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ARE BLACKCAPS *SYLVIA ATRICAPILLA* DIFFERENTIAL DISTANCE MIGRANTS BY SEX?

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SUMMARY.—*Are blackcaps* Sylvia atricapilla *differential distance migrants by sex?*

Aims: To investigate if male and female blackcaps show differences in the amplitude of migratory movements.

Methods: The extent of movements of male and female British blackcaps were analysed using ringing recovery records. Furthermore, through a literature review and the collection of original field data, the sex-ratios of blackcap samples taken at several latitudes in Europe and Africa were compared.

Results: There were no differences between British male and female blackcaps in relation to wintering latitude or distance moved during migration. Sex-ratios of blackcap samples were quite even across a wide range of latitudes. However, there was a significantly larger proportion of females in samples of birds that wintered in Africa.

Conclusions: Laboratory data and morphological studies have yielded inconclusive results in relation to the question of whether or not European blackcaps are differential distance migrants. The results from the present study suggest that British blackcaps are not differential distance migrants. Furthermore, there is, at best, only a weak latitudinal segregation of the sexes of blackcaps wintering in Europe and Africa. The slightly higher proportion of males in European samples, when compared to Africa, could result from a differential behaviour of males and females in some blackcap populations, or simply result from differences in the sex-ratios of blackcap populations breeding and wintering in different areas. An absence of a pronounced latitudinal segregation in the size-monomorphic blackcap is interesting, and contrasts with the pattern found in more sexually dimorphic species, such as the chiffchaff *Phylloscopus collybita* or the robin *Erithacus rubecula*.

Key words: Sex-ratio, ringing recoveries, Europe, Africa, Morocco, Portugal.

RESUMEN.—*¿Presentan las currucas capirotada* Sylvia atricapilla *migración diferencial en distancia por sexos?*

Objetivos: Investigar si existen diferencias sexuales en la amplitud de movimientos migratorios en la curruca capirotada.

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Métodos: El alcance de los movimientos de machos y hembras de las currucas británicas fue analizado utilizando registros de recapturas de aves anilladas. Además, a través de una revisión bibliográfica y de la obtención de datos de campo originales, se ha comparado la razón de sexos en distintas poblaciones de currucas capirotadas en Europa y África.
Resultados: No existen diferencias significativas entre los machos y hembras de la especie en relación a la latitud de invernada o a la distancia recorrida en migración. La proporción de sexos muestreadas en un amplio rango de latitudes mostró valores bastante igualados. Sin embargo, existe una proporción significativamente mayor de hembras en las muestras obtenidas en localidades invernantes en África.
Conclusiones: Datos de laboratorio y estudios morfológicos han llevado a resultados inconclusos en relación a la cuestión de si las currucas capirotadas europeas muestran o no una migración diferencial en distancia. Además, existe en el mejor de los casos una débil segregación latitudinal de sexos en las currucas capirotadas invernantes en Europa y África. La ligera mayor proporción de machos en las muestras europeas, en comparación con las provenientes de África, podría ser el resultados de un diferente comportamiento de los dos sexos de currucas en algunas poblaciones, o simplemente ser el resultado de una razón de sexos diferente en las distintas poblaciones reproductoras o invernantes de diferentes áreas geográficas. La ausencia de una pronunciada segregación latitudinal en esta especie con similar tamaño entre los dos sexos es interesante, y contrasta con el patrón encontrado en especies que presentan un mayor dimorfismo sexual, como puede ser el mosquitero común *Phylloscopus collybita* o el petirrojo europeo *Erithacus rubecula*.

Palabras clave: Razón de sexos, recuperación de anillamientos, Europa, África, Marruecos, Portugal.

