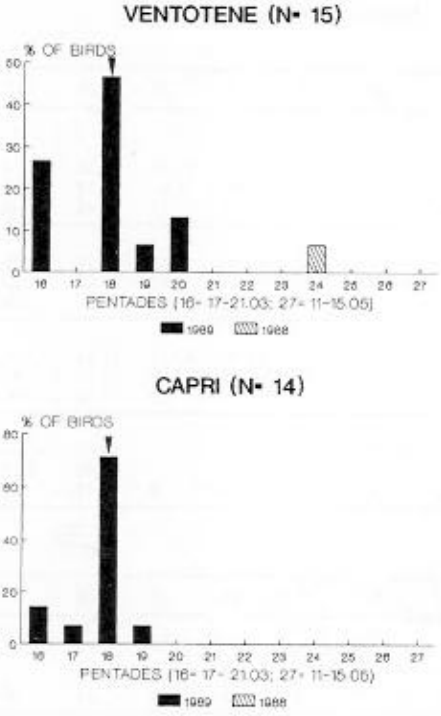
	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean									60.48	61.33	61.58	61.14
S. D.									.90	1.63	1.57	1.82
N	0	0	0	0	0	0	0	0	5	19	16	30
GIANNUTRI												
Mean									61.00	61.13	61.29	60.96
S. D.										1.45	3.05	1.78
N	0	0	0	0	0	0	0	0	1	12	24	50
VENTOTENE												
Mean									61.00	62.11	61.63	61.39
S. D.									1.41	1.86	1.68	1.95
N	0	0	0	0	0	0	0	0	4	19	93	190
CAPRI												
Mean							62.70				59.83	60.64
S. D.											1.48	1.55
N	0	0	0	0	0	0	1	0	0	0	12	39

Fat score

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Median									0	2	1	1
N	0	0	0	0	0	0	0	0	5	19	16	30
GIANNUTRI												
Median									0	3	3	3
N	0	0	0	0	0	0	0	0	1	12	24	50
VENTOTENE												
Median									2	1	2	2
N	0	0	0	0	0	0	0	0	4	19	93	190
CAPRI												
Median							2				3	2
N	0	0	0	0	0	0	1	0	0	0	12	39

Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean									11.66	12.04	11.74	11.39
S. D.									1.03	1.04	.78	1.16
N	0	0	0	0	0	0	0	0	5	19	16	30
GIANNUTRI												
Mean									12.00	12.00	11.70	11.73
S. D.										1.39	1.11	1.18
N	0	0	0	0	0	0	0	0	1	12	24	50
VENTOTENE												
Mean									11.43	11.31	11.92	12.10
S. D.									.56	1.03	1.28	.99
N	0	0	0	0	0	0	0	0	4	19	93	190
CAPRI												
Mean							12.90				12.38	12.47
S. D.											.74	.98
N	0	0	0	0	0	0	1	0	0	0	12	39



SPECTACLED WARBLER (**Sylvia conspicillata**)

Scatterly distributed mostly around the central and western Mediterranean, on Canaries, Cape Verde and Madeira islands; an isolated population in the Near East (Glutz & Bauer 1991a). European populations winter in northern Africa and into the Sahara (Curry-Lindahl 1981). Distribution of the Italian population poorly known; fairly common summer visitor in the south as well as in Sicily and Sardinia, with isolated populations as far north as the northern Apennines (Gellini & Montevecchi 1986, Manzi & Perna 1990). It does not breed on our four islands (Meschini & Frugis in press).

Trapping patterns. An early and definitely uncommon migrant, only recorded, with reasonable numbers, on the two southern stations (C, V), with a total of 33 ringed birds. Four birds trapped on G and M Passage migrants already present by mid-March, and movements almost over by mid-April. A similar trapping pattern is observed on both islands, with peak passage in pentade 18, when also the median date falls. Spring migratory period between March and April is also reported for other Mediterranean sites (Finlayson 1992, Glutz & Bauer 1991a).

Third primary. Mean values between 40.85 and 43.05 (range: 39.0-44.2). Given the very small numbers and the scattered samples, a decrease in wing length is observed on C and V between birds ringed on pentades 16 and 18 respectively. Biometrical data from the Camargue indicate males as being on average larger than females (Glutz & Bauer 1991a).

Fat score. High median fat scores recorded on C and V in both main pentades.

Body mass. Mean values between 8.53 and 9.15 (on G); range 7.4-10.4. On both pentades 16 and 18, birds ringed on C heavier than those passing on V. Similar values, with mean body mass of 9.0 , reported from the Camargue between March and May (Glutz & Bauer 1991a).

Spectacled Warbler - **Sylvia conspicillata**

Third primary

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean			42.00									
S. D.												
N	0	0	1	0	0	0	0	0	0	0	0	0
GIANNUTRI												
Mean	42.90		40.20									
S. D.	.14											
N	2	0	1	0	0	0	0	0	0	0	0	0
VENTOTENE												
Mean	42.55		41.56	44.00	40.85				42.00			
S. D.	.79		1.40		.49							
N	4	0	7	1	2	0	0	0	1	0	0	0
CAPRI												
Mean	43.05	43.00	40.96	40.00								
S. D.	1.63		1.14									
N	2	1	10	1	0	0	0	0	0	0	0	0

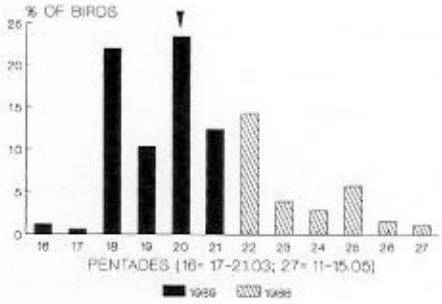
Fat score

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Median			4									
N	0	0	1	0	0	0	0	0	0	0	0	0
GIANNUTRI												
Median	4		0									
N	2	0	1	0	0	0	0	0	0	0	0	0
VENTOTENE												
Median	4		4	4	5				5			
N	4	0	7	1	2	0	0	0	1	0	0	0
CAPRI												
Median	4	2	4	2								
N	2	1	10	1	0	0	0	0	0	0	0	0

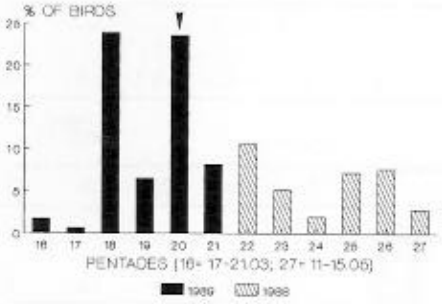
Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean			9.00									
S. D.												
N	0	0	1	0	0	0	0	0	0	0	0	0
GIANNUTRI												
Mean	9.15		7.40									
S. D.	.49											
N	2	0	1	0	0	0	0	0	0	0	0	0
VENTOTENE												
Mean	8.53		8.67	8.10	8.85				8.90			
S. D.	.87		.75		.07							
N	4	0	7	1	2	0	0	0	1	0	0	0
CAPRI												
Mean	9.00	7.40	9.10	8.00								
S. D.	.57		.87									
N	2	1	10	1	0	0	0	0	0	0	0	0

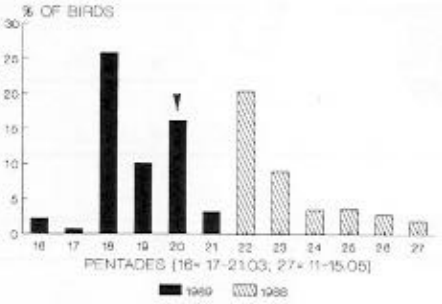
MONTECRISTO (N= 812)



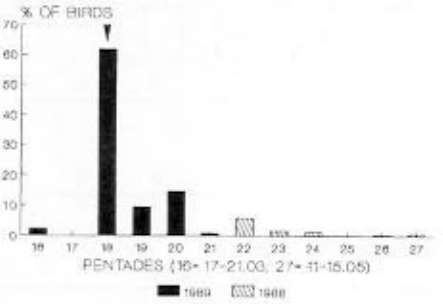
GIANNUTRI (N= 752)



VENTOTENE (N= 2155)



CAPRI (N= 292)



SUBALPINE WARBLER (**Sylvia cantillans**)

Long distance migrant wintering, with different subspecies, from the Sahara south to west Africa and Libya, Sudan and Egypt more to the east (Glutz & Bauer 1991a). A widespread breeder of low and median altitudes in central and southern Italy (Meschini & Frugis in press, Brichetti 1983).

Trapping patterns. A total of 4,011 birds have been ringed on the four islands. Spring migration starts at the end of March already with large numbers, while relatively few birds are still crossing the Mediterranean by the half of May. Trapping patterns are very similar on the four stations, with median passage dates in pentade 20 (M, G, and V) and 18 (C), and main peaks on pentades 18, 20 and 22 on all islands. Spring movements between March and May are reported also for other sites within the Mediterranean (Glutz & Bauer 1991a).

Third primary. Mean values vary from 43.50 to 48.30, with most birds falling between 45 and 47 (range: 41.0–61.5). A general decrease in third primary values is observed along the trapping period on all islands, with smaller birds passing later in the season. On the basis of the slightly smaller dimensions of females with respect to males, such pattern could indicate a differential migration of sexes, and/or the passage of birds belonging to different populations.

Fat score. In most pentades, median values from 1 to 4 are recorded on all islands; a general decrease is observed on pentade 21. Birds passing on C and V tend to have higher amounts of fat if compared to those ringed, at the same time, on G and M.

Body mass. Mean values between 8.49 and 10.44., with most pentades ranging from 8.5 and 9.5 (range: 5.1-15.7, including the lowest value so far recorded for the species, Glutz & Bauer 1991a). A very clear tendency for a progressive decrease in body mass from South to North is observed in birds trapped in a single pentade on the four islands, indicating the progressive use of energetic reserves in a long, possibly non-stop flight. Mean values of 10.8 and 10.0 are reported in spring from Malta and Cyprus respectively (Flint & Stewart 1983, Gauci & Sultana 1976).

Subalpine Warbler - **Sylvia cantillans**

Third primary

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
MONTECRISTO												
Mean	46.70	46.70	46.73	46.18	45.83	45.86	46.67	46.31	46.47	46.46	46.44	46.31
S. D.	1.64	2.33	1.87	1.73	1.60	1.61	1.89	1.74	1.43	2.61	1.23	1.17
N	10	5	179	84	191	101	116	32	24	47	13	10
GIANNUTRI												
Mean	48.28	48.30	47.05	45.95	45.98	45.84	45.44	45.79	45.75	46.38	45.61	46.00
S. D.	1.48	.69	1.88	1.39	1.69	1.40	1.85	1.80	1.70	1.44	1.42	1.52
N	13	5	180	49	177	62	80	39	15	54	57	21
VENTOTENE												
Mean	47.12	46.48	47.30	46.50	45.80	45.58	46.67	46.33	46.23	45.98	45.74	45.45
S. D.	1.77	1.09	1.80	1.66	1.56	1.28	1.82	1.86	1.56	1.64	1.60	1.37
N	49	16	558	218	349	70	441	195	76	79	62	42
CAPRI												
Mean	47.26		46.26	46.44	45.73	44.80	45.62	44.64	47.00		45.00	43.50
S. D.	1.64		1.62	1.53	2.18	1.71	2.09	.89	.71			.71
N	7	0	181	28	43	3	18	5	4	0	1	2

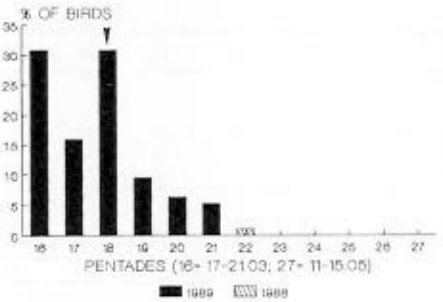
Fat score

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
MONTECRISTO												
Median	3	2	1	1	1	0	2	2	2	1	11	
N	10	5	179	84	191	101	116	32	24	47	13	10
GIANNUTRI												
Median	2	0	3	2	2	0	1	2	2	2	2	3
N	13	5	180	49	177	62	80	39	15	54	57	21
VENTOTENE												
Median	4	2	4	3	3	2	2	2	2	1	2	2
N	49	16	558	218	349	70	441	195	76	79	62	42
CAPRI												
Median	4		3	4	4	2	2	2	3		2	5
N	7	0	181	28	43	3	18	5	4	0	1	2

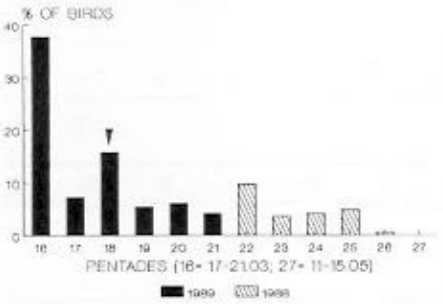
Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
MONTECRISTO												
Mean	9.74	9.04	9.12	8.74	8.91	8.49	8.91	8.98	9.02	8.53	8.62	8.80
S. D.	1.19	.59	1.14	.82	1.04	1.07	.89	.97	.71	.67	.89	.78
N	10	5	179	84	191	101	116	32	24	47	13	10
GIANNUTRI												
Mean	10.18	8.74	9.22	8.84	8.99	8.52	8.88	8.82	8.78	8.97	8.50	8.99
S. D.	1.20	.89	1.12	.68	.87	1.06	.75	.86	.96	.72	.68	.60
N	13	5	180	49	177	62	80	39	15	54	57	21
VENTOTENE												
Mean	9.55	9.16	9.66	9.30	9.25	8.66	9.06	9.05	9.23	9.11	8.87	9.27
S. D.	1.24	.72	1.06	1.00	.96	.70	.88	.85	.86	1.12	.77	.82
N	49	16	558	218	349	70	441	195	76	79	62	42
CAPRI												
Mean	10.44		9.58	10.14	9.91	9.67	9.18	9.00	9.45		8.50	10.35
S. D.	1.33		.91	1.14	1.15	.95	.71	.79	.88			.21
N	7	0	181	28	43	3	18	5	4	0	1	2

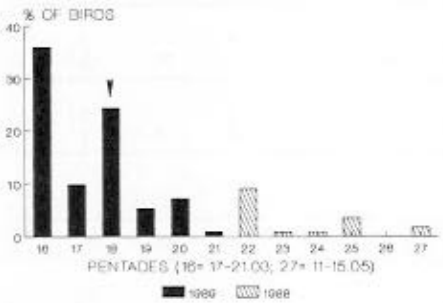
MONTECRISTO (N= 94)



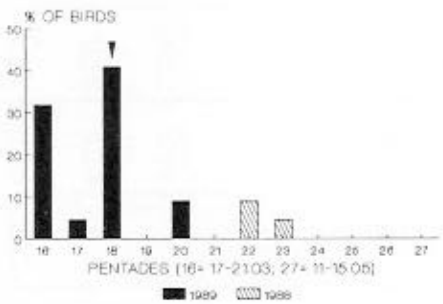
GIANNUTRI (N= 164)



VENTOTENE (N= 111)



CAPRI (N= 22)



SARDINIAN WARBLER (**Sylvia melanocephala**)

Resident or short to medium distance migrant, breeding almost exclusively within the Mediterranean basin, where the bulk of the population also winters (Glutz & Bauer 1991b). A single recovery in southern Algeria (Zink 1987) and few sightings south of the Sahara (Glutz & Bauer 1991b) have been recorded. In Italy the species is widely distributed south of the Apennines, with scattered populations also more to the north (Meschini & Frugis in press, Glutz & Bauer 1991b); a regular breeder on all our four study islands.

