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New record of the black rat (Rattus rattus L.) from Hungary, and a review of its distribution in Central Europe (Mammalia)

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Abstract—A population of black rats was found at Csokonyavisonta, southern Hungary in October 1980. External and cranial measurements and weights of inner organs are tabulated and two other unpublished records are given. The material of *Rattus rattus* from Central Europe deposited in the Hungarian Natural History Museum is reviewed. With 1 table and 2 figures.

Introduction—In the course of post-graduate research by the first author on the biology and control of the Norway rat (*Rattus norvegicus* BERKENHOUT) in Hungary (JABIR 1985), a population of black rats (*Rattus rattus*) was found in southern Hungary. A small series was collected and this recent record of occurrence led us to review the material of this species from central and eastern Europe deposited in the Mammal Collection of the Zoological Department, Hungarian Natural History Museum, Budapest.

Black rats are rare in Hungary and of restricted distribution. MÉHELY (in BREHM 1902) and ÉHIK (in BREHM 193(?)) reviewed the old literature on the occurrence of the black rat in Hungary and concluded that though mentioned in several publications, no substantiated evidence was provided until 1882, when ENTZ reported the species from Transylvania (now part of Rumania). In another early publication, not mentioned by MÉHELY and ÉHIK, in SEVERINUS (1779) we also found mention of both the black rat and the Norway rat. MOJSISOVICS (1897) reported the species as common in certain parts of southern Hungary (part of it today belonging to Yugoslavia). MÉHELY (1907) reported black rats from several localities in Vas county, western Hungary. ÉHIK (1919) added further localities from Vas and Somogy counties, near to the Austrian border. PASZLAVSZKY (1918) further added localities from south-east Transylvania and north Hungary. PETRICSKO (1892) and ORTVAY (1902) provided records of occurrence from Selmeczbánya and Pozsony, respectively (now in Slovakia). Reports of the presence of black rats in Budapest date back as far as 1818 (HORVÁTH 1918), the first authenticate specimens were however only reported in 1907 (MÉHELY 1907). The only published report of black rats from Hungary after the Second World War is from Békés county, south-east Hungary (KISZEL et al. 1957). In addition, a single specimen was trapped in early 1973 in the top floor of a grain store in the Csepel Island Free Port in Budapest (BAJOMI 1980).

New records

The Bábolna Pest Control Centre carried out routine deratization in grain stores and farm buildings in 1980 at Csokonyavisonta, Somogy county, southern Hungary. The project was unsuccessful and the cause of inefficacy was found to be the difference in target species, as *Rattus rattus* proved to be the pest instead of *R. norvegicus*, and the former is known to be more resistant to poisons than the latter species (GREAVES et al. 1976, MATHUR & PRAKASH 1981, RANA & MATHUR 1981).

A series of 8 black rats, all of adult age, were collected and dissected in October, 1980. Table 1 contains the external and cranial measurements and weights of the internal organs. One of the two females was pregnant and contained 4+4 embryos. The skull of a specimen is shown in Fig. 2.—The deratization project using target-specific control was subsequently successful.

MAYER (pers. comm.) reported having collected black rats in 1965 from Simontornya (No. 17 on Fig. 1), some of the skulls of which are now kept in the collection of the Department of Zoology, Janus Pannonius University, Pécs.

