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On the diet of owls (Strigiformes) in Jordan

Príspevok k potrave sov (Strigiformes) v Jordánsku

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Abstract: Between 2005 and 2015 I undertook eight trips to Jordan during which I collected pellets from seven owl species. In them 14,203 food items were identified. Mammals (Mammalia, 46 species, 37.9% of prey items) formed the most numerous component, invertebrates (Evertebrata) made up 33.4%, birds (Aves, 25.4%) were represented with at least 104 species, reptiles (Reptilia) came to 3.2%, and two species of amphibian were identified (Amphibia, 0.2%). Pharoah eagle owls (*Bubo ascalaphus*) and Byzantine eagle owls (*Bubo bubo interpositus*) primarily hunt larger mammals and birds, although Agamidae and Scorpiones were also represented more frequently among *B. ascalaphus*. Mammals predominated among tawny owls (*Strix aluco wilkonskii*) (Mammalia, 58.9%), mainly the eastern rock mouse (*Apodemus mystacinus*) (24.9%). For wintering long-eared owls *Asio otus otus* the most important food was small birds (Aves, 78.3%), especially house sparrows (*Passer domesticus*), Fringillidae and Sylviidae. For barn owls (*Tyto alba erlangeri*) the principal prey was small mammals (83.1%), mainly mice (*Mus* sp.), Günther's vole (*Microtus guentheri*), grey hamster (*Cricetulus migratorius*) and shrews (Soricidae). Hume's tawny owl (*Strix butleri*) pellets contained mostly invertebrates (58.9%) and lizards, and their most frequent mammal prey were Wagner's gerbil (*Gerbillus dasyurus*) and spiny mice (*Acomys* sp.). There was an even higher propostion of invertebrates (86.4%) among lilith owlets (*Athene lilith*). In addition to the insect orders Coleoptera, Orthoptera and Hymenoptera, remains of Scorpiones and Solifugae were also frequently found. The summarized results from individual owl species are compared with those gathered by the author in the surrounding Middle Eastern countries: Israel, Syria, Lebanon and Egypt.

Abstrakt: Počas 8 ciest do Jordánska medzi rokmi 2005 až 2015 som zbieral vývržky od 7 druhov sov. Určil som 14 203 kusov potravy. Cicavce (Mammalia, 46 druhov, 37,9 % kusov koristi) boli najpočetnejšou zložkou, bezstavovce (Evertebrata) tvorili 33,4 %, vtáky (Aves, 25,4 %) boli zastúpené minimálne 104 druhmi, plazy (Reptilia) tvorili 3,2 % a určené boli aj 2 druhy obojživelníkov (Amphibia, 0,2 %). Výr púšťový (*Bubo ascalaphus*) a výr skalný turecký (*Bubo bubo interpositus*) lovia prevažne väčšie druhy cicavcov a vtákov, ale u *B. ascalaphus* sú početnejšie zastúpené tiež Agamidae a Scorpionida. U sovy obyčajnej (*Strix aluco wilkonskii*) prevažujú cicavce (Mammalia, 58,9 %), dominuje ryšavka *Apodemus mystacinus* (24,9 %). Pre zimujúce myšiarky ušaté (*Asio otus otus*) sú najdôležitejšou potravou vtáky (Aves, 78,3 %), najmä vrabce (*Passer domesticus*), Fringillidae a Sylviidae. U plamienky driemavej (*Tyto alba erlangeri*) boli hlavnou korisťou drobné cicavce (83,1 %), najmä myš (*Mus* sp.), hraboš *Microtus guentheri*, chrček *Cricetulus migratorius* a piskorovité (Soricidae). Vývržky sovy svetlej *Strix butleri* obsahujú hlavne bezstavovce (58,9 %), jašterice, z cicavcov je najčastejšie lovený pieskomil *Gerbillus dasyurus* a bodlinaté myši (*Acomys* sp.). Ešte vyšší podiel bezstavovcov (86,4 %) je u kuvika sýrskeho (*Athene lilith*). Okrem radov hmyzu Coleoptera, Orthoptera a Hymenoptera sa často nachádzajú aj zvyšky od Scorpiones a Solifugida. Sumárne výsledky od jednotlivých druhov sov sú porovnávané z výsledkami autora z okolitých štátov Blízkeho Východu: Izrael, Sýria, Libanon a Egypt.

Key words: diet, Jordan, *Tyto alba*, *Bubo bubo*, *Bubo ascalaphus*, *Asio otus*, *Athene lilith*, *Strix aluco*, *Strix butleri*.

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Introduction

Collection of owl pellets enables the acquisition of relatively well-preserved osteological material, thorough examination of which may improve the faunistic knowledge of a territory under research. Individual owl species apply different hunting strategies, so researching the diets of various species extends our insights into the distribution and density of the species of their prey.

Data published so far refer only to the diet of barn owl (*Tyto alba*) in northern Jordan (Rifai et al. 1998)

and in the Shaumari Nature Reserve (Baker et al. 2005), and the diet of pharaoh eagle owl (*Bubo ascalaphus*) in eastern Jordan (Amr et al. 1997, Rifai et al. 2000). My results to date concern the diets of long-eared owl (*Asio otus*) (Obuch 2011a, Obuch & Tulis 2015), Eurasian eagle owl (*Bubo bubo*) (Obuch 2014) and of several other owl species (Obuch 2017). Initial information about the diet of tawny owl (*Strix aluco*) is presented in the paper Obuch (2011b). Data on bats identified from owl pellets found in Jordan are published in the paper Benda et al. (2011). Some of my unpublished results have been used in the latest survey of rodents in Jordan (Amr et al. 2018). The incidence of mammal remains in owl pellets in Syria has been investigated by Shehab with regard to *B. bubo* (Shehab 2004) and *T. alba* (Shehab 2005, 2006). In Israel the occurrence of mammals in the diets of five owl species has been assessed by Comay & Dayan (2018a). In their reconstruction of the original fauna, Comay & Dayan (2018b) also made use of earlier work by Dor (1947) on the diet of *T. alba* in the Jordan valley.

In the period between 2005 and 2015 I undertook the collection of owl pellets throughout the country of Jordan. The variety of natural conditions is reflected in the adaptations of the diets of seven owl species: *T. alba*, *B. bubo*, *B. ascalaphus*, *A. otus*, Lilith owlet (*Athene lilith*), *S. aluco* and Hume's owl (*Strix butleri*). I compare the summarized data with my own results on the diets of the same species in the surrounding countries.

Material and methods

Collection of owl pellets was carried out predominantly around the locations of their daytime roosts. When searching in rocky landscape I found pellets from *B. bubo*, *T. alba*, *S. aluco*, *S. butleri* and *A. lilith*. Inside old buildings out in the desert there were pellets from *T. alba*, *A. lilith* and *B. ascalaphus*. Below the trees in oases I found pellets from *T. alba*, *A. otus* and *B. ascalaphus*. In coniferous woods, mainly below pines of the species *Pinus halepensis*, there were pellets from *A. otus*. Pellets from *S. aluco* were found only in the wettest wooded part of the Northern Highlands, while pellets from *B. bubo* spread from that range along the upper edge of the rift zone above the Jordan valley, the Dead Sea and Wadi Araba, which is the area most affected by the more humid Mediterranean climate. In the wadis of the dry lower parts of the rift from the Dead Sea down to the Southern Rift and in Wadi Rum I found pellets from *S. butleri*. Pellets from *A. lilith* could be found in every part of the country. I visited certain locations regularly to find out the seasonal changes in prey composition. An overview of collection sites for individual owl species is presented in Appendix 1. The locations of the sites are marked on the map of Jordan in Fig. 1. The collected pellets were processed in Slovakia after my return. The pellets making up individual collections were disintegrated together in a 5% solution of NaOH. Washing in water then produced clean osteological material intermixed with solid invertebrate remains. After drying the material was sorted in order to identify the jaws of mammals, the cranium, humerus, metacarpus and tarsometatarsus of birds, the jaws of reptiles, the os ilium of frogs and the jaws of fish. In the case of invertebrates I sorted either the heads or the jaws and pincers. The number of each species in a particular sample was set as the least possible based on the greatest occurrence of an identified body part. In identifying body parts I started out using my own comparative osteological collections. For bird species I then used the works of Andrews (1995) and Porter et al. (1996), and for mammals I used Harrison & Bates (1991), Mendelssohn & Yon-Tow (1987) and Aulagnier et al. (2009). The names of species and subspecies of owl are based on those given by König et al. (2015). The names of frogs are taken from Holliday (2016). Because of problems with distinguishing all individuals by their jaws, the species of western house mouse (*Mus domesticus*) and Balkan short-tailed mouse (*Mus macedonicus*) are combined under the name *Mus* sp., and those of the eastern spiny mouse (*Acomys dimidiatus*) and golden spiny mouse (*Acomys russatus*) are generalized as *Acomys* sp.

Due to the particular methods of sample processing used, the data on owl diets in the Middle East presented by other researchers are markedly different (they do not use mass processing of samples in NaOH or identify four species of bird bones). As a rule they deal with small samples and restricted numbers of identified species, focusing exclusively on mammal prey. This is why I base my comparisons of results from the surrounding countries on my own collections of pellets, which were acquired and processed using a uniform methodology, and were sufficiently numerous in the first place.

The results are presented in standardized tables with the species set out in the upper part with "plus" values indicating Marked Differences from the Mean/ (MDFM, Obuch 2001). Below the broken line there are more numerous species without marked differences arranged in descending order of incidence. Species occurring in low numbers are listed below some of the tables (Tab. 1, 3–7, Appendices 3, 4 and 6), so that the record of all

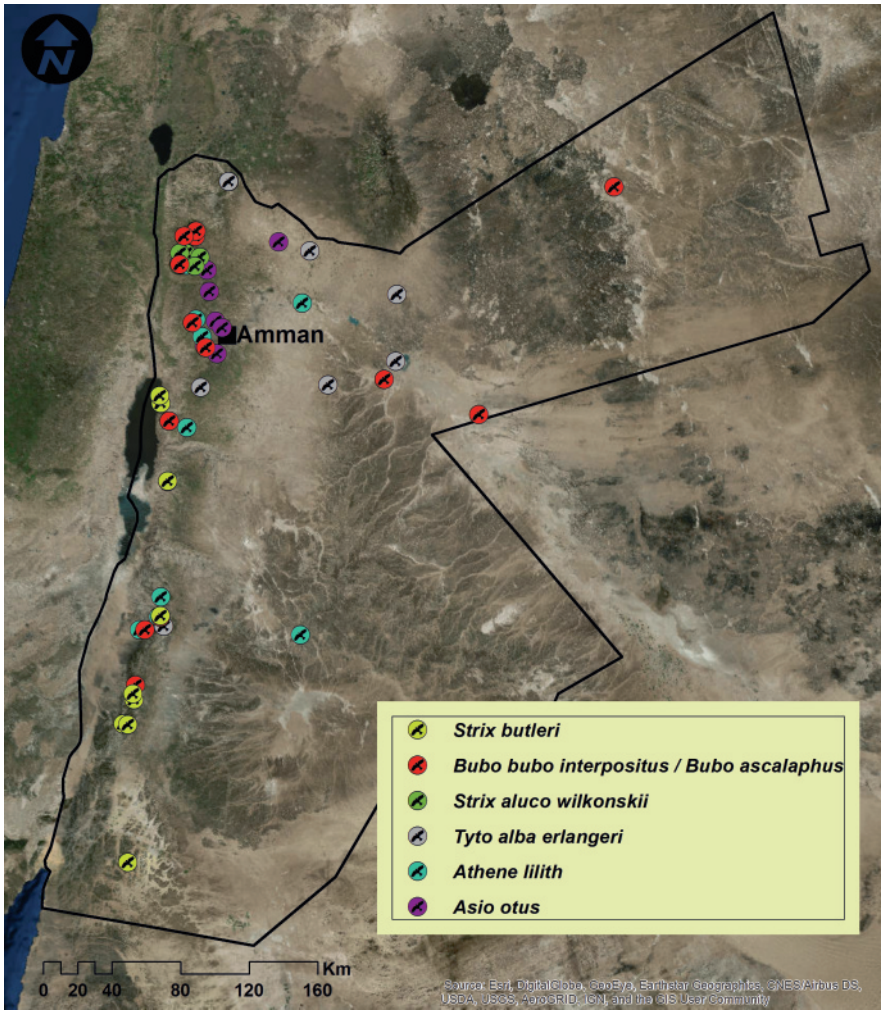


Fig. 1. Locations of owl pellet collections in Jordan.
Obr. 1. Poloha zberov vývržkov sov v Jordánsku.

species identified in the given locations is complete. The other tables (Tab. 2, Appendices 2, 5, 7–15) present quantitative assessments and do not include low-number species. Shannon's index of diversity H' (Shannon & Weaver 1949) is also presented. The MDFM calculations and compilation of standardized tables were done using Zber software (Šipöcz 2004).

Results and discussion

Barn owl (*Tyto alba erlangeri* W. L. Sclater, 1921)

Most of the pellet material from this species was collected just in the vicinity of the Syrian border (locations Wadi Al Sharayat and Um al Jammal). These owls are irregular visitors to the Shaumari Nature Reserve (NR), and in the Dana NR only small numbers of pellets were found in 2008 and 2012. In other localities there was evidence of sporadic, short-term stays by *T. alba*.

In this material the 2800 food items were composed primarily of mammal remains (Mammalia, 21 species, 83.1%). Birds (Aves, at least 46 species, 14.6%) were a supplementary component, while amphibians and reptiles (Amphibia + Reptilia, 1.0%) and invertebrates (Evertebrata, 1.4%) were hunted only sporadically, mainly in arid environments. The most frequent prey among the mammals were mice (*Mus* sp., 31.5%), Tristram's jird (*Meriones tristrami*, 16.8%) and Günther's vole (*Microtus guentheri*, 15.8%), and among the birds it was sparrow (*Passer domesticus*, 8.5%).

Tab. 1. Composition of the diet of the barn owl (*Tyto alba*) in Jordan. Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these sites (see Methods).

Tab. 1. Zloženie potravy plamienky driemavej (*Tyto alba*) z Jordánska. Číselné hodnoty v tabuľke sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov na lokalitách (pozri Metodiku).

no. of locality / číslo lokality	**1**		**8**		**9**		**2**		**6**		**5**		**4**		**3**		**7**		**10**	**Σ**	**%**
taxa / taxón																					
Microtus guentheri	2+	438	2-	0			5-	2			5-	0	4-	0		1	2-	0		441	15.75
Crocidura leucodon	1+	15					1-	0			1-	0		4						19	0.68
Meriones tristrami	1+	259	2+	47				147			5-	0	4-	0		4		14		471	16.82
Nannospalax ehrenbergi		5	1+	8															1	14	0.50
Sylviidae	1-	1	2+	11	1+	8	2-	0				7		4				1		32	1.14
Cricetulus migratorius	1-	26		7			2+	103			4-	0	2-	0		3				139	4.96
Rattus rattus		2					1+	14			1-	0								16	0.57
Streptopelia senegalensis	1-	0		2			1+	13				1		2						18	0.64
Phoenicurus ochruros	1-	0					1+	13				1								14	0.50
Passer hispaniolensis							1+	10												10	0.36
Passer domesticus	2-	19	2-	0			2+	177		2	2-	11		22		5		1		237	8.46
Allactaga euphratica	1-	0		1			1+	11	1+	5	1-	0				1				18	0.64
Jaculus jaculus	2-	0					1-	0	1+	8	1+	13		4						25	0.89
Suncus etruscus	2-	3					2-	2			2+	81		5				1		92	3.29
Meriones libycus	3-	0					2-	0		1	2+	54		5						60	2.14
Mus sp.	2-	76	3-	0			1-	170	1-	0	1+	522	1+	112	1-	1	3-	0		881	31.46
Crocidura suaveolens	1-	1						4			1-	1	2+	15						21	0.75
Gerbillus nanus												3	1+	5						8	0.29
Hirundo rustica												1	1+	8				1		10	0.36
Riparia riparia													1+	7						7	0.25
Pelophylax cf. *bedriagae*													1+	5						5	0.18
Agamidae		1		1				3		1					1+	5				11	0.39
Gerbillus dasyurus	1-	19		1				20				32		12		1	1+	11		96	3.43
Apodemus mystacinus		1		1													1+	6		8	0.29
Lacertidae		1		4				4								1		2		12	0.43
Coleoptera		2						4				2						3	1	12	0.43
Orthoptera		2		1		1						1						4		9	0.32
Meriones crassus										1		4		2						7	0.25
Coturnix coturnix		1		1				3								1		1		7	0.25
Alauda arvensis		4						2												6	0.21
Scorpionida				2								1						1	1	5	0.18
Mammalia, 21 species		**848**		**66**	**2-**	**0**	**1-**	**475**		**15**		**713**		**164**	**1-**	**11**		**33**	**1**	**2326**	**83.07**
Aves, minim. 46 species	**2-**	**43**	**1+**	**21**	**1+**	**9**	**1+**	**235**		**2**	**2-**	**30**	**1+**	**51**	**1+**	**10**		**7**	**0**	**408**	**14.57**
Amphibia, Reptilia	**1-**	**2**		**5**		**0**		**7**		**1**	**1-**	**0**		**5**	**1+**	**6**		**2**	**0**	**28**	**1.00**
Evertebrata	**1-**	**6**		**3**		**2**		**7**		**0**		**6**		**1**		**0**	**2+**	**10**	**3**	**38**	**1.36**
Σ		**899**		**95**		**11**		**724**		**18**		**749**		**221**		**27**		**52**	**4**	**2800**	**100.00**
Diversity Index H'		1.58		1.94		0.89		2.10		1.44		1.22		1.99		2.37		2.30	1.39	2.40	

In the wetter, intensively farmed countryside near Irbid (Wadi Al Sharayat), the principal prey of *T. alba* were voles *M. guentheri* and jirds *M. tristrami*, while the latter was the most numerous diet component in the Dana NR as well. In the ruins of Um al Jammal sparrows *P. domesticus* were frequently hunted in addition to the grey hamster *Cricetulus migratorius*. The Euphrates jerboa (*Allactaga euphratica*) was also found at the Qal al Kharana fort together with the lesser Egyptian jerboa (*Jaculus jaculus*), which also appeared at the Azrak oasis and in the Shaumari NR together with the Libyan jird (*Meriones libycus*). In both Azrak and Shaumari the dominant prey was mice *Mus* sp. In the wetlands of the Azrak NR, *T. alba* also hunted barn swallows (*Hirundo rustica*), sand martins (*Riparia riparia*) and Levant water frogs (*Pelophylax* cf. *bedriagae*) (Tab. 1).