Introduction

In species displaying differential distance migration, one of the sexes makes, on average, longer migratory movements to reach the wintering grounds (Cristol *et al.*, 1999). This implies that these species show some form of geographical sexual segregation in the winter quarters, leaving males and females exposed to different threats and selective pressures (Catry *et al.*, 2005a). Differential migration is interesting but little understood, as the single-factor hypotheses attempting to explain this phenomenon make similar predictions, and the predictions of each one of them seem not to fit patterns observed in some migratory species (Cristol *et al.*, 1999).

The study of differential migration in blackcaps *Sylvia atricapilla* can be particularly interesting given that, unlike most other passerines, they show virtually no sexual size dimorphism (Cramp, 1992; Pérez-Tris and Tellería, 2002), which could allow a separation of the effects of size and gender in the migratory behaviour of sex classes. Blackcaps have been intensively used as a model organism in the study of bird migration (*e.g.* Berthold, 1988, 1993). Interestingly, however, it is not clear whether or not, or to what extent, this species is a differential migrant. Work on captive blackcaps taken from the fully migratory southern Germany breeding population has shown that migratory restlessness is more intense and lasts longer in females, compared to males (Terril and Berthold, 1989). This was interpreted as evidence for endogenously programmed differential migration. However, further studies with the same population, using a larger sample size, yielded no significant differences between the sexes (Berthold and Pulido, 1994). Berthold (1986) has also shown some evidence, using similar tests, that there is a greater tendency for males to be sedentary in a partial migratory population in southern France. Furthermore, Pérez-Tris and Tellería (2001) suggested, based on a morphological analysis, that there might be a greater migratory tendency of females in partially migratory blackcap populations. Clearly, there is a need of field studies to complement the laboratory and morphological data.

In this paper, the recoveries of blackcaps ringed in the United Kingdom during the breeding season are analysed in order to assess whether males and females show differences in their migratory movements. Data was also compiled from several published and original field studies carried out in Europe, the Middle East and Africa, to investigate the geographical segregation by sex of blackcaps.

Methods

Blackcaps nest over most of Europe (and parts of North Africa), with the exception of the extreme north and the driest areas around the Mediterranean (Cramp, 1992). They are mostly sedentary in the south, partially migrant at intermediate latitudes, and fully migratory in the northern part of the breeding range (Cramp, 1992). The main wintering ranges of migratory birds are located around the Mediterranean and in Africa south of the Sahara. Recently, an increasing number of central European birds have started to winter in the British Isles (Berthold, 1995) and to a lesser degree in Scandinavia (Fransson and Stolt, 1994). The blackcap is almost monomorphic with respect to size (Cramp, 1992, Pérez-Tris and Tellería, 2002). In autumn and winter, birds are readily sexed on plumage characteristics alone.

The BTO Ringing Scheme recoveries data was used to investigate if male and female birds ringed in the United Kingdom during spring-summer (March - August) have similar winter (November - February) distributions. Non-parametric tests were used to compare latitude distribution of male and female winter recoveries and distances separating ringing and recovery sites.

Blackcaps were trapped using mist-nets in southern Portugal, Morocco and Gambia (the study sites are described in Hamidi *et al.*, 1996; Hjort *et al.*, 1996; Catry *et al.*, 2005b). More data were obtained by a literature review. Only ringing data collected between 15 November and 15 February was used, in order to avoid including birds that were caught during the main migratory periods (*e.g.* Cramp, 1992), but published data collected in "winter" is included, even when the actual dates were not given by the authors. In some analyses (discriminated in the Results section) data is also included from birds caught at migratory stopovers, when there was a fairly precise idea of where their ultimate wintering destination was.

Tape-lures (known to produce male-biased samples in this species; Herremans, 1989) were not used in the collection of the original data presented in this paper, but it can not be confirmed that the same applies to all data obtained from the literature review. However, on no occasion was any evidence found that tape-lures might have been used. Besides samples resulting from localised field studies in winter, blackcap data taken from the literature included: a) one sample of birds ringed in Europe and recovered all over Iberia, mostly in the south, in winter (Cantos, 1992), b) Blackcaps seen or captured in winter in a range of Swedish, Danish, Belgium and British locations (Fouarge, 1980; Leach, 1981; Fransson and Stolt, 1994; Johansen, 2001) and, c) birds caught at stopover sites in Spain and Israel, when moving to or from Africa (Murillo and Sancho, 1969; Izhaki and Maitav, 1998).