Trapping patterns. The total number of ringed birds is 391, with the median date of passage in pentade 18 on all four islands. This strong similarity, together with the very high number of birds ringed during the second half of March, suggests the presence of actively migrating birds, in addition to the local breeding populations. During April and May there are marked differences among the four islands, which could be explained also by the uneven density of breeders.

Third primary. Mean values between 42.50 to 45.28 (range: 40.7–49.2), do not show any trend along the study period, and are possibly related to the presence of both sexes in all pentades and till the second half of March, when the end of migratory movements probably occurs.

Fat score. Medians of fat score show on the whole stable and intermediate values, relatively high if compared with those of almost all long-distance migrants; both breeding and migratory birds appear therefore to be in fairly good physical conditions.

Body mass. Mean values vary from 10.85 to 12.59 (range: 8.9–17.4), in accordance with those previously recorded elsewhere within the Mediterranean (Glutz & Bauer 1991b). Remarks similar to those concerning third primary can be done, pointing out that no differences in body mass values come out between birds ringed during the main migratory period (presumably migrants) and those belonging to the local populations, which might be related to a short-step migration strategy.

Sardinian Warbler - **Sylvia melanocephala**

Third primary

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
Islands	March			April						May		
MONTECRISTO												
Mean	44.16	44.43	43.79	44.67	45.17	44.40	42.50					
S. D.	1.24	1.08	1.03	1.06	.68	.82						
N	29	15	29	9	6	5	1	0	0	0	0	0
GIANNUTRI												
Mean	44.43	45.28	44.05	44.69	44.31	43.50	44.47	43.92	43.64	44.44	44.00	
S. D.	1.58	1.65	1.00	1.61	1.08	1.04	1.71	1.53	1.28	1.74		
N	62	12	26	9	10	7	16	6	7	8	1	0
VENTOTENE												
Mean	44.06	44.87	44.27	44.43	44.31	45.50	44.83	44.00	44.00	44.95		45.00
S. D.	1.12	1.65	1.61	1.98	1.87		1.58			1.87		.00
N	40	11	27	6	8	1	10	1	1	4	0	2
CAPRI												
Mean	43.84	44.50	42.51		44.65		43.95	47.00				
S. D.	.91		1.30		2.33		1.77					
N	7	1	9	0	2	0	2	1	0	0	0	0

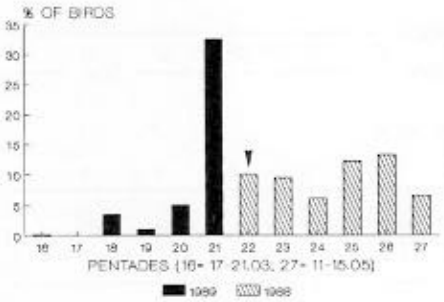
Fat score

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
Islands	March			April						May		
MONTECRISTO												
Median	1	2	1	2	1	2	0					
N	29	15	29	9	6	5	1	0	0	0	0	0
GIANNUTRI												
Median	2	2	2	3	2	2	2	1	0	0	2	
N	62	12	26	9	10	7	16	6	7	8	1	0
VENTOTENE												
Median	4	4	3	3	2	0	2	2	5	2		1
N	40	11	27	6	8	1	10	1	1	4	0	2
CAPRI												
Median	2	0	2		1		2	3				
N	7	1	9	0	2	0	2	1	0	0	0	0

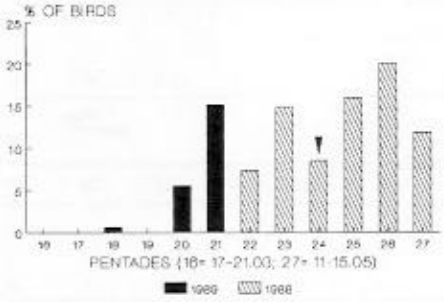
Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
Islands	March			April						May		
MONTECRISTO												
Mean	10.85	11.17	11.39	11.42	11.08	11.38	10.90					
S. D.	.95	.98	1.33	1.08	.44	.89						
N	29	15	29	9	6	5	1	0	0	0	0	0
GIANNUTRI												
Mean	11.77	11.80	11.39	11.79	11.66	11.27	11.86	11.50	12.59	12.48	11.50	
S. D.	1.54	.74	1.09	1.45	1.11	.91	.91	.92	1.74	.75		
N	62	12	26	9	10	7	16	6	7	8	1	0
VENTOTENE												
Mean	11.75	11.71	11.40	11.22	11.99	10.70	11.75	11.00	11.30	11.52		11.60
S. D.	1.17	1.71	1.19	1.23	1.04		1.02			.38		.85
N	40	11	27	6	8	1	10	1	1	4	0	2
CAPRI												
Mean	11.76	11.50	11.53		11.15		12.0012.10					
S. D.	2.51		.73		.07		.85					
N	7	1	9	0	2	0	2	1	0	0	0	0

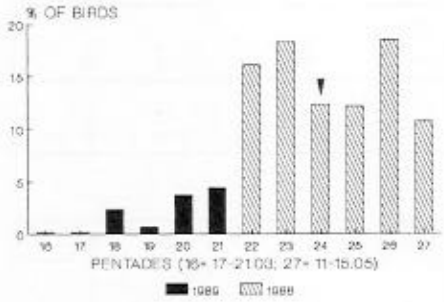
MONTECRISTO (N= 476)



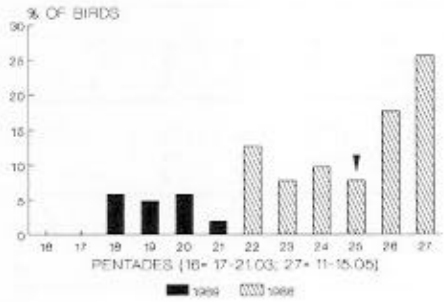
GIANNUTRI (N= 270)



VENTOTENE (N= 583)



CAPRI (N= 102)



WHITETHROAT (**Sylvia communis**)

Long distance migrant widely distributed all over Europe, except in the northernmost regions and in scattered areas within the Mediterranean basin (Glutz & Bauer 1991b). Apart from rare records of birds wintering around the Mediterranean (Gibraltar, S-France; Zink 1987), European populations migrate mainly to sub-Saharan savannas of western and central Africa; Eastern and southern regions of Africa, where Asian races regularly occur, are only occasionally occupied (Glutz & Bauer 1991b, Zink 1987). In Italy the species is widely distributed below 1500 m a.s.l. (Brichetti 1985, Meschini & Frugis in press).

Trapping pattern. The total number of ringed birds is 1431, fairly well distributed on all four islands. Median pentades 22 (M), 24 (G, V) and 25 (C). Very few birds are trapped before the end of March; a first peak is observed around mid-April (pentade 21), but only in the northernmost islands. A strong migration is then recorded from mid-April to the end of our study period, and the passage seems to go on well after mid-May, as already reported (Baccetti **et al.** 1981, Pettersson **et al.** 1990, Sultana & Gauci 1982, Thibault 1983).

Third primary. Mean values vary from 53.80 to 56.66 (range: 46.5–63.0). No clear trends are observed, either during the study period or comparing the four islands. C shows mean values which are generally lower than those referred to the other islands.

Fat score. Median values of fat score substantially show intermediate values, pointing out the general good physiological conditions of these birds while crossing central Mediterranean.

Body mass. Mean values vary from 11.88 to 15.56 (range: 7.8–21.6), hence including the lowest values so far recorded for this species; anyway, data are on the whole in accordance with those previously recorded during spring migration (Glutz & Bauer 1991b). No clear trends can be observed; C shows the highest values in almost all pentades.

Whitethroat - **Sylvia communis**

Third primary

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
		March				April					May	
Islands												
MONTECRISTO												
Mean	51.00		55.68	55.70	56.06	56.05	55.65	56.14	55.94	55.34	55.84	56.00
S. D.			1.50	.97	2.46	2.03	2.14	2.05	1.49	1.74	1.69	1.85
N	1	0	17	5	24	155	48	45	29	58	63	31
GIANNUTRI												
Mean			55.50		56.52	56.32	55.91	55.83	56.78	55.30	54.66	55.31
S. D.			.99		1.54	2.07	2.08	1.89	1.77	1.85	2.25	1.46
N	0	0	2	0	15	41	20	40	23	43	54	32
VENTOTENE												
Mean	53.00	57.50	56.24	53.80	56.13	56.13	56.40	56.49	56.60	56.41	55.50	55.10
S. D.			2.00	2.51	2.13	1.30	2.06	1.76	2.09	1.68	1.67	1.80
N	1	1	14	4	22	26	94	107	72	71	108	63
CAPRI												
Mean			54.55	54.52	55.75	54.90	55.05	54.41	55.87	55.41	54.58	54.15
S. D.			1.80	3.15	2.32	1.27	1.95	2.85	1.15	1.41	2.07	1.80
N	0	0	6	5	6	2	13	8	10	8	18	26

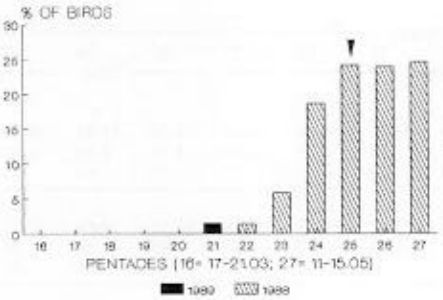
Fat score

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
		March				April					May	
Islands												
MONTECRISTO												
Median	4		3	2	3	3	1	2	2	2	0	2
N	1	0	17	5	24	155	48	45	29	58	63	31
GIANNUTRI												
Median			4		2	2	0	0	3	2	2	2
N	0	0	2	0	15	41	20	40	23	43	54	32
VENTOTENE												
Median	2	4	4	2	3	2	1	3	3	2	1	3
N	1	1	14	4	22	26	94	107	72	71	108	63
CAPRI												
Median			3	4	4	3	3	4	4	4	3	4
N	0	0	6	5	6	2	13	8	10	8	18	26

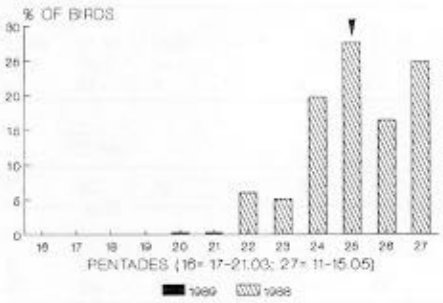
Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
		March				April					May	
Islands												
MONTECRISTO												
Mean	13.90		13.96	13.64	13.69	13.47	13.16	13.30	13.61	12.94	12.60	13.47
S. D.			1.34	1.77	1.11	1.38	1.52	1.29	1.51	1.38	1.27	1.30
N	1	0	17	5	24	155	48	45	29	58	63	31
GIANNUTRI												
Mean			13.10		13.09	13.12	12.10	13.30	13.67	13.75	12.46	13.19
S. D.			.14		1.54	1.32	.80	1.20	1.50	1.95	1.25	1.49
N	0	0	2	0	15	41	20	40	23	43	54	32
VENTOTENE												
Mean	12.50	13.60	13.72	11.88	13.38	12.93	12.80	13.78	13.65	13.44	13.01	13.70
S. D.			.99	.50	.92	1.43	1.35	1.54	1.47	1.39	1.55	1.23
N	1	1	14	4	22	26	94	107	72	71	108	63
CAPRI												
Mean			13.02	13.98	14.98	14.75	14.03	13.85	15.56	13.48	12.96	14.03
S. D.			1.18	1.19	1.06	1.91	2.36	.76	1.27	1.37	1.60	1.31
N	0	0	6	5	6	2	13	8	10	8	18	26

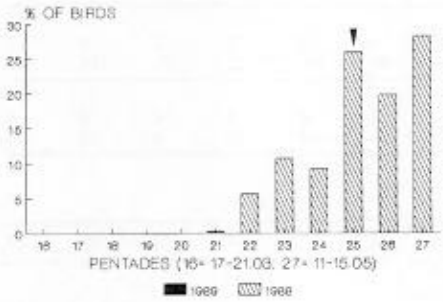
MONTECRISTO (N= 450)



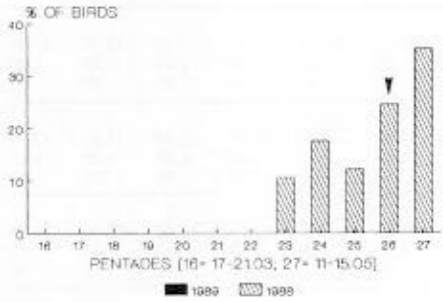
GIANNUTRI (N= 331)



VENTOTENE (N= 789)



CAPRI (N= 58)



GARDEN WARBLER (**Sylvia borin**)

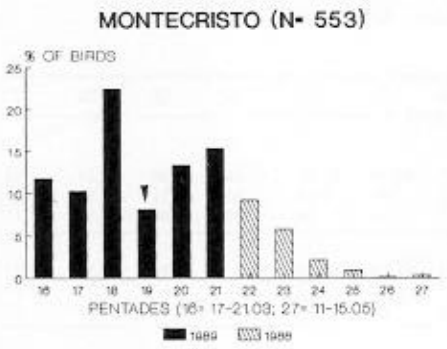
Long distance migrant breeding all over Europe, though scarcely in the Mediterranean area, wintering in tropical and southern Africa (Curry-Lindahl 1981, Dowsett **et al.** 1988, Glutz & Bauer 1991a). Populations present in northern Italy of presumably limited importance (Meschini & Frugis in press).

