

Notas Breves

SPRING MIGRATION IN RELATION TO SEX AND AGE OF MARSH HARRIERS *CIRCUS AERUGINOSUS* OVER A CENTRAL MEDITERRANEAN ISLAND

MIGRACIÓN PRENUPIAL DEL AGUILUCHO LAGUNERO *CIRCUS AERUGINOSUS* SEGÚN SEXOS Y EDADES SOBRE UNA ISLA DEL MEDITERRÁNEO CENTRAL

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The Marsh Harrier *Circus aeruginosus* migrates in a broad front, undertaking crossings of large bodies of water using powered flight (Cramp & Simmons, 1980; Kerlinger, 1989). During spring migration in the Mediterranean basin, the largest concentration of birds occurs on the Straits of Messina, between the Italian Peninsula and Sicily, where the peak has been observed between the end of March and the beginning of April (Giordano, 1991; Agostini *et al.*, 1995; Agostini & Malara, 1997; Agostini & Logozzo, 2000). In particular, during the springs of 1994 and 1997, about 1000 and 1300 birds, respectively, crossed the Straits at its narrowest point (Agostini *et al.*, 1995; Agostini & Logozzo, 2000). If compared with counts made at the Straits of Messina, very few birds are observed each spring at the Strait of Gibraltar (usually under 200; Bernis, 1980; Finlayson, 1992), while over the Bosphorus the passage of this species is virtually non-existent (Collman & Croxall, 1967). At this important bottleneck area of southern Italy, birds crossing the Mediterranean Sea between Tunisia and Sicily (150 km) converge with birds crossing between Libya and Sicily via the island of Malta (>400 km) (Beaman & Galea, 1974; Sultana & Gauci, 1982; Agostini & Duchi, 1994; Agostini & Logozzo, 1998). A substantial number of birds using the first route concentrate over the island of Marettimo (Agostini & Logozzo, 1998), where the greatest passage of Accipitriformes during post-reproductive movements on the central Mediterranean occurs (Agostini *et al.*, 2000). The aim of this study was to investigate

the spring migration of this species on this site and during the peak movement, recording the passage of birds belonging to different age and sex classes.

Marettimo is a small mountainous island (12 km²) about 30 km off western Sicily and 130 km NE from the Cap Bon peninsula (Tunisia; Agostini & Logozzo, 1998). Observations were made from 26th March to 14th April 2000. I used a single post at an altitude of about 500 m. From this post it was possible to dominate both the western and eastern coasts of the island. The observation period has been divided into five four-day periods. It was possible to determine the age and sex of some birds by observation of their plumage (Porter *et al.*, 1981; Forsman, 1999) generally when they were very close (<150 m). I estimated the total number of individuals belonging to age and sex groups according to their proportions among identified individuals for each four-day period, following the method used by Kjellén (1992) in his study on the autumn migration of raptors at the Falsterbo peninsula. In particular, the proportion of females and juveniles was estimated dividing unidentified individuals of the group female/juvenile between the two age groups according to their proportions among the identified individuals (Kjellén, 1992; Agostini & Logozzo, 2000). 160 hr of observations were carried out using a 10 × 40 binocular.

I counted 577 Marsh Harriers, with a peak between 7th and 10th of April (Fig. 1). I observed the plumage of 322 (55.8%) birds; 235 (73%) of them were adults and 87 (27%) juve-

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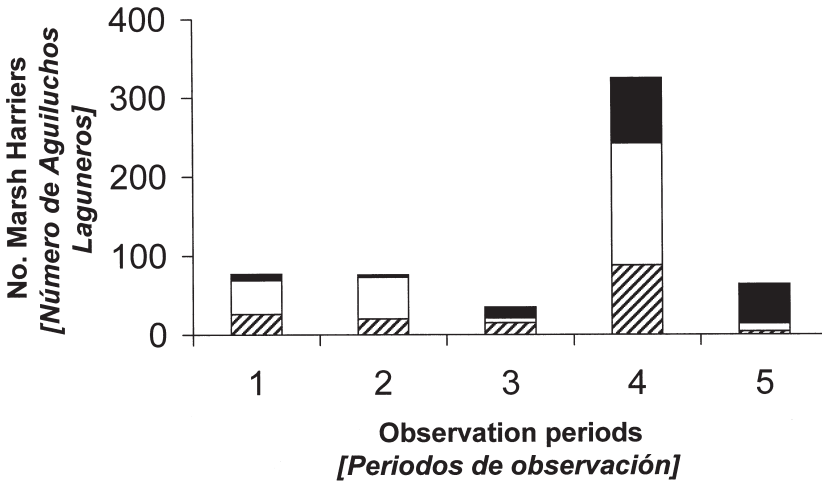


FIG. 1.—Juvenile (close), female (open) and male (striped) Marsh Harriers observed over Marettimo in the five four-day periods between 26th March and 14th April 2000.

[Aguiluchos Laguneros jóvenes (barras oscuras), hembras (barras vacías) y machos (barras rayadas) observados sobre la isla de Marettimo (Italia) en periodos de cinco días desde el 26 de marzo al 14 de abril de 2000.]

niles. Among adults, females outnumbered males (148 vs. 87, $\chi^2=199.64$, d.f.=1, $P < 0.001$), mostly between 7th and 10th April (Fig. 1). A marked difference between numbers of individuals belonging to sex groups in this species was also recorded by Yosef (1996) in his study on the spring migration of raptors at Eilat (Israel). This result could be correlated with the high tendency towards polygyny in this species (Newton, 1979). The variation of the migratory flow reported on the island of Marettimo was similar to that observed at the Straits of Messina in 1997, when about 1000 Marsh Harriers were counted during the same period peaking in the first five days of April (Agostini & Logozzo, 2000; nevertheless, they do not report a significant difference between numbers belonging to sex classes). As mentioned above, large numbers of Marsh Harriers cross the central Mediterranean between Libya and Sicily via the island of Malta (Beaman & Galea, 1974; Sultana & Gauci, 1982). During 60 h of observation made at the highest point of the island of Malta (approx. 250 m a.s.l.) between the last ten-days of March and the first half of April 2000, Charles Coleiro (*pers. obs.*) aged and sexed 261 Marsh Harriers using the same method of this study; 188 of them were adults

(72%) and 73 (28%) juveniles. Among adults, the difference between males and females was not significant (90 vs 98). Among long-distance migrants, adults tend to migrate earlier than juveniles during spring (Kerlinger, 1989). In the case of the Marsh Harrier, however, both observations over Marettimo and over Malta (Coleiro, *pers. obs.*) confirm the results of the previous study carried out on the Straits of Messina in 1997, when a large overlap in the migration periods of individuals belonging to different age groups was recorded (Agostini & Logozzo, 2000). These results agree also with observations on the Marsh Harrier made in the breeding areas and reported by Newton (1979), showing that some juveniles, arriving early in the season and taking a territory, are ousted at a later date by adults. Many Marsh Harriers winter in the Mediterranean basin (Cramp & Simmons, 1980) and observations made in Italy showed that the largest part of wintering individuals consists of juveniles (Chiavetta, 1981; Agostini & Logozzo, 2000). The tendency of juveniles to migrate shorter distances than adults could explain the large overlap in their migration periods during spring, because perhaps this is the result of the contemporaneous passage of juveniles wintering in the Mediter-

rranean basin and adults wintering in tropical Africa (Cramp & Simmons, 1980) but beginning earlier their northwards migration.

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