

MAMMAL FAUNA (MAMMALIA) OF THE BUZĂU AND TELEAJEN VALLEYS (EASTERN CARPATHIANS – ROMANIA)

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Abstract. A number of 54 mammal species were identified from the two studied areas (Buzău and Teleajen Valleys), 40 species being common in both sites. Eleven species were recorded only in the Buzău Valley and in addition other three species only in the Teleajen Valley. Information about the home range as well as about the approximately density is given for most of the presented species. Altitudinal distribution, preferred habitat and their place in ecosystems are mentioned for all the reported species. Considering the protection statute, 18 species are vulnerable, 7 are endangered and 18 species of mammals are with not enough evaluated populations to confer a certain statute. However, two of the species (*Mus musculus* and *Rattus norvegicus*) need to be controlled because of the risk to disseminate pathogenic agents (viruses and bacteria) of severe diseases both for animals and for humans.

Key words: distribution, density, habitats, ecosystems, protection, control.

1. INTRODUCTION

Both valleys (Buzău and Teleajen) are situated in the southern part of the Eastern Carpathians. Their names are given after the rivers which flow through them, Buzău and Teleajen. The first river springs from Tătaru Mountains and flows into Siret, and the second one springs from the Ciucaș Mountains and flows into Prahova river.

Until now, the mammals from this area were not studied. For Buzău Valley, MURARIU & ANDREESCU (1979) have mentioned only small-sized mammals – insectivores and rodents. POPESCU (1963) has written a systematic list of the vertebrate species of the Prahova County, without specifying their distribution. Teleajen Valley belongs to this county and the single contribution to the knowledge of the small-sized mammals was published by ANDREESCU & MURARIU (1973).

Both valleys go through mountain areas, with coniferous forests or of conifers mixed with deciduous trees, and then with forests only of beech (excepting small areas with inversions of forestry vegetation), of hornbeam, elm and oak from the hilly and plain areas. Grassy vegetation is poorer in the spruce and fir forests, but richer and higher in clearings and along water flows. In hilly and plain altitudes, the forests alternate with the cultivated fields and the faunal landscape of the mammals is different.

We used the nomenclature according to the lists published by MURARIU (1984) and BOURGAT & ROURE (2001).

In this paper we raise for discussion the similarities and dissimilarities in the mammal fauna from the valleys of the Buzău and Teleajen rivers in the Eastern Carpathians (Fig.1).

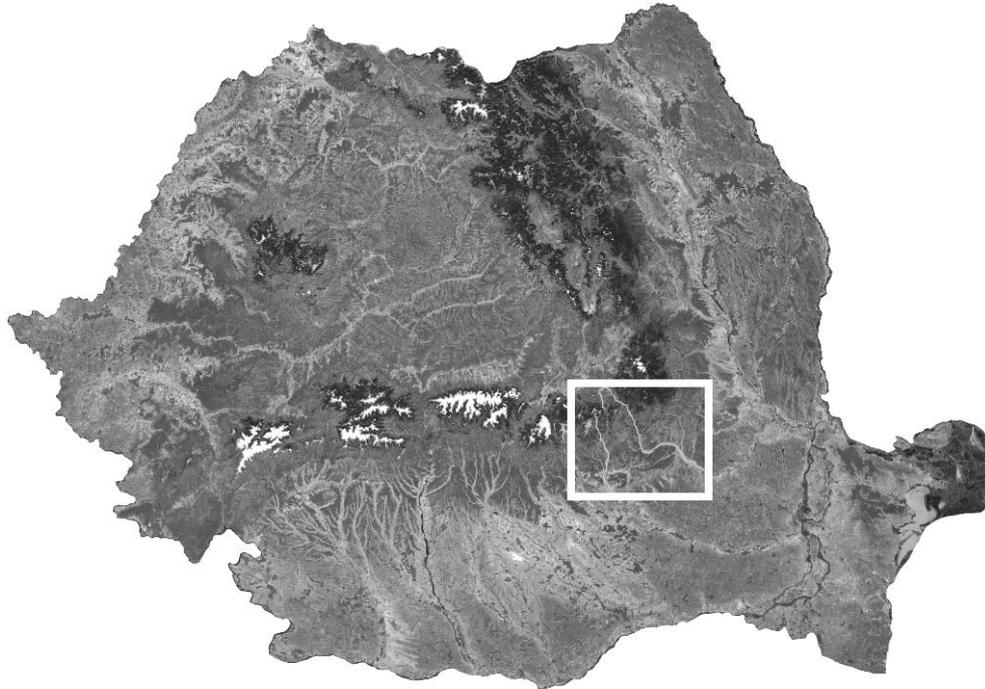


Fig. 1. The white square is marking the surveyed area from the Eastern Carpathians – Romania.

