

## RINGING RESULTS OF THE CARPATICA RINGING STATION (S POLAND) IN 1998-2005

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### ABSTRACT

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The Carpatica ringling station is located at Myscowa, in the centre of the Beskid Niski Mountains, in southern Poland. The ringling site has been operating since 1998 and since 2000 it has belonged to the SEEN (SE European Bird Migration Network) – an international organization for institutions that study bird migration. The Carpatica ringling station is situated on the south-eastern migration flyway crossing the Carpathian Mountains. Totally, 29 869 birds out of 92 different species, mainly passerines were ringling in 1998-2005. Station location and biotopes, species composition of captured birds, field work methods and results are described in the paper.

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### STUDY AREA AND METHODS

The Carpatica ringling station is located at village Myscowa (49°32'N, 21°34'E), in the central part of the Beskid Niski Mountains. Localization of the study area on a map of Europe is shown in Figure 1. Ornithological station is placed in the wide valley of the Wisłoka, which narrows considerably in southern direction. The described area is overgrown by riverside vegetation such as willows (*Salix sp.*), European Filbert (*Corylus avellana*) and Blackthorn (*Prunus spinosa*), which are typical of this region. The nets were located in a dense osiers strip, which overgrew the right bank of the river (Plate 1 and 2). Particularly important in the research was the vegetation height, usually reaching up to three meters, which gave us an ideal opportunity to set the nets. The studied place is also covered by: Common Pine (*Pinus sylvestris*), Dogberry (*Cornus sanguinea*), Wild Crab Apple (*Malus sylvestris*), Grey Alder (*Alnus incana*), Common Spindle-tree (*Euonymus europaea*), etc. It makes

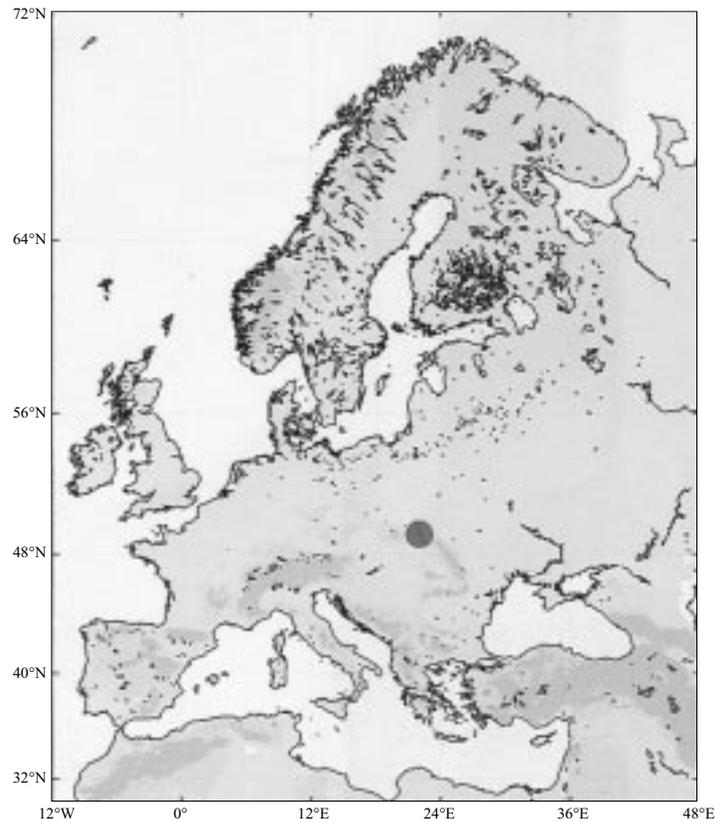


Fig. 1. Location of the Carpatica Bird Ringing Station

this location an excellent stopover place (both resting and foraging) for migrating birds. The research started in 1998 and included nine seasons – eight autumn seasons and one spring. Because of low number of caught birds and difficult weather conditions (flood), spring work was not organized later. The field data were collected from the end of July to the beginning of November.

