

Travaux du Muséum National d'Histoire Naturelle «Grigore Antipa»	Vol. XLVIII	pp. 473–479	© 30 Dec. 2005
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## DATA ON THE MICROMAMMALS (INSECTIVORA, CHIROPTERA, RODENTIA ) FROM PIATRA CRAIULUI NATIONAL PARK (ROMANIA)

NĂSTASE RĂDULEȚ

**Abstract.** The author presents the results of the studies on the micromammals from Piatra Craiului Massif made during 2001-2003, especially on the western slope. Two insectivorous species, 9 rodents and the Little horseshoe-nosed bat, *Rhinolophus hipposideros* (Bechstein, 1800) are reported. As yet, *Microtus arvalis* (Pallas, 1778) was not reported from Piatra Craiului Massif. Also, some causes which could lead to the diminishing or even to the disappearance of the “wild” species and their replacement with the synanthropic ones, *Mus musculus* Linnaeus, 1766 and *Rattus norvegicus* (Berkenhout, 1769), are underlined.

**Résumé.** L’auteur présente les résultats des études sur les petits mammifères dans le Massif Piatra Craiului, pendant les années 2001-2003, surtout sur le versant de l’ouest. On mentionne la présence de 2 espèces d’insectivores, 9 rongeurs et du petit rhinolophe fer-à-cheval, *Rhinolophus hipposideros* (Bechstein, 1800). Jusqu’à présent l’espèce *Microtus arvalis* (Pallas, 1778) n’a pas été signalée dans le Massif Piatra Craiului. De même, on mentionne des certaines causes qui pourraient déterminer la diminution ou même la disparition des espèces «sauvages» et leur remplacement avec des espèces synanthropes, *Mus musculus* Linnaeus, 1766 et *Rattus norvegicus* (Berkenhout, 1769).

**Key words:** Mammalia, Insectivora, Rodentia, Chiroptera, faunistic, a new report, Piatra Craiului National Park, Romania.

Within the research programme on the flora and fauna of the ecosystem and species protection, “Biodiversity conservation of Piatra Craiului National Park”, some of the scientists of “Grigore Antipa” National Museum of Natural History (Bucharest) and of other institutions made some studies in the area, since 2000.

Till 2000, in Romania, numerous studies were made in different regions of the country, but without dealing with the small mammals (rodents, insectivores, chiropterans) from Piatra Craiului Massif.

Dumitrescu et al. (1962-1963) reported the following species from the cave of Peștera village: *Rhinolophus ferrumequinum* (Schreber, 1774), *Rhinolophus hipposideros* (Bechstein, 1800) (isolated individuals) and *Myotis myotis* (Borkhausen, 1797) (colony). Murariu (2003 a) presented the state of the mammals from Piatra Craiului Massif, conservation statute and their ecological importance, and reported (2003 b) the presence of 41 mammal species from the southern side of Piatra Craiului Massif. Gheorghiu et al. (2003) reported the presence of *Myotis myotis* (Borkhausen, 1797), *Myotis blythii* (Tomes, 1857) and *Rhinolophus ferrumequinum* (Schreber, 1774) in the Avenul de sub Colții Grindului. According to the authors and of the Directive of the European Community (May 1992) Annex II, it is necessary to create “a special preservation area” of the roosts and of the surrounding territory for *Rhinolophus ferrumequinum* (Schreber, 1774) and *Myotis*

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English translation by Mihaela Barcan Achim.

*myotis* (Borkhausen, 1797). Deaconu (2003) made an estimation of the rodent populations from the northern side of Piatra Craiului Massif, presenting 7 species.

In this paper, from the Piatra Craiului Massif, I report the presence of 2 insectivorous species, 9 rodent ones and 1 chiropteran, *Rhinolophus hipposideros* (Bechstein, 1800) from Peștera Mare from Peștera village (Brașov County).