2. MATERIAL AND METHODS

Data on the mammals which live in the natural and cultivated ecosystems along both valleys are known since 1971, and irregularly published until 2012 (ANDREESCU & MURARIU, 1973). The most numerous identifications of the insectivorous and rodents mammal species were made after the material collected using spring traps, live traps, sheet iron cylinders buried in the ground, and the bat species were reported after the individuals caught with Japanese nets and identified by the Bat Detector (*BATBOX DUET*) with frequencies between 18 – 126 kHz. Middle and large sized mammals were not collected, and faunal data for them were gathered according to the observations on the spot, to the study of the tracks in snow or soft soil, to the paths and galleries, or to the burrows, droppings, hair left on the tree barks, when animals scratched their bodies or horns. A part of the

information of hunting interest were got from the County Associations of the Sport Hunters and Fishermen and from the Forest Departments of the two counties (Prahova and Buzău) or directly, from the forest rangers. After 2000, the ultrasound Bat Detector was used for the identification of the bat species. Collected specimens were measured, weighed, labelled with the provisory identifications and preserved in 70% ethylic alcohol for the collections of “Grigore Antipa” National Museum of Natural History of Bucharest.

3. RESULTS AND DISCUSSIONS

Along annual seasons and year by year, mammal populations change in the structure of the individuals by age, in the sex ratio and from numerical point of view. In spring, populations of each species are represented by the smallest number of individuals, because in winter, besides the unfavourable environmental factors, there is a pressure of the birds of prey and of the carnivorous mammals on the small-sized ones, and on the species of hunting interest from legal hunting or poaching. Such pressures affect the mammal species which are active all over the year. Those which adapted to winter hibernating also pay their numerical tribute, by the disturbing of their shelters (as most of the bats from caves, church steeples and lofts) and by the risk of the insufficient resources accumulated in autumn, in order to be enough vigorous in spring. Just because of the long winter fast, the breeding of most of the bat species is in autumn, and ovulation and egg fecundation, in spring.

Among insectivorous mammals, 9 species belonging to five genera of three families were identified, in both Valleys (Buzău and Teleajen – Fig. 2), from plainy level to the alpine one, as follows:

Order **INSECTIVORA** Bowdich, 1821

Family **Erinaceidae** Bonaparte, 1838

Erinaceus concolor Martin, 1838 was observed in both studied sectors, both in the plain areas and the hilly ones; it was not present in the mountain area (Tab. 1). The density of the individuals is greater in the plain area (approximately 3–4 individuals/10 ha) than in the hills (1–2 individual/10 ha).



Fig. 2. Map of the surveyed area between the Buzău and Telajen rivers – Eastern Carpathians.

In both areas, the tendency of the urchin populations run low, mainly because of the anthropic pressure followed by the carnivores (including the stray dogs) hunting activity. The Eastern Hare populations are not sufficiently evaluated in order to get a protection statute, but it can be considered a vulnerable species.

Family **Talpidae** Gray, 1825

Talpa europaea L., 1758 occurs in both studied sectors, from the plain level to the mountain area, with a higher density in the areas with low altitudes (Tab. 1). It prefers the well structured light lands, with humus, in which there is its base food, too – the earthworms. It is not welcomed in grass plots and in cultivated lands or in nurseries, because it makes mounds of earth and makes more difficult the grass mowing, and because of its galleries (for instance, in nurseries) it generates the drying of the cultivated plants. On the other hand, it feeds on insect larvae and adults, harmful to cultivated plants, thus being a useful species. Digging the galleries, it takes out the soil from the lower horizons and allows the soil

ventilation, as well as the deep infiltration of the rainfall water, favouring the preserving of a high humidity degree in the ground. The low density of the European mole in the mountain area could be explained, on the one hand, because of the altitude increasing, and on the other hand, because of the large surfaces with rocks, which are not proper for digging the gallery net. European mole populations are not very well evaluated for getting a protection statute, but it can be considered a species with stable populations.

Family **Soricidae** (Gray, 1821)

Sorex araneus L., 1758 has a distribution almost similar to *E. concolor*, but it is represented by more numerous populations (Tab. 1) in the lower areas (around 6 – 8 individuals/5ha), more reduced in the hills (app. 3 – 4 ind./5ha), and very rare or even absent in the mountains (app. 2 – 3 ind./10 ha). Along both studied valleys, it is important in the trophic relationships, being component in the food of the birds of prey and carnivorous mammals. It has the habit to dig galleries, not matter how superficial they are, as in the leaf layer of the deciduous forests, it looks for the same type of soil preferred by *T. europaea*. Common shrew populations are not sufficiently well evaluated for getting a protection statute, but it can be considered a species with relatively stable populations.

Sorex minutus L., 1766 is present in small populations in the plain area of the two valleys, but it is more frequent in the hilly and mountain ones (Tab. 1). In comparison with the previous species, it has much numerically reduced populations (in the mountain area having a density of 1 – 2 ind./10 ha). It hasn't an important biomass, but it is within the trophic relationships of the ecosystems of the Buzău and Teleajen valleys. Eurasian pygmy shrew populations are not sufficiently well evaluated for getting a protection statute, but it can be considered a vulnerable species.

Sorex alpinus Schinz, 1837 it is reported for the first time from the Teleajen Valley (Tab. 1), above the locality Cheia, in Zăganu Mountain and in Muntele Roșu, near the water flows or in muddy places. In the Romanian fauna, it was also reported from Făgăraș and Țarcu mountains in the Southern Carpathians (MURARIU & BENEDEK, 2005). Also, in the southern part of the Eastern Carpathians, the species is represented by small and isolated populations, with a density of only 1 individual /10 ha. In the Red Book of Vertebrates from Romania (C.R.V.R. by BOTNARIUC & TATOLE, 2005) it is considered a vulnerable species.

