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BIRD RINGING RESULTS IN HRVATSKO ZAGORJE REGION (NORTH-WESTERN CROATIA): RINGING RECOVERIES IN OTHER COUNTRIES

ZDRAVKO DOLENEC

Department of Zoology, Faculty of Sciences, University of Zagreb, Rooseveltov trg 6, HR-10000 Zagreb, Croatia (e-mail: dolenec@zg.biol.pmf.hr)

Dolenec, Z.: Bird ringing results in Hrvatsko zagorje region (north-western Croatia): ringing recoveries in other countries. Nat. Croat., Vol. 17, No. 4, 325–333, 2008, Zagreb.

This paper is based on the recoveries of birds ringed in the territory of Hrvatsko zagorje region (north-western Croatia). In the period from 1972 to 2007 I ringed 16400 birds (70 species), 31 of which were recorded outside the territory of Croatia (5 species: starling *Sturnus vulgaris* – 26, woodpigeon *Columba palumbus* – 1, blackbird *Turdus merula* – 2, song thrush *Turdus philomelos* – 1 and blue tit *Parus caeruleus* – 1). Twenty-two birds were recovered in Europe (8 in Italy and 1 in Spain, France, Hungary and the Czech Republic) and nine in Africa (5 in Algeria and 4 in Tunisia).

Key words: ringed, recoveries, migration of Croatian birds, Hrvatsko zagorje region

Dolenec, Z.: Rezultati prstenovanja ptica u Hrvatskom zagorju (sjeverozapadna Hrvatska): nalazi u drugim zemljama. Nat. Croat., Vol. 17, No. 4, 325–333, 2008, Zagreb.

U ovome se radu donose rezultati dugogodišnjeg prstenovanja ptica na području Hrvatskog zagorja, a odnose se na nalaze u drugim zemljama. U razdoblju od 1972. do 2007. godine prstenovao sam 16400 ptica (70 vrsta) od koji je izvan granica Hrvatske nađena 31 ptica (5 vrsta: čvorak *Sturnus vulgaris* – 26, golub grivnjaš *Columba palumbus* – 1, kos *Turdus merula* – 2, drozd cikelj *Turdus philomelos* – 1 i plavetna sjenica *Parus caeruleus* – 1). Dvadeset i dvije ptice nađene su u Europi (18 u Italiji i po 1 u Španjolskoj, Francuskoj, Mađarskoj i Češkoj) i devet u Africi (5 u Alžiru i 4 u Tunisu).

Ključne riječi: prstenovanje, nalazi, selidba hrvatskih ptica, Hrvatsko zagorje

INTRODUCTION

Areas of the world alternate between highly productive and extremely barren. The ability to move areas that are productive, to tap their resources and then move out again before conditions deteriorate must be advantageous. Because of their great mobility, birds are better able to do this than most other animal organisms

Croatian Natural History Museum, Demetrova 1, Zagreb, Croatia

(PERRINS & BIKHEAD, 1983). Much of the information we now have on the destinations of migrating birds has been gained from studies of ringed birds. Analyses of recoveries from ringed birds have revealed much of the knowledge of migration routes and wintering areas of different species and populations (FRANSSON, 2001). The date that the majority of birds reach particular latitudes may vary from year to year, as birds may linger longer than usual in the northern parts of their wintering range when food-supplies there are good (NEWTON & DALE, 1997). Nowadays, after 100 years of bird ringing, the spatial and temporal patterns of bird migrations are much clearer (BARLEIN, 2001). Some bird species were under very strong hunting pressure a few decades ago as they were hunted/caught for food, which allowed a high recovery rate, while under conditions of much higher protection now, birds dead from natural causes are much less frequently found and reported (BUSE, 2000). Data on bird migration from Croatia can be found in the other works of DOLENEC (e.g. 1994, 1998).

MATERIAL AND METHODS

The research took place in the Mokrice (46°00'N, 15°55'E) and Stubičke Toplice (45°59'N, 15°56'E) area (Hrvatsko zagorje region, north-western Croatia). My studies comprise the period from 1972 to 2007. The study area is a mixed farming area with small woods (up to 10 ha). Gardens and orchards surround the houses. The small woods are dominated by oak (*Quercus robur*) and hornbeam (*Carpinus betulus*). I used aluminium rings from the Ornithology Institute of the Academy of Sciences and Arts, Zagreb (Fig. 1). Most adult birds were ringed during the nesting period. In the research period (1972–2007) I ringed 16400 birds (70 bird species, see Appendix), 31 (5 bird species) of which were recorded outside the territory of Croatia. Migration patterns of bird migrants are usually analysed using ringing recoveries as a basic source of information. Although new and challenging tools are emerging for the study of avian migrations, the use of rings is still as attractive as it was over the last 100 years (BARLEIN, 2001). According to VAURIE (1959), the starlings from the Hrvatsko zagorje region belong to the ssp. *Sturnus vulgaris vulgaris*, woodpigeon – ssp. *Columba palumbus palumbus*, blackbird – ssp. *Turdus merula merula*, song thrush – ssp. *Turdus philomelos philomelos* and blue tit – ssp. *Parus caeruleus caeruleus*).

