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**NEW ASPECTS ON THE OUT OF WINTER FOOD RESERVES
OF THE BADGER (*MELES MELES* L., 1758) (MAMMALIA:
CARNIVORA) IN COMANA FOREST (SOUTH ROMANIA)**

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Abstract. Impressive amount of badger's food was found in Comana forest, in first half of April 2005. Murid specimens (53) were superficially buried in soil dugged by badger. In addition, two specimens of mole and two of domestic cat were found close by badger's lodge. An incomplete skull of muskrat and feathers of domestic hen found also in front of lodge suggest new component of badger's food.

Résumé. Une quantité impressionnante de nourriture du blaireau a été trouvée dans la forêt de Comana, dans la première moitié d'avril 2005. Les exemplaires de Muridae (53) étaient enterrées superficiellement dans le sol excavé par le blaireau. En outre, deux exemplaires de taupe et deux chats domestiques ont été trouvés près de la loge du blaireau. Un crâne incomplet de rat musqué et des plumes de poule domestique trouvés également devant la loge suggèrent le nouveau composant de la nourriture de blaireau.

Key words: *Meles meles*, badger, food, reserves, Comana forest, South Romania, lodge, behaviour.

In spite of man's interest in the badger, as a game, on the one side, and as a positive and negative practical importance on the other side, the biology and ethology of the species are rather unknown.

It is considered a nocturnal species and the lack of data seems to be a result of this behaviour. Murariu & Munteanu (2005) noted the observations on the familial groups which had got out around 3 a.m., after short June rains, probably for catching the earthworms and insects driven out by the humidity and air refreshment.

From the feeding point of view, the badger is omnivorous, its food varying both according to the season (Korchmar, 1962), and according to its range. Saint Girons (1973), citing Neal (1948), noted some common preys of the badger: hares, mice and rats, snails, insects (mainly coleopterans) and earthworms. To all these, the vegetal food has to be added: fruits, roots, bulbs, rhizomes and even grassy plants.

There are some other papers which deal with the structure of the food of this species: Kaletskaya (1957), Korchmar (1962), Likhachev (1965), Shilova-Krasova (1951), Savinova (1940), Sludskii (1953), Popescu & Sin (1968).

According to Heptner & col. (2001), the food of animal origin includes rodents (especially *Microtus*), different small birds, amphibians (especially frogs), reptiles (especially lizards), insects (both larvae and adults), molluscs, earthworms. Heptner & col. (op. cit.) pointed out the importance of the badger in controlling the rodents and the injurious insects.

In Romania, Popescu & Sin (1968), made an analysis of the trophic spectrum of this species, besides the description of a shelter from Capul Doloşman (Dobrogea), and established that the food of the animal origin was prevalent in

spring and in summer, and in autumn the badger fed on vegetal food, represented by fruits and seeds.

By this paper we present original data on the badger habit of stocking food of animal origin, near its shelters, in spring.

MATERIAL AND METHOD

Observations were made within the first decade of April 2005, at about 30 km South of Bucharest, near locality Comana (Fig. 1). There, Gabriel Chișamera identified a complex of burrows, placed in a young deciduous forest: oak, elm, ash, linden, robinia (Fig. 2).

The tracks of the badgers on the sand in front of their burrow were fresh, confirming that those shelters were populated. As regards the presence of the badgers in those burrows, the caught animals, stocked near the shelter have the same importance, at least (Tab. 1). It is about the representatives of the Galliformes birds (*Gallus domestica*) and of the mammals: Insectivora (*Talpa europaea*), Rodentia (arvicolid *Ondatra zibethicus*, murid *Apodemus sylvaticus* and *A. flavicollis*) and Carnivora (felid *Felis catus*). These preys were collected and identified using the binocular. We have to make a special mention for the skull of *Meles meles*, found at the opening of one of the burrows.

