Slovak Rapt J 2009, 3: 13–20
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Feeding ecology of a nesting population of the Common Buzzard (*Buteo buteo*) in the Upper Nitra Region, Central Slovakia

Potravná ekológia hniezdnej populácie myšiaka hôrneho (*Buteo buteo*) na hornom Ponitrí, stredné Slovensko

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Šotnár K & Obuch J 2009: Feeding ecology of a nesting population of the Common Buzzard (*Buteo buteo*) in the Upper Nitra region, Central Slovakia. Slovak Rapt J 3: 13–20.

Abstract: During routine checks of the nests of the Common Buzzard in the Upper Nitra region (Central Slovakia) we collected food remains and recorded all prey given to the nestlings. We present results from the period 2006–2008. 606 food items were determined, comprising mainly mammals (67%). Birds were also frequent (17%), less so amphibians and reptiles (7%) and invertebrates (7%). During the rodent population peak in 2007, Buzzard pairs nesting in the valley preyed mainly on *Microtus arvalis*, whereas pairs living at the rim of the valley fed on *Myodes glareolus* and *Talpa europaea*, and higher in the Vtáčnik Mts birds fed on *Apodemus flavicollis.* After a massive decline in the rodent population in the following year 2008, the survival rate of the nestlings was very low and the proportion of invertebrates in their diet increased. Birds that were most frequently preyed upon included juvenile *Turdus philomelos* and *Garrulus glandarius,* prey identified from amphibian was mainly *Bufo bufo,* and from reptile prey was largely *Anguis fragilis.*

Abstrakt: Pri kontrolách hniezd myšiaka hôrneho v oblasti horného Ponitria (stredné Slovensko) sme zbierali zvyšky jeho potravy a zaznamenávali korisť, prinesenú mláďatám. Prezentujeme výsledky z rokov 2006–2008. Determinovali sme 606 kusov potravy, v ktorej dominujú cicavce (67 %). Početné sú aj vtáky (17 %), obojživelníky a plazy (7 %) a bezstavovce (9 %). Pri vysokej populačnej hladine hlodavcov v roku 2007 bol u párov, hniezdiacich v kotline, dominantnou korisťou druh *Microtus arvalis*, na okraji kotliny druhy *Myodes glareolus* a *Talpa europaea* a u párov, hniezdiacich vyššie v pohorí Vtáčnik druh *Apodemus flavicollis*. Po silnom poklese populačnej hladiny hlodavcov v nasledujúcom roku 2008 bola nízka úspešnosť hniezdenia myšiakov a v ich potrave stúpol podiel bezstavovcov. Z vtákov boli najčastejšie lovené mláďatá druhov *Turdus philomelos* a *Garrulus glandarius*, z obojživelníkov *Bufo bufo* a z plazov *Anguis fragilis*.

Key words: *Buteo buteo*, diet, Upper Nitra region, Central Slovakia

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Acknowledgments: We owe our gratitude to Martin Dúbrava and Branislav Beniska who physically examined the Buzzard nests, collected pellets and food remains of the Common Buzzard in the Upper Nitra region.

Introduction

In contrast to owls, bones are digested to a greater degree in the pellets of birds of prey. Therefore the investigation of their diet requires employing several different methods. During the nesting period, examination of pellets, determination of bone and feather remains in the nest can be used, as well as recording prey items presented to the nestlings. Prey remains in the nests of the *Buteo buteo* were evaluated by Šotnár (2003, 2007). In South Moravia this method was used for examining the food of the *B. buteo* by Voříšek et al. (1997) and Horák & Matušík (2000), a smaller sample from the Czech Republic and Moravia was examined by Toufar (1958). In Germany, the same method was used to examine the food of *B. buteo* by Wuttky (1963) and Mebs (1964).

In the past when birds of prey were hunted legally and shot individuals were concentrated in taxidermist workshops, the stomach content of the birds could be examined. Sládek (1961, 1966) used this method in cooperation with the taxidermist workshop in Žiar nad Hronom. In the same manner, Sabadoš & Sládek (1968) studied the diet of the birds of prey shot in the pheasant reserve during an exceptionally harsh winter. Ševčík (1980) examined the food of the Buzzards shot in the pheasant reserves in the

Czech Republic. Extensive material collected by Rörig from Germany was studied by Uttendörfer (1939).

