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Food of the Striped Field Mouse in Different Types of Urban Green Areas

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Studies were made of the food consumed by the striped field mouse *Apodemus agrarius* (Pallas, 1771) living in two urban green areas in Warsaw: the Orthodox Cemetery and Łazienki Park, and also in a suburban area at Białołęka. Plant food predominated over animal food in the diet of *A. agrarius*. Mice living under urban conditions have a more homogeneous diet than those from suburban areas. This was manifested in the greater proportion of tree seeds in the diet of urban mice and less frequent consumption of the seeds of herb layer plants, the predominance of grasses in the green plants' food component and predominance of insects, particularly of their larval forms in the animal food component. The diet of urban mice was more caloric, which may account for the greater weight of rodents in the city in comparison with mice living on suburban areas.

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1. INTRODUCTION

Apodemus agrarius (Pallas, 1771) is a non-synanthropic rodent often found in urbanized areas. Long-term studies on urban populations of this species revealed a large number of features distinguishing them from populations living in a suburban habitats (Andrzejewski, Babińska-Werka, Gliwicz & Goszczyński, 1978, Babińska-Werka, Gliwicz & Goszczyński, 1979, 1981). One of the important characteristics of urban habitats of *Apodemus agrarius* is the different composition of their biocenoses then in suburban areas. In comparable areas outside the city both the flora and invertebrate fauna are different, which affects the diet of the field mice.

There are few studies on the food of *Apodemus agrarius* (Sviridenko, 1944; Naumov, 1948; Holišová, 1967) and they are not concerned with diet of mice living in urban habitats. Hence the purpose of the present study is to analyze food composition of field mice living in town, and to find differences between the diet of these rodents living under urban and suburban conditions.

2. STUDY AREA, MATERIAL AND METHODS

The studies were carried out in Warsaw in two urban green spaces: in Łazienki Park (together with the Botanical Gardens) and in the Orthodox Cemetery. Łazienki Park is situated in the centre of Warsaw, and the Orthodox Cemetery in the eastern part of the city at a distance of approximately 3 km from the centre. The control area in relation to the urban areas was the suburban study area at Białołęka, to the north of Warsaw and about 20 km from the city centre.

In many of the analyses the diet of mice from two urban green areas was treated jointly and contrasted with the diet of mice in the suburban population.

Łazienki Park, together with the adjoining Botanical Gardens, occupies an area of 50 ha and is surrounded by busy streets and compact blocks of housing. The park is covered with the vegetation characteristic of old parks: groups of trees and shrubs with large grassy areas. From the species composition and structural aspects the vegetation is similar to the *Tilio-Carpinetum* association. The trees in groups reach densities of up to 90% and bushes up to 75%, which results in considerable shade and consequently a very poor herb layer. Characteristic trees here are *Acer platanoides, Tilia cordata, Carpinus betulus, Aesculus hippocastanum, Robinia pseudacacia* and *Populus alba*. The grassy areas included deformed *Galinsogo-Setarietum* habitats and associations with *Poa annua* and *Agrostis canina*. The grassy areas are regularly mown and leaves of trees raked up in the autumn.

The Orthodox Cemetery covers an area of 12 ha, is adjoined by a busy street, housing and from one side by apark. Although the vegetation is artificially planted it is similar to the *Tilio-Carpinetum* association. The herb layer forms a mosaic of patches and is more luxuriant than in Łazienki Park, since the trees in groups reach densities a maximum of 80%. The *Galinsogo-Setarietum* association occurs in this study area with *Galinsogo parviflora* as the dominant species, and the association with *Poa annua*. The Orthodox Cemetery is much less frequented by humans than Łazienki Park.

Białołęka is a typical suburban area, with separate dwellings and small farms. There is little traffic in the streets. The studies were made in habitats of *Tilio-Carpinetum* and *Circaeo-Alnetum* (Roo-Zielińska, in press). Associations of the *Querco-Fagetea* class occur there, with the species characteristic of mesophyllous deciduous tree stands, and also weed associations of cereal crops (*Secalietea*), fertile meadows and pastures of the *Molinio-Arhenatheretea* class.