Neomys fodiens (Pennant, 1771) is present along the studied valleys, without going further from the water flows, tributaries to the Buzău and Teleajen rivers, in the plain, hilly and mountain areas (Tab. 1). Its populations are very small, with a density of only 1–2 ind. /10 ha, regardless of the altitude. In C.R.V.R. it is considered endangered species.

Neomys anomalus Cabrera, 1907 is rarer than the previous species, with an approximate density of 2 ind./15 ha, only in plain and hilly areas of the both studied sites (Tab. 1). In C.R.V.R. it is considered endangered species.

Crocidura suaveolens (Pallas, 1811) occurs only in the plain and hilly areas, in both studied valleys, in well grass plated habitats, but also in orchards and cereal cultures (Tab. 1). It hasn't numerous populations and in C.R.V.R. it is considered vulnerable species.

C. leucodon (Hermann, 1780) rare occurred, only in the plain area of the Buzău Valley (Tab. 1). The populations of the Bicolored shrew are not well evaluated in order to get a protection statute, but because of the anthropic pressure and habitat changes, it can be considered a vulnerable species.

Table 1

Altitudinal distribution of the insectivore mammals collected and observed on the Buzău and Teleajen Valleys – Eastern Carpathians

Species	Buzăului Valley			Teleajenului Valley			Statute
	Plain	Hill	Mount.	Plain	Hill	Mount.	
<i>Erinaceus concolor</i> Martin, 1838	+	+	–	+	+	–	N.E.
<i>Talpa europaea</i> L., 1758	+	+	+	+	+	+	N.E.
<i>Sorex araneus</i> L., 1758	+	+	+	+	+	+	N.E.
<i>Sorex minutus</i> L., 1766	–	+	+	–	+	+	N.E.
<i>Sorex alpinus</i> Schinz, 1837	–	–	–	–	–	+	V
<i>Neomys fodiens</i> (Pennant, 1771)	+	+	+	+	+	+	P
<i>Neomys anomalus</i> Cabrera, 1907	+	+	–	+	+	–	P
<i>Crocidura suaveolens</i> (Pallas, 1811)	+	+	–	+	+	–	V
<i>Crocidura leucodon</i> (Hermann, 1780)	+	–	–	–	–	–	N.E.

The bat order is represented in the studied areas by 11 species, belonging to six genera and two families.

Order **CHIROPTERA** Blumenbach, 1779 Family **Rhinolophidae** Bell, 1836

Rhinolophus ferrumequinum (Schreber, 1774) was observed and identified only in the hilly areas of both valleys (Tab. 2), knowing that in summer, the individuals of this species leave the hibernation shelters (usually from caves or rock fissures) and shelter in tree hollows and lofts of the houses. Often, it was identified in the feeding habitats together with *Myotis myotis*. In C.R.V.R., it is considered vulnerable species. Worldwide, it is included in AI – DH¹ and AII² – DH;

¹Annex I – Habitat Directive 92/43/EEC with animal and plant species which need specific conservation measures of the habitats.

balconies. Kuhl's pipistrelle populations are not well evaluated for getting a protection statute, but the species is included in the list of the chiropterans with numerical decline populations.

Plecotus auritus (L., 1758) was observed only in the Teleajen Valley, in the locality Cheia, at the feet of Zăganu Mountain (Tab. 2). In C.R.V.R., it is considered a vulnerable species. Internationally, it is included in AI – DH and AII – DH.

Plecotus austriacus (Fischer, 1829) was identified only in the Buzău Valley, in the locality Gura Siriului (Tab. 2). In C.R.V.R. it is considered endangered species. In the world, it is included in AI – DH and AII – DH.

Vespertilio murinus L., 1758 was reported for both valleys, at low altitude (Tab. 2). Usually, it shelters in lofts and in household annexes. In C.R.V.R., it is considered an endangered species. In the world, it is included in AI – DH and AII – DH.

Table 2

Altitudinal distribution of Chiroptera and Lagomorpha species observed and collected on the Buzău and Teleajen Valleys

Species	Buzaului Valley			Teleajenului Valley			Statute
	Plain	Hill	Mt.	Plain	Hill	Mt.	
<i>Rhinolophus ferrumequinum</i> (Screbere, 1774)	-	+	-	-	+	-	V;o.i.
<i>Rhinolophus hipposideros</i> (Bechtsein, 1800)	-	-	+	-	-	+	V;o.i.
<i>Myotis myotis</i> (Borkenhausen, 1779)	+	+	-	+	+	-	P.o.i.
<i>M. daubentonii</i> (Kuhl, 1819)	-	+	-	+	+	-	V;o.i.
<i>Nyctalus noctula</i> (Schreber, 1774)	-	+	-	+	+	-	N.E.
<i>Pipistrellus pipistrellus</i> (Schreber, 1774)	-	-	+	-	-	+	N.E.
<i>P. pygmaeus</i> Leach, 1825	-	-	-	-	+	-	N.E.
<i>P. kuhlii</i> (Kuhl, 1817)	-	+	-	-	-	-	N.E.
<i>Plecotus auritus</i> (L., 1758)	-	-	-	-	-	+	V;o.i.
<i>P. austriacus</i> (Fischer, 1829)	-	+	-	-	-	-	P.o.i.
<i>Vespertilio murinus</i> L., 1758	+	-	-	+	-	-	P.o.i.
<i>Lepus europaeus</i> Pallas, 1778	+	+	+	+	+	+	CIN

In the studied sites, the hares are represented by a single species:

Order **LAGOMORPHA** Brandt, 1855
Family **Leporidae** Gray, 1821

Lepus europaeus Pallas, 1778 is a common species in all types of habitats spreaded along both studied valleys. The individual density is higher (about 3 ind./5 ha) in field areas than in the mountain ones, where there is 1 ind./5 ha. It has no protection statute, but as a species of hunting interest it is included in A 1 of the Law 103/1996.

