

Seasonal dynamics of woodpeckers in the natural fir-beech, spruce-beech-fir and spruce forests of Slovakia^{*)}

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Zusammenfassung

Die jahreszeitliche Dynamik der Spechte-Gemeinschaften in den natürlichen Wäldern der Tannen-Buchen- bis zur Fichtenregion der Großen (Veľká) und Kleinen (Malá) Fatra (Slowakei) wurde in den Jahren 1989–1997 untersucht. Dabei wurde die Methode der Linientaxierung angewandt.

Sechs Arten (Schwarzspecht *Dryocopus martius*, Buntspecht *Dendrocopos major*, Weißrückenspecht *D. leucotos*, Dreizehenspecht *Picoides tridactylus*, Grauspecht *Picus canus* und Grünspecht *P. viridis*) bildeten das ganze Jahr hindurch die Gemeinschaft der Spechte in den natürlichen Wäldern der Tannen-Buchen-Region. Der höchste Wert der Gesamtdichte dieser Arten wurde im Sommer erreicht (2,7 Individuen/10 ha). Populationen des Bunt- und des Weißrückenspechtes wurden jeweils im Frühling mit der höchsten Dichte (1,0 Ind./10 ha und 0,6 Ind./10 ha) beobachtet.

Fünf Arten (Schwarz-, Bunt-, Weißrücken-, Dreizehen- und Grauspecht) bildeten das ganze Jahr hindurch die Gemeinschaft der natürlichen Wälder der Fichten-Buchen-Tannen-Region. Ihre Gesamtdichte war im Vergleich zur vorhergehenden niedriger (1,9 Ind./10 ha). Der Weißrücken- und der

Dreizehenspecht waren jeweils im Frühjahr in dieser Vegetationsstufe mit der höchsten Dichte (0,6 Ind./10 ha und 0,4 Ind./10 ha) vertreten.

In den natürlichen Fichtenwäldern gab es vier Arten (Schwarz-, Bunt-, Weißrücken- und Dreizehenspecht). Ihre Gesamtdichte war die niedrigste innerhalb der untersuchten Waldtypen (1,2 Ind./10 ha im Frühjahr). Beim Dreizehen- und Weißrückenspecht wurde die höchste Frühlingsdichte festgestellt (0,6 Ind./10 ha).

Die Gesamtdichte der Spechte nahm im Sommer wegen der Jungen zu, doch ist diese Zunahme nicht sehr auffallend, da die Altvögel weniger wahrgenommen wurden.

Summary

Seasonal dynamics of woodpeckers' communities in the natural forests of the fir-beech to spruce vegetation tiers of the Veľká and Malá Fatra mountains (Slovakia) was studied during the years 1989–1997 using the strip transect method.

Six species (*Dryocopus martius*, *Dendrocopos major*, *D. leucotos*, *Picoides tridactylus*, *Picus canus* and *P. viridis*) formed the community of woodpeckers in the natural forests of the fir-beech vegetation tier all year long. The highest value of total density of this woodpeckers' community was found in summer (2,7 ind/10 ha). Populations of

^{*)} Der Beitrag bezieht sich auf Exkursionsgebiete, die wir bei der Tagung 1997 (monticola, 8, Seite 55–84) aufgesucht haben.

Dendrocopos major and *D. leucotos* were registered with the highest density (1,0 ind/10 ha and 0,6 ind/10 ha, respectively in spring).

Five species (*Dryocopus martius*, *Dendrocopos major*, *D. leucotos*, *Picoides tridactylus* and *Picus canus*) formed woodpeckers community of the natural forests of the spruce-beech-fir vegetation tier all year long. Total density of this woodpeckers community was lower in comparison with the previous community (1,9 ind/10 ha). *Dendrocopos leucotos* and *Picoides tridactylus* were present in this vegetation tier, with the highest density (0,6 ind/10 ha and 0,4 ind/10 ha, respectively in spring).