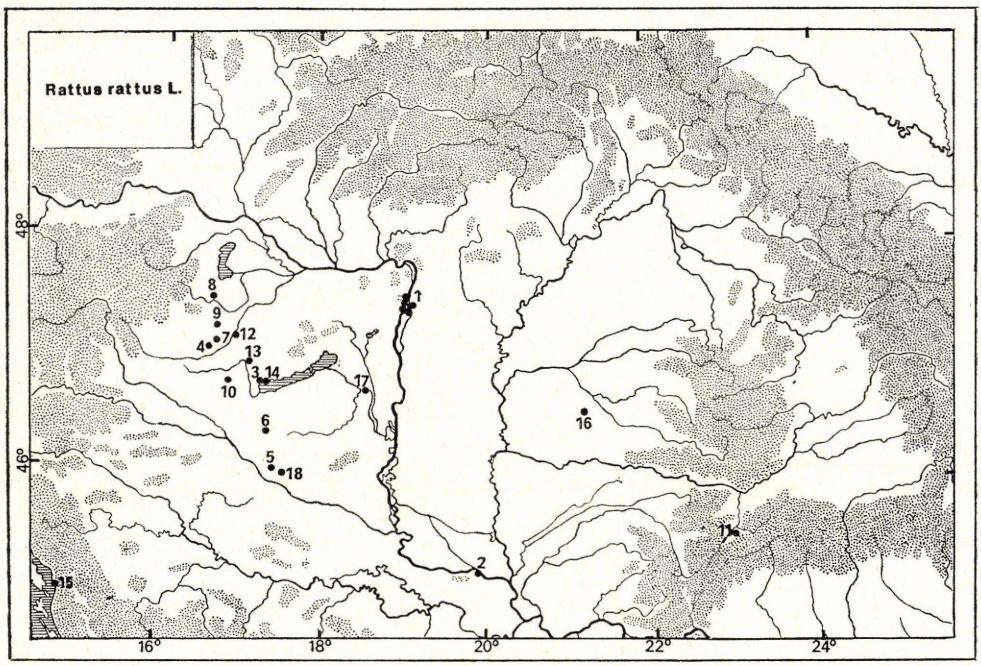

Fig. 1. Map of the localities of black rat *(Rattus rattus)* material from central and eastern Europe deposited in the Hungarian Natural History Museum, Budapest

Review of the Central European Rattus rattus material in the Hungarian Natural History Museum

The localities are listed in alphabetical order, followed by the number of specimens, collection date, collector, mode of preservation and citation if previously published.

1. Budapest—a) Budafok: 2 juv., Nos 3062/43. 1–2, 24 September, 1919, coll. J. Bartkó, in alcohol.—b) Nádorkert: 1♀ +1 juv., Nos 2742. 1–2, 12 May, 1908, coll. J. Bartkó, in alcohol.—c) Palatinus garden: 2 spp., No. 2730, 21 September, 1907, No. 2731, 12 October, 1907, coll. I. Studva, in alcohol.—d) Soroksári avenue, mill: 2 spp., ♂ No. 64.2.1, 7 October, 1961, coll. I. Németh, skin +skull; No. 72.66.1, coll. M. Eőry, mounted.

2. Gradiste (Yugoslavia): No. 68.439.1, ♂, 30 September, 1926, coll.: J. Mallász, skin +skull.

3. Gyenesdiás (Zala county): 1 ♂, No. 2778, January 1911, coll. J. Győrffy, skin +broken skull.

4. Ják (Vas county): 2 juv. ♂♂, Nos 3753/1–2, 2 September, 1930, coll. O. Geduly, skin +skull.

5. Háromfa (Somogy county): 4 spp., Nos 3733/1–2, ♂♂, Nos 3733/3–4, ♀♀, August—September, 1925, coll. M. Vasvári, skins +skulls.

6. Kaszópuszta (Somogy county): 4 spp., No. 3585/1, skull, Nos 3585/2–4, 3 ♀♀, 22 April, 1927, coll.: G. Éhik, skin +skull.

7. Kis Pőse (Vas county): 3 spp., No. 2703, ♀, 24 August, 1905, coll. L. Méhely, skin +skull; No. 2447/7, ♂, 16 August, 1899, coll. L. Méhely, in alcohol with skull removed; No. 2729, August 1906, coll. L. Méhely, in alcohol (MÉHELY 1907).

8. Léka (now in Austria): No. 2864/32, 17 February, 1895, in alcohol.

9. Lukácsháza (Vas county): 12 spp., Nos 2758.1–2, juv.; Nos 2758.3, ♂; Nos 2758.4–6, 8, ♀♀; No. 2758.7, ♂, January-February 1910; skins with skulls included; Nos 2758.9–12, neonates, 1 March, 1910, in alcohol. All collected by Sarolta Soós.

10. Ormánd (Zala county): 11 spp., No. 2900.1, ♂; Nos 2900.2–3, ♀♀, 1920; No. 2901, 14 January, 1921; No. 3004, 11 June, 1921; No. 3008, 15 July, 1921; Nos 3009.1–5, juv., 11 June, 1921, coll. M. Vasvári, all in alcohol (ÉHIK 1921; VASVÁRI 1921).

11. Ponor (now in Rumania): 2 spp., No. 1877/1179, mounted, coll. H. Lojka; No. 3267, 4 November, 1875, coll. J. Csató, skin +fragmentary skull (ENTZ, 1882).

12. Sárvár (Vas county): No. 3513, 27 April, 1926, coll.: N. Medveczky, skull +disarticulated skeleton.

Fig. 2. Photograph of the skull of a male *Rattus rattus* from Csokonyavisonta, southern Hungary

13. Türje (Zala county): No. 4422, 3 November, 1949, coll. Éhik & Bunday, skin + skull.

14. Vonyarcvashegy (Veszprém county): 5 spp., No. 3557/1, 25 January, 1927; No. 3557/2, 29 January, 1927; No. 3557/3, 20 December, 1926; No. 3557/4, ♂, 20 December, 1926; No. 3557/5, juv., 4 March, 1927, coll. I. Tolnay, skins + skulls.

