ISRAEL JOURNAL OF ZOOLOGY, Vol. 47, 2001, pp. 161–165

NOTE:

PHENOLOGY AND BIOMETRICS OF THE MIGRATORY REED BUNTING (*EMBERIZA SCHOENICLUS*) IN ISRAEL

KOBI MEYROM,[a] REUVEN YOSEF,[b,*] AND PIOTR TRYJANOWSKI[c]
[a]*Kibbutz Nir David, Mobile Post Har-Gilboa 19150, Israel*
[b]*International Birding and Research Centre in Eilat, Department of Life Sciences, Ben-Gurion University of the Negev, P.O. Box 774, Elat 88000, Israel*
[c]*Department of Avian Biology and Ecology, Adam Mickiewicz University in Poznań, Fredry 10, 61-701 Poznań, Poland*

The reed bunting (*Emberiza schoeniclus*) is the most widespread species of the west Palearctic family *Emberizidae*. It inhabits oceanic islands and peninsulas, and continental plains from arctic through boreal, temperate, and Mediterranean to steppe and even desert climatic zones, between July isotherms from 10–11°C in the north to above 32°C in the south (Snow and Perrins, 1998). Within this vast range, however, the choice of sites is restricted to particular types of dense, low vegetation that are mainly associated with high soil moisture. Throughout its range, whether resident or migratory, there is a shift after the breeding season to drier and more open habitats, such as fields, lake shores, and marram grass on sand dunes, similar to the habitats of other *Emberizidae* in this season.

The separation to subspecies is not easy owing to the clinal and slight morphological differences among specimens. It involves the depth of background color and width of dark streaking on the upperparts and flanks of both sexes and on the chest of the female, as well as the size and shape of bill (Shirihai, 1996; Snow and Perrins, 1998). Snow and Perrins (1998) recognized two subspecies-groups: the thin-billed *schoeniclus* in the north, and the thick billed *pyrrhuloides* in the south.

In Israel, the reed bunting is considered a scarce to quite common migrant, but is chiefly a winter visitor in low lying parts of northern and central Israel (Shirihai, 1996). It is an active nocturnal migrant; staging stops can be diurnal and nocturnal. Most of the information published to date on the species relates almost exclusively to field observations (e.g., Paz, 1987). The information provided by Shirihai (1996) is from museum collections. We attempted to determine the phenology of occurence, sexual differences in biometry of birds ringed, and correlation between various body measurements and body mass at two major ringing projects in Israel: Kibbutz Nir David in the Bet Shean Valley in the north, and the International Birding and Research Centre in Eilat (IBRCE) in the south. Because there have not been any recoveries or controls of any of the *Emberiza* spp. outside Israel (Yosef, 1997; Bear and Nitzan, 1999), it was hypothesized that the sub-species of reed bunting that migrate through or winter in Israel comprise a part of the breeding populations east of the concentration of European ringing stations, i.e., in Asia, where there is little data on the species.

*Author to whom correspondence should be addressed. E-mail: ryosef@eilatcity.co.il
Accepted January 2001.

The birds studied were captured by mist-net by K.M. over the 14 years 1986–2000, between October and April, in the fish pond area of Kibbutz Nir David and Mesillot (32°30′N, 35°28′E) and in Ma'oz Hayyim (32°30′N, 35°33′E) in the Bet Shean Valley in northern Israel (cf. Merom et al., 1999, 2000). All birds trapped were fitted with an aluminum ring of the Israeli ringing scheme, weighed with a Pesola scale (+0.1 g), and wing chord and tail were measured using a graded wing-ruler (+1 mm). However, biometric data were not measured for all individuals, resulting in a variation in sample sizes.

Similarly, ringing by the IBRCE was initiated in 1984 and continues to date. Elat is located on the northern edge of the Saharan-Arabian desert belt, and is a critical site for many migrant species because it is reached after a flight of almost 2000 km of continuous desert (Sahel, Sahara, and Sinai) (Safriel, 1968). To the NNE, there are still 650 km of the Syrian desert, and due east is the vast Arabian desert. Hence, many birds are enticed to land in the green areas that surround Elat and to rest before (in autumn) or after (in spring) crossing the deserts (Morgan and Shirihai, 1997).

Data from the two trapping sites were pooled for analysis because no significant difference in body measurements ($p > 0.2$ in all comparisons) was found between the two locations. This could be due to the small sample size from Elat (13 individuals and 2 retraps). Data from all years were pooled too, due to lack of significant differences among years in body measurements, independent of sex or age (all comparisons in ANOVA models at $p > 0.3$).

Sexing and ageing of birds were based on information from the scientific literature (e.g., Bell 1970; Rymkevich, 1983; Jenni and Winkler, 1994).