Woodpeckers community of the natural forests of the spruce vegetation tier consisted of four species (*Dryocopus martius*, *Dendrocopos major*, *D. leucotos* and *Picoides tridactylus*). Total density of this woodpeckers community was the lowest among the studied forest types (1,2 ind/10 ha in spring). *Picoides tridactylus* and *Dendrocopos leucotos* were registered with the highest spring density (0,6 ind/10 ha and 0,2 ind/10 ha, respectively).

Introduction

At the present time the forest biocoenoses are more and more damaged by air pollution and its long-term effect results in changes in the species composition and structure of the vegetation components and thus has a secondary impact on animal organisms.

It would be one of the elementary tasks of research to know in many details the structure and composition of all the components of the primeval and relatively little damaged forest biocoenoses in order to have an oppor-

tunity in the future to compare the state of the changed and damaged biocoenoses with the structure of the natural biocoenoses.

Fragments of original forests, relatively unspoiled by human activities, have successfully been conserved in some less accessible parts of the Vel'ká and Malá Fatra mountains up till today. Therefore, the attention was aimed, in the years 1989–1997, at research of the bird communities of the forest natural biocoenoses in these regions. Parts of the results concerning the woodpeckers are presented in this paper.

1. Study area

The research was carried out in the Vel'ká and Malá Fatra Mts. (18°50'–19°18'E; 48°47'–49°19'N, Slovakia) where ten localities were selected on the basis of the groups of forest types (ZLATNÍK 1959, 1976, RANDUŠKA et al. 1986). Transects were selected (2 in the fir-beech Vegetation tier, 10 in the spruce-beech-fir, and 6 in the spruce Vegetation tiers) within forest biocoenoses as much as possible similar (according to species composition and structure) to the natural biocoenoses (fragments of primeval forests). Main habitat features of the censused localities are summarized in Table 1. Characteristics of the studied localities are provided in Forest Management Plans prepared by Lesprojekt Zilina in 1988–1997. The geobiocoenology nomenclature of groups of forest types were prepared by RANDUŠKA et al. (1986).

2. Material and Methods

Seasonal dynamics of woodpecker communities were investigated over three seasons in 1989–1997; spring (from the beginning of April to late June), summer (from the begin-

ning of July to late September), and winter (from October to March). The boundaries between seasons are considered to be abstract, as they change fluently.

Bird censuses were carried out using the strip transect method (VERNER 1985). All the birds seen or heard up to a distance of 25 m to each side of the axis of the transect were counted. Individuals flying above the survey belt were not registered. Juveniles were not taken into account during the spring season. A male, pair of birds, family, feeding bird, and a bird defending nest area were considered as a pair (2 individuals) during the spring season. One bird seen or heard was considered as one individual in this period (BLONDEL et al. 1970).

Lengths of transects are given in Table 1. During spring and summer birds were counted twice per day (early in the morning from 3:00 a.m. to 9:00 a.m. CET and later in the evening from 7:00 p.m. to 8:00 p.m. CET). During winter birds were observed in the morning after sunrise and in the afternoon before sunset. All checks were made under satisfactory weather conditions. Each transect check was registered on a separate form, with data from the certain periods being combined to calculate the density per 10 ha.

3. Results

3.1. Woodpecker community of the fir-beech vegetation tier

In spring, six species formed the community of woodpeckers with a total density of 2,6 ind/10 ha. Populations of *Dendrocopos major* (1,0 ind/10 ha) and *Dendrocopos leucotos* (0,6 ind/10 ha) were registered with the highest density.

In summer and winter, similarly as in the spring season, six species were present in the

natural forests of fir-beech vegetation tier with a total density of 2,7 ind/10 ha and 2,1 ind/10 ha, respectively. Similarly as in the previous period, *Dendrocopos major* and *Dendrocopos leucotos* were registered with the highest density (Table 2).