The studies were carried out from 1977—1979 during three trapping periods: spring (April-June), autumn (September-October), and winter (January-March). A total of 187 field mice were caught (Table 1). Field mice were caught in snap-traps, set out in the most suitable places. The mice were weighed, dissected, their sex and reproductive condition defined, and stomachs preserved for further analysis.

The diet of the mice was analyzed by means of a modified version of Holišová's method (1966, 1971). The excised stomachs were preserved by means of drying at a temperature of 50°C, for several days. Later prior to their examination the stomachs were soaked in water for 24 hours, then opened, inspected under a binocular eyepiece and their contents identified. The stomach contents were placed in a Petri dish, water added, then thoroughly mixed. Several drops of the suspension were placed on reference slides and examined under a microscope with

magnification 5×40. In all, ten entirely separate fields of vision were analyzed. Three food fractions were distinguished: seeds, the upper vegetative parts of plants and food of animal origin. In order to calculate the percentage formed by the various food fractions in the whole of the stomach contents a grid was placed in the microscope eyepiece, dividing the whole field of vision into 100 smaller fields.

For identification of animal remains the whole stomach contents were analyzed under a binocular eyepiece. The method used for identifying animal remains is given in the paper by Babińska-Werka & Garbarczyk (1981).

Control reference slides were made in order to identify seeds, the upper vegetative parts of herbs found in the stomachs. They were prepared in the following way. Above-ground parts and seeds of many herbs were collected from the study areas and fed to captive field mice, each of the plant species separately for three days. In the case of some plant species the diet was insufficient and a high mortality occured among the mice fed with them. Therefore it was necessary to prepare from flour, margarine and water a stiff dought to which finely chopped tissues and crushed seeds of different plant species were added, according to the "cafeteria test" method (Górecki & Gębczyńska 1962; Drożdż, 1966). Pieces of dough with the different plant species were supplied to the mice for 3 days, than glycerine reference slides of their stomach contents were made by placing on the slides the remains of herbs' tissues and the starch grains characteristic of different seeds. A total of 32 control reference slides were made from seeds and 44 from the upper parts of herbs. In addition a series of reference slides was made from different parts of these plants (stems, flowers, roots and seeds) directly after collecting them from the field (without passing them throught alimentary tract of mice).

Using phytosociological records it was found that as many as 161 plant species were included in the flora of the study areas. As it was impossible to make control reference slides from all the plants, they were made from those species only which occurred in all three study areas.

These control reference slides were used for identification of plant remains found in stomachs of free living mice. In order to identify characteristic starch grains, seeds were treated with the Lugol's reagent before examination.

3. DIET OF THE FIELD MOUSE

Field mice feed on food of animal and plant origin. Frequency of occurrence of the three components distinguished (seeds, upper vegetative parts of herbs and animal food) differed in the food of rodents from different areas (Table 1). Seeds and animal components were found in the majority of the stomachs, while the green parts of plants were encountered least frequently. Thus all the stomachs contained seeds, regardless of the place from which the mice were obtained, whereas in the city the percentage of stomachs containing animal food was about 84% and was slightly higher (differences statistically non-significant) than outside the city at Białołęka, where this food component was found in 71% of the stomachs. The reverse applies for the green parts of

Tabela 1
Description of the stomach contents of *Apodemus agrarius* inhabiting different urban green areas.

	Białołęka	Orthodox Cemetery	Łazienki Park
Number of stomachs examined	68	78	43
% of stomachs containing seeds	100.0	98.7	97.8
% of stomachs containing green parts of plants	48.5 [1]	23.3 [1]	25.6 [1]
% of stomachs containing animal food	71,2 [2]	83.3 [2]	83.7 [2]

[1] Statistically significant differences $p \leqslant 0.05$ — Student t test;
[2] Differences not statistically significant — Student t test.

plants. At Białołęka almost half the individuals of *Apodemus agrarius* examined supplemented their diet with this type of food, whereas in the city only 1/4 of the total number did so (differences statistically significant $p \leqslant 0.05$, Student t test).