During ten years of research in Jordan I gathered material containing 2800 food items for *T. alba*, but after just three weeks in Israel I had 4302 items, and three expeditions to Syria produced 21,839 items. Part of these results was published in the paper Obuch & Benda (2009). This suggests that the density of this owl's incidence in Jordan is substantially lower than in the above-mentioned neighbouring countries. This is connected with the larger area of desert land in Jordan, into which it penetrates only sporadically (Shaumari, Qal al Kharana), and with the intensively-grazed pasture land, which leads to lower rodent numbers in the country. In Egypt I collected pellets from this owl in the Nile valley, but in more westerly oases and in Sinaj I did not find any. This is connected with its dietary specialization on small mammals and birds, whereas reptiles and invertebrates are no more than supplementary items with an incidence of up to 2%.

The dominant prey species in all three countries compared here is the mouse *Mus* sp. (*Mus domesticus* and *M. macedonicus*, 40.3%), represented most of all in Syria. In Israel and Jordan there is more numerous occurrence of Günther's vole (*M. guentheri*), and in Jordan also of Tristram's jird (*M. tristrami*). Various species from the subfamily Gerbillinae are widespread in Syria and Israel. In Jordan however, birds are more frequently represented, especially Passeriformes and laughing doves (*Streptopelia senegalensis*). In Syria, mainly along the river Euphrates, part of the prey of *T. alba* consisted of bats (Appendix 2).

Byzantine eagle owl (*Bubo bubo interpositus* Rothschild & Harter, 1910) and pharoah eagle owl (*Bubo ascalaphus* Savigny, 1809)

I assume that all samples taken from the desert in eastern Jordan came from pharoah eagle owls (*B. ascalaphus*) (Fig. 2), while the wetter zone of mountains extending from the Northern Highlands down to the Shara Highlands in the south is inhabited by Byzantine eagle owls *B. bubo interpositus* (Andrews 1994).

In the 2117 items of food remains in this material, the most numerous species were mammals (Mammalia, 32 species, 51.9%). Birds (Aves, at least 66 species, 33.9%) were the second most frequently represented. Lower-level vertebrates (Amphibia + Reptilia + Pisces, 5.5%) and invertebrates (Evertebrata, 8.7%) were hunted less frequently. The diet was dominated by medium-sized mammal species: Tristram's jird (*M. tristrami*, 18.7%), brown rat (*Rattus norvegicus*, 4.7%), lesser Egyptian jerboa (*J. jaculus*, 6.6%) and white-breasted hedgehog (*Erinaceus concolor*, 2.8%) as well

Tab. 1. Continuation.
Tab. 1. Pokračovanie.
Locality / lokalita: 1 – Al Sharayat, wadi, 27.5.2009, 8 – Dana, Wadi Al Barra, 8.4.2008, 9 – Rajif, Wadi Suweid, 22.10.2008, 2 – Um al Jammal, 28.5.2009 + 5.10.2010 + 29.10.2013, 6 – Qal al Kharana, 12.10.2008 + 2.4.2008, 5 – Shaumari, 20.9.2005 + 25.4.2006 + 13.10.2008 + 6.10.2010 + 29.10.2013, 4 – Azrak, 29.5.2009 + 6.10.2010 + 26.10.2013, 3 – Lava Tube, Al Bishriya, 5.10.2010, 7 – Dana, caves, 7.4.2008 + 22.11.2012, 10 – Madaba, 21.9.2005.
Other species (locality–number) / ostatné druhy (lokalita–počet):
Hemiechinus auritus (1–2), *Lepus capensis* (2–1), *Eliomys melanurus* (8–1), *Acomys* cf. *dimidiatus* (2–1), *Acomys* cf. *russatus* (7–1), *Gerbillus henleyi* (1–1; 5–3), *Falco naumanni* (2–1), *Alectoris chukar* (2–1), *Porzana pusilla* (1–1), *Crex crex* (8–1), Pteroclidae (2–1), *Columba livia* (1–1; 2–1; 3–1), *Streptopelia decaocto* (4–1), *Streptopelia turtur* (5–1), *Oena capensis* (2–1), *Tyto alba* (1–2), *Athene noctua* (1–1; 3–1), *Galerida cristata* (8–2; 2–1), *Melanocorypha calandra* (1–2), *Ammomanes deserti* (3–1), Alaudidae (1–1; 8–2; 2–5; 5–1; 7–1), *Ptyonoprogne rupestris* (1–1; 2–1), *Motacilla alba* (4–3), *Motacilla flava* (4–1), *Pycnonotus xanthopygos* (2–1), *Pycnonotus leucogenys* (4–1), *Lanius* sp. (1–1; 5–1; 3–1), Muscicapidae (9–1), *Monticola* sp. (1–1), *Oenanthe* sp. (1–2), *Phoenicurus phoenicurus* (7–1), *Luscinia* sp. (5–4), *Turdus merula* (8–1), *Nectarinia osea* (5–2), *Emberiza* sp. (2–1), *Carduelis carduelis* (1–1), *Carduelis cannabina* (1–1), *Carduelis chloris* (1–1), *Carpodacus syonicus* (7–1), Fringillidae (8–1), *Sturnus vulgaris* (2–1), *Sturnus roseus* (2–1), *Garrulus glandarius* (2–1), Passeriformes (1–2; 4–2), Hymenoptera (9–1; 2–1; 4–1; 10–1), *Gryllotalpa* sp. (2–2), Odonata (1–1), Decapoda (1–1), Solifugida (5–2; 7–2).

Tab. 2. Similarity in the representation of diagnostic species in pellet samples from pharaoh eagle owl (*Bubo ascalaphus*) and Eurasian eagle owl (*Bubo bubo*) in Jordan. Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these samples (see Methods).

Tab. 2. Podobnosť v zastúpení diagnostických druhov vo vzorkách potravy výra púšťového (*Bubo ascalaphus*) a výra skalného (*Bubo bubo*) Jordánsku. Číselné hodnoty v tabuľke sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov vo vzorkách (pozri Metodiku).

sample / vzorka	**7**		**4**		**8**		**5**		**6**		**9**		**2**		**3**		**1**		**Σ**	**%**
taxa / taxón																				
Apodemus mystacinus	1+	6		1		1				2		3							13	0.61
Pica pica	1+	5		4															9	0.43
Garrulus glandarius	2+	30	1+	62		4			2-	0	2-	0			3-	0	1-	0	96	4.53
Rattus norvegicus	1+	18	1+	67	1+	14		1	2-	0	2-	0			3-	0	1-	0	100	4.72
Erinaceus concolor	1+	15	1+	37		7			1-	0	1-	0			2-	0			59	2.79
Hemiechinus auritus		1	1+	15						1					1-	0		1	18	0.85
Nannospalax ehrenbergi		4	1+	30		4				6		3			2-	0			47	2.22
Falco tinnunculus			1+	8		1		1		1									11	0.52
Turdus merula		4	1+	8		1													13	0.61
Coturnix coturnix			1+	17						1	1+	11		1	1-	3		3	36	1.70
Columba livia		6	2+	70	1+	16	1+	8	2-	2	2-	0	1-	0	3-	0	1-	0	102	4.82
Bufotes variabilis					2+	12													12	0.57
Pelophylax cf. *bedriagae*					1+	5													5	0.24
Decapoda					2+	10													10	0.47
Scorpionida		3	3-	1	1+	13				9	1-	2		6	1+	61	1-	0	95	4.49
Acomys cf. *russatus*			1-	0			2+	9		3		4							16	0.76
Cricetulus migratorius				6					1+	13		5			1-	0			24	1.13
Meriones tristrami	2-	6	1-	62	2-	1	1-	3	2+	170	2+	153	2-	0	5-	0	3-	0	395	18.66
Eliomys melanurus				1						1	1+	10						1	13	0.61
Luscinia sp.		2		9						1	1+	11			1-	1		1	25	1.18
Fringilla coelebs				1							1+	5							6	0.28
Gerbillus dasyurus			1-	4				3		5	1+	15	2+	21		13			61	2.88
Coleoptera		1	1-	0						1		1	1+	6		7			16	0.76
Jaculus jaculus	2-	0	4-	0	1-	0			3-	0	3-	0	1+	12	2+	122		6	140	6.61
Sylviidae		3		20	1-	0				21		14	1+	10	1+	38	1-	0	106	5.1
Mus sp.			2-	2						5	1-	0			2+	46			53	2.50
Meriones crassus	1-	0	3-	0					2-	0	2-	0		4	2+	71	1-	0	75	3.54
Streptopelia turtur			2-	1					1-	0	1-	0			2+	39		4	44	2.8
Orthoptera			1-	1		2		2		5				2	1+	12			24	1.13
Solifugida			1-	3				1		3	1-	0		5	1+	25			37	1.75
Meriones libycus			1-	0										3	1+	14	1+	9	26	1.23
Lacertidae			1-	2				1	1-	0		1		4	1+	16	1+	7	31	1.46
Agamidae		1	1-	5		1			1-	3	2-	0			3-	0	3+	57	67	3.16
Allactaga euphratica																	1+	5	5	0.24
Alectoris chukar		4		6		2		2		6					1-	0			20	0.94
Passer domesticus				8		1		1				1		5		6			22	1.4
Crex crex				9		1				1		6				2		1	20	0.94

Tab. 2. Continuation.
Tab. 2. Pokračovanie.

sample / vzorka	**7**		**4**		**8**		**5**		**6**		**9**		**2**		**3**		**1**		**Σ**	**%**
taxa / taxón																				
Streptopelia senegalensis	2		4		1		3		1		4				2				17	0.80
Ammoperdix heyi			6				2										4		12	0.57
Lepus capensis			3		2				1		5						1		12	0.57
Athene lilith	2		4		2		3										1		12	0.57
Merops apiaster			5												5				10	0.47
Mammalia, 32 species	**55**		**236**		**1-**	**32**	**1-**	**18**	**1+**	**212**	**1+**	**198**		**45**		**275**	**1-**	**27**	**1098**	**51.87**
Aves, minim. 66 species	**1+**	**67**	**1+**	**288**		**32**	**1+**	**31**	**1-**	**51**	**1-**	**72**	**1-**	**16**	**1-**	**131**	**1-**	**29**	**717**	**33.87**
Amphibia, Reptilia, Pisces	**1-**	**1**		**2.7**	**1+**	**19**		**1**	**2-**	**3**	**2-**	**1**		**4**	**1-**	**17**	**3+**	**64**	**117**	**5.53**
Evertebrata	**1-**	**5**		**3.5**	**1+**	**25**		**3**		**19**	**2-**	**3**	**1+**	**19**	**1+**	**106**	**2-**	**0**	**185**	**8.74**
Σ		**128**		**536**		**108**		**53**		**285**		**274**		**84**		**529**		**120**	**2117**	**100.00**
Diversity Index H'		2.78		3.16		2.76		2.88		1.93		2.00		2.34		2.66		2.23	3.57	

Sample / vzorka: 7 – Ajun reserve + Rasoun + Wadi el Haraniya + Wadi Yabis, 4 – Marj al – Hammam, 8 – Fuhays, 5 –Wadi Ibn Hammad + Wadi al Asal + Mukavir, 6 – Dana, camp, 9 – Petra, Al Baida + Wadi Chuweir, 2 – Hazim, 3 – Shaumari, 1 – Burqu.

as birds: rock pigeon (*Columba livia*, 4.8%) and Eurasian jay (*Garrulus glandarius*, 4.5%), reptiles Agamidae (3.2%) and invertebrates Scorpiones (4.5%) (Tab. 2).

In the wetter north-western part of Jordan, which is partially forested (four localities around the town of Ajun), and in the environs of Amman (Appendix 3), birds were more frequently represented than mammals. There was one exceptional sample from a valley with running water below Fuhays, where *B. bubo* also hunted frogs and crabs. In the valley below Marj al Hammam in 2006 there was more numerous occurrence of the brown rat (*R. norvegicus*), while in 2008 it was Tristram's jird (*M. tristrami*) and the common quail (*Coturnix coturnix*), in 2010 it was several species of songbird, in 2012 the Palestine mole-rat (*Nannospalax ehrenbergi*) and in 2013 the rock pigeon (*C. livia*).

In samples from locations south of Amman (Appendix 4), *M. tristrami* was clearly predominant (53.4%), mainly in the Dana NR and in Al Baida. In smaller samples from Wadi Ibn Hammad *C. livia* was more numerous.

In the wetter parts of Israel I found three smaller samples, and in Syria the majority of pellets were collected from the Palmyra oasis. My conclusion from comparison of the diet spectra of *B. bubo* in these three countries is that marked differences exist in the predominance of particular species of mammals and birds. Lower vertebrates and invertebrates form a component of low significance (around 5%) (Appendix 4). Similar presence of classes of vertebrates and invertebrates is noted by Amr et al. (2016a) in Palestine and by Shehab

J Obuch

Fig. 2. Pharoah eagle owl in a eucalyptus in the Shaumari Natural Reserve.
Obr. 2. Výr púšťový na eukalypte v rezervácii Shaumari.

(2004) in central Syria. Based on the number of finds and the limited occurrence of rocky landscape, I further conclude that the density of habitation of *B. bubo* in Syria was lower than in Jordan and in Israel (Appendix 5).

The diet composition of *B. ascalaphus* in the eastern part of Jordan was quite different (Appendix 6): dominant among the mammals were *J. jaculus* (19.1%), *Meriones crassus* (10.2%) and *M. libycus* (3.6%), among the birds it was the turtle dove *Streptopelia turtur* (5.9%), the reptiles Agamidae (7.8%) and the invertebrates Scorpiones (9.1%) and Solifugae (4.1%). A sample from the Burqu fort was dominated by Agamidae, and *A. euphratica* was quite numerous.

Collections of *B. ascalaphus* in Egypt came from the western oases and from the Nile valley. Compared with the samples from eastern Jordan, they contained more invertebrate prey, mainly Solifugida, Orthoptera and Hymenoptera. In Jordan there were more reptiles from the Agamidae family and more birds, especially *S. turtur* and Sylviidae. Mammals were represented in a similar proportion (46.4%), but with a different composition of species (Appendix 7). Similar proportions in the incidence of classes of vertebrates and invertebrates in the *B. ascalaphus* diet were found in Morocco by Thevenot (2006).

Long-eared owl (*Asio otus otus* Linnaeus, 1758)

I assume that these are samples of the diet of *A. otus*, which is present in Jordan outside of the nesting period (Andrews 1994). We saw long-eared owls already residing in the localities of our October collections.

The 2493 items in the pellet material from *A. otus* in Jordan included a majority of bird parts (Aves, at least 48 species, 78.3%). Mammals (13 species, 19.9%) were found to be more numerous in the pellets of long-eared owls wintering outside of the towns. They also hunted lizards (Lacertidae, 1.1%), but only locally and invertebrates only sporadically (Evertebrata, 0.6%). Among the birds sparrows were dominant (*P. domesticus*, 40.1%), and songbirds were frequently hunted from the families Sylviidae (13.9%) and Fringillidae (11.1%). Among the mammals the most numerous species were mice *(Mus* sp., 8.5%), the jird (*M. tristrami*, 4.0%) and the vole (*M. guentheri*, 3.2%) (Tab. 3).