3.2. Woodpecker community of the spruce-beech-fir vegetation tier

Five species formed woodpecker community of the natural forests of the spruce-beech-fir vegetation tier all year long. *Dendrocopos leucotos* and *Picoides tridactylus* were present in the natural forests of this vegetation tier with the highest density (spring density 0,6 and 0,4 ind/10 ha, respectively).

3.3. Woodpecker community of the spruce vegetation tier

Woodpecker community of the natural forests of the spruce vegetation tier consisted of four species. Total density of this woodpecker community was the lowest among the studied communities (Table 2). *Picoides tridactylus* and *Dendrocopos leucotos* were registered with the highest density (0,6 and 0,2 ind/10 ha, respectively, Table 2).

3.4. Seasonal dynamics of the woodpecker communities

The total density of the woodpecker communities increased in the summer season owing to the fledglings, yet this increase was not expressive due to the dwindling conspicuousness of adults. The lowest values of the density of the woodpecker communities were found during the winter season.

4. Discussion

During previous studies of primeval mixed spruce-beech forests, PAVELKA (1987) reported woodpecker community consisting of four species (*Dendrocopos major*, *Dendro-*

copos leucotos, *Picus canus*, *Dryocopus martius*) at a total density of 2,1–2,5 pairs/10 ha during the spring season and of five species (*Dendrocopos major*, *Dendrocopos leucotos*, *Picus canus*, *Dryocopus martius* and *Picoides tridactylus*) at a total density of 0,51–1,46 ind/10 ha in the winter season.

KROPIL (1996) found in the primeval mixed fir-spruce-beech forest of the Dobroč nature reserve (Slovakia) during the breeding season five woodpecker species (*Dendrocopos major*, *Dendrocopos leucotos*, *Dryocopus martius*, *Picoides tridactylus* and *Picus canus*) at a total density of 1,0 pair/10 ha, which approximately corresponds with my findings.

Similarly, spring and winter woodpecker community of the spruce-beech natural forest in the Bavarian forest (Bayerischer Wald, Germany) was found to contain five species (*Dendrocopos major*, *Picoides tridactylus*, *Picus canus*, *Dendrocopos leucotos*, and *Dryocopus martius*) at a density of 17,1 ind/100 ha (SCHERZINGER 1986).

On the contrary, FLOUSEK (1989) found in beech-spruce forest in the Giant mountains (Riesengebirge, Czech rep.) only three woodpeckers species (*Picus canus*, *Dryocopus martius* and *Dendrocopos major*) at very low density (1,6 pairs/100 ha).

TURCEK (1955), who studied the bird community in the natural spruce forest in the Pol'ana mountains, stated five woodpeckers species (*Dendrocopos major*, *Picoides tridactylus*, *Picus canus*, *Picus viridis* and *Dryocopus martius*) at a total density of 2,3 ind/100 ha.

In the natural spruce forests of Pol'ana state nature reserve, KROPIL (1995) reported three

species of woodpeckers at a total density of 0.6 pair/10 ha, which is very similar to that of the present study.

In the spruce biocoenoses of the Bavarian forest (Bayerischer Wald) SCHERZINGER (1986) found four species (*Dryocopus martius*, *Picoides tridactylus*, *Dendrocopos major* and *Dendrocopos leucotos*) at a total spring density of 1,7 ind/10 ha and winter density of 1,5 ind/10 ha.

GLOWACINSKI (1990) found in the natural spruce forests of Gorce Natinal Park (the Carpathians, Southern Poland) three woodpecker species (*Dendrocopos leucotos*, *Dryocopus martius* and *Picoides tridactylus*) at a total density of 0,5 pair/10 ha.

In the primeval forests damaged by pollution (Smrk nature reserve, Czech rep.), ČAPEK (1994) observed four woodpecker species (*Picus canus*, *Dryocopus martius*, *Dendrocopos leucotos* and *Picoides tridactylus*) at very low total density (2,6–3,2 pairs/100 ha).