We used 60 mist-nets and sometimes special traps for raptors. Only 0.02% of the ringed birds – Common Buzzard (*Buteo buteo*), Lesser Spotted Eagle (*Aquila pomarina*), Roller (*Coracias garrulus*), Magpie (*Pica pica*), Collared Dove (*Streptopelia decaocto*) – were caught in traps. Every year nets were located in the same places. Methods of work were according to SEEN standards (Busse 2000). After catching the bird, we determined species, age and sex (if it was possible) and ringed it. We took measurements of wing, tail and wing formula. We also defined fat score and weight of birds. Beside ringing and measuring, directional preferences of some nocturnal migrants were tested using Busse's cage (Busse 1995). Over 1000 orientation tests, mainly of three dominant species – Chiffchaff (*Phylloscopus collybita*),



Plate 1. Biotopes characteristics for Carpatica ringing station site. Photos made by M. Jędra.



Plate 2. Biotopes characteristics for Carpatica ringing station site. Photos made by M. Jędra.

Robin (*Erithacus rubecula*) and Blackcap (*Sylvia atricapilla*) – were performed. Additionally, visual observations of migrating birds were made.

## RESULTS

### Ringing results

The total number of ringed birds was 29 869 out of 92 different species, mainly passerines (Table 1). The highest number of caught and ringed birds we obtained in 2001 – 5712 individuals (Fig. 2). The most commonly ringed (total number in all years) species were: Chiffchaff, Robin, Blackcap, Blue Tit (*Parus caeruleus*), Great Tit (*Parus major*) and Willow Warbler (*Phylloscopus trochilus*). In the case of the Chiffchaff – 5297 individuals were caught, and the peak year was 2001, when we caught and ringed more than 1000 of them (Fig. 3). The second one, very close to the “leader”, was the Robin – the total number was 5277, but every year the number of caught individuals of this species decreased (Fig. 3). The Blackcap was the third most common species. During nine seasons, 3447 birds were ringed altogether (Fig. 3). Other more numerous species were: Blue Tit – 2619 (Fig. 3), Great Tit – 1438 (Fig. 3) and Willow Warbler – 1 136 (Fig. 3), Siskin (*Carduelis spinus*) – 859, Dunnock (*Prunella modularis*) – 752, Song Thrush (*Turdus philomelos*) – 686, Long-tailed Tit (*Aegithalos caudatus*) – 587, Yellowhammer (*Emberiza citrinella*) – 541 and Blackbird (*Turdus merula*) – 514.

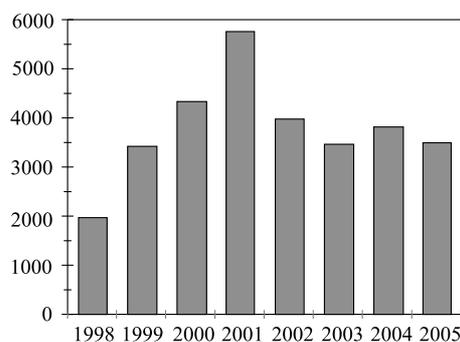


Fig. 2. Numbers of birds caught in 1998-2005

Particularly interesting was the capture of the Yellow-browed Warbler (*Phylloscopus inornatus*), which was the second record of this species in southern part of country. Two very rare species – Long-legged Buzzard (*Buteo rufinus*) and Egyptian Vulture (*Neophron percnopterus*) – were also observed in the vicinity of the ringing site.

In the first fieldwork season – autumn 1998, the total number of ringed birds was 1925 out of 54 different species. The “Akacja Carpatica” participants experienced then hard weather conditions – the last two weeks was a constant rainfall period, and it resulted in lower number of birds caught.

