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Survey of the small mammal fauna in north-western Somogy county (Hungary), based on Barn Owl *Tyto alba* (Scopoli, 1769) pellet analysis

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Purger, J. J.: *Survey of small mammal fauna in north-western Somogy county (Hungary), based on Barn Owl Tyto alba (Scopoli, 1769) pellet analysis.*

Abstract: Barn Owl pellets were collected in Somogy county between 1994 and 2012, from 30 localities (investigated area: XM65, XM77, XM76, XM75, XM87, XM86, XM85, XM97 and XM96 UTM grids). In a total of 3114 Barn Owl pellets there were 9693 prey remnants (the prey per pellet ratio was 3.1). Small mammals were dominating (98.4%). Remnants of birds, amphibians and insects made up 1.6% of total prey. Mammal prey consisted of Soricomorpha (*Crocidura leucodon, C. suaveolens, Sorex araneus, S. minutus, Neomys anomalus, N. fodines*) 46.7%, Chiroptera (*Eptesicus serotinus, Pipistrellus nathusii, Nyctalus noctula, Plecotus auritus, P. austriacus, Myotis myotis*) 0.1% and Rodentia (*Muscardinus avellanarius, Microtus agrestis, M. arvalis, M. oeconomus, M. subterraneus, Arvicola amphibius, Myodes glareolus, Apodemus agrarius, A. flavicollis, A. sylvaticus, A. uralensis, Micromys minutus, Mus musculus, M. spicilegus, Rattus norvegicus*) 53.2%. In this paper, distribution data for 27 small mammal species are presented. Other important results include the confirmation of the occurrence of Pygmy Field Mouse (*Apodemus uralensis*), noted in two new locations (UTM: XM85, XM96) in Somogy county, as well as the finding of Root Vole (*Microtus oeconomus*) remnants from new localities (UTM: XM87, XM86, XM97, XM96).

Keywords: diet, prey, distribution, Soricomorpha, Chiroptera, Rodentia

Introduction

There is a great tradition of owl pellet analysis in Hungary, this effective indirect method often being used for surveying small mammal faunas of particular areas (Schmidt 1967a, Kalivoda 1999, Bihari et al. 2007). During the recent two decades, we have prioritised the collecting and analysis of Barn Owl (*Tyto alba*) pellets in order to obtain as complete picture of small mammal distribution in Somogy county as possible. As part of the systematic surveying of the small mammal fauna in the county, so far 18 thousand pellets have been analysed, yielding remnants of almost 53 thousand small mammal individuals (Purger 1996, 1997, 1998, 2002, 2004, 2005, 2008, 2013).

Earlier mammalogical studies in the north-western part of Somogy county were performed mostly in the Kis-Balaton area (Lanszki & Purger 2001). The locations of research were quite often referred to as „Kis-Balaton" or „Kisbalaton" only (e.g. Vasvári 1930, Schmidt 1967b, 1974a, b, Szabó 1969), making it difficult without exact locations to provide a sound faunal evaluation of these data. The larger, western part of

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the Kis-Balaton belongs to Zala county. From areas east of the protected area, we find less published data; therefore it was justified to carry out a survey of small mammal fauna in north-western Somogy county.