In Croatia, only two species were recovered outside the research area: starling *Sturnus vulgaris* (Botinec, 25 km S) and goldfinch *Carduelis carduelis* (Jarun, 20 km S).

RESULTS AND DISCUSSION

a) Recoveries of starlings ringed in the Hrvatsko zagorje region

In the period from 1972 to 2007 I ringed 8043 starlings, 26 (0.32%) of which were recorded outside the territory of Croatia. The starling is a common bird in north-

Fig. 1. Ringed great spotted woodpecker (*Picoides major*) male (Photo: Z. Dolenec)

western Croatia because of the substantial food availability and good nesting possibilities (DOLENEC, 1997; 1999). The results are shown in Tab. 1 and Fig. 2. Seventeen birds were recovered in Europe (15 in Italy, 1 in Spain and 1 in Hungary), and nine in North Africa (5 in Algeria and 4 in Tunisia). The starlings found in Italy (no. 7) and Hungary (no. 13) in August were performing intermediate migration, all the others were performing regular migration (synonymously: annual, obligate or true migrant). According to TERRILL & ABLE (1988), the term annual migrant should be applied to populations (species or geographically defined breeding populations of a species) in which all individuals migrate from their breeding sites on an annual basis. The most distant recovery within regular migration was starling no. 25, found 2110 km from the ringing place and the shortest distance was covered by bird no. 14 (300 km). The average distance measured from ringing to finding was 834.7 km. Bird nos. 1, 2, 3, 7, 9, 16, and 17 were ringed as adult exemplars, while all other recoveries refer to juvenile birds ringed in a nest. Out of 7 recoveries of adult starlings, 5 were ringed during the nesting period (birds no. 1 and 2 were ringed the period of intermediate migration).

Tab. 1. Starlings recovered in other countries and ringed by the author of this paper in the Hrvatsko Zagorje region

Ordinal number	Date of recovery	Date of ringing	Locality of finding	Country
1	? 10. 74.	31. 07. 74.	Bautista: 36º29` N, 10º18` E	Tunisia
2	30. 10. 74.	21. 07. 74.	Civit. Marche: 43º10` N, 13º`40` E	Italy
3	03. 03. 75.	19. 05. 74.	Foligno: 42º57` N, 12º43` E	Italy
4	05. 01. 78.	17. 05. 75.	Reghaia: 36º44` N, 03º21` E	Algeria
5	06. 01. 83.	15. 05. 82.	Ars. Cagliari: 39º03` N, 09º01` E	Italy
6	09. 03. 83.	15. 05. 82.	Arezzo: 43º20` N, 11º55` E	Italy
7	18. 08. 83.	15. 04. 81.	Ravenna: 44º14` N, 12º16` E	Italy
8	15. 10. 83.	12. 05. 83.	Blida: 36º34` N, 02º55` E	Algeria
9	03. 11. 83.	22. 04. 82.	Cagliari: 39º03` N, 09º00` E	Italy
10	14. 02. 84.	15. 05. 82.	Catania: 37º43` N, 15º11` E	Italy
11	30. 11. 84.	21. 06. 84.	Gav. Grosseto: 42º42` N, 11º08` E	Italy
12	06. 12. 84.	10. 05. 84.	Rovogo: 45º00` N, 11º58` E	Italy
13	15. 06. 87.	09. 05. 85.	Zala: 46º24` N, 16º52` E	Hungary
14	15. 02. 88.	09. 05. 85.	Venezia: 45º30` N, 12º10` E	Italy
15	31. 01. 89.	14. 05. 88.	Beja: 36º39` N, 09º40` E	Tunisia
16	12. 03. 89.	23. 04. 88.	Asc. Piceno: 43º18` N, 13º45` E	Italy
17	27. 12. 89.	01. 06. 89.	Skikda: 36º55` N, 06º45` E	Algeria
18	20. 10. 94	13. 06. 94.	Civit. Marche: 43º10` N, 13º`40` E	Italy
19	23. 11. 94.	20. 06. 94.	Ancona: 43º39` N, 13º22` E	Italy
20	25. 01. 96.	30. 04. 94.	Roma: 41º`47` N, 12º40` E	Italy
21	09. 03. 96.	30. 04. 94.	Forli: 44º12`N, 12º08` E	Italy
22	28. 01. 98.	15. 05. 97.	Sousse: 35º49` N, 10º38` E	Tunisia
23	15. 01. 00.	24. 05. 99.	Al Qayrawan: 35º38`N, 09º40` E	Tunisia
24	10. 11. 01.	05. 05. 01.	Jijel: 36º48`N, 05º46` E	Algeria
25	22. 11. 01.	10. 05. 00.	Huelva: 37º00` N, 06º30` W	Spain
26	31. 01. 02.	05. 05. 01.	Tizi-Ouzou: 36º35`N, 04º05` E	Algeria