Comprehensive data from Central Europe is summarized in the papers of Glutz et al. (1989) and Cramp & Simmons (1980). Our aim was to evaluate and compare the diet of the Common Buzzard population in three nesting seasons and three elevation zones of the Upper Nitra region.

Material and Methods

In 2006–2008 we collected pellets and recorded food remains in the nests of the Common Buzzard in the Upper Nitra region. Nests were examined in May–July. Our work builds upon the study by Šotnár & Topercer (2009). Collected material was classified into two cathegories:

Provisions – visual examination of food items. Determination of whole individuals, food remains, feather and fur directly in the nest.

Pellets – analysis of pellets and bone remains. All samples were processed in 5% NaOH solution to dissolve the feather and hair material. Bone fragments were used for the determination of vertebrate prey and elytrae and jaws were used to determine invertebrates. Mammals were determined according to cranial fragments, moles were also identified using humerus, Microtids using the lower molar teeth M_1. Birds were determined according to 4 types of bone fragments: beaks, *humerus, metatarsus* and *tarsometatarsus*. Reptiles were determined according to jaws, skeletons and skin or scale remains. Food samples collected in 2007 and 2008 were classified into 3 zones:

A. Nesting pairs from the valley, coline zone 300–500 m a. s. l. (agrocenoses, field forests, riparian vegetation, 42 samples);

B. Nesting pairs from the piedmont area of Vtáčnik, submontane zone 500–700 m a. s. l. (forest edge up to 1 km deep into the forest, 36 samples);

C. Nesting pairs from the mountain range Vtáčnik, montane zone 700–1100 m a. s. l. (deep in the forests, approximately 2–5 km from the rim of the valley, 15 samples).

To evaluate the results in the Table 1–4 the method of marked differences from the mean (MDFM; Obuch 2001) was used. In the tables samples are sorted according to their similarity. Species in the upper part of the table are sorted that those with marked positive deviations are arranged in blocks bordered by solid lines. Species with less marked deviations are sorted under the dashed line according to descending frequency. Those with frequency less than 5 are shown in Table 1. The lower part of the table shows sums for individual vertebrate and invertebrate classes. The diversity index H‘ is calculated according to the formula of Shannon & Weaver (1949).

Results

In 2006–2008 we studied food remains in the nests of *B. buteo* and determined 606 prey items. The most dominant part of the diet comprised mammals (Mammalia, 67%), less frequent were birds (Aves, 17%), amphibians and

Tab. 1. Food composition of *B. buteo* in the Upper Nitra Valley, inter-annual comparison

Tab. 1. Potrava *B. buteo* na hornej Nitre, porovnanie rokov

Year (no.) / Rok (č.) Species / Druhy	2006 (1)	2007 (2)	2008 (3)	Σ	%
Apodemus flavicollis	1- 1	1+ 35	1- 0	36	5.94
Coleoptera sp.	5	20	1+ 19	44	7.26
Hymenoptera sp.		1	1+ 7	8	1.32
Microtus arvalis	38	110	1- 13	161	26.57
Talpa europaea	27	65	21	113	18.65
Myodes glareolus	6	37	9	52	8.58
Turdus philomelos	5	11	1	17	2.81
Garrulus glandarius	5	6	5	16	2.64
Sorex araneus		10	3	13	2.15
Bufo bufo	1	9	1	11	1.82
Anguis fragilis	3	2	3	8	1.32
Coccothraustes coccothr.	4	2	2	8	1.32
Sturnus vulgaris	1	5	1	7	1.16
Arvicola terrestris	2	4	1	7	1.16
Buteo buteo		2	4	6	0.99
Columba livia domestica	1	2	2	5	0.83
Terricola subterraneus	2	3		5	0.83
Mammalia	**78**	**275**	**1- 53**	**406**	**67.00**
Aves	**26**	**54**	**21**	**101**	**16.67**
Amphibia, Reptilia	**13**	**23**	**5**	**41**	**6.77**
Evertebrata	**8**	**1- 24**	**1+ 26**	**58**	**9.57**
Σ	125	376	105	606	100.00
H' diversity index / index diverzity	2.49	2.58	2.67	2.74	