For most of the research activities that started nearly a hundred years ago, the primary goal has been, instead of surveying or presenting data about the small mammal fauna (VÁSÁRHELYI 1939a, b, MAJER 1992, LELKES 1994, LELKES & HORVÁTH 2000, LANSZKI 2004, FEHÉR et al. 2005, LANSZKI et al. 2008), to indicate the parasite fauna of certain mammal species (e.g. SZABÓ 1964, 1969, 1973, PIOTROWSKI 1970, MURAI 1972, 1974, AMBROS 1982, KOVÁČIK 1982, MOLNOS 1982), to investigate the stomach content and pellet composition of owls (GRESCHIK 1911, SCHMIDT 1973, 1974a, b, 1976), or to analyse the food composition of carnivorous mammal species (LANSZKI 2005). Regarding the Root Vole (*Microtus oeconomus*), a strictly protected glacial relict species, special attention was devoted in the region to exploring its occurrence locations (e.g. ÉHIK 1952, SZUNYOGHY 1954, HAVRANEK 1961, SZÖRÉNYI 1987, LELKES & HORVÁTH 2000, LANSZKI & ROZNER 2007), telling about its research history (GUBÁNYI et al. 2004), monitoring its population (HORVÁTH 2004), as well as to finding out about factors influencing the survival of its populations, and to producing nature conservation strategies (HORVÁTH & GUBÁNYI 2004). Besides all the published data, the Atlas of mammals of Hungary was produced including data from collections and various databases processed, as well as other mammalogical data from other sources of information (BIHARI et al. 2007). Distribution maps of the particular species contain data collected after 1980 only, thus they depict the current occurrence situation (BIHARI et al. 2007). The distribution maps of the mammalogical atlas already include (formerly unpublished) data from seven of our samples (XM76: Sávoly - 04; XM75: Nemesvid - 10a and 10b; XM86: Sáripuszta - 15; XM85: Cserfekvés - 20b; XM97: Imremajor- 21; XM96: Táska - 29, Table 1.), thus the research deficiencies mentioned above are no longer that striking. There are practically no literature data from the XM76 and XM87 grids and the Somogy county areas of the XM65 grid, and nor did we have processed data from the XM65 and XM87grids from our collecting activity, thus these grids remained to be white spots regarding the distribution maps of most of the species (BIHARI et al. 2007).

Despite the abundance of mammalogical literature in the area of north-western Somogy county data had been deficient about the majority of small mammal species. The aim of our study has been to completely survey the small mammal fauna in this area by systematically collecting and analysing Barn Owl pellets.

Material and methods

For assessing small mammal fauna, the method of Barn Owl pellet analysis was used (SCHMIDT 1967a, MIKUSKA et al. 1979). The method is based on the fact that usually there are large amounts of pellets available at the nesting and roosting places of the owls. Based on skulls, mandibles and teeth intactly surviving in the pellets, it is possible to precisely separate the different small mammal species, and the results reflect the small mammal fauna of the surrounding areas (SCHMIDT 1967a).

Small mammal fauna surveying was done on the grounds of 10×10 km UTM grid maps (MISKOLCZI et al. 1997), in particular locations corresponding with the given sites or grids, this way ensuring the compatibility of the new fauna (biotic) data with our earlier surveys (DÉVAI et al. 1997). The pellets were collected between the years 1994 and 2012, from the area of nine UTM grids (XM65, XM77, XM76, XM75, XM87,