Rodents are the most numerous, being represented by 20 species which belong to 14 genera of five families:

Order **RODENTIA** Bowdich, 1821

Family **Sciuridae** Gray, 1821

Sciurus vulgaris L., 1758 it is a species present in deciduous and coniferous forests, in the hilly and mountain areas of both studied regions (Tab. 3). It hasn't got a special protection statute, but it is included in A 1 of the Law 103/1996 as a species of hunting interest.

Spermophilus citellus (Linnaeus, 1766) was observed only in Buzău Valley, near locality Beilic – on the bank of the Buzău River (Tab. 3). It hasn't a uniform distribution and therefore the density of its isolated populations is relevant only for restricted habitats in which it is present; in such kind of habitats 20 ind./ha can exist. In C.R.V.R. it is considered an endangered species. Internationally, it is included in AI – DH and AII – DH.

Family **Myoxidae** Gray, 1821

Muscardinus avellanarius (L., 1758) was observed in bushes with *Crataegus* and *Corilus*, in undergrowths and forest skirts, in the plain and mountain areas, along the valleys of Buzău and Teleajen (Tab. 3). Globular nests are made in difficultly accessed vegetal thickets. It is a species with small populations, with a density of about 2 ind./ha. In C.R.V.R. it is considered a vulnerable species and it is included in the Annexes of the Law 13/1993 of adhesion of Romania to Bern Convention/1979.

Myoxus glis (L., 1758) was observed in both studied valleys, only in hilly and mountain areas, in the oak and beech forests, near water flows with high grassy vegetation (Tab. 3). If a familial group of this species was observed in a certain place, another one could be found at a distance of 600 – 800 m farther. That means the density is low, of about 2 ind./ha. In C.R.V.R. it is considered a vulnerable species and it is included in the Annexes of the Law 13/1993 of adhesion of Romania to Bern Convention/1979.

Family **Cricetidae** Rochebrune, 1883

Cricetus cricetus (L., 1758) was observed only in the Buzău floodplain, near the alfalfa cultures and in the fallow lands of Mărculești locality (Tab. 3). In C.R.V.R. it is considered a vulnerable species. It is included in the Annexes of the

Law 13/1993 of adhesion of Romania to Bern Convention/1979 and in the Law 462 on the protected natural areas, conservation of the natural habitats, of wild flora and fauna.

Family **Arvicolidae** Gray, 1821

Myodes (= *Clethrionomys*) *glareolus* Schreber, 1780 is a relatively common species along the two valleys, but only in the hilly and mountain areas (Tab. 3). Evaluating the individual territory at about 600 – 700 m², it results a density of 16 – 18 ind./ha. It prefers forest habitats but with grassy vegetation in forest skirts and clearings; in the middle of the forest it shelters under the stones and digs galleries under the leaf layer, if there are Gramineae in the neighbourhood, its main food. It also feeds on moss, mushrooms, as well as on insect larvae, little gastropods. Bank vole populations are not sufficiently evaluated in order to get a protection statute, but it can be considered a species with stable population.

Arvicola terrestris terrestris (L., 1758) is present in both studied sites, but only at low altitude and it is strictly bound of the water flows, with marshy vegetation, in which the sedge, mace and reed are prevalent (Tab. 3). Water vole populations are not evaluated enough for getting as protection statute, but it can be considered a species with stable populations.

Arvicola terrestris scherman (Shaw, 1801) was observed in both sites, but only along the water flows and near the marshes invaded by aquatic vegetation, from the mountain areas (Tab. 3). In C.R.V.R. is considered vulnerable species.

Microtus arvalis (Pallas, 1779) is common in the studied sites, from plain to about 1400 m altitude (e.g. near the Challet from the shore of Lacul Vulturilor) and to the level of the Muntele Roșu Challet, upstream Telajen Valley (Tab. 3 and Fig. 5). It is known as a species which has periodical explosive breeding (once to 4 – 5 ani), but in our collecting and observations made in the two sites, along 30 years, invasive phenomena did not occur. Checking individual territories of 1000 – 1500 m², it means that the individual density is of about 10/ha. Common vole populations are not sufficiently evaluated for getting a protection statute, but it can be considered a species with stable populations.

Microtus (= *Pitymys* Mc Murtrie, 1831) *subterraneus* (de Sélys-Longschamps, 1836) was observed only in the plain and hilly areas of the two studied sites (Tab. 3). It is less competitive than *M. arvalis* and has smaller populations. Therefore the density is lower (about 2–3 ind/ha). European pine vole populations are not well evaluated for getting a protection statute, but it can be considered a species with stable populations.

Microtus agrestis (L., 1761), generally, has a slightly larger size than *M. arvalis*. I identified it only in mountain habitats, in both sites (Tab. 4). It prefers the

places with a high humidity degree, with sedge, club rush and reed. In C.R.V.R., it is considered a vulnerable species.

