

Travaux du Muséum National d'Histoire Naturelle «Grigore Antipa»	Vol. XLIX	pp. 387–399	© Octobre 2006
---	-----------	-------------	-------------------

MAMMAL ECOLOGY AND DISTRIBUTION FROM NORTH DOBROGEA (ROMANIA)

DUMITRU MURARIU

Abstract. There are reported 49 mammal species from North Dobrogea which represent 48% from total Romanian mammal fauna. Forests, steppe pastures, narrow plains along main rivers, cultivated areas, marshes and the Danube River in the West, North and East border of studied area determined different distribution of these 49 species. They belong to 5 orders and 18 families, some of them (Erinaceidae, Talpidae, Leporidae) with only one species.

Résumé. On rapporte 49 espèces de mammifères de Dobrogea du nord qui représentent 48 % de la faune de mammifères de la Roumanie. Les forêts, les pâturages de steppe, les plaines étroites le long des rivières principales, les secteurs cultivés, les marais et le fleuve de Danube qui délimite la frontière de l'ouest, du nord et de l'est du secteur étudié ont déterminé la distribution différente de ces 49 espèces. Ils appartiennent à 5 ordres et à 18 familles, certains (Erinaceidae, Talpidae, Leporidae) avec une seule espèce.

Key words: mammals, ecology, distribution, habitats.

The horst of Dobrogea is dominated by a series of summits and tablelands which characterizes by an aridity reflected by the floral and faunal structure. Telîța and Taița are the main rivers of northern Dobrogea. On the border of the heights mentioned above there is a rich hydrographical net, West -, North -, and eastwardly dominated by the Danube flow, with the Delta and Razim-Sinoe Lagoonal Complex. Southwards the landscape of Dobrogea is unchanged, the passing between the counties Tulcea and Constanța being made through the Casimcea Tableland (Fig. 1).

The orogenesis of the hercinic chain and the surrounding of the Danube with its small tributaries, as well as the presence of the mentioned lagoonal complex confer on northern Dobrogea a relief with high physical-geographical contrasts, with barren or afforested summits (e.g. beech forest reservation), with tableland covered by forests (e.g. Babadag afforested tableland) or large agricultural surfaces as on Niculițel, Tulcea and Nalbant hills.

Under these circumstances there are some mammal species which do not depend on the water flows, on the wet or, at least, shadowed areas. *Mesocricetus newtoni*, *Cricetulus migratorius*, *Sicista subtilis*, *Mustela eversmanni*, *Vormela peregusna* are only some examples, out of which the first and the last species do not exceed their distribution in Dobrogea to the other areas of Romania. Meanwhile, other species (*Neomys fodiens*, *N. anomalus*, *Arvicola terrestris*, *Ondatra zibethicus*, *Lutra lutra* and so one) are spread only along the water flows.

But there are a few references on the mammals of northern Dobrogea, as yet. On the one hand, most of the data are on the mammals of the Danube Delta (Almășan & Hamar, 1958; Andone, 1959, 1966; Barbu, 1967, 1968 a, b, 1970; Barbu & Popescu, 1965; Barbu & Barbu, 1968; Randik and col., 1980; Rudescu & Godeanu, 1980; Simionescu, 1971; Murariu, 1981 a, b, 1996).

English translation by Mihaela Barcan Achim.

