Bee-eater *Merops apiaster*

Carles Barriocanal & David Robson

Range

The Bee-eater is a trans-Saharan migrant that breeds at mid- and low-to-mid-latitudes in the W Palearctic (Snow & Perrins, 1998). Populations from W Europe winter in W Africa north of the Equator, while those from C and E Europe and Asia do so in E and S Africa south of the Equator (Hagemeijer & Blair, 1997). This species breeds at some study sites in Catalonia and on the larger Balearic Islands, although with the exception of Catalonia the vast majority of captures correspond to migrants.

Migratory route

Only two recoveries are available and both indicate a SW-NE axis of movement (fig. 1). One bird was ringed on Formentera in early May and recovered in E Germany two months later, while another was ringed in E Germany in July and recovered in Formentera the following spring. Both recoveries suggest that populations established in E Germany originate from birds wintering in W Africa and thus that not all C European birds winter in E and S Africa as is usually suggested (Hagemeijer & Blair, 1997; Cramp, 1998).

Most birds are trapped on Formentera (fig. 2) where conditions seem to be optimum for capturing this species. Data from this site are clearly inflated by this methodological trait, although the species is a common migrant in islands both in the W and C Mediterranean (pers. obs. Cramp, 1985; Spina & Volponi, 2008). In spite of this, the Bee-eater does show some tendency to concentrate at the narrowest crossings of the Mediterranean (Cramp, 1998).

Phenology

The first individuals pass through the study area in early April, giving way to a peak in late April-early May (fig. 3). Numbers during the second half of May are somewhat inflated due to the presence of local birds in Catalonia, but passage is known to occur well into June (Finlayson, 1992; Thévenot et al., 2003). The overall pattern is similar to that reported in S France and the C Mediterranean (Blondel & Isenmann, 1981; Finlayson, 1992; Rubolini et al., 2004). Passage in Morocco occurs somewhat earlier than reported here, beginning in mid-March in the SE and late March in the N (Thévenot et al., 2003). No consistent differences in median dates of passage according to age or sex are observed (fig. 3) as occurs in Italy (Rubolini et al., 2004).

Biometry and physical conditions

Mean values of wing length vary from 147.7 in N Morocco to 149.1 on Els Columbrets (table 1; only one male in wet Balearics 158.5). The mean ranges of wing length by sex are 143.3-147.1 for females and 149.5-151.2 for males, with the lowest means in N Morocco and the highest in the dry Balearics in both cases. The third primary length tends to increase over time, but not significantly (fig. 6).

Overall, birds have low fat reserves, with mean values ranging between 0.6 on Els Columbrets and 1.1 in the dry Balearics, while mean body mass varies from 46.2 on Els Columbrets to 55.8 in N Morocco (table 1). No clear temporal trends are observed in fat, body mass and physical condition (figs. 7-9). Body mass and physical condition are significantly higher in the dry Balearics and Catalonia than on Els Columbrets (also when considering each sex separately).

Our data shows no clear pattern of mass gain in NW Africa or of any difference in condition between continental Spain and the island sites (mass in Catalonia being higher than on Els Columbrets but lower than in the dry Balearics). The few birds ringed in N Morocco have the highest mean body mass, but the differences from Catalonia and the dry Balearics are not significant. Data from S Morocco are also rather inconclusive, since reported mean body mass in the area differs markedly: 48.7 at Defilia (n = 46; Ash, 1969) and 57.6 at Merzouga (n = 20; Gargallo et al., unpubl.) probably due to interannual differences. It thus remains unclear as to whether birds regain some mass while in N Africa.

Stopover

The number of available recaptures is very low (fig. 5), reflecting the low capture rate of this aerial feeder and also a high turnover of birds. A similar lack of retraps has been reported during spring migration in Israel (Yosef et al., 2006). Minimum stopover length and fuel deposition rates based on such a small sample are of little interest.