Chionomys nivalis (Martins, 1842) was identified only after the traces from the sand under the rocks of the Zăganu Mountain and Siriu Massif (Tab. 4). The difference from the other species of the genus was made after the size, sand tracks and droppings, which are bigger. In C.R.V.R. it is considered a vulnerable species

Ondatra zibethicus (L., 1766) was observed in both sites, only along the water flows from plain and hilly areas (Tab. 4). It is included in Annex 1 of the Law 103/1996.

Family **Muridae** Gray, 1821

Micromys minutus (Pallas, 1771) was identified only in the plain area, after a nest found in the high grassy vegetation from Buzău Valley (Tab. 4). In C.R.V.R. it is considered vulnerable species.

Apodemus sylvaticus (L., 1758) is the species present in all types of habitats, at all altitudes of both sites (Tab. 4). Having individual territories of 1800 – 2000 m², the density is estimated at 4 ind./ha. Wood mouse populations are not well evaluated in order to get a protection statute, but it can be considered a species with stable populations.

Apodemus flavicollis (Melchior, 1834) was identified only in the habitats of compact forest from hilly and mountain areas of both sites (Tab. 4). It is represented by smaller populations than those of the species *A. sylvaticus* and the density is not higher than 2 ind./ha. Yellow-necked mouse populations are not sufficiently evaluated for getting a protection statute, but it can be considered a species with stable populations.

Apodemus agrarius (Pallas, 1771) occurs only in Buzău Valley, in the plain, in grassy vegetation from places with high humidity (Tab. 4). The density of the individuals is of 5 – 6/ha. Striped field mouse populations are not sufficiently evaluated in order to get a protection statute, but it can be considered a species with stable populations.

Mus spicilegus Petenyi, 1882 was identified based on tumuli (small hills) filled up with ears of grains, spontaneous and cultivated plant inflorescences. It was recorded from low altitudes to middle altitudes and its presence was noticed only in the Buzău Valley.

Mus musculus L., 1766 was present in both studied sites (Tab. 4), with a higher density (about 15 – 20 ind./ha) in low altitude areas, rarer in the hilly ones, and of only 1 – 2 ind./ha in the mountain areas. The species populations tend to increase and do not need protection measures.

Table 3

Altitudinal distribution of some collected and observed rodent species on Buzău and Teleajen Valleys

Species	Buzăului Valley			Teleajenului Valley			Statute
	Plain	Hill	Mount.	Plain	Hill	Mount.	
<i>Sciurus vulgaris</i> L., 1758	-	+	+	-	+	+	CIN
<i>Spermophilus citellus</i> (Linnaeus, 1766)	+	-	-	-	-	-	P; o.i.
<i>Muscardinus avellanarius</i> (L., 1758)	+	+	+	+	+	+	V; o.i.
<i>Myoxus glis</i> (L., 1758)	-	+	+	-	+	+	V; o.i.
<i>Cricetus cricetus</i> (L., 1758)	+	-	-	-	-	-	P; o.i.
<i>Myodes</i> (= <i>Clethrionomys</i>) <i>glareolus</i> Schreber, 1780	-	+	+	-	+	+	N.E.
<i>Arvicola terrestris terrestris</i> (L., 1758)	+	-	-	+	-	-	N.E.
<i>Arvicola terrestris scherman</i> (Shaw, 1801)	-	-	+	-	-	+	V
<i>Microtus arvalis</i> (Pallas, 1779)	+	+	+	+	+	+	N.E.
<i>Microtus</i> (= <i>Pitymys</i>) <i>subterraneus</i> (de Selys-Longschamps, 1836)	+	+	-	+	+	-	N.E.

Table 4

Altitudinal distribution of some collected and observed rodent species on Buzău and Teleajen Valleys

Species	Buzăului Valley			Teleajenului Valley			Statute
	Plain	Hill	Mount.	Plain	Hill	Mount.	
<i>Microtus agrestis</i> (L., 1761)	-	-	+	-	-	+	V
<i>Chionomys nivalis</i> (Martins, 1842)	-	-	+	-	-	+	V
<i>Ondatra zibethicus</i> (L., 1766)	+	+	-	+	+	-	o.i.
<i>Micromys minutus</i> (Pallas, 1771)	+	-	-	-	-	-	N.E.
<i>Apodemus sylvaticus</i> (L., 1758)	+	+	+	+	+	+	N.E.
<i>Apodemus flavicollis</i> (Melchior, 1834)	-	+	+	-	+	+	N.E.
<i>Apodemus agrarius</i> (Pallas, 1771)	+	-	-	-	-	-	N.E.
<i>Mus spicilegus</i> Petenyi, 1882	+	-	-	-	-	-	N.E.
<i>Mus musculus</i> L., 1766	+	+	+	+	+	+	-
<i>Rattus norvegicus</i> (Berkenhout, 1769)	+	+	+	+	+	+	-

Rattus norvegicus (Berkenhout, 1769) is the species with the largest adaptive plasticity, practically being present in the rural and urban environments, but also outside localities (Tab. 4). The species populations clearly tend to increase, and because the individuals are intermediary hosts for a series of pathogenic agents which can transmit contagious diseases to other animals and people control measures are necessary to be taken.

