

HISTORICAL FINDINGS OF THE PANNONIAN ROOT VOLE (*MICROTUS OECONOMUS MEHELII*) IN THE FIRST HALF OF 20TH CENTURY

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Abstract: Root vole consists of 30 subspecies distributed in Holarctic. The subspecies Pannonian root vole (*Microtus oeconomus mehelyi* Éhik, 1928) is one of the rarest, since it occurs only in isolated areas of Central Europe. This paper brings together some early facts about the subspecies assembled from historical papers, correspondence, and information from the museum collections with the aim to identify and assign the museum specimens to the records. The oldest known specimens, collected by the taxidermist Károly Kunszt at the end of 19th century, come from the vicinity of Šamorín. The exact trapping locality of at least some of them is the Danubian island Helena at the river kilometer 1845. The oldest specimen probably comes from the year 1892; however, the exact date and locality of collection of this specimen have not been stated. The type set originally used to describe the *mehelyi* subspecies comprised 15 specimens also coming from K. Kunszt. Four of them (1 holotype and 3 paratypes) were identified; the rest of the paratype set could not be identified unambiguously.

Key words: *Microtus oeconomus*, Slovakia, Hungary, Austria, holotype, paratype, first record, museum collections.

INTRODUCTION

The Pannonian root vole (*Microtus oeconomus mehelyi* Éhik, 1928) is one of the rarest subspecies of root vole (*Microtus oeconomus* (Pallas, 1776)). It is regarded as a glacial relict, whose distribution is restricted to the north-west part of Pannonian Basin only (AMBROS 2010, BRUNHOFF et al. 2003), specifically two regions: (1) the northwest of Hungary (Tóköz-Fertő-Hanság, Szigetköz), adjacent areas to eastern Austria (Neusiedler See, Seewinkel) and the southwest of Slovakia (Podunajská nížina lowland); (2) the area of Kis-Balaton (Hungary) (GUBÁNYI et al. 2009, AMBROS 2010). In addition, Pannonian root vole lives in moist habitats mainly

with reed bed and sedge cover. Due to its restricted distribution range and specific habitat requirements, Pannonian root vole is an endangered taxon listed in both the Appendix III to the Bern Convention and the Habitat Directive. Therefore, every record of its occurrence is followed by considerable attention. The aim of this paper is to examine the oldest records collected in the first half of 20th century. Thus, we addressed not only the museums from Slovakia, Czech, Hungary and Austria, but also the Natural History Museum in London and the Museum of Natural History in Berlin. In case of museum specimens from the Hungarian Natural History Museum and Natural History Museum in



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Vienna, the correct species identification was verified by the shape of M_1 teeth according to ANDĚRA & HORÁČEK (2005).

RESULTS AND DISCUSSION

The oldest published mentions of Pannonian root vole from the Pannonian Basin can be summarized as follows:

A mention of one individual from Fischamend (Austria) in MOJSISOVICS VON MOJSVÁR (1897) is considered as the first written reference to Pannonian root vole in the area of Pannonian Basin.

Another published data come from MÉHELY (1908), the custodian of zoological collections in the Hungarian Natural History Museum (the HNHM) in Budapest, who wrote he got 12 specimens of strange-looking voles from Károly Kunszt from Šamorín (Slovakia) in 1902. Méhely identified these individuals as *Microtus ratticeps* (older synonym of *M. oeconomus*) and published it as the first finding of this species in former Kingdom of Hungary (MÉHELY 1908). He also wrote that since 1894, the HNHM owns one individual of this species that was determined by M. R. Oldfield Thomas in London. According to the way of preparation and some another more unspecified details, MÉHELY (1908) additionally stated the locality of origin and the name of taxidermist being Šamorín and K. Kunszt, respectively. Moreover, he mentioned another four specimens of Pannonian root vole from Šamorín, which were deposited under incorrect names in the HNHM.

GRESCHIK (1910, 1911, 1924) analysed the food-structure of some birds of prey and owls from the stomach contents and pellets. In the years 1901-1903, he recorded the remains of 7 specimens, followed by the record of 1 specimen in 1921 (Tab. 1). Unfortunately, we did not find any data about the deposit of these specimens either in literary sources or in the databases of requested museums. It is possible that this material was lost or destroyed during the WW II or during the Soviet invasion to Hungary in 1956, when the considerable part of zoological collections in the HNHM was burned up (see BOROS 1957).