The latitude of the wintering sites was either directly read on a map (for single locations) or estimated as a weighed mean of the latitudes of several locations within a region. For birds caught at stopover sites, it was impossible to calculate or estimate a wintering latitude value.

Results

Blackcaps ringed in the UK, between March and August, and recovered between November and February (n = 100) were mostly found in South Iberia and North Africa, although a few remained as far north as the UK. Neither

TABLE 1

Movements of male and female blackcaps ringed in the United Kingdom in spring / summer and recovered in autumn / winter.
[Movimientos de machos y hembras de curruca capirotada anillados en Inglaterra en primavera / verano y recuperados en otoño / invierno.]

	Males *[Machos]*	Females *[Hembras]*	Mann-Whitney Test
Latitude of recovery [Latitud de la recuperación]			
Mean ± SD *[Media ± DT]*	37º 40' ± 5º 40'	37º 20' ± 5º 40'	
Median *[Mediana]*	36º 40'	35º 40'	$U = 1.117$, $P = 0.52$
Distance (km) *[Distancia (km)]*			
Mean ± SD *[Media ± DT]*	1667 ± 580	1718 ± 569	
Median *[Mediana]*	1810	1878	$U = 1.014$, $P = 0.17$
Sample size *[Tamaño de muestra]*	59	41	

median latitude at recovery location nor median distance flown, between ringing and recovery, differed between the sexes (Table 1). These analyses were repeated excluding a few birds recovered at latitudes > 50º N (as they were more likely not at their wintering locations), but results were unchanged. Analyses were also repeated excluding birds ringed in March as they could be central European migrants wintering in the UK, but again the results did not change.

The proportion of male blackcaps in samples taken at different locations in Europe and Africa did not correlate with latitude (Spearman $r = 0.54$, $n = 9$, $P = 0.13$; Table 2). Inspection of Table 2, including the larger sample size provided by samples with incomplete or imprecise latitudinal information, suggests that, although there is little variation of sex-ratios with latitude, there seem to be slightly more males in the European samples (57.3 ± 2.0 % males, $n = 7$ samples) than in the African ones (51.4 ± 1.2 %, $n = 4$), a highly significant difference, despite the small sample size (Mann-Whitney Test $U = 0$, $P < 0.01$). Note that, in the African group data were included from a known migration site in southern coastal Spain, of birds most likely to be moving to Africa (Murillo and Sancho, 1969), and also a sample of birds, caught at a migration site in Israel, known to be African winterers (Izhaki and Maitav, 1998).

DISCUSSION

Results from this study clearly show that there is little or no segregation of male and female blackcaps in the winter quarters. In line with laboratory results (Berthold, 1986; Terril and Berthold, 1989; Berthold and Pulido, 1994), field data included in this paper present a somewhat mixed picture in relation to the

TABLE 2

Observed blackcap sex composition in samples taken from populations wintering in different geographical areas.
[Porcentaje de machos de curruca capirotada en diferentes poblaciones.]