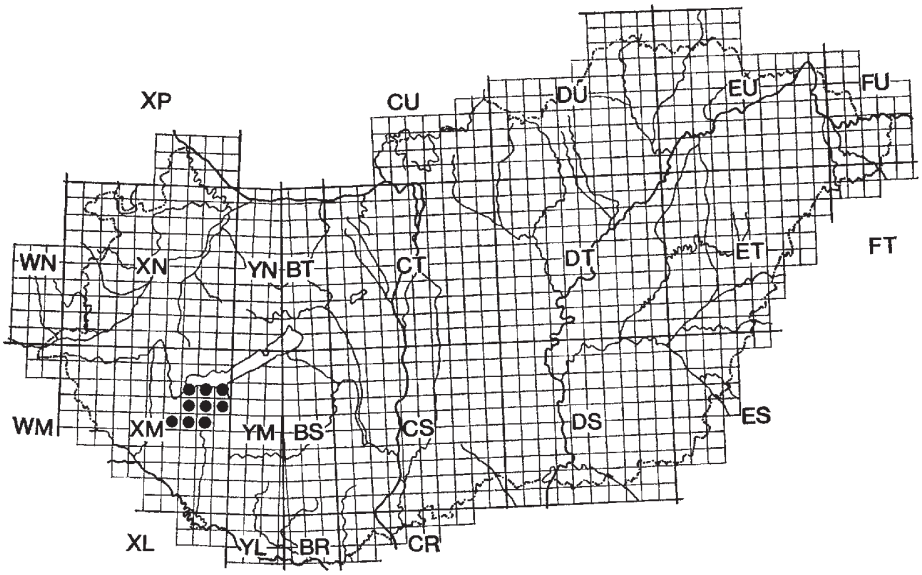

Fig. 1: Location of the investigated area in the UTM grid map of Hungary

XM86, XM85, XM97, XM96) (Fig. 1.), in a total of 30 different sampling sites (Table 1.). In some of the sites we collected more than once, thus the number of processed samples numbered altogether 36, containing 3114 pellets (Table 1.). Surveying the sample areas and collecting the pellets was performed, in addition to the author (JJP), by László Bécsy (LB), Zoltán Horváth (ZH), József Lanszki (JL), Tamás Nyemcsok (TNy), András Pintér (AP), György Rozner (GyR), Zoltán Szegvári (ZSz), and members of the Barn Owl Foundation (BOF) (Table 1.).

Only whole pellets were used for processing, and because it was not possible to securely determine the age of the pellets in most of the cases, the indicated dates refer to the time of collection only (Table 1.). Their disintegration was done using the dry technique, that is, the individual pellets were broken down by hand (SCHMIDT 1967a, MIKUSKA et al. 1979). The identification of small mammals was done on the basis of skeletal parameters (ÁCS 1985, KRYŠTUFEK 1991, KRYŠTUFEK & JANŽEKOVIČ 1999, MÄRZ 1972, NIETHAMMER & KRAPP 1978, 1982, 1990, SCHMIDT 1967a, UJHELYI 1989, ZÖRÉNYI 1990, YALDEN 1977, YALDEN & MORRIS 1990). For the identification of species belonging to the *Sylvaemus* subgenus, the method by TVRTKOVIĆ (1979) was followed. Specimens that were unidentifiable due to damaged skull are listed as *Apodemus* sp. in the tables (Table 2a., 2b., 2c., 3.). The identification of the two species belonging to the *Neomys* genus, i.e. the Water Shrew (*Neomys fodiens*) and the Miller's Water Shrew (*N. anomalus*) was done as described by TVRTKOVIĆ et al. (1980). For differentiating between the Eastern House Mouse (*Mus musculus*) and the Steppe Mouse (*M. spicilegus*) we used the identification key by MACHOLÁN (1996). Problematic or damaged specimens belonging to the Mus and *Rattus* genera were listed as *Mus* sp. and *Rattus* sp. (Table 2a., 2b., 2c., 3.). The scientific and English common names of the small mammal species were used in accordance with the nomenclature in BIHARI et al. (2007).

Table 1: Number of pellets and their prey contents, collected in different localities