#### MATERIAL AND METHOD

The observations and collectings were made in the trips from Șpirla, Prăpăștiile Zărneștilor (13th -14th of June 2001), “Spiridon Șipoteanu” Chalet, Plaiul Mare Gorges, Valea Largă (26th of June – 1st of July 2002) and Plaiul Mare Gorges, Ghimbav Valley, Brusturet, Sățic (21st – 30th of August 2003) (Fig. 1).

The studied habitats were the humid alpine lawns (“Spiridon Șipoteanu” Chalet), the banks of Dâmbovița River with alders (*Alnus glutinosa*), stinging nettles (*Urtica dioica*) and limited by mountain hayfields (at the end of Plaiul Mare Gorges), and the skirt of the beech forest (*Fagus sylvatica*) (the end of Sățic village), grassy detritus with bushes and beech, spruce fir trees (*Picea excelsa*) (800 m upstream Brusturet), the banks of Valea Largă stream with stinging nettles, colt’s foot (*Tussilago farfara*), alders and limited by mountain hayfields, mixed forest (Ghimbav Valley).

For capturing small mammals (insectivores and rodents) I used small and big metallic spring traps, but also live traps.

After collecting, the small mammals (insectivores, rodents and chiropterans) were identified, measured with the sliding callipers and SuperSamson balance (0-50 g), then a part of them was released, and the others preserved in 70% alcohol. Later, they were inventoried and included in the data base of “Grigore Antipa” National Museum of Natural History.

#### Abbreviations:

Ș – Șpirla; PZ - Prăpăștiile Zărneștilor; ȘS - “Șipoteanu Spiridon” Chalet (the ex Piatra Craiului Hunting Chalet); PM- Plaiul Mare Gorges; VL - Valea Largă; B – Brusturet; VG – Ghimbav Valley; S- Sățic; PP – Peștera Mare from Peștera village.

#### RESULTS AND DISCUSSIONS

Large mammals (bear, stag, wolf, etc) are easily remarked, to identified, and that is why they are so well-known both by the local people and by the rangers. In exchange, small mammals are less known and for this reason I focused on the study on this group.

Between 2001-2003 I made several trips in Piatra Craiului Massif where I collected 74 micromammals, out of which an individual of *Rhinolophus hipposideros* (Bechstein, 1800), 9 insectivorous specimens and 64 rodents, from 9 stations (Brașov and Argeș counties). From a total of 106 mammal species present in Romania, I mention 12 species of small mammals for Piatra Craiului Massif (Tab. 1).

Piatra Craiului Massif is covered mostly by deciduous, coniferous or mixed forests – 9,292 ha representing 65.7% from the total surface of the park (Mihăilescu, 2003), but also by lawns and pastures. The summit can reach 2,229 m (Grindu), 2,231 m (Țimbalul Mic) or 2,238 m (La Om) where there is alpine vegetation (*Vaccinium* sp., *Juniperus communis*, *Pinus montana*).

As I have mentioned above Dumitrescu et al. (1962-1963) reported in Peștera Mare from Peștera village isolated individuals of *Rhinolophus ferrumequinum*