Table 1  
Number of birds caught in years 1998-2005

Scientific name	English name	1998-2004	2005	TOTAL
<i>Accipiter nisus</i>	Sparrowhawk	11	2	13
<i>Acrocephalus arundinaceus</i>	Great Reed Warbler	5	-	5
<i>Acrocephalus palustris</i>	Marsh Warbler	253	43	296
<i>Acrocephalus schoenobaenus</i>	Sedge Warbler	190	13	203
<i>Acrocephalus scirpaceus</i>	Reed Warbler	100	12	112
<i>Actitis hypoleucos</i>	Common Sandpiper	5	-	5
<i>Aegithalos caudatus</i>	Long-tailed Tit	505	82	587
<i>Alcedo atthis</i>	Kingfisher	116	20	136
<i>Anthus pratensis</i>	Meadow Pipit	1	-	1
<i>Anthus trivialis</i>	Tree Pipit	34	6	40
<i>Aquila pomarina</i>	Lesser Spotted Eagle	1	1	2
<i>Bonasa bonasia</i>	Hazel Grouse	1	-	1
<i>Buteo buteo</i>	Common Buzzard	2	-	2
<i>Calidris alpina</i>	Dunlin	1	-	1
<i>Caprimulgus europaeus</i>	Nightjar	3	-	3
<i>Carduelis carduelis</i>	Goldfinch	102	151	253
<i>Carduelis chloris</i>	Greenfinch	23	10	33
<i>Carduelis flammea</i>	Redpoll	3	9	12
<i>Carduelis spinus</i>	Siskin	776	83	859
<i>Carpodacus erythrinus</i>	Common Rosefinch	6	1	7
<i>Certhia brachydactyla</i>	Short-toed Treecreeper	2	-	2
<i>Certhia familiaris</i>	Treecreeper	89	10	99
<i>Cinclus cinclus</i>	Dipper	8	-	8
<i>Coccothraustes coccothraustes</i>	Hawfinch	161	16	177
<i>Coracias garrulus</i>	Roller	1	-	1
<i>Delichon urbica</i>	House Martin	5	1	6
<i>Dendrocopos leucotos</i>	White-backed Woodpecker	8	2	10
<i>Dendrocopos major</i>	Great Spotted Woodpecker	21	4	25
<i>Dendrocopos minor</i>	Lesser Spotted Woodpecker	33	3	36
<i>Emberiza citrinella</i>	Yellowhammer	385	156	541
<i>Emberiza schoeniclus</i>	Reed Bunting	67	12	79
<i>Erithacus rubecula</i>	Robin	4 751	526	5 277
<i>Ficedula albicollis</i>	Collared Flycatcher	2	1	3
<i>Ficedula hypoleuca</i>	Pied Flycatcher	111	29	140
<i>Ficedula parva</i>	Red-breasted Flycatcher	18	2	20
<i>Fringilla coelebs</i>	Chaffinch	243	227	470
<i>Fringilla montifringilla</i>	Brambling	80	44	124
<i>Garrulus glandarius</i>	Jay	31	9	40
<i>Hippolais icterina</i>	Icterine Warbler	79	11	90
<i>Hirundo rustica</i>	Barn Swallow	158	17	175
<i>Jynx torquilla</i>	Wryneck	9	1	10
<i>Lanius collurio</i>	Red-backed Shrike	23	-	23
<i>Lanius excubitor</i>	Great Grey Shrike	2	-	2
<i>Locustella fluviatilis</i>	River Warbler	17	2	19
<i>Locustella luscinioides</i>	Savi's Warbler	4	-	4
<i>Locustella naevia</i>	Grasshooper Warbler	11	2	13