From the comparison of the results of the present study with data published previously, it is obvious that there exists similarity of the species composition of the compared woodpecker communities. Differences in the density of bird species observed here and previously result especially from differences in the character of the understudied forests (composition of the tree species, vertical stratification).

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Table 1: Features of examined localities.

Locality	Length of transect	Group of forest types	Tree composition	Vegetation tier Exposure
Suchý vrch (Vel'ká Fatra)	T 1 700 m	<i>Fageto Piceetum</i> 140 years old	<i>Picea abies</i> <i>Fagus sylvatica</i>	90% 10% 3.3. East
	T 2 700 m	<i>Fageto Aceretum</i> 125 years old	<i>Fagus sylvatica</i> <i>Picea abies</i>	95% 5% 3.2. Southeast
	T 3 1 000 m	<i>Abieto Fagetum</i> 120 years old	<i>Fagus sylvatica</i> <i>Picea abies</i> <i>Acer pseudoplatanus</i>	50% 45% 5% 3.2. East
	T 4 1 000 m	<i>Fageto Aceretum</i> 200 years old	<i>Fagus sylvatica</i> <i>Picea abies</i> <i>Acer pseudoplatanus</i> <i>Abies alba</i>	60% 25% 10% 5% 3.2. Southeast
	T 5 1 000 m	<i>Fageto Aceretum</i> <i>Fageto Piceetum</i> 200 years old	<i>Fagus sylvatica</i> <i>Picea abies</i> <i>Acer pseudoplatanus</i> <i>Abies alba</i>	50% 35% 10% 5% 3.2. Southeast
Ostré brdo (Vel'ká Fatra)	T 6 500 m	<i>Fageto Piceetum</i> 135 years old	<i>Picea abies</i> <i>Fagus sylvatica</i>	65% 35% 3.3. North
	T 7 1 500 m	<i>Fageto Aceretum</i> 130 years old	<i>Fagus sylvatica</i> <i>Picea abies</i>	65% 35% 3.2. Northeast
Lúšťava (Vel'ká Fatra)	T 8 2 000 m	<i>Fageto Abietum</i> 90 years old	<i>Fagus sylvatica</i> <i>Picea abies</i> <i>Abies alba</i>	50% 45% 5% 3.1. Northwest
Smrekovica (Vel'ká Fatra)	T 9 5 000 m	<i>Sorbeto Piceetum</i> 200 years old	<i>Picea abies</i> <i>Sorbus aucuparia</i>	90% 10% 3.3. SW and NW
	T 10 1 000 m	<i>Fageto Aceretum</i> 150 years old	<i>Fagus sylvatica</i> <i>Acer pseudoplatanus</i> <i>Picea abies</i>	90% 5% 5% 3.2. Southeast
Čierny kameň (Vel'ká Fatra)	T 11 1 000 m	<i>Fageto Aceretum</i> 150 years old	<i>Fagus sylvatica</i> <i>Picea abies</i>	90% 10% 3.2. West
	T 12 1 000 m	<i>Abieto Fagetum</i> <i>Fageto Aceretum</i> 150 years old	<i>Fagus sylvatica</i> <i>Acer pseudoplatanus</i> <i>Picea abies</i>	80% 10% 10% 3.2. Northeast
Čiernej kameň (Vel'ká Fatra)	T 13 1 000 m	<i>Fageto Piceetum</i> 150 years old	<i>Picea abies</i> <i>Pinus mugo</i>	80% 20% 3.3. Northeast
Paráč (Malá Fatra)	T 15 1 000 m	<i>Sorbeto Piceetum</i> 155 years old	<i>Picea abies</i>	100% 3.3. South
	T 16 1 000 m	<i>Fageto Aceretum</i> 140 years old	<i>Picea abies</i> <i>Abies alba</i>	95% 5% 3.2. Southeast
Minčol (Malá Fatra)	T 17 2 000 m	<i>Acereto piceetum</i> 120 years old	<i>Picea abies</i> <i>Fagus sylvatica</i>	80% 20% 3.3. Northwest
	T 18 1 200 m	<i>Fageto Aceretum</i> <i>Abieto Fagetum</i> 150 years old	<i>Picea abies</i> <i>Abies alba</i> <i>Fagus sylvatica</i>	80% 10% 10% 3.2. Southwest
	T 20 1 300 m	<i>Fageto Abietum</i> 150 years old	<i>Fagus sylvatica</i> <i>Acer pseudoplatanus</i> <i>Abies alba</i> <i>Picea abies</i>	40% 10% 30% 20% 3.1. Southwest