Birds made up the principal diet component for *A. otus* in the centre of Amman especially (Appendix 8). In certain pellets collected in the grounds of Jordan University they were represented almost 100% (in 2009, 2010 and 2012). Among the mammals the more numerous species were mice (*Mus* sp.) (in 2008) and the jird (*M. tristrami*) (in 2015). In the outskirts of Amman (Appendix 9) mammals were represented in greater numbers in pellets collected in the Amman National Park in 2015, especially species of mice (*Mus* sp.), the jird (*M. tristrami*), the vole (*M. guentheri*) and the rat (*R. norvegicus*). In the locality of Wasfi Tal the gerbil (*Gerbillus dasyurus)* was more dominant, while in two samples from Mafraq in northern Jordan the grey hamster (*C. migratorius*) was abundant alongside the predominant sparrow (*P. domesticus*).

The dominance of birds in owl diets is higher in Jordan than in the surrounding countries mainly due to the samples from Amman, where in some years they made up nearly 100% of the prey. Similar composition of the *A. otus* diet from the nesting period, dominated by *P. domesticus*, was found by Göçer (2016) in the town of Denizli in SW Turkey. The Syrian samples came mostly from the Palmyra oasis, where the predominant mammals were mice (*Mus* sp.), while Lacertidae were represented in larger numbers and *Gryllotalpa* among the invertebrates. Samples from Israel came from the edge of the Jut desert, where several species from the subfamily Gerbillinae were found to be numerous, as well as birds from the family Sylviidae (Appendix 10).

Lilith owlet (*Athene lilith*, Harter, 1913)

A. lilith is uniformly widespread throughout Jordan (Andrews 1994). It has stable territories in agriculturally exploited areas, while in the deserts in the east of the country it takes a nomadic approach to feeding.

The 3573 prey items in our *A. lilith* pellet material comprised a great majority of invertebrates (Evertebrata, 86.4%), while mammals (19 species, 6.3%) and birds (Aves, at least 38 species, 4.6%) were found in lower numbers, but in terms of biomass volume they formed a significant component of the diet. Lizards were also of some importance as food (Lacertidae, 2.2%). Among the invertebrates the most numerous were Coleoptera (30.3%), Orthoptera (19.1%), Scorpiones (7.8%) and Solifugae (5.1%).

The proportional representation of taxonomic groups of invertebrates differed among the individual localities. Orthoptera were more numerous in the environs of Amman (Wadi Seer, Fuhays), at Sela and in Wadi Hidan, while Hymenoptera dominated in the eastern desert (Qal

Tab. 3. Comparison of the diet of the long-eared owl (*Asio otus*) in five parts of Jordan. Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these samples (see Methods).
Tab. 3. Porovnanie potravy myšiarky ušatej (*Asio otus*) z 5 častí Jordánska. Číselné hodnoty v tabuľke sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov vo vzorkách (pozri Metodiku).

sample / vzorka	**5**		**4**		**3**		**2**		**1**		**Σ**	**%**
taxa / taxón												
Motacilla alba	1+	11	1-	0							11	0.44
Carduelis cannabina	1+	48		40		11	2-	2			101	4.5
Emberiza sp.	1+	34	1-	5			1-	0			39	1.56
Mus sp.	1-	49	1+	132	1-	6	1-	17	1+	7	211	8.46
Rattus norvegicus		2	1+	19							21	0.84
Meriones tristrami	1-	20	1+	68		2		10			100	4.1
Microtus guentheri	3-	1	1+	78		1	2-	0			80	3.21
Phylloscopus sp.	1-	2	1+	18				2			22	0.88
Gerbillus dasyurus	2-	0	2-	2	3+	28		7			37	1.48
Lacertidae	1-	2	2-	0	3+	25		1			28	1.12
Carduelis chloris		30		39	1+	13		8			90	3.61
Passer domesticus		313		435	1-	33	1+	218	1-	0	999	40.07
Passer hispaniolensis	1-	0		13			1+	8			21	0.84
Cricetulus migratorius	1-	0	2-	1			2+	25			26	1.4
Sylvia sp.		108		194	1-	8	2-	10		1	321	12.88
Fringilla coelebs		29		43	1-	0	2-	0			72	2.89
Lanius sp.		11		20			1-	0			31	1.24
Streptopelia senegalensis		13		18		2		3			36	1.44
Pycnonotus xanthopygos		8		17		1		3			29	1.16
Turdus merula		5		12		1		1			19	0.76
Galerida cristata		6		5				4			15	0.60
Luscinia sp.		4		6							10	0.40
Turdus philomelos		5		3		2					10	0.40
Oenanthe sp.		1		2				5			8	0.32
Mammalia, 13 species	**1-**	**72**	**1+**	**314**	**1+**	**42**		**60**	**1+**	**9**	**497**	**19.94**
Aves, minim. 48 species		**663**		**940**	**1-**	**75**		**274**	**1-**	**1**	**1953**	**78.34**
Reptilia	**1-**	**2**	**2-**	**0**	**3+**	**25**		**1**		**0**	**28**	**1.12**
Evertebrata		**6**		**4**		**2**		**3**		**0**	**15**	**0.60**
Σ		**743**		**1258**		**144**		**338**		**10**	**2493**	**100.00**
Diversity Index H'		2.26		2.48		2.27		1.61		0.94	2.50	

Sample / vzorka: 5 – Amman, Jordan University + Sport City, 4 – Amman National Parc + Mar j al – Hammam, 3 – Wasfi Tal + Dibin, 2 – Mafraq, American Hospital, 5.10.2010 + 29.10.2013, 1 – Shaumari, 13.10.2008
Other species (sample–number) / ostatné druhy (vzorka–počet):
Crocidura suaveolens (4–1), *Rhinolophus hipposideros* (4–1), *Pipistrellus kuhlii* (4–1), *Acomys dimidiatus* (4–1; 3–4), *Meriones crassus* (1–1), *Coturnix coturnix* (4–2; 2–1), *Streptopelia decaocto* (4–1), *Streptopelia turtur* (4–3; 2–1), *Melopsittacus undulatus* (5–1), *Upupa epops* (5–1; 4–2; 2–2), *Alauda arvensis* (4–4), Alaudidae (5–1; 4–2), *Hirundo rustica* (5–2; 4–1), *Delichon urbica* (5–1; 2–1), *Riparia riparia* (5–2; 4–1; 2–2), *Ptyonoprogne rupestris* (4–3), *Motacilla flava* (5–3), *Acrocephalus stentoreus* (5–1; 4–3), *Regulus regulus* (5–2), *Muscicapa striata* (4–4), *Saxicola torquata* (4–5), *Monticola* sp. (5–1), *Cercotrichas galactotes* (2–1), *Turdus viscivorus* (4–1; 3–1), *Parus major* (5–1; 4–3), *Nectarinia osea* (4–1), *Emberiza cia* (4–1), *Coccothraustes coccothraustes* (5–1; 4–1), *Petronia petronia* (2–1), *Sturnus vulgaris* (2–1), *Sturnus roseus* (4–2), Passeriformes (5–2; 4–2; 3–3), Coleoptera (5–2; 3–1; 2–1), Orthoptera (5–1; 4–2), Solifugida (5–1).

ak Kharana, the desert road and in Wadi Araba (Wadi Chuweir)), Coleoptera in the north-east (Qasr al Hallabad) and in the Dana NR, Scorpiones at the Mukavir fort, and Solifugae in Wadi al Sharayat in the north-west. Among the mammals the most frequently hunted were the jird (*M. tristrami*) in the Dana NR and species from the *Acomys* genera in three locations (Tab. 4, 5).

At the time of publication of the paper Obuch & Krištín (2004), the separate species *A. lilith* was not recognized in the Middle East. The common feature of the diet for all the *Athene* genera in arid areas is the great

Tab. 4. Diet of the Lilith owlet (*Athene lilith*) in the northern part of Jordan. Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these sites (see Methods).
Tab. 4. Potrava kuvika sýrskeho (*Athene lilith*) v severnej časti Jordánska. Číselné hodnoty v tabuľke sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov na lokalitách (pozri Metodiku).

no. of locality / číslo lokality	**2**		**3**		**4**		**5**		**8**		**6**		**7**		**1**	**Σ**	**%**
taxa / taxón																	
Acomys sp.	2+	15											1-	0		15	0.94
Solifugida			1+	7		5		11	1-	0				14		37	2.32
Passer domesticus		1		2	2+	16		1				1	1-	3		24	1.50
Coleoptera	1-	0		14	1+	86	1-	52		51	1-	3	1-	107	14	327	20.50
Allactaga euphratica						3	1+	7					1-	0		10	0.63
Jaculus jaculus							1+	6								6	0.38
Lacertida		1				4	1+	19		3		2	1-	4	2	35	2.19
Hymenoptera	1-	2	1-	6	2-	17	1+	131	1+	134	1-	4		166	2- 0	460	28.84
Orthoptera	2-	1	1-	4	1-	31	1-	72	4-	2	1+	46	1+	375	16	547	34.29
Gerbillus dasyurus		4		1		1		1					1-	0	3	10	0.63
Sylviidae				1		3		5		4			1-	0	1	14	0.88
Scorpionida				2		5		4						5	2	18	1.13
Agamidae				1				6		1				1		9	0.56
Meriones libycus						2		6								8	0.50
Mus sp.				1		2		1						3		7	0.44
Meriones crassus						2		4								6	0.38
Mammalia, 14 species	**2+**	**22**		**3**		**12**	**1+**	**29**	**2-**	**0**		**1**	**2-**	**7**	**4**	**78**	**4.89**
Aves, minim. 25 species		**5**		**4**	**2+**	**34**		**17**		**6**		**2**	**2-**	**10**	**3**	**81**	**5.8**
Amphibia, Reptilia		**1**		**2**		**4**	**1+**	**25**		**4**		**2**	**1-**	**5**	**2**	**45**	**2.82**
Evertebrata	**2-**	**3**		**34**		**144**		**270**		**187**		**53**		**668**	**32**	**1391**	**87.21**
Σ		**31**		**43**		**194**		**341**		**197**		**58**		**690**	**41**	**1595**	**100.00**
Diversity Index H'		1.75		2.14		2.7		2.00		0.88		0.85		1.27	1.58	1.86	

Locality / lokalita: 2 – Ballas, 2.11.2013, 3 – Wadi Al Sharayat, 27.5.2009, 4 – Qasr al Hallabad, 20.9.2005 + 13.10.2008, 5 – Qal Al Kharana, 21.9.2005 + 25.4.2006 + 2.4.2008 + 12.10.2008, 8 – desert highway, 26.10.2013, 160 km from Azrak, 6 – Fuhays, 3.10.2010, 7 – Wadi Seer, 28.4.2006 + 3.4.2008 + 10.5.2009 + 19.10.2013, 1 – Wadi Haraniya 2.11.2013.
Other species (locality–number) / ostatné druhy (lokalita–počet):
Pipistrellus kuhlii (5–2), *Otonycteris hemprichi* (5–2), *Apodemus mystacinus* (2–3; 7–1), *Rattus rattus* (4–1), *Cricetulus migratorius* (4–1; 1–1), *Meriones tristrami* (3–1; 6–1; 7–2), *Microtus guentheri* (7–1), *Falco tinnunculus* (4–1), *Coturnix coturnix* (4–2; 5–2), *Streptopelia senegalensis* (7–1), *Upupa epops* (4–1), *Galerida cristata* (6–1), Alaudidae (4–2; 5–1), *Hirundo rustica* (1–1), *Ptyonoprogne rupestris* (2–1), *Motacilla alba* (1–1), *Lanius* sp. (4–1; 5–1), *Oenanthe pleshanka* (7–1), *Oenanthe* sp. (4–1; 5–1; 7–1), *Phoenicurus* sp. (5–1), *Luscinia* sp. (5–1), *Turdus merula* (7–1), *Turdus philomelos* (7–2), *Parus major* (2–1), *Sitta neumayer* (4–1), *Emberiza* sp. (5–1; 8–1), *Carduelis carduelis* (4–1), *Passer hispaniolensis* (4–3), *Petronia petronia* (8–1), *Garrulus glandarius* (3–1), Passeriformes (2–2; 4–1; 5–3; 7–1), Aves sp. juv. (4–1), *Bufotes variabilis* (3–1), Odonata (3–1; 7–1).

predominance of invertebrates (Evertebrata, around 80%). Data from Jordan do not differ in terms of the overall predominance of invertebrates, but more Scorpiones and the like are represented here, while in Egypt there are more Orthoptera. Among the mammals *Acomys* sp. and the gerbil (*G. dasyurus*) are more numerous, and Sylviidae among the birds. In Egypt and Syria Coleoptera are well-represented, and Hymenoptera too in Syria. The dominant reptile species are from the family of Lacertidae (2.6%) (Appendix 11).

Tawny owl (*Strix aluco wilkonskii*, Menzbier, 1896)
The 1230 items of *S. aluco* diet material were made up predominantly of mammal parts (Mammalia, 19 species, 58.9%). Birds (Aves, at least 38 species, 15.9%) were a supplementary food component for tawny owls in Jordan. The more numerous representatives of the lower vertebrates were lizards from the Lacertidae family (4.7%), and among the invertebrates (Evertebrata, 19.4%) the most abundant were Coleoptera (9.6%), Orthoptera (5.3%) and Solifugae (3.3%). The predominant mammal species was the eastern rock mouse

Tab. 5. Diet of the Lilith owlet (*Athene lilith*) in the southern part of Jordan. Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these sites (see Methods).
Tab. 5. Potrava kuvika sýrskeho (*Athene lilith*) v južnej časti Jordánska. Číselné hodnoty v tabuľke sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov na lokalitách (pozri Metodiku).

no. of locality / číslo lokality	**5**		**1**		**6**		**2**		**3**		**4**		**Σ**	**%**
taxa / taxón														
Meriones tristrami	1+	22	2-	1				1				12	36	1.82
Scorpionida	1+	98	1+	116		16	1-	3	1-	0	2-	29	262	13.25
Acomys sp.	2-	0	1+	34	1+	8		2			2-	0	44	2.22
Passer domesticus		1		1	1+	7		2				2	13	0.66
Orthoptera		40	1-	18	1+	1 9	1+	12				47	136	6.88
Hymenoptera		112		119		24	1+	24	1+	27	1-	78	384	19.41
Sylviidae		1		5		2			1+	6		7	21	1.6
Coleoptera	1-	125		244	2-	14	2-	5	1-	6	1+	363	757	38.27
Gerbillus dasyurus		15	1-	8		4		1				18	46	2.33
Solifugida		40		56	1-	1		3		2		43	145	7.33
Lacertidae		6		14		4		3				18	45	2.28
Diptera				3								6	9	0.46
Suncus etruscus		1										4	5	0.25
Apodemus mystacinus		2										3	5	0.25
Agamidae		1				1		1		1		1	5	0.25
Mammalia, 11 species		**40**		**48**	**1+**	**16**		**4**		**0**		**38**	**146**	**7.38**
Aves, minim. 28 species	**1-**	**6**		**26**	**2+**	**20**		**4**	**1+**	**8**		**20**	**84**	**4.25**
Amphibia,Reptilia		**7**		**14**		**5**		**4**		**2**		**19**	**51**	**2.58**
Evertebrata		**415**		**560**	**1-**	**74**		**47**		**35**		**566**	**1697**	**85.79**
Σ		**468**		**648**		**115**		**59**		**45**		**643**	**1978**	**100.00**
Diversity Index H'		1.88		1.94		2.49		1.93		1.29		1.66	2.4	

Locality / lokalita: 5 – Dana, caves, 19.10.2008 + 11.10.2010 + 21.10.2013, 1 – Mukavir, 21.9.2005 + 21.5.2009 + 19.11.2012 + 17.10.2013, 6 – Sela, 22.10.2013, 2 – Wadi Hidan 17.10.2013, 3 – Wadi Chuweir, 15.5.2009, 4 – Dana, camp, 8.4.2008 + 19.10.2008 + 19.5.2009 + 11.10.2010 + 22.11.2012 + 22.10.2013.
Other species (locality–number) / ostatné druhy (lokalita–počet):
Aselia tridens (1–3), *Plecotus christii* (6–1), *Otonycteris hemprichi* (4–1), *Nannospalax ehrenbergi* (6–1), *Mus* sp. (1–2; 6–1), *Cricetulus migratorius* (6–1), *Ammoperdix heyi* (4–1), *Coturnix coturnix* (5–1; 1–1; 6–1), *Columba livia* (1–1), *Streptopelia senegalensis* (5–1; 6–1), *Athene noctua* (4–1), *Apus affinis* (1–1), *Upupa epops* (1–1; 6–1), *Alauda arvensis* (1–1), *Galerida cristata* (1–2), Alaudidae (4–1), *Delichon urbica* (6–1), *Ptyonoprogne fuligula* (1–1), *Anthus* sp. (4–1), *Pycnonotus xanthopygos* (4–2), *Lanius* sp. (1–1; 6–1; 4–1), *Monticola* sp. (1–1), *Oenanthe* sp. (1–2; 6–1; 4–1), *Phoenicurus phoenicurus* (2–1), *Luscinia* sp. (1–1), *Cercotrichas galactotes* (1–1), *Turdus philomelos* (6–1; 4–1), *Emberiza* sp. (1–1; 4–1), *Carduelis carduelis* (1–1), *Carpodacus syonicus* (3–2), *Petronia petronia* (5–1; 1–1; 2–1), *Sturnus vulgaris* (6–1), Passeriformes (1–3; 6–3; 4–1), Aves (5–1), *Pelophylax* cf. *bedriagae* (3–1), Heteroptera (1–3), Diplopoda (1–1).