No.	Locality	UTM	Date	Collectors	Pellet	Prey
01.	Somogysimonyi (Cath. church.)	XM65	06.10.1995.	ZH	12	38
02.	Balatonszentgyörgy (railway station)	XM77	29.05.2012.	JJP, GyR	3	13
03.	Battyánpuszta (country-seat attic)	XM77	29.05.2012.	JJP, GyR	63	219
04.	Sávoly (Cath. church)	XM76	31.10.1995.	ZH	39	124
05.	Somogysámson (Cath. church.)	XM76	05.09.2011.	TNy, JJP	24	74
06.	Somogysámson (stable)	XM76	05.09.2011.	TNy, JJP	11	37
07.	Horvátkút (Cath. church.)	XM76	20.06.2002.	BOF	45	145
08.	Csákány (Cath. church.)	XM75	12.10.2006.	JL, AP, JJP, ZSz	19	55
09.	Andormajor (granary)	XM75	12.10.2006.	JL, AP, JJP, ZSz	9	27
10a.	Nemesvid (Cath. church.)	XM75	06.10.1995.	ZH	21	79
10b.	Nemesvid (Cath. church.)	XM75	09.02.1999.	BOF	11	44
10c.	Nemesvid (Cath. church.)	XM75	12.10.2006.	JL, AP, JJP, ZSz	296	865
11.	Nagyszakácsi (Cath. church.)	XM75	12.10.2006.	JL, AP, JJP, ZSz	66	197
12.	Balatonújlak (stable)	XM87	27.10.2011.	JJP, GyR	47	152
13.	Pálmajor (stable)	XM87	06.10.1995.	LB, JJP	7	17
14.	Kéthely (stable)	XM86	27.10.2011.	JJP, GyR	200	673
15.	Sáripuszta (water tower)	XM86	06.10.1995.	LB, JJP	180	452
16a.	Somogyszentpál (Cath. church.)	XM86	28.09.2000.	BOF	62	234
16b.	Somogyszentpál (Cath. church.)	XM86	20.06.2002.	BOF	76	250
17.	Marcali-Kisgomba (Cath. church.)	XM86	05.09.2011.	TNy, JJP	66	125
18.	Marcali (Hospital, water tower)	XM86	05.09.2011.	TNy, JJP	15	56
19a.	Mesztegnyő (Cath. church.)	XM85	06.08.1997.	ZH	45	142
19b.	Mesztegnyő (Cath. church.)	XM85	12.10.2006.	JL, AP, JJP, ZSz	290	651
20a.	Cserfekvés (church ruins)	XM85	03.03.1994.	LB, JJP	16	58
20b.	Cserfekvés (church ruins)	XM85	06.07.1995.	ZH	139	550
21.	Imre major (mixing facility)	XM97	06.10.1995.	LB, JJP	111	319
22.	Imremajor (theater)	XM97	29.05.2012.	JJP, GyR	329	850
23.	Csisztapuszta (stable)	XM97	06.10.1995.	LB, JJP	4	11
24.	Csisztapuszta (granary)	XM97	28.12.2006.	GyR	136	519
25.	Kundpuszta (stable)	XM96	28.12.2006.	GyR	33	66
26.	Fehérvízpuszta (stable)	XM96	12.05.1994.	JJP	58	247
27a.	Buzsák (Cath. church)	XM96	06.10.1995.	LB, JJP	289	1043
27b.	Buzsák (Cath. church.)	XM96	14.09.2006.	JL, AP, JJP	266	884
28.	Táska (twilight home)	XM96	06.10.1995.	LB, JJP	80	318
29.	Táska (Cat. church)	XM96	31.07.2002.	BOF	41	137
30.	Nikla (Cath. church.)	XM96	05.09.2011.	TNy, JJP	5	22
	Total				**3114**	**9693**

Table 2a. Number of prey specimens in pellets of Barn Owl in samples (01-10c)

