

## The pygmy wood mouse (*Sylvaemus uralensis*) in the region of the Ukrainian Carpathians

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**BARKASZI, Z. The pygmy wood mouse (*Sylvaemus uralensis*) in the region of the Ukrainian Carpathians.** — Information on the specifics of distribution and habitat preferences of the pygmy wood mouse in the region of the Ukrainian Carpathians is generalised according to data from original sources on the species' records with consideration of results of the revision of regional collection series of wood mice. The currently known geographical range of the species is presented. A comparative analysis between morphometric data from various sources and of the revised collection series is carried out. The possibility of existence of a high-mountain population of the species *Sylvaemus uralensis* in the Ukrainian Carpathians is supported.

### Introduction

Wood mice of the genus *Sylvaemus* are common species in the mammal fauna of Europe, where the species richness of the genus increases to the east: in Western Europe, *S. tauricus* and *S. sylvaticus* occur sympatrically, a third species (*S. uralensis*) appears in Central Europe, and another one (*S. witherbyi*) in Eastern Europe (Orlov *et al.* 1996). Respectively, the sympatry of three species is observed in the region of the Ukrainian Carpathians, while the Carpathian region is considered as the south-western edge of the geographic range of *S. uralensis* (Kryštufek *et al.* 2008).

Due to the absence of clear diagnostic criteria for a long time, researchers of the region's fauna had often misidentified these species, which led to various implications on their distribution and ecology. Some zoologists considered that *S. sylvaticus* is a non-abundant species in the region (Sokur 1952; Kolyushev 1953; Tatarinov 1956) occurring only in lowland and piedmont areas (Sokur 1952; Kolyushev 1953). Others, on the contrary, thought that this species occurs in piedmont and mountain areas (Shnarevych 1959) or even that it is one of the most widely distributed species in the region (Turyanin 1959).

Little information is available on the occurrence of *S. uralensis* in the region. This species is known practically in the whole of Ukraine, although it is considered more common in the eastern regions (Mezhzherin *et al.* 2002; Naglov 1995). The presence of the pygmy wood mouse in the Ukrainian Carpathian has long been de-

bated, although in the late 1950s I. I. Turyanin already draw attention to the occurrence of “both large and small forms” of *S. sylvaticus* in the fauna of Transcarpathia (Turyanin 1959). However, the first record of *S. uralensis* in Transcarpathia was reported only in 1980 (Polushyna & Vozniuk 1980). Later, a high-mountain population of the species was reported from Sheshurska Polonyna of the Chornohora massif (Kyseliuk 1993).

The recent revision of museum collections of wood mice from the Ukrainian Carpathians and development of regional identification keys (Barkaszi 2018) allow to generalise currently available data on the distribution of the species in the region, which is the aim of this report.

## Material and Methods

Information from original sources on the occurrence and morphological variation of the pygmy wood mouse in the region of the Ukrainian Carpathians (Polushyna & Vozniuk 1980; Kyseliuk 1993) is generalised with consideration of results of the revision of regional collection series of wood mice (Barkaszi 2018). The map of the species’ distribution was created in QGis 3.10. The comparative analysis of morphometric data was carried out in MS Excel 2013.

## Results and Discussion

The pygmy wood mouse is generally a little known species in the fauna of the region of the Ukrainian Carpathians with few actual records, although it is a common and quite abundant species in adjacent lowland regions of neighbouring countries (Cserkés 2005; Cichocki *et al.* 2011; Čanádý *et al.* 2014).

In the region of the Ukrainian Carpathians, it is traditionally considered a common species of lowland rodent communities, although in the early 1990s a population was found at high elevation on Sheshurska Polonyna of the Chornohora massif (Kyseliuk 1993).

The revision of museum specimens and the results of the author’s field studies showed that the pygmy wood mouse occurs in the region only in lowland areas of Transcarpathia (Fig. 1), where it prefers floodplain habitats and vineyards with shrubby vegetation. All of the specimens mentioned in the literature for the Transcarpathian lowland (Polushyna & Vozniuk 1980) were caught in vineyards or in shrubs of the blackthorn nearby to vineyards. On the other hand, reliable records of the species (either collection specimens or published data with metrics) have not yet been reported from Ciscarpathia (i.e. Prykarpattia) and from Bukovina.

The recent revision of identification criteria of Carpathian wood mice showed that, among external characters, hindfoot length and auricle length have diagnostic value, whereas the most clear differences between the wood mouse and pygmy wood mouse in craniometrical characters were revealed only by the upper molars length (Barkaszi 2018).

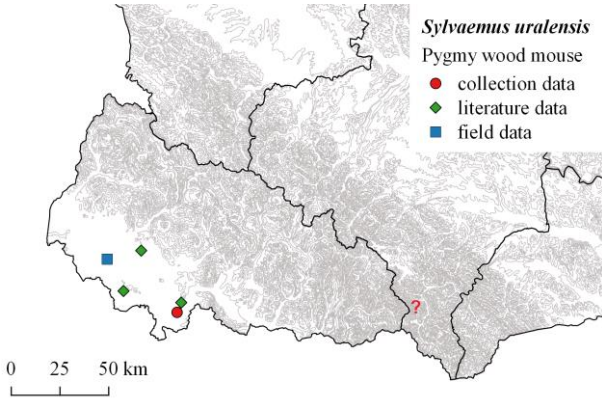


Fig. 1. Records of the pygmy wood mouse in the region of the Ukrainian Carpathians. The question mark denotes Sheshurska Polonyyna.

Рис. 1. Знахідки миші малої в регіоні Українських Карпат. Знаком питання позначено полонину Шешурську.