Wintering region *[Zona de invernada]*	Latitude N (degrees) *[Latitud N (grados)]*	% males [% de machos]	Sample size *[Tamaño de muestra]*	Source *[Fuente]*
Data used in all statistical analyses *[Datos usados en todos los análisis estadísticos]*				
Sweden	62	56	510	Fransson and Stolt, 1994
Denmark	56	60	492	Johansen, 2001
United Kingdom	51	58.8	1,656	Leach, 1981
Belgium	51	54.2	48	Fouarge, 1980
Iberia	38	57.1	546	Cantos, 1992
SW Portugal	37	58.8	342	This study
SE Portugal	37	56.2	235	This study
Morocco	34.5	52.5	200	This study
The Gambia	13	50.3	372	This study
Data with imprecise latitudinal information *[Datos con información latitudinal imprecisa]*				
N. and W. Africa		52.3	ca. 190	Murillo and Sancho, 1969
East Africa		50.5	5,222	Izhaki and Maitav, 1998

question on whether blackcaps are differential migrants at all. Ringing recoveries suggest that British blackcaps do not display any clear form of differential distance migration, despite the fact that sample sizes are reasonably large. On the other hand, sex-ratios in samples collected at different latitudes suggest that relatively more females than males may engage in long-distance migration between Europe and Africa. However, one should be cautious with the interpretation of these data. First, it must be recognised that, in the comparison between Europe and Africa, we are pooling together samples from different blackcap "flyways" (*e.g.* Busse, 1987), and the sampling locations are quite heterogeneous in size and geographic definition. Furthermore, the exact destination of birds caught at one sampling site, in southern Spain, was not known. Finally, it is possible that these comparisons are including different blackcap populations that would have slightly different sex-ratios during the breeding season, which would then produce similar differences in the winter quarters. Keeping these caveats in mind, it is concluded that male and female blackcaps show a broadly similar migratory behaviour; but the possibility remains to be investigated that in some populations, unlike the British one, females move, on average, slightly further than males. Blackcaps show a remarkable variability in their migratory behaviour, with populations ranging from wholly migratory to partially migratory and to completely sedentary (Berthold, 1988). It seems therefore reasonable to admit that such variability is also found in differential migration behaviour, with different populations displaying diverse patterns of sex-specific winter distribution. It is

also possible that within-population variation exists, being dependent on environmental or other influences. Further research will be necessary to test these hypotheses.

It is interesting to note that the evidence for protandry (the early arrival of males to the breeding grounds, relative to females) in the blackcap is, like the evidence for differential distance migration, mixed and rather inconclusive. Izhaki and Maitav (1998), for example, have shown that males migrate ahead of females in Israel, during spring. Rubolini and colleagues (2004), on the other hand, found no significant differences between males and females stopping over at four Mediterranean islands. In this latter study, the median capture date of males at the stopovers was one day earlier than the median capture date of females, and it is unclear if the marginally non-significant test ($P = 0.062$) really means an absence of protandry or just the existence of a large variability (and noise) resulting from the simultaneous sampling of various populations during spring migration.

Many blackcap populations appear to be mostly sedentary in southern Europe. The presence of such birds could obscure any patterns related to latitudinal sexual segregation. However, this study deals almost exclusively with samples of migratory birds. Belgium and UK wintering birds include many short-distance migrating individuals originating in central Europe (Fouarge, 1980, Berthold, 1995). Iberian and African winter samples included either birds ringed north of the Pyrenees and recovered anywhere in continental Spain and Portugal (Cantos, 1992) or birds ringed at locations where they are common in winter, but extremely scarce or absent during the breeding season (original samples in this study).

The slight surplus of male blackcaps in most winter samples is not unexpected, given that there is some evidence for a slightly male-biased sex ratio in natural populations of this species (*e.g.* Langslow, 1976; Berthold, 1986; Olioso, 1986; Herremans, 1989; Holloway and Edwards, 1989; Pérez-Tris and Tellería, 2001).