Table 1. Mean (± SD), range and sample size of main biometric parameters according to area.

	n	Wing	Third primary	Body mass	Fat score
Catalonia	131	147.9 ± 4.1 (139.0-159.0)	109.0 ± 4.9 (97.0-119.0)	54.2 ± 4.7 (35.0-66.4)	0.7 ± 0.7 (0-2)
Columbrets	22	149.1 ± 3.8 (144.0-156.0)	110.4 ± 3.1 (105.5-117.5)	46.2 ± 4.0 (40.3-55.0)	0.6 ± 0.4 (0-2)
Balearics (dry)	495	149.0 ± 4.3 (136.0-159.0)	109.5 ± 3.5 (98.0-120.0)	55.6 ± 5.0 (35.7-66.6)	1.1 ± 0.5 (0-4)
Balearics (wet)	1	158.5	115.5	51.1	1.0
Chafarinas	0				
N Morocco	8	147.7 ± 3.9 (140.0-155.0)	107.8 ± 4.6 (99.0-114.0)	55.8 ± 3.2 (49.5-60.5)	0.4 ± 0.5 (0-2)
S Morocco	0				

Table 2. Variation in fuel deposition rate (g/day) according to area and type of retraps involved (mean ± 95% CI and sample size are given).

	Catalonia	Columbrets	Balearics (dry)	Balearics (wet)	Chafarinas	N Morocco
All retraps	0.04 ± 0.84 (2)		1.61 ± 1.70 (6)			
Retraps >1 day	0.04 ± 0.84 (2)					

Figure 1. Map of recoveries of birds captured in the study area during the study period (March to May).

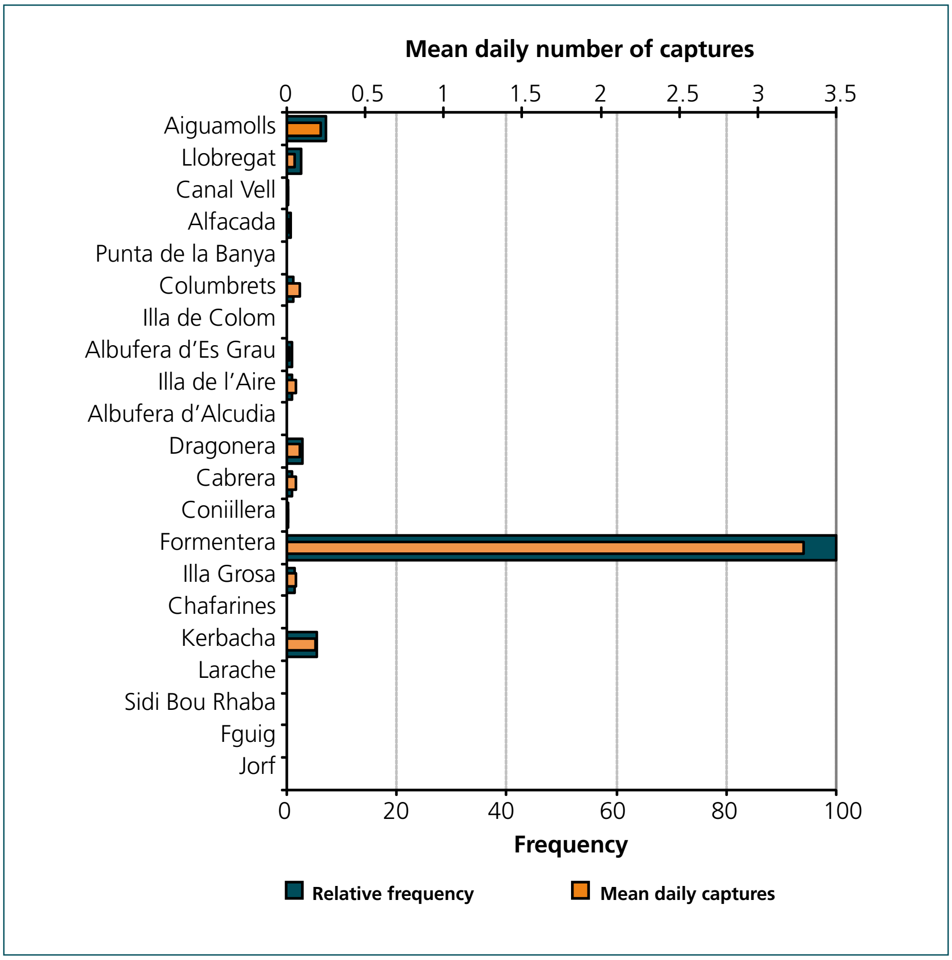


Figure 2. Relative frequency of captures and mean daily numbers according to site during the standard period (16 April to 15 May).