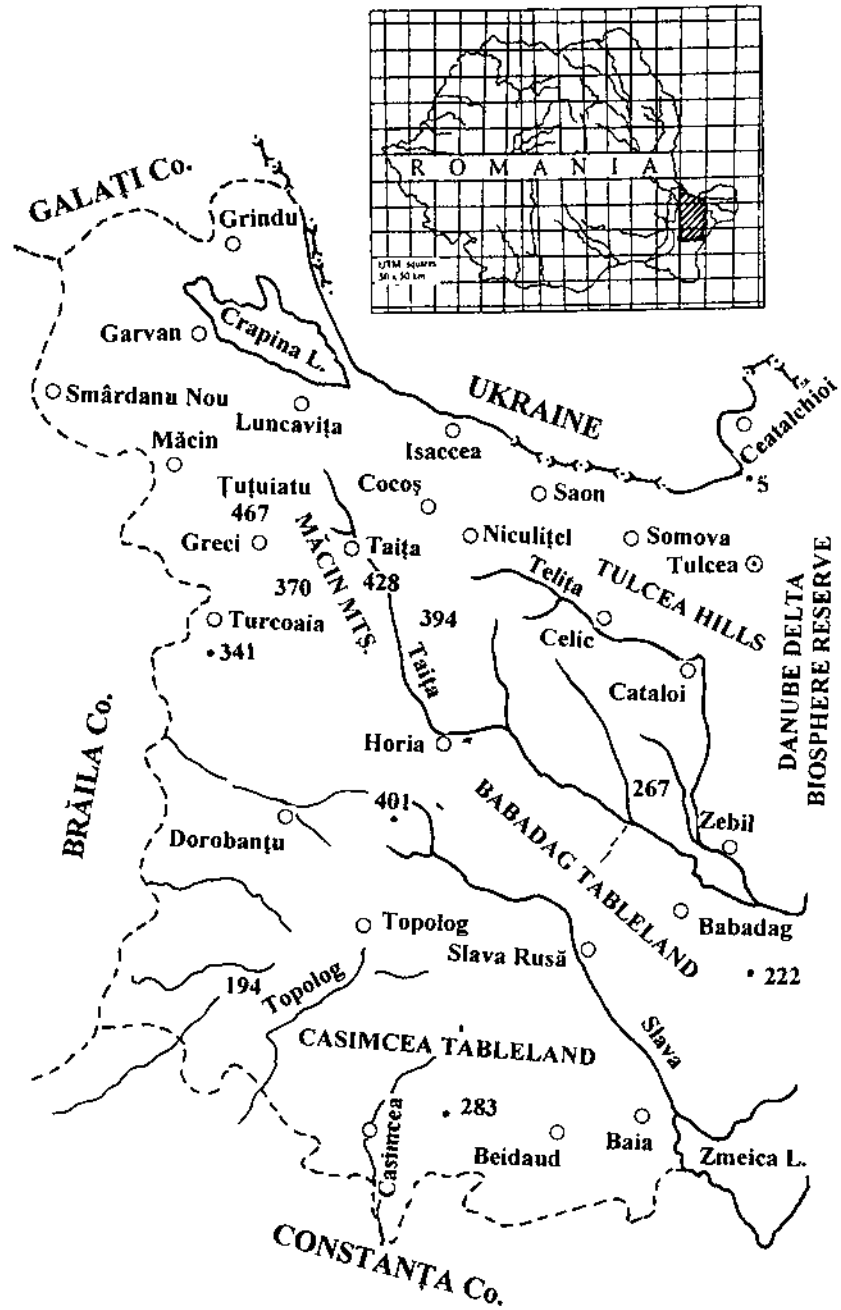


Fig. 1 – Marking of the surveyed area (hatched) of Romania and detail of North Dobrogea.

On the other side, the references on the mammals of northern Dobrogea specify an order or a single species, at the most (e.g. Popescu, 1967, 1968, 1972, 1977). These contributions dealt with the state of the rodents from North-western Dobrogea, the study of the pellets of some day and night birds of prey, the ground squirrel food. Ausländer & Hellwing (1957) presented some ecological aspects of the small mammals from the protective forest belts (robinia plantations) from Valul lui Traian, which belonged in fact to southern Dobrogea, Constanța County.

Helminthofauna of the small mammals of Dobrogea was approached by Chiriac (1972), Chiriac & Barbu (1962), and Suci (1971) identified the parasitic siphonapterans on the small mammals of Dobrogea and the Danube Delta. Popescu and col. (1964, 1966, 1967, 1968, 1970, 1974) studied the systematics and dynamics of some small mammals (e.g. from the Măcin area), the food of the mole rat and of some birds of prey. Vasiliu (1964) wrote about *Nyctereutes procyonoides* from Romania, Dobrogea and mainly the Danube marshes.

By this paper I propose a characterization of some ecosystems from northern Dobrogea and to present the state of the mammals of the area in comparison with those from inside Romania and the conservation statute.

MATERIAL AND METHOD

The trips in northern Dobrogea were made practically in all seasons, along the period 1985 – 2005, and Tulcea hills were also investigated in the '70s (Murariu, 1981 a, b). That is why the list of the sites is very rich: Grindu, Garvan, Smârdanu Nou, Luncavița, Isaccea, Saon, Cocos, Taița, Greci, Măcin, Turcoaia, Niculițel, Celic Dere, Poșta, Cataloi, Horia, Izvoarele, Cerna, Ciucurova, Topolog, Babadag, Casimcea, Baia. All these sites presume the study of the hills (Tulcea, Nalbant, Niculițel), tablelands (Babadag and Casimcea) and summits Țuțuiatu, Pricopan, Moroianu, Pietrosul Mare and Coștiag.

Ecological remarks on the habitats were completed with observations on the mammal tracks and droppings. In addition, 140 pellets of the birds of prey were collected, from which some small mammals were identified; also, small mammals were collected using different spring traps, for killing and less the live ones. Body measurements, weighing, identification and preliminary conservation were made on spot, in laboratory being made the checking of the identification and the introduction of the material in the collection of "Grigore Antipa" National Museum of Natural History (Bucharest).

RESULTS AND DISCUSSIONS

Order Insectivora Bowdich, 1821

From this order there are representatives of the three families (Erinaceidae Bonaparte, 1838; Talpidae Gray, 1825; Soricidae Gray, 1821) reported for the Romanian fauna, but with small and isolated populations in the surveyed area.

As far as I know, *Erinaceus concolor* was not reported from northern Dobrogea as yet, only from the surroundings of Babadag locality, at the feet of the oak afforested hills. Its main food (insects, earthworms, mice) occurs only in grassy places, with a rich humus stratum where there is a certain humidity level – a rare condition for the Dobrogea steppe. Nevertheless, near the localities which lay along the rivers Telița and Taița, the species is known by the local people, and I remarked the Eastern European Hedgehog at Celic Dere.

Talpa europaea Linnaeus, 1758 is more frequent than the hedgehog, especially in the fallow lands, along the valleys and water flows. The cultivated lands are generally avoided just because of the agricultural works, when the gallery nets are destroyed, and the rocky areas allow with difficulty the digging of the galleries and, mainly, foraging. The forest skirts from Valea Fagilor and of the mixed forests from Niculițel have better soils and, therefore, populated with moles.

Sorex araneus Linnaeus, 1758 occur both in Bididia hill near Tulcea, and in the ruderal vegetation from the edge of the road which links the localities Cataloi and Niculițel. Telița river occur on this way, it creating an optimum humidity necessary to an abundant spontaneous vegetation, where numerous invertebrates shelter – the base food of this shrew.

Sorex minutus Linnaeus, 1766 is rather more xerophilous than the previous species. It was collected from the hills from Luncavița, Măcin, Saon, Bididia, Celic Dere and Casimcea. In September 2005, a single specimen was caught, from the joining area between the oak forest and agricultural land, after locality Poșta, towards Celic Dere. Although there there is a steppe area, the brown and grey soils allow the digging of the galleries for refuges and, especially, for foraging: earthworms, larvae and adult insects, small terrestrial gastropods, myriapods, and so on.

Neomys fodiens (Pennant, 1771) was collected only in May 1997, from the bank of the Telița River, in front of Celic Dere Monastery, and it was remarked in the dead branch of the Danube, North to locality Smârdanul Nou.