It is interesting that blackcap sex-ratios are fairly even at all latitudes (Table 2). This contrasts with other European migrant passerines, such as the robin *Erithacus rubecula* or the common chiffchaff *Phylloscopus collybita*, where strongly skewed sex-ratios (> 80 % of the birds being either male or female) have been reported from various wintering regions (*e.g.* Catry *et al.*, 2004, 2005b). It is maybe no coincidence that blackcaps are virtually monomorphic in relation to body size, while in robins and chiffchaffs males are clearly larger than females. The absence of large differences of migratory behaviour of male and female blackcaps, reported here, might be seen as lending some support to the body-size hypothesis, which proposes that differential migration and sexual segregation arise because birds of the larger sex are more resistant to low temperatures, hence being able to winter at higher latitudes, where climates are colder (Ketterson and Nolan, 1976). The reduced sexual size dimorphism of blackcaps would predict little latitudinal sexual segregation in this species, which fits with the data. The problem, however, is that size dimorphism also relates to dominance asymmetries, larger birds being generally dominant over smaller ones (Piper, 1997). Hence, the virtual lack of geographical segregation between male and female Blackcaps (also found at the habitat level, within a wintering region; Pérez-Tris and Tellería, 2002) is also, to some extent, predicted by the dominance hypothesis, that proposes that subordinate individuals are forced to move to areas further away from the breeding grounds by the dominant classes, which tend to move shorter distances or remain sedentary (Gauthreux, 1982).

Only more studies with blackcaps and other species will allow a better evaluation of these and other hypotheses.

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BIBLIOGRAPHY

BERTHOLD, P. 1986. Wintering in a partially migratory mediterranean blackcap (*Sylvia atricapilla*) population: strategy, control and unanswered questions. *Ric. Biol. Selvaggina*, 10: S33-S45.

BERTHOLD, P. 1988. Evolutionary aspects of migratory behaviour in European warblers. *Journal of Evolutionary Biology*, 1: 195-209.

BERTHOLD, P. 1993. *Bird Migration. A General Survey*. Oxford University Press, Oxford.

BERTHOLD, P. 1995. Microevolution of migratory behaviour illustrated by the blackcap *Sylvia atricapilla*: 1993 Witherby Lecture. *Bird Study*, 42: 89-100.

BERTHOLD, P. and PULIDO, F. 1994. Heritability of migratory activity in a natural bird population. *Proceedings of the Royal Society of London, Series B*, 257: 311-315.

BUSSE, P. 1987. Migration patterns of European passerines. *Sitta*, 1: 18-36.

CANTOS, F. J. 1992. *Migración e invernada de la Familia Sylviidae (Orden Paseriformes, Clase Aves) en la península Ibérica*. PhD Thesis, Universidad Complutense de Madrid.

CATRY, P., CAMPOS, A., ALMADA, V. and CRESSWELL, W. 2004. Winter segregation of migrant European robins *Erithacus rubecula* in relation to sex, age and size. *Journal of Avian Biology*, 35: 204-209.

CATRY, P., PHILLIPS, R. and CROXALL, J. P. 2005a. Sexual segregation in birds: patterns, processes and implications for conservation. In, K. E. Ruckstuhl and P. Neuhaus (Eds): *Sexual Segregation in Vertebrates*. Cambridge University Press, Cambridge.

CATRY, P., LECOQ, M., ARAÚJO, A., CONWAY, G., FELGUEIRAS, M., KING, J. M. B., RUMSEY, S., HAMIDI, S. and TENREIRO, P. 2005b. Differential migration of chiffchaffs *Phylloscopus collybita* and *Phylloscopus ibericus* in Europe and Africa. *Journal of Avian Biology*, 36: 184-190.

CRAMP, S. (Ed). 1992. *The Birds of the Western Palearctic. Vol VI*. Oxford University Press. Oxford.

CRISTOL, D. A., BAKER, M. B. and CARBONE, C. 1999. Differential migration revisited. Latitudinal segregation by age and sex class. In, V. Nolan Jr, E. D. Ketterson and C. F. Thompson (Eds.): *Current Ornithology. Vol. 15*, pp. 33-88. Kluwer Academic/Plenum Publishers. New York.

FOUARGE, J. 1980. Le point sur les cas d'hivernage de la Fauvette à Tête Noire (*Sylvia atricapilla*) en Belgique. *Aves*, 17: 17-27.