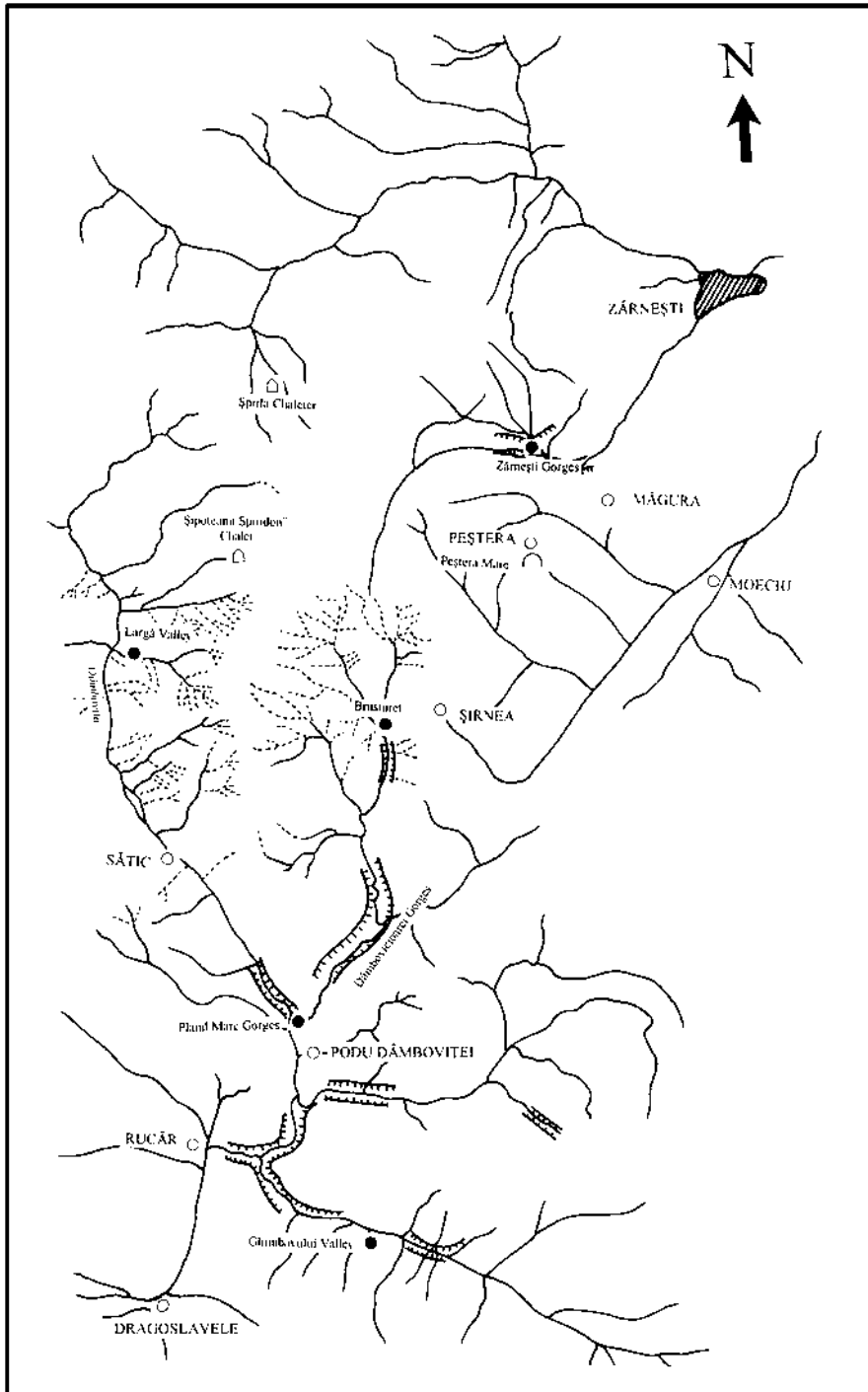


Fig. 1 – Map of Piatra Craiului National Park.

Table 1

Collected small mammals from Piatra Craiului National Park in the period 2001-2003.

Crt. No	Order/Species	Year/Locality									
		2001		2001			2003				
		Ș	PZ	ȘS	PM	VL	PM	B	VG	S	PP
1	INSECTIVORA <i>Sorex araneus</i> Linnaeus, 1758						2	1	2		
2	<i>Neomys anomalus</i> Cabrera, 1907				1	1			2		
1	CHIROPTERA <i>Rhinolophus hipposideros</i> (Bechstein, 1800)										1
1	RODENTIA <i>Muscardinus avellanarius</i> (Linnaeus, 1758)			1							
2	<i>Myoxus glis</i> (Linnaeus, 1766)		1								
3	<i>Clethrionomys glareolus</i> (Schreber, 1780)	3		3	7	4	3			1	
4	<i>Arvicola terrestris</i> (Shaw, 1801)			4		1					
5	<i>Microtus arvalis</i> (Pallas, 1778)							1			
6	<i>Microtus agrestis</i> (Linnaeus, 1761)		3	3							
7	<i>Apodemus sylvaticus</i> (Linnaeus, 1758)			7	3	5					
8	<i>Apodemus flavicollis</i> (Melchior, 1834)			4	4	5					
9	<i>Apodemus agrarius</i> (Pallas, 1771)					1					

(Schreber, 1774), *Rhinolophus hipposideros* (Bechstein, 1800), colony of *Myotis myotis* (Borkhausen, 1797), colony and subfossil remains of *Miniopterus schreibersi* (Kuhl, 1819).