Neomys anomalus Cabrera, 1907 was remarked only at the feet of the Consul hill, at about 300 m far from the bed of the Taița River. The habitat characterizes by the presence of the spontaneous gramineae and rare arborescent bushes. In May 1997, in that place, I collected a specimen of *Coluber caspius*, which probably accidentally included *N. anomalus* in its food, mainly consisting in Lacertidae and rodents.

Crocidura suaveolens (Pallas, 1811) finds optimum conditions in the steppe areas, from the hills Tulcea, Nalbant, Țuțuiatu, Moroianu and Pricopan. A female specimen, with a high tear level of its teeth, was found on the road near the Celic Dere Monastery, by Alexandru Iftime. It is an additional confirmation of the carnivore experience in catching shrews, in the period when they still confound them with the mice. Then, feeling the repellent smell of the tegumentary glands from the body sides, they abandon them. The food of this shrew is exclusively formed of insects, orthopterans being prevalent (about 70%). Dipterans, coleopterans, lepidopterans, then myriapods and terrestrial gastropods are eaten in small percentages. The earthworms are much less present in the food of this shrew, because they find a few organic substances for metabolizing them in the rocky hills.

Order Chiroptera Blumenbach, 1779

From this order the representatives of both families (Rhinolophidae Bell, 1836 and Vespertilionidae Gray, 1821) occur and are reported in the Romanian fauna.

Rhinolophus ferrumequinum (Schreber, 1774) is largely distributed in the caves and the clefts of the limy rocks of North Dobrogea. Consul hill, mentioned by Dumitrescu and coll. (1962 – 1963) is an example of a relief where such kind of shelters occurs. In May 1997, surveying the cave from Consul hill, I found only a specimen of *R. ferrumequinum*, killed by a boy who shepherded in the area a day before. Local people's hostile attitude against bats bases on the wrong believes on these nocturnal animals, which rest in dark shelters and couldn't be correctly studied as the others.

Rhinolophus hipposideros (Bechstein, 1800) and *Rhinolophus mehelyi* Matschie, 1901, than *Myotis blythii* (Tomes, 1857), *M. emarginatus* (E. Geoffroy, 1806), *M. mysracinus* (Kuhl, 1819), *M. bechsteini* (Kuhl, 1818), *Plecotus auritus* (Linnaeus, 1758), *Eptesicus serotinus* Schreber, 1774 and *Miniopterus schreibersii* (Kuhl, 1819) are species reported by Dumitrescu and coll. (op. cit.), only from South Dobrogea, which I didn't identified in North Dobrogea, but possible to be, especially in the rocks of Culmea Măcinului.

But *Myotis nattereri* (Kuhl, 1818), also reported both from South and North Dobrogea (Dumitrescu and coll., 1962 – 1963) was identified by me, too, in August 1995, in the caves „de la Moară” – placed at the northern end of Consul hill from Tulcea County.

Other two bat species - *Nyctalus leisleri* (Kuhl, 1818) and *Pipistrellus nathusii* (Keyserling and Blasius, 1839) – were previously reported from North and South Dobrogea and were not identified by me.

Nyctalus noctula (Schreber, 1774) and *Pipistrellus pipistrellus* (Schreber, 1774) were not reported from North Dobrogea, as yet, but I remarked them at Garvan, Cocoș, Greci, Topolog and Baia. A specimen of *P. pipistrellus* was found by Oana and Alexandru Iftime, at Celic Dere, in the window blind of a room from the station of the Institute of Ecomuseum Research of Tulcea, in September 2005.

Order Lagomorpha Brandt, 1855

This order is represented by a single species *Lepus europaeus* Pallas, 1778 (family Leporidae Gray, 1821) in North Dobrogea, with a very wide distribution (localities Grindu, Garvan, Luncavița, Isaccea, Taița, Cocoș, Greci, Măcin, Turcoaia, Horia, Cerna, Ciucurova). The remarks on its shelter, traks and droppings were made also within the Măcin Mountains National Park, on the summits Țuțuiatu, Pricopan, Moroianu, Pietrosul Mare and Coștiag, at 300 – 400 m altitude. Young wood, grassy bushes and limy rocks inside the park, then the croplands, hayfields and the vegetation along the thin water flows offer optimum conditions for foraging and shelter for the hares of North Dobrogea.

Order Rodentia Bowdich, 1821

In comparison with other mammal orders from the surveyed area this order is represented by the most numerous species, which belong to eight families: Sciuridae Gray, 1821; Myoxidae Gray, 1821; Cricetidae Rochebrune, 1883; Arvicolidae Gray, 1821; Muridae Gray, 1821; Spalacidae Gray, 1821; Zapodidae Coues, 1875 and Myocastoridae Ameghino, 1904.

Spermophilus citellus (Linnaeus, 1766) is more and more subjected to the anthropic pressure, on the one hand by the decreasing of the common surfaces and the more intense grazing of the others, and on the other side by the intensification of the traffic and by the daily killing of a part of the small isolated populations. In May 1997, on the road from Hârșova to Tulcea, I observed three ground squirrels hit by cars, between localities Topolog, Ciucurova and Cataloi; I saw other two ground squirrels between the localities Horia and Smârdanu Nou. Generally, it is considered that the decreasing of some species populations owns to the limiting and destroying of the habitats, to the activity of the birds of prey and carnivorous mammals, but, as regards the ground squirrel, the traffic is responsible for the fast decreasing of the individual number.

Grindu, Garvan, Smârdanu Nou, Luncavița, Cocoș, Dăeni, Casimcea and Beidaud are localities in whose open and uncultivated outskirts there are stable populations of *S. citellus*. Popescu (1968) reported the species, together with other rodents, from compact forests, forest skirts, bushes or isolated trees and from nurseries from Babadag hills.