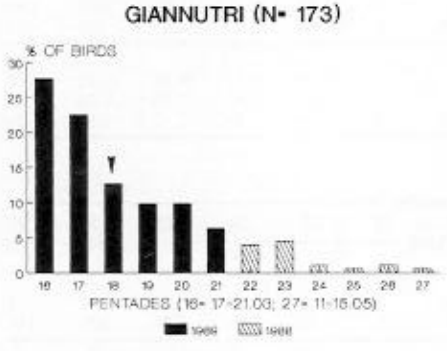
Trapping patterns. Well represented on all islands, with a total of 1,628 ringed birds. Captures are concentrated in the first half of May, rather few birds being trapped before the end of April. Spring passage goes on well after the end of our study period (Glutz & Bauer 1991a, Pettersson **et al.** 1990), with median dates in pentades 25 (V, G, M) and 26 (C). No sharp peaks can be detected, and an increasing tendency is observed till the last pentade. Islands G and V show a marked similarity with a flex in pentade 26. Seasonal patterns consistent with those reported from other Mediterranean sites (Finlayson 1992, Glutz & Bauer 1991a).

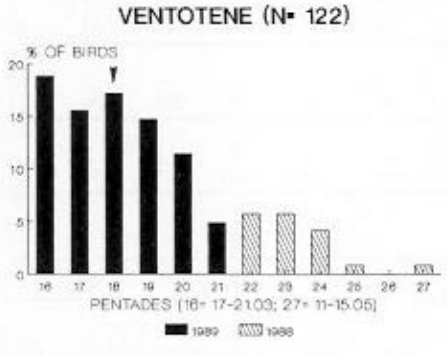
Third primary. On all islands mean values from 59.75 to 62.61 (range: 55.0-70.0). No marked tendencies can be observed apart from a decrease starting from pentades 23 (G, V) or 24 (M, C). A similar pattern is reported from former years on C (Pettersson **et al.**, 1990). Given the uniformity in biometrics of sexes and the geographical cline in wing length (Glutz & Bauer 1991a), such dimensional trends are well worth further analyses.

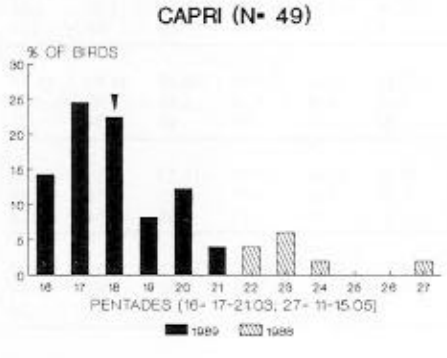
Fat score. Mean values on all islands are generally low or very low. A decrease in fat scores parallel to the latitudinal gradient is observed, indicating a progressive use of reserves by birds at different stages of their sea crossing. Later in the season higher values are recorded at all stations.

Body mass. Mean values between 14.55 and 16.83 (range: 10.1-25.3), and showing no differences among the four stations. Also in relation to fat score, a slight tendency to the increase is observed during the study period. Similar spring average values already reported from M and C (Baccetti **et al.**, 1985, Pettersson **et al.**, 1990); slightly heavier birds recorded in some coastal Mediterranean sites (Bairlein 1991).









BLACKCAP (**Sylvia atricapilla**)

Resident, partial, short to long distance migrant, distributed in the whole of Europe; northern populations exhibit a stronger migratory activity than the southernmost ones (Berthold et al. 1990, Glutz & Bauer 1991b). The wintering areas of European populations extend from the Mediterranean basin, through north Africa, as far south as the sub-Saharan regions of west Africa, where the recoveries of ringed birds are concentrated (Dowsett **et al.** 1988). In Italy the species is widespread and common (Meschini & Massa in press), with also an insular subspecies, **S. a. pauluccii** (Berthold **et al.** 1990, Thibault 1983).

Trapping pattern. Well represented on all four islands, the total of ringings amounting to 897 inds., 62% of which trapped on M, where a remarkable wintering population is also present. Median pentades are 17 (G), 18 (V,C) and 19 (M). Captures are concentrated in the first half of our study period; the high percentage of ringings in pentade 16 suggest that most migrants cross the Central Mediterranean from the beginning of March, also in accordance with mean arrival dates in Europe (Glutz & Bauer 1991a). During the second half of April captures markedly decrease, even if the species is recorded till the end of the trapping period, as also reported for Malta (Sultana & Gauci 1982).

Third primary. Mean values vary from 52.63 to 57.00 (range: 48.0–65.5), showing a scarce variabilty among the different islands, even if the lowest values were found at C and the highest ones at M. Here, where the highest percentage of Blackcaps was ringed, an increasing trend of mean values was found along the season. This might be explained by the presence, in March-April, of birds belonging to smaller-sized southern populations (Berthold **et al.** 1990), wintering within the Mediterranean basin, followed, later on, by the passage of larger, more northern and presumably longer distance migrants (Finlayson 1992, Glutz & Bauer 1991b).

Fat score. A general decrease along the trapping period is observed, apparently in contrast with third primary data; as a matter of fact, this pattern might confirm that late birds have performed a longer migration.

Body mass. Mean values vary from 14.90 to 18.14 (range: 8.5–25.0), hence including the lowest values so far recorded for this species (Glutz & Bauer 1991b). Similar assumptions as for fat score values can be made on the decreasing trend in body mass observed along the season.

Blackcap - **Sylvia atricapilla**

Third primary

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
Islands	March			April						May		
MONTECRISTO												
Mean	54.88	54.45	55.10	55.08	55.43	55.74	55.70	55.84	55.98	56.74	56.00	57.00
S. D.	2.19	1.89	2.06	1.95	2.32	1.95	1.93	1.97	2.40	3.56		1.41
N	65	57	124	45	74	85	51	32	12	5	1	2
GIANNUTRI												
Mean	55.67	55.64	54.71	54.99	55.70	56.25	53.86	55.56	53.25	55.00	56.00	
S. D.	2.00	2.14	2.34	2.17	2.38	2.21	3.08	1.64	1.77			
N	48	39	22	17	17	11	7	8	2	1	1	0
VENTOTENE												
Mean	55.70	54.76	54.90	55.76	55.29	55.85	56.00	55.76	56.50	53.50		
S. D.	2.20	1.16	2.64	2.10	2.39	2.26	1.66	1.82	1.00			
N	23	19	21	18	14	6	7	7	5	1	0	0
CAPRI												
Mean	52.63	53.83	53.63	53.20	52.77	53.65	51.80	55.47	52.70			55.00
S. D.	1.86	2.62	1.81	1.53	2.71	1.20	2.83	2.73				
N	7	12	11	4	6	2	2	3	1	0	0	1

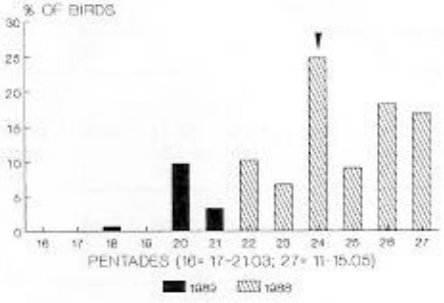
Fat score

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
Islands	March			April						May		
MONTECRISTO												
Median	2	3	3	3	3	3	2	2	2	2	1	1
N	65	57	124	45	74	85	51	32	12	5	1	2
GIANNUTRI												
Median	2	4	2	4	2	3	1	0	2	0	5	
N	48	39	22	17	17	11	7	8	2	1	1	0
VENTOTENE												
Median	3	5	5	2	3	4	4	3	3	3		0
N	23	19	21	18	14	6	7	7	5	1	0	1
CAPRI												
Median	2	2	3	3	2	1	3	2	1			1
N	7	12	11	4	6	2	2	3	1	0	0	1

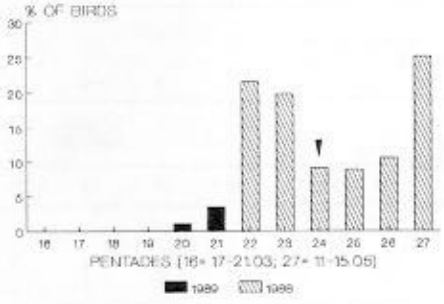
Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
Islands	March			April						May		
MONTECRISTO												
Mean	17.09	16.54	17.51	16.36	17.91	17.28	15.84	15.38	15.35	16.14	15.00	15.20
S. D.	2.07	1.68	2.51	2.11	2.87	2.51	1.67	1.74	2.01	3.64		2.26
N	65	57	124	45	74	85	51	32	12	5	1	2
GIANNUTRI												
Mean	17.31	17.62	16.73	16.93	15.96	17.39	15.89	16.41	15.55	14.60	15.30	
S. D.	1.70	1.79	2.43	2.07	1.32	2.04	1.33	1.43	.21			
N	48	39	22	17	17	11	7	8	2	1	1	0
VENTOTENE												
Mean	17.14	18.14	17.96	16.88	17.56	17.55	15.04	16.59	15.78	16.90		
S. D.	2.00	1.77	2.65	2.32	2.53	1.91	3.28	1.98	1.40			
N	23	19	21	18	14	6	7	7	5	1	0	0
CAPRI												
Mean	16.74	16.72	16.67	18.08	15.25	14.90	16.35	16.00	14.60			15.50
S. D.	1.42	1.27	1.47	1.70	1.42	.99	.21	1.21				
N	7	12	11	4	6	2	2	3	1	0	0	1

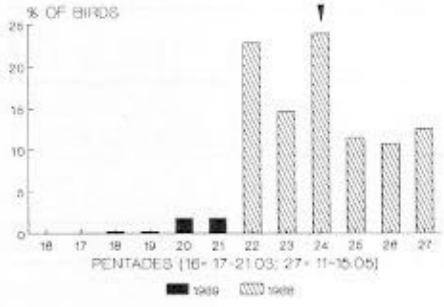
MONTECRISTO (N= 430)



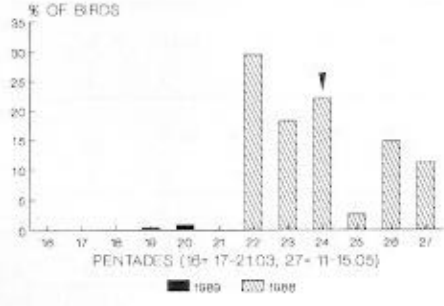
GIANNUTRI (N= 282)



VENTOTENE (N= 439)



CAPRI (N= 230)



WOOD WARBLER (**Phylloscopus sibilatrix**)

Trans-Saharan migrant breeding in Europe except for the Iberian peninsula and wintering in tropical Africa mostly north of the equator (Glutz & Bauer 1991b). In Italy breeds on the Apennines and the Alps (Meschini & Frugis in press).

Trapping patterns. Well represented on all four islands with a total of 1381 ringed inds. Captures are concentrated from mid-April to mid-May, median pentade of passage = 24 on all islands, with nearly no birds trapped in March. This seasonal pattern is in accordance with similar studies on other Mediterranean sites (see Glutz & Bauer 1991b, Thibault 1983). Spring migration still progressing after the end of our study period has been reported from C (Pettersson **et al.** 1990). On M the trapping pattern seems to differ from the similar ones recorded on the other three islands.

Third primary. Mean values vary from 56.22 to 61.67 (range: 41.6–66.0). A very clear tendency to the decrease is observed on all four islands, suggesting a different transit of sexes across the central Mediterranean (shorter-winged females (Glutz & Bauer 1991b) passing later than males). A similar range of values has been reported in summer and autumn from central Europe (Berthold **et al.** 1991).

Fat score. Median scores on all islands are very low, and no marked tendencies are observed. Median scores are higher on C, ranging between 1 and 3, with a slight tendency to the increase at the end of the study period. On G only on pentade 22 the median score is 0, while on V and M just a few birds show any fat reserves.

Body mass. The mean values vary from 7.76 to 9.12 (range: 5.3-13.2), in accordance with a study in another Mediterranean site (see Glutz & Bauer 1991b), although the extreme minimum value seems to be the lowest so far recorded for the species. A general tendency to decrease can be observed on all the islands starting from pentade 22. On C the very slight increase from pentade 25 could be related to higher fat scores.