Prey	01.	02.	03.	04.	05	06.	07.	08.	09.	10a.	10b.	10c.
Crocidura leucodon	5	1	29	11	9	2	27	2	0	10	0	54
Crocidura suaveolens	5	1	47	22	3	2	20	8	1	17	6	46
Sorex araneus	1	4	17	7	9	11	4	5	13	5	3	330
Sorex minutus	0	5	4	1	0	3	4	2	1	0	3	46
Neomys anomalus	0	0	6	2	3	1	0	0	1	3	1	20
Neomys fodiens	1	0	3	0	0	0	0	0	0	1	0	4
Pipistrellus nathusii	0	0	1	0	0	0	0	0	0	0	0	0
Plecotus austriacus	0	0	0	0	0	0	1	0	0	0	0	0
Myotis myotis	0	0	0	0	0	0	0	2	0	0	0	1
Muscardinus avellanarius	1	0	1	0	2	0	0	0	0	1	0	4
Microtus agrestis	1	0	4	2	0	1	0	4	0	2	0	31
Microtus arvalis	16	2	21	39	20	8	49	10	9	24	19	171
Microtus subterraneus	0	0	1	1	2	1	12	8	0	0	3	16
Arvicola amphibius	1	0	0	1	2	0	0	0	0	1	0	4
Myodes glareolus	1	0	23	0	1	3	0	0	0	5	0	12
Apodemus agrarius	1	0	28	12	2	2	2	7	0	0	2	21
Apodemus flavicollis	0	0	14	2	5	2	4	1	0	1	1	1
Apodemus sylvaticus	0	0	4	4	5	0	9	2	1	4	0	13
Apodemus sp.	1	0	5	6	9	1	4	1	0	0	0	11
Micromys minutus	4	0	4	6	0	0	1	1	0	5	3	10
Mus musculus	0	0	4	8	2	0	4	1	0	0	1	15
Mus spicilegus	0	0	0	0	0	0	2	0	0	0	1	0
Mus sp.	0	0	0	0	0	0	0	0	0	0	0	1
Rattus norvegicus	0	0	0	0	0	0	1	1	0	0	1	0
Aves (indet.)	0	0	2	0	0	0	1	0	0	0	0	48
Amphibia (*Pelobates fuscus*)	0	0	1	0	0	0	0	0	1	0	0	5
Insecta Coleoptera (Ditiscus)	0	0	0	0	0	0	0	0	0	0	0	1
Total	**38**	**13**	**219**	**124**	**74**	**37**	**145**	**55**	**27**	**79**	**44**	**865**

Results and discussion

The majority of Barn Owl pellets (47%) in the studied area were found in church towers and attics. Other important collecting sites included farm buildings such as stables, barns, granaries (33%), water towers and the attic of other public buildings (20%). Altogether 3114 pellets were collected, of which the remnants of 9693 prey items were separated (Table 1.). One pellet contained remnants of an average of 3.1 prey animals. The food of Barn Owls living in the study area was dominated by small mammals (98.4%). Only 1.6% of the prey was made up by bird, amphibian and insect remains (Table 2a., 2b., 2c). The analysed pellets revealed the remnants of 9536 small mammal individuals of 27 species (Table 3). Altogether 46.7% of the mammalian prey was made up by species belonging to the families of shrews (Soricidae), 0.1% to common bats (Vespertilionidae), 0.3% to dormice (Gliridae), 37.1% to hamsters (Cricetidae) and 15.8% to mice (Muridae).

Among the 6 shrew species found in the pellets, the dominant species were the Common Shrew (*Sorex araneus*), the Lesser White-toothed Shrew (*Crocidura suaveo-*

Table 2b. Number of prey specimens in pellets of Barn Owl in samples (11-20a)