The rodents' diet was predominately a mixture, the only food fraction occurring solely being seeds. The mixed food in the rodents' stomachs consisted either of two components (seeds and animal food or seeds and the green parts of plants) or three components. The mice most frequently

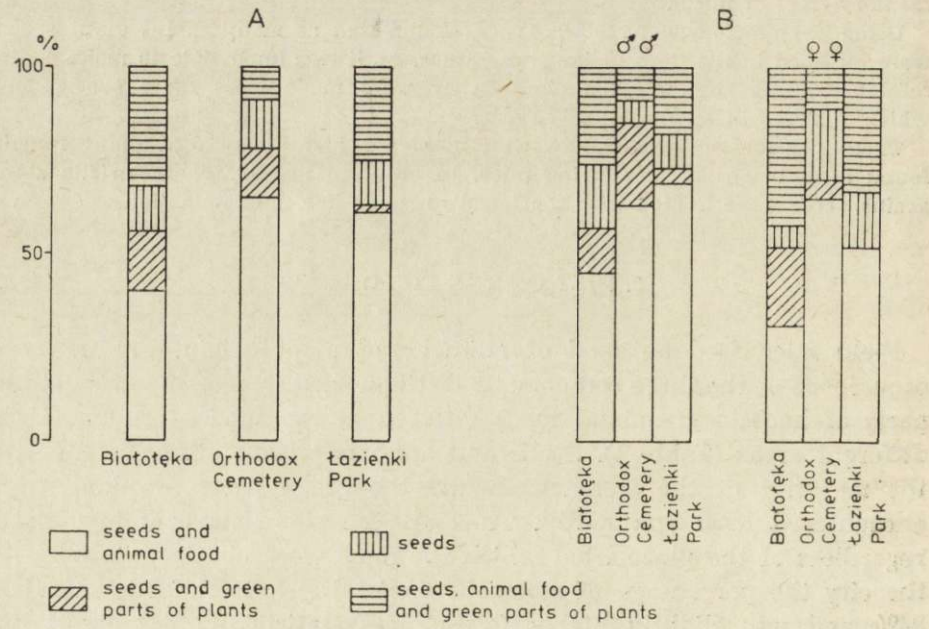

Fig. 1. Percentage in the study material of *Apodemus agrarius* stomachs containing different food fractions. A — all mice, B — division into males and females.

fed on seeds and animal food, the percentage of stomachs obtained from urban mice containing food consisting of these two fractions being higher than at Białołęka (Fig. 1A). The most heterogeneous diet was found in mice from Białołęka, where the percentage of stomachs containing three food fractions was greater than in the city. On the other hand, diet consisting of two fractions predominated in mice from the city. 13% of the stomachs from all the study areas were filled solely with seeds.

Females consumed more varied food, and a higher percentage of their stomachs was found with three food fractions, whereas the diet of males consisted mainly of two components (Fig. 1B).

Volume of different food fractions in the stomachs was also examined. The measure of volume was expressed as percentage of the field of vision under the microscope eyepiece covered by the given fraction (mean value from 10 fields of vision). It was found that seeds formed the chief component of the field mouse's diet. They constitute 86—90% of the food volume (Fig. 2). Animal food forms 8—12% of the volume of stomach contents. Urban mice consumed slightly more seeds and less animal food than suburban ones. *Apodemus agrarius* supplemented its diet with the green parts of plants which formed approximately 1% of the volume of the stomachs irrespectively of the place from which the mice were obtained. Sand and small stones, forming 1% of stomach volume, were also found in the stomachs of the majority of these rodents.

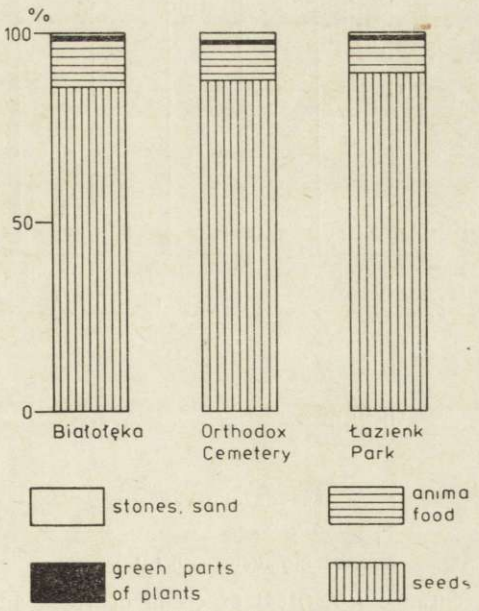

Fig. 2. Different food fractions (in %) in stomachs contents of *Apodemus agrarius*.