According to MILLER (1912), the Natural History Museum in London (NHML) got two specimens of Pannonian root vole from the HNHM in 1894. These individuals originated from Šamorín and were determined by M. R. Oldfield Thomas (MILLER 1912).

In 1928, Gyula Éhik described a new subspecies based on 12 specimens from Šamorín (probably a part of the material mentioned in MÉHELY 1908) and three specimens from Rajka (Szigetköz, Hungary) (ÉHIK 1928). In honour of Lajos Méhely, the subspecies was named *Microtus ratticeps méhelyi* Éhik, 1928.

Later, VICZIÁN (1933) reported 4 specimens of Pannonian root voles that were found in owl pellets collected at the Farnos site (central Hungary, in the river Tisa region) in 1932. The credibility of these data has not been questioned; however, other findings of this species in the vicinity of the river Tisa have (see TOPÁL 1963, GUBÁNYI et al. 2004).

During the study of food composition of birds of prey, high number of Pannonian root vole was found in the stomach contents of 11 *Buteo lagopus* and 2 *Circus aeruginosus* (VASVÁRI 1944-47). The birds were hunted in the region of Kis-Balaton (Hungary) in March 1943. These are the first records of Pannonian root vole's occurrence near Kis-Balaton (VASVÁRI 1943, 1944-47). The species was found in the stomach of birds of prey also in winter 1943/44 (VASVÁRI 1944-47). The exact number of individuals and other information about the deposition of this material are unknown.

From the published information mentioned above, the discovery of this new subspecies seems to be clearly connected with 12 specimens from 1902 (e.g. STOLLMANN & AMBROS 1998, GUBÁNYI et al. 2009, AMBROS 2010). However, tracking of the individuals in the museum collections is more complicated.

The specimen from Fischamend mentioned in MOJSISOVICS VON MOJSVÁR (1897) was provided by August von Pelzeln. However, the date of its collection or any additional information about this specimen is missing. Although Pelzeln was in charge of the mammal collections in the former Imperial Natural History Museum (current Natural History Museum in Vienna, NHMV), the oldest Pannonian root vole specimen found in NHMV is from the year 1925 (Tab.1). Therefore, we suppose the specimen from Fischamend is not deposited in NHMV. Despite the lack of details, the information in MOJSISOVIC VON MOJSVÁR (1897) is considered to be reliable (SPITZENBERGER 2001).

According to MÉHELY (1908), the HNHM owned five specimens of Pannonian root vole from Šamorín collected by K. Kunszt that are dated into 19th century. Upon verification of individuals and records of Pannonian root vole in the collections of HNHM in Budapest, we have found not only these specimens, but also two more individuals dated before the year 1902 (Tab.1). From these seven individuals, the specimen identified by M. R. Oldfield Thomas has the date of evidence 1892 and is considered to be the oldest Pannonian root vole specimen known at present (Tab. 1). Based on the HNHM data, the authorship of this specimen is also attributed to K. Kunszt. Later, two specimens have been exchanged by the HNHM and deposited in the NHML in London under the registration numbers BM(NH)1894.3.1.64 and BM(NH)1894.3.1.65 (HILLS *in lit.*). According

to the records of the HNHM, these two individuals had originally ID Number 1873.83 and 1873.97 and were apparently collected in May 1893. Both individuals are also mentioned in MILLER (1912).

In the collections of the HNHM, we have found only two individuals from 1902 (Tab. 1). Following the museum records, they came from Šamorín from K. Kunszt but the HNHM obtained them in 1952. They probably belong to the set of 12 individuals, based on which MÉHELY (1908) published the first record of this species in Hungary and ÉHIK (1928) described the new subspecies *mehelyi*. However, we do not have more information about their origin and circumstances of the acquisition. Besides these two individuals, another Pannonian root vole specimens from Šamorín collected by K. Kunszt are registered in the HNHM. Unfortunately, there is no information about their date of collection. Moreover, the authorship of the specimens (and probably also the locality of collection) was identified additionally based on the way of preparation (Tab. 1, ID NR. 3177.1-10). Though, according to their incremental numbers (ID numbers), they are from the same set and therefore possibly came from the same trapping locality and the same trapping action. One specimen deposited in the NHMV, which was received from the HNHM in 1925, has also origin in this set of individuals (Tab. 1, ID number 28123). Today it is registered as one of the *mehelyi* subspecies paratypes. Therefore we assume this series of individuals could be a part of the set of 12 individuals sent by K. Kunszt to L. Méhely to the HNHM in 1902; and subsequently, used by Gy. Éhik for

the description of new subspecies. However, there are still several confusing details. First of all, the whole set (3177.1-10, ID Number in the HNHM, see Tab. 1) was obtained as a gift from Gyula Madarász in 1924. Moreover, two specimens of them look like albinos. Only ÉHIK (1928) wrote about albinotic individuals in the deposits of the HNHM. However, he mentioned they were not a part of the paratype set and were “deposited in collection already before”.

