

BREEDING BIRD COMMUNITIES IN CERMES OAK FORMATIONS (*QUERCUS COCCIFERA* L.) IN BULGARIA

Nikolai Karaivanov

Institute of Zoology - BAS, 1 Tzar Osvoboditel Boul. , 1000 Sofia
e-mail: karaivanov@zoology.bas.bg

ABSTRACT. *Cermes* (*Quercus coccifera* L.) is one of the rare species in Bulgarian flora and it is the only evergreen representative of the oaks. It is typical mediterian species. Observations were made during the breeding seasons in 2002 and 2003. For estimation of the number of breeding pairs the Line transects method was used. During the period of the investigation, 37 species of birds were established as breeding in the plant formation with prevalence of cermes. The most strong in numbers were found to be the species belonging to order Passeriformes. The common density of birds in these plant formations is 21.52pair/10 ha. but in particular years it ranges from 9.41 to 18.12 pair/10 ha. Dominant species in this region were found to be Turtle Dove (*Streptopelia turtur*), Nightingale (*Luscinia megarhynchos*), Olivaceous Warbler (*Hippolais pallida*), Blackbird (*Turdus merula*). Such kind of habitats is preferable by the Sylvia Warblers (g. *Sylvia*).

KEY WORDS. Cermes Oak, Bird, Community, Density.

INTRODUCTION

Cermes (*Quercus coccifera* L.) is one of the rare species in Bulgarian flora and it is the only evergreen representative of the oaks. It is typical mediterian species. The populations of cermes are seriously injured and its spreading is rather limited because of the intensive use and influence of many anthropogenic factors. Relatively large by area formations are to be found only in the Southwest Bulgaria, along the valley of the River Struma. There are two differentiated regions of spreading of cermes – one around the villages Mikrevo, Dolna Krushitza and the other in the South part of Pirin Mountain, near by the village Kalimantzi. (Велчев, Василев 1982).

Birds are good indicators for the condition of the biodiversity and for changes of the environment. The investigations on the ornithofauna in these maditerrian habitats have been conducted by Simeonov (1971a, 1974). These investigations have been

published almost 35 years ago and studying of the changes and parameters of bird communities is of great interest. The present data show that some rare for Bulgaria bird species have been established as breeding in formations of juniper (*Juniperus oxycedrus*) and cermes.

The aim of the present work was to establish the current species composition of birds in the investigated plant formations, to determine the parameters of breeding bird communities, to trace out the changes in these parameters for the period of 35 years and to compare these communities with other mediterranean plant communities. On the basis of these data the degree of anthropogenic influence can be estimated.

MATERIAL AND METHODS

Observations were made during the breeding seasons in 2002 and 2003. For estimation of the number of breeding pairs the Line transects method was used (Bibby et al., 1992). Sample plots were mapped out in the regions with well preserved natural cermes formations near by Kalimantzi and Mikrevo villages. In the region of Kalimantzi the two transects spread to total area of 32 ha. Besides cermes (*Quercus coccifera*), which is 3-4 m. in height, Juniper (*Juniperus oxycedrus*), Christ's-thorn (*Paliurus aculeatus*) as well as single Oriental Hornbeans (*Carpinus orientalis*) and oaks (*Quercus sp.*) are to be found in the region of Kalimantzi village. Also there are two lines transect in the further northern region situated between the villages Mikrevo and Krushitza. Their total area is 34 ha. On the first site, the concomitant plant species are Christ's-thorn and Oriental Hornbeans and on the second site, about 10% fall on the Juniper.

RESULTS

During the period of the investigation, 37 species of birds were established as breeding in the plant formation with prevalence of cermes. The most strong in numbers were found to be the species belonging to order Passeriformes. Four species of woodpeckers, two species from order Coraciiformes and one from Galliformes, Columbiformes Cuculiformes (Table 1). In the south territories increasing of both species, composition and density have been observed.

In the region between Kalimantzi and Beliovo villages, situated at the foot of the Pirin Mountain the breeding bird community consists of 30 species of birds. During the first year of the survey 25 species of birds have been established there. Dominant species in this region were found to be Turtle Dove (*Streptopelia turtur*), Nightingale (*Luscinia megarhynchos*), Olivaceous Warbler (*Hippolais pallida*), Blackbird (*Turdus merula*).