Carnivore mammals are represented only by the following 3 species:

Order **CARNIVORA** Bowdich, 1821
Family **Canidae** Gray, 1821

Canis lupus L., 1758 was present in both studied sites, but only in mountain areas (Fig. 4 – left and Tab. 5). Shepherds blame it for damaging the populations of tamed animals, and the hunters, for decimating the individuals of the species of hunting interest. In C.R.V.R. it is considered a vulnerable species and it is included in Annex 1 of the Law 103/1996.

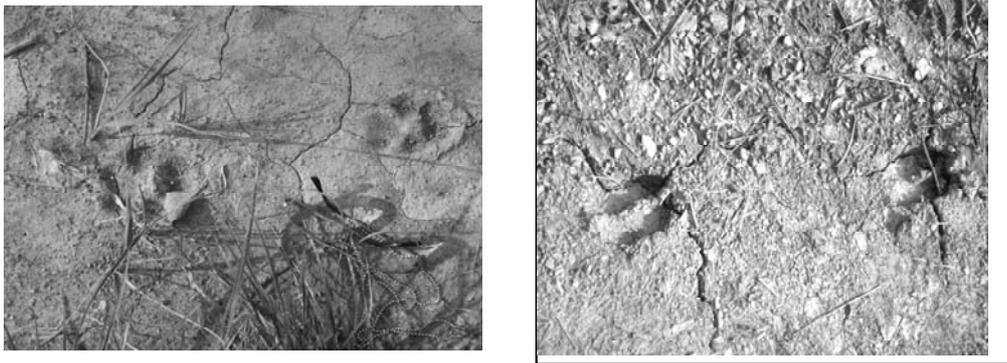


Fig. 3. Tracks of *Canis lupus* (left) and *Cervus elphus* (right).

Canis aureus L., 1758 is a species with stable populations in the Romanian fauna, after 1980, when entered through Bulgaria. In Dobrogea, it enlarged its range westwards, in all Danube Floodplain. It was observed inside the Danube Delta, many times: in Letea and Caraorman islets, in Periparava, Tătaru and Sărăturile islets at Sfântu Gheorghe –Deltă (MURARIU, unpublished notes). Besides the first estimation according to which *C. aureus* would occupy a free niche, created after the range restriction of the species *C. lupus* in the Romanian territory, surely there also are other causes of the jackal range expansion. Climatic changes are also invoked in this explanation, but we have to take into consideration that in southern Europe (in Greece), species populations drastically decline, spreading northwards (Galați, Buzău – in the plain and hilly areas, Brașov, Maramureș) and westwards, through Serbia, Hungary, Croatia, Slovenia, up to Austria. We observed only trails of the species but we do not have any other information on its presence in Teleajen Valley, too (Tab. 5). In C.R.V.R. it is considered vulnerable species and it is included in the Annex 1 of the Law 103/1996.

Vulpes vulpes (L., 1758) occurs in both studied sites, in all altitudes (Tab. 5). It is of hunting interest and it is included in the Annex 1 of the Law 103/1996.

Family **Ursidae** Gray, 1825

Ursus arctos L., 1758 is the species with a high mobility, covering an individual territory of 72 km² (Tab. 5). That means the bears might be counted

repeatedly also from the opposite slopes or from different mountain massifs (Fig. 4), conducting to a possible over estimating of the populations. For covering such large territories, connection corridors are necessary, between the habitats they live in from both sites, from hilly and mountain areas. In present, natural habitats of the bear are fragmented or destroyed by the construction of roads between Wallachia and Transylvania, both in Buzău Valley and in Teleajen Valley, by construction of artificial lakes (e.g. Lacul Siriu), by the development of villa construction very close to or in the habitats preferred by bears. In C.R.V.R. it is considered a vulnerable species, and being of hunting interest, it is included in the Annex 1 of the Law 103/1996.



Fig. 4. Characteristic habitats from Penteleu Mountains.

Family **Mustelidae** Swainson, 1835

Meles meles (L., 1758) was observed only in the afforested habitats of the plain area of Buzău Valley (Tab. 5). If it is not disturbed, it digs its burrows also in the clayey banks from open places, but the anthropic pressure made by hunting and, especially, by poaching (mounting loops at the burrow entrances) diminished drastically the species populations. It is included in Annex 1 of the Law 103/1996.

Martes martes (L., 1758) was present in both studied sites, only in afforested habitats, at all altitudes (Tab. 5). In C.R.V.R. it is considered a vulnerable species, and as a species of hunting interest it is included in Annex 1 of the Law 103/1996.

Mustela erminea L., 1758 was reported only after the local people's information from the hilly and mountain areas from the two studied sites (Tab. 5). It lives in forest habitats, with numerous clearings and other open places; it might not occur in compact forests (Fig. 5). In C.R.V.R. it is considered a vulnerable species, and it is included in Annex 1 of the Law 103/1996 as a species of a high hunting interest.



Fig. 5. View from Siriu Mountains, close to “Lacul Vulturilor” (Vultures Lake).

Mustela putorius (L., 1758) was recorded in all types of habitats, in both studied sites, in the plain and hilly areas (Tab. 5). It is included in Annex 1 of the Law 103/1996.