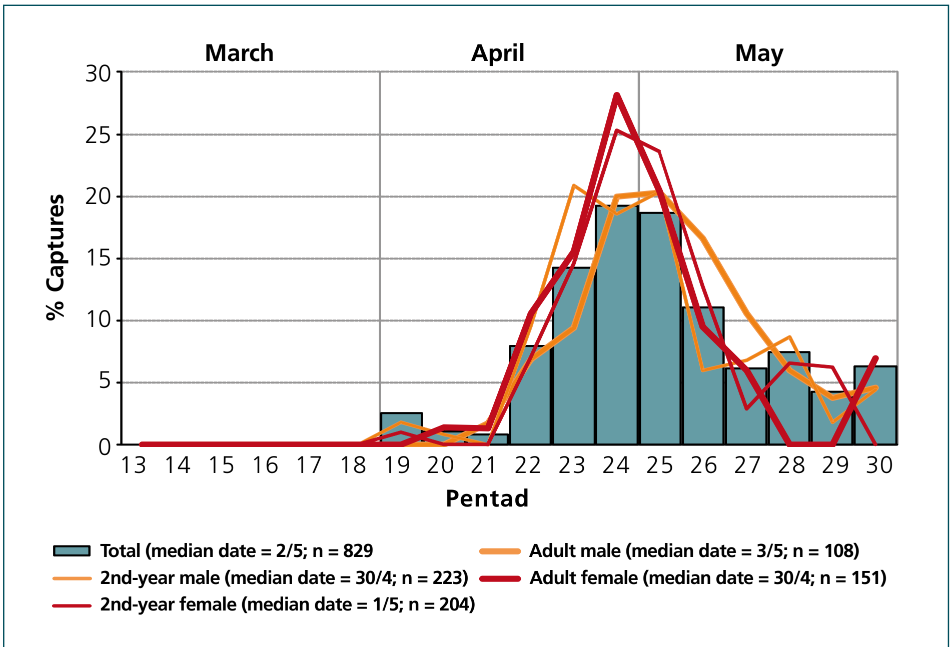


Figure 3. Frequency of captures during the study period.

Figure 4. Variation in body mass and fat score according to site during the standard period (16 April to 15 May).

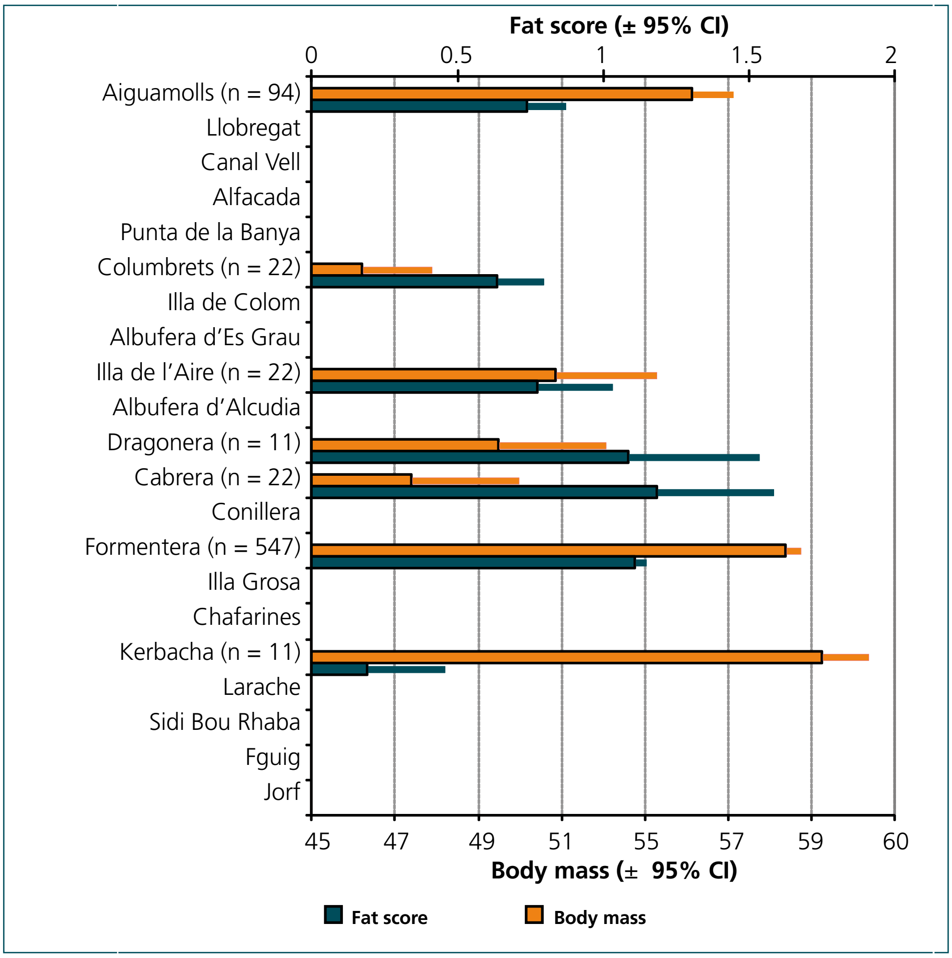
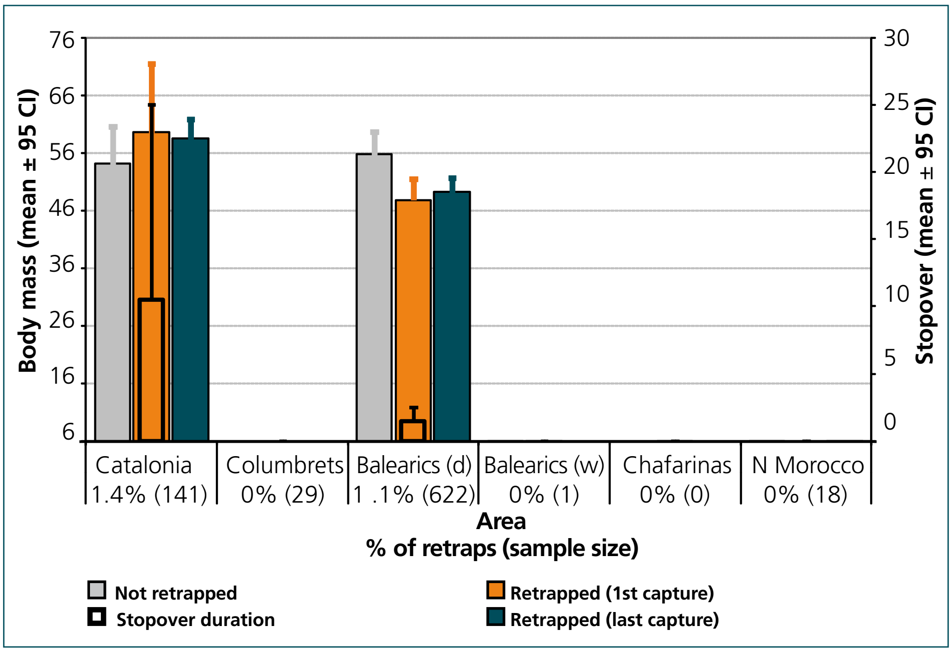