According to our observations, *S. citellus* does occur neither in the afforested lands nor in the cultivated ones. Only accidentally, ground squirrels occur in croplands, for 2 – 3 years, till their withdrawal in the newly digged galleries in open places.

Dryomys nitedula (Pallas, 1779) is a species whose presence in Dobrogea, in general, or especially in North Dobrogea raised questions. Popescu and coll. (1974) cited *D. nitedula*, without mentioning any locality, when he presented some ecological aspects on the rodent populations from Dobrogea. But the species is included in two of four lists made for the area and biotope, as being collected. Unspecification of a locality by the above mentioned authors and absence of the species in my collecting and observations (Murariu, 1981 a, b and 1996), made me to reduce myself to the information given by the engineer Ion Bitoneanu (Babadag Forest Range), according to which the species might have been present in Babadag forest. Those years I referred to the absence of the reports after 1970. Later, I collected two specimens of *D. nitedula* from the oak forest of Celic Dere hills (May 1997 and September 2005), this time introducing the material in the collection of “Grigore Antipa” National Museum of Natural History of Bucharest. Also, the species was remarked in the forests from Culmea Țuțuiatu, at about 350 m altitude.

Muscardinus avellanarius (Linnaeus, 1758) was observed by us only in the forests of Babadag hills (Murariu, 1996), and later, in Niculițel and Luncavița.

Mesocricetus newtoni (Nehring, 1898) was reported by Popescu (1968) from Jijila and Măcin, and Murariu (1996), from the Tucea hills. Also, this species was reported by Popescu (op. cit.) in two of the four areas and biotopes, where the road margins and fallows are included – habitats from where I reported the species for Bididia, near Tulcea.

Arvicola terrestris (Linnaeus, 1758) is a species strictly bound of the running waters. I collected a specimen in September 2005 from the bank of Telița river, near the neighbourhood of Celic Dere Monastery and I remarked its hills on the right bank of Taița river, upstream locality Horia. On other occasions, too, I observed its competition with *Rattus norvegicus*, an ubiquitous and a very good swimming species. Because of this, the populations of *A. terrestris* continuously decrease and their scarceness reflects in trophic relations of the birds of prey and of carnivorous mammals, which can catch faster an arvicolid than a murid.

Microtus (= *Pitymys* Mc Murtrie, 1831) *subterraneus* (de Selys-Longschamps, 1836) populates the fallow lands, even those cultivated, especially when these lands are close to forests. It can be said that the skirts of the forests are winter shelters for the arvicolids and murids, from where they spread in croplands during summer. Smârdanu Nou, Măcin, Celic Dere and Poșta are the places from where I collected one specimen of *P. subterraneus* from each of them. I identified its paths under grass near Cerna, Niculițel, Cataloi.

Microtus arvalis (Pallas, 1779) represents one of the base elements of the bird of prey and of carnivorous mammal food in North Dobrogea. Popescu (1968) reported 175 specimens collected by traps and 2,349 specimens of *M. arvalis* identified from the pellets of two colonies of Long-eared Owl (*Asio otus otus* L.)

from Ghecet, 3 km far from the locality Smârdanu Nou. I identified it both in pellets and in traps, in the neighbourhood of localities Taița, Greci, Măcin, Niculițel, Poșta, Izvoarele, Cerna, Ciucurova and Babadag. The easiest way of identification is after the openings of the galleries and the paths between them, in the Lucerne cultures. It also makes paths in the fallow lands, under grass, rather deeper than those of *M. subterraneus*.

Popescu and coll. (1974) studied the the gastro-intestinal content of several rodent species, among them being also 254 specimens of *M. arvalis*. In comparison with other six species (*Spermophilus citellus*, *Spalax leucodon*, *Mus spicilegus*, *Apodemus agrarius*, *A. sylvaticus* and *A. flavicollis*), in *M. arvalis* they identified the remains of 68 plant species. Therefore, this is the highest food diversity, the second being *A. sylvaticus* with 46 identified plant species.

Microtus agrestis (Linnaeus, 1761) was not present in my rodent collecting from North Dobrogea nor in the 140 pellets of the birds of prey. I cite it but after Marcheș and coll.'s reports (1954), from Valul lui Traian (South Dobrogea). Popescu (1968), Popescu and coll. (1974) reported it just from North Dobrogea, from Smârdanu Nou and Jijila, being identified both in the trap collecting (20 specimens) and in pellets (57 specimens). But Popescu (1968) specified that: „Cercetările noastre confirmă deci prezența în fauna Dobrogii a acestei specii, care se pare că populează numai zona umedă din vecinătatea apelor, de unde probabil ajunge rareori și în plină stepă atunci când sezonul este ploios.” (Our studies confirm the presence of this species in the fauna of Dobrogea, which seems to populate only the wet area around the waters, and probably reaches the steppe during the rainy season, now and then).

In one of our papers (Murariu and coll., 1979) we were sceptical on the species presence in Dobrogea, taking into consideration the condition of the habitats from where we collected *M. agrestis* in other areas of Romania, totally different from those from the South-West Romania.

Microtus rossiaemeridionalis Ognev, 1924 was reported for the Romanian fauna after 1980 (Randik and coll., 1980; Murariu, 1984; Gavrilă and coll., 1984, 1986). In North Dobrogea there are small and isolated populations, near the water flows (lower flows of the rivers Teliața and Taița), with high grassy vegetation and high humidity. Maybe, in the previous reports of *M. arvalis* also there were specimens of *M. rossiaemeridionalis*, the external morphological differences between species being hardly established.

Ondatra zibethicus (Linnaeus, 1766) occurs on the sides of the horst of Dobrogea. I observed it on the shores of the pools, lakes and on the banks of the rivers invaded by aquatic vegetation from Grindu, Garvan, Zebil.