(*Apodemus mystacinus*) (24.9%), especially in the Saqeb locality (Tab. 6).

Data from the first two pellet collections at the Iraq al Wahaj cave in 2008 and 2009 have been published (Obuch 2011b). In 2012 the roosting-place of another owl was found in rocks 500 metres away from that cave, and in 2013 and 2015 smaller numbers of pellets were found at another five locations.

In the rocks around Iraq al Wahaj the species *G. dasyurus*, *Mus* sp. and yellow-necked mouse (*Apodemus flavicollis*) were present in larger numbers, but inside the Iraq al Wahaj cave itself the tawny owl frequently hunted the young of the Egyptian fruit bat (*Rousettus aegyptiacus*). The greatest number of these was found in the first collection in 2008. In 2010 shepherds burned the remains left in the cave after it was used as a sheepfold, and the colony of *R. aegyptiacus* was drastically reduced. In 2012 a dead tawny owl was found in the cave, but in 2015 the number of *S. aluco* pellets increased again (Appendix 12).

Our work on the diet of *S. aluco* (Obuch 2011b) mentioned only two pellet collections within Jordan, both at the Iraq al Wahaj cave. Later this material was supplemented with more pellets from other locations,

Tab. 6. Comparison of the diet of the tawny owl (*Strix aluco*) in eight localities in north-west Jordan. Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these sites (see Methods).
Tab. 6. Porovnanie potravy sovy obyčajnej (*Strix aluco*) na 8 lokalitách SZ Jordánska. Číselné hodnoty v tabuľke sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov na lokalitách (pozri Metodiku).

no. of locality / číslo lokality	**1**		**2**		**3**		**4**		**5**	**6**	**7**	**8**	**Σ**	**%**
taxa / taxón														
Rousettus aegyptiacus	1+	36	2-	0	1-	0							36	2.93
Passer domesticus	1+	22		4		2						1	29	2.36
Sylviidae	1+	26		10	1-	0					1		37	3.1
Coleoptera	1+	92	1-	17	2-	2	1-	0	2		2	3	118	9.59
Mus sp.		49	1+	33	2-	0			1	3	2	4	92	7.48
Gerbillus dasyurus		31	1+	37	2-	0		2	1			1	72	5.85
Apodemus flavicollis	2-	9	1+	24	1+	26				1	3		63	5.12
Apodemus mystacinus	1-	77		82	1+	122	1-	4	4	3	7	7	306	24.88
Meriones tristrami		11	1-	1	1+	16			1		1	4	34	2.76
Microtus guentheri	1-	0			1+	10					2		12	0.98
Cricetulus migratorius	1-	0			1+	9					1		10	0.81
Solifugida		22	1-	3	1-	0	2+	14	1				40	3.25
Acomys cf. *dimidiatus*		14		10	1-	0		2	1			1	28	2.28
Lacertidae		35		16	2-	0		3	1		2	1	58	4.72
Orthoptera		34		23	2-	0		5	1	1	1		65	5.28
Nannospalax ehrenbergi		13		6		3							22	1.79
Turdus merula		12		2		2					1		17	1.38
Crocidura suaveolens		5		5		4				1	1		16	1.30
Turdus philomelos		8		1		2		1					12	0.98
Fringilla coelebs		7		1				2					10	0.81
Rattus norvegicus		3		6									9	0.73
Rattus rattus		9											9	0.73
Agamidae		5		2		1				1			9	0.73
Luscinia sp.		7						1					8	0.65
Apodemus witherbyi				4		3							7	0.57
Streptopelia senegalensis		5		1									6	0.49
Phoenicurus phoenicurus		2		4									6	0.49
Carduelis chloris		5		1									6	0.49
Garrulus glandarius		4		2									6	0.49
Hymenoptera		3		1				1				1	6	0.49
Pycnonotus xanthopygos		5											5	0.41
Pelophylax cf. *bedriagae*		3		1								1	5	0.41
Mammalia, 19 species	**1-**	**261**		**210**	**1+**	**194**	**1-**	**9**	**8**	**8**	**17**	**17**	**724**	**58.86**
Aves, minim. 38 species	**1+**	**140**	**1-**	**34**	**2-**	**8**		**10**	**1**	**0**	**2**	**1**	**196**	**15.93**
Amphibia, Reptilia		**43**		**19**	**2-**	**1**		**3**	**1**	**1**	**2**	**2**	**72**	**5.85**
Evertebrata	**1+**	**155**	**1-**	**46**	**3-**	**2**	**1+**	**20**	**4**	**1**	**6**	**4**	**238**	**19.35**
Σ		**599**		**309**		**205**		**42**	**14**	**10**	**27**	**24**	**1230**	**100.00**
Diversity Index H'		3.17		2.66		1.53		2.26	2.14	1.64	2.34	2.1	3.4	

Locality / lokalita: 1 – Iraq al Wahaj, cave, Obuch 2011 + 4.10.2010 + 9.11.2012 + 30.10.2013 + 6.11.2015, 2 – Iraq al Wahaj, rocks, 9.11.2012 + 30.10.2013 + 6.11.2015, 3 – Saqeb, rocks, 7.11.2012 + 7.11.2015, 4 – Kufrinja, Samis Cliff , 1.11.2013, 5 – Wadi Haraniya, 2.11.2013, 6 – Mahmud Cliff, 2.11.2013, 7 – Rasoun, 1.11.2013, 8 – Wadi Yabis, Organ Suweid, 8.11.2015.
Other species (locality–number) / ostatné druhy (lokalita–počet):
Erinaceus concolor (2–1), *Suncus etruscus* (1–2; 2–1; 4–1), *Crocidura leucodon* (3–1), *Rhinolophus ferrumequinum* (1–1), *Myotis blythii* (1–1), *Ixobrychus minutus* (1–1), *Alectoris chukar* (2–1), *Ammoperdix heyi* (1–1), *Crex crex* (1–2), *Streptopelia decaocto* (1–1; 2–1), *Streptopelia turtur* (1–1), *Otus scops* (1–1), *Upupa epops* (1–1), *Dendrocopos syriacus* (1–2), Alaudidae (1–1; 3–2), *Hirundo rustica* (1–2), *Hirundo daurica* (1–3), *Delichon urbica* (1–1), *Riparia riparia* (1–2), *Ptyonoprogne rupestris* (1–1; 2–1; 4–2), *Lanius* sp. (2–1), *Muscicapa striata* (1–2; 2–1), *Oenanthe* sp. (1–1), *Erithacus rubecula* (1–2; 4–2), *Parus major* (1–3), *Periparus ater* (1–1), *Troglodytes troglodytes* (1–1), *Emberiza* sp. (1–1; 2–1), *Carduelis cannabina* (2–1), *Petronia petronia* (1–1), *Pica pica* (1–1), Passeriformes (1–1; 4–2; 5–1), Aves sp. juv. (1–3; 2–1), *Gryllotalpa* sp. (1–1; 2–1), Odonata (7–3), Scorpionida (1–3; 2–1).

enabling more precise differentiation of the diet spectrum in Jordan from those in neighbouring countries, mainly the predominance of *Apodemus mystacinus* among the mammals, Lacertidae among the reptiles, and Orthoptera and Solifugae among the invertebrates. Samples from Lebanon for example are characterized by the incidence of Limacidae, and the predominance of *M. guentheri*, similar to the *S. aluco* diet in south-west Syria (Appendix 13).

Hume's Owl (*Strix butleri* Hume, 1878)

We found pellets from *S. butleri* in the rocky massifs and ravines of wadis above the Dead Sea in the north (Dead Sea Rift Margins) down as far as Wadi Rum in the south.

Similarly to those of *A. lilith*, the pellets of *S. butleri* contained predominantly remains of invertebrates (Evertebrata, 58.9%) and half as much from mammals (25 species, 26.0%), while the proportion of birds (Aves, at least 40 species, 8.1%) was actually greater. In desert condition these owls also hunted more lizards (Lacertidae, 6.3%). The most frequent representatives of invertebrates were Coleoptera (31.7%); less numerous were Orthoptera (10.5%), Hymenoptera (5.5%), Solifugae (5.6%) and Scorpiones (5.3%). Of the mammals the most often hunted were *G. dasyurus* (12.5%) and species of genus *Acomys* (7.1%).

In the rock walls of Petra we found two roosts of *S. butleri*: at Wadi Numayr their pellets contained mostly remains of Coleoptera and *G. dasyurus*, while at Wadi Khariobsa there were more representatives of Orthoptera and Lacertidae. At Wadi Rum we collected *S. butleri* pellets in three locations around the Rum settlement. They contained mainly Coleoptera and Orthoptera, but remains of the European free-tailed bat (*Tadarida teniotis*) were numerous here, as well as the Baluchistan gerbil (*Gerbillus nanus*). In three localities spiny mice (*Acomys* sp.) were more frequently hunted, while at Ain Amshit in the Masuda massif it was Sundevall's jird (*M. crassus*). In the Dana NR pellets from *S. butleri* were often found below hollows in the rock walls near the caves. Remains of *M. tristrami* predominated in these, while invertebrates were represented by Solifugae and Scorpiones (Tab. 7).

Two smaller *S. butleri* samples were collected in wadis on the Israeli shore of the Dead Sea. These differed from the Jordanian material due to their higher proportion of mammals, mainly *Acomys* sp. and *Meriones crassus*, as well as reptiles from the Lacertidae family. The proportion of invertebrates was lower here, represented by Coleoptera, Orthoptera and Hymenoptera (Appendix 14). A smaller sample of the *S. butleri* diet from Oman featuring mammals and reptiles is mentioned by Amr et al. (2016b).

Comparison of the diets of seven owl species in Jordan

Individual owl species differ in their survival strategies. They each prefer a particular type of environment, and within that environment they specialize on certain groups of animal prey (König et al. 2015). In the territory of Jordan the owls can be divided into two groups:

a) species living in the wetter environment along the upper edge of the rift, affected by the Mediterranean climate – *B. bubo*, *S. aluco*, *A. otus* and *T. alba*.

b) species which are able to survive in arid environments near the Dead Sea, in Wadi Araba and in the desert across the eastern part of the country – *A. lilith*, *S. butleri* and *B. ascalaphus*.

The species *A. otus* and *T. alba* penetrate as far as the Azrak oasis and the Shaumari NR, but the majority of the population lives in the west of the country. The species *A. lilith* lives scattered throughout Jordan. In the more sustaining wetter areas it behaves territorially, but in the desert it takes on a nomadic approach to hunting, exhasting sources of prey in one place, then moving on to other localities and later returning again to the first one. We identified this kind of occasional occurrence on our visits to the Qal al Kharana fort, and it is also mentioned with reference to the Dasht-e Lut desert in Iran (Obuch & Krištín 2004).

The diet of *B. bubo* consists typically of larger prey: Appendix 15 includes a block of more than twenty species of mammals and birds, which clearly differentiates its diet from those of the smaller owl species. *B. ascalaphus* hunts other species of mammal in the desert, such as jerboas from the family Dipodidae and gerbils from the subfamily Gerbillinae, but also large numbers of reptiles from the families Agamidae and Lacertidae. Their invertebrate prey frequently includes Scorpiones and Solifugida, similarly to the smaller owl species *A. lilith* and *S. butleri*. The diets of these owls are dominated to a great extent by insects (Insecta) from the orders Coleoptera, Orthoptera and Hymenoptera. For *T. alba* and *S. aluco* small mammals are typical, but from different ecological groups: steppe species for *T. alba* and more hygrophilic forest species for *S. aluco*. Com-

Tab. 7. Comparison of the diet of Hume's owl (*Strix butleri*) in nine localities in the south part of Jordan. Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these sites (see Methods).
Tab. 7. Porovnanie potravy sovy svetlej (*Strix butleri*) z 9 lokalít v južnej časti Jordánska. Číselné hodnoty v tabuľke sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov na lokalitách (pozri Metodiku).

no. of locality / číslo lokality	**4**		**8**		**5**		**1**		**2**		**6**		**3**		**7**		**9**		**Σ**	**%**
taxa / taxón																				
Gerbillus dasyurus	1+	150	2-	15		31	2-	7		3		18	1-	12		11		1	248	12.46
Turdus philomelos	1+	7												1					8	0.40
Coleoptera	1+	246	1+	174	1-	49		83	1-	1	1-	19		51	1-	6	1-	1	630	31.66
Tadarida teniotis			1+	7															7	0.35
Gerbillus nanus			1+	6															6	0.30
Orthoptera	1-	26	1+	83	1+	63	1-	18			1-	7	1-	6		6			209	10.50
Carpodacus syonicus					1+	9								1					10	0.50
Lacertidae	2-	10	1-	12	1+	45	1+	37		4		7	1-	3		2		5	125	6.28
Hymenoptera		39	1-	16		21	1+	27			1-	2	1-	5					110	5.53
Sylviidae		5	1-	0		3	1+	8						1				2	19	0.95
Acomys sp.	1-	30		34	1-	9	1+	28	1+	6	1+	22	2-	2		4		6	141	7.9
Meriones crassus	1-	0		2							2+	19							21	1.6
Apodemus mystacinus													1+	6					6	0.30
Solifugida ???	1-	17		21		15		19		2		3	1+	34				1	112	5.63
Scorpionida		23		16		14		19		1		5	1+	22		4		1	105	5.28
Meriones tristrami	2-	0	1-	1	1-	0	1-	0				3	2+	37	1+	6			47	2.36
Passer domesticus		4		1				1				1		2				2	11	0.55
Meriones libycus		2		6								1							9	0.45
Agamidae				4								1		2					7	0.35
Delichon urbica		2		2		1		1											6	0.30
Eliomys melanurus				3		2													5	0.25
Apus pallidus		3				2													5	0.25
Petronia petronia		4								1									5	0.25
Heteroptera								4				1							5	0.25
Mammalia, 25 druhov		**184**	**1-**	**81**	**1-**	**44**	**1-**	**41**		**10**	**1+**	**69**		**59**	**1+**	**21**		**9**	**518**	**26.3**
Aves, min. 40 druhov		**48**	**1-**	**11**	**1+**	**32**		**24**		**2**		**10**		**21**		**8**		**6**	**162**	**8.14**
Amphibia, Reptilia	**2-**	**10**	**1-**	**16**	**1+**	**45**	**1+**	**38**		**4**		**9**	**1-**	**6**		**2**	**1+**	**7**	**137**	**6.88**
Evertebrata		**351**	**1+**	**312**		**162**		**170**	**1-**	**4**	**1-**	**37**		**118**	**1-**	**16**	**1-**	**3**	**1173**	**58.94**
Σ		**593**		**420**		**283**		**273**		**20**		**125**		**204**		**47**		**25**	**1990**	**100.00**
Diversity Index H'		1.94		2.9		2.34		2.34		1.95		2.55		2.37		2.34		2.30	2.56	

Locality / lokalita: 4 – Petra, Wadi am Numayr, 24.9.2005 + 2.5.2006 + 18.5.2009 + 10.10.2010 + 16.10.2013, 8 – Wadi Rum, 27.9.2005 + 18.5.2009 + 8.10.2010 + 16.11.2012 + 24.10.1013, 5 – Petra, Wadi Khariobsa, 3.5.2006 + 18.5.2009 + 10.10.2010, 1 – Wadi Abu al Asal, 15.10.2010 + 15.11.2012 + 16.10.2013, 2 – Wadi Ibn Hammad, 23.10.2008 + 21.11.2012, 6 – Ain Amshit, 16.5.2009 + 9.10.2010, 3 – Dana, caves, 19.10.2008 + 20.5.2009 + 11.10.2010 + 22.11.2012, 7 – Rajif, Wadi Suweid, 22.10.2008, 9 – Wadi Manshala, 19.11.2012 + 16.10.2013.