Standard statistical methods were used to describe and analyze the data (Sokal and Rohlf, 1995). Calculations were conducted using the SPSS for Windows package (Norusis, 1986). Parametric tests were used when the necessary assumptions were fulfilled, otherwise, nonparametric tests were used. All statistical tests were two-tailed. We considered $p < 0.05$ as the minimum acceptable level of significance. All data are presented as mean ± SD unless otherwise specified.

A total of 125 (7.8 ± 6.9; range 1–23) reed buntings were trapped. Of these, 121 (96.8%) were of the subspecies *schoeniclus* and four were of the subspecies *pyrrhuloides*. At least 33% were first-year birds.

The status and phenology of the reed bunting, based on our trapping, suggest that the species is a rare migrant, from late October to mid-April (Fig. 1); most birds were trapped in November and December. The sporadic trapping of low numbers of the species in Elat suggests that they rarely venture south. In northern Israel, the data indicate that the wintering population is comparatively larger than a transient one. However, this should be treated with caution because of the retrap history of some of the birds between years. Male (X 61892) was initially trapped as a first-year (EURING code 3) on 14.xi.89 and retrapped almost 16 months later as an adult (EURING code 6) on 11.iii.91. Another male (T 60199) was ringed on 23.xii.94 and retrapped almost a year later, on 8.xii.95, at the same location. Moreover, three other individuals were retrapped within periods of less than 30 days. These data may suggest fidelity to wintering places.

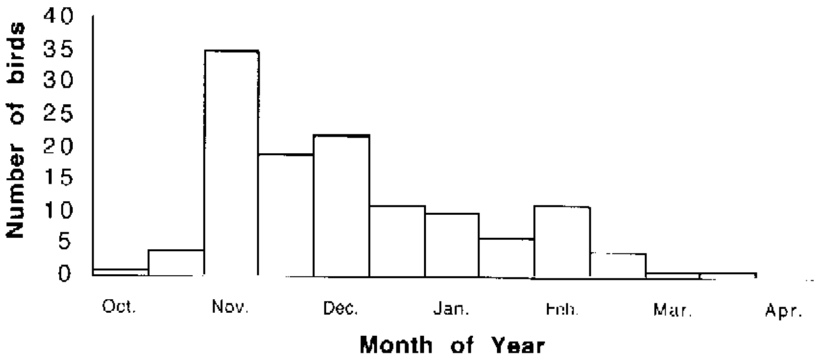

Fig. 1. Phenology, expressed in half-month periods, of reed bunting at Nir-David and Elat, Israel. Data from all years (1986–2000) pooled (N = 125 individuals).

which is similar to the pattern of roost-behavior reported at stop-over autumn sites in Central Europe (Berthold et al., 1991).

The earliest bird ringed in autumn was on 24.x.98 and the last bird ringed in spring was on 13.iv.89. This is similar to the dates reported by Shirihai (1996) who found that the earliest arrivals are between 18–25.x and that the rearguard leaves in the spring between 25.iii and 2.iv.

Shirihai (1996) further found that arrival in autumn was in small flocks of up to about 15 individuals. This is similar to the daily pattern of trapping, which suggested that reed buntings arrived in Israel in small groups numbering 1–8 birds (mean 1.8 ± 1.4).

A comparison of the biometrics of wing length and body mass in relation to sex showed significant differences. Wing cord [male 79.85 ± 2.65 (39) vs. female 76.32 ± 1.61 (36); *t*-test, $t = -6.89$ and $p < 0.0001$], tail length [67.25 ± 1.72 (10) vs. 64.89 ± 2.03 (19); $t = -3.13$, $p = 0.004$] and body mass [20.64 ± 2.25 (38) vs. 18.39 ± 1.47 (37); Mann–Whitney *U*-test, $z = -4.50$, $p < 0.0001$] were significantly larger in males than females. This concurs with the data on wing length reported for the species in Europe (Glutz von Blotzheim, 1997), but our adults were longer winged than local Spanish populations (78.3 mm in Israel vs. 74.5 mm). We consider this as an indication that the populations caught in Israel belong to strictly migrating population/s (Copete et al., 1999). Similar to other *Emberiza* buntings (Byers et al., 1995), differences between the sexes in body size are normal for reed buntings, even in first-year individuals (Walton and Walton, 1999). Body mass was similar to data reported by Berthold et al. (1991) and several others reviewed by Glutz von Blotzheim (1997).