Wood Warbler - **Phylloscopus sibilatrix**

Third primary

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
Islands												
MONTECRISTO												
Mean			60.50		60.55	59.79	60.08	59.83	58.65	57.76	58.04	57.87
S. D.			1.80		2.02	2.04	1.69	1.87	1.98	2.19	1.78	1.81
N	0	0	3	0	42	14	44	29	107	39	79	73
GIANNUTRI												
Mean					61.67	60.59	59.26	59.54	58.98	58.68	57.20	57.69
S. D.					2.08	.81	2.15	1.54	2.63	2.20	2.07	1.94
N	0	0	0	0	3	10	61	56	26	25	30	71
VENTOTENE												
Mean			60.00	60.00	60.93	60.89	59.95	60.18	59.30	59.14	58.18	57.38
S. D.					1.39	1.26	1.91	2.02	2.00	2.05	1.69	1.57
N	0	0	1	1	8	8	100	64	105	50	47	55
CAPRI												
Mean				57.80	58.75		59.55	59.18	59.40	59.08	56.22	56.55
S. D.					3.89		1.96	1.96	2.01	1.74	3.32	1.96
N	0	0	0	1	2	0	68	42	51	6	34	26

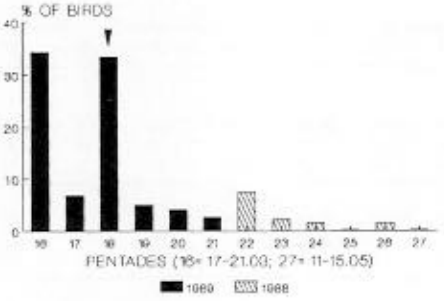
Fat score

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
Islands												
MONTECRISTO												
Median			0		2	3	0	0	0	0	0	0
N	0	0	3	0	42	14	44	29	107	39	79	73
GIANNUTRI												
Median					2	3	0	1	2	1	2	2
N	0	0	0	0	3	10	61	56	26	25	30	71
VENTOTENE												
Median			0	0	0	2	0	0	0	0	0	0
N	0	0	1	1	8	8	100	64	105	50	47	55
CAPRI												
Median				3	2		2	2	2	1	3	3
N	0	0	0	1	2	0	68	42	51	6	34	26

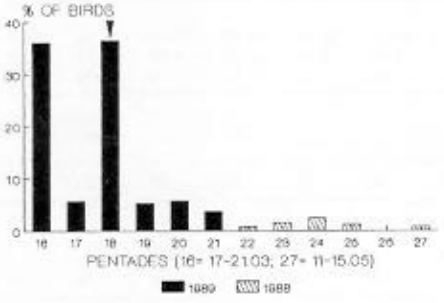
Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
Islands												
MONTECRISTO												
Mean			8.67		8.66	8.92	8.31	8.16	8.10	8.04	8.00	7.80
S. D.			1.04		.89	1.14	.86	.82	.74	1.30	.76	.70
N	0	0	3	0	42	14	44	29	107	39	79	73
GIANNUTRI												
Mean					8.70	9.12	8.12	8.26	8.16	8.06	7.81	8.15
S. D.					.98	.35	.88	.85	.72	.63	.70	.63
N	0	0	0	0	3	10	61	56	26	25	30	71
VENTOTENE												
Mean			7.50	7.60	8.40	8.82	8.19	8.10	7.93	7.76	7.82	7.97
S. D.					.88	.96	.87	.72	.68	.55	.52	.69
N	0	0	1	1	8	8	100	64	105	50	47	55
CAPRI												
Mean				8.90	8.75		8.80	8.48	8.87	8.40	8.48	8.52
S. D.					.35		1.08	.81	.98	1.26	.67	.65
N	0	0	0	1	2	0	68	42	51	6	34	26

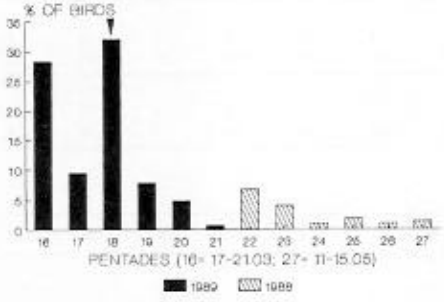
MONTECRISTO (N= 439)



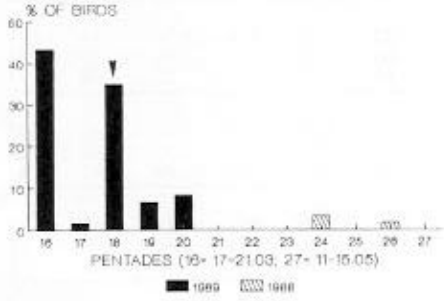
GIANNUTRI (N= 246)



VENTOTENE (N= 265)



CAPRI (N= 60)



CHIFFCHAFF (**Phylloscopus collybita**)

Breeding all over Europe, with winter quarters ranging from the Mediterranean basin to tropical Africa (Glutz & Bauer 1991b). A common and widespread breeding and wintering species in Italy (Meschini & Frugis in press).

Trapping patterns. Well represented on M, G and V, less on C, the total of catches amounting to 1010 birds. Most captures are concentrated in the second half of March, but the passage seems to continue, although with very few birds, till the end of the period. The median pentade of passage is 18 on all four islands. In Gibraltar the passage starts from the end of February to mid-April, with birds captured till mid-May (see Glutz & Bauer 1991b, Finlayson 1992). Two peaks can be observed on pentades 16 and 18 in all four islands, with a strong similarity in migratory pattern on all stations, especially during the first part of the period.

Third primary. On all islands mean values vary between 41.00 and 45.54 (range: 37.0–52.5). A decrease in mean values from pentade 16 to pentade 18 (when most of the birds have been trapped) can be observed on all stations. The unclear trend observed later in the season could be related to the passage across central Mediterranean of different populations with different biometrics (see Glutz & Bauer 1991b).

Fat score. Most birds show median values between 2 and 4. A general decrease in median fat scores parallel to the latitudinal gradient can be observed in all four sites during the first three pentades (apart from pentade 16, where C shows median scores lower than V); this could suggest a progressive use of fat reserves by birds at different stages of sea crossing.

Body mass. Mean values vary between 6.12 and 7.52 (range: 4.9–10.6); the extreme minimum value seems to be the lowest so far recorded for the species (see Glutz & Bauer 1991b). Apart from C, where mean values are usually higher, no differences can be observed for the first three pentades on the other islands. M and V seem to present an opposite tendency during the study period.

Chiffchaff - **Phylloscopus collybita**

Third primary

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
Islands												
MONTECRISTO												
Mean	44.86	43.75	43.60	43.36	44.31	45.54	43.37	44.20	42.83	43.00	44.16	43.50
S. D.	3.06	3.25	2.59	2.02	2.74	1.90	1.70	1.92	2.64		3.12	
N	151	30	147	22	18	12	33	10	7	1	7	1
GIANNUTRI												
Mean	44.20	44.97	43.30	43.71	43.86	44.03	41.00	44.25	43.10	43.17		44.00
S. D.	2.80	3.02	2.24	1.91	2.03	2.83	.00	3.38	1.98	3.55		3.54
N	89	14	90	13	14	9	2	4	6	3	0	2
VENTOTENE												
Mean	43.51	43.56	42.99	42.98	42.55	42.00	43.56	42.99	43.50	44.70	42.00	42.83
S. D.	2.90	2.33	2.24	2.74	2.01	.00	3.08	1.51	2.18	1.52	.00	2.66
N	75	25	85	21	13	2	18	11	3	5	3	4
CAPRI												
Mean	44.98	41.30	42.41	41.80	42.70				45.30		45.00	
S. D.	2.76		1.32	4.23	1.20				3.82			
N	26	1	21	4	5	0	0	0	2	0	1	0

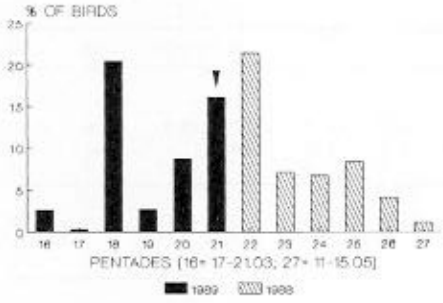
Fat score

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
Islands												
MONTECRISTO												
Median	2	2	2	2	2	2	0	2	2	2	2	2
N	151	30	147	22	18	12	33	10	7	1	7	1
GIANNUTRI												
Median	3	2	2	0	2	0	3	0	1	3		1
N	89	14	90	13	14	9	2	4	6	3	0	2
VENTOTENE												
Median	4	4	3	3	3	1	0	2	2	1	1	1
N	75	25	85	21	13	2	18	11	3	5	3	4
CAPRI												
Median	3	5	3	5	2				3		2	
N	26	1	21	4	5	0	0	0	2	0	1	0

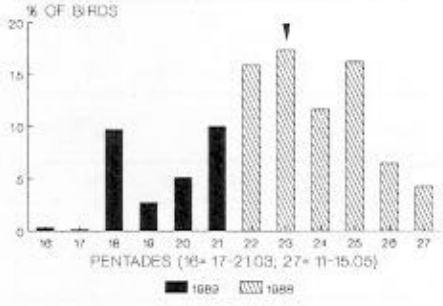
Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
Islands												
MONTECRISTO												
Mean	7.14	6.95	6.91	6.54	6.96	7.50	6.42	6.98	6.64	6.50	7.39	6.90
S. D.	.94	.74	.87	.69	.69	.84	.45	.54	1.02		.48	
N	151	30	147	22	18	12	33	10	7	1	7	1
GIANNUTRI												
Mean	7.12	7.01	6.67	6.56	7.05	6.59	7.00	6.95	6.78	6.67		7.00
S. D.	1.10	.86	.74	.65	.63	.91	1.41	1.12	.82	.81		.28
N	89	14	90	13	14	9	2	4	6	3	0	2
VENTOTENE												
Mean	7.11	7.04	6.95	6.92	6.77	6.30	6.66	6.12	7.10	6.86	6.90	6.73
S. D.	.96	.77	.72	.91	.84	.14	.87	.44	.95	.78	.26	.66
N	75	25	85	21	13	2	18	11	3	5	3	4
CAPRI												
Mean	7.32	8.40	7.26	6.90	7.52				7.20		8.10	
S. D.	1.05		.54	.48	.91				.99			
N	26	1	21	4	5	0	0	0	2	0	1	0

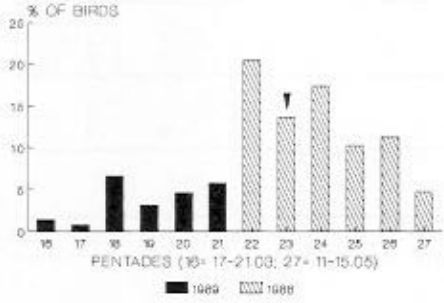
MONTECRISTO (N= 874)



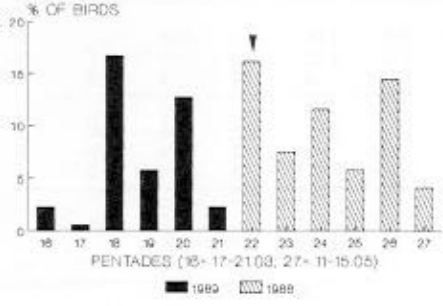
GIANNUTRI (N= 628)



VENTOTENE (N= 800)



CAPRI (N= 173)



WILLOW WARBLER (**Phylloscopus trochilus**)

Transequatorial migrant breeding all over Europe north of the Alps and wintering in most of the Afrotropics (Glutz & Bauer 1991b). Not breeding in Italy (Meschini & Frugis in press).

Trapping patterns. Well represented on all four sites, with a total 2475 ringed inds. The captures are distributed all over the study period, starting from mid-March and concentrating from mid-April to mid-May (median period of the passage: pentade 21 on M, 23 on G and V, 22 on C). A tendency to the decrease of northwards movements at the end of the study period is evident for all islands. The spring passage of the species is confirmed from March to the end of May also in other Mediterranean sites (Pettersson **et al.** 1990, Bezzi & Gustin 1991, Glutz & Bauer 1991b, Finlayson 1992, Thibault 1983). Two peaks can be observed on all four islands on pentade 18 and 22 (23 in G).

Third primary. Mean values vary from 48.40 to 54.17 (range: 40.0–62.9). A very clear tendency to the decrease can be observed on all four islands till the end of the study period, when in all stations the shortest-winged birds are trapped. This seems to be related to the differential migration of sexes across the Mediterranean, females passing later (Bezzi & Gustin 1991, Pettersson **et al.** 1990). Mean values of third primary in central Europe in summer and autumn seem to be generally lower (Berthold **et al.** 1991).

Fat score. Median scores on all islands are quite high, only few birds showing scores lower than 3. No real tendencies can be observed, apart from a slight increase (M and G) of the median scores at the end of the period. Our values are well in accordance to those already recorded on C (Bezzi & Gustin 1991).

Body mass. Mean values vary from 7.10 to 9.57 (range: 5.4–12.6), and seem to be generally in accordance with other spring samples (Bezzi & Gustin 1991, Pettersson et al 1990). Island C shows mean values generally higher than the others, and in all stations body mass decreases after the very first pentades, during which the larger birds are passing. The similarity between tendencies and mean values in M and G is again very clear.