Seasonal analysis of volume of three food fractions in the stomachs of males and females separately was also made. No statistically significant differences between sexes and seasons were found, although there was slight an increase in the seed fraction during the period from spring to winter, and a decrease in the percentage of animal food.

4. PLANT FOOD

Plant food consumed by field mice was classified into two fractions: seeds and the vegetative parts of herbs. Their importance for the rodents was not identical. The basis of the rodents' diet consisted of seeds, while the green parts of plants played only supplementary role.

4.1. Seeds

In the *Apodemus agrarius* stomachs seeds of 18 plant species belonging to 15 families were found (Table 2). This includes eight species of trees and ten species of herbs and grasses. In 52.4% of the stomachs examined

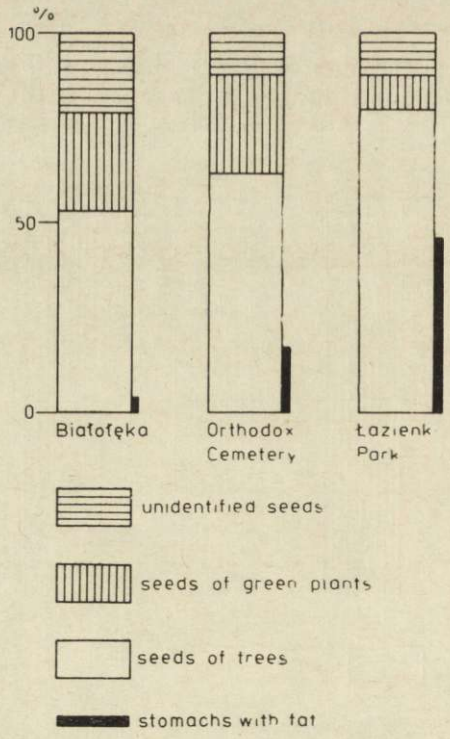

Fig. 3. Percentage occurence $[(f/\Sigma f)100]$ of seeds of trees and herb layer plants in the stomachs of field mice.

Table 2
Relative frequency (% f) of seeds (A) and green parts of plants (B) in the diet of *Apodemus agrarius* living in different urban green areas.

	Białołęka		Orthodox Cemetery		Łazienki Park	
	A	B	A	B	A	B
Rosaceae						
Rosa arvensis Huds.	1.54					
Papilionaceae						
Robinia pseudoacacia	6.15		5.19			
Cruciferae						
Berteroa incana L.	3.08		2.60		2.38	
Capsella bursa-pastoris L.		9.37				27.27
Tiliaceae						
Tilia cordata Mill.	20.0		31.17		16.70	
Geraniaceae						
Geranium pratense L.		18.75				
Aceraceae						
Acer platanoides L.	23.8		37.66		59.52	
Hippocastanaceae						
Aesculus hippocastanum L.	15.38		24.67		19.05	
Fagaceae						
Quercus sp.	16.92		5.19		30.95	
Polygonaceae						
Polygonum sp.	20.15		18.18		11.90	
Rumex sp.			1.30			
Polygonum lapathifolium L.		3.12				
Caryophyllaceae						
Melandrium album Mill.			1.30			
Stellaria media L.		25.00		5.55		
Oleaceae						
Fraxinus excelsior L.	1.54		1.30			
Caprifoliaceae						
Sambucus nigra L.	1.54		1.30			
Amaranthae						
Amaranthus retroflexus L.		3.12				
Labiatae						
Glechoma hederacea L.		3.12		5.55		
Solanaceae						
Solanum nigrum L.	7.69		2.60		7.14	
Scrophulariaceae						
Veronica sp.	1.54		1.30			
Vebrascum sp.				11.11		
Compositae						
Arthemisia vulgaris L.	3.08		1.30			
Xanthium strumarium L.			1.30		2.38	
Taraxacum officinale Web.		12.50				
Sonchus arvensis L.		3.12		5.55		9.09
Lapsana communis L.		3.12				
Artemisia vulgaris L.		3.12				
Gramineae						
Dactylis glomerata L.		3.12	5.19			27.27
Echinochloa crusgalli L.[1]	6.15		9.09		4.76	
Setaria sp.[1]						
Lolium perenne L.				22.22		27.27
Avena fatua L.				5.55		9.09
Epidermis of leaves and grass stalks, indet.		6.25		38.89		36.36
Green parts of plant, indet.		47.87		33.33		9.09
Seeds, indet.		23.08		14.28		