Other species / Ostatné druhy (year no. / rok č. – number / počet): *Erinaceus concolor* (1–1; 3–1), *Sorex minutus* (1–1), *Neomys fodiens* (2–1; 3–1), *Crocidura suaveolens* (2–1), *Lepus europaeus* (2–3; 3–1), *Sciurus vulgaris* (3–2), *Mus* cf. *musculus* (2–1), *Apodemus sylvaticus* (2–1), *Microtus agrestis* (2–1), *Mustela nivalis* (2–1), Artiodactyla sp. (2–2; 3–1), *Columba oenas* (3–1), *Columba palumbus* (1–1; 2–1; 3–1), *Columba* sp. (2–2), *Aegolius funereus* (2–1), *Strix aluco* (1–1), *Dryocopus martius* (2–1), *Dendrocopos medius* (2–1), *Dendrocopos* sp. (2–4; 3–1), *Anthus* sp. (2–1), *Locustella fluviatilis* (1–1), *Turdus* sp. (2–1), *Sitta europaea* (2–2), *Emberiza citrinella* (3–1), *Fringilla coelebs* (1–1; 3–1), *Pica pica* (2–1), Passeriformes sp. (1–6; 2–11; 3–1), *Bombina variegata* (1–1), *Rana temporaria* (1–1; 2–1), *Rana* cf. *esculenta* (2–1), Amphibia sp. (1–3), *Lacerta agilis* (2–1; 3–1), *Natrix natrix* (2–2), *Elaphe longissima* (1–1; 2–4), *Coronella austriaca* (1–1), Colubridae sp. (1–2; 2–3), Orthoptera sp. (1–3; 2–1), *Melolontha melolontha* (2–1), Diptera sp. (2–1)

reptiles (Amphibia and Reptilia, 7%; Fig. 1–7). Invertebrates (Evertebrata, 10%) are numerous, but comprise an insignificant part of the total biomass.

The most dominant prey species *Microtus arvalis* (26.6%) was less frequent in 2008, *Talpa europaea* (18.7%) is equally frequent in samples from 2006, 2007 and 2008, *Apodemus flavicollis* (5.9%) is more frequent in 2007. The lack of rodents in 2008 is partially compensated by increased proportion of invertebrates, including mainly insects of the orders Coleoptera and Hymenoptera (Table 1). The most frequent mammals include *Myodes glareolus* (8.6%) and *Sorex araneus* (2.2%). From birds *B. buteo* fed most frequently on juveniles of *Turdus philomelos* (2.8%) and *Garrulus glandarius* (2.6%). *Bufo bufo* (1.8%) was among the most frequent amphibian prey and *Anguis fragilis* (1.3%) was the most frequent reptile .

Tab. 2. Food composition of *B. buteo* in the Upper Nitra Valley, comparison between sampling methods
Tab. 2. Potrava *B. buteo* na hornej Nitre, porovnanie metód zberov

Druhy \ Druh zberu	**a**		**b**		**∑**	**%**
Buteo buteo	1-	0	1+	6	6	0.99
Turdus philomelos	1-	4	1+	13	17	2.81
Coccothraustes coccothr.	1-	0	1+	8	8	1.32
Sturnus vulgaris	1-	1	1+	6	7	1.16
Garrulus glandarius	2-	1	1+	15	16	2.64
Passeriformes sp.	2-	0	2+	18	18	2.97
Apodemus flavicollis		36	2-	0	36	5.94
Myodes glareolus		52	2-	0	52	8.58
Microtus arvalis		144	1-	17	161	26.57
Coleoptera sp.		42	1-	2	44	7.26
Talpa europaea		92		21	113	18.65
Sorex araneus		13			13	2.15
Bufo bufo		11			11	1.82
Anguis fragilis		7		1	8	1.32
Hymenoptera sp.		8			8	1.32
Arvicola terrestris		7			7	1.16
Terricola subterraneus		5			5	0.83
Columba livia dom.		5			5	0.83
Elaphe longissima		3		2	5	0.83
Mammalia		**363**	**1-**	**43**	**406**	**67.00**
Aves	**2-**	**17**	**2+**	**84**	**101**	**16.67**
Amphibia, Reptilia		**32**		**9**	**41**	**6.77**
Evertebrata		**55**	**1-**	**3**	**58**	**9.57**
∑		467		139	606	100.00
H‘ diversity index / index diverzity		2.35		2.81	2.74	

a – pellets / vývržky; b – nest supply / zásoba na hniezde

The pellets revealed three times more prey items than food provisions in the nests. Therefore the comparison of species composition using the MDFM method (Table 2) showed marked differences only in the less frequent material collected in the nests. The pellets comprised mainly mammals (77.7%), including *M. arvalis*, *M. glareolus* and *A. flavicollis.* Coleopterans were the most frequent invertebrate prey. Nest provisions included mainly birds (Aves, 60.4%), namely *G. glandarius*, *T. philomelos*, *Sturnus vulgaris* and *Coccothraustes coccothraustes*.