15. Senj (Zengg) (Yugoslavia): 16 spp., Nos 3131.1–6, juv.; Nos 2709/7.1–2, ♀♀, 8–15 October, 1905, all in alcohol; Nos 2709/7.3, 8 October, 1905; No. 2709/8, juv. ♀, 15 August, 1905, all skins + skulls; No. 2716/1, in alcohol; No. 2716/2, August 1906, broken skull, No. 68.635.1, ♀, all coll. Padewieth; Nos 2736/a-d, 1908; No. 3758/20, juv. coll. F. Dobrisch, all skulls.

Fig. 1. shows a map of the localities. The specimen reported by KISZEL et al. (1957) (no. 16 on Fig. 1) has not been seen by us, thus this record remains unverified.

Discussion

The small sample from Csokonyavisonta falls into the lower region of variability in head and body length and tail length, as compared with the data presented by BECKER (1978). The mean of the condylobasal lengths is in good agreement with the same data from several southern and central European localities (BECKER, loc. cit.).

The distribution of the black rat in Europe is nowadays principally the southern half of the continent with isolated localities, mainly ports, in the northern part. BECKER (loc. cit.) was however wrong in including nearly the whole of the Carpathian Basin into this region (cf. Fig. 1). As far as material evidence goes, in recent times (from the second half of the 19th century), the black rat has been restricted to isolated localities, mainly in the south-western part of the region.

The rapid withdrawal of the species in the last century has been attributed to a number of causes, including displacement through scramble competition by the Norway rat, a notion no longer tenable (STEINIGER 1952), and the replacement of wooden houses by buildings of more modern construction (JIRSIK 1955).

Table 1. External and cranial measurements (in mm) and weights (g) of internal organs of given for the paired internal organs.

No.	Sex						Cranial measurements						
		Weight (g)	Head & body	Tail	Hind-foot	Ear	Condy-lobasal length	Dias-tema	Length of upper molar row	Length of man-dible	Inter-orbital con-striction	Zygo-matic width	Width of brain-case
1.	♂	158	135	197	34	24	36.4	10.4	7.0	23.2	5.7	18.1	15.5
2.	♂	252	178	—	36	23	44.4	13.0	7.2	25.3	6.6	21.6	18.0
3.	♀	143	133	194	34	22	broken	9.7	6.8	20.3	5.7	broken	broken
4.	♂	253	195	broken	35	23	43.3	12.1	6.8	24.7	6.5	20.6	17.9
5.	♀	208	170	200	33	22	41.6	12.4	6.7	22.2	6.4	20.7	17.5
6.	♂	242	—	—	36	22	—	—	—	—	—	—	—
7.	♂	185	171	broken	32	23	43.0	12.0	7.0	—	6.8	20.5	17.7
8.	♂	212	172	broken	33	22	—	—	—	—	—	—	—
mean		206.6	164.9	197.0	34.1	22.6	41.7	11.6	6.9	23.1	6.3	20.3	17.3
st.d.		42.0	22.7	3.0	2.1	0.7	3.1	1.3	0.2	2.0	0.5	1.3	1.0

Black rats are apparently again on the increase in Europe and may even be the obnoxious problem animal of the future (SIMON 1982). In Hungary the river ports along the Danube (and especially Budapest) are possible entry points. In Slovakia the river route provides recruitment to the isolated populations around Bratislava (HANAK 1967). The recent widespread use of containers in transporting good also facilitates the dispersal of the rats (BECKER 1978, SIMON 1982).

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Rattus rattus collected in October 1980 at Csokonyavisonta, south Hungary. Mean weights are

Inner organs									
Heart	Lungs	Liver	Spleen	Stomach + contents	Kidneys	Testicles	Adrenals	Epididymes (mg)	Ovaries
1.2	1.0	4.2	6.0	9.0	0.31	0.36	22.5	85	—
2.0	1.8	5.8	2.0	—	0.63	0.97	53.0	—	—
0.8	5.0	3.5	2.0	—	0.20	—	25.0	—	—
0.8	1.1	3.3	—	10.4	0.39	—	25.5	—	—
0.8	1.6	5.4	2.0	1.3	0.38	—	63.5	—	28
1.0	1.5	3.3	3.0	5.0	0.50	0.70	23.0	330	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
1.1	1.3	4.3	0.3	4.4	0.40	0.67	35.4	—	—
0.5	0.5	1.1	0.2	4.4	0.15	0.31	18.0	—	—

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