Interestingly, in males the correlation between wing length and body mass was not significant ($r = 0.286$, $p = 0.0815$, $n = 38$,) but between wing length and tail length was significant [$y = 0.628$ (0.167) ± 0.780, $t = 3.766$, $p = 0.0055$]. In females, correlations between wing length and tail length, and wing length and body mass were not significant ($p > 0.25$ in both cases). However, the correlation between tail length and body mass was significant [$y = 0.491\ (0.161) \pm 0.594$, $t = 3.046$, $p = 0.0073$]. Walton and Walton (1999) reported a correlation between wing length and body mass in birds trapped in Scotland. However, correlation coefficients obtained in Scotland were very similar to those obtained by us, and were probably significant due to the much larger sample size. Differences could also be a result of the prevalent weather. Individuals with larger bodies should be heavier in the comparatively colder Great Britain, but not necessarily so in the warmer Medditerranean climate (cf. Walton and Walton, 1999). The authors were unable to find an ecological reason for the differences found between the sexes in northern Israel.

In northern and southern Israel, the reed buntings were trapped almost exclusively in the vicinity of aquatic habitats. The retrap of individuals at the same sites between years has important conservation implications (Cantos and Telleria, 1994). The continued loss of wetlands in an important migratory flyway such as Israel can have dire consequences for species with specific requirements. Hence, the intensive agricultural practices, draining of wetlands, and continued loss of important staging or wintering habitats in Israel could pose a threat to the migratory species in the region.

ACKNOWLEDGMENTS

We thank Adrian Surmacki for his help in tracking down relevant references. We thank the various ringers and volunteers, too numerous to name, who have helped through the years at the IBRCE ringing station. Two anonymous reviewers improved an earlier version of the manuscript.

REFERENCES

Bear, A., Nitzan, R. 1999. Summary of bird recoveries in Israel from 1845 to 1998. Suppl. Torgos 28, 31pp.

Bell, B.D. 1970. Moult in the reed bunting—a preliminary analysis. Bird Study 17:269–281.

Berthold, P., Fliege, G., Heine, G., Querner, U., Schlenker, R. 1991. Wegzug, Rastverhalten, Biometrie und Mauser von Kleinvögeln in Mitteleuropa. Vogelwarte 36 (Sonderheft): 1–221.

Byers, C., Curson, J., Olson, U. 1995. Sparrows and buntings. A guide to the sparrows and buntings of North America and the world. Houghton Mifflin, New York.

Cantos, F.J., Telleria, J.L. 1994. Stopover site fidelity of four migrant warblers in the Iberian Peninsula. J. Avian Biol. 25: 131–134.

Copete, J.L., Marine, R., Bigas, D., Martinez-Vialata, A. 1999. Differences in wing shape between sedentary and migratory reed buntings (*Emberiza schoeniclus*). Bird Study 46: 100–103.

Glutz von Blotzheim, U.N. 1997. Handbuch der Vögel Mitteleuropas. Bd. 14. Passeriformes. Teil 5. 3. Emberizidae. AULA-Verlag, Wiesbaden.

Jenni, L., Winkler, R. 1994. Moult and ageing of European Passerines. Academic Press, London.

Merom, K., McClery, R., Yom-Tov, Y. 1999. Age related changes in wing length and body mass in the reed warbler *Acrocephalus scirpaceus* and Clamorous Reed Warbler *A. stentoreus*. Bird Study 46:249–255.

Merom, K., Yom-Tov, Y., McClery, R. 2000. Philopatry to stopover site and body condition of transient Reed Warblers during autumn migration through Israel. Condor 102: 441–444.

Morgan, J.H., Shirihai, H. 1997. Passerines and passerine migration in Elat. International Birding Research Centre in Eilat, Tech. Publ. Vol. 6, no. 1, Elat.

Norusis, M. 1986. SPSS PC+. Advanced statistics. SPSS Inc., Chicago.

Paz, U. 1987. The birds of Israel. Christopher Helm Ltd., London.

Rymkevich, T.A. 1983. Comparative study of the moult characteristics of buntings (G. *Emberiza*) in Leningrad region. Comm. Baltic Comm. Study Bird Migr. 14: 85–112.

Safriel, U. 1968. Bird migration at Eilat, Israel. Ibis 110: 283–320.

Shirihai, H. 1996. The birds of Israel. Academic Press, London.

Snow, D.W., Perrins, C.M. 1998. The birds of the Western Palearctic. Concise ed. Vol. 2. Passerines. Oxford Univ. Press, Oxford.

Sokal, R.R., Rohlf, F.J. 1995. Biometry. 3rd ed. Freeman, New York.

Walton, C., Walton, P. 1999. Sexing first year reed buntings *Emberiza schoeniclus* using biometrics. Ringing Migration 19: 327–331.

Yosef, R. 1997. Clues to the migratory routes of the eastern flyway of the western Palearctics—ringing recoveries at Eilat, Israel [I Ciconiiformes, Chardriiformes, Coraciiformes, and Passeriformes.] Vogelwarte 39:131–140.