Figure 5. Variation in body mass by trapping status, minimum stopover length and frequency of retraps according to area.



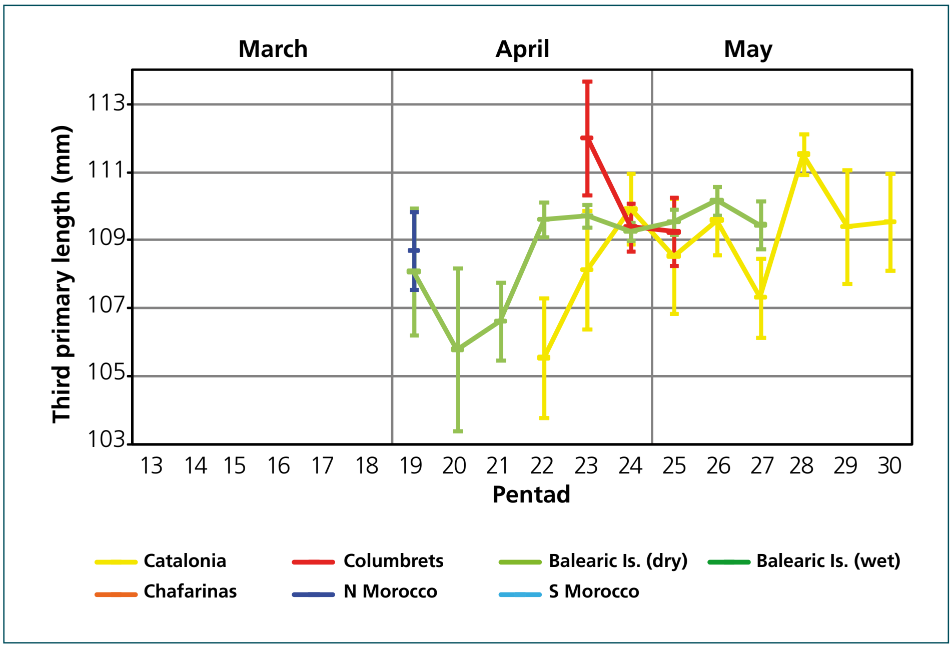


Figure 6. Temporal variation of third primary length according to area.