Mustela nivalis L., 1766 was present in both studied sites (Tab. 5) and which feels “at home” in afforested habitats, at all altitudes, but also in rural localities, looking for mice in households. It is included in Annex 1 of the Law 103/1996.

Table 5

Altitudinal distribution of some observed carnivore mammals in Buzău and Teleajen Valleys

Species	Buzăului Valley			Teleajenului Valley			Statute
	Plain	Hill	Mount.	Plain	Hill	Mount.	
<i>Canis lupus</i> L., 1758	–	–	+	–	–	+	V; CIN
<i>Canis aureus</i> L., 1758	+	+	–	–	–	–	V; CIN
<i>Vulpes vulpes</i> (L., 1758)	+	+	+	+	+	+	CIN
<i>Ursus arctos</i> L., 1758	–	+	+	–	+	+	V; CIN
<i>Meles meles</i> (L., 1758)	+	–	–	–	–	–	CIN
<i>Martes martes</i> (L., 1758)	+	+	+	+	+	+	V; CIN
<i>Mustela erminea</i> L., 1758	–	+	+	–	+	+	V; CIN
<i>Mustela putorius</i> (L., 1758)	+	+	–	+	+	–	CIN
<i>Mustela nivalis</i> L., 1766	+	+	+	+	+	+	CIN

Family **Felidae** Gray, 1821

Felis silvestris Schreber, 1777 occurs in the afforested habitats, at all altitudes of the two sites (Tab. 6). According to our observations, the density of the individuals was higher in the plain areas, especially along the floodplains, sheltering in tree hollows, under stones, fallen trunks and even in the high vegetation of sledge, mace and reed (Fig. 5). Therefore, if in the plain area there are 3 – 4. ind./5ha, in the mountain area they do not exceed 2 – 3 ind/10 ha. In C.R.V.R. it is considered vulnerable species. Being of hunting interest, it is included in the Annex 2 of the Law 103/1996.

Lynx lynx (L., 1758) occurs only in the forest habitats with deciduous and coniferous trees, between 700–1600 m altitudes, in both studied sites (Tab. 6). Knowing their individual territories of about 300 km², we can assert that it is a species which needs connection corridors between different slopes and between different mountain massifs; only in 24 hours it can cover 15 – 20 km, looking for food (hares, young goats and deer, mice, and also birds which it can catch). In a compact forest of *Fagus silvestris* from the Siriu Massif, in July 2010, I remarked the alarm of six hen flock of *Tetrao urogalus*, when a lynx was getting closer. While they were preoccupied for finding food in the leaf layer, suddenly they flew in the canopy of the neighbouring trees. In C.R.V.R. it is considered a vulnerable species, declared Natural Monument. It is protected by Law 13/1993 of Romanian adhesion to Bern Convention, by the European Directive 92/43/EEC, Nature 2000 and by the Law 462/2001 on the regime of the protected natural areas, natural habitat conservation, of wild flora and fauna.

Order **ARTIODACTYLA** Owen, 1848

Family **Suidae** Gray, 1821

Sus scrofa L., 1758 prefers afforested habitats, from the plain to the mountain areas of the two studied sites (Tab.6). Although it goes out the forest thickets at sunset, it enters in cultivated lands destroying more than it eats. When active, it routs all the time after mouse and birds nests, insect larvae and adults, snails, bulbs, rhizomes and juicy roots, leaving behind characteristic traces of its presence in those places. It was not included in C.R.V.R. but in the Annex 1 of the Law 103/1996.

Family Cervidae Gray, 1821

Cervus elaphus L., 1758 is the species with an unusual mobility of the individuals, passing easily from a slope to another one or from a massif to another (Fig. 4 – right and Tab.6). It prefers the compact deciduous forests from both studied sites. The distances when looking for food and quiet refugees can exceed 200 km. Under these circumstances, the stag density is reported with a large error margin, of about 2 – 4 ind./40 – 60 ha. In C.R.V.R. it is considered a vulnerable species, and it is included in the Annex 1 of the Law 103/1996, as a species of hunting interest.

Capreolus capreolus (L., 1758) prefers the afforested areas for a better protection, but it is widely distributed, from plain to above the forest limit in Buzău and Teleajen valleys (Tab.6). In summer, solitary individuals or family groups, at the most, can be observed; they gather in herds of 10 – 15 individuals only in winter. It is less mobile than *C. elaphus*, the distances covered by an individual being limited to around 1 km². In C.R.V.R. it is considered a vulnerable species, and it is included in the Annex 1 of the Law 103/1996, as a species of hunting interest.

Table 6

Altitudinal distribution of the observed two carnivore species and three artiodactyls in Buzău and Teleajen Valleys

Species	Buzăului Valley			Teleajenului Valley			Statute
	Plain	Hill	Mount.	Plain	Hill	Mount.	
<i>Felis silvestris</i> Schreber, 1777	+	+	+	+	+	+	V; CIN
<i>Lynx lynx</i> (L., 1758)	–	+	+	–	+	+	V; o.i.; CIN; MN
<i>Sus scrofa</i> L., 1758	+	+	+	+	+	+	CIN
<i>Cervus elaphus</i> L., 1758	–	–	+	–	–	+	V; CIN
<i>Capreolus capreolus</i> (L., 1758)	+	+	+	+	+	+	V; CIN

From faunistic point of view, the 54 mammal species reported from Buzău and Teleajen valleys belong to 37 genera of 17 families of six orders: Insectivora, Chiroptera, Lagomorpha, Rodentia, Carnivora and Artiodactyla. Excepting order Lagomorpha, which is represented by a single family with a single monospecific genus in the Romanian fauna, the other orders are represented by two families (Chiroptera and Carnivora), by three families (Insectivora) or by 4 or 5 families (Carnivora, respectively, Rodentia).