Willow Warbler - **Phylloscopus trochilus**

Third primary

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
MONTECRISTO												
Mean	53.35	54.17	52.66	52.90	51.68	51.46	51.04	50.96	51.66	50.31	49.73	49.17
S. D.	1.43	.76	1.99	1.55	2.61	2.60	2.56	2.60	2.35	2.59	2.62	2.45
N	23	3	179	24	76	141	188	62	59	73	36	10
GIANNUTRI												
Mean	52.50	56.20	53.24	52.85	52.72	51.05	50.36	50.52	51.18	50.21	48.93	49.37
S. D.	.71		1.81	1.49	2.21	2.96	2.93	2.76	2.86	2.47	1.66	2.22
N	2	1	61	17	32	63	100	109	73	102	41	27
VENTOTENE												
Mean	53.62	53.50	53.50	52.65	52.02	51.46	51.12	51.31	50.87	51.08	50.28	49.36
S. D.	1.40	.55	1.69	2.04	2.42	2.62	2.68	3.01	2.50	2.40	2.05	2.28
N	11	6	53	25	37	46	164	109	139	82	90	38
CAPRI												
Mean	52.50	52.10	52.33	53.22	52.05	51.15	51.10	49.38	50.51	51.23	48.78	48.40
S. D.	.92		1.46	1.07	1.34	3.78	2.76	2.53	2.42	2.56	2.17	.92
N	4	1	29	10	22	4	28	13	20	10	25	7

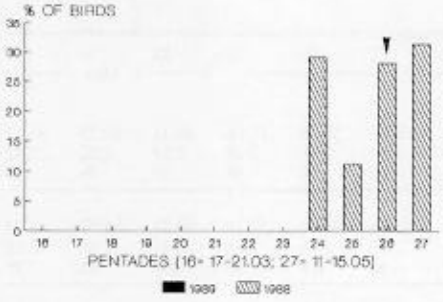
Fat score

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
MONTECRISTO												
Median	0	2	3	3	3	2	3	3	3	3	2	3
N	23	3	179	24	76	141	188	62	59	73	36	10
GIANNUTRI												
Median	0	2	5	4	4	2	3	2	3	3	3	4
N	2	1	61	17	32	63	100	109	73	102	41	27
VENTOTENE												
Median	3	3	4	2	5	4	3	3	3	1	3	3
N	11	6	53	25	37	46	164	109	139	81	90	38
CAPRI												
Median	3	2	4	4	3	5	4	3	3	4	4	4
N	4	1	29	10	22	4	28	13	20	10	25	7

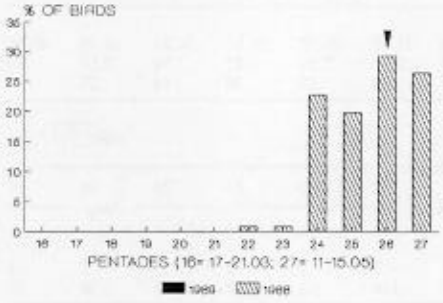
Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March			April						May		
MONTECRISTO												
Mean	7.66	8.13	8.81	8.43	8.47	7.89	8.14	8.08	8.05	8.19	7.34	7.89
S. D.	.68	.40	1.09	1.19	.90	1.16	1.01	.74	.86	.84	.58	.94
N	23	3	179	24	76	141	188	62	59	73	36	10
GIANNUTRI												
Mean	7.10	8.90	9.17	8.36	8.87	7.62	8.14	8.01	8.01	8.11	7.17	7.66
S. D.	.14		.91	1.02	.91	1.30	1.07	.91	.81	.89	.71	.95
N	2	1	61	17	32	63	100	109	73	102	41	27
VENTOTENE												
Mean	8.26	8.72	9.03	8.44	8.62	8.19	8.06	7.92	7.82	7.57	7.67	7.83
S. D.	.68	1.09	.92	1.17	.95	1.03	1.19	1.03	1.05	.97	.79	.86
N	11	6	53	25	37	46	164	109	139	82	90	38
CAPRI												
Mean	8.02	8.10	9.34	8.93	9.44	9.57	8.73	8.00	8.69	8.23	8.17	7.99
S. D.	1.07		.73	.76	.87	.59	1.01	.92	1.12	1.55	.74	.42
N	4	1	29	10	22	4	28	13	20	10	25	7

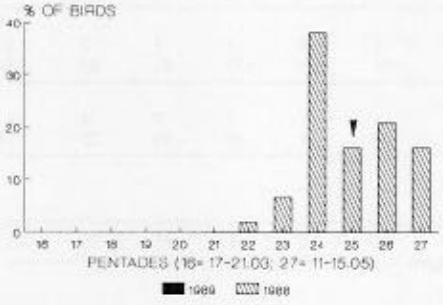
MONTECRISTO (N= 89)



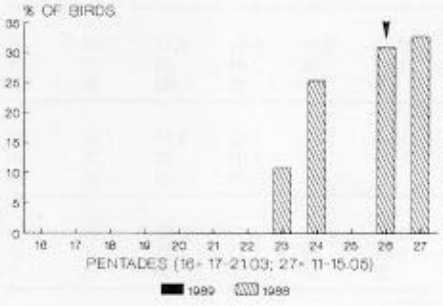
GIANNUTRI (N= 106)



VENTOTENE (N= 105)



CAPRI (N= 55)



SPOTTED FLYCATCHER (**Muscicapa striata**)

Long distance migrant, breeding across most of western Palearctic east to central Asia; distinct subspecies described, including one (**tyrrhenica**) in the central Mediterranean region (Vaurie 1959). Winters in southern Africa, a concentration of recoveries from the Zaire basin being referred still to passage migrants (Dowsett **et al.** 1988). A widespread and locally common breeder in Italy (Meschini & Frugis in press), very numerous also on some of the study islands (Baccetti **et al.** 1981).

Trapping patterns. A late migrant, 355 birds ringed in total; comparable sample sizes at each island. Evidence of first presences between 19 (V) and 26 (M) April, large scale influx not earlier than the last pentade of this month. Passage of birds still important at the end of the study season, also at the southernmost island (C), consistently with previous data which indicated migratory peaks as late as 23.05 (Pettersson **et al.** 1990). Birds belonging to local breeding populations may slightly bias the trapping pattern of migrants. Median pentades 25 (V) and 26 (M, G); at C median also 26, probably delayed by unfavourable conditions preventing any capture on pentade 25. Median passage date immediately after the Mediterranean crossing (Camargue) is 5–10 days later than on our islands (13 May, pentade 27) (Isenmann 1989): this difference seems partly due to passage after the end of our season, as early trappings in the Camargue are nearly at the same time as on islands.

Third primary. Mean values between 66.08 and 69.61 (range: 61.5–74.0); pentade means from Southern Germany during post-breeding migration, including juveniles, more concentrated between 67.0–68.0 (Berthold **et al.** 1991). Most remarkable feature is a drop of means in pentade 26, recorded at all islands; otherwise no clear trend is discernible.

Fat score. In most cases median scores range between 1 and 2, indicating generally low levels of fat accumulation on all islands. Median values 0 occur only at M and 3 at C, otherwise there are no marked differences along the latitudinal gradient.

Body mass. Mean values between 12.45 and 15.33 (range: 10.4–17.8). Only C has sensibly higher means than other islands, in 3 pentades out of 4 comparable ones. The only pentade with similar means at all sites is the same one featured by shorter wing lenght (26). A more or less decreasing trend in mean body masses is apparent for all islands. Further north in the Mediterranean (Camargue: Isenmann 1989), spring means of 10-day periods vary between 14.8 and 15.9 without such a trend; they seem to indicate the possibility that some refuelling has already occurred, though minimum values (11.4–13.1) are comparable with the situation on islands.

Spotted Flycatcher - **Muscicapa striata**

Third primary

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean									68.68	68.83	67.18	68.24
S. D.									1.61	1.98	1.90	1.57
N	0	0	0	0	0	0	0	0	26	10	25	28
GIANNUTRI												
Mean								67.50	68.44	66.98	66.08	67.98
S. D.									2.25	2.34	2.09	2.45
N	0	0	0	0	0	0	0	1	24	21	31	28
VENTOTENE												
Mean							69.25	69.30	68.97	69.44	67.51	68.56
S. D.							.35	1.79	1.57	2.00	2.10	1.71
N	0	0	0	0	0	0	2	7	40	17	22	17
CAPRI												
Mean								68.98	69.61		67.38	67.64
S. D.								2.42	2.00		1.75	1.97
N	0	0	0	0	0	0	0	6	14	0	17	18

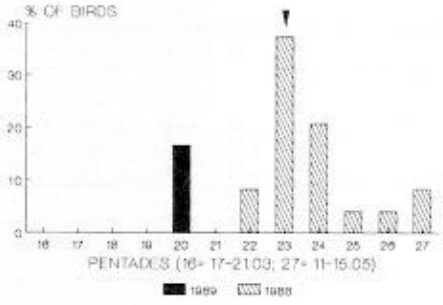
Fat score

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Median									1	2	2	0
N	0	0	0	0	0	0	0	0	26	10	25	28
GIANNUTRI												
Median							4	2	2	2	2	2
N	0	0	0	0	0	0	1	1	24	21	31	28
VENTOTENE												
Median							1	2	2	1	1	2
N	0	0	0	0	0	0	2	7	40	17	22	17
CAPRI												
Median								2	2		3	3
N	0	0	0	0	0	0	0	6	14	0	17	18

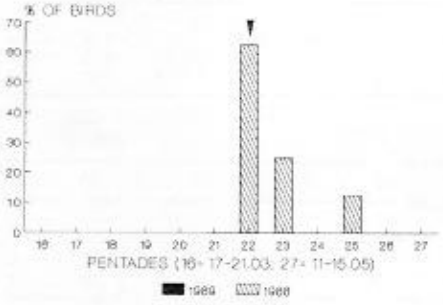
Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean									13.39	13.21	13.22	12.45
S. D.									1.26	.85	1.22	.98
N	0	0	0	0	0	0	0	0	26	10	25	28
GIANNUTRI												
Mean							16.70	13.90	13.14	13.44	12.96	12.89
S. D.									1.71	1.26	1.04	1.21
N	0	0	0	0	0	0	1	1	24	21	31	28
VENTOTENE												
Mean							14.10	13.74	13.68	13.39	13.65	13.17
S. D.							.71	1.00	1.14	1.64	1.20	1.40
N	0	0	0	0	0	0	2	7	40	17	22	17
CAPRI												
Mean								14.88	15.33		13.54	14.24
S. D.								.57	1.04		.77	1.26
N	0	0	0	0	0	0	0	6	14	0	17	18

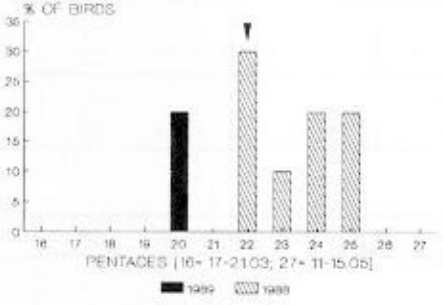
MONTECRISTO (N= 24)



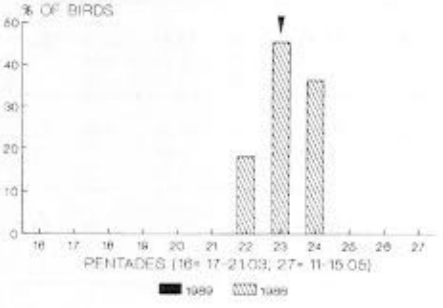
GIANNUTRI (N= 8)



VENTOTENE (N= 10)



CAPRI (N= 11)



COLLARED FLYCATCHER (**Ficedula albicollis**)

Long distance migrant, breeding across central and eastern Europe also at relatively low latitudes; isolated northernmost population in the Baltic area (Lundberg & Alatalo 1992). Winter quarters entirely in sub-Saharan Africa, mainly south of the equator (Curry-Lindahl 1981, Dowsett **et al.** 1988). The species is a regular though scarce breeder in Italy, mainly distributed in Apennine mountain forests at the same latitudes as our study islands (Meschini & Frugis in press).

Trapping patterns. Ringing total 53 birds, with a single reasonable sample (24 on M). Early captures, from 09.04 (pentade 20: M, V), have relatively more importance than in Pied Flycatcher. Median passage dates also slightly earlier than this species: in pentades 22 (G, V) and 23 (M, C), apparently independent from latitude of islands. Presences still recorded at the end of the study period in a single case (M). On C, during 5 seasons, median date much later (2 May, i.e. pentade 25) (Pettersson **et al.** 1990) possibly determined by a later start of catching activities; main migratory routes supposed to be more to the east, not confirmed by our data indicating more sensible presences rather to the west (i.e. M). On Malta the species may be observed as early as late March (Sultana & Gauci 1982).

Third primary. Mean values between 62.75 and 65.50 (range: 60.0–68.0). Far too small material to allow any variation being detected, though means are apparently stable (64.39–64.90) in all best represented samples from pentades 20–24 at M.

Fat score. Most median scores based on reliable samples are 0 (2 at C), indicating comparably low reserve levels as in Pied Flycatcher.

Body mass. Mean values between 9.85 and 11.67, both extremes being recorded on the same island (M); actual range 9.0–15.0. Apparently no differences either among islands or among periods, the latter having possibly too small samples after the median date of passage.