During the second year there were established 24 species of breeding birds and the dominant species were found to be Nightingale and Golden Oriole (*Oriolus oriolus*). The common density was 17.81 pair/10 ha. which is similar to the density established in the previous year (18.12 pair/10 ha.). It makes an impression some difference in the species composition and dominant structure in two years of the investigation. During the first year the part of the dominant species in the plant formations on this area was 43.12%. In the second year only two species were found

to be dominant and their common part was 26.33%. Oriole was established as a common species. Olivaceous Warbler, is routine for this region but it wasn't observed in 2003. It was established decreasing in numbers of Blackbird, Chaffinch (*Fringilla coelebs*) and Turtle Dove. Lesser Whitethroat (*Sylvia curruca*) and Whitethroat (*S. communis*) also show significant variability in their numbers during the investigated period. It was found out that increasing in the number of the one of species leads to decreasing in number of the other and this may be due to the rival relationship between these two species (Симеонов 1974). The presence of four species from the order Piciformes is some unusual and it may be due to the presence of single larger trees situated between the cermes. They also set the pattern for other nest in holes birds like Tits (p. *Parus*).

In the other region situated in the north between the villages Mikrevo and Krishitza there are also Junipers, Christ's-thorns and Oriental Hornbeans in the Cermes formation. The species composition of the breeding bird community here is smaller than in the first region. There were 26 species established here during the two years (Table 1). Common density of pairs in this region is lower but in the second year of the investigation it approaches the density in the region of Kalimantzi.

Dominant species were found Nightingale and Turtle Dove as well as in the other region. In the second year sudden increase in the number of Woodchat Shrike (*Lanius senator*) which dominance was 12.52% was registered. In comparison to the first year of the survey when the density was lowest – just 9.41pair/10 ha., in 2003 it decreases to 16.47pair/10 ha. Species richness also decreases from 19 to 21 species besides some species have decreased their number. These species are Whitethroat, Subalpine Warbler (*Sylvia cantillans*) and Orphean Warbler (*S. hortensis*), as well as Cuckoo (*Cuculus canorus*). Cuckoo wasn't observed as breeding in this plant formation during the first year.

Up to now the only investigation on the ornithofauna of the plant formations with prevalence of cermes is made by Simeonov (1971). The author has reported 21 species from the territory between Kalimantzi and Beljovo villages and 24 bird species from the formation with prevalence of juniper (*Junipereta oxycedrii*) and cermes in general. He determines Nightingale, as well as Ortolan (*Emberiza hortulana*) and Subalpine Warbler as dominant species. According to our results the last two species have lower numbers. Olivaceous Warbler, determined by Simeonov (1971), as characteristic species for the investigated formations show a good number in our results too. Blackbird and Turtle Dove also retain a high percentage of dominance as in previous studies. From the five rare for Bulgaria breeding bird species reported in the paper mentioned above Olive-tree Warbler (*Hippolais olivetorum*) and Sardinian Warbler (*Sylvia melanocephala*) absent in our data.

The richer species composition we have established is at the expense of the lower density of breeding birds at the any particular sample areas. General density obtained by Simeonov 35 years ago is 24,33 pair/10 ha. and in our results it ranges from 9.41 to 18.12pair/10 ha. However the general density in the Cermes Oak forest in South Pirin during the period of investigation is 25.31pair/10 ha., which is close to the data obtained by previous surveys on this territory.

In the typical forest mediterranean communities (Rucner, 1967), the dominant species are Subalpine Warbler, Nightingale and Blackbird. Their density is 20.17 pair/10 ha. It might say that the parameters of breeding assemblages are rather similar to previous studies as well as to the current results obtained by us.

CONCLUSION

There are 37 breeding bird species altogether in the investigated territories with prevalence of Cermes, Juniper and Christ's-thorn in Southwest Bulgaria. The species composition in the southern part of this territory, situated between Kalimantzi and Beliovo villages is richer than that near by the village Mikrevo, respectively 30 and 26 species. Among the dominant species are Nightingale, Golden Oriole, Blackbird, Olivaceous Warbler, Woodchat Shrike etc..

The common density of birds in these plant formations is 21.52 pair/10 ha. but in particular years it ranges from 9.41 to 18.12 pair/10 ha.

Such kind of habitats is preferable by the Sylvia Warblers (g. Sylvia). We have established 5 species belonging to the genus Sylvia - Lesser Whitethroat (*Sylvia curruca*), Whitethroat (*S. communis*), Subalpine Warbler (*S. cantillans*), Orphean Warbler (*S. hortensis*) and Blackcap (*S. atricapilla*).