Other species (locality–number) / ostatné druhy (lokalita–počet): *Paraechinus aethiopicus* (6–1), *Suncus etruscus* (5–1), *Crocidura suaveolens* (1–3; 6–1), *Aselia tridens* (4–1; 1–1), *Hypsugo ariel* (1–2), *Plecotus christii* (2–1), *Otonycteris hemprichi* (8–1; 5–1; 6–2), *Nycteris thebaica* (9–1), *Jaculus jaculus* (4–1; 8–1), *Nannospalax ehrenbergi* (3–1), *Mus* sp. (3–1; 8–1; 9–1), *Nesokia indica* (8–1), *Gerbillus henleyi* (8–1), *Psammomys obesus* (8–1; 6–2), *Procavia capensis* (8–1), *Alectoris chukar* (8–2), *Ammoperdix heyi* (8–1; 1–1; 7–1; 9–1), *Coturnix coturnix* (3–4), *Columba livia* (8–1; 1–1), *Columba oenas* (8–2), *Streptopelia senegalensis* (4–1), *Merops apiaster* (3–2), *Upupa epops* (7–1), *Galerida cristata* (5–1; 3–1), *Ammomanes deserti* (4–1), Alaudidae (4–6; 1–2; 6–3; 7–1), *Hirundo rustica* (4–1; 5–1), *Riparia riparia* (6–1), *Ptyonoprogne rupestris* (1–3), *Ptyonoprogne fuligula* (4–1), *Pycnonotus xanthopygos* (4–2), *Lanius* sp. (4–1; 1–1; 7–1), *Muscicapa striata* (5–1), *Monticola* sp. (1–1), *Oenanthe* sp. (1–1; 7–1), *Phoenicurus phoenicurus* (1–1), *Phoenicurus* sp. (4–2), *Cercotrichas galactotes* (7–1), *Sitta neumayer* (5–2), *Nectarinia osea* (1–2), *Emberiza calandra* (3–1), *Emberiza* sp. (4–1; 2–1; 7–1), *Carduelis carduelis* (6–1; 3–2), *Carduelis cannabina* (4–2; 3–2), *Carduelis chloris* (5–3), *Rhodospiza obsoleta* (4–1; 1–1), Fringillidae (4–2; 5–3; 7–1), *Sturnus vulgaris* (6–1), Passeriformes (4–2; 8–2; 5–6; 6–3; 3–2; 9–1), Aves sp. juv. (3–2), *Pelophylax* cf. *bedriagae* (9–2), Chameleonidae (6–1; 3–1), Serpentes (1–1), Odonata (8–2).

pared with the other owls, the diet of *A. otus* stands out due to its focus on a block of 15 prey taxa, a greater number of which are song-birds.

Remarks on certain species of mammals in the diets of these owls

The subfamily Gerbillinae was represented most numerously in the diets of the owls in Jordan by the jird species (*M. tristrami*) (7.7%). This predominated in the diet of *T. alba* in the north (Al Sharayat), but it also featured in the diets of all species of owls in the Dana NR. The smaller gerbil species *G. dasyurus* also had a wide ecological amplitude, frequently represented in the diet of *S. aluco* in north-west Jordan, but also in that of *S. butleri* in Petra (Wadi am Numayr).

The vole *M. guentheri*, dominant in the diet of *T. alba* in northern Jordan, also appeared in that of *A. otus* in the southern outskirts of Amman (Amman National Park).

Eleven species of bats (Chiroptera, 0.5%) were identified in the diets of owls in Jordan. They were much more numerous in the diet of *T. alba* in Syria, especially in localities along the River Euphrates (Benda et al. 2006).

The only species of dormouse (Gliridae) living in Jordan is *Eliomys melanurus* (Amr et al. 2018), and it was most frequently found in Petra as the prey of *B. bubo* (Al Baida), but also of *S. butleri* (Wadi Khariobsa).

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Appendix 1. Overview of pellet collection locations for seven owl species in Jordan.
Príloha 1. Prehľad miest zberov vývržkov od siedmych druhov sov v Jordánsku.

tab.	no. of loc. / tab. č.	taxa / taxón locality / lokalita	N°	E°	m a.s.l. / m n. m.	site of pellets' collection / miesto zberu vývržkov
		Tyto alba erlangeri				
1	1	Al Sharayat, wadi	32.633488	35.940175	330	artifical cave / umelá jaskyňa
	2	Um al Jammal	32.324533	36.366602	670	ruined town / ruiny mesta
	3	Lava Tube, Al Bishriya	32.132613	36.823558	780	lava chasm / lávová priepasť
	4	Azrak	31.833670	36.818007	510	below palm trees / pod palmami
	5	Shaumari	31.752401	36.756705	520	below eucalyptus trees / pod eukalyptami
	6	Qal al Kharana	31.728890	36.462815	650	karavansaraj / karavánna stanica
	7	Dana, caves	30.690457	35.584420	1220	rock chimney / skalný komín
	8	Dana, wadi Al Barra	30.643107	35.600509	1130	rock hollows / skalné dutiny
	9	Rajif, wadi Suweid	30.197488	35.413253	920	overhanging rock / skalný previs
	10	Madaba	31.717817	35.793901	790	town garden / mestská záhrada
		Bubo ascalaphus				
2	1	Burqu	32.608359	37.962357	650	ruined forts / zrúcanina pevnosti
	2	Hazim	31.595952	37.252245	520	below palm trees / pod palmami
	3	Shaumari	31.752401	36.756705	520	below eucalyptus trees / pod eukalyptami
		Bubo bubo interpositus				
2	4	Marj al Hammam	31.895426	35.821304	720	sandstone rocks / pieskovcové skaly
	5a	Ibn Hammad, wadi	31.296127	35.622033	140	sandstone rocks / pieskovcové skaly
	5b	Wadi Abu al Asal	31.645817	35.585076	-210	sandstone rocks / pieskovcové skaly
	5c	Mukavir	31.567090	35.628541	650	limestone rocks / vápencové skaly
	6	Dana camp	30.684359	35.583590	1130	sandstone rocks / pieskovcové skaly
	7a	Ajun reserve	32.389757	35.765895	900	limestone rocks / vápencové skaly
	7b	Rasoun	32.413827	35.769783	840	limestone rocks / vápencové skaly
	7c	Wadi Haraniya	32.265764	35.684702	580	limestone rocks / vápencové skaly
	7d	Wadi Yabis, Organ Suweid	32.391470	35.706684	470	limestone rocks / vápencové skaly
	8	Fuhays	32.005505	35.751525	590	limestone rocks / vápencové skaly
	9a	Al Baida	30.375852	35.452308	1160	sandstone rocks / pieskovcové skaly
	9b	Chuweir, wadi	30.626531	35.501655	290	sandstone rocks / pieskovcové skaly
		Asio otus				
3	1	Shaumari	31.752401	36.756705	520	below eucalyptus trees / pod eukalyptami
	2	Mafraq, American Hospital	32.365751	36.203165	680	below thuja trees / pod tujami
	3a	Wasfi Tal	32.145207	35.840704	700	below pine trees / pod borovicami
	3b	Dibin	32.239637	35.828343	710	below pine trees / pod borovicami
	4a	Amman National Parc	31.867336	35.879872	890	below pine trees / pod borovicami
	4b	Marj al Hammam	31.901483	35.815600	840	below pine trees / pod borovicami
	5a	Amman, Jordan University	32.013105	35.872690	1000	below pine trees / pod borovicami
	5b	Amman, Sport City	31.984116	35.906148	940	below pine trees / pod borovicami
		Athene lilith				
4	1	Wadi Haraniya	32.266608	35.678988	440	rock wall / skalná stena
	2	Ballas	32.262938	35.720927	800	quarry / kameňolom
	3	Al Sharayat, wadi	32.633538	35.943841	310	rock wall / skalná stena
	4	Qasr el Hallabat	32.092834	36.327999	630	castle / hrad
	5	Qal al Kharana	31.728890	36.462815	650	karavansaraj / karavánna stanica
	6	Fuhays	32.021179	35.770060	770	rock wall / skalná stena
	7	Wádí Seer	31.944050	35.802244	740	rock wall / skalná stena
	8	desert highway	30.604338	36.318265	1010	rock wall / skalná stena
5	1	Mukavir	31.567090	35.628541	650	rock wall / skalná stena
	2	Wadi Hidan	31.536724	35.722705	280	rock wall / skalná stena
	3	Wadi Chuweir	30.627732	35.473161	230	rock wall / skalná stena
	4	Dana, camp	30.686283	35.573060	1150	rock wall / skalná stena
	5	Dana, caves	30.690457	35.584420	1220	rock wall / skalná stena
	6	Sela	30.775484	35.585909	1060	rock wall / skalná stena

Appendix 1. Continuation.
Príloha 1. Pokračovanie.

tab.	no. of loc. / tab. č.	taxa / taxón locality / lokalita	N°	E°	m a.s.l. / m n. m.	site of pellets' collection / miesto zberu vývržkov
		Strix aluco wilkonskii				
6	1	Iraq al Wahaj, cave	32.311733	35.712717	740	cave / jaskyňa
	2	Iraq al Wahaj, rock	32.314848	35.716535	680	rocks in the forest / skaly v lese
	3	Saqeb, rocks	32.297074	35.791074	1030	rocks in the forest / skaly v lese
	4	Kufrinja, Samis Cliff	32.315294	35.684358	550	rocks in the forest / skaly v lese
	5	Wadi Haraniya	32.262107	35.680375	540	rocks in the forest / skaly v lese
	6	Mahmud Cliff	32.256625	35.763932	770	rocks in the forest / skaly v lese
	7	Rasoun	32.412490	35.766970	840	rocks in the forest / skaly v lese
	8	Wadi Yabis, Organ Suweid	32.391470	35.706684	470	rocks in the forest / skaly v lese
		Strix butleri				
7	1	Wadi Abu al Asal	31.645817	35.585076	-210	rock chimney / skalný komín
	2	Wadi Ibn Hammad	31.296626	35.621870	100	overhanging rock / skalný previs
	3	Dana, caves	30.690457	35.584420	1220	rock hollows / diery v previse
	4	Petra, Wadi am Numayr	30.311721	35.443910	990	rock hollows / diery v previse
	5	Petra, Wadi Khariobsa	30.336974	35.438280	980	rock hollows / diery v previse
	6	Ain Amshit	30.201112	35.386917	950	rock chimney / skalný komín
	7	Rajif, Wadi Suweid	30.197488	35.412253	920	overhanging rock / skalný previs
	8	Wadi Rum	29.569504	35.413410	1090	overhanging rock / skalný previs
	9	Wadi Manshala	31.680310	35.580106	-330	rock chimney / skalný komín

Appendix 2. Comparison of the diets of the barn owl (*Tyto alba*) in Jordan, Israel and Syria (author's data). Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these countries (see Methods).
Príloha 2. Porovnanie potravy plamienky driemavej (*Tyto alba*) v Jordánsku, Izraeli a v Sýrii (údaje autora). Číselné hodnoty v prílohe sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov v krajinách (pozri Metodiku).

country / štát	**Jordan**		**Israel**		**Syria**		**Σ**	**%**
No. of localities / n lokalít	10		10		20		40	
taxa / taxón								
Gerbillus dasyurus	3+	96	2-	4	2-	27	127	0.44
Meriones libycus	2+	60	2-	0	1-	38	98	0.34
Streptopelia senegalensis	2+	18		7	2-	4	29	0.10
Phoenicurus sp.	2+	15				4	19	0.07
Meriones tristrami	1+	471		507		2288	3266	11.29
Cricetulus migratorius	1+	139	4-	7		558	704	2.43
Suncus etruscus	1+	92	1-	61		522	675	2.33
Nannospalax ehrenbergi	1+	14		10	1-	19	43	0.15
Gerbillus nanus	1+	8		5	2-	0	13	0.04
Passer domesticus	1+	237	2-	39		974	1250	4.32
Passer hispaniolensis	1+	10			1-	6	16	0.06
Sylviidae	1+	32	1-	15		110	157	0.54
Agamidae	1+	11		1	1-	8	20	0.07
Orthoptera	1+	9	1-	0		33	42	0.15
Scorpionida	1+	5		1		2	8	0.03
Microtus guentheri	1+	441	2+	1308	1-	1091	2840	9.81
Rattus rattus	1+	16	1+	32	1-	33	81	0.28
Gerbillus gerbillus	3-	0	3+	297	6-	0	297	1.3
Gerbillus henleyi	1-	4	2+	88	1-	73	165	0.57
Gerbillus andersoni			2+	21	2-	0	21	0.07
Crocidura leucodon		19	2+	160	2-	56	235	0.81
Crocidura suaveolens	1-	21	2+	127	1-	179	327	1.13
Acomys sp.		2	2+	29			31	0.11
Apodemus flavicollis			2+	28	1-	13	41	0.14
Meriones sacramenti			1+	12	2-	0	12	0.04
Gerbillus pyramidum			1+	8	1-	0	8	0.03
Rattus norvegicus			1+	8	1-	3	11	0.04
Sturnus vulgaris		1	1+	10		21	32	0.11
Gerbillus cheesmani	5-	0	6-	0	1+	1082	1082	3.74
Meriones crassus	2-	7	1-	28	1+	394	429	1.48

country / štát	**Jordan**		**Israel**		**Syria**		**Σ**	**%**
taxa / taxón								
Tatera indica	3-	0	3-	0	1+	212	212	0.73
Nesokia indica	1-	0	2-	0	1+	81	81	0.28
Apodemus witherbyi	1-	0	1-	0	1+	46	46	0.16
Pipistrellus kuhlii	6-	0	4-	13	1+	1874	1887	6.52
Otonycteris hemprichi	1-	0	2-	0	1+	61	61	0.21
Riparia riparia	1-	7	3-	2	1+	177	186	0.64
Motacilla sp.	1-	4	2-	0	1+	82	86	0.29
Gryllotalpa sp.	2-	2	2-	6	1+	208	216	0.75
Hyla savignyi	2-	0	2-	4	1+	141	145	0.50
Mus sp.	1-	881	1-	1304		9463	11,648	40.25
Hirundo rustica	1-	10	2-	7		158	175	0.60
Galerida cristata	1-	3	1-	4		100	107	0.37
Apodemus mystacinus	2-	8		37		274	319	1.10
Jaculus jaculus		25	3-	1		253	279	0.96
Allactaga euphratica		18	3-	0		119	137	0.47
Lacertidae		12	2-	3		146	161	0.56
Aselia tridens			1-	0		35	35	0.12
Myotis capaccinii			1-	0		31	31	0.11
Solifugida		4	1-	0		37	41	0.14
Pelophylax cf. *bedriagae*		5	1-	5		69	79	0.27
Coleoptera		12		25		91	128	0.44
Alauda arvensis		6		6		47	59	0.20
Coturnix coturnix		7		3		41	51	0.18
Anthus sp.				3		34	37	0.13
Taphozous nudiventris				1		32	33	0.11
Mammalia		**2326**		**4101**		**18,915**	**25,342**	**87.56**
Aves	**1+**	**408**	**2-**	**149**		**2160**	**2717**	**9.39**
Amphibia, Reptilia	**1-**	**28**	**2+**	**18**		**367**	**413**	**1.43**
Evertebrata		**38**	**1-**	**34**		**397**	**469**	**1.62**
Σ		**2800**		**4302**		**21,839**	**28,941**	**100.00**
Diversity Index H'		2.40		2.13		2.42	2.52	

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Appendix 3. Diet of the Eurasian eagle owl (*Bubo bubo*) in the northern part of Jordan. Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these samples (see Methods).
Príloha 3. Potrava výra skalného (*Bubo bubo*) v severnej časti Jordánska. Číselné hodnoty v prílohe sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov vo vzorkách (pozri Metodiku).