3.1.: fir-beech vegetation tier

3.2.: spruce-beech-fir vegetation tier

3.3.: spruce vegetaion tier

Table 2: Density of woodpeckers (ind/10 ha) in the natural forests of the fir-beech (FB), spruce-beech-fir (SBF) and spruce (S) vegetation tiers, Central Slavakia (1989–1997)

Species	Spring			Summer			Winter		
	FB	SBF	S	FB	SBF	S	FB	SBF	S
<i>Dryocopus martius</i>	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
<i>Dendrocopos major</i>	1,0	0,4	0,2	0,9	0,3	0,1	0,9	0,3	0,1
<i>Dendrocopos leucotos</i>	0,6	0,6	0,2	0,7	0,8	0,3	0,4	0,6	0,2
<i>Picoides tridactylus</i>	0,2	0,4	0,6	0,2	0,7	0,8	0,2	0,5	0,7
<i>Picus canus</i>	0,3	0,3		0,3	0,3		0,2	0,2	
<i>Picus viridis</i>	0,3			0,4			0,2		
Altogether	2,6	1,9	1,2	2,7	2,3	1,4	2,1	1,8	1,2

LITERATURE

BLONDEL, J., FERRY, C., FROCHOT, B. (1970):

La méthode des indices ponctuels d'abondance (I.P.A.) ou des relevés d'avi-faune par „stations d'écoute“. – In: Alauda, 38, 55–71

Čapek, M. (1994): Birds in mountain ecosystems under pressure of air pollution. – In: Acta Sc. Nat. Brno, 28, 1–46.

FLOUSEK, J. (1989): Impact of industrial emissions on bird populations breeding in mountain spruce forests in Central Europe. – In: Ann. Zool. Fennici, 26, 255–263.

GLOWACINSKI, Z. (1990): The breeding bird communities of the Kamienica watershed in Gorce National Park (The Carpathians, Southern Poland). – In: Acta Zool. Cracov., 33, 273–301.

KROPIL, R. (1995): Významné vtáčie územie Pol'ana ornitocenóza prírodného smrekového lesa typu Acereto-Piceetum. 132–138.

– (1996): The breeding bird community of the West Carpathians fir-spruce-beech primeval forest (The Dobroč nature reservation). – In: Biológia, Bratislava, 51, 585–598.

PAVELKA, J. (1987): Ptačí spoločenstva v jedlobukovom pralese Razula v mimohnízd-

ním období. – In: Cas. Siez. Huz. Opava (A), 36, 159–168.

RANDUŠKA, D. VOREL, J., PLÍVA, K. (1986): Fytocenológia a lesnícka typológia. Priroda, Bratislava, 339 pp.

SCHERZINGER, W. (1986): Die Vogelwelt der Urwaldgebiete im Inneren Bayerischen Wald. Wiss. SchrR. Bayer. Staatsmin. ELF, 12, 1–188.

TURČEK, F.J. (1955): On the bird Population of the spruce forest community in Slovakia. – In: Ibis, 98, 24–33.

VERNER, J. (1985): Assessment of counting techniques. – In: Curr. Ornithol., 2, 247–302.

ZLATNÍK, A. (1959): Přejhľad slovenských lešú podle skupin lesních typů. VSZ, Brno, 195 pp.

– (1976): Lesnícká fytocenologie. SZN, Praha, 495 pp.

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