Our results don't show significant changes in the species composition and density of the breeding birds in the last 35 years. Differences in the dominant structure of the community were observed as the number of species belonging to the genera Sylvia and Emberiza have decreased. Nightingale, Blackbird, Turtle Dove and Olivaceous Warbler have retained their numbers in this region. Increasing in numbers of some forest species as Golden Oriole, Chaffinch and Great Tit (*Parus major*) was established. In the cermes formations, not one of the four species of woodpeckers have been observed in previous surveys.

This change may be due to the successive growth of the ecosystem as well as to the anthropogenic influence and in the concrete to the pasture of domestic animals.

REFERENCES

- ВЕЛЧЕВ, В., П. ВАСИЛЕВ 1982. Пърнарът (*Quercus coccifera* L.) в България и неговото опазване. В: Нац. теорет. конф. по опазване и възпроизводство на обкръжаващата среда. София, том I, 302-305.
- СИМЕОНОВ, С. 1971. Орнитоценологични проучвания на Пирин планина. Канд. дис., СУ, Биол.фак., 194 стр.
- СИМЕОНОВ, С. 1971 а. Проучване върху гнездовата орнитофауна в псевдомакфисите на Пирин планина. Год. СУ, Биол. фак., т. 63, кн. 1, 15-26.
- СИМЕОНОВ, С. 1974. Екологична адаптация на видовете от р. Sylvia. Год. СУ, Биол. фак., т. 66, кн. 1, 111-124.
- BIBBY, I., N. BURGESS, D. HILL 1992. Bird census techniques. London, Academic Press: 257p.
- RUCNER, R. 1967. Beitrag zur qualitativen und quantitativen Bestandsaufnahme der Ornis in einigen Waldgesellschaften West-Kroatiens. Larus, XIX, Zagreb, p. 44-85.

Table 1. Parameters of the breeding bird communities in Cermes Oak formations.

№	SPECIES	Kalimantzi		Mikrevo	
		p/10 ha	d	p/10 ha	d
1	Luscinia megarhynchos	2,5	9,88	2,35	13,11
2	Oriolus oriolus	2,19	8,65	1,18	6,55
3	Turdus merula	2,19	8,65	0,59	3,28
4	Streptopelia turtur	1,88	7,41	1,76	9,84
5	Hippolais palida	1,88	7,41	0,88	4,92
6	Fringilla coelebs	1,56	6,18	0,29	1,64
7	Sylvia communis	1,56	6,18	1,18	6,55
8	Parus major	1,25	4,94	0,29	1,64
9	Miliaria calandra	0,94	3,71	0,29	1,64
10	Lanius collurio	0,94	3,71	0,29	1,64
11	Sylvia curruca	0,94	3,71	0,29	1,64
12	Sylvia atricapilla	0,62	2,47		
13	Emberiza hortulana	0,62	2,47	0,29	1,64
14	Merops apiaster	0,62	2,47	-	-
15	Emberiza citrinela	0,62	2,47	-	-
16	Garrulus glandarius	0,62	2,47	0,29	1,64
17	Dendrocopos major	0,31	1,23	-	-
18	D. syriacus	0,31	1,23	-	-
19	Cuculus canorus	0,31	1,23	0,88	4,92
20	Upupa epops	0,31	1,23	0,29	1,64
21	Sylvia cantilans	0,31	1,23	0,88	4,92
22	Picus canus	0,31	1,23	-	-
23	Carduelis carduelis	0,31	1,23	0,29	1,64
24	Carduelis cannabina	0,31	1,23	-	-
25	Parus caeruleus	0,31	1,23	-	-
26	Lanius senator	0,31	1,23	2,06	11,48
27	Sylvia hortensis	0,31	1,23	1,47	8,19
28	Emberiza cirrus	0,31	1,23	-	-
29	Picus viridis	0,31	1,23	-	-
30	Corvus corone cornix	0,31	1,23	-	-
31	Oenanthe hispanica	-	-	0,29	1,64
32	C. coccothraustes	-	-	0,29	1,64
33	Parus palustris	-	-	0,29	1,64
34	Alectoris graeca	-	-	0,29	1,64
35	Em. melanocephala	-	-	0,29	1,64
36	Parus lugubris	-	-	0,29	1,64
37	Sturnus vulgaris	-	-	0,29	1,64
	общо	25,31	100%	17,94	100%