Micromys minutus (Pallas, 1771) is extremely rare within Dobrogea conditions, the richer grassy vegetation being limited to the surroundings of the marshy places: Grindu, Garvan, Isaccea and Saon.

Apodemus sylvaticus (Linnaeus, 1758) is the widely spread species in North Dobrogea. It was collected by traps or observed in the trips from the hills Tulcea, Niculițel, Nalbant, Casimcea, on Culmile Măcinului, in forests and fallowed open places and on the edge of the roads. From the mammals killed by cars, *A. sylvaticus* occurred in a number almost equal with that of *Microtus arvalis*. Popescu and coll. (1974) considered that the presence of this species is of 60.50%, in comparison with the rest of the rodents collected from Dobrogea.

Apodemus flavicollis (Melchior, 1834) occurs much more rarely, preferring the afforested habitats with large surfaces, without anthropic perturbations: grazing, forestry operations or pest control. Popescu and coll. (1974) established four areal categories and biotopes for Dobrogea. They reported the species from three of them, it being absent only in the Danube Delta.

Making an analysis of the infestation of 14 rodent species from Dobrogea Popescu and coll. (1974) noted that while *A. flavicollis* represented only 4.18% of the collected rodents, the infestation with acari was of 58.53%, and with nematods, almost 43%, some very high percentages, and which, finally led to a high mortality.

Apodemus agrarius (Pallas, 1771) prefers, as it is known, the high humidity places and therefore it should be present only „... în terenuri din vecinătatea apelor...” (in the areas close to streams) (Popescu and coll., 1974). But, as I have noted on other occasions (Murariu, 1981 b), *A. agrarius* also uses to dig its galleries near the food deposits made by *Mus spicilegus*. This one looks for the croplands or, at the most, the areas from the limit of the crops with the forests, where spontaneous plants grow. Its food reserves for winter consist in the seed and grains of the cultivated plants but also in the seed, flowers, leaves and even the stems of the spontaneous ones. They use to gather tubercles and pieces of roots and fruits (e.g. of *Crataegus monogyna*). This food is also searched by *A. agrarius*, thus explaining the vicinity of these two species. In addition, in the food of *A. agrarius*, Popescu and coll. (1974) identified elements of animal origin: homopterans, dipterans, coleopterans.

According to the results of our collecting and of the rodent identifications, in the 140 pellets *A. agrarius* is more frequently occurred than *A. flavicollis*, but rarer than *A. sylvaticus*, *Mus spicilegus* or *Microtus arvalis*. Celic Dere, Poșta, Cataloi, Izvoarele and Greci are localities from whose surroundings *A. agrarius* was caught in traps.

Apodemus uralensis (Pallas, 1811) is present in the fallow open hills, with a steppe vegetation, from Bididia, Saon, Greci, Izvoarele, Poșta.

Rattus norvegicus (Berkenhout, 1769) is a cosmopolitan species, adapted to different habitats of the natural or cultivated ecosystems. It is rarely caught in traps. When it makes its shelter along the water flows it replaces *Arvicola terrestris*. A larger frequency occurs in garbage and in rural localities. In comparison with the analyses of other pellets, in those ones from North Dobrogea *R. norvegicus* was not identified. Also, I identified *R. rattus* neither in the collected material nor in the pellets taken from the surveyed area.

Mus musculus Linnaeus, 1766 is also a cosmopolitan species, but which prefer rural settlements. A specimen was photographed by Alexandru Iftime, in September 2005, just in Celic Dere, station of the Institute of Ecomuseum Research of Tulcea.

Mus spicilegus Petenyi, 1882 is not a novelty for North Dobrogea, with a typical steppe vegetation replaced by the marshy one, from the sides of the hercinic elevations. The limits between the afforested and the cultivated areas are preferred places. I collected from such places two specimens of mound-building mouse, at the end of locality Poșta, towards Celic Monastery, in September 2005. In summer, there were wheat growings, and the reserves consisted mainly in ears. Next to them there were the flowers and the ears of the spontaneous plants gathered from the fallowed area between the cropland and the forest.

A specific aspect of the studied deposit was the partial covering (at the half of September) of the reserves, the ears of *Setaria glauca* being only gathered. Then, the proper deposit was not extremely large, meaning that the family of the “inhabitants” was not too big. On the other hand, going deeper in the forest, I occurred several mounds of grain, all of them completely covered with a 10 – 15 cm soil stratum, as I occurred in other regions of Dobrogea, too, in September; the case of the mound situated between the stubble field and the forest seems to be specific, either by its protection under the canopy or because the food resources could be gathered during autumn, yet, at that limit.

Spalax leucodon Nordmann, 1840 is subjected to the anthropic pressure by the periodical agricultural workings, and especially to the action of the predator carnivores, beginning with *Mustela nivalis* and ending with *Vormela peregusna*. But, even they are under such a pressure, its hills were observed at Măcin, Greci, near the monasteries Cocoş and Saon, then at Taiţa, Celic Dere, Horia, Izvoarele, Casimcea and Beidaud.

Another species which I expected to collect or observe in the steppes of North Dobrogea is *Sicista subtilis* (family Zapodidae), which I haven't occurred during my trips of the last 20 years. The species was reported from South Dobrogea (Ausländer & Hellwing, 1957).

Myocastor coypus (Molina, 1782) can have a wider distribution in North Dobrogea, but I remarked its obvious tracks only at Grindu, Garvan and Isaccea. Surely, it escaped from the breeding farms, but it is well adapted and can develop populations in the areas covered with reed, rush, club rush, soft rush (*Juncus*).

Order Carnivora Bowdich, 1821

This order is represented by the species of the families Canidae Gray, 1821, Mustelidae Swainson, 1835 and Felidae Gray, 1821, in North Dobrogea.

Canis aureus Linnaeus, 1758 is reported since the '80s from the forests from Niculiţel hills. Today, it is distributed in all North Dobrogea. Babadag, Topolog and Casimcea are some other localities from where the jackal was heard. It goes in open places for foraging, but the shelters are made in the forest thickets and high grassy vegetation.