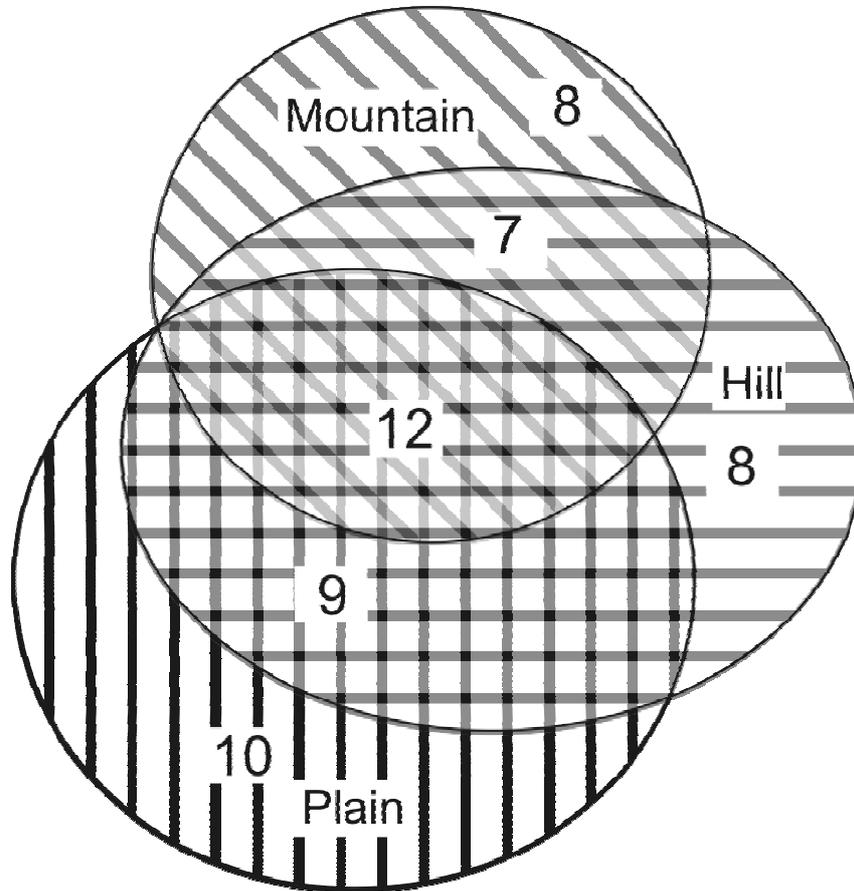


Fig. 6. Venn diagram of the shared and unique species on altitude (plain, hill, mountain) cumulated for both studied areas (the Buzau and Teleajen Valleys).

According to the preferred ecosystems, a number of 10 mammal species are present only in the plain area of the two studied valleys (Fig. 6), while four species are present only in the hilly forests, and nine species are present only in the mountain habitats. A number of 15 species are present from the plain to the level of the alpine meadows; eight are common to the hilly and mountain ecosystems, and nine to those of plain and hill.

From the protection point of view, 18 are vulnerable and seven – endangered. In the orders Lagomorpha, Rodentia, Carnivora and Artiodactyla there are 15 species which are of hunting interest, besides different protection statutes. A number of 13 vulnerable and endangered species of the Romanian fauna, and particularly, of the two studied valleys, have also a statute of international protection,

being included in the annexes of different conventions and directives. A relatively large number of species (18) are not sufficiently well evaluated for getting a protection statute. Finally, for two of the reported species a severe control must be implemented, due to the damages they make and especially to the risk of spreading (as hosts) the pathogenous agents of some important diseases (viral and microbial), being out of discussion any protection statute.

4. CONCLUSIONS

1. Along the Buzău and Teleajen Valleys there are approximately 50% of mammal species reported from the Romanian fauna. This mammal diversity corresponds to the variety of the natural and cultivated ecosystems in the southern part of the Eastern Carpathians.

2. The home range, as well as the density of specimens on a certain area, were estimated for most species.

3. Ten mamal species were observed only in the plain area and some of them only in one of the two surveyed Valleys. It is the case of *Spermophilus citellus* – reported only from the Buzău Valley. Being a species of communitary interest for the Natura 2000 protective area network, this species has a higly conservative value.

4. Nine mammal species were identified for plain and hilly ecosystems. Four species are characteristic only to hilly areas, and eight species are characteristic for hilly and mountainous areas.

5. Nine species are reported only for mountain areas and 15 species – for ecosystems from plain, hily and mountain areas.

6. The statute of endangered and vulnerable is attributed to 18 mammal species. Except of two species of Muridae (which must be controlled), the other 18 species have not enough known and evaluated populations to give a conservative statute.

7. In orders Lagomorpha, Rodentia, Carnivora and Artiodactyla from the southern part of the Eastern Carpathians there are 15 mammal species, which in addition to their conservation statute, they also are of cynegetic interest.

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