[1] Impossible to distinguish seeds.

only seeds of one plant species was found, in 36.8% — of two species, and in the remainder of three (8.6%) or more species (2.2%). This is evidence that mice usually ate the most easily accessible kind of seeds. This is also confirmed by the results of the studies by Holišová (1971), Hansson (1971).

Preference of certain kinds of seeds was established by means of the relative frequency index — %f (Obrtel & Holišová, 1974). This index gives the percentage of stomachs containing particular seeds, assuming that all the stomachs containing food form 100%. The seeds most often eaten by mice were those of: *Acer platanoides, Tilia cordata, Aesculus hippocastanum* and *Quercus* sp. (Table 2). The proportion of these seeds in the diet of urban mice was higher than in the diet of mice at Białołęka, which additionally consumed seeds of such trees as *Robinia pseudoacacia, Fraxinus excelsior, Sambucus nigra* and others. Various species, *Polygonum* sp. and *Solanum nigrum,* predominated among the seeds of herb layer plants found in the rodents' stomachs. Seeds of *Echinochloa crus-galli* and *Setaria* sp. were also frequently consumed. At Białołęka the number of species of herb layer seeds found in the rodents' stomachs was higher than in the city. This was not due to the greater diversity of the flora in the suburban area, since both the number of herb species and of tree species were comparable in all the study areas.

The proportion of tree seeds and herb layer plant seeds in the diet of *Apodemus agrarius* was calculated by means of the percentage occurrence index (Obrtel & Holišová, 1974). This index is the percentage of each major component in the total sum of frequency, considered to be 100%. Tree seeds formed the basic component of the rodents' diet (Fig. 3). Percentage occurrence of these seeds in the stomachs of urban mice reached as much as 80%, whereas in the case of rodents from suburban areas this figure was only 54%. The seeds of herb layer plants were in 9 to 26% of stomachs, their percentage occurrence in the stomachs of mice from urban areas being almost twice smaller than in suburban mice.

Examination was made of diversity of seeds in the diet of *Apodemus agrarius* living in the study areas. Diversity of the seeds in the rodents' food was calculated by the Shannon-Wiener index (Cox, 1967) $H=\Sigma p_i \ln p_i$, where it was taken that H = index of species diversity, p_i — fraction of the given species of seeds in the number of seeds of all species. This index was calculated separately both for tree seeds and seeds of herb layer plants. In both cases it was higher for mice from suburban areas than for urban mice (tree seeds: Białołęka 1.64, Cemetery 1.46, Łazienki 1.25 and the seeds of herb layer plants: 1.96, 1.63, 1.43). Thus the diet of mice from suburban areas included a greater variety of

seeds than that of urban mice, which had a more homogenous diet. Variety of seed species occuring in the urban and suburban study areas is smilar, as far as the number of different plant species are considered. But their relative frequency was not examined, though the less variable, seed diet of urban rodents might be caused by less frequent occurrence of some seeds in urban habitat.

4.2. The Vegetative Parts of Herb Layer Plants

The diet of field mice was supplemented by the vegetative upper parts of herb layer plants. They formed only 1% of the volume of the food consumed by these rodents (Fig. 2) and were found in about 50% stomachs of suburban mice and only in 25% of stomachs of urban mice (Table 1). The mice most often consumed only one species of plant: Białołęka — 68.7% of the stomachs examined, and city (Cemetery and Łazienki jointly on account of the small amount of material) — 75.9%. Less often two species of plants were eaten: Białołęka — 21.9%, city — 24.1%. At Białołęka some rodents with three or four plant species in their stomachs were found (9.4%), while none such rodent was found in town. This shows that mice from suburban areas exhibit a greater variety of their diet.