Vulpes vulpes (Linnaeus, 1758) it is known to be active during the night but it forages during the day, too. Its presence during day time at the feet of the summits Pricopan, Moroianu and Pietrosul Mare might be due to the need of completion the food, insufficient quantitatively during the night. Also the relative scarceness of preys (especially of rodents) leads it sometimes to reach the men's yards, where it kills more hens than it can eat. In addition to the mentioned areas, the fox was also observed in the hills Tulcea and Casimcea.

Meles meles (Linnaeus, 1758) makes its borrow only in forests, the other habitats from North Dobrogea creating no protection, the poaching being encouraged. As a matter of fact, at a badger borrow from the Babadag forest I found wire loops. Although it is carnivorous, eating small mammals, insects, earthworms and terrestrial snails, also it forages for grass, roots, bulbs, berries, grains and seeds. Man's deeper penetration in its quiet habitats does not lead to an optimistic perspective for the preserving of this species in the fauna of North Dobrogea.

Lutra lutra (Linnaeus, 1758) is absent in the Dobrogea horst; it was remarked only along the marshes of the Danube, in the West and North of the surveyed area, where common otter finds its base food – the fish.

Martes martes (Linnaeus, 1758) was seen only in the compact forest from the Babadag hills. It was not remarked by the local people entering in rural localities. When common marten does not find enough consistent food (small mammals and birds), it catches amphibians as well a series of insects (mainly orthopterans and coleopterans).

Martes foina (Erxleben, 1777) is attracted by deserted buildings, strongholds walls, garrets, where it makes its burrow. In the farms where *M. foina* is present, the rodents are absent. But also, it does not give up the fowls and, especially, their eggs. Coleopterans are the auxiliary elements frequently occurred in the stomach content of *M. foina*. In September 2005, in Culmile Măcinului I found frequently excrements of *M. foina*, most of them coloured in red, from the fruits of *Cornus mas*. In the '90s I visited Enisala Stronghold, several times, and I observed the shelter and the tracks of *M. foina*, later reported by the local people of locality Sarichioi.

Mustela putorius (Linnaeus, 1758) uses to live near human settlements, in sheds, under wood piles more than *M. foina*. Rodents, hares, birds, fish and frogs are its main food. Only when these elements are absent the polecats feed on insects and their larvae. Individuals of *M. putorius* were observed at Niculițel, Slava Rusă and Ciucurova.

Mustela eversmanni Lesson, 1827, although it is characteristic to Dobrogea (unexceeding the limits of this region), I report it for North Dobrogea basing only on the information given by the local people from Baia, Cerna and Greci.

Mustela erminea Linnaeus, 1758 is rarer than *M. nivalis*, but still present in the forests from the hills Tulcea, Nalbant, Casimcea and from the afforested slopes of Culmile Măcinului. I didn't see it, but local people know it very well, making the specification that the tip of its tail is black.

Mustela nivalis Linnaeus, 1766 lives in the same habitats mentioned for *M. erminea* and it is more frequent in North Dobrogea. It is considered that where *M. erminea* is present there are lesser individuals of *M. nivalis*, probably because they are competitor for the same type of food: lizards, birds and eggs, mice and mole rats. Also, it prefers the afforested places, but it goes in open places, too, or enters in rural localities. In September 2005, Alexandru Iftime took a female of *M. nivalis*, hit by a car, on the road near localities Cataloi – Tulcea.

Vormela peregusna Gldenstaedt, 1770 prefers afforested habitats, but it also goes in fallow open places, especially for foraging: lizards and snakes, birds and eggs, mice and mole rats. Smârdanu Nou, Isaccea, Măcin and the hills near Saon Monasteries are places where *V. peregusna* is easily observed.

Felis silvestris Schreber, 1777 is present in the hills Tulcea, Niculițel and Casimcea, but was more frequently reported from the river meadows and the surroundings of the pools, where, probably, it could find easierly the food, mainly consisting in birds and rodents.

Order Artiodactyla Owen, 1848

This order is represented by the species of the families Suidae Gray, 1821 and Cervidae Gray, 1821, in North Dobrogea.

Sus scrofa Linnaeus, 1758, less frequent in the forests of North Dobrogea but often occurred around the pools and crop lands. It goes in the forests and the high grassy vegetation only for sheltering. Afforested slopes of North Dobrogea are

rocky, relatively poor in bulbs, roots and tubercles, as well as in the bird and small mammal fauna. That is why the frequency increasing of the wild boars, reported for other regions of Romania, is not remarked in North Dobrogea.

Capreolus capreolus (Linnaeus, 1758) was practically observed in all forests of North Dobrogea. On the western slope of Țuțuiatu Summit I saw tracks and droppings, and Alexandru Iftime observed a specimen of *C. capreolus*, in September 2005. Sometimes it visits the crop lands near the forests, in order to feed, even during day time. I saw it at the forest skirt towards village Poșta and near the locality Niculițel.

Conclusions

1. In North Dobrogea there are 49 mammal species, which represent 48% from all mammals of Romania.

2. The 49 species belong to 18 families, which, in their turn, belong to 5 orders, as follows: Insectivora = 3 families with 7 species; Chiroptera = 2 families with 6 species; Lagomorpha = 1 family with 1 species; Rodentia = 7 families with 21 species; Carnivora = 3 families with 12 species and Artiodactyla = 2 families with 1 species each.

3. From ecological point of view, the mammals of North Dobrogea live in afforested habitats, in the steppe grassy ones, the narrow plains along the water flows, crop lands and in the subterranean shelters available in the hills and limy summits of the region, especially for chiropterans.