Prey	11.	12.	13.	14.	15	16a.	16b.	17.	18.	19a.	19b.	20a.
Crocidura leucodon	20	17	1	95	17	8	3	12	9	0	43	12
Crocidura suaveolens	17	44	2	93	28	9	26	3	6	5	29	4
Sorex araneus	25	13	3	93	6	91	71	4	16	39	66	7
Sorex minutus	11	3	0	35	0	17	10	2	5	12	18	13
Neomys anomalus	4	1	0	46	2	7	4	0	8	5	8	0
Neomys fodiens	0	2	0	5	0	4	2	0	0	2	2	0
Eptesicus serotinus	0	0	0	0	0	0	0	0	0	0	1	0
Plecotus auritus	0	0	0	0	1	0	0	0	0	0	0	0
Muscardinus avellanarius	1	0	0	1	0	0	1	1	0	0	2	0
Microtus agrestis	13	2	1	14	9	7	4	11	0	3	11	4
Microtus arvalis	49	30	4	125	308	29	50	30	7	42	244	15
Microtus oeconomus	0	2	0	1	0	2	7	0	0	0	0	0
Microtus subterraneus	6	13	0	10	8	4	11	4	0	6	33	0
Arvicola amphibius	1	1	0	9	0	0	2	2	1	0	2	0
Myodes glareolus	6	1	1	7	3	8	9	2	2	1	24	2
Apodemus agrarius	11	6	2	34	28	23	23	16	1	8	28	0
Apodemus flavicollis	8	2	3	16	6	0	6	8	0	3	18	0
Apodemus sylvaticus	6	7	0	23	8	5	2	11	0	2	27	0
Apodemus uralensis	0	0	0	0	0	0	0	0	0	0	2	0
Apodemus sp.	11	2	0	16	8	7	6	9	1	6	28	0
Micromys minutus	1	0	0	11	5	8	4	1	0	1	7	0
Mus musculus	1	3	0	16	3	1	3	9	0	4	31	0
Mus spicilegus	1	0	0	3	8	1	1	0	0	1	1	1
Mus sp.	0	0	0	0	2	0	0	0	0	1	1	0
Rattus norvegicus	0	0	0	1	0	0	0	0	0	0	9	0
Rattus sp.	0	0	0	0	0	0	0	0	0	0	3	0
Aves (indet.)	5	3	0	0	2	3	1	0	0	1	13	0
Amphibia (*Pelobates fuscus*)	0	0	0	18	0	0	4	0	0	0	0	0
Insecta Coleoptera (Ditiscus)	0	0	0	1	0	0	0	0	0	0	0	0
Total	**197**	**152**	**17**	**673**	**452**	**234**	**250**	**125**	**56**	**142**	**651**	**58**

lens) and the Bicoloured White-toothed Shrew (*Crocidura leucodon*), found in large numbers in almost every sample (Table 2a., 2b., 2c.). Small numbers were found almost everywhere of the Pigmy Shrew (*Sorex minutus*) and Miller's Water Shrew (*Neomys anomalus*) except in grid XM65, and Water Shrew (*Neomys fodiens*) exept for grid XM76 (Table 3.). There are occurrence data in literature about the aforementioned shrew species (e.g. VÁSÁRHELYI 1939a, SCHMIDT 1973, 1976, LELKES 1994, LANSZKI 2004, LANSZKI & ROZNER 2007, LANSZKI et al. 2008), yet we have little knowledge about the distribution of some of them. However, for the completion of the distribution maps of the mammalogical atlas (BIHARI et al. 2007), data about the seven (formerly unpublished) samples mentioned in the introduction (04, 10a, 10b, 15, 20b, 21 and 29, Table 1.) were already taken into account. There are no literature data from the XM65 and XM87 grids, and we did not have processed samples at the time of data collecting for

Table 2c. Number of prey specimens in pellets of Barn Owl in samples (20b-30)

Prey	20b.	21.	22.	23.	24	25.	26.	27a.	27b.	28.	29.	30.
Crocidura leucodon	88	15	117	0	68	2	16	149	145	37	5	0
Crocidura suaveolens	59	36	91	2	146	8	17	106	113	65	7	3
Sorex araneus	33	40	187	0	146	11	91	135	128	39	26	9
Sorex minutus	41	2	22	0	16	2	20	46	34	18	19	2
Neomys anomalus	2	1	19	0	9	1	0	1	15	5	0	1
Neomys fodiens	0	1	5	0	1	0	0	3	8	0	0	0
Nyctalus noctula	0	0	1	0	0	0	0	0	0	0	0	0
Myotis myotis	0	0	0	0	0	0	0	0	1	0	0	0
Muscardinus avellanarius	0	2	1	0	2	0	2	1	4	1	0	0
Microtus agrestis	4	3	9	0	2	1	5	21	15	2	5	0
Microtus arvalis	237	156	223	9	69	22	52	407	240	116	49	3
Microtus oeconomus	0	0	1	0	3	0	0	10	5	1	5	0
Microtus subterraneus	1	2	12	0	3	0	3	8	14	1	1	2
Arvicola amphibius	1	0	9	0	6	1	1	4	5	1	2	0
Myodes glareolus	4	11	16	0	0	2	1	4	13	0	0	1
Apodemus agrarius	9	14	61	0	14	4	10	38	27	7	4	1
Apodemus flavicollis	1	4	19	0	4	0	6	13	17	2	0	0
Apodemus sylvaticus	6	11	36	0	1	0	6	26	29	1	6	0
Apodemus uralensis	0	0	0	0	0	1	0	0	0	0	0	0
Apodemus sp.	4	6	10	0	8	2	3	14	29	7	6	0
Micromys minutus	10	2	9	0	5	6	7	29	9	2	1	0
Mus musculus	1	2	1	0	4	2	2	17	18	4	0	0
Mus spicilegus	45	1	1	0	4	1	3	5	4	3	0	0
Mus sp.	0	0	0	0	0	0	0	1	0	0	0	0
Aves (indet.)	3	10	0	0	4	0	0	3	7	0	1	0
Amphibia (*Pelobates fuscus*)	0	0	0	0	4	0	2	2	4	0	0	0
Insecta Col. (Melolontha)	1	0	0	0	0	0	0	0	0	6	0	0
Total	**550**	**319**	**850**	**11**	**519**	**66**	**247**	**1043**	**884**	**318**	**137**	**22**