The fact that suburban mice consume a greater variety of plant species is also shown by the total number of plant species found in the stomachs of all rodents from the given area, for instance from 6 to 7 species of plants were found in the stomachs of urban mice, and at Białołęka as many as 12 species. Urban mice most often consumed different plants of the *Graminea* family and *Capsella bursa-pastoris* (Table 2), whereas *Stellaria media* and *Geranium pratense* predominated in the stomachs of suburban mice, and the percentage of grasses was small.

The percentage occurrence of herb layer plants was calculated in the diet of these rodents (Fig. 4). Grasses were most often encountered in the stomachs of urban mice, occurring in 50% of the stomachs containing the herb layer plant fraction. In diet of suburban mice no predominant plant species was found, and much greater diversity of plants was stated. Confirmation of this is also provided by the fact that the percentage of unidentified plants was greater in the case of suburban mice, which could be caused by the difficulty in identifying them, as they probably belong to a large number of taxonomic groups. The Shannon-Wiener index shows that the diet of suburban mice is more diverse in its herb layer plant component (Fig. 4). The index value is lower in the city (treating the Cemetery and Łazienki Park jointly on account

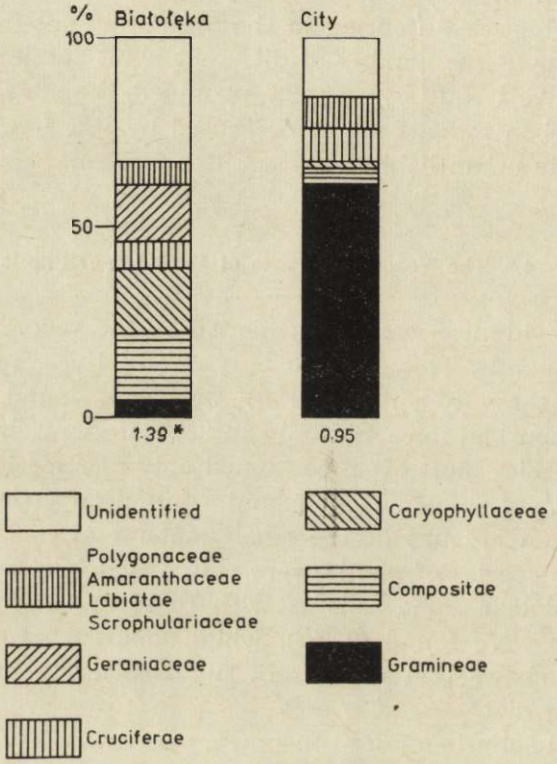

Fig. 4. Percentage occurrence [$(f/\Sigma f)100$] of herb layer plants in the stomachs of *Apodemus agrarius*.
* Index of diversity (Shannon-Wiener) of herb plant species in the rodents' stomachs.

of the small amount of material) than in the suburban area. Thus the mice living in the city also have a more homogenous fraction composed of herb layer plants in their diet than the suburban mice.

5. ANIMAL COMPONENTS OF DIET

Animal components of food were found in 71—84% of the rodents' stomachs, the percentage of this fraction being higher in urban than in suburban mice (Table 1). Animal food consumed by *Apodemus agrarius* consists primarily of invertebrates, whereas vertebrates (muscle tissue, feathers, fur) formed only 4% of the whole animal food.

Detailed studies of the composition of animal components, their significance in the food of the field mouse are presented in the paper by

Babińska-Werka & Garbarczyk (1981). Animal food most often consumed by these mice consisted of *Insecta* (dominating component), *Aranea* and *Chilopoda*. The proportion of insects was higher in the diet of *Apodemus agrarius* in the city, while the proportion of *Aranea* and *Chilopoda* was lower than in the suburban area. Among *Insecta* the dominant group consisted of caterpillars (*Lepidoptera* and *Hymenoptera Symphyta* larvae) while *Coleoptera* were second in importance. *Diptera* representatives were more numerous in the city than of Białołęka. Generally, the larval forms of *Insecta* were slightly more often encountered in the animal food of urban than suburban mice.