FRANSSON, T. and STOLT, B. O. 1994. The wintering of blackcaps *Sylvia atricapilla* (L.) in Sweden. *Ornis Svecica*, 4: 105-112.

GAUTHREAUX, S. A. Jr. 1982. The ecology and evolution of avian migration systems. In, *Avian Biology. Vol. 6*. Academic Press, New York.

HAMIDI, S., MAAMRI, A., BOUARICHE, B., CHAVANON, G. and BERRAHOU, A. 1996. Variation du poids et de l'adiposité de la Fauvette à Tête Noire *Sylvia atricapilla* dans une localité du Maroc Oriental: *Jbel Hamra. Porphyrio*, 8: 41-54.

HERREMANS, M. 1989. Habitat and sampling related bias in sex-ratio of trapped blackcaps *Sylvia atricapilla*. *Ringing and Migration*, 10: 31-34.

HJORT, C., PETTERSSON, J., LINDSTRÖM, Å. and KING, J. M. B. 1996. Fuel deposition and potential flight ranges of blackcaps *Sylvia atricapilla* and whitethroats *Sylvia communis* on spring migration in The Gambia. *Ornis Svecica*, 6: 137-144.

HOLLOWAY, G. J. and EDWARDS, P. J. 1989. Biometrics, capture date and sex ratio in relation to migration in blackcaps. *Ringing and Migration*, 10: 108-112.

IZHAKI, I. and MAITAV, A. 1998. Blackcaps *Sylvia atricapilla* stopping over at the desert edge; inter- and intra-sexual differences in spring and autumn migration. *Ibis*, 140: 234-243.

JOHANSEN, B. T. 2001. Vinterforekomst af Munk *Sylvia atricapilla* i Danmark. *Dansk Ornitologisk Forening*, 96: 67-74.

KETTERSON, E. D. and NOLAN, V. Jr. 1976. Geographic variation and its climatic correlates in the sex-ratio of eastern-wintering dark-eyed juncos (*Junco hyemalis hyemalis*). *Ecology*, 57: 679-693.

LANGSLOW, D. R. 1976. Weights of blackcaps on migration. *Ringing and Migration*, 1: 78-91.

LEACH, I. H. 1981. Wintering blackcaps in Britain and Ireland. *Bird Study*, 28: 5-14.

MURILLO, F. and SANCHO, F. 1969. Migracion de *Sylvia atricapilla* y *Erithacus rubecula* según datos de capturas. *Ardeola*, 13: 129-137.

OLIOSO, G. 1986. La masse corporelle des Fauvettes à Tête Noire Sylvia atricapilla capturées a Grignan (Drôme) a L'automne 1985. *Bièvre*, 8: 63-68.

PÉREZ-TRIS, J. and TELLERÍA, J. L. 2001. Age-related variation in wing shape of migratory and sedentary blackcaps *Sylvia atricapilla*. *Journal of Avian Biology*, 32: 207-213.

PÉREZ-TRIS, J. and TELLERÍA, J. L. 2002. Migratory and sedentary blackcaps in sympatric non-breeding grounds: implications for the evolution of avian migration. *Journal of Animal Ecology*, 71: 211-224.

PIPER, W. H. 1997. Social dominance in birds: early finding and new horizons. In, V. Nolan Jr, E. D. Ketterson and C. F. Thompson (Eds.): *Current Ornithology. Vol. 14*, pp. 125-187. Plenum Press, New York.

RUBOLINI, D., SPINA, F. and SAINO, N. 2004. Protandry and sexual dimorphism in trans-Saharan migratory birds. *Behavioral Ecology*, 15: 592-601.

TERRIL, S. B. and BERTHOLD, P. 1989. Experimental evidence of endogenously programmed differential migration in the blackcap (*Sylvia atricapilla*). *Experientia*, 45: 207-209.

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