the atlas either, therefore these grids remained as white patches in that publication in the case of the distribution of each of the shrew species.

The importance of bats in the food of owls is quite low, but their occurrence in pellets does have faunal significance. There are 14 bat species known to occur in the analysed areas (BIHARI et. Al 2007), and these include the species indicated in our lists too (Table 3.). For some of the species, it became possible to add to the exactness of the distribution maps: there had not been information about the presence of the Noctule (*N. noctula*) in the UTM grid XM97, of the Brown Long-eared Bat (*Plecotus auritus*) in XM87, and of the Grey Long-eared Bat (*Plecotus austriacus*) in XM76.

The largest proportion (53.2%) of the Barn Owl's mammalian prey was rodents (Rodentia). Among dormice (Gliridae), remnants of only the Common Dormouse (*Muscardinus avellanarius*) were found. Barn Owls seldom catch Common Dormouse,

Table 3. Quantitative distribution of mammal species in the investigated UTM grids

Prey	XM65	XM77	XM76	XM75	XM87	XM86	XM85	XM97	XM96
Crocidura leucodon	5	30	49	86	18	144	143	200	354
Crocidura suaveolens	5	48	47	95	46	165	97	275	319
Sorex araneus	1	21	31	381	16	281	145	373	439
Sorex minutus	0	9	8	63	3	69	84	40	141
Neomys anomalus	0	6	6	29	1	67	15	29	23
Neomys fodiens	1	3	0	5	2	11	4	7	11
Eptesicus serotinus	0	0	0	0	0	0	1	0	0
Pipistrellus nathusii	0	1	0	0	0	0	0	0	0
Nyctalus noctula	0	0	0	0	0	0	0	1	0
Plecotus auritus	0	0	0	0	0	1	0	0	0
Plecotus austriacus	0	0	1	0	0	0	0	0	0
Myotis myotis	0	0	0	3	0	0	0	0	1
Muscardinus avellanarius	1	1	2	6	0	3	2	5	8
Microtus agrestis	1	4	3	50	3	45	22	14	49
Microtus arvalis	16	23	116	282	34	549	538	457	889
Microtus oeconomus	0	0	0	0	2	10	0	4	21
Microtus subterraneus	0	1	16	33	13	37	40	17	29
Arvicola amphibius	1	0	3	6	1	14	3	15	14
Myodes glareolus	1	23	4	23	2	31	31	27	21
Apodemus agrarius	1	28	18	41	8	125	45	89	91
Apodemus flavicollis	0	14	13	12	5	36	22	27	38
Apodemus sylvaticus	0	4	18	26	7	49	35	48	68
Apodemus uralensis	0	0	0	0	0	0	2	0	1
Apodemus sp.	1	5	20	23	2	47	38	24	61
Micromys minutus	4	4	7	20	0	29	18	16	54
Mus musculus	0	4	14	18	3	32	36	7	43
Mus spicilegus	0	0	2	2	0	13	48	6	16
Mus sp.	0	0	0	1	0	2	2	0	1
Rattus norvegicus	0	0	1	2	0	1	9	0	0
Rattus sp.	0	0	0	0	0	0	3	0	0
Total	**38**	**229**	**379**	**1207**	**166**	**1761**	**1383**	**1681**	**2692**