ÉHIK (1928) wrote that the set of individuals he used for the description of the subspecies came from the older collection of 12 individuals from 1902 deposited in the HNHM, which came from the Rye Island, Šamorín, and three individuals from Rajka (Hungary) collected and sent by K. Kunszt in 1925. Éhik set one male from Rajka as the holotype (Fig. 1.). According to our revision, three individuals from the year 1925 are registered in the collections of the HNHM – one holotype and two paratypes. However, the two paratypes are not assigned to Rajka but to Šamorín (Csallóköz-Somorja) locality. We suppose that this confusion in localities arose from the proximity of the cities Šamorín and Rajka together with the disintegration of Austro-Hungarian Monarchy in 1918. Although the distance between Rajka and Šamorín is less than 10 km in bee-line, they are separated by the Danube River and its extensive branch-system. In 1918, the Danube was stated as the border-line between the newly established countries Czechoslovakia and Hungary. Thus, we assume the source locality of the Pannonian root vole was located somewhere in the area of Danube branch-system near to both cities. Kunszt living



Figure 1. The holotype of *Microtus oeconomus mehelyi* deposited in Hungarian Natural History Museum in Budapest.

Table 1. The list of *Microtus oeconomus mehelyi* specimens recorded before 1950.

HNHM – Hungarian Natural History Museum in Budapest; NHML – Natural History Museum in London; NHMV – Natural History Museum in Vienna; * – according to evidence in the HNHM; ** – stated additionally according to details of preparation.

ID Number	Date of collecting	Date of evidence/purchase	Locality of origin	Country of origin	Name of collector	Placed	Notes	Published in
1790	-	1892 Aug. 10.*	Šamorín**	Slovakia	Kunszt K.**	HNHM	purchased from K. Kunszt; identified by O. Thomas	MÉHELY (1908)
1873.81	1893 May*	1894 Febr. 19.*	Šamorín	Slovakia	Kunszt K.	HNHM	originally identified as <i>Paludicola amphibi</i>	MÉHELY (1908)
1873.82	1893 May*	1894 Febr. 19.*	Šamorín	Slovakia	Kunszt K.		exchange to A. B. Howell	MÉHELY (1908)
1873.96	1893 May*	1894 Febr. 19.*	Šamorín	Slovakia	Kunszt K.	HNHM	originally identified as <i>Agricola</i> sp.	MÉHELY (1908)
1873.104	1893 May*	1894 Febr. 19.*	Šamorín	Slovakia	Kunszt K.	HNHM	originally identified as <i>Paludicola terrestris</i> juv.	MÉHELY (1908)
BM(NH)1894.3.1.64	1893 May*	1894	Šamorín	Slovakia	Kunszt K.	NHML	exchange with the HNHM; (original ID Nr. in HNHM 1873.83), registered by O. Thomas in NHML	MILLER (1912)
BM(NH)1894.3.1.65	1893 May*	1894	Šamorín	Slovakia	Kunszt K.	NHML	exchange with the HNHM; (original ID Nr. in HNHM 1873.97), registered by O. Thomas in NHML	MILLER (1912)
-	1901 Dec. 8.	-	Királyerdő	Slovakia	Greschik J.		remains in food of <i>Asio otus</i>	GRESCHIK (1910)
-	1901 Dec. 8.	-	Királyerdő	Slovakia	Greschik J.		remains in pellet of <i>Strix aluco</i>	GRESCHIK (1911)
-	1902 Febr. 28.	-	-	Hungary	Greschik J.		remains in food of <i>Asio otus</i>	GRESCHIK (1910)
-	1902 Febr. 28.	-	-	Hungary	Greschik J.		remains in food of <i>Asio otus</i>	GRESCHIK (1910)
4571.1	1902	1952 June 23.	Šamorín	Slovakia	Kunszt K.	HNHM		
4571.2	1902	1952 June 23.	Šamorín	Slovakia	Kunszt K.	HNHM		
-	1903 March	-	Šamorín	Slovakia	Greschik J.		remains in pellet of <i>Strix aluco</i>	GRESCHIK (1911)
-	1903 March	-	Šamorín	Slovakia	Greschik J.		remains in pellet of <i>Strix aluco</i>	GRESCHIK (1911)
-	1903 March	-	Šamorín	Slovakia	Greschik J.		remains in pellet of <i>Strix aluco</i>	GRESCHIK (1911)
-	1921 Dec. 26.	-	Győr	Hungary	Greschik J.		remains in food of <i>Asio otus</i>	GRESCHIK (1924)
3177.1	-	1924 Febr. 1.*	Šamorín**	Slovakia	Kunszt K.**	HNHM	albino	
3177.3	-	1924 Febr. 1.*	Šamorín**	Slovakia	Kunszt K.**	HNHM	albino	
3177.4	-	1924 Febr. 1.*	Šamorín**	Slovakia	Kunszt K.**		exchange to K. Zimmermann	
3177.5	-	1924 Febr. 1.*	Šamorín**	Slovakia	Kunszt K.**	HNHM		
3177.6	-	1924 Febr. 1.*	Šamorín**	Slovakia	Kunszt K.**		exchange to K. Zimmermann	
3177.7	-	1924 Febr. 1.*	Šamorín**	Slovakia	Kunszt K.**	HNHM		
3177.8	-	1924 Febr. 1.*	Šamorín**	Slovakia	Kunszt K.**	HNHM		