sample / vzorka	**1**		**2**		**3**		**4**		**5**		**7**		**6**		**11**		**10**		**8**	**9**	**Σ**	**%**
taxa / taxón																						
Rattus norvegicus	1+	13		42	1-	1	1-	3		8		13		1		2		14		2	99	12.82
Meriones tristrami			1+	52	1-	0		6		4	1-	1				1	1-	3	1	1	69	8.94
Coturnix coturnix			1+	16				1													17	2.20
Sylviidae			1-	2	2+	15				3								2		1	23	2.98
Luscinia sp.					1+	8				1						1		1			11	1.42
Garrulus glandarius	1-	0	3-	2	1+	18	1+	30		12	1-	4	1-	0			1+	26	2	2	96	12.44
Nannospalax ehrenbergi		2		15		2	1+	11	1-	0		3		1		1		3			38	4.92
Columba livia		9		24	1-	2		7	1+	28	1+	16	1-	0		1	1-	5			92	11.92
Scorpionida		1	1-	0							2+	13						3			17	2.20
Decapoda													2+	10							10	1.30
Bufotes variabilis													2+	12							12	1.55
Pelophylax cf. *bedriagae*													1+	5							5	0.65
Erinaceus concolor		5		14		6		6		6		6		1	1+	7		8			59	7.64
Hemiechinus auritus		3		8						4						1					16	2.7
Turdus merula				1		2		1		4		1				1		3			13	1.68
Alectoris chukar				3				1		2		2				1		2	1		12	1.55
Crex crex				4		1		3		1		1									10	1.30
Falco tinnunculus				3				2		3		1									9	1.17
Pica pica		1		1				2										5			9	1.17
Passer domesticus		1		2		2		2		1		1									9	1.17
Apodemus mystacinus								1				1				2		2	2		8	1.4
Athene noctua				2				1		1		1		1				1	1		8	1.4
Streptopelia senegalensis				3						1		1						2			7	0.91
Agamidae		1		3				1				1							1		7	0.91
Cricetulus migratorius		1		4				1													6	0.78
Ammoperdix heyi				3				2		1											6	0.78
Lepus capensis				2				1				2									5	0.65
Merops apiaster						3		1		1											5	0.65
Mammalia	**1+**	**27**	**1+**	**146**	**1-**	**9**		**30**	**1-**	**24**		**28**	**1-**	**4**		**14**		**34**	**4**	**3**	**323**	**41.84**
Aves	**1-**	**13**	**1-**	**94**	**1+**	**55**		**58**	**1+**	**68**		**29**	**2-**	**3**		**8**		**51**	**4**	**4**	**387**	**50.13**
Amphibia, Reptilia, Pisces		**1**		**4**		**0**		**2**		**0**		**1**	**2+**	**18**		**0**		**0**	**1**	**0**	**27**	**3.50**
Evertebrata		**1**	**1-**	**3**		**0**		**1**	**1-**	**0**	**1+**	**15**	**1+**	**10**		**0**		**5**	**0**	**0**	**35**	**4.53**
Σ		**42**		**247**		**64**		**91**		**92**		**73**		**35**		**22**		**90**	**9**	**7**	**772**	**100.00**
Diversity Index H'		2.14		2.96		2.15		2.57		2.62		2.44		1.82		2.35		2.56	1.89	1.55	3.29	

Sample / vzorka: 1–5: Marj al – Hammam, 6–7: Fuhays, 11: Yabis wadi, 10: Rasoun, 8: Ajun reserve, 9: Haraniya wadi.
Other species (sample–number) / ostatné druhy (vzorka–počet):
Crocidura suaveolens (2–1), *Eliomys melanurus* (2–1), *Mus* sp. (1–2), *Acomys* cf. *dimidiatus* (2–2; 5–1; 7–1), *Rattus rattus* (2–1; 6–1), *Gerbillus dasyurus* (1–1; 2–3), *Microtus guentheri* (2–1; 5–1; 10–2), *Canis familiaris* (10–1), *Vulpes vulpes* (4–1), *Martes foina* (7–1), *Felis silvestris* (10–1; 8–1), *Anas platyrhynchos* (10–1), *Accipiter nisus* (2–1; 5–1), *Falco naumanni* (2–1), *Falco* sp. (1–1), *Gallus gallus dom.* (2–2; 6–1; 11–1), *Porzana porzana* (2–1), *Hoplopterus spinosus* (2–1), *Tringa* sp. (2–1),

Appendix 4. Diet of the Eurasian eagle owl (*Bubo bubo*) in the south part of Jordan. Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these sites (see Methods).
Príloha 4. Potrava výra skalného (*Bubo bubo*) v južnej časti Jordánska. Číselné hodnoty v prílohe sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov na lokalitách (pozri Metodiku).

no. of locality / číslo lokality	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Σ**	**%**
taxa / taxón										
Columba livia	1		1+ 7	1	1			1- 0	10	1.64
Eliomys melanurus						1		1+ 10	11	1.81
Coturnix coturnix					1			1+ 11	12	1.97
Luscinia sp.						1		1+ 11	12	1.97
Meriones tristrami	1- 0	1- 3	2- 0	1- 1	50	118	1- 0	153	325	53.45
Acomys sp.	3	2	4	1		2	4	1- 0	16	2.63
Scorpionida					2	7	2	1- 0	11	1.81
Sylviidae					4	17		14	35	5.76
Gerbillus dasyurus	1	2				5		15	23	3.78
Cricetulus migratorius					4	9		5	18	2.96
Nannospalax ehrenbergi					2	3		3	8	1.32
Alectoris chukar			2	4	1	1			8	1.32
Streptopelia senegalensis		3				1	1	3	8	1.32
Crex crex						1		6	7	1.15
Petronia petronia			2			5			7	1.15
Orthoptera	1	1				5			7	1.15
Lepus capensis						1		5	6	0.99
Mus sp.					1	4			5	0.82
Columba oenas			2	1				2	5	0.82
Fringilla coelebs								5	5	0.82
Mammalia	**5**	**1- 7**	**1- 6**	**6**	**58**	**145**	**4**	**194**	**425**	**69.90**
Aves	**2**	**10**	**1+ 19**	**1+ 9**	**1- 11**	**1- 30**	**3**	**69**	**153**	**25.16**
Amphibia, Reptilia	**0**	**1**	**0**	**1**	**0**	**2**	**0**	**1**	**5**	**0.82**
Evertebrata	**1**	**2**	**0**	**0**	**3**	**1+ 16**	**2**	**2- 1**	**25**	**4.11**
Σ	**8**	**20**	**25**	**16**	**72**	**193**	**9**	**265**	**608**	**100.00**
Diversity Index H'	1.67	2.36	2.23	2.34	1.35	1.72	1.27	1.89	2.33	

Locality / lokalita: 1 – Wadi Abu al Asal, 15.10.2010, 2 – Mukavir, 19.11.2012, 3 – Wadi Ibn Hammad,12.10.2010 + 21.11.2012 + 19.10.2013, 4 – Dana, camp, 9.4.2008, 5 – Dana, camp, 22.11.2012, 6 – Dana, camp, 21.10.2013, 7 – Wadi Chuweir, 14.5.2009, 8 – Al Baida, 19.5.2009.
Other species (Locality–number) / ostatné druhy (lokalita–počet):
Hemiechinus auritus (5–1), *Paraechinus aethiopicus* (4–2), *Plecotus christii* (6–2), *Otonycteris hemprichi* (1–1), *Apodemus mystacinus* (4–1; 8–3), *Rattus norvegicus* (3–1), *Rattus rattus* (3–1), *Procavia capensis* (4–1), *Pernis apivorus* (3–1), *Falco tinnunculus* (2–1), *Ammoperdix heyi* (3–2), *Gallinula chloropus* (8–1), *Hoplopterus spinosus* (4–1), *Gallinago media* (8–2), *Streptopelia decaocto* (1–1; 2–1; 7–2), *Cuculus canorus* (4–1), *Otus scops* (8–1), *Athene noctua* (2–3), *Coracias garrulus* (3–1), *Upupa epops* (8–2), *Jynx torquilla* (8–1), *Melanocorypha calandra* (6–1), *Lanius* sp. (3–1), *Ficedula* sp. (8–3), *Oenanthe* sp. (2–1; 5–2), *Turdus philomelos* (8–3), *Emberiza* sp. (6–1; 8–1), *Carduelis chloris* (5–1), Fringillidae (6–1), *Passer domesticus* (2–1; 8–1), *Onychognathus tristrami* (8–1), *Corvus ruficollis* (4–1), *Corvus rhipidurus* (3–1), Passeriformes (5–1; 6–1; 8–1), Lacertidae (2–1; 8–1), Agamidae (4–1; 6–2), Hymenoptera (6–1), Coleoptera (6–1; 8–1), Solifugida (2–1; 5–1; 6–2).

◄ **Appendix 3.** Continuation.
◄ **Príloha 3.** Pokračovanie.
Scolopax rusticola (2–1), Limicolae (2–1), *Columba palumbus* (2–1), *Streptopelia decaocto* (11–1), *Streptopelia turtur* (5–1), *Tyto alba* (10–1), *Asio otus* (2–1), *Otus scops* (2–1; 4–1; 5–1; 9–1), *Coracias garrulus* (2–1), *Dendrocopos syriacus* (3–1; 5–1), *Galerida cristata* (2–3), *Delichon urbica* (5–1; 10–1), *Riparia riparia* (5–1; 10–1), *Ptyonoprogne rupestris* (2–1), *Pycnonotus xanthopygos* (2–1; 11–1), *Lanius* sp. (4–1; 11–1), *Saxicola torquata* (3–1), *Phoenicurus ochruros* (3–1), *Turdus philomelos* (2–1; 4–2; 5–1), *Parus major* (4–1), *Emberiza calandra* (5–1), *Emberiza* sp. (3–1), *Fringilla coelebs* (2–1), *Carduelis chloris* (2–1), *Sturnus vulgaris* (2–1), *Corvus cornix* (1–1), *Corvus monedula* (2–3; 5–1), Passeriformes (2–3; 7–1; 6–1), Lacertidae (2–1; 4–1), Cypriniformes (6–1), Coleoptera (10–1), Orthoptera (2–1; 7–2), Solifugida (2–2; 4–1), Gastropoda (10–1).
Date of collection (sample – date) / dátum zberu (vzorka–dátum): 1 – 27.4.2006, 2 – 4.4.2008, 3 – 2.10.2010, 4 – 14.11.2012, 5 – 15.10.2013, 6 – 31.3.2008, 7 – 28.10.2013, 8 – 24.10.2008, 9 – 2.11.2013, 10 – 1.11.2013, 1 1 –8.11.2015.

Appendix 5. Comparison of the diets of the Byzantine eagle owl (*Bubo bubo interpositus*) in Jordan, Israel and Syria (author's data). Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these countries (see Methods).
Príloha 5. Porovnanie potravy výra skalného (*Bubo bubo interpositus*) v Jordánsku, Izraeli a v Sýrii (údaje autora). Číselné hodnoty v prílohe sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov v krajinách (pozri Metodiku).

country / štát	**Jordan**		**Israel**		**Syria**		**Σ**	**%**
no. of localities / počet lokalít	**12**		**4**		**3**		**19**	
taxa / taxón								
Meriones tristrami	1+	395	1-	11	4-	0	406	22.32
Rattus norvegicus	1+	100	1-	1	2-	0	101	5.55
Garrulus glandarius	1+	96	1-	0	2-	0	96	5.28
Nannospalax ehrenbergi	1+	47			1-	0	48	2.64
Sylviidae	1+	58		1	2-	0	59	3.24
Microtus guentheri	1-	4	2+	13			17	0.93
Columba livia		102	1+	18	1-	5	125	6.87
Coturnix coturnix		29	1+	12		6	47	2.58
Mus sp.	1-	7	1+	10			17	0.93
Lepus capensis		11	1+	7			20	1.10
Rattus rattus		3	1+	6			9	0.49
Procavia capensis	1-	1	1+	7			8	0.44
Hemiechinus auritus	2-	17	1-	2	2+	89	108	5.94
Meriones libycus	4-	0		1	2+	50	51	2.80
Psammomys obesus	3-	0			2+	26	26	1.43
Jaculus jaculus	3-	0			2+	24	24	1.32
Allactaga euphratica	2-	0			2+	17	17	0.93
Paraechinus aethiopicus	1-	2			1+	7	9	0.49
Columba oenas		5		1	1+	7	13	0.71
Erinaceus concolor		59		9	2-	0	68	3.74
Acomys sp.		20		6	1-	0	26	1.43
Scorpionida		28				1	29	1.59
Gerbillus dasyurus		27				1	28	1.54
Alectoris chukar		20		3		2	25	1.37
Cricetulus migratorius		24					24	1.32
Luscinia sp.		23					23	1.26
Crex crex		17		2		1	20	1.10
Streptopelia senegalensis		15		4			19	1.4
Athene noctua		11		2		3	16	0.88
Falco tinnunculus		11				4	15	0.82
Turdus merula		13		1			14	0.77
Apodemus mystacinus		13					13	0.71
Agamidae		10				3	13	0.71
Eliomys melanurus		12					12	0.66
Bufotes variabilis		12					12	0.66
Passer domesticus		11					11	0.60
Orthoptera		10					10	0.55
Decapoda		10					10	0.55
Mammalia		**751**		**86**	**1+**	**222**	**1059**	**58.22**
Aves		**541**		**63**	**1-**	**51**	**655**	**36.01**
Amphibia,Reptilia,Pisces		**32**		**1**		**8**	**41**	**2.25**
Evertebrata		**60**	**1-**	**0**	**1-**	**4**	**64**	**3.52**
Σ		**1384**		**150**		**285**	**1819**	**100.00**
Diversity Index H'		3.19		3.29		2.52	3.53	

Appendix 6. Diet of the pharaoh eagle owl (*Bubo ascalaphus*) in the east part of Jordan. Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2- are marked deviations from the mean (MDFM, Obuch 2001) for the species in these samples (see Methods).
Príloha 6. Potrava výra púšťového (*Bubo ascalaphus*) vo východnej časti Jordánska. Číselné hodnoty v prílohe sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov vo vzorkách (pozri Metodiku).

sample / vzorka		**1**		**2**		**3**	**4**		**5**		**6**		**7**	**Σ**	**%**
taxa / taxón															
Meriones crassus	1+	30		3		6	7		25		4	2-	0	75	10.23
Jaculus jaculus	1+	34	1+	17	1+	18	11	1-	42		12	2-	6	140	19.10
Mus sp.	1-	2		2			2	1+	40	1-	0	1-	0	46	6.28
Scorpionida		9				1	1	1+	50		6	2-	0	67	9.14
Sylviidae	1-	0				3		1+	30	1+	10	1-	0	43	5.87
Coleoptera						1	1		5	1+	6			13	1.77
Gerbillus dasyurus		2							11	2+	21	1-	0	34	4.64
Allactaga euphratica												1+	5	5	0.68
Agamidae	2-	0						3-	0	1-	0	2+	57	57	7.78
Meriones libycus		7		3				1-	4		3		9	26	3.55
Streptopelia turtur		6				5	4		24	1-	0		4	43	5.87
Solifugida		6				1			18		5	1-	0	30	4.9
Lacertidae		8							8		4		7	27	3.68
Orthoptera		2				3			7		2			14	1.91
Passer domesticus						2			4		5			11	1.50
Alaudidae						2			4				3	9	1.23
Coturnix coturnix		1							2		1		3	7	0.95
Paraechinus aethiopicus									4				2	6	0.82
Gerbillus nanus							1		1		4			6	0.82
Lanius sp.		2		1		1			2					6	0.82
Merops apiaster									5					5	0.68
Phylloscopus sp.									5					5	0.68
Mammalia	**1+**	**77**	**1+**	**25**		**25**	**21**		**127**		**45**	**1-**	**27**	**347**	**47.34**
Aves	**1-**	**13**	**1-**	**1**		**13**	**8**	**1+**	**96**		**16**		**29**	**176**	**24.1**
Reptilia		**8**		**0**	**1-**	**0**	**0**	**2-**	**9**	**1-**	**4**	**2+**	**64**	**85**	**11.60**
Evertebrata		**17**	**1-**	**0**		**6**	**2**	**1+**	**81**		**19**	**3-**	**0**	**125**	**17.5**
Σ		**115**		**26**		**44**	**31**		**313**		**84**		**120**	**733**	**100.00**
Diversity Index H'		2.13		1.10		1.96	1.81		2.79		2.34		2.23	2.98	

Sample / vzorka: 1–5 – Shaumari, 6 – Hazim, 7 – Burqu.
Other species (sample–number) / ostatné druhy (vzorka – počet): *Hemiechinus auritus* (7–1), *Suncus etruscus* (1–1), *Lepus capensis* (7–1), *Eliomys melanurus* (7–1), *Gerbillus henleyi* (1–1; 3–1; 6–1; 7–1), *Gerbillus mesopotamiae* (7–1), *Ammoperdix heyi* (7–4), *Rallus aquaticus* (1–1; 5–2), *Crex crex* (5–2; 7–1), Glareolidae (7–1), *Tringa glareola* (7–1), Pteroclidae (7–3), *Streptopelia decaocto* (5–1), *Streptopelia senegalensis* (5–2), *Tyto alba* (5–1), *Otus scops* (4–1), *Athene noctua* (7–1), *Coracias garrulus* (5–1), *Alcedo atthis* (5–1), Galerida cristata (7–1), *Ammomanes deserti* (7–1), *Hirundo rustica* (5–1; 7–2), *Riparia riparia* (7–1), *Oenanthe deserti* (1–2), *Oenanthe* sp. (1–1; 5–1), *Luscinia* sp. (5–1; 7–1), *Cercotrichas galactotes* (5–1), *Emberiza cia* (5–2), *Passer hispaniolensis* (5–1), *Sturnus vulgaris* (7–1), Passeriformes (4–3; 5–3; 7–1), Serpentes (5–1), Hymenoptera (5–1).
Date of collection (sample – date) / dátum zberu (vzorka – dátum): 1 – 2.4.2008, 2 – 13.10.2008, 3 – 29.5.2009, 4 – 6.10.2010, 5 – 29.10.2013, 6 – 29.5.2009, 7 – 14.10.2008.

Appendix 7. Comparison of the diets of the pharaoh eagle owl (*Bubo ascalaphus*) in Jordan and Egypt (author's data). Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these countries (see Methods).