On 26th of August 2003, in Peștera Mare from Peștera village (Brașov County), I found only isolated individuals of *Rhinolophus hipposideros* (Bechstein, 1800) (Fig 1) (Tab. 1).

*Sorex araneus* Linnaeus, 1758 lives in the grassy biotopes from Plaiul Mare Gorges, Brusturet, Ghimbav Valley (Fig. 2) (Tab. 1).

Unlike *Neomys fodiens* (Pennant, 1771), *Neomys anomalus* Cabrera, 1907 is considered more a terrestrial species. I remarked it in the wet habitats from Plaiul Mare Gorges, Valea Largă, Ghimbav Valley (Figs 1, 2) (Tab. 1).

*Microtus agrestis* is present in a lower percentage and only in the grassy areas with a high humidity (Prăpăștiile Zărneștilor, "Șipoteanu Spiridon" Chalet) (Figs 1, 2) (Tab. 1).

Populations of *Microtus arvalis* (Pallas, 1778) from the mountains areas have a reduced number of individuals and only in opened areas (Brusturet) (Fig. 1) (Tab. 1).

*Arvicola terrestris* (Linnaeus, 1758) lives near the water flows, aspect remarked by me on the spot. I found the species in the alpine lawn near "Șipoteanu Spiridon" Chalet and in Valea Largă. (Figs 1-3) (Tab. 1).

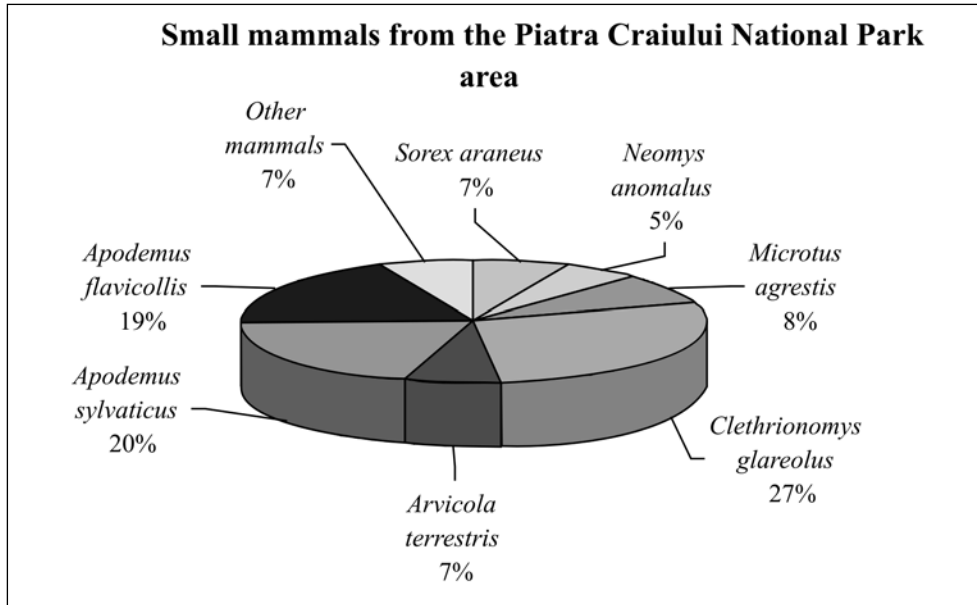


Fig. 2 – Cyclogram with % of each collected small mammal from the Piatra Craiului National Park area.