b) Recoveries of other bird species ringed in the Hrvatsko zagorje region (Tab. 2 and Fig. 3)

(1) The woodpigeon is a short-distance regular migrant. An exemplar ringed in Hrvatsko zagorje region (no. 1) moved in the SW direction from the territory where it was ringed. This is the first finding of woodpigeon ringed in Croatia in another

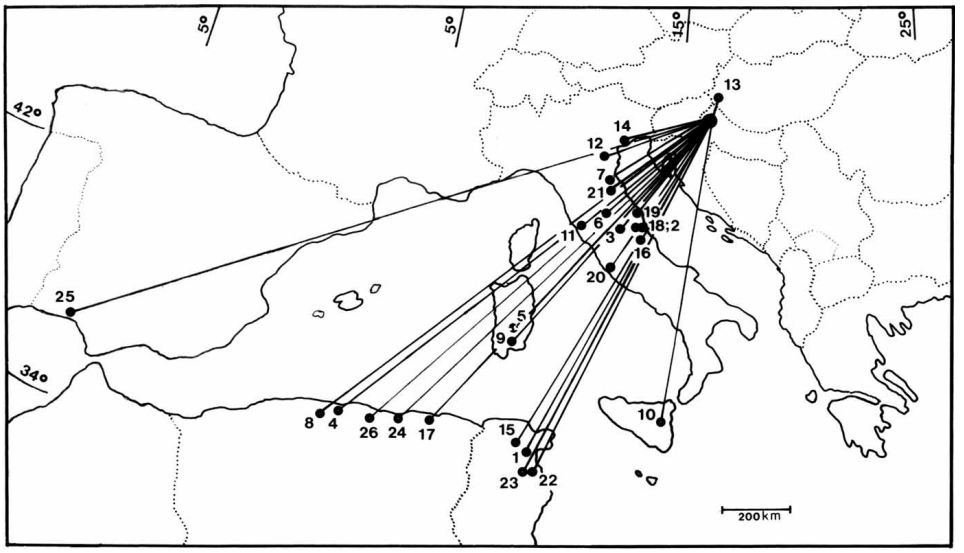

Fig. 2. Recoveries of starlings as stated in Tab. 1.

Tab. 2. Other birds recovered in other countries and ringed by the author of this paper in the Hrvatsko zagorje region (woodpigeon – no. 1, blackbird – no. 2 and no. 4, blue tit – no. 3, song thrush – no. 5)

Ordinal number	Date of recovery	Date of ringing	Locality of finding	Country
1	02. 01. 75.	18. 06. 74.	Balgheri: 43º36`N, 10º14`E	Italy
2	19. 12. 77.	09. 08. 74.	du Tallano: 41º41`N, 09º03`E	France
3	28. 05. 82.	19. 01. 82.	Breclav: 48º45`N, 16º45`E	Czech Rep.
4	29. 10. 94.	23. 09. 94.	Forli: 44º12`N, 12º08`E	Italy
5	20. 08. 99.	25. 01. 99.	Siena: 43º28`N, 11º02`E	Italy

country (2). The blackbird was an exclusively migratory species in central Europe until the beginning of the 19th century and then became a partial migrant (BERTHOLD, 1994). According to SCHÜZ & MEISE (1968), partial migrant populations include some individuals that do and some that do not migrate from the same breeding area. Partial migration is often considered a transitory stage between migration and residency (NILSSON *et al.*, 2006). Among migrants, juveniles and females normally predominate (GAUTHREAUX, 1982). The blackbirds migrating from Croatia move in SW and WSW direction (Fig. 4) to their winter grounds (France – no. 2 and