4. The distribution of the mammals, according to the mentioned habitats, is different in the horst of Dobrogea (some can be xerophilous, more independent from the waters flows) and on its margins (West -, North - and eastward) where there are the pools and the arms of the Danube; they offer optimum conditions to the amphibian mammals or to those which prefer humid areas, but also for the necessary degree of humidity for other terrestrial mammals.

ACKNOWLEDGEMENTS

The author wants to thank to his colleagues and local people (some of them mentioned in the text) who offered him information or even gave him relevant material on the presence of different mammal species in North Dobrogea. Thanks are also for the anonymous referee for reading and correcting the manuscript. To Mrs Petruța Dumitrică, for tracing the map in China ink.

ECOLOGIA ȘI RĂSPÂNDIREA MAMIFERELOR DIN DOBROGEA DE NORD (ROMÂNIA)

REZUMAT

Rezultatele colectărilor și observațiile asupra mamiferelor în perioada 1985–2005 în Dobrogea de Nord au permis estimarea existenței a 49 specii din 5 ordine, unele (în principal rozătoare și mustelide) independente de cursurile de ape și de zonele umede, iar altele chiar cu mod de viață amfibiu (ex. *Neomys fodiens*, *Arvicola terrestris*, *Lutra lutra*), raportate pentru marginile horstului dobrogean.

În afara zonelor împădurite, a stepelor înierbate, a îngustelor șesuri de-a lungul principalelor cursuri de apă și a terenurilor cultivate din care am semnalat prezența celor mai multe mamifere terestre, din adăposturile subterane au fost raportate 6 specii de chiroptere (1 specie de Rhinolophidae și 5 specii de Vespertilionidae).

Răspândirea celor 49 de specii în Dobrogea de Nord este diferită, după condițiile pe care le întâlnesc în habitatele notate mai sus; o parte însă din specii sunt ubicviste și practic se întâlnesc în întreaga regiune cercetată.

LITERATURE CITED

- ALMĂȘAN, H., M. K. HAMAR, 1958 – S rasprastraneniyy enotovidnoi sobaki (*Nyctereutes procyonoides* Gray) i ondatry (*Ondatra zibethica*) v Rumynskoi narodnoi Respublike. Zoologhiceskii Jurnal, 37 (9): 1417-1418.
- ANDONE, GH., 1959 – Bizamul (*Ondatra zibethica*) în delta Dunării. Revista Pădurilor, 2: 100-104. (in Romanian)
- ANDONE, GH., 1966 – Înmulțirea câinelui enot în Deltă. Vânătorul și Pescarul Sportiv, 18 (4): 11. (in Romanian)
- AUSLÄNDER, D., S. HELLWING, 1957 – Observations écologiques sur les petits Mammifères des écrans forestiers de protection de „Valul Traian”: Références spéciales concernant leur dynamique. Travaux du Muséum d'Histoire Naturelle „Grigore Antipa”, 1: 111-139.
- BARBU, P., 1967 – Contribuții la cunoașterea ecologiei câinelui-enot (*Nyctereutes procyonoides* Gray) din Delta Dunării. Ocrotirea Naturii, 11 (1): 75-83. (in Romanian)
- BARBU, P., 1968 a – Noi contribuții la cunoașterea ecologiei câinelui-enot (*Nyctereutes procyonoides ussuriensis* Matschie, 1907) din Delta Dunării. Studii și Cercetări de Biologie, Seria Zoologie, 21 (1): 103-115. (in Romanian)
- BARBU, P., 1968 b – La nourriture du Nyctérite (*Nyctereutes procyonoides* Gray) du Delta du Danube. Revue Roumaine de Biologie, Serie Zoologie, 13 (5): 301-306.
- BARBU, P., 1970 – Sur la reproduction du Nyctérite (*Nyctereutes procyonoides ussuriensis* Matschie, 1907) dans le Delta du Danube. Travaux du Muséum d'Histoire Naturelle „Grigore Antipa”, 10: 331-345.
- BARBU, P., I. BARBU, 1968 – Dihorul de stepă în pădurile Albele. Vânătorul și Pescarul, 20 (5): 13-14. (in Romanian)
- BARBU, P., A. POPESCU, 1965 – Variația hranei la *Asio otus otus* (L.) din pădurea Comorova (Reg. Dobrogea), stabilită cu ajutorul ingluviilor. Studii și Cercetări de Biologie, Seria Zoologie, 17 (2): 187-195. (in Romanian)
- CĂLINESCU, R., 1934 – Les mammifères de la Dobroudja et surtout ceux du littoral de la Mer Noire. Annales Scientifiques de l'Université du Iassy, 19: 373-374.
- CHIRIAC, E., P. BARBU, 1962 – Contribuții la cunoașterea helmintofaunei micromamiferelor din împrejurimile Măcinului (Dobrogea de Nord). Academia R.P.R. Studii și Cercetări de Biologie, Seria Biologie Animală, 16 (3): 385-392. (in Romanian)
- CHIRIAC, E., A. POPESCU, ȘT. TORCEA, 1972 – Contribution à la connaissance de la parasitofaune de *Spalax leucodon* Nordm. Travaux du Muséum d'Histoire Naturelle „Grigore Antipa”, 12: 25-37.
- DUMITRESCU M., J. TANASACHI, TR. ORGHIDAN, 1962-1963 – Răspândirea chiropterelor în R.P. Română. Lucrările Institutului de Speologie „Emil Racoviță”, București, 1-2: 509-576. (in Romanian)
- GAVRILĂ, L., A. LUNGEANU, C. ȘTEFAN, D. MURARIU, 1984 – The cytogenetic study of the species *Microtus epiroticus* (Ondrias, 1966) (Mammalia, Arvicolidae) from Romania. Travaux du Muséum d'Histoire Naturelle „Grigore Antipa”, 25: 341-346.
- GAVRILĂ, L., A. LUNGEANU, C. ȘTEFAN, D. MURARIU, 1986 – New contributions to the cytogenetic study of *Microtus epiroticus* (Ondrias, 1966) (Mammalia, Arvicolidae). Travaux du Muséum d'Histoire Naturelle „Grigore Antipa”, 28: 271-274.
- MARCHEȘ G., D. AUSLÄNDER, S. HELLWING, G. MARCOCI, B. SCHNAPP, V. VÂLCEANU, 1954 – Date preliminare cu privire la dinamica mamiferelor din perdelele forestiere de protecție de la Valul lui Traian – (Dobrogea) și Mărculești – (Bărăgan). Natura, 5 (6): 69-77. (in Romanian)
- MURARIU, D., 1981 a – Contributions à la connaissance de la distribution et de l'écologie des Mammifères de la zone du Delta du Danube et du Lac Razelm. Travaux du Muséum d'Histoire Naturelle „Grigore Antipa”, 23: 283-296.
- MURARIU, D., 1981 b – La présence de *Mus musculus spicilegus* Petenyi, 1822 dans le Delta du Danube accompagné de son parasite *Apodemus agrarius* (Pall., 1771). Travaux du Muséum d'Histoire Naturelle „Grigore Antipa”, 23: 297-304.
- MURARIU, D., 1984 – La liste des Mammifères actuels de Roumanie; noms scientifiques et roumains. Travaux du Muséum d'Histoire Naturelle „Grigore Antipa”, 26: 251-261.
- MURARIU, D., 1996 – Mammals of the Danube Delta (Romania). Travaux du Muséum National d'Histoire Naturelle „Grigore Antipa”, 36: 361-371.
- MURARIU, D., ȘT. TORCEA, I. ANDREESCU, 1979 – *Microtus agrestis bailloni* (de Selys Long, 1841) – Mammalia, Rodentia – en Roumanie. Travaux du Muséum d'Histoire Naturelle „Grigore Antipa”, 20 (1): 513-519.