Scientific name	English name	1998-2004	2005	TOTAL
<i>Luscinia luscinia</i>	Trush Nightingale	17	8	25
<i>Luscinia svecica</i>	Bluethroat	2	-	2
<i>Motacilla alba</i>	White/Pied Wagtail	54	6	60
<i>Motacilla cinerea</i>	Grey Wagtail	36	12	48
<i>Motacilla flava</i>	Yellow Wagtail	5	1	6
<i>Muscicapa striata</i>	Spotted Flycatcher	81	5	86
<i>Nucifraga caryocatactes</i>	Nutcracker	9	-	9
<i>Oenanthe oenanthe</i>	Wheatear	-	1	1
<i>Parus ater</i>	Coal Tit	115	4	119
<i>Parus caeruleus</i>	Blue Tit	2 403	216	2 619
<i>Parus major</i>	Great Tit	1 301	137	1 438
<i>Parus montanus</i>	Willow Tit	358	26	384
<i>Parus palustris</i>	Marsh Tit	152	18	170
<i>Phoenicurus ochruros</i>	Black Redstar	162	26	188
<i>Phoenicurus phoenicurus</i>	Redstar	164	8	172
<i>Phylloscopus collybita</i>	Chiffchaff	4 864	433	5 297
<i>Phylloscopus inornatus</i>	Yellow-browed Warbler	1	-	1
<i>Phylloscopus sibilatrix</i>	Wood Warbler	35	7	42
<i>Phylloscopus trochilus</i>	Willow Warbler	979	157	1 136
<i>Pica pica</i>	Magpie	1	-	1
<i>Picus canus</i>	Grey-headed Woodpecker	9	1	10
<i>Picus viridis</i>	Green Woodpecker	7	-	7
<i>Prunella modularis</i>	Dunnock	694	58	752
<i>Pyrrhula pyrrhula</i>	Bullfinch	431	46	477
<i>Regulus ignicapillus</i>	Firecrest	32	7	39
<i>Regulus regulus</i>	Goldcrest	285	31	316
<i>Remiz pendulinus</i>	Penduline Tit	49	-	49
<i>Saxicola rubetra</i>	Whinchat	18	-	18
<i>Saxicola torquata</i>	Stonechat	14	11	25
<i>Serinus serinus</i>	Serin	22	25	47
<i>Sitta europaea</i>	Nuthatch	16	-	16
<i>Streptopelia decaocto</i>	Collared Dove	-	1	1
<i>Strix aluco</i>	Tawny Owl	1	-	1
<i>Sturnus vulgaris</i>	Starling	8	-	8
<i>Sylvia atricapilla</i>	Blackcap	3 040	407	3 447
<i>Sylvia borin</i>	Garden Warbler	375	63	438
<i>Sylvia communis</i>	Whitethroat	410	45	455
<i>Sylvia curruca</i>	Lesser Whitethroat	323	40	363
<i>Sylvia nisoria</i>	Barred Warbler	2	-	2
<i>Troglodytes troglodytes</i>	Wren	266	37	303
<i>Turdus iliacus</i>	Redwing	15	1	16
<i>Turdus merula</i>	Blackbird	468	46	514
<i>Turdus philomelos</i>	Song Trush	641	45	686
<i>Turdus pilaris</i>	Fieldfare	96	12	108
<i>Turdus viscivorus</i>	Mistle Trush	1	-	1
<i>Upupa epops</i>	Hoopoe	-	1	1
<b>TOTAL</b>	Number of species: 92	26 419	3 450	29 869

During the spring season in 1999, altogether 258 birds of 23 species were ringed. Comparing to the autumn 1998, the number of caught birds in this time was very low. Additionally, the spring result was similar to the one achieved by Biologists' Scientific Circle of Warsaw University in 1964, after exploration research in the Przełęcz Dukielska area (49°26'N, 21°42'E), lying only 20 km away from Myscowa. Throughout the comparable time period, at Przełęcz Dukielska, 266 birds of 36 species were ringed (Herman 1964).

In the autumn of 1999, 3117 birds of 65 species were ringed. When we consider the difficulty of catching and ringing birds passing through the mountains, the result seems to be very good. The number of birds ringed in autumn was considerably higher than of those ringed in spring.

In 2000, altogether 4288 birds of 67 species were ringed. The number of birds ringed in the autumn of 2000 was even higher than in the previous year. Extension of the research period enabled the researchers to ring over 30% more birds than in the autumn of 1999. Moreover, 15 individuals of six new species were ringed.