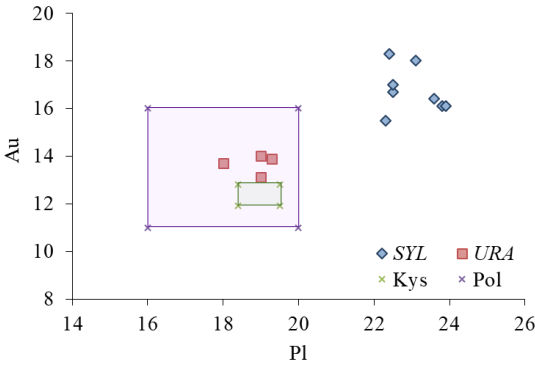


Fig. 2. Relation between hind-foot length and auricle length in adult specimens of *S. uralensis* (URA) and *S. sylvaticus* (SYL) determined by discriminant analysis compared to limits of characters as reported by Kyseliuk 1993 (Kys) and Polushyna & Vozniuk 1980 (Pol).

Рис. 2. Співвідношення між довжинами вуха і стопи у лісових мишей за різними вибірками.

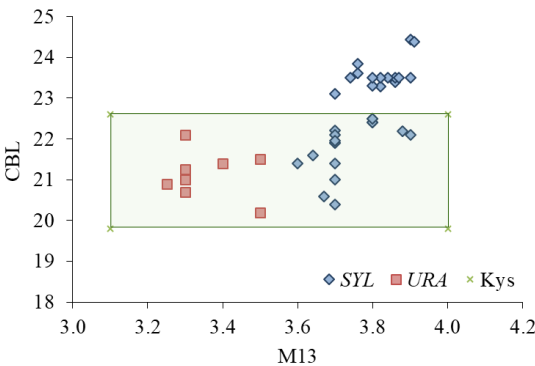


Fig. 3. Relation between upper molars length and condylobasal length in adult specimens of *S. uralensis* (URA) and *S. sylvaticus* (SYL) determined by discriminant analysis compared to limits of characters as reported by Kyseliuk 1993 (Kys).

Рис. 3. Співвідношення між конділобазальною довжиною та довжиною верхнього ряду молярів у лісових мишей за різними вибірками.

Table 1. Comparison between mean values of morphometric characters of adult *S. uralensis* specimens from museum collections (determined by discriminant analysis) and data reported in: Kyseliuk 1993

Таблиця 1. Порівняння середніх значень морфометричних ознак дорослих особин *S. uralensis* із музейних колекцій (визначених дискримінантним аналізом) та за даними з: Киселюк 1993

Characters	Collection specimens			Kyseliuk 1993			<i>t</i>	p
	Mean	SD	n	Mean	SD	n		
Pl	23.01	0.57	4	18.6	0.41	10	0.73	>0.1
Au	16.76	0.40	4	12.2	0.41	10	6.20	0.001
M13	3.78	0.10	8	3.36	0.24	9	0.04	>0.1
FIL	5.20	0.20	8	4.46	0.24	9	1.06	>0.1
FIB	1.88	0.15	8	1.40	0.18	9	3.16	0.001
NAL	9.18	0.57	8	8.22	0.51	9	0.08	>0.1
ROH	5.66	0.16	8	5.58	0.18	9	1.29	>0.1
CBL	22.64	0.57	8	21.44	0.99	9	0.80	>0.1
CRB	10.48	0.22	8	10.79	0.39	9	4.93	0.001
CRH	8.71	0.12	8	8.81	0.27	9	7.20	0.001
BUL	4.41	0.11	8	4.35	0.21	9	3.14	0.01
DIA	6.39	0.29	8	6.64	0.39	9	2.93	0.01

Pl, hindfoot length; Au, auricle length; M13, upper molars length; FIL, incisive foramen length; FIB, incisive foramen width; NAL, nasal bones length; ROH, rostral height; CBL, condylobasal length; CRB, braincase width; CRH, braincase height; BUL, auditory bulla length; DIA, diastema length.

Comparison of metric characters of the pygmy wood mouse from the high-mountain population with parameters of the revised sample is of special interest, since the existence of pygmy wood mouse population at high altitudes in the Ukrainian Carpathians is known only by a single report (Kyseliuk 1993). Besides, the pygmy wood mouse was not revealed in the process of the revision among specimens collected in the Chornohora massif, the species identification of which was also confirmed by multivariate statistics (Barkaszi, unpubl. data).

The comparison of mean values of available morphometric characters revealed that significant differences between the revised collection series of the pygmy wood mouse and the sample described in Kyseliuk 1993 are absent for most of the characters, including those having high diagnostic value (Table 1).

Considering all of the revealed features, there is a reason to suggest the existence of a high-mountain (isolated ?) population of the pygmy wood mouse in the Ukrainian Carpathians.

In sum, the pygmy wood mouse in the region of the Ukrainian Carpathians occurs mainly in the Transcarpathian lowland, where it prefers vineyards as well as ecotone and floodplain shrubby habitats. The existence of a population of the species in the Ukrainian Carpathians at high elevations is quite possible.

Currently, no data are available to analyse the species' distribution in Ciscarpathia and Bukovina. Considering the entire body of available data, the species remains a little known species of rodents in the region of the Ukrainian Carpathians.

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## Резюме

**БАРКАСИ, З. Мишак малий (*Sylvaemus uralensis*) у регіоні Українських Карпат.** — Узагальнено відомості про особливості поширення та біотопної приуроченості *Sylvaemus uralensis* у регіоні Українських Карпат за даними першоджерел про знахідки виду з урахуванням результатів ревізії регіональних колекційних серій лісових мишей. Показано відомий на сьогодні ареал виду. Проведено порівняльний аналіз морфометричних даних щодо цього виду з різних джерел з даними ревізованої серії. Підтверджено можливість існування високогірної популяції *Sylvaemus uralensis* в Українських Карпатах.