To sum up, it appears that field mice living in the city more readily and more often consume animal food than mice from suburban areas. At the same time they have a more homogenous animal fraction of the diet, since insects, and particularly their larval forms, predominate in the animal food they consume.

6. ESTIMATING THE CALORIFIC VALUE OF FOOD

During analysis of all the food fractions consumed by field mice the question arose as to whether there were differences in the calorific value of food consumed by these rodents living in towns and in more natural (suburban) habitats. According to Obrtel & Holišová (1979), Hansson (1971) high-calorie food are seeds and animals as they are rich in carbohydrates and fats.

The most important component in the diet of field mice consisted of seeds. *Apodemus agrarius* more often fed on seeds of trees than those of herb layer plants (Fig. 3). Among tree seeds the rodents most often consumed such species as *Acer platanoides, Tilia cordata, Aesculus hippocastanum, Quercus* sp. Grodziński & Sawicka-Kapusta (1970) state that the calorific value of these seeds varies within limits of 5.5—6.0 kcal/g of dry mass, while, as shown by Falińska's studies (1969), the seeds of herb layer plants have a caloric value from 3.4 to 6.1 kcal/g of dry mass. The percentage of tree seeds of higher caloric value in the diet of urban rodents was higher than in that of suburban mice (city — 80%, Białołęka — 54%) (Fig. 3). At the same time urban mice less often consume the seeds of herb layer plants.

A second high-calorie component in the diet of field mice consists of the larval forms of insects, such as caterpillars (*Hymenoptera Symphyta* and *Lepidoptera*) and *Diptera* larvae. Their percentage in the food of *Apodemus agrarius* is slightly higher in the city and reached as much as 59%, whereas at Białołęka the larval forms formed 50% of all insects encountered in the rodents' stomachs (Fig. 5).

When stomach contents were examined under a microscope floating droplets of fat could be seen, but unfortunately it proved impossible to state their origin. This might have been fat from vegetable or animal tissues consumed by rodents, or fat originating from the human food remnants found by rodents in the city. At Białołęka only 4% of the stomachs contained this food element (Fig. 3). In the Cemetery 17% of the stomachs contained fat, and in Łazienki Park as many as 46%. It is thus clear that the presence of fat in the stomachs of *Apodemus agrarius* was distinctly more frequent in the city, and it can therefore be concluded that mice living in the city consume more caloric food than mice from suburban areas.

7. DISCUSSION

Apodemus agrarius is a species consuming high-calorie food, that is, chiefly seeds and invertebrates (Voronov, 1954), and indeed, as shown by the results obtained in the present study, seeds and invertebrates form the chief source of the food of this species. Similar results were obtained by Holišová (1967), who stated that seeds form the most important component of food of the field mouse. Other species of mice also feed on these two most caloric food fractions, but the proportions of animal food in their diet is different. For instance it is invertebrates (chiefly insects) which predominate over the seeds of both trees and herb layer plants in the food of *Apodemus flavicollis* and *Apodemus sylvaticus* (Obrtel & Holišová, 1979, 1980).

The field mouse's food was thus chiefly formed by seeds, which were found in all the stomachs examined (Table 1). This agrees with the data given by Holišová (1967), who found that frequency of seeds in the rodents' stomachs was as much as 93%, and animal components up to 68%. In suburban areas at Białołęka frequency of animal food was 71%, but in the city this figure was as great as 84%. This may be due to the smaller proportion of seeds of herb layer plants in the diet of urban mice (Fig. 3). The rodents make up for this by greater consumption of tree seeds and invertebrates. This is evidence of the great adaptability of the field mouse and the ease with which it can switch to currently abundant food, as has been previously observed by Hansson (1971) in several species of rodent.

The results obtained in the present study show quite clearly that *Apodemus agrarius*, living in a city and undergoing the process of synurbization, feeds on food less diversified than individuals of the same species living in suburban areas. The homogenity of the food of urban

mice was ascertained by analyzing all three food fractions, that is, seeds, green parts of plants and animal food. In the city, as compared with Białołęka, the mice more often consumed tree seeds, and less frequently seeds of herb layer plants (Fig. 3). In the city the twice smaller frequency of consuming the seeds of herb layer plants can be explained by the lower production in urbanized areas of such seeds, due to mowing grass plots and using herbicides. On the other hand the increase in consumption of tree seeds may be due to the concentration in city parks of many species of trees producing seeds readly eaten by these rodents.