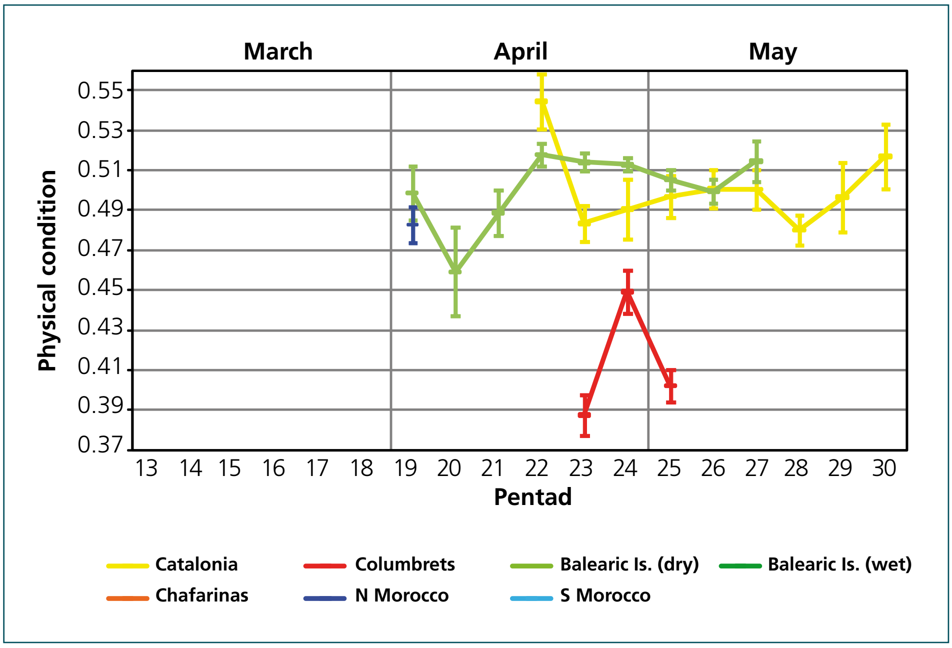


Figure 7. Temporal variation of physical condition according to area.

Figure 8. Temporal variation in body mass according to area.

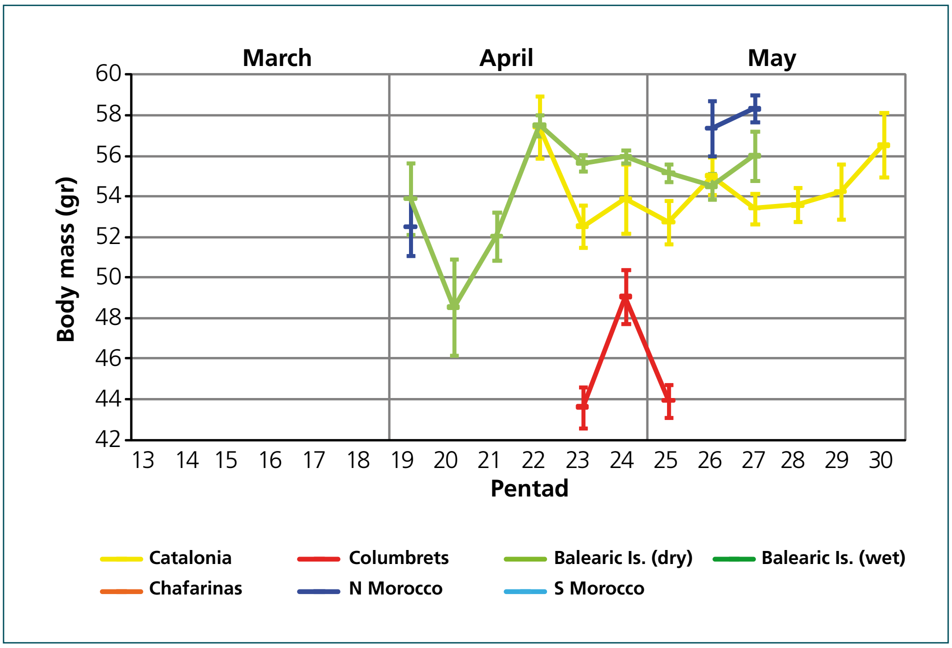


Figure 9. Temporal variation in fat score according to area.