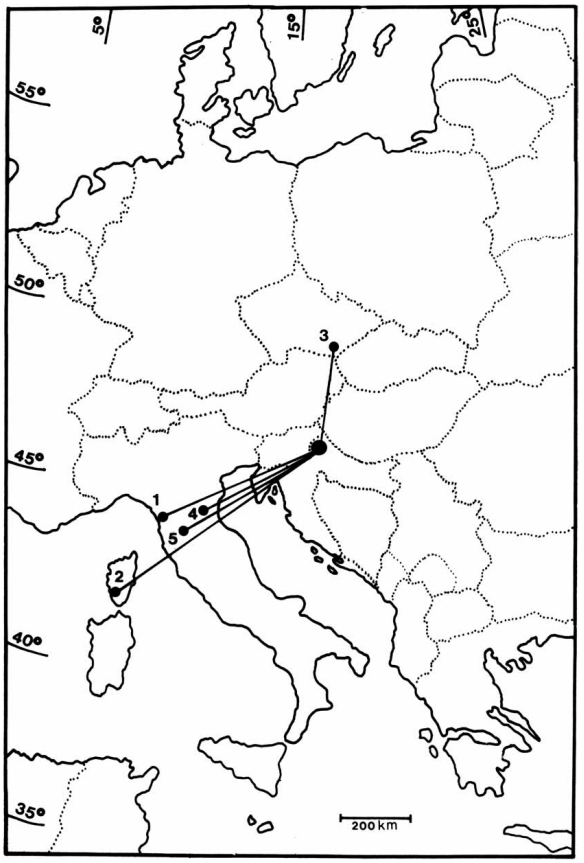

Fig. 3. Recoveries of other birds as stated in Tab. 2.

Italy – no. 4). (3) The song thrush is a common bird in the research area and a short-distance (pre-Saharan) migrant. One was recorded in Italy (no. 5). Song thrushes start reaching Italy from the end of August, with a peak of migration between the end of October – early November (ANDREOTTI *et al.*, 1999). (5) The blue tit was ringed in the winter period in Croatia (no. 3), and found in the Czech Republic in the breeding period. The blue tit is irruptive (LINDSKOG & ROOS, 1979) and a facultative partial migrant (TERRILL & ABLE, 1988). In some years large-scale migration takes place, especially when population density is high (SVENSSON, 1981) and juvenile females show the largest tendency to migrate, followed by, in turn, juvenile males, adult females, and, finally, adult males (SMITH & NILSSON, 1987). Out of 31 recoveries of the birds, 29 moved between 180°S and 270°W (Fig. 4). Although the present-day data on the migration of birds are substantial, every new item of information adds to the explanation of the phenomenon we call the migration of birds. According to BERTHOLD (2001), exceptionally extensive changes in bird mi-

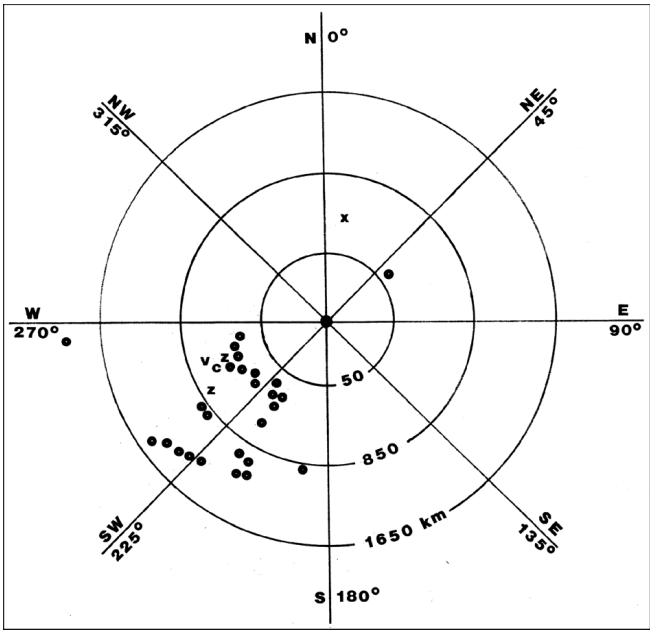

Fig. 4. Recoveries of birds ringed in Hrvatsko Zagorje region
• = starling, z = blackbird, c = song thrush, v = woodpigeon, x = blue tit

gration can be expected, particularly if marked changes in global climate should occur, as has been postulated by many meteorologists. There is still much to be explored with respect to migration routes and the distribution of migrants, migration systems, winter ecology of migrants, the integration of migration in the annual cycle of a migratory species, and life-history aspects of migrations (BAIRLEIN, 2003).