Collared Flycatcher - **Ficedula albicollis**

Third primary

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean					64.75		62.00	64.39	64.90	63.00	63.00	62.75
S. D.					1.66		2.83	1.58	2.26			1.77
N	0	0	0	0	4	0	2	9	5	1	1	2
GIANNUTRI												
Mean							64.60	63.25		63.50		
S. D.							2.70	3.18				
N	0	0	0	0	0	0	5	2	0	1	0	0
VENTOTENE												
Mean					64.60		63.00	65.00	65.50	64.60		
S. D.					.85		.95		2.12	2.26		
N	0	0	0	0	2	0	3	1	2	2	0	0
CAPRI												
Mean							65.50	63.30	62.97			
S. D.							.71	1.57	1.40			
N	0	0	0	0	0	0	2	5	4	0	0	0

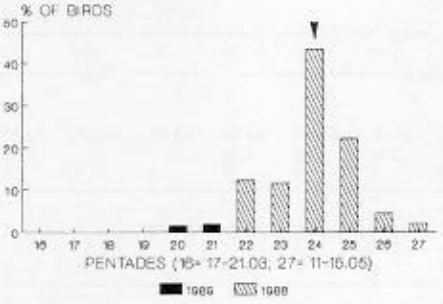
Fat score

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Median					0		0	0	0	0	00	
N	0	0	0	0	4	0	2	9	5	1	1	2
GIANNUTRI												
Median							0	2		0		
N	0	0	0	0	0	0	5	2	0	1	0	0
VENTOTENE												
Median					1		0	0	1	1		
N	0	0	0	0	2	0	3	1	2	2	0	0
CAPRI												
Median							2	2	2			
N	0	0	0	0	0	0	2	5	4	0	0	0

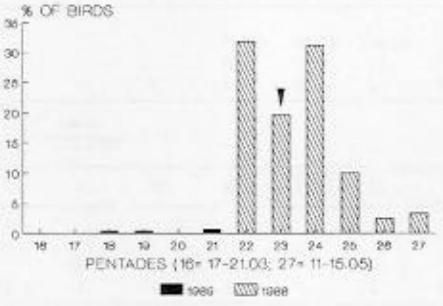
Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean					10.07		9.85	11.67	11.22	11.20	10.00	10.25
S. D.					.43		1.20	1.47	.88			.78
N	0	0	0	0	4	0	2	9	5	1	1	2
GIANNUTRI												
Mean							11.00	11.55		11.70		
S. D.							.55	2.19				
N	0	0	0	0	0	0	5	2	0	1	0	0
VENTOTENE												
Mean					10.65		10.67	10.40	11.25	11.65		
S. D.					.78		.80		1.91		.64	
N	0	0	0	0	2	0	3	1	2	2	0	0
CAPRI												
Mean							11.50	11.74	11.28			
S. D.							.85	1.14	1.91			
N	0	0	0	0	0	0	2	5	4	0	0	0

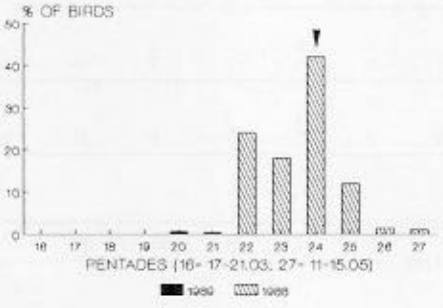
MONTECRISTO (N= 444)



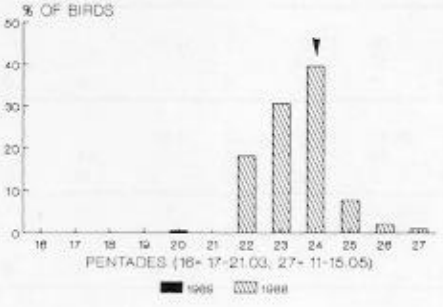
GIANNUTRI (N= 270)



VENTOTENE (N= 266)



CAPRI (N= 192)



PIED FLYCATCHER (**Ficedula hypoleuca**)

Long distance migrant, breeding with the nominate race over most of central and eastern Europe, at latitudes included between the Alps and northern Scandinavia (Lundberg & Alatalo 1992). Other races on disjunct ranges (e. g. Spain: **iberiae**) and east of the Urals (**tomensis**). Winter quarters entirely in sub-Saharan Africa, mainly north of the equator and west of the Nile. An exceptional breeder in Italy, not even recorded during recent enquiries.

Trapping patterns. Ringing total 1,172 birds, with samples from each island exceeding 100. Onset of passage between pentades 18 and 20 (earliest bird: 29.03, G), with unrelevant numbers everywhere until pentade 22, after mid-April. Medians of passage on pentade 24 (G: 23), when peak figures were recorded on most islands. Sharp decrease in numbers afterwards, though no interruption in presences till the end of the study period. A similar pattern has been recorded on C during 5 seasons, with a median date on 1 May and presence between 11 April and 23 May (Pettersson **et al.** 1990); on Malta the species may be observed as early as mid-March (Sultana & Gauci 1982). At migration or breeding sites in central Europe, Pied Flycatchers usually start being recorded around mid April though as early dates as 7 April have been reported; in southern Sweden, mean first arrivals on 2 May, with exceptional dates as early as 14 April (Zink 1987, Lundberg & Alatalo 1992). Sex and age differences in times are known at different levels of the spring migratory route (Lundberg & Alatalo 1992).

Third primary. Mean values between 59.25 and 62.98 (range: 51.5–68.5). Similar values reported from central Europe in autumn (Berthold **et al.** 1991). A decreasing trend in mean length can be observed at all sites, as an effect of size differences existing among sex and age-classes and their different timing of migration (Lundberg & Alatalo 1992).

Fat score. Very low median values in all samples except those from C. No evidence of a trend within the data from any island.

Body mass. Mean values between 10.02 and 11.60 (range: 7.7–17.0). Means at C consistently higher than at all other sites, never below 11.23 , otherwise no obvious differences among islands. Generally decreasing trends which may be partly connected to those observed in wing length.

Pied Flycatcher - **Ficedula hypoleuca**

Third primary

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean					61.79	61.61	62.25	61.94	61.35	60.60	60.53	60.73
S. D.					1.50	1.34	1.38	1.14	1.62	1.71	1.45	1.24
N	0	0	0	0	7	9	55	52	193	99	20	9
GIANNUTRI												
Mean			63.20	63.00		61.40	61.34	61.98	61.15	61.31	61.86	60.75
S. D.						.57	2.05	1.63	1.42	1.73	3.25	1.71
N	0	0	1	1	0	2	86	53	84	27	7	9
VENTOTENE												
Mean					61.75	60.00	62.35	62.94	61.80	61.76	61.20	61.17
S. D.					1.06		2.07	1.52	1.57	1.57	1.29	2.02
N	0	0	0	0	2	1	64	48	112	32	4	3
CAPRI												
Mean					64.80		61.61	61.98	61.74	59.87	60.38	59.25
S. D.							1.63	1.61	1.73	1.71	1.25	1.77
N	0	0	0	0	1	0	35	59	76	15	4	2

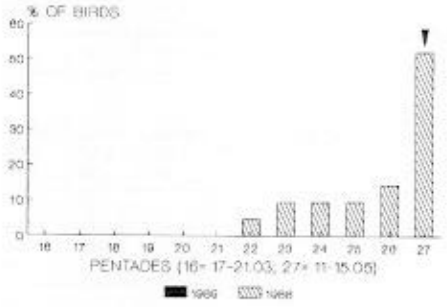
Fat score

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Median					0	0	0	1	0	0	1	0
N	0	0	0	0	7	9	55	52	193	99	20	9
GIANNUTRI												
Median			4	0		2	0	0	0	1	1	1
N	0	0	1	1	0	2	86	53	84	27	7	9
VENTOTENE												
Median					3	5	0	0	0	0	0	0
N	0	0	0	0	2	1	64	48	112	32	4	3
CAPRI												
Median					2		2	2	2	2	4	3
N	0	0	0	0	1	0	35	59	76	15	4	2

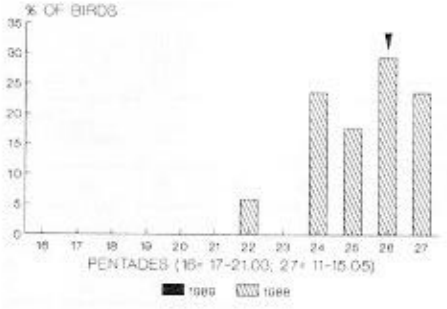
Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean					10.49	10.86	10.92	10.84	10.71	10.68	11.01	10.41
S. D.					.55	1.45	.95	.84	.86	1.09	.78	.65
N	0	0	0	0	7	9	55	52	193	99	20	9
GIANNUTRI												
Mean			11.40	10.80		10.70	10.63	10.64	10.80	10.49	10.24	10.28
S. D.						2.12	.94	.84	.92	.87	.81	.71
N	0	0	1	1	0	2	86	53	84	27	7	9
VENTOTENE												
Mean					11.60	14.60	10.77	10.93	10.57	10.40	10.02	11.37
S. D.					.00		1.08	.86	.87	1.14	.13	1.42
N	0	0	0	0	2	1	64	48	112	32	4	3
CAPRI												
Mean					11.70		11.26	11.53	11.41	11.25	11.23	11.25
S. D.							.93	.88	.88	1.38	.48	1.20
N	0	0	0	0	1	0	35	59	76	15	4	2

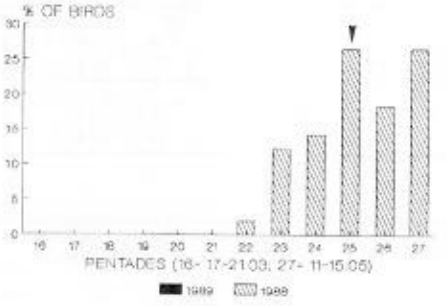
MONTECRISTO (N= 21)



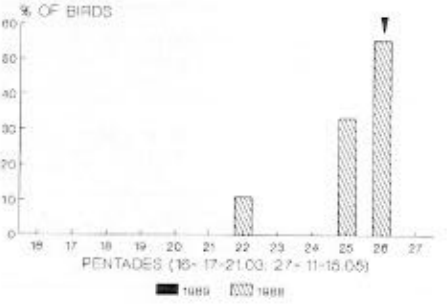
GIANNUTRI (N= 17)



VENTOTENE (N= 49)



CAPRI (N= 9)



GOLDEN ORIOLE (**Oriolus oriolus**)

Long distance migrant breeding with the nominate subspecies over most of Eurasia, except for the higher latitudes. Winters in tropical and southern Africa (Moreau 1972, Feige 1986, Curry-Lindahl 1981). A rather common breeder in Italian lowlands and hilly areas (Meschini & Frugis in press).

Trapping patterns. A late migrant, totally absent from all islands till the second half of April, with main passage from the end of the month and in May. Birds still present with good numbers at the end of the trapping period. Median dates of passage for the total of 96 ringed birds on pentade 25 (V) and 26 (C, G, M). Same pattern already reported for C (Pettersson **et al.** 1990), as well as for other Mediterranean sites (Finlayson 1992).

Third primary. Mean values between 110.0 and 116.57 (range: 106.0-123.0). On all islands, a clear negative trend is observed during the trapping period, as a consequence of the differential migration of sexes (Feige 1986, Spina **et al.** 1991), with smaller females passing later than males.

Fat score. Birds trapped on all islands show very low levels of subcutaneous fat or no visible reserves at all, median scores being mostly 0 or 1.

Body mass. Mean values between 48.50 and 65.00 (range: 45.0-76.0), with a tendency to decrease along the trapping period, which is to be related to the smaller size of females (Feige 1986). A mean of 52.6 reported from a small spring sample on M (Baccetti **et al.** 1981), with a local difference of more than 20 with birds on autumn migration.

Golden Oriole - **Oriolus oriolus**

Third primary

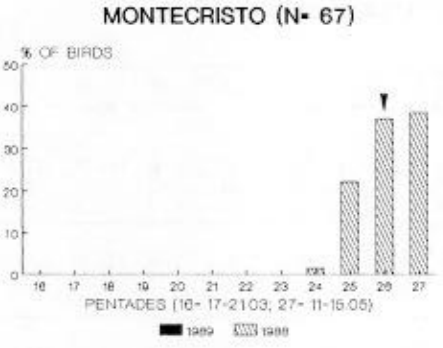
	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean							118.50	112.50	116.00	115.00	114.25	113.26
S. D.								3.54	.00	2.12	1.77	2.41
N	0	0	0	0	0	0	1	2	2	2	3	11
GIANNUTRI												
Mean							115.00		113.50	112.50	112.00	110.00
S. D.									3.87	4.77	4.06	2.46
N	0	0	0	0	0	0	1	0	4	3	5	4
VENTOTENE												
Mean							116.00	114.83	116.57	115.17	113.72	114.71
S. D.								2.38	3.77	2.49	1.33	1.98
N	0	0	0	0	0	0	1	6	7	13	9	13
CAPRI												
Mean							118.20			114.17	113.00	
S. D.										2.84	3.24	
N	0	0	0	0	0	0	1	0	0	3	5	0

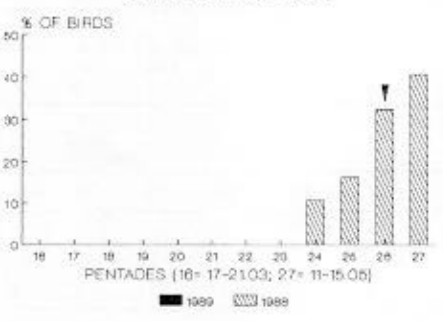
Fat score

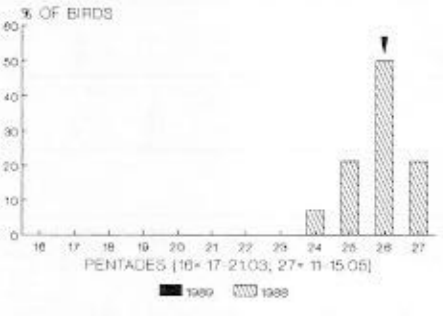
	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Median							0	1	0	1	1	1
N	0	0	0	0	0	0	1	2	2	2	3	11
GIANNUTRI												
Median							0		0	1	1	2
N	0	0	0	0	0	0	1	0	4	3	5	4
VENTOTENE												
Median							0	0	0	0	0	0
N	0	0	0	0	0	0	1	6	7	13	9	13
CAPRI												
Median							1			0	2	
N	0	0	0	0	0	0	1	0	0	3	5	0

Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean							60.00	59.50	48.50	65.00	56.00	56.91
S. D.								10.61	2.83	12.73	5.20	4.76
N	0	0	0	0	0	0	1	2	2	2	3	11
GIANNUTRI												
Mean							59.00		60.38	56.67	56.00	54.50
S. D.									12.66	6.03	6.86	2.93
N	0	0	0	0	0	0	1	0	4	3	5	4
VENTOTENE												
Mean							66.00	61.25	63.96	59.40	55.17	57.27
S. D.								4.54	6.27	4.22	4.64	5.39
N	0	0	0	0	0	0	1	6	7	13	9	13
CAPRI												
Mean							61.00			64.00	62.40	
S. D.										10.44	6.23	
N	0	0	0	0	0	0	1	0	0	3	5	0







RED-BACKED SHRIKE (**Lanius collurio**)

Breeding with different subspecies across most of the Palearctic; European populations belong to the nominate form and are entirely migrant (Vaurie 1959). Their African winter range is reached following in the initial stage a clear SE-oriented route, through eastern Mediterranean. An even more eastern route is apparently used in spring (Curry-Lindahl 1977, Zink 1987). This species is totally absent in the Gibraltar area during the spring migration (Finlayson 1992) and almost the same happens in Malta (Sultana & Gauci 1982). In Italy it is a widespread species, only missing in Sardinia and most of Sicily; it commonly breeds also on some small Tyrrhenian islands (Meschini & Frugis in press) and Corsica (Thibault 1983).