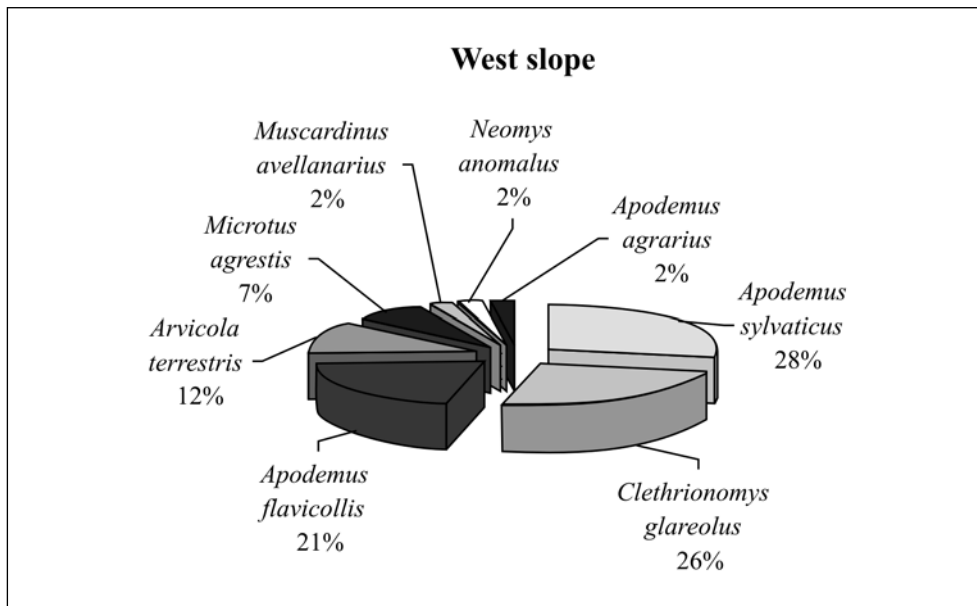


Fig. 3 – Cyclogram with % of each collected small mammal from the Western part of Piatra Craiului National Park.

Even if for some species - *Muscardinus avellanarius* (Linnaeus, 1758), *Myoxus glis* (Linnaeus, 1766), *Apodemus agrarius* (Pallas, 1771) - there are good conditions for surviving, they occur in small populations and were included within other mammals (Fig. 2) (Tab. 1).

Taking into consideration the large afforested surface, the species which prefer this kind of habitat are very well represented - *Clethrionomys glareolus* (Schreber, 1780), *Apodemus sylvaticus* (Linnaeus, 1758) and *Apodemus flavicollis* (Melchior, 1834) (Fig. 2).

Lately, by the extension of the human settlements, the synanthropic species - *Mus musculus* Linnaeus, 1766 and *Rattus norvegicus* (Berkenhout, 1769) - should have been present in the area, but I hadn't occur them in the field.

Some trips were made on the western side of Piatra Craiului Massif during the period 2001-2003, at Șpirila shelter, "Șipoteanu Spiridon" Chalet, Valea Largă and Sătic village (Tab. 1) (Fig. 1). A number of 43 specimens were collected, out of which a single insectivorous mammal (*Neomys anomalus* Cabrera, 1907) and 42 rodents. *Apodemus sylvaticus* (Linnaeus, 1758) (28%), *Clethrionomys glareolus* (Schreber, 1780) (26%) and *Apodemus flavicollis* (Melchior, 1834) (21%) are the prevalent species. *Arvicola terrestris* (Linnaeus, 1758) seems to be a characteristic species to the wet alpine lawns, in a percentage of 12 % (Fig. 3).

*Microtus agrestis* (Linnaeus, 1761) with a percentage of 7% dominates the other 3 species: *Muscardinus avellanarius* (Linnaeus, 1758), *Apodemus agrarius* (Pallas, 1771) and *Neomys anomalus* Cabrera, 1907 (Fig. 3).

A few trips were made on the eastern side, in a too short period of time, reports being made only from Peștera Mare from Peștera village and Brusturet.