In 2001, 5712 birds of 74 species were ringed. The total number of birds ringed in the autumn of 2001 was higher than in the previous year and record-breaking for the season so far. In 2001, 15 individuals of five new species were ringed. Most of them were rather common species like: Nuthatch (*Sitta europaea*), Yellow Wagtail (*Motacilla flava*) or Collared Flycatcher (*Ficedula albicollis*), but the researchers managed to ring a very rare species in this area such as the Roller. Some vital changes in the number of ringed individuals, compared to the previous years, are also worth noting. Birds that were ringed in definitely higher number than in the previous season were as follows: Chiffchaff, Great Tit, Goldcrest (*Regulus regulus*), Siskin, Brambling (*Fringilla montifringilla*), Hawfinch (*Coccothraustes coccothraustes*) and Pied Flycatcher (*Ficedula hypoleuca*). Unfortunately, for some of the species like the Blackbird (*Turdus merula*) or Penduline Tit (*Remiz pendulinus*), compared to the year 2000 a decrease in their number was noted.

In the autumn season of 2002, altogether 3930 of 65 species were ringed. The number of birds ringed in autumn was lower than in the corresponding period in 2001. In 2002, four new species were ringed: Hazel Grouse (*Bonasa bonasia*), Barred Warbler (*Sylvia nisoria*), Common Buzzard and Magpie. "Akcja Carpatica" participants experienced then hard weather conditions – the first five, six weeks of work were rainless, while the remaining six weeks was a period of constant rainfall. Within the described period we could observe the general decrease in the number of ringed birds, mainly resulting from numbers of 2-3 species. On the other hand, some of the species several times outnumbered the averages from the previous years. The most important change in number of the ringed birds was definitely a considerable drop in the dominant species number – the Chiffchaff (about 50% less than in the previous year). Furthermore, in the Great Tit and Willow Warbler we could also observe about 50% decline in their numbers. The number of Blue Tits decreased even more – down to 65%, and we caught 10 times less Goldcrests than in the previous year. However, *Sylvia* warblers did not show such a trend – the