Trapping patterns. A late migrant. Captures uniformly started being recorded on pentade 24 and medians falled on pentade 26, suggesting a fast passage of birds, still important at the end of our period. Ringing total 119 birds, obviously concentrated on northern islands (M,G); hardly any birds were found on C. This might confirm an eastern origin of the birds, which probably originate from eastern Mediterranean just having crossed the Adriatic Sea and Italian peninsula in a westerly direction. Passage dates fit the onset of breeding activities in Central Europe, where first clutches are started around mid-May (Rudin 1990).

Third primary. Mean values between 67.97 and 71.17 (range: 64.0–74.0). Seasonal differences in the passage of sexes might be the reason for the slightly decreasing trend of means recorded at the two best represented islands.

Fat score. Median values, excluding a single instance, higher than score 1. This fact might be due to food availability along most of the migratory route (e. g. exausted migrants) as well as to the possibilities for stopover on the mainland before the Tyrrhenian Sea is reached.

Body mass. Mean values between 25.13 and 28.25 (range: 20.5–31.5); lower means towards the end of the period probably due to the higher number of females in late samples. Values are similar at all three islands where regular captures occurred.

Red-backed Shrike - **Lanius collurio**

Third primary

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean									70.00	70.09	69.10	69.57
S. D.										2.02	1.66	2.45
N	0	0	0	0	0	0	0	0	1	15	25	26
GIANNUTRI												
Mean									70.25	68.33	68.46	67.97
S. D.									2.18	3.39	2.17	2.01
N	0	0	0	0	0	0	0	0	4	6	12	15
VENTOTENE												
Mean									72.50	69.00	71.17	69.17
S. D.										1.73	2.22	3.62
N	0	0	0	0	0	0	0	0	1	3	7	3
CAPRI												
Mean												69.00
S. D.												
N	0	0	0	0	0	0	0	0	0	0	0	1

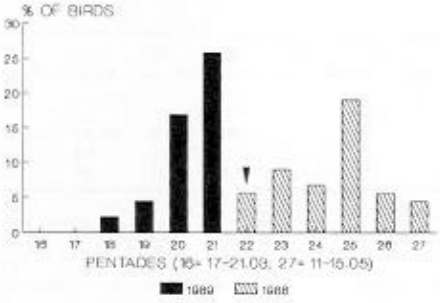
Fat score

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Median									2	2	2	2
N	0	0	0	0	0	0	0	0	1	15	25	26
GIANNUTRI												
Median									3	3	2	1
N	0	0	0	0	0	0	0	0	4	6	12	15
VENTOTENE												
Median									5	0	1	0
N	0	0	0	0	0	0	0	0	1	3	7	3
CAPRI												
Median												3
N	0	0	0	0	0	0	0	0	0	0	0	1

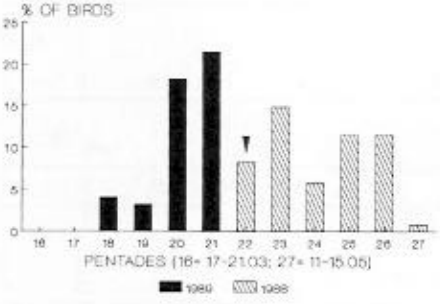
Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
Islands												
MONTECRISTO												
Mean									25.50	27.25	26.08	25.17
S. D.										1.62	2.38	1.98
N	0	0	0	0	0	0	0	0	1	15	25	26
GIANNUTRI												
Mean									28.25	26.52	25.13	25.29
S. D.									1.08	2.81	1.79	1.30
N	0	0	0	0	0	0	0	0	4	6	12	15
VENTOTENE												
Mean									28.40	25.37	25.89	25.57
S. D.										1.54	2.16	.85
N	0	0	0	0	0	0	0	0	1	3	7	3
CAPRI												
Mean												27.20
S. D.												
N	0	0	0	0	0	0	0	0	0	0	0	1

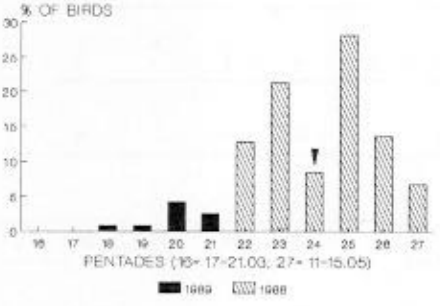
MONTECRISTO (N= 89)



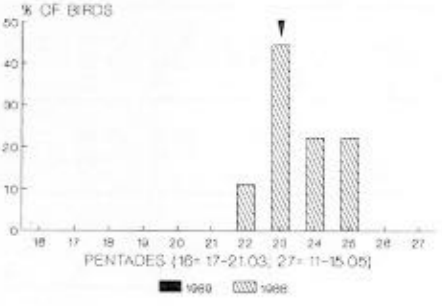
GIANNUTRI (N= 120)



VENTOTENE (N= 118)



CAPRI (N= 9)



WOODCHAT SHRIKE (**Lanius senator**)

Long distance migrant, breeding in a wide area of the western Palearctic except the Atlantic coasts of Europe, England and Scandinavia; also distributed in north Africa and the Near East. Winters south of the Sahara, between the Sahelian zone and the tropical forest belt (Curry-Lindahl 1981). Breeds over most of continental and peninsular Italy, from coastal areas up to occasionally more than 1,000 m a.s.l. (Meschini & Frugis in press, Brichetti 1985). Two different subspecies breed around the Mediterranean, with **L.s.badius** nesting on Corsica, Sardinia and the Balearics, and showing in general a more southern distribution than the nominate race (Bub 1981).

Trapping patterns. Good comparable samples on three stations, only few birds ringed at C out of a total of 336. Spring migration starts from the end of March, still progressing at the end of our study period in mid-May. Apparently an earlier passage takes place on the two northern stations, with median dates on pentades 22 (G, M), 23 (C) and 24 (V). Interesting similarities in trapping peaks between G and M on pentades 20 and 21, as well as on all four islands on pentade 23. Along the coast of Latium, mean movements recorded between mid-April and mid-May (Fraticelli 1984). Arrivals on breeding grounds in Central Europe recorded in the first three weeks of May (Ullrich 1971). A slightly earlier passage of **badius** is reported from the coast of Latium (Fraticelli 1984).

Third primary. Mean values between 77.88 and 78.55 (range: 68.0–88.0). On all three islands with better samples, a clear progressive seasonal decrease in mean wing length is observed. Such trend could be related to the differential migration of sexes, which seems to be the rule.

Fat score. Median values recorded on all islands indicate fairly good physical conditions, to be related also to the intense predation of the shrikes on small to medium-sized migrants.

Body mass. Mean values between 29.30 and 39.70 (range: 21.5 43.0); most cases lay between 31 and 34 . A very similar seasonal pattern to the one referred to size is observed on all islands, with a late passage of smaller birds.

Woodchat Shrike - **Lanius senator**

Third primary

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean			76.25	76.50	75.20	75.93	74.60	74.69	75.42	75.53	74.30	75.13
S. D.			1.06	1.73	2.05	1.80	3.29	1.81	1.07	3.23	2.77	1.31
N	0	0	2	4	15	23	5	8	6	17	5	4
GIANNUTRI												
Mean			77.30	77.88	77.00	76.56	76.80	75.67	74.93	75.07	74.29	73.50
S. D.			1.57	.85	2.07	1.90	1.93	3.45	1.51	2.28	2.09	
N	0	0	5	4	22	26	10	18	7	14	14	1
VENTOTENE												
Mean			79.00	77.50	76.00	74.47	77.00	76.53	76.37	75.64	74.93	76.03
S. D.					1.46	1.27	2.55	2.12	1.62	2.73	2.40	1.47
N	0	0	1	1	5	3	15	25	10	33	16	8
CAPRI												
Mean							75.00	75.88	78.55	74.00		
S. D.								2.02	1.48	1.41		
N	0	0	0	0	0	0	1	4	2	2	0	0

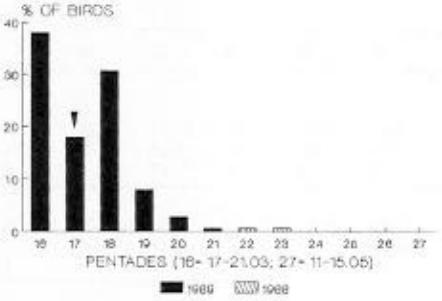
Fat score

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Median			4	0	2	2	3	2	1	2	0	1
N	0	0	2	4	15	23	5	8	6	17	5	4
GIANNUTRI												
Median			0	1	2	2	2	0	1	2	2	3
N	0	0	5	4	22	26	10	18	7	14	14	1
VENTOTENE												
Median			4	2	2	2	1	2	2	0	2	2
N	0	0	1	1	5	3	15	25	10	33	16	8
CAPRI												
Median							3	3	3	4		
N	0	0	0	0	0	0	1	4	2	2	0	0

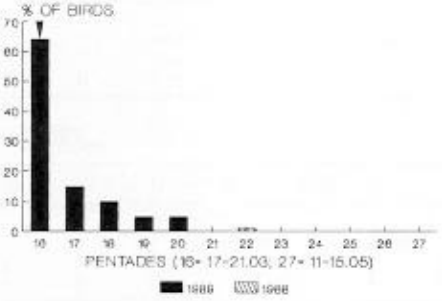
Body mass

Islands	Pentades 16	17	18	19	20	21	22	23	24	25	26	27
	March					April					May	
MONTECRISTO												
Mean			39.70	34.30	35.43	32.93	35.14	33.13	29.30	34.09	31.78	31.10
S. D.			.42	2.58	3.46	2.80	4.35	5.55	2.31	3.99	4.23	4.44
N	0	0	2	4	15	23	5	8	6	17	5	4
GIANNUTRI												
Mean			33.48	35.20	35.94	33.44	32.81	31.63	32.14	33.13	33.86	32.00
S. D.			1.97	2.55	2.42	2.66	4.01	3.15	2.43	3.25	2.89	
N	0	0	5	4	22	26	10	18	7	14	14	1
VENTOTENE												
Mean			34.70	34.00	34.40	32.33	31.89	33.10	33.19	32.49	31.74	33.58
S. D.					2.30	1.11	3.89	2.48	3.22	1.93	3.12	3.81
N	0	0	1	1	5	3	15	25	10	33	16	8
CAPRI												
Mean							32.40	33.00	33.65	32.35		
S. D.								2.65	2.05	4.03		
N	0	0	0	0	0	0	1	4	2	2	0	0

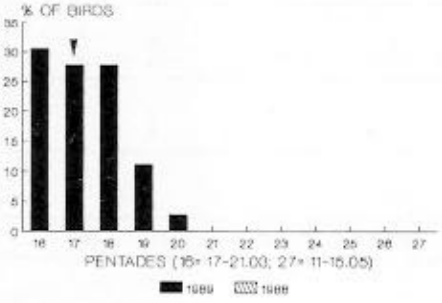
MONTECRISTO (N= 273)



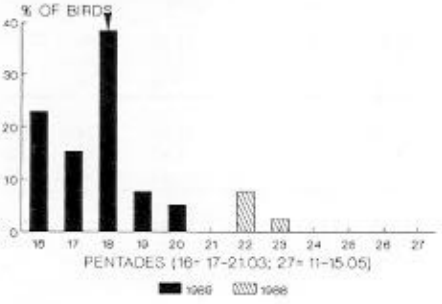
GIANNUTRI (N= 81)



VENTOTENE (N= 36)



CAPRI (N= 39)



CHAFFINCH (**Fringilla coelebs**)

A common species breeding across most of Europe and the Mediterranean basin, east to central Asia and the Middle East (Newton 1972). Migrant and resident populations do occur on the different parts of the species range. The winter range does not penetrate into Africa much further than the Mediterranean coast. Most birds passing through Italy (or wintering there) seem to originate from central and eastern European countries (Savigni & Massa 1983). Breeding in Italy occurs widely, also on the main islands and some of the small ones (e. g. C) (Brichetti 1985, Meschini & Frugis in press).

Trapping patterns. Ringing total 429 birds, with most captures on northern islands (M,G). Everywhere marked peaks in the earliest pentades due to an earlier start of migration and a steady decrease afterwards; only occasional birds captured after mid-April. Median pentades 16 (G), 17 (M, V) and 18 (C), with no obvious latitudinal gradient. The difference in numbers between northern and southern islands does not seem related to the size of the local wintering numbers (unrelevant both at M and G); the presence of important wintering populations in Corsica and Sardinia as well as the use of Corsica-Sardinia bridge by birds coming from Africa might instead explain this fact. Both cases would determine the Tyrrhenian sea being crossed mainly at a relatively high latitude.