The evaluation of *B.buteo* diet composition in relation to habitat was strongly influenced by the gradation of rodents in 2007 and the subsequent decline combined with unfavourable weather conditions in 2008. Great abundance of food in 2007 was reflected in the higher nesting success. Therefore in 2007 we collected a three times larger sample of food than in 2008. In 2007 the most frequent prey item of *B.buteo* in the valley included *M. arvalis* (51.4%), in the piedmont of Vtáčnik, *M. glareolus* and *T. europaea* were more frequent in the montane zone, *A. flavicollis* was dominant. In 2008, Aves and Evertabrata were more frequent in the valley and *T. europaea* and Evertebrata in the piedmont area. The montane zone yielded only a small sample of 22 food items. Notable prey items included *Aegolius funereus, Strix aluco* and *Locustella fluviatilis.*

Discussion

Our data on the food composition of *B. buteo* from the Upper Nitra valley, which were collected through the analysis of pellets and food provisions in the nests, corresponds with the results of other authors using similar methods in South Bohemia and Germany. Since the works of Voříšek et al. (1997) and Horák & Matušík (2000) only include prey determined to higher taxonomic levels, we decided to make comparison in Table 4 only with our own data from the determination of pellets at Pálava. All four studies on the diet of *B. buteo,* used in the comparison, show a lower proportion of the dominant species *M. arvalis* and higher proportion of the subdominant *Talpa europaea.* Birds can be seen in higher proportion, especially *G. glandarius* and *T. philomelos* species. In contrast to other studies, our results show higher proportion of *S. araneus, A.flavicollis, C. coccothraustes* and *Elaphe longissima.* In our results we also included findings of dead *B. buteo* nestlings, killed mainly as a result of cainism during the shortage of food in 2008. Studies using similar methods found other species more abundant such as *Apodemus sylvaticus*, *Arvicola terrestris*, *Lacerta agilis*, *Anguis fragilis* (Mebs 1964) *Lepus europaeus*, *Alauda arvensis* (Mebs 1964, Wuttky 1963), *C. cricetus* , *Emberiza citrinella*, *Columba livia*


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Fig. 1. The most frequently preyed bird – *Garrulus glandarius* (Veľká Čausa, 29 May 2008, 1 pull. 13-day and 1 egg).
Obr. 1. Najčastejšie lovený druh vtákov bol *Garrulus glandarius* (Veľká Čausa, 29. máj 2008, 1 pull. 13-dňové a 1 vajce).


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Fig. 2. Prey item in the nest – *Sciurus vulgaris* without head (Fančová, 27 May 2008, 2 pull. 5–7 days old).
Obr. 2. Potrava na hniezde – *Sciurus vulgaris* bez hlavy (Fančová, 27. máj 2008, 2 pull. 5–7-dňové).


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Fig. 3. Food supply – *T. europaea*, *A. terrestris*, *L. fluviatilis*, *T. merula* (Lehota pod Vtáčnikom, 6 June 2006, pull. 21 days old).
Obr. 3. Zásoba potravy – *T. europaea*, *A. terrestris*, *L. fluviatilis*, *T. merula* (Lehota pod Vtáčnikom, 6. jún 2006, mláďa 21-dňové).


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Fig. 4. Prey item – *Coronella austriaca* (Cígeľ, Vtáčnik, 24 May 2004, 2 pull. ca 18–20 days old and 1 egg).
Obr. 4. Potrava – *Coronella austriaca* (Cígeľ, Vtáčnik, 24. máj 2004, 2 pull. asi 18–20 dňové a 1 vajce).


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Fig. 5. Main food component of the Common Buzard – *Microtus arvalis* (Nováky, 6 June 2007, 2pull. ca 28 days old).
Obr. 5. Hlavná zložka potravy myšiakov – *Microtus arvalis* (Nováky, 6. jún 2007, 2pull. asi 28-dňové).