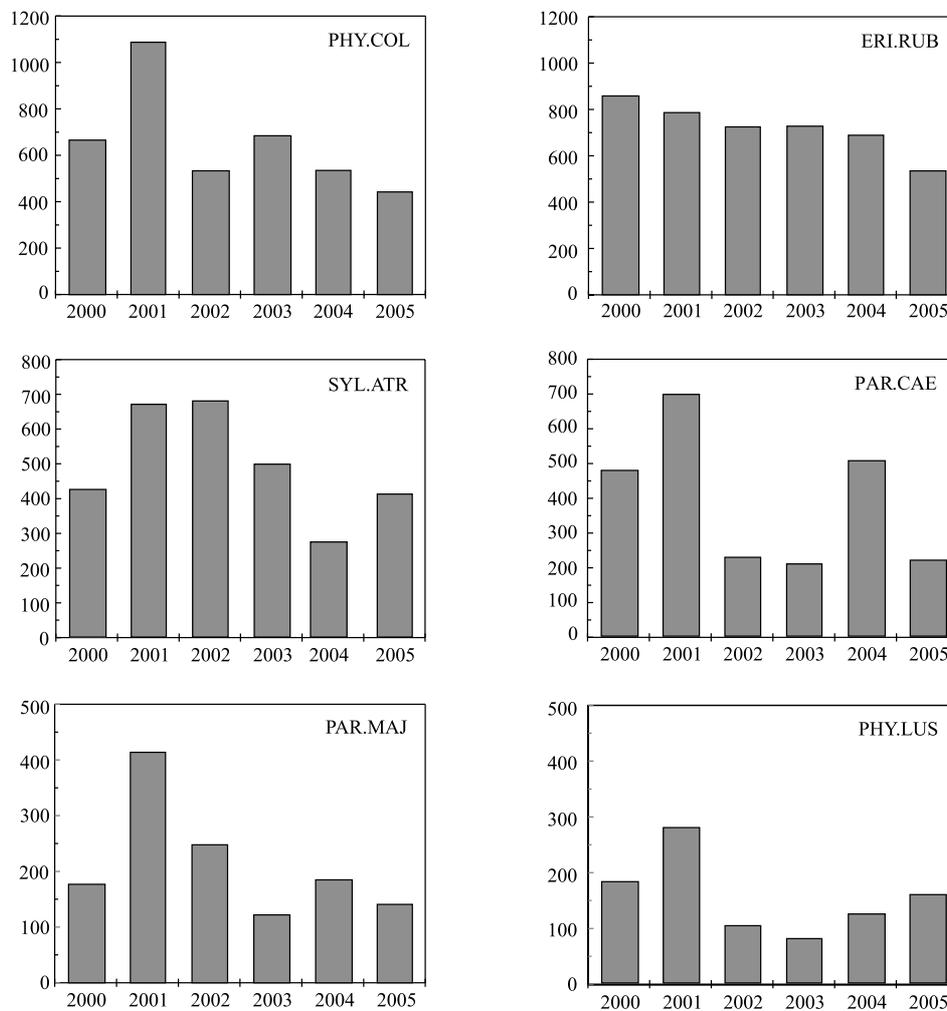


Fig. 3. Numbers of six dominant species caught in 1998-2005: Chiffchaff (PHY.COL), Robin (ERI.RUB), Blackcap (SYL.ATR), Blue Tit (PAR.CAE), Great Tit (PAR.MAJ) and Willow Warbler (PHY.LUS)

number of caught individuals was practically identical as in the previous year. The case of thrushes (*Turdidae*) was particularly interesting in this tendency – twice as many Song Thrushes and three times as many Blackbirds as in the previous year were ringed.

In 2003, 3418 birds of 62 species were ringed. The total number of birds ringed in autumn 2003 was lower than in the corresponding period in 2002. In 2003, an individual of the Dunlin (*Calidris alpina*) – a new species – was ringed. It was a very interesting record of this, somewhere else quite common species, in the central part of the Carpathian Mountains. Compared to the past results, autumn 2003 was poor as far as the number of ringed birds was concerned. However, the weather condi-

tions in that season were quite favourable. What is worth noting is the fact that in case of dominants ringed every year at the Carpatica ringing station, the decrease in the numbers was not observed. The most numerous species were the same as in the previous season. In the case of Chiffchaffs we could even observe a slight increase in their number compared to the previous year. Moreover, in some species caught every year in rather low numbers, we could also observe some increases. It allows us to suppose that conditions and catching methods had no influence on the results, unlike the number fluctuation within the concerned species. The observed changes in the numbers of ringed birds, compared to the previous year, are first and foremost, the considerable decrease in the population of the Song Thrush. We observed four times less Blackbirds and twice less Song Thrushes. The number of Great Tits was also by a half lower than in the previous year. Therefore, consecutive year showed completely different trends as far as the numbers of ringed birds are concerned. Except for the three most numerous species, it was quite apparent that other species appear so irregularly, that it is hardly impossible to draw any unambiguous conclusions on the basis of the present results.

The 2004 autumn was fairly similar to the 2003 one, regarding the number of the ringed birds. However, the individual species numbers showed considerable fluctuations. Throughout the whole season, 3771 birds of 67 species were ringed, which constitute 10% more individuals and about 3% more species than in the previous year. During the 2004 season, one new species – the Lesser Spotted Eagle – was ringed. The noticeable change, compared to the previous year, was about 50% decline in the number of Blackcaps and Lesser Whitethroats (*Sylvia communis*). We also observed about 60% decrease in the Long-tailed Tit number and about 25% decrease in the case of the Chiffchaff. On the contrary, we could observe a considerable increase in the Willow Tit (*Parus montanus*) number of about 490%, Siskin – of about 280%, Blue Tit and Marsh Tit (*Parus palustris*) – of about 250% each, Redstart (*Phoenicurus phoenicurus*) – of about 230%, Great Tit and Willow Warbler – of about 150%. Similar significant fluctuations were also observed in other species, but small numbers of ringed individuals did not allow to draw credible conclusions. We could also observe the Turnstone (*Arenaria interpres*), which appears sporadically in this area.