Príloha 7. Porovnanie potravy výra púšťového (*Bubo ascalaphus*) v Jordánsku a v Egypte (údaje autora). Číselné hodnoty v prílohe sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov v týchto krajinách (pozri Metodiku).

country / štát	**Jordan**		**Egypt**		**Σ**	**%**
no. of localities / počet lokalít	**3**		**5**		**8**	
taxa / taxón						
Jaculus jaculus	1+	140	3-	4	144	14.23
Meriones crassus	1+	75	3-	0	75	7.41
Gerbillus dasyurus	1+	34	2-	0	34	3.36
Streptopelia turtur	1+	43	2-	0	43	4.25
Sylviidae	1+	48	2-	1	49	4.84
Agamidae	1+	57	2-	0	57	5.63
Solifugida	1-	30	1+	35	65	6.42
Orthoptera	1-	14	1+	26	40	3.95
Hymenoptera	2-	1	1+	15	16	1.58
Gerbillus amoenus	4-	0	2+	48	48	4.74
Gerbillus pyramidum	2-	0	1+	18	18	1.78
Arvicanthis niloticus	2-	0	1+	12	12	1.19
Rattus rattus	2-	0	1+	13	13	1.28
Acomys cahirinus	1-	0	1+	6	6	0.59
Coturnix coturnix		7	1+	10	17	1.68
Mus sp.		46	1-	9	55	5.43
Meriones libycus		26	1-	0	26	2.57
Scorpionida		67	1-	13	80	7.91
Lacertidae		27		12	39	3.85
Coleoptera		13		12	25	2.47
Passer domesticus		11		5	16	1.58
Mammalia		**347**		**123**	**470**	**46.44**
Aves		**176**	**1-**	**38**	**214**	**21.15**
Reptilia		**85**	**1-**	**12**	**97**	**9.58**
Evertebrata	**1-**	**125**	**1+**	**106**	**231**	**22.83**
Σ		**733**		**279**	**1012**	**100.00**
Diversity Index H'		2.95		2.95	3.30	

Appendix 14. Comparison of the diets of Hume's owl (*Strix butleri*) in Jordan and Israel (author's data). Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these countries (see Methods).

Príloha 14. Porovnanie potravy sovy svetlej (*Strix butleri*) v Jordánsku a v Izraeli (údaje autora). Číselné hodnoty v prílohe sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov v krajinách (pozri Metodiku).

country / štát	**Jordan**		**Israel**		**Σ**	**%**
no. of localities / počet lokalít		**9**		**2**	**11**	
taxa / taxón						
Acomys sp.		141	2+	38	179	8.42
Meriones crassus	1-	21	1+	12	33	1.55
Gerbillus gerbillus	1-	0	1+	8	8	0.38
Otonycteris hemprichi	1-	4	1+	8	12	0.56
Lacertidae		125	1+	17	142	6.68
Gerbillus dasyurus		248	2-	0	248	11.67
Coleoptera		630	2-	9	639	30.7
Orthoptera		209	1-	6	215	10.12
Hymenoptera		110	1-	2	112	5.27
Scorpionida		105		12	117	5.51
Solifugida		112		4	116	5.46
Meriones tristrami		47			47	2.21
Sylviidae		19		3	22	1.4
Passer domesticus		11			11	0.52
Agamidae		7		4	11	0.52
Tadarida teniotis		7		3	10	0.47
Carpodacus syonicus		10			10	0.47
Mammalia		**518**	**1+**	**73**	**591**	**27.81**
Aves		**162**		**7**	**169**	**7.95**
Amphibia,Reptilia		**137**	**1+**	**22**	**159**	**7.48**
Evertebrata		**1173**	**1-**	**33**	**1206**	**56.75**
Σ		**1990**		**135**	**2125**	**100.00**
Diversity Index H'		2.56		2.44	2.63	

Appendix 8. Seasonal changes in the diet of the long-eared owl (*Asio otus*) in Amman. Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these samples (see Methods).
Príloha 8. Sezónne zmeny v potrave myšiarky ušatej (*Asio otus*) v Ammáne. Číselné hodnoty v prílohe sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov vo vzorkách (pozri Metodiku).

sample / vzorka **taxa / taxón**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Σ**	**%**
Fringilla coelebs	1+ 13	10	3			2	1- 1.1		29	3.90
Carduelis chloris	1+ 12	5	4		2	1- 1	5	1	30	4.4
Mus sp.	3	2+ 31	1- 2	1- 0	1	6	6		49	6.59
Motacilla alba		1+ 7						4	11	1.48
Carduelis cannabina	1- 0	1+ 23	10	3	1- 0	11	1- 1.1		48	6.46
Emberiza sp.	2	1- 0	2+ 30			2	1- 0		34	4.58
Passer domesticus	1- 16	1- 33	1- 32	1+ 52	34	60	1+ 75	11	313	42.13
Meriones tristrami		1			2	7	1+ 9	1	20	2.69
Sylvia sp.	17	19	12	5	8	22	21	4	108	14.54
Streptopelia senegalensis	3	2	1	1	4	1	1		13	1.75
Lanius sp.	2			2	3	1	1	2	11	1.48
Pycnonotus xanthopygos	3		1		1	2	1		8	1.8
Galerida cristata			1	1		1	3		6	0.81
Turdus merula	1					4			5	0.67
Turdus philomelos	1	2			1	1			5	0.67
Carduelis carduelis			2	1		2			5	0.67
Serinus serinus							5		5	0.67
Mammalia	**3**	**1+ 33**	**1- 2**	**1- 0**	**3**	**14**	**15**	**2**	**72**	**9.69**
Aves	**75**	**108**	**100**	**66**	**57**	**113**	**120**	**24**	**663**	**89.23**
Reptilia	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**2**	**0.27**
Evertebrata	**0**	**0**	**0**	**0**	**2**	**4**	**0**	**0**	**6**	**0.81**
Σ	**78**	**141**	**102**	**66**	**62**	**131**	**136**	**27**	**743**	**100.00**
Diversity Index H'	2.16	2.12	1.89	0.88	1.72	2.1	1.68	1.86	2.26	

Sample / vzorka: 1–7: Amman, Jordan University, 8: Amman, Spor City.
Date of collection (sample – date) / dátum zberu (vzorka – dátum): 1 – 9.5.2006, 2 – 1.4.2008, 3 – 11.5.2009, 4 – 14.10.2010, 5 – 7.11.2012, 6 – 27.10.2013, 7 – 4.11.2015, 8 – 26.4.2006 + 27.10.2013.

Appendix 9. Seasonal changes in the diet of the long-eared owl (*Asio otus*) in the environs of Amman. Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these samples (see Methods).
Príloha 9. Sezónne zmeny v potrave myšiarky ušatej (*Asio otus*) v okolí Ammánu. Číselné hodnoty v prílohe sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov vo vzorkách (pozri Metodiku).

sample / vzorka	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Σ**	**%**
taxa / taxón											
Mus sp.	8	1+ 25	6	1- 0	1- 20	1+ 65	8	1- 6		138	9.84
Phylloscopus sp.	3	1+ 10			2	3				18	1.28
Saxicola rubetra		1+ 7								7	0.50
Sylvia sp.	12	22	1+ 23	6	60	53	18	1- 8		202	14.41
Passer domesticus	49	55	24	1+ 37	1+ 153	1- 93	1- 24	1- 33		468	33.38
Lanius sp.	1	3	1	1	1+ 12	2				20	1.43
Rattus norvegicus	1	1			5	1+ 12				19	1.36
Microtus guentheri	9	12	1		1- 7	1+ 49	1- 0	1- 1		79	5.63
Meriones tristrami	1- 1	2- 0			1- 7	2+ 58	2	1- 1	1	70	4.99
Passer hispaniolensis	4			2			1+ 7			13	0.93
Gerbillus dasyurus					1- 0	1- 2		2+ 28		30	2.14
Lacertidae					1- 0	1- 0		2+ 25		25	1.78
Carduelis cannabina	9	1- 2	4		15	1- 8	2	1+ 11		51	3.64
Carduelis chloris	2	5			17	14	1	1+ 13		52	3.71
Fringilla coelebs	7	10	1		8	12	5	1- 0		43	3.7
Streptopelia senegalensis	2	5			6	2	3	2		20	1.43
Pycnonotus xanthopygos	2	3			6	3	3	1		18	1.28
Turdus merula		3			4	3	2		1	13	0.93
Apodemus mystacinus		1				2	4			7	0.50
Phoenicurus ochruros		1	2		3					6	0.43
Acomys cf. *dimidiatus*							1	4		5	0.36
Galerida cristata		3			1	1				5	0.36
Saxicola torquata	1			3			1			5	0.36
Phoenicurus phoenicurus		2			1	2				5	0.36
Erithacus rubecula						5				5	0.36
Luscinia sp.	4						2			6	0.43
Turdus philomelos		3						2		5	0.36
Emberiza sp.		1					4			5	0.36
Mammalia	**1- 20**	**39**	**1- 7**	**2- 0**	**1- 41**	**1+ 191**	**1- 16**	**41**	**1**	**356**	**25.39**
Aves	**99**	**138**	**59**	**1+ 50**	**296**	**1- 215**	**83**	**1- 74**	**1**	**1015**	**72.40**
Reptilia	**0**	**0**	**0**	**0**	**1- 0**	**1- 0**	**0**	**2+ 25**	**0**	**25**	**1.78**
Evertebrata	**0**	**0**	**0**	**0**	**1**	**1**	**2**	**2**	**0**	**6**	**0.43**
Σ	**119**	**177**	**66**	**50**	**338**	**407**	**101**	**142**	**2**	**1402**	**100.00**
Diversity Index H'	2.18	2.37	1.65	0.93	2.3	2.38	2.71	2.22	0.69	2.59	

Sample / vzorka: 1–6: Amman National Parc, 7: Mar j al – Hammam, 8: Wasfi Tal, 9: Dibin.
Date of collection (sample – date) / dátum zberu (vzorka – dátum): 1 – 6.5.2006, 2 – 28.3.2008, 3 – 14.10.2010, 4 – 13.11.2012, 5 – 15.10.2013, 6 – 2.11.2015, 7 – 11.5.2006, 7 – 15.10.2013, 8 – 27.10.2008.

Appendix 10. Comparison of the diets of the long-eared owl (*Asio otus*) in Jordan, Syria and Israel (Obuch 2011a + author's data). Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these countries (see Methods).
Príloha 10. Porovnanie potravy myšiarky ušatej (*Asio otus*) v Jordánsku, Sýrii a v Izraeli (Obuch 2011a + údaje autora). Číselné hodnoty v prílohe sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov v krajinách (pozri Metodiku).

country / štát	**Jordan**		**Syria**		**Israel**		**Σ**	**%**
no. of localities / počet lokalít	8		4		2		14	
taxa / taxón								
Passer domesticus	1+	999	1-	105	6-	0	1104	30.62
Carduelis cannabina	1+	101	1-	5	2-	4	110	3.5
Carduelis chloris	1+	90	2-	0		13	103	2.86
Fringilla coelebs	1+	72		8	2-	0	80	2.22
Emberiza sp.	1+	40		2	1-	1	43	1.19
Microtus guentheri	1+	80	2-	0	2-	0	80	2.22
Cricetulus migratorius	1+	26			1-	0	26	0.72
Mus sp.	1-	211	2+	160	2-	18	389	10.79
Meriones libycus	2-	0	2+	23			23	0.64
Gryllotalpa sp.	2-	0	2+	15		1	16	0.44
Lacertidae		28	1+	14	1-	2	44	1.22
Aselia tridens	1-	0	1+	6			6	0.17
Eliomys melanurus	1-	0	1+	10			10	0.28
Allactaga euphratica	1-	0	1+	11			11	0.31
Alauda arvensis	1-	4	1+	10		5	19	0.53
Hirundo rustica	1-	3	1+	7		2	12	0.33
Delichon urbica	1-	2	1+	7		1	10	0.28
Riparia riparia		5	1+	7			12	0.33
Rhodospiza obsoleta	1-	0	1+	7			7	0.19
Passer hispaniolensis	1-	21	1+	12		13	46	1.28
Jaculus jaculus	2-	0	1+	10	1+	11	21	0.58
Gerbillus andersoni	4-	0	1-	0	2+	55	55	1.53
Gerbillus henleyi	2-	0		1	2+	20	21	0.58
Meriones sacramenti	2-	0			2+	14	14	0.39
Sylviidae	1-	347	2-	24	2+	311	682	18.92
Gerbillus nanus	1-	0			1+	10	10	0.28
Erithacus rubecula		7		1	1+	7	15	0.42
Gerbillus dasyurus		37	1-	0		5	42	1.17
Streptopelia senegalensis		36	1-	0		6	42	1.17
Pycnonotus xanthopygos		29	1-	0		11	40	1.11
Meriones tristrami		100		14		21	135	3.74
Lanius sp.		31		7		9	47	1.30
Galerida cristata		15		7		3	25	0.69
Rattus norvegicus		21					21	0.58
Turdus merula		19					19	0.53
Suncus etruscus		6		4		1	11	0.31
Motacilla alba		11					11	0.31
Luscinia sp.		10		1			11	0.31
Jynx torquilla		6				4	10	0.28
Saxicola torquata		5		1		4	10	0.28
Turdus philomelos		10				1	11	0.31
Mammalia	**1-**	**497**	**1+**	**251**		**164**	**912**	**25.30**
Aves		**1953**	**1-**	**234**		**426**	**2613**	**72.48**
Reptilia		**28**	**1+**	**14**		**3**	**45**	**1.25**
Evertebrata	**1-**	**15**	**1+**	**17**		**3**	**35**	**0.97**
Σ		**2493**		**516**		**596**	**3605**	**100.00**
Diversity Index H'		2.46		2.64		2.20	2.76	

Appendix 11. Comparison of the diets of the Lilith owlet (*Athene lilith*) in Jordan and Syria and the little owl (*Athene noctua*) in Egypt (Obuch & Krištín + author's data). Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these countries (see Methods).
Príloha 11. Porovnanie potravy kuvika sýrskeho (*Athene lilith*) v Jordánsku, a v Sýrii a kuvika obyčajného (*Athene noctua*) v Egypte (Obuch & Krištín + údaje autora). Číselné hodnoty v prílohe sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov v krajinách (pozri Metodiku).

country / štát	**Jordan**		**Egypt**		**Syria**		**Σ**	**%**
no. of localities / počet lokalít		**14**		**5**		**15**	**24**	
taxa / taxón								
Acomys sp.	1+	59	1-	1	3-	1	61	0.67
Gerbillus dasyurus	1+	56	2-	0		49	105	1.15
Sylviidae	1+	35		4	1-	11	50	0.55
Scorpionida	1+	280	4-	2	1-	151	433	4.76
Orthoptera	1+	683	1+	215	1-	220	1118	12.28
Dermaptera	5-	0	3+	176	1-	47	223	2.45
Araneida	3-	0	2+	25		16	41	0.45
Mus sp.	3-	10	2+	95		112	217	2.38
Gerbillus amoenus	1-	0	2+	15	1-	0	15	0.16
Gerbillus pyramidum			1+	9	1-	0	9	0.10
Rattus rattus		1	1+	8		3	12	0.13
Mantodea	1-	0	1+	12	1-	2	14	0.15
Diptera		9	1+	13	2-	1	23	0.25
Coleoptera		1084	1+	579		1396	3059	33.60
Cricetulus migratorius	2-	3	1-	0	1+	38	41	0.45
Gerbillus cheesmani	2-	0	1-	0	1+	28	28	0.31
Meriones tristrami		40	2-	0	1+	65	105	1.15
Agamidae		14	1-	0	1+	30	44	0.48
Hymenoptera		844	3-	49	1+	1358	2251	24.73
Solifugida		182	1-	53	1+	304	539	5.92
Allactaga euphratica		10	1-	0		21	31	0.34
Passer domesticus		37	1-	3		59	99	1.9
Lacertidae		80		34		122	236	2.59
Meriones libycus		8				13	21	0.23
Apodemus mystacinus		9				8	17	0.19
Oenanthe sp.		7		1		8	16	0.18
Galerida cristata		3		1		9	13	0.14
Coturnix coturnix		7				4	11	0.12
Lanius sp.		5		2		4	11	0.12
Petronia petronia		4				7	11	0.12
Mammalia	**1-**	**224**	**1+**	**132**		**367**	**723**	**7.94**
Aves		**165**	**1-**	**20**		**184**	**369**	**4.5**
Amphibia, Reptilia		**96**		**36**		**155**	**287**	**3.15**
Evertebrata		**3088**		**1127**		**3510**	**7725**	**84.85**
Σ		**3573**		**1315**		**4216**	**9104**	**100.00**
Diversity Index H'		2.9		1.90		2.9	2.21	