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Fig. 6. Three nestlings in the nest, food supply – 6 *M. arvalis* (Kamenec p. Vtáčnikom, 24 May 2008).
Obr. 6. Tri mláďatá na hniezde, potrava na hniezde – 6 *M. arvalis* (Kamenec p. Vtáčnikom, 24. máj 2008).

Tab. 3. Food composition of *B. buteo* in the Upper Nitra Valley, evaluation of 2007 and 2008 samples according to habitat zones
Tab. 3. Potrava *B. buteo* na hornej Nitre, vyhodnotenie zberov z rokov 2007 a 2008 podľa zón

Year / Rok	**2007**						**2008**							
Zone / Zóna // Species / Druhy	**A**		**B**		**C**		**A**		**B**		**C**		**∑**	**%**
Microtus arvalis	1+	73	1-	34	1-	3		10	1-	2	1-	1	123	25.47
Myodes glareolus	2-	2	1+	26		9				3		6	46	9.52
Talpa europaea	1-	13	1+	44		8	1-	1	1+	18		2	86	17.81
Apodemus flavicollis	1-	5		15	1+	15							35	7.25
Coleoptera sp.		10	1-	6		4	1+	8		7		4	39	8.07
Hymenoptera sp.		1						2	1+	5			8	1.66
Sorex araneus		4		3		3				1		2	13	2.69
Turdus philomelos		2		7		2				1			12	2.48
Garrulus glandarius		3		3				3		1		1	11	2.28
Bufo bufo		2		5		2				1			10	2.07
Buteo buteo				2				4					6	1.24
Sturnus vulgaris		3		2				1					6	1.24
Arvicola terrestris		3		1				1					5	1.04
Anguis fragilis		2						1		1		1	5	1.04
Mammalia		**106**		**129**		**40**	**1-**	**14**		**25**		**14**	**328**	**67.91**
Aves		**17**		**31**		**7**	**1+**	**15**		**4**		**3**	**77**	**15.94**
Amphibia, Reptilia		**7**		**11**		**5**		**1**		**3**		**1**	**28**	**5.80**
Evertebrata		**12**	**1-**	**8**		**4**	**1+**	**10**	**1+**	**12**		**4**	**50**	**10.35**
∑		142		179		56		40		44		22	483	100.00
H‘ diversity index / index diverzity		2.11		2.50		2.36		2.44		2.00		2.22	2.73	

Zone: A – coline zone 300–500 m a. s. l., B – submontane zone 500–700 m a. s. l., C – montane zone 700–1100 m a. s. l.
Zóna: A – kolínna 300–500 m n. m., B – submontánna 500–700 m n. m., C – montánna 700–1100 m n. m.

domestica (Wuttky 1963) and Coleoptera (Voříšek et al. 1997; Table 4).

The papers focusing on the examination of stomach contents more frequently studied winter samples, dominated mainly by *M. arvalis.* Stomach contents of Common Buzzards shot in the pheasant reserves more often included *Phasianus colchicus* and *Gallus gallus domestica* species (Ševčík 1980). Invertebrates are usually better preserved in stomach samples than vertebrates, therefore Coleoptera, Orthoptera (Sládek 1961), as well as Lepidopteran larvae (caterpillars) were often found in the stomach contents (Ševčík 1980, Uttendörfer 1939).

According to our study from the Upper Nitra, small game (hare, pheasant, grey partridge) comprises less than 1% of the Common Buzzard‘s diet. Several authors (Sládek 1966, Horák & Matušík 2000) suggested that small game were not originally preyed upon by *B. buteo* and that it only fed on their carcasses.



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Fig. 7. *Astacus* sp. – unusual prey of Common Buzard. **LOKALITA, DATUM**.
Obr. 6. *Astacus* sp. – nezvyčajná potrava na hniezde myšiaka hôrneho. **LOKALITA, DÁTUM**.