Third primary. Mean values between 64.04 and 66.45 (range: 59.0–75.0). Sex-related differences in size and migratory habits, well known in this species (Newton 1972), are probably the factors determining a slightly decreasing trend in the latest representative samples.

Fat score. All median scores of richest samples at northern islands (M,G) equal to 0; fatter birds are caught at the other sites throughout the season, indicating the possibility for either a progressive use of reserve substances along a same route (despite the absence of a gradient among median pentades), or a different and closer departure area for the birds examined at southern islands.

Body mass. Mean values 17.83 to 20.68 (range: 14.6–27.3). As a confirmation of fat score analysis, a tendency to higher values at southern sites is apparent. All our mean values are, however, outside the lower limit of the range indicated for migratory seasons (Newton 1972).

Chaffinch - **Fringilla coelebs**

Third primary

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April							May	
Islands												
MONTECRISTO												
Mean	65.80	65.31	65.08	64.50	64.94	64.25	63.50	70.00				
S. D.	2.92	2.65	2.18	1.92	3.02	1.06	.71	.00				
N	104	49	84	22	8	2	2	2	0	0	0	0
GIANNUTRI												
Mean	66.21	66.20	64.04	64.80	65.75		72.00					
S. D.	2.96	3.23	2.32	1.64	3.59							
N	52	12	8	4	4	0	1	0	0	0	0	0
VENTOTENE												
Mean	66.45	65.34	65.51	64.20	62.00							
S. D.	3.10	2.42	2.29	1.28								
N	11	10	10	4	1	0	0	0	0	0	0	0
CAPRI												
Mean	64.21	63.88	64.29	65.80	64.25		63.33	66.80				
S. D.	1.00	.57	1.85	3.72	1.77		.58					
N	9	6	15	3	2	0	3	1	0	0	0	0

Fat score

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April							May	
Islands												
MONTECRISTO												
Median	0	0	0	1	2	1	4	1				
N	104	49	84	22	8	2	2	2	0	0	0	0
GIANNUTRI												
Median	0	0	0	0	1		0					
N	52	12	8	4	4	0	1	0	0	0	0	0
VENTOTENE												
Median	4	3	3	1	4							
N	11	10	10	4	1	0	0	0	0	0	0	0
CAPRI												
Median	2	3	3	2	3		0	1				
N	9	6	15	3	2	0	3	1	0	0	0	0

Body mass

	Pentades											
	16	17	18	19	20	21	22	23	24	25	26	27
	March			April							May	
Islands												
MONTECRISTO												
Mean	18.84	18.68	18.43	18.88	19.94	19.15	19.70	21.50				
S. D.	2.02	1.51	1.43	1.25	1.71	2.05	.14	1.27				
N	104	49	84	22	8	2	2	2	0	0	0	0
GIANNUTRI												
Mean	17.83	18.66	18.51	17.75	18.20		19.30					
S. D.	1.75	2.32	1.65	.68	2.07							
N	52	12	8	4	4	0	1	0	0	0	0	0
VENTOTENE												
Mean	20.68	19.88	20.24	18.67	23.30							
S. D.	2.26	1.41	1.90	1.39								
N	11	10	10	4	1	0	0	0	0	0	0	0
CAPRI												
Mean	20.39	20.23	19.71	19.07	21.20		18.97	23.20				
S. D.	2.92	1.92	1.73	2.63	2.26		.51					
N	9	6	15	3	2	0	3	1	0	0	0	0

7. Closing remarks

The results derived from the first two years of the project confirm the rôle that Mediterranean islands can play as a network of ringing stations to monitor bird migration, through the contemporary involvement of ringers and the use of standardized techniques for data collection.

On a seasonal basis, long-distance migrants pass through later than those wintering within the Mediterranean basin. The migratory patterns recorded on the four selected islands indicate a general tendency of many different species for a fast sea crossing. In several species, a decline in median fat scores and mean body mass values is observed for birds trapped on the four islands (i.e. sampled at different stages of sea crossing); this indicates the progressive use of energy reserves stored before leaving Africa by migrants which do not refuel en route.

Further steps in the analysis will include aspects like migration speed and differential passage of sex and age classes, which have not been included in this paper, intended as a first presentation of general results.

From its start in 1988, the project has greatly developed, through the activity of more than 300 people and over 144.000 ringed birds; in 1992, 16 different stations joined the field activities. Since 1990, the involvement of a growing number of foreign stations allowed also a much wider geographical coverage (Massi **et al.** 1992), which will provide further insights into such an interesting field of research as the return movements of Palearctic-African migrants to their breeding grounds.

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APPENDIX I. Ringing Totals.

M = Montecristo; G = Giannutri;
V = Ventotene; C = Capri;

SPECIES	M		G		V		C		TOTAL	
	88	89	88	89	88	89	88	89	88	89
Cory's Shearwater (Calonectris diomedea)			1	10					1	10
Manx Shearwater (Puffinus puffinus)	2	2		1					2	3
Night Heron (Nycticorax nycticorax)	4		1						5	
Little Egret (Egretta garzetta)	3								3	
Grey Heron (Ardea cinerea)	1								1	
Kestrel (Falco tinnunculus)		4	1			2		1	1	7
Quail (Coturnix coturnix)	1		4	1	3	1		1	8	3
Spotted Crake (Porzana porzana)	1					1			1	1
Moorhen (Gallinula chloropus)	2				1				3	
Woodcock (Scolopax rusticola)			1						1	
Common Sandpiper (Actitis hypoleucos)	16	1							16	1
Yellow-legged Gull (Larus cachinnans)			21	13					21	13
Woodpigeon (Columba palumbus)		2								2

SPECIES	M		G		V		C		TOTAL	
	88	89	88	89	88	89	88	89	88	89
Collared Dove (Streptopelia decaocto)		1								1
Turtle Dove (Streptopelia turtur)	31	2	47		22		13		113	2
Great Spotted Cuckoo (Clamator glandarius)							1			1
Cuckoo (Cuculus canorus)	21		5	1	1		3		30	1
Scops Owl (Otus scops)	13	18	13	12	12	6	9	6	47	42
Long-eared Owl (Asio otus)				1						1
Nightjar (Caprimulgus europaeus)	4	1	14	1	3	1	2		23	3
Bee-eater (Merops apiaster)	15	2	14		9		4		42	2
Hoopoe (Upupa epops)	18	24	63	53	33	38	12	7	126	122
Wryneck (Jynx torquilla)	12	25	10	8	38	30	5	9	65	72
Short-toed Lark (Calandr. brachydactyla)		1			1				1	1
Woodlark (Lullula arborea)				1						1
Skylark (Alauda arvensis)				2		2		3		7
Sand Martin (Riparia riparia)	6		13		12				31	
Swallow (Hirundo rustica)	50	11	132	12	167	26	23	5	372	54
Red-rumped Swallow (Hirundo daurica)					2				2	
House Martin (Delichon urbica)	78		5		34	3	13	1	130	4

SPECIES	M		G		V		C		TOTAL	
	88	89	88	89	88	89	88	89	88	89
Tawny Pipit (Anthus campestris)	2		2				2		6	
Tree Pipit (Anthus trivialis)	106	88	58	26	119	25	25	7	308	146
Meadow Pipit (Anthus pratensis)	1	13		3				16	1	32
Water Pipit (Anthus spinoletta)				1		1				2
Yellow Wagtail (Motacilla flava)	70	31	20	4	13	3			103	38
Grey Wagtail (Motacilla cinerea)				1						1
White Wagtail (Motacilla alba)		14		3						17
Wren (Troglodytes troglodytes)	4	8		13		3		7	4	31
Dunnock (Prunella modularis)	2	25		21	1	14		5	3	65
Alpine Accentor (Prunella collaris)		2								2
Robin (Erithacus rubecula)	64	864	27	425	24	792		195	115	2276
Nightingale (Luscinia megarhynchos)	77	88	62	30	281	62	5	3	425	183
Bluethroat (Luscinia svecica)		2		1		2				5
Black Redstart (Phoenicurus ochruros)		42	1	21	3	49	2	119	6	231
Redstart (Phoenicurus phoenicurus)	100	101	117	47	114	28	40	10	371	186
Whinchat (Saxicola rubetra)	98	1	90	12	150	5	160	2	498	20
Stonechat (Saxicola torquata)		14		37		29		33		113

SPECIES	M		G		V		C		TOTAL	
	88	89	88	89	88	89	88	89	88	89
Wheatear (Oenanthe oenanthe)	1	1	10	75	50	54	204	297	265	427
Black-eared Wheatear (Oenanthe hispanica)	1		1	4	5	12	47	40	54	56
Rock Thrush (Monticola saxatilis)					5	2	2		7	2
Blue Rock Thrush (Monticola solitarius)						3	1	5	1	8
Blackbird (Turdus merula)	6	23	4	8		1			10	32
Song Thrush (Turdus philomelos)	13	82	5	31	20	156	3	45	41	314
Redwing (Turdus iliacus)		1								1
Mistle Thrush (Turdus viscivorus)		1								1
Fan-tailed Warbler (Cisticola juncidis)						2		2		4
Grasshopper Warbler (Locustella naevia)	1		1		1				3	
Savi's Warbler (Locustella luscinioides)		1	1		2				3	1
Sedge Warbler (Acroceph. schoenobaenus)	56	13	57	2	93	9	1		207	24
Reed Warbler (Acrocephalus scirpaceus)	13		3		28				44	
Great Reed Warbler (Acrocephalus arundinaceus)	36	2	8	2	13				57	4
Icterine Warbler (Hippolais icterina)	70		87		306		52		515	
Melodious Warbler (Hippolais polyglotta)	5				1				6	
Marmora's Warbler (Sylvia sarda)				3		1				4

SPECIES	M		G		V		C		TOTAL	
	88	89	88	89	88	89	88	89	88	89
Dartford Warbler (Sylvia undata)	1	4	3	2	1				5	6
Spectacled Warbler (Sylvia conspicillata)		1		3	1	14		14	1	32
Subalpine Warbler (Sylvia cantillans)	242	570	266	486	895	1260	30	262	1433	2578
Sardinian Warbler (Sylvia melanocephala)	1	93	38	126	18	93	3	19	60	331
Rüppel's Warbler (Sylvia rüppelli)						1				1
Lesser Whitethroat (Sylvia curruca)		2		1						3
Whitethroat (Sylvia communis)	274	202	212	58	515	68	83	19	1084	347
Garden Warbler (Sylvia borin)	443	7	329	2	787	2	58		1617	11
Blackcap (Sylvia atricapilla)	103	450	19	154	21	101	7	42	150	747
Bonelli's Warbler (Phylloscopus bonelli)	1		9	2	4				14	2
Wood Warbler (Phylloscopus sibilatrix)	371	59	269	13	421	18	227	3	1288	93
Chiffchaff (Phylloscopus collybita)	59	380	17	229	44	221	3	57	123	887
Willow Warbler (Phylloscopus trochilus)	428	446	452	176	622	178	103	70	1605	870
Goldcrest (Regulus regulus)	1	19	1	17		13		2	2	51
Firecrest (Regulus ignicapillus)	4	16	2	36		29		5	6	86
Spotted Flycatcher (Muscicapa striata)	89		106		105		55		355	
Collared Flycatcher (Ficedula albicollis)	20	4	8		8	2	11		47	6

SPECIES	M		G		V		C		TOTAL	
	88	89	88	89	88	89	88	89	88	89
Semi-collared Flycatcher (Ficedula semitorquata)							1		1	
Pied Flycatcher (Ficedula hypoleuca)	428	16	266	4	263	3	191	1	1148	24
Great Tit (Parus major)								12		12
Short-toed Treecreeper (Certhia brachydactyla)							2	2	2	2
Golden Oriole (Oriolus oriolus)	21		17		49		9		96	
Red-backed Shrike (Lanius collurio)	67		37		14		1		119	
Woodchat Shrike (Lanius senator)	45	44	63	57	108	10	9		225	111
Starling (Sturnus vulgaris)		9		2		6				17
Italian Sparrow (Passer italiae)	4	7	18	1	34	63	17	5	73	76
Spanish Sparrow (Passer hispaniolensis)	4				12				16	
Tree Sparrow (Passer montanus)		3			25	12			25	15
Passer sp.	13				25				38	
Chaffinch (Fringilla coelebs)	4	269	1	80		36	4	35	9	420
Brambling (Fringilla montifringilla)		1		1						2
Serin (Serinus serinus)	9	60	1	15	4	12	10	32	24	119
Citril Finch (Serinus citrinella)		2								2
Greenfinch (Carduelis chloris)	15	51	53	37	7	9	4	1	79	98

SPECIES	M		G		V		C		TOTAL	
	88	89	88	89	88	89	88	89	88	89
Goldfinch (Carduelis carduelis)	23	71	17	19	1	4	2		43	94
Siskin (Carduelis spinus)		7		2				1		10
Linnet (Carduelis cannabina)	1	17	6	20	2	11	1	11	10	59
Crossbill (Loxia curvirostra)		3								3
Hawfinch (Coccothr. coccothraustes)	2	7							2	7
Cirl Bunting (Emberiza cirlus)		1								1
Ortolan Bunting (Emberiza hortulana)	3				10		5		18	
Little Bunting (Emberiza pusilla)	1		1						2	
Red-headed Bunting (Emberiza bruniceps)	1								1	
Corn Bunting (Miliaria calandra)	1	5	1	2			1		3	7
TOTAL	3683	4337	3111	2431	5563	3529	1465	1413	13822	11710
CUM.	8020		5542		9092		2878		25532	