Appendix 12. Seasonal changes in the diet of the tawny owl (*Strix aluco*) in the cave and the rocks at Iraq al Wahaj.
Key: Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these samples (see Methods).
Príloha 12. Sezónne zmeny v potrave sovy obyčajnej (*Strix aluco*) v jakyni a v skalách Iraq al Wahaj.
Vysvetlivky: Číselné hodnoty v prílohe sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov vo vzorkách (pozri Metodiku).

sample / vzorka	**1**	**2**	**3**	**4**	**5**	**7**	**6**	**8**	**9**	**Σ**	**%**
taxa / taxón											
Rousettus aegyptiacus	1+ 20	6	2	5	2		1- 1	1- 0	1- 0	36	3.96
Solifugida	1+ 11	3	4	2	2		1- 0	2	1	25	2.75
Coleoptera	22	2+ 41	3	10	9	7	1- 7	1- 4	1- 6	109	12.00
Orthoptera	7	1+ 17	6	1	3	3	2- 0	6	1+ 14	57	6.28
Turdus philomelos	2	1		1+ 5					1	9	0.99
Passer domesticus	1- 0	1	5	1+ 7	2	3	7		1	26	2.86
Lacertidae	7	3	4	4	2	1+ 10	1+ 15	4	1- 2	51	5.62
Apodemus mystacinus	1- 16	2- 2	6	1- 7	1- 3	12	1+ 43	1+ 31	1+ 39	159	17.51
Mus sp.	1- 6	1- 2	5	10	5	1	1+ 21	1+ 21	11	82	9.3
Acomys cf. *dimidiatus*	2	1			1		1+ 10	1+ 8	2	24	2.64
Gerbillus dasyurus	1- 3	1- 2	1	8	5	5	12	1+ 17	15	68	7.49
Apodemus flavicollis	2	2		1			4	1+ 11	1+ 13	33	3.63
Rattus norvegicus		1					2		1+ 6	9	0.99
Sylviidae	4	2	5	6	2	2	7	1	7	36	3.96
Nannospalax ehrenbergi	4	1	3	1	3	2	1	2	2	19	2.9
Turdus merula	1	1			4	1	6		1	14	1.54
Meriones tristrami	6		1	2			2		1	12	1.32
Crocidura suaveolens	3	1			1			5		10	1.10
Rattus rattus	5		1	2			1			9	0.99
Fringilla coelebs	4	3				1				8	0.88
Luscinia sp.	3	1	1		1		1			7	0.77
Agamidae	2	1		1		2	1			7	0.77
Streptopelia senegalensis		1			2		2		1	6	0.66
Phoenicurus phoenicurus	2					1		3		6	0.66
Carduelis chloris	2	1	1	1				1		6	0.66
Garrulus glandarius	1	1			2			1	1	6	0.66
Pycnonotus xanthopygos			2				3			5	0.55
Mammalia	**68**	**1- 19**	**1- 19**	**37**	**20**	**1- 20**	**98**	**1+ 99**	**1+ 91**	**471**	**51.87**
Aves	**35**	**17**	**15**	**1+ 24**	**1+ 16**	**9**	**33**	**1- 10**	**1- 15**	**174**	**19.16**
Amphibia, Reptilia	**10**	**4**	**4**	**5**	**2**	**1+ 13**	**1+ 18**	**4**	**1- 2**	**62**	**6.83**
Evertebrata	**43**	**2+ 63**	**15**	**13**	**14**	**13**	**2- 7**	**1- 12**	**21**	**201**	**22.14**
Σ	**156**	**103**	**53**	**79**	**52**	**55**	**156**	**125**	**129**	**908**	**100.00**
Diversity Index H'	3.13	2.42	2.72	2.77	2.75	2.46	2.57	2.42	2.38	3.11	

Sample / vzorka: 1–6 – cave, 7–9 – rock.
Date of collection (sample – date) / dátum zberu (vzorka – dátum): 1 – 25.10.2008, 2 – 26.5.2009, 3 – 4.10.2010, 4 – 9.11.2012, 5 – 30.10.2013, 7 –9.11.2012, 6 – 6.11.2015, 8 – 30.10.2013, 9 – 6.11.2015.

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Appendix 13. Comparison of the diets of the tawny owl (*Strix aluco*) in Jordan, Israel, Lebanon and Syria (Obuch 2011b). Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species in these countries (see Methods).
Príloha 13. Porovnanie potravy sovy obyčajnej (*Strix aluco*) v Jordánsku, Izraeli, Libanone a v Sýrii (Obuch 2011b). Číselné hodnoty v prílohe sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov v krajinách (pozri Metodiku).

country / štát	**Jordan**		**Israel**		**Lebanon**		**Syria**		**Σ**	**%**
no. of localities / počet lokalít		**8**		**1**		**2**		**2**	**13**	
taxa / taxón										
Rousettus aegyptiacus	1+	36			1-	0	1-	0	36	1.78
Nannospalax ehrenbergi	1+	22				1	1-	0	23	1.13
Gerbillus dasyurus	1+	72		3	2-	0	2-	0	75	3.70
Lacertidae	1+	58			2-	1		7	66	3.26
Orthoptera	1+	67			1-	3	2-	2	72	3.55
Solifugida	1+	40			1-	1	1-	1	42	2.7
Acomys cf. *dimidiatus*		28	1+	9	1-	0	1-	0	37	1.83
Meriones tristrami		34	1+	7	2-	0		11	52	2.57
Pipistrellus pipistrellus	2-	0			2+	16		1	17	0.84
Microtus socialis	2-	0			2+	15			15	0.74
Petronia petronia	1-	1			2+	15			16	0.79
Limacidae	4-	0			2+	85	2-	2	87	4.29
Apodemus witherbyi	1-	7			1+	14			21	1.4
Chionomys nivalis	1-	0			1+	11			11	0.54
Passer domesticus		29			1+	21	1-	5	55	2.71
Scincidae	1-	0			1+	10			10	0.49
Microtus guentheri	2-	12		4	1+	58	1+	47	121	5.97
Hyla savignyi	2-	0			1-	0	2+	26	26	1.28
Crocidura suaveolens		16				5	1+	13	34	1.68
Dryomys nitedula	2-	0				7	1+	8	15	0.74
Rattus rattus	1-	9		1		5	1+	10	25	1.23
Coleoptera		118	1-	1	3-	3	1+	56	178	8.78
Hymenoptera		6					1+	7	13	0.64
Apodemus mystacinus		306	1-	3	2-	20		91	420	20.72
Sylviidae		37		3		12	1-	4	56	2.76
Mus cf. *macedonicus*		92		6		26		28	152	7.50
Apodemus flavicollis		63		2		12		21	98	4.83
Turdus merula		17				1			18	0.89
Fringilla coelebs		10		3				2	15	0.74
Turdus philomelos		12							12	0.59
Cricetulus migratorius		10				1			11	0.54
Rattus norvegicus		9						1	10	0.49
Agamidae		9						1	10	0.49
Mammalia		**724**		**39**		**193**		**242**	**1198**	**59.10**
Aves		**196**	**1+**	**21**		**65**	**1-**	**22**	**304**	**15.00**
Amphibia, Reptilia		**72**		**2**	**1-**	**11**	**1+**	**35**	**120**	**5.92**
Evertebrata		**238**	**2-**	**1**	**1+**	**96**		**70**	**405**	**19.98**
Σ		**1230**		**63**		**365**		**369**	**2027**	**100.00**
Diversity Index H'		3.3		2.93		2.77		2.61	3.31	

Appendix 14. For appendix see page 32.
Príloha 14. Príloha je na strane 32.

Appendix 15. Comparison of the diet spectra of seven owl species in Jordan. Numerical data in the table are given in absolute values, and positive and negative deviations (e.g 1+, 2+, 1-, 2-) are marked deviations from the mean (MDFM, Obuch 2001) for the species of these owls' prey (see Methods).
Príloha 15. Porovnanie potravných spektier 7 druhov sov v Jordánsku. Číselné hodnoty v prílohe sú uvedené v absolútnych hodnotách, kladné a záporné odchýlky (1+, 2+, 1-, 2- a podobne) sú výrazné odchýlky od priemeru (MDFM, Obuch 2001) druhov koristi u druhov sov (pozri Metodiku).

owl species / druh sovy	**B.b.**		**S.a.**		**A.o.**		**T.a**		**A.l.**		**S.b.**		**B.a.**		**Σ**	**%**
taxa / taxón																
Erinaceus concolor	3+	59		1	2-	0	2-	0	2-	0	2-	0			60	0.42
Columba livia	3+	102	2-	0	3-	0	2-	3	3-	1	2-	2	1-	0	108	0.76
Garrulus glandarius	3+	96		6	3-	0	2-	1	3-	1	2-	0	1-	0	104	0.73
Rattus norvegicus	3+	100		9		21	3-	0	4-	0	3-	0	1-	0	130	0.92
Hemiechinus auritus	2+	17						2	1-	0				1	20	0.14
Falco tinnunculus	2+	11								1					12	0.08
Alectoris chukar	2+	20		1	1-	0		1	1-	0		2			24	0.17
Coturnix coturnix	2+	29	1-	0	1-	3		7	1-	7		4		7	57	0.40
Crex crex	2+	17		2	1-	0		1	1-	0				3	23	0.16
Luscinia sp.	2+	23		8		10	1-	4	1-	2	1-	0		2	49	0.34
Bufotes variabilis	2+	12								1					13	0.09
Lepus europaeus	1+	11						1						1	13	0.09
Eliomys melanurus	1+	12						1	1-	0		5		1	19	0.13
Ammoperdix heyi	1+	8		1						1		4		4	18	0.13
Columba oenas	1+	5										2			7	0.05
Otus scops	1+	5		1										1	7	0.05
Athene lilith	1+	11						2		1				1	15	0.11
Pica pica	1+	9		1											10	0.07
Petronia petronia	1+	7		1		1				4		5			18	0.13
Decapoda	1+	10						1							11	0.08
Meriones tristrami	2+	395	2-	34	1-	100	1+	471	3-	40	2-	47	4-	0	1087	7.65
Nannospalax ehrenbergi	2+	47	1+	22	2-	0		14	3-	1	2-	1	1-	0	85	0.60
Apodemus mystacinus	1-	13	3+	306	3-	7	3-	8	3-	9	3-	6	3-	0	349	2.46
Apodemus flavicollis	1-	0	3+	63	2-	0	2-	0	2-	0	2-	0			63	0.44
Rousettus aegyptiacus			3+	36	1-	0	1-	0	2-	0	1-	0			36	0.25
Apodemus witherbyi			1+	7											7	0.05
Turdus philomelos		7	1+	12		10	2-	0	1-	4		8			41	0.29
Phoenicurus phoenicurus			1+	6		6		1		1		1			15	0.11
Crocidura suaveolens		1	1+	16	1-	1	1+	21	2-	0		4			43	0.30
Rattus rattus		3	1+	9	1-	0	1+	16	1-	1	1-	0			29	0.20
Turdus merula	1+	13	1+	17	1+	19	1-	1	2-	1	1-	0			51	0.36
Streptopelia senegalensis	1+	15		6	1+	36		18	2-	3	2-	1		2	81	0.57
Sylviidae		58	1-	37	2+	347	2-	32	2-	35	2-	19	1+	48	576	4.6
Lanius sp.		3		1	2+	31	1-	3	1-	5		3		6	52	0.37
Emberiza sp.		4		2	2+	40	1-	1	1-	4		4		2	57	0.40
Pycnonotus xanthopygos		2		5	2+	29	1-	2	1-	2		2			42	0.30
Fringilla coelebs		6		10	2+	72	3-	0	3-	0	2-	0	1-	0	88	0.62
Carduelis cannabina	2-	0	1-	1	2+	101	3-	1	3-	0	1-	4	1-	0	107	0.75
Carduelis chloris	1-	2		6	2+	90	2-	1	3-	0	1-	3	1-	0	102	0.72
Passer domesticus	3-	11	2-	29	2+	999		237	3-	37	4-	11	3-	11	1335	9.40
Passer hispaniolensis					1+	21		10	1-	3	1-	0		1	35	0.25
Jynx torquilla		1			1+	6									7	0.05
Galerida cristata		3			1+	15		3		3		2		1	27	0.19
Motacilla alba					1+	11		3		1					15	0.11
Saxicola rubetra					1+	7									7	0.05
Erithacus rubecula				4	1+	7									11	0.08

Appendix 15. Continuation.
Príloha 15. Pokračovanie.

owl species / druh sovy taxa / taxón	B.b.		S.a.		A.o.		T.a		A.l.		S.b.		B.a.		Σ	%
Serinus serinus					1+	6									6	0.04
Mus sp.	4-	7		92		211	2+	881	5-	10	5-	3	1-	46	1250	8.80
Microtus guentheri	3-	4	2-	12		80	2+	441	5-	1	5-	0	3-	0	538	3.79
Cricetulus migratorius		24	1-	10	1-	26	2+	139	3-	3	3-	0	2-	0	202	1.42
Suncus etruscus	2-	0	1-	4	1-	6	2+	92	2-	5	2-	1	1-	1	109	0.77
Crocidura leucodon				1			2+	19	1-	0					20	0.14
Allactaga euphratica					1-	0	1+	18		10	1-	0		5	33	0.23
Hirundo rustica				2		3	1+	10	1-	1		2		3	21	0.15
Phoenicurus ochruros		1				6	1+	14	1-	0					21	0.15
Meriones libycus	2-	0	2-	0	3-	0	2+	60	1-	8		9	2+	26	103	0.73
Diptera									1+	9					9	0.06
Hymenoptera	5-	1	3-	6	4-	7	5-	4	2+	844	1-	110	4-	1	973	6.85
Coleoptera	5-	3	1-	118	6-	4	5-	12	1+	1084	1+	630	3-	13	1864	13.12
Orthoptera	3-	10	1-	65	5-	3	4-	9	2+	683	1+	209	2-	14	993	6.99
Scorpionida	1-	28	3-	4	5-	0	4-	5	1+	280	1+	105	1+	67	489	3.44
Solifugida	2-	7		40	4-	1	4-	4	1+	182	1+	112	1+	30	376	2.65
Lacertidae	2-	4	1+	58	1-	28	2-	12		80	2+	125	1+	27	334	2.35
Gerbillus dasyurus	1-	27	1+	72	2-	37		96	2-	56	2+	248		34	570	4.1
Acomys sp.		20		28	3-	5	3-	2		59	2+	141	2-	0	255	1.80
Tadarida teniotis											1+	7			7	0.05
Apus pallidus											1+	5			5	0.04
Carpodacus syonicus								1		2	1+	10			13	0.09
Jaculus jaculus	3-	0	2-	0	3-	0	1-	25	2-	6	2-	2	4+	140	173	1.22
Meriones crassus	2-	0	2-	0	2-	1	1-	7	2-	6		21	3+	75	110	0.77
Streptopelia turtur		1		1		4	1-	1	2-	0	1-	0	3+	43	50	0.35
Agamidae		10		9	3-	0	1-	11	1-	14	1-	7	3+	57	108	0.76
Paraechinus aethiopicus		2										1	1+	6	9	0.06
Gerbillus nanus								8	1-	0		6	1+	6	20	0.14
Merops apiaster		5										2	1+	5	12	0.08
Riparia riparia		2		2		5		7	1-	0		1		1	18	0.13
Pelophylax cf. *bedriagae*		5		5				5		1		2			18	0.13
Ptyonoprogne rupestris		1		4		3		2		1		3			14	0.10
Delichon urbica		2		1		2				1		6			12	0.08
Upupa epops		2		1		5				3		1			12	0.08
Carduelis carduelis						6		1		2		3			12	0.08
Alauda arvensis						4		6		1					11	0.08
Streptopelia decaocto		5		2		1		1						1	10	0.07
Mammalia	**1+**	**751**	**1+**	**724**	**1-**	**497**	**1+**	**2326**	**3-**	**224**	**1-**	**518**	**1+**	**347**	**5387**	**37.93**
Aves	**1+**	**541**	**1-**	**196**	**2+**	**1953**	**1-**	**408**	**3-**	**165**	**2-**	**162**		**176**	**3601**	**25.35**
Amphibia, Reptilia, Pisces	**1-**	**32**	**1+**	**72**	**2-**	**28**	**2-**	**28**	**1-**	**96**	**1+**	**137**	**2+**	**85**	**478**	**3.37**
Evertebrata	**3-**	**60**	**1-**	**238**	**6-**	**15**	**5-**	**38**	**2+**	**3088**	**1+**	**1173**	**1-**	**125**	**4737**	**33.35**
Σ		**1384**		**1230**		**2493**		**2800**		**3573**		**1990**		**733**	**14,203**	**100.00**
Diversity Index H'		3.19		3.4		2.46		2.40		2.9		2.56		2.95	3.39	

Owl / sova: B.b. – *Bubo bubo*, S.a. – *Strix aluco*, A.o. – *Asio otus*, T.a. – *Tyto alba*, A.l. – *Athene lilith*, S.b. – *Strix butleri*, B.a. – *Bubo ascalaphus*.