- POPESCU, A., 1967 – Contribuții la studiul sistematicii și dinamicii helmintofaunei populațiilor de rozătoare din Dobrogea de Nord. Studii și Cercetări de Biologie, Seria Zoologie, 19 (6): 501-508. (in Romanian)
- POPESCU, A., 1968 – Observații asupra rozătoarelor din nord-vestul Dobrogei. Studii și Cercetări de Biologie, Seria Zoologie, 20 (2): 153-163. (in Romanian)
- POPESCU, A., 1972 – Nourriture du suslik d'Europe (*Citellus citellus* L.) dans les conditions de la steppe et sylvosteppe en Dobroudja. Analele Universității București, Biologie Animală, 21: 89-94.
- POPESCU, A., 1977 – Date privind hrana de vară a șorecarului comun (*Buteo buteo* L.). Studii și Cercetări de Biologie, Seria Zoologie, 29 (1): 99-102. (in Romanian)
- POPESCU, A., P. BARBU, 1964 – Contribuții la studiul sistematicii și dinamicii mamiferelor mici din împrejurimile Măcinului. Studii și Cercetări de Biologie, Seria Zoologie, 16 (4): 351-360. (in Romanian)
- POPESCU, A., GH. SIN, 1966 – Despre cuibăritul și hrana bufniței (*Bubo bubo bubo* L.) în Dobrogea de nord. Ocrotirea Naturii, 10 (2): 217-222 (in Romanian)
- POPESCU, A., GH. SIN, 1967 – Le terrier et la nourriture du blaireau (*Meles meles* L.) dans les conditions de la steppe de Dobroudja. Travaux du Muséum d'Histoire Naturelle „Grigore Antipa”, 8 (2): 1003-1012.
- POPESCU A., ȘT. TORCEA, 1968 – Hrana orbetelui (*Spalax leucodon* Nordm.) din Dobrogea de Nord. Societatea de Științe Biologice din R.S. România, Comunicări de Zoologie, 7: 55-59. (in Romanian)
- POPESCU, A., ȘT. TORCEA, 1970 – Caractéristique biométrique de la population de *Spalax leucodon* Nordmann, 1840, dans la Dobroudja du Nord. Travaux du Muséum d'Histoire Naturelle „Grigore Antipa”, 10: 347-357.
- POPESCU, A., M. SUCIU, E. CHIRIAC, 1974 – Quelques considerations écologiques concernant les populations des Rongeurs de Dobroudja. Studii și Comunicări, Muzeul de Științele Naturii Bacău: 119-128.
- RANDIK, A., M. ŠEBELA, J. ZIMA, 1980 – Contributions to the knowledge of small mammals (Insectivora, Rodentia) of the Danube Delta. Acta Musei Moraviae, Science Naturelle, 65: 191-198.
- RUDESCU, L., M. GODEANU, 1980 – Fauna ornitologică și mamalogică a Deltei Dunării. Pp. 239-240. In: Ecosistemele din România, București. (in Romanian)
- SIMIONESCU, V., 1971 – Studii privind sistematica și variabilitatea geografică a genului *Micromys* Dehne, 1841 (Ord. Rodentia). Studii și Comunicări, Muzeul de Științele Naturii Bacău: 365-392. (in Romanian)
- SUCIU, M., 1971 – Date ecologice asupra sifonapterelor parazite pe mamifere mici (Insectivora, Rodentia) din Dobrogea de Nord și Delta Dunării. Studii și Cercetări de Biologie, Seria Zoologie, 23 (2): 173-184. (in Romanian)
- VASILIU, G. D., 1964 – Der Marderhund in Rumänien. Zeitschrift für Jagdwissenschaft, 10 (3): 89-91.

Received: January 19, 2006
Accepted: April 26, 2006

Muzeul Național de Istorie Naturală „Grigore Antipa”
Șos. Kiseleff nr. 1, 011341 București 2, România
e-mail: dmurariu@antipa.ro