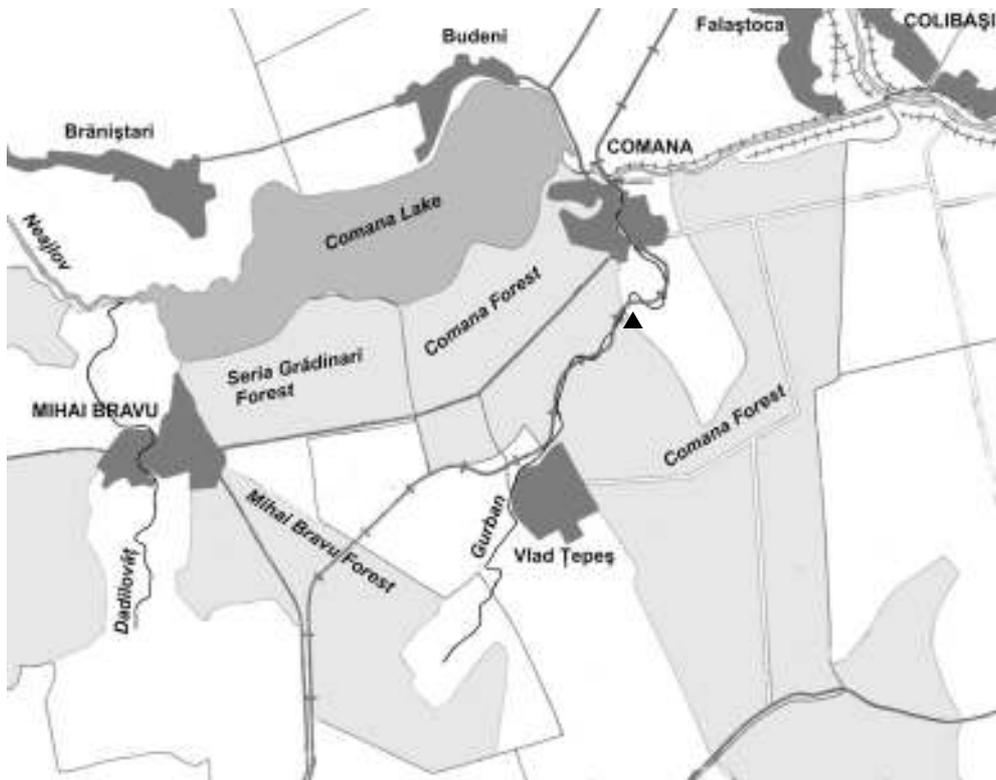


Fig. 1 – Sketch of the area where the observations were made: ▲ – the approximate location of the studied burrows.



Fig. 2 – Aspect of Comana Forest, where the burrows were placed.

Table 1

Food reserve of animal origin, stocked by the badger in Comana Forest.

| Group of animals and species | No of spec. | Observations |
|--|-------------|---|
| Mammalia | | |
| Insectivora Talpidae: <i>Talpa europaea</i> | 2 | Complete individuals and well preserved |
| Rodentia Muridae: <i>Apodemus sylvaticus</i> <i>Apodemus flavicollis</i> | 41 12 | Mixed with <i>A. flavicollis</i> , grouped 3 - 5 specimens and superficially buried in soil |
| Rodentia Articolidae: <i>Ondatra zibethicus</i> | 1 | An incomplete skull (without mandible) |
| Carnivora Felidae: <i>Felis catus</i> | 2 | One fresh specimen and another one decayed. |
| Aves Galliformes: <i>Gallus domesticus</i> | 1 | Only feathers of domestic hen in front of the lodge. |

RESULTS AND DISCUSSIONS

From literature, it is known that the badger uses to stock food for the winter time, even if it gets fat during autumn. Our observations on the food reserves of the badger refer to its out of winter habit and contribute to the completion of the knowledge of this species biology, on the one hand, and on the other one to a better

knowledge of its trophic spectrum, within the conditions in which the burrows are placed in a field forest.

The 4 openings of the burrows were grouped within a surface of about 100 m², and around them, we found several specimens of preys (Tab. 1). The species to which they belong (Figs 3, 4) present the specific structure of the fauna within the territory controlled by the badger (about 1 km²). It has to be remarked the high number of Muridae (53) (*Apodemus sylvaticus* and *A. flavicollis*).

Such kind of preys were found grouped in 3 – 5 specimens, slightly digged in an uneven ground and partially covered by leaves (Fig. 3).

Knowing that in the Comana area there are Arvicolidae (*Microtus arvalis*, *M. subterraneus*, *Arvicola terrestris terrestris*, *Ondatra zibethicus*) we would have expected to find a larger diversity of rodents among the preys brought near the burrows. At least *M. arvalis* and *A. t. terrestris* were found by us in the pellets of the night birds of prey collected lately from the same area. That is why we expected to find these arvicolides in the composition of the food of the badger. On the other side, the situation presented in table 1 illustrates that the badger took its preys from a covered habitat (forest), where the birds of prey hunt less. Even if the Strigiformes have their resting and nesting places in the forest, their feeding habitat is mainly open, as the cultivated lands near the forests. There, there are the preferred habitats of most of the Arvicolidae, and *Arvicola terrestris terrestris* is bound by the wet areas and even by the water flows.

But among the skulls found near the burrows of the badger one belongs to *Ondatra zibethicus* (Fig. 5). That means that the badger went close to the banks of the Neajlov River, near the Comana Forest, looking for food. Because of this fact we expected to find remains of *A. t. terrestris*, too.

Reporting also two corps of domestic cats among the preys (Fig. 4) we have to reconsider its moving speed, at least when it is in need, if they were caught by the badger. Its moving at a trap is characteristic to it. It seems that it prospects the ground with its muzzle (maybe for possible preys) and it swings its back in the rhythm of its own steps. Obviously, the cats might have come from Comana locality and caught by the badger when hunting mice with other competitors.

Also, at the edge of the forest the badger might have found *Gallus domesticus*. Near the burrows only feathers were collected. The study of the stomach contents or, at least, of the excrements will let us make a more complete estimation of the structure of the food.

Korchmar' (1962), considering that the badger feed both on animal and vegetal food, underlined the availability degree of the food. In consequence, the structure of the food differs according to the season when it is analyzed. Thus, the table 2 presents the percentages of the different components from 572 samples/excrements in the first half of the summer, in comparison with the results of the analysis of 226 samples from August – September. It is surprising the presence of the sweet cherries, over 60%, among all reported components recorded for the first period. Different coleopteran species have also a frequency of over 30%, and the mammals appear with 18.3% (for Muridae) and 10.4% (for Arvicolidae). During the period of the transition from summer to autumn there are some vegetal components, with a frequency of 44 – 65%, and the Muridae, with 67.5%. Maybe the addition of 7.5% of Passeriformes is included in the diversity of the food structure during the intense feeding period for fattening, for preparing for winter.

Table 2

Seasonal change of the food structure of the badger in Moldavia (Korchmar, 1962).

| First half of the summer | Frequency in the samples (%) | Second half of the summer | Frequency in the samples (%) |
|-------------------------------|------------------------------|--|------------------------------|
| Rodents | 18.3 | Rodents | 67.5 |
| Underground mice | 10.4 | Small birds | 7.5 |
| Coleoptera: Lucanidae | 45.2 | Coleoptera: Carabidae | 10.0 |
| Coleoptera: Carabidae | 45.2 | Coleoptera: <i>Melolontha subspinossus</i> | 10.0 |
| Coleoptera: <i>Melolontha</i> | 31.3 | Coleopteran larvae | 7.0 |
| Coleopteran larvae | 33.3 | Plums | 65.0 |
| <i>Prunus avium</i> | 60.3 | <i>Cornus</i> sp. | 44.0 |
| Wilde strawberries | 12.9 | Apples | 10.0 |
| Pears | 5.0 | Grapes | 7.0 |

After we had found a complete skull of *Meles meles*, in a good state, in front of the entrance of its burrow, we could establish the presence of mortality in the badger populations, generated by causes unidentified by us, yet. Murariu & Munteanu (2005) reported a dead badger specimen, found by Gabriel Chişamera, on 24th of February 2002, in the same forest, Comana.

Popescu & Sin (1968) reported observations on the badger burrows and food from Dobrogea. As a result of 400 samples/excrements they could establish the frequency (rare, a little frequent, frequent and very frequent) of some gastropods,



Fig. 3 – *Apodemus* sp. – three stocked specimens, partially covered with dead leaves.



Fig. 4 – Preys stocked close to the burrows of *Meles meles*, in Comana Forest.



Fig. 5 – Skull of *Ondatra zibethicus*, collected at the entrance of the burrow.

insects (representatives of 13 families), fishes, amphibians, reptiles, birds and mammals. The Ditiscidae, from Coleoptera, Bufonidae from Anura and Emiidae from Reptilia were very frequent. From the mammals we mention the Insectivora (*Erinaceus europaeus* – now *E. concolor*) and Rodentia, a species of each of the families Cricetidae, Arvicolidae and Muridae.

The hedgehogs are absent from our samples, but there are (in the food reserves of the badger) two specimens of *Talpa europaea* (Fig. 4).

Conclusions

From our observations and data from 4 badger burrows occurred Comana Forest, in April 2005, we conclude that within the conditions of an abundant food, the badgers can stock food reserves out of the cold season.

The 53 specimens of *Apodemus sylvaticus* and *Apodemus flavicollis*, found at the entrance of the studied burrows are the proof. The certainty that these rodents are food reserves is underlined by the entire state and by the way in which these rodents were stocked, 3 – 5 in a place, in uneven ground, sometimes digged by the badger, and covered by a thin layer of soil or dead leaves.

The identification of two dead specimens of domestic cats near the burrow might have to explanations: either the two cats were caught as an accidental prey or they had been found dead and then brought to the burrow, as food reserve, being known that the badger fed also with dead bodies.

Among the components of the badger food, we identified two specimens of *Talpa europaea* and a specimen of *Ondatra zibethicus* – species unreported, yet.

It is interesting the catching of the moles – typically burrowing (Fig. 5). Maybe, at the beginning of April, they leave the galleries to mate during their short ovulation period.

Muskrat could be caught only when it got out from the Neajlov River or from the marshes near the river. Badger can be a very good swimmer, but only in need, avoiding water.

The identification of the hen feathers at the entrances of the burrows completes the list of the food components of the badger. That is why it can be blamed for the decreasing number of the fowls but, in the same time, to be appreciate for its importance in controlling the rodent and insect populations.

ASPECTE NOI PRIVIND REZERVELE DE HRANĂ EXTRAHIVERNALE ALE BURSUCULUI (*MELES MELES* L., 1758) (MAMMALIA: CARNIVORA) ÎN PĂDUREA COMANA (SUDUL ROMÂNIEI)

REZUMAT

Bursucul (*Meles meles* L., 1758) obișnuiește să-și adune provizi și în timpul primăverii. În prima jumătate a lunii aprilie 2005, în pădurea Comana, în jurul unei vizuini, întinsă pe o suprafață de cca. 100 m² a fost descoperită o cantitate impresionantă de hrană. Îngropate superficial în pământ s-au găsit 53 exemplare de muride (*Apodemus sylvaticus* și *A. flavicollis*) grupate câte 3 – 5, precum și două exemplare de cârțiță și două de pisică domestică. De asemenea, lângă vizuină au mai fost găsite un craniu incomplet de bizam și pene de găină domestică, elemente noi în hrana acestui carnivor.

LITERATURE CITED

- HEPTNER, V. G., N. P. NAUMOV, P. B. YURGENSON, A. A. SLUDSKII, A. F. KIRKOVA, A. G. BANNIKOV, 2001 – Mammals of the Soviet Union, 2 (1b): 1–1552.
 KALETSKAYA, M. L., 1957 – Rol' rezhima Rybinkovo vodokhranilishcha v zhizni mlekopitayushchik Darvinskovo zapovednika. Tr. Darvinsk. gos. zapovedn., 4: 37–41.

- KORCHMAR, N. D., 1962 – Nekotorye dannye o rasprostraneniі biologii i khozyaistvennom znachenii barsuka v Moldavii. Sb. Voprosy ekologii i praktich. Znacheniya ptits i mlekopit. Moldavii: 1–32. (in Russian)
- LIKHACHEV, G. N., 1965 – Nekotorye cherty ekologii barsuka v shirokolistvennom lesu v Tul'skikh Zasek, Sb. mater. po rezul'tatam izuch. mlekopyt. v gos. Zapovedn.: 43–49. (in Russian)
- MURARIU, D., D. MUNTEANU, 2005 – Carnivora. *In*: Fauna României, Mammalia. Edit. Academiei Române, București, 16 (5): 1–223. (in Romanian)
- NEAL, E., 1948 – The badger. Collins, London. 158 pp. (cited after Saint Girons, 1973).
- POPESCU, A., G. SIN, 1968 – Le terier 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.
- SAINT GIRONS, M.- CH., 1973 – Les Mammifères de France et du Benelux (faune marine exceptée). Doin, éditeurs, Paris: 1–481.
- SHILOVA-KRASOVA, S. A., 1951 – O pitanii barsuka v Buzulukskom boru, Zool. Zhurn., 30: 6. (in Russian)
- SAVINOVA, M. I., 1940 – Barsuk v Krymskom gosudarstvennom zapovednike, evo biologiya i rasprostranenie, Tr. Krymsk. gos. zapovedn., 2: 51–63. (in Russian)
- SLUDSKII, A. A., 1953 – Otryad khischnye (Order Carnivora). *In*: A. V. Afanas'ev, V. S. Bazhanov, M. N. Korelev, A. A. Sludskii, E. I. Strautman., Zveri Kazakhstana. Alma-Ata: 1–370. (in Russian)

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