With regard to the total number of ringed birds, season 2005 was somewhat worse than season 2004, and, excluding birds caught in special nets and comparing the results from only 60 constant nets, in the 2005 season about 15% birds less than in the previous year were ringed. Therefore, year 2005 was similar to year 2003 in terms of the total number of ringed birds. Throughout the season of 2005, altogether 3450 birds of 66 species were ringed, among them individuals of three new species: Hoopoe (*Upupa epops*), Wheatear (*Oenanthe oenanthe*) and Collared Dove. Furthermore, the second time in the history of the Carpatica ringing station, the Lesser Spotted Eagle was caught and ringed. One of the most interesting things, which happened in the end of October, was the capture of a Chiffchaff that was identified as *Phylloscopus tristis* (the application to Faunistic Committee was sent – we are waiting for answer). Research season 2005 showed different proportions of

given species, despite the total number of ringed birds was similar to the two preceding years. The numbers of ringed Long-tailed Tits and Blue Tits were by a half lower, numbers of Siskins and Willow Tits were four times lower than in the previous season, also about 20% less Chiffchaffs were ringed. In contrast to the above mentioned species, we could observe an increase in the number of the following ones: Blackcap – of about 40%, Goldfinch (*Carduelis carduelis*) and Chaffinch (*Fringilla coelebs*) – of about 1000% and Yellowhammer – of almost 300%. We owe this considerable raise in the number of the three recently mentioned species to special nets, set in the intensive foraging place of these birds. The eighth year of the research, since the beginning, seemed to be poor in terms of catching numbers. It could have been caused by a very warm and dry autumn. It cannot also be precluded that the lower numbers of e.g. Song Thrushes, Blue Tits and Willow Tits resulted from shifting of their passage after the period of finishing work at the station.

### Ringing recoveries

We noted 9 ringing recoveries among birds caught at the Carpatica ringing station: Chiffchaffs from Estonia, Lithuania, Spain and Poland; Lesser Whitethroat – Nigeria (two times the same bird); Robin – Slovenia; Garden Warbler (*Sylvia borin*) – Croatia; Blue Tit – Russia. There were 14 birds ringed at the station and recaptured somewhere else: in Hungary – two Blue Tits, one Blackcap and one Dunnock; in Slovenia – one Blackcap; in Italy – four Song Thrushes and two Blackbirds; in Slovakia – one Goldfinch; in Poland – one Blue Tit and one Robin. High number of own controls was obtained (Table 2).

Table 2  
Number of ringed birds, controls and foreign rings

Year	Ringed birds	Own controls	Foreign rings
1998	1925	-	-
1999	3375	46	1
2000	4288	52	3
2001	5712	92	2
2002	3930	87	-
2003	4318	73	1
2004	3771	99	1
2005	3450	62	1
Total	29 869	511	9

### Orientation tests

During the whole autumn migration in the studied years, 388 Robins and 357 Chiffchaffs were tested with Busse's method (Busse 1995) for directional behaviour. The data were elaborated using method for evaluation of circular data proposed by

Busse and Trocińska (1999), which enables to show multimodal distribution. The seasonal dynamics of caught birds was divided into periods reflecting migration waves. Both of studied species have shown differentiation of directional preferences. In case of the Robin such directions as: SSE, SSW, ESE and WSW were preferred. The clearest migration pattern was obtained for the Chiffchaff's data – SSE and WSW directions dominated. Although in both species the sampling was short and irregular, the obtained results were different. The Chiffchaff's migration pattern was clear and similar in all studied seasons. On the contrary, the Robin distribution of headings was complicated and difficult to analyze. Robins indicated intra-seasonal changes and differentiation between all study seasons. The detailed analyses were described in the paper of Adamska and Filar (2005).

## CONCLUSIONS

The aim of these studies is to collect data about one of the principal migratory routes in Europe. The Carpatia ringing station is located on the south-eastern migration flyway passing through the Carpathian Mountains. At the moment, it is the furthest south located place in Poland where the researchers can study birds' migration. Because of its setting, it allows to study strategies of migrating passerines with contact to natural geographical barriers like Carpathians. The conducted research could answer a lot of questions concerning the birds' migration. The confirmed species diversity as well as the high number of caught individuals from the three most common species suggest that the study area is a very important site in migration of passerines. This fact seems to be confirmed by the visual observations. Our knowledge about this migratory route is still poor and limited. Only intensification of research could broaden the present knowledge.

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