Tab. 4. Evaluation of data on *B. buteo* diet in the Central Europe
Tab. 4. Vyhodnotenie údajov o potrave *B. buteo* v strednej Európe

Species / Druhy	**1**		**2**		**3**		**4**		**5**		**6**		**7**		**∑**	**%**
Sorex araneus	1+	13						3		4		7	2-	0	27	0.44
Buteo buteo	1+	6										1			7	0.11
Coccothraustes coccothr.	1+	8						1		2			1-	0	11	0.18
Elaphe longissima	1+	5													5	0.08
Hymenoptera sp.	1+	8													8	0.13
Apodemus flavicollis	2+	36		7				3		11	1-	0	3-	0	57	0.93
Talpa europaea	2+	113	1+	31	1+	38	1+	25	2-	14	3-	1	1-	115	337	5.49
Turdus philomelos	2+	17	2+	17				1	1-	0			2-	0	35	0.57
Garrulus glandarius	2+	16	1+	6		2			1-	0			2-	0	24	0.39
Bufo bufo	1+	11	1+	7				1		5		2	2-	0	26	0.42
Sturnus vulgaris	1+	7			1+	7							1-	0	14	0.23
Myodes glareolus	2+	52		11		5	1+	11	1-	12	1-	4	4-	0	95	1.55
Apodemus sylvaticus		1	1+	7		4		3		10		1	2-	0	26	0.42
Arvicola terrestris		7	1+	7				2		3				10	29	0.47
Turdus merula			1+	6		4				3		2	1-	0	15	0.24
Lacerta agilis		2	1+	15				3	1-	4	1-	0		30	54	0.88
Anguis fragilis		8	3+	39				2	2-	1	1-	0		26	76	1.24
Lepus europaeus	1-	4	1+	21	1+	11		6		16		6		33	97	1.58
Alauda arvensis			1+	8	1+	7							1-	0	15	0.24
Cricetus cricetus	2-	0	1-	0	3+	56			2-	3	2-	1		57	117	1.91
Emberiza citrinella		1			1+	6				2		1	1-	0	10	0.16
Columba livia dom.		5			1+	9				1		5	2-	0	20	0.33
Coleoptera sp.		45	3-	0		19	3+	79	1+	137	1+	69	5-	1	350	5.70
Gryllotalpa gryllota	1-	0	1-	0					2+	58	1-	0	2-	7	65	1.06
Orthoptera sp.	2-	4	2-	0	2-	0	2-	0	2+	221	2-	3	3-	12	240	3.91
Gallus gallus dom.						2				3	1+	7		4	16	0.26
Phasianus colchicus								1	1-	1	2+	27	1-	11	40	0.65
Lepidoptera sp.	3-	0	3-	0	2-	0	2-	0	4-	0	2+	87	1+	172	259	4.22
Microtus arvalis		161	1-	156	2-	61	1-	48		587		323	1+	1896	3232	52.66
Terricola subterraneus		5		1				2		2			1-	0	10	0.16
Perdix perdix				1		2				5		1		18	27	0.44
Lacerta vivipara				5						3				10	18	0.29
Oryctolagus cuniculus						3						1		12	16	0.26
Mustela nivalis		1		1				1		1		1		10	15	0.24
Capreolus capreolus				2		4								4	10	0.16
Rattus norvegicus				3						1		2		3	9	0.15
Sciurus vulgaris		2		1				1		1				4	9	0.15
Natrix natrix		2												6	8	0.13
Pisces sp.										1		1		6	8	0.13
Rana temporaria		2		4											6	0.10
Corvus corone				3						1		2			6	0.10
Fringilla coelebs		2				3		1							6	0.10
Microtus agrestis		1				1				3		1			6	0.10
Neomys fodiens		2								1		3			6	0.10
Mus cf. *musculus*		1								4					5	0.08
Carduelis carduelis								1		4					5	0.08
Mammalia		**406**		**266**		**215**	**1-**	**105**	**1-**	**735**		**376**		**2248**	**4351**	**70.89**
Aves	**1+**	**101**	**1+**	**48**	**2+**	**72**		**17**		**79**	**1+**	**87**	**2-**	**39**	**443**	**7.22**
Amphibia, Reptilia, Pisces		**41**	**1+**	**70**	**2-**	**2**	**1-**	**6**	**2-**	**26**	**3-**	**5**	**1+**	**264**	**414**	**6.74**
Evertebrata	**1-**	**58**	**4-**	**0**	**1-**	**19**	**1+**	**79**	**1+**	**418**	**1+**	**160**	**1-**	**196**	**930**	**15.15**
∑		606		384		308		207		1258		628		2747	6138	100.00
H' diversity index / index diverzity		2.74		2.38		2.65		2.06		2.07		1.93		1.36	2.31	