Table 1. Continued.

ID Number	Date of collecting	Date of evidence/purchase	Locality of origin	Country of origin	Name of collector	Placed	Notes	Published in
3177.10	-	1924 Febr. 1.*	Šamorín**	Slovakia	Kunszt K.**	HNHM		
28123	-	1925	Šamorín**	Slovakia	Kunszt K.	NHNV	paratype, exchange with the HNHM (ID Nr. in HNHM 3177.9; date of collecting in HNHM: 1924 February 1.)	
3326.1	1922	1925 March 5.	Šamorín	Slovakia	Kunszt K.	HNHM		unpublished
3326.2	1922	1925 March 5.	Šamorín	Slovakia	Kunszt K.	HNHM		unpublished
3350.1	1925 Febr.	1925 May 8.	Rajka	Hungary	Kunszt K.	HNHM	holotype	ÉHIK (1928), CSORBA & DEMETER (1991)
3350.2	1925 March	1925 May 8.	Šamorín	Slovakia	Kunszt K.	HNHM	paratype	ÉHIK (1928), CSORBA & DEMETER (1991)
3350.3	1925 March	1925 May 8.	Šamorín	Slovakia	Kunszt K.	HNHM	paratype	ÉHIK (1928), CSORBA & DEMETER (1991)

in Šamorín signed the locality of 3 specimens collected in 1925 as Šamorín (in original Csallóköz-Somorja). However, Gy. Éhik living in Hungary could correct the locality to Szigetköz-Rajka in his paper (ÉHIK 1928). It is possible that such a correction could have been made also in the records of the HNHM in the case of the holotype but not in the case of the two paratypes.

Although the individuals collected by K. Kunszt at the end of 19th and the beginning of 20th century originated in Šamorín (in original Csallóköz-Somorja), we suppose it is an approximate localization and the direct places of trapping were situated somewhere in the surrounding of this city. This assumption was confirmed by a part of the handwritten record of Lajos Csiba about his teacher of ornithology K. Kunszt. The exact trapping location of the first Pannonian root vole is reported to be the Danubian Helena Island located at river kilometre 1845. At that time (in the former Austro-Hungarian Monarchy), this island belonged to the land area of village Čilistov. Today, Čilistov is a part of the city Šamorín in Slovakia, but the island Helena is situated in the land area of village Dunakiliti in Hungary. Although L. Csiba has significantly clarified the localities of the early records of Pannonian root vole, there is still an important discrepancy in the date of the first record of this subspecies. L. Csiba mentions the year 1894, however, the oldest specimen of Pannonian root vole registered in the HNHM is dated earlier, specifically into 1892 (Tab. 1).

Taken together, the individual from the year 1892 coming from Šamorín (Slovakia), which is deposited in the HNHM in Budapest under the ID number 1790, is considered to be the oldest finding of the Pannonian root vole. Furthermore, one of the oldest known localities of Pannonian root vole occurrence is the Helena Island in the branch-system of Danube River.

Besides verification and revision of published data, we have found two yet unpublished specimens of Pannonian root vole deposited in the HNHM that were collected by the taxidermist K. Kunszt in Šamorín in the year 1922 (Tab. 1).

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