As yet, *Microtus arvalis* (Pallas, 1778) was not reported from Piatra Craiului Massif.

From the reported species, *Rhinolophus hipposideros* (Bechstein, 1800), *Sorex araneus* Linnaeus, 1758, *Neomys anomalus* Cabrera, 1907, *Muscardinus avellanarius* (Linnaeus, 1758), *Myoxus glis* (Linnaeus, 1766) were proposed to be included in the "Red Book" (Murariu, 2000).

#### Conclusions

Piatra Craiului Massif was declared National Park and taking into consideration that it is visited by thousand of tourists annually, it is necessary the tourism to be better organized, establishing some precise routes which has to be strictly respected, also some rules regarding the people's behaviour in the Park, permanently displayed and monitored.

Gradually the grazing had to be diminished, and finally excluded from the perimeter of the National Park.

Interdiction of the extension of the human settlements (e.g. Ghimbav Valley), depositing of the housing waste (e.g. Plaiul Mare Gorges) not to affect the "wild" fauna and not to permit its replacing with the synanthropic species: *Mus musculus* Linnaeus, 1766 and *Rattus norvegicus* (Berkenhout, 1769).

Also, the forest cuttings can lead to the disappearance of the species which depend on them, *Clethrionomys glareolus* (Schreber, 1780), *Apodemus sylvaticus* (Linnaeus, 1758), *Apodemus flavicollis* (Melchior, 1834), and their replacement with synanthropic species.

Small mammal species, *Sorex araneus* Linnaeus, 1758, *Neomys anomalus* Cabrera, 1907, *Rhinolophus hipposideros* (Bechstein, 1800), and all the other chiropteran species, *Muscardinus avellanarius* (Linnaeus, 1758), *Myoxus glis*

(Linnaeus, 1766) are proposed to be included in the “Red Book”, therefore they impose protection, both them and their habitats, with their feeding and sheltering places.

Because the data from the eastern and southern sides of Piatra Craiului National Park are less numerous, it is necessary to continue the studies in these areas.

#### DATE ASUPRA MAMIFERELOR MICI (INSECTIVORA, CHIROPTERA, RODENTIA) DIN PARCUL NAȚIONAL PIATRA CRAIULUI (ROMÂNIA)

##### REZUMAT

Autorul prezintă rezultatele cercetărilor asupra micromamiferelor, din 9 stații, din Masivul Piatra Craiului, între anii 2000-2003, cu accent pe versantul vestic. Dintr-un total de 74 exemplare de micromamifere colectate 9 sunt insectivore (2 specii), 64 rozătoare (9 specii) și un exemplar de liliac mic cu nas potcoavă - *Rhinolophus hipposideros* (Bechstein, 1800). Astfel, dintr-un total de 106 specii de mamifere prezente în România, noi semnalăm 12 specii de mamifere mici, pentru Masivul Piatra Craiului.

Având în vedere suprafața mare împădurită, sunt bine reprezentate speciile care preferă aceste condiții - *Clethrionomys glareolus* (Schreber, 1780), *Apodemus sylvaticus* (Linnaeus, 1758) și *Apodemus flavicollis* (Melchior, 1834).

Specia *Microtus arvalis* (Pallas, 1778) nu a mai fost semnalată din Masivul Piatra Craiului. Sunt evidențiate și câteva cauze principale care ar determina reducerea sau chiar dispariția speciilor “sălbatică” și înlocuirea lor cu speciile sinantropice, *Mus musculus* Linnaeus, 1766 și *Rattus norvegicus* (Berkenhout, 1769).

Mamifere mici ca: *Rhinolophus hipposideros* (Bechstein, 1800), *Sorex araneus* Linnaeus, 1758, *Neomys anomalus* Cabrera, 1907, *Muscardinus avellanarius* (Linnaeus, 1758), *Myoxus glis* (Linnaeus, 1766) au fost propuse pentru a fi incluse în “Cartea Roșie”.

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Received: January 31, 2005

Accepted: February 28, 2005

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