1 – own data / vlastné údaje, 2 - Mebs 1964, Germany / Nemecko, 3 - Wuttky 1963, Germany / Nemecko, 4 – Voříšek et al. 1997, south Moravia / južná Morava, 5 – Sládek 1961, Slovakia / Sovensko, 6 – Ševčík 1980, Bohemia / Čechy, 7 – Uttendörfer 1939, Germany / Nemecko

Tab. 5. Comparison of *B.buteo* food composition with diet of *A. gentilis* and *A. pomarina* in Central Slovakia
Tab. 5. Porovnanie potravy *Buteo buteo* s potravou *Accipiter gentilis* a *Aquila pomarina* na strednom Slovensku

Species / Druhy	***Apom***		***Bbut***		***Agen***		**∑**	**%**
Microtus arvalis	1+	394	1-	161	4-	4	559	37.62
Microtus agrestis	1+	40	2-	1	1-	0	41	2.76
Arvicola terrestris	1+	57	2-	7	2-	0	64	4.31
Mustela nivalis	1+	11		1			12	0.81
Rana temporaria	1+	13		2			15	1.01
Talpa europaea	2-	16	1+	113	3-	0	129	8.68
Sorex araneus	1-	0	1+	13			13	0.87
Apodemus flavicollis	1-	9	1+	36		5	50	3.36
Myodes glareolus	3-	0	1+	52	1-	1	53	3.57
Bufo bufo	1-	0	1+	11			11	0.74
Coleoptera sp.	2-	3	1+	45	2-	0	48	3.23
Hymenoptera sp.			1+	8			8	0.54
Columba livia dom.	3-	4	3-	5	2+	94	103	6.93
Garrulus glandarius	2-	1		16	2+	31	48	3.23
Buteo buteo	1-	0		6	1+	8	14	0.94
Phasianus colchicus		1			1+	6	7	0.47
Streptopelia decaocto	1-	0	1-	0	1+	13	13	0.87
Dendrocopos major	1-	0	1-	0	1+	12	12	0.81
Turdus merula		1	1-	0	1+	11	12	0.81
Turdus philomelos	2-	1		17	1+	20	38	2.56
Sciurus vulgaris	1-	0		2	1+	9	11	0.74
Coccothraustes coccothr.	1-	0		8		6	14	0.94
Lepus europaeus		5		4		2	11	0.74
Anguis fragilis		3		8			11	0.74
Sturnus vulgaris		1		7		2	10	0.67
Columba palumbus		2		3		3	8	0.54
Perdix perdix		2				5	7	0.47
Strix aluco				1		5	6	0.40
Columba oenas				1		4	5	0.34
Terricola subterraneus				5			5	0.34
Elaphe longissima				5			5	0.34
Mammalia	**1+**	**541**		**406**	**3-**	**22**	**969**	**65.21**
Aves	**2-**	**34**	**1-**	**101**	**2+**	**260**	**395**	**26.58**
Amphibia, Reptilia		**19**	**1+**	**41**	**2-**	**0**	**60**	**4.04**
Evertebrata	**2-**	**4**	**1+**	**58**	**2-**	**0**	**62**	**4.17**
∑		**598**		**606**		**282**	**1486**	**100.00**
H‘ diversity index / index diverzity		1.55		2.74		2.72	2.81	

Apom – *Aquila pomarina* (Dravecký et al. 2008, central Slovakia / stredné Slovensko), ***Bbut*** – *Buteo buteo* (own data / vlastné údaje), ***Agen*** – *Accipiter gentilis* (Šotnár 2000)

A study of the diet of two similar sized birds of prey; *Accipiter gentilis* (Šotnár 2000) and *Aquila pomarina* (Dravecký et al. 2008) carried out in Upper Nitra region were studied in the Upper Nitra region: compare their diets (Tab. 5). In the Lesser Spotted Eagle (*A. pomarina*) greater proportion of the diet comprises *M. arvalis* and several other non-sylvatic vole species: *M. agrestis* and *Arvicola terrestris.* The most frequently hunted frog species include *Rana temporaria,* whereas *B. buteo* hunts *B. bufo* more frequently. The Goshawk is markedly specialized to hunting birds (92% of the diet), few mammals killed include mainly *Sciurus vulgaris*. Block comparison of species comprising the majority of the diet shown in tab. 5 reveals that the food niches of these 3 larger bird of prey species have a minimal overlap.

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