Although the green parts of plants were only a supplementary element in their diet, in the case of urban mice they formed a very homogenous fraction, with the *Gramineae* family predominating, whereas in the case of mice from Białołęka this fraction was more diversified (Fig. 4). The volume of this food fraction in the stomachs is only 16%, but formed an important component of their diet, since the vitamin contents in the green parts of plants play an important part in the nutrition of the animals (Voronov, 1954; Sahno, 1957; Holišová, 1967).

The animal food consumed by field mice living in the city was predominantly composed of insects, and to a lesser degree of *Aranea* and *Chilopoda* (Fig. 5). The total proportion of larval forms in the diet of urban mice was also greater than at Białołęka. Urban mice thus consumed chiefly *Diptera,* caterpillars and larvae of *Diptera,* and large, inactive and therefore easily accessible phytophages and saprophages. The latter applies to *Coleoptera,* which frequently exhibit a tendency to congregate. Spiders form a large proportion of the diet of *Apodemus agrarius* in addition to these animals. In the city the lower proportion of spiders and beetles in the rodents' diet can be explained by the lower density of these animals in the study area (Babińska-Werka & Garbarczyk, 1981). The mice are therefore forced to change over to a different type of animal food — the kind most easily accesible, easy to catch or find and of high-calorie value. Caterpillars and larvae of *Diptera* form this type of food. Thus in the city the rodents' diet is more homogenous in respect of species composition than it is in suburban areas.

The fact that the mice consume high-calorie food, established by Voronov, 1954; Holišová, 1967; Obrtel & Holišová, 1979, 1980; was also confirmed in the present study, urban mice feeding on more calorific food (Fig. 3, 5) than mice from suburban areas.

Life under urban conditions in habitats different and greatly altered in comparison with natural habitats, brought about a change of diet in *Apodemus agrarius.* Diet of rodents living in the city was less diversified but more caloric, and this might have been the cause of the higher body weight of mice living in the city as compared with individuals of

this species living in suburban areas, as found earlier by Andrzejewski *et al.* (1978).

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POKARM MYSZY POLNEJ ŻYJĄCEJ W RÓŻNYCH TYPACH ZIELENI MIEJSKIEJ

Streszczenie

Analizę pokarmu myszy polnych przeprowadzono w Warszawie na dwóch terenach zieleni miejskiej: w Łazienkach i na Cmentarzu Prawosławnym oraz na terenie pozamiejskim w Białołęce. Zbadano 187 żołądków *Apodemus agrarius* stosując zmodyfikowaną metodę Holišovéj (Tabela 1). Na dietę myszy składały się nasiona, nadziemne wegetatywne części roślin zielnych oraz pokarm pochodzenia zwierzęcego. Pokarm roślinny przeważał nad pokarmem zwierzęcym, a dominującym komponentem w diecie myszy były nasiona (Tabela 2). Występowały one u wszystkich badanych gryzoni, stanowiąc 86—90% objętości żołądków (Ryc. 2). Myszy żyjące w mieście miały dietę bardziej jednorodną niż myszy z terenów pozamiejskich, co przejawiało się we wszystkich frakcjach pokarmu. Większy udział nasion drzew w diecie myszy z jednocześnie rzadszym spożywaniem nasion roślin zielnych stwierdzono w mieście (Ryc. 3). Zielone części roślin zielnych stanowiły jedynie uzupełnienie diety *Apodemus agrarius*. U gryzoni miejskich charakterystyczny był fakt zdominowania tej frakcji pokarmu przez trawy (Ryc. 4). Pokarm zwierzęcy stanowił od 8 do 12% objętości żołądków i u myszy miejskich przeważały w nim owady, a wśród nich formy larwalne. Dieta myszy miejskich była nie tylko mniej urozmaicona niż myszy pozamiejskich, ale jednocześnie bardziej kaloryczna. Przejawiało się to dominacją nasion drzew i form larwalnych owadów oraz zawartością pływających kropli tłuszczu w żołądkach myszy (Ryc. 3). