

## DATA ON THE SMALL-MAMMALIA FAUNA OF TISZAKARÁD AND ITS ENVIRONS

T. SZITTA

*Bakony Museum of Natural History, Zirc*

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### Abstract

The author publishes here the results of his investigations into mammals performed in the environs of Tiszakarád, September through December.

Comparing the data obtained in the course of trapping here with his results in the environs of Szeged, he calls the attention to the somehow different mammalian faunas of the Upper and Lower Tisza Reaches. In the Upper Tisza Region the dominance of *Apodemus agrarius*, in the Lower Tisza Region that of *Apodemus sylvaticus* is established.

The author's observations of ecological character, performed in the course of the investigations in different biotopes, are also contained in the paper.

### Aim and method of the investigation

From September up to mid-December, 1974, I stayed in the community Tiszakarád and during this time I also performed mammalogical investigations. Taking into consideration the few literary data published till now on the mammals of the Tisza Region, I think it would not be without interest to publish the results of these researches, without any claim to completeness.

My aim was mainly to come to know the fauna of mammals as completely as possible. I could not investigate into the formation of the population through a complete period of multiplication, however interesting an investigation like this would be, mainly because of the presence of *Apodemus agrarius* occurring in large numbers. My investigations took place between September and December. The dominance relations, to be mentioned in the following, refer similarly to this period. This period shows, at the same time, the most saturated picture of the population.

I have endeavoured, depending on the time at my disposal, to carry out my collecting work systematically. I have got some data from every month of my staying there. About 15–20 days were spent with collecting. Case-traps, made by myself for catching animals alive, and crushing traps purchased in a shop were used. The collected animals were prepared by myself. They are, at present, to be found in the Bakony Museum of Natural History in Zirc.

### Natural geographic conditions

Tiszakarád and its environs belong into the structural unit of Bodrogeköz and, within this, to the smaller sub region of the Upper Tisza Region.

The area investigated falls on the alluvial flatland, extending till Zemplénagárd-Tokaj and following the Tisza in a 0.5–6 km broad zone.

Its soil is mainly formed mainly by alluvial formations, resp. meadow-clay farther from the river. Meteorologically it belongs to the moderately warm, moderately dry district of cold winters.

The total annual precipitation is 550–600 mm. It is characteristically poor in snow-cover.

My collection were carried out in the time of the late-summer and early-autumn small-water season, of the late-autumn culmination, resp. in the beginning of Winter. In the time of the autumn precipitation maximum, the Tisza overflowed its banks and flooded the area up to the dams. In this period, I could, of course, perform no collections.

It belongs to the hydrographic picture of the neighbourhood, as well, to take into consideration the dead-arm south of Tiszakarád whose picture calls to mind the old Tisza landscape. The Tiszakarád Main Channel, the water of which leads the water surplus of the north eastern part of Bodrogeköz through the pumping station at Tiszakarád into the Tisza, flows through our area.

The localization of subsoil water is very high and it often covers large areas.

### Description of the collecting sites

I have set my collecting sites in the most characteristic parts of the area and strived to penetrate with my traps into different coenoses. The topographical distribution of the collecting sites are illustrated in the following sketch-map (Fig. 1).

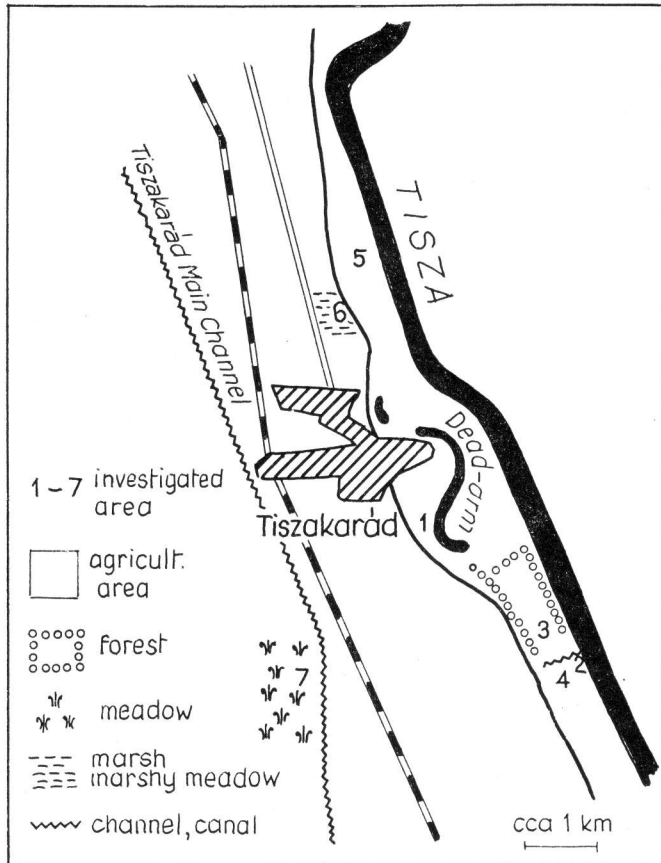


Fig. 1

### (a) Areas in the Tisza flood plain

Collecting site 1: about 1.5 km south of the village, at a cut bed-arm. It has shallow water and is richly overgrown by a characteristic marshy vegetation, its water-side is bordered by straggling scrub groups (dom.: acacia) of thin undergrowth.

Collected species: *Arvicola terrestris*, *Mus musculus spicilegus*. In the riparian mud, some traces of *Rattus* and *Vulpes* could be observed. The missing of *Apodemus agrarius* and *Soricidae*, collected in other places in large numbers, is characteristic. This may be explained with the microclimatic conditions (Later, at mentioning the single areas, I will give the serial numbers of these).

Collecting site 2: an area about 2.5 km from the village, divided by a channel flowing into the river. Its soil is sand. Its rich vegetation is flood-plain furrow-weed. Its most characteristic representants are the following: *Chenopodium album*, *Typhoides arundinacea*, *Aristolochia clematidis*, *Echinocystis lobata*, *Rumex obtusifolius*, *Urtica dioica*, *Glechoma hederacum*, *Polygonum convulvulus*, etc.

The small-mammal stock was concentrated here from the adjacent acacia-, poplar-, and ulmus- (*U. laevis*) -forests (*Ulmo-Populetum*) of small alimentary ability. The vegetation, treated above, has brought about abundant alimentary, resp. favourable microclimatic conditions, mainly for the *Sorex* and *Apodemus* species from which I could collect some individuals in a very high catching percentage. Control collections were also carried out in this site on 21 and 29 September and 12–13 November. The species found here are: *Talpa europaea*, *Sorex araneus*, *Microtus arvalis*, *Mus musculus spicilegus*, *Apodemus agrarius*, *Apodemus sylvaticus*, *Apodemus flavicollis*.

Collecting site 3: some 100 m far from the former one. It is a corn-field harvested and a fringe coenosis of a forest zone formed by *Ulmus*, *Populus* species, with high bent-reed.

Demonstrated species: *Talpa europaea*, *Sorex araneus*, *Microtus arvalis*, *Apodemus sylvaticus*, *Lepus europaeus*, *Capreolus capreolus*.

Collecting site 4: agriculture, a stack of compost heaped up close to a ploughland, and its environs. The species collected here are: *Mus musculus spicilegus*, *Apodemus agrarius*, *Mustela nivalis*.

Collecting site 5: north-east of the village, about 1.5–2 km far from the border of the community. It is a clearing with standing maize. Close to the dam, there is a willow-poplar (*Salicetum albae fragilis*) mixed forest and at the river a thick shrub (*Sambucus nigra*, *Sambucus ebulus*). It is a biotope representing the present picture of the flood plain well. On the basis of the collections carried out on two occasions (7 and 16 October) it emerges from the individual number of the mammals found here that *Apodemus agrarius* has been dominant: *Sorex araneus* 1, *Mus musculus spicilegus* 6, *Apodemus agrarius* 15, and *Apodemus sylvaticus* 7 individuals.

### (b) Areas extending outside the anti-inundation dam

Collecting site 6: an area on the side of the dam, opposite to the river, at the dam foot. The anti-inundation dams are followed ribbon-like by such and similar associations, in a breadth of about 15 to 20 m. These are characteristic humid biotopes, supplied partly by water, oozing through from the flood-plain, partly by that penetrating in the place of the earth dug out in the course of building the dam.

Their vegetation is an uliginous one, Cyperaceae are dominant. Dewberry (*Rubus caesius*), the sarmentose *Potentilla* (*P. reptans*) and the corn-thistle (*Cirsium brachicephalum*) of small nest and forming a high dry stalk of weed occur fre-

quently. The "marsh zone" is flanked with acacia, elder and other trees, shrubs. Its saturation by water is the function of the meteorological conditions. At the date of my investigations (9–10 September 1974) it showed the tendency of drying up.

Demonstrated Mammalia species: *Sorex araneus*, *Apodemus sylvaticus*, *Apodemus agrarius*.

Collecting site 7: an area surveyed north-west of the village, along the Tiszakarád Main Channel. It is an original herb remain, protruding into the agrocoenosis (maize-fields), characterized by a soft-stalked vegetation, thickly weaving through the cut old willow and poplar trunks. It is mostly constantly covered with subsoil water. In these places, its vegetation is formed by high growing kinds of grasses, bulrushes, etc. This area is islandlike in its environment, assuring hiding-place and food to animals. A result of this is the varied picture of the fauna: *Crocidura leucodon*, *Sorex araneus*, *Mus musculus spicilegus*, *Apodemus sylvaticus*, *Apodemus agrarius*, *Micromys minutus*. The observed species are: *Lepus europaeus*, *Mustela nivalis*, *Mustela putorius*, *Vulpes vulpes*. At the channel-side I have observed *Rattus norvegicus* and *Ondatra zibethicus* and also performed here autumn (27, 31 October) and winter collections (11, 12 December).

### Evaluation of data, ecological observations concerning species

In this chapter of my paper, I avail myself of the data received by the kind information by GY. CSIZMAZIA, as well as of the results of my investigations carried out in the Tisza Region on the confines of Szeged in 1972–1973 (SZITTA 1974), too. The list of species published here can, of course, not be complete because, for example, animals belonging to the Chiroptera order were not collected.

#### (1) *Erinacidae*

*Erinaceus europaeus roumanicus* BARR.–HAMM.

I have not found it within the flood-plain but have often seen its run-over individuals on the subsidiary road at Tiszakarád.

#### (2) *Talpidae*

*Talpa europaea* L.

It is cosmopolitan although it is often forced by water-saturation of the soil to stay rather in places of higher situation. Its casts can often be seen on the dam-side and even in the inundation areas.

#### (3) *Soricidae*

The most generally occurring shrew species in the area is *Sorex araneus*, the only representative of shrews with red teeth, collected by me. It is worth mentioning that *Sorex*, resp. another member of the *Neomys* genus does not have any part among the data of GY. CSIZMAZIA from 1964, either. (It may be supposed that *Sorex minutus* is rarer in the flood plains of the Upper Tisza Region than, e.g., in the Tisza reaches at Szeged and its environs where I established its occurrence in a ratio of about 5.3:1 as compared with *Sorex araneus* (SZITTA 1974). I have succeeded in demonstrating *Sorex araneus* from collecting sites 2, 3, 5, 6, and 7.

*Crocidura leucodon*, a representative of *Crociduridae*, was found at collecting site 7. But I have not collected *Crocidura suaveolens* from the flood-plain, in the course either of my investigations at the environs of Szeged or of those at Tiszakarád (SZITTA 1974). I consider its occurrence only outside the dam, in drier biotopes, as

probable. The species are mentioned by I. VÁSÁRHELYI, in his unpublished paper, from Tiszakarád, as well, regarding it as frequent as *C. leucodon*. But he does not designate the more exact place of its occurrence.

(4) *Microtidae*

*Arvicola terrestris* L.

In the neighbourhood of agricultural areas it is common. I have collected it in very low individual numbers, and observed at my investigations in the vicinity of Szeged, as well, how thinly this species, appearing elsewhere in large numbers, is present in the flood-plain. It is generally known that the gradation of the field-vole shows a certain periodicity. It is probable, therefore, that my investigations may have fallen between so-called periods "rich-in-voles". (They were collected by Csizmazia, in the course of his collectings in 1964, in approximately 38 individuals in ten days).

*Microcrotus agrestis* L.

It is known from this area on the basis of CSIZMAZIA's investigations (22 July, 1 August, 1964).

*Ondatra zibethica* L.

It occurs mainly at the sides of channels, crossing the flood-plain, resp. along the Tiszakarád Main Channel (Collecting site 7), as well as in the vicinity of the dead-arms, in not high individual numbers. The cause of this is probably the missing of a continuous *Phragmites*, resp. *Carex* vegetation. In the menu of ondatra shellfishes often appear. I often found their remains e.g. at collecting site 7.

(5) *Muridae*

*Apodemus agrarius* L.

It is the most common Mammalia species of the investigated area. It is generally wide-spread in the Upper Tisza Region (SCHMIDT 1975, SCHMIDT 1969, VÁSÁRHELYI 1942). It is characteristic of its individual number that, from among the total collected small mammals, 65 percent was *Apodemus agrarius*. In the course of my collectings, it occurred in every biotope and proved to be dominant. We know but little of the ecological demands of this animal, known from not every region of our country, as yet. The opinions vary in respect of the criteria of its occurrence. It is a fact that in the course of my collectings, performed in different regions of the country, I could not find it, as yet, in an expressly dry environment. A humid, hazy milieu must, therefore belong to the essentials of its life. This only factor is, however, by no means satisfying for acknowledging the conditions of its environment because areas of a microclimate, like this, can be found within any geographical unit. It probably prefers the rainy areas with comparatively little sunshine. It may be explained by this that this species is missing, for instance, from my collections in the environs of Szeged. They move in the day-time, too, particularly the young individuals. They are less cautious than, for instance, the other members of the *Apodemus* genus. They move in rainy days, too. Their food is mostly of animal origin. I have observed on my animals held in captivity, as well, that they prefer this form of nourishment.

*Micromys minutus* PALL.

I have trapped two individuals of these in their typical habitats, Collecting site 7.

*Apodemus sylvaticus* L. & *A. flavicollis* MELCH.

I have found a typical *flavicollis* at Collecting site 4 (e.g. no. 415). The commonest ones were, however, on the basis of their external features, the forms to be considered

as transitional (e.g. no. 340) where the correlation of tail-length and body-length and the sharp colour effect referred to *flavicollis*, on the other hand, the lack of the yellow hackles hints to *sylvaticus*. I have, otherwise, observed this in the course of my investigations at Szeged, as well.

It is the most commonly occurring mammal, apart from *Apodemus agrarius*, and like this, it may be evaluated as subdominant. It is to be mentioned that in the Tisza Region at Szeged I have found it dominant.

The features of the *Apodemus flavicollis* species are characteristic only in adult age. It is for this that I have dealt with both species jointly.

#### *Rattus norvegicus* BERK.

It is very frequent mainly in the neighbourhood of waters (dead-arns, „living” river-bed, channels). Of this we may be convinced on the basis of many traces. I have trapped an individual close to Collecting site 7.

#### *Mus musculus spicilegus* L.

It is a constant and, in addition to *Apodemus sylvaticus*, subdominant member of the associations of the region. I consider this as interesting because in the course of my collecting, performed in other natural habitats, the representatives of the *Mus* genus could only be found rarely. Thus on the confines of Szeged, as well. I have only collected them in large numbers in areas exposed to anthropogenous influences.

#### *Carnivora*

##### *Vulpes vulpes* L.

It can be regarded as frequent. I have more than once observed its trails and the traces of its activity.

##### *Mustela erminea* L.

Its data referring hereto play a part in the enumeration of I. VÁSÁRHELYI.

##### *Mustela nivalis* L.

It can mainly occur in drier parts of the flood-plain (environment of agricultural areas). I have collected a female individual from collecting side 4 and have often observed its trails, for instance, in collecting side 7, as well. On 15 November 1974, I have obtained a litter of young male individuals (4 of them) from the confines of the village.

##### *Mustela putorius* L.

An individual shot in the region is mentioned by CSIZMAZIA on 29 July 1964. On the basis of informations got from the regional population, it may be comparatively common.

#### *Ungulata*

##### *Capreolus capreolus* L.

I have often met its smaller packs in the flood-plain and outside that.

## Results

As from the period of my investigations (autumn — winter period) — as far as I know — there were no mammalogical data available from the Upper Tisza Region, I may have succeeded in contributing with these to the completion of the mammalogical picture of the indicated area.

Comparing the results of my collections with the data of others, we can ascertain the presence of about twenty species of mammals in the neighbourhood of Tiszakarád.

It can be established that the fauna of the Tisza Upper Region is a little different from the faunal picture of the Southern Tisza Region both in quantitative and in qualitative respects. The former one is characterized by the dominance of *Apodemus agrarius*, followed by *Apodemus sylvaticus* — *Apodemus flavicollis* and *Mus musculus spicilegus*, *Sorex araneus*, while the latter area is characterized by the dominance of *Apodemus sylvaticus* — *Apodemus flavicollis* and the subdominance of *Sorex araneus*.

We have succeeded in getting recent data concerning the ecological demands of the single mammalian species by means of trapping in the different habitats. These establishments refer exclusively to the biocoenosis of the flood-plain along the river o which the cast-analysing investigations cannot be applied.

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### Adatok Tiszakarád környékének kismérf faunájához

SZITTA T.

Bakonyi Természettudományi Múzeum, Zirc

#### Kivonat

Szerző 1974. szeptember—december közötti Tiszakarád környékén végzett emlőstani vizsgálati eredményeit közli.

Az itteni csapdázások során nyert adatokat összevetve Szeged-környéki eredményivel rámutat a folyó felső és alsó szakaszának némiképp különböző emlősfajára. A Felső-Tisza-vidéken az *Apodemus agrarius*, a déli Tisza-szakaszon az *Apodemus sylvaticus* dominanciáját állapítja meg.

A dolgozat tartalmazza a különböző élőhelyeken végzett vizsgálatok során tett ökológiai jellegű megfigyeléseit is.

## Prilog poznavanju faune sitnih sisara u okolini Tiszakarád

T. SZITTA

Prirodnjački muzej, Zirc

### Abstract

Autor prikazuje rezultate istraživanja sisara u periodu sept.-dec. 1974. god. u okolini Tiszakarád. Upoređujući dobijene podatke sa navedenog područja sa rezultatima istraživanja iz okoline Szeged, ukazuje se na izvesne razlike faune sisara na gornjem i donjem toku reke. Utvrđeno je da na gornjem području Tise dominira *Apodemus agrarius*, a na južnoj deonici *Apodemus sylvaticus*.

U radu su prikazana i posmatranja sa različitih biotopa, koja imaju ekološki karakter.

## Данные относительно фауны мелких млекопитающих района Тисакарад

Т. Ситта

Баконьский Музей естествоведения, Зирц

### Резюме

Автор публикует результаты исследований, проведенных в сентябре-декабре 1974 г. в районе Тисакарад. Сопоставляя данные, полученные здесь при ловле с помощью капканов, с результатами в районе г. Сегед, автор указывает на некоторые различия фауны млекопитающих верхнего и нижнего течения Тисы.

В верхних притисайских районах доминирует *Apodemus agrarius*, в южных — *Apodemus sylvaticus*.

Работа содержит наблюдения экологического характера, сделанные в ходе проведенных в различных местах мест нахождения животных исследований.