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APPENDIX

List of species of birds ringed:

Little bittern (čapljica voljak) *Ixobrychus minutus*, kestrel (vjetruša) *Falco tinnunculus*, pheasant (fazan) *Phasianus colchicus*, woodpigeon (golub grivnjaš) *Columba palumbus*, collared dove (grlica gugutka) *Streptopelia decaocto*, turtle dove (grlica) *Streptopelia turtur*, cuckoo (kukavica) *Cuculus canorus*, little owl (sivi ćuk) *Athene noctua*, tawny owl (šumska sova) *Strix aluco*, long-eared owl (mala ušara) *Asio otus*, nightjar (leganj) *Caprimulgus europaeus*, swift (čiopa) *Apus apus*, kingfisher (vodomar) *Alcedo atthis*, hoopoe (pupavac) *Upupa epops*, wryneck (vijoglav) *Jynx torquilla*, great spotted woodpecker (veliki djetlić) *Picoides major*, grey-headed woodpecker (siva žuna) *Picus canus*, green woodpecker (zelena žuna) *Picus viridis*, barn swallow (lastavica) *Hirundo rustica*, house martin (piljak) *Delichon urbica*, grey wagtail (gorska pastirica) *Motacilla cinerea*, pied wagtail (bijela pastirica) *Motacilla alba*, tree pipit (prugasta trepteljka) *Anthus trivialis*, red-backed shrike (rusi svračak) *Lanius collurio*,

lesser grey shrike (sivi svračak) *Lanius minor*, waxwing (kugara) *Bombycilla garrulus*, dunnock (sivi popić) *Prunella modularis*, robin (crvendać) *Erithacus rubecula*, thrush nightingale (mrki slavuj) *Erithacus luscina*, nightingale (slavuj) *Erithacus megaryinchos*, black redstart (mrka crvenrepka) *Phoenicurus ochruros*, redstart (šumska crvenrepka) *Phoenicurus phoenicurus*, stonechat (crnoglava travarka) *Saxicola torquata*, blackbird (kos) *Turdus merula*, fieldfare (drozd bravenjak) *Turdus pilaris*, song thrush (drozd cikelj) *Turdus philomelos*, redwing (mali drozd) *Turdus iliacus*, mistle thrush (drozd imelaš) *Turdus viscivorus*, sedge warbler (trstenjak rogožar) *Acrocephalus schoenobaenus*, marsh warbler (trstenjak mlakar) *Acrocephalus palustris*, icterine warbler (žuti voljić) *Hippolais icterina*, garden warbler (siva grmuša) *Sylvia borin*, blackcap (crnokapa grmuša) *Sylvia atricapilla*, whitethroat (grmuša pjenica) *Sylvia communis*, lesser whitethroat (grmuša čevrljinka) *Sylvia curruca*, chiffchaff (zviždak) *Phylloscopus collybitus*, wood warbler (šumski zviždak) *Phyloscopus sibilatrix*, pied flycatcher (crnoglava muharica) *Ficedula hypoleuca*, spotted flycatcher (muharica) *Muscicapa striata*, long-tailed tit (sjenica dugorepa) *Aegithalos caudatus*, marsh tit (crnoglava sjenica) *Parus palustris*, coal tit (jelova sjenica) *Parus ater*, great tit (velika sjenica) *Parus major*, blue tit (plavetna sjenica) *Parus caeruleus*, nuthatch (brgljez) *Sitta europaea*, short-toed treecreeper (dugokljuni puzavac) *Certhia brachydactyla*, yellowhammer (strnadica žutovoljka) *Emberiza citrinella*, chaffinch (zeba) *Fringilla coelebs*, brambling (sjeverna zeba) *Fringilla montifringilla*, serin (žutarica) *Serinus serinus*, greenfinch (zelendur) *Carduelis chloris*, goldfinch (češljugar) *Carduelis carduelis*, hawfinch (batokljun) *Coccothraustes coccothraustes*, house sparrow (vrabac) *Passer domesticus*, tree sparrow (poljski vrabac) *Passer montanus*, starling (čvorak) *Sturnus vulgaris*, golden oriole (vuga) *Oriolus oriolus*, jay (šojka) *Garrulus glandarius*, magpie (svraka) *Pica pica*, hooded crow (siva vrana) *Corvus corone cornix*