but a few specimens were caught in almost each of the UTM grids, apart from only one (XM87) (Table 3.). From this we can conclude that this infrequent small mammal which had been discussed in only few pieces of earlier literature (e.g. LELKES & HORVÁTH 2000), and whose distribution is not well known (BIHARI et. al. 2007), does occur in the entire study area.

The high representation of the hamster family (Cricetidae) (37.1% of total mammalian prey) is mostly due to the presence of Common Vole (*Microtus arvalis*) remnants in the pellets. Besides the Common Vole, pellets from each of the UTM grids of the study area yielded remnants of the Field Vole (*Microtus agrestis*) and the Bank Vole (*Myodes glareolus*), too. The Common Pine Vole (*Microtus subterraneus*) and the Water Vole (*Arvicola amphibius*) were also found in pellets, except for the former in the XM65 and the latter in the XM77 UTM grids, yet these species show a wide distribution. Unlike the aforementioned species, the Root Vole (*Microtus oeconomus*) was revealed only from

pellets found in the Nagyberek area (XM86, XM87, XM96, XM97) (Table 3.). There is substantial amount of information about the distribution of this strictly protected glacial relict species (GUBÁNYI et al. 2004), and owl pellet analysis can call the attention to further potential habitats (e.g. PURGER 2008, 2013).

Following the members of the shrew and the hamster families, mice (Muridae), too, are important in the feeding of Barn Owls in the study area. Among wood mouse species, it was the Striped Field Mouse (*Apodemus agrarius*) that had remnants revealed from pellets collected in all nine UTM grids. The Yellow-necked Mouse (*Apodemus flavicollis*) and the Wood Mouse (*Apodemus sylvaticus*) are also frequently caught prey animals for the Barn Owls, and are considered to be common small mammals in the entire area (Table 3.). The only grid without these species was XM65, the two *Apodemus* species probably missing due to the small size (12 pellets) of the sample (Table 1.). The information about the distribution of these common species was not known precisely for long, because only specimens caught in traps could be securely identified. It is difficult to separate them on the basis of their skeletal remains (TVRTKOVIĆ 1979, CSERKÉSZ 2005), thus in the past both were usually referred to as *Apodemus* sp. (e.g. LELKES 1994; Lelkes & Horváth 2000). The Pigmy Field Mouse (*Apodemus uralensis*) had not been known formerly to exist in the study area. Barn Owls could have caught the three specimens in our sample near Mesztegnyő (XM85) and Kundpuszta (XM96) (Table 2b., 2c.). The presence of the Pigmy Field Mouse in the county was revealed in last decade (LANSZKI & PURGER 2001, BIHARI et al. 2007) and more research is required to exactly define the south-western margin of its distribution (CSERKÉSZ 2005). Despite that there was one UTM grid (XM87) in which the Harvest Mouse (*Micromys minutus*) was not shown; probably it does occur all around the study area. Similarly, the Brown Rat (*Rattus norvegicus*), the Eastern House Mouse (*Mus musculus*) and the Steppe Mouse (*Mus spicilegus*) are probably common species here, occurring in the entire study area. However, based on their numbers in the pellets, it is only at places that they are significant constituents in the diet of the Barn Owl (Table 3.).

Our results contribute to the knowledge about the mammal fauna of Somogy county, with distribution data of 27 small mammal species. An important achievement is to have recorded the new occurrence data of the Pigmy Field Mouse, and to have revealed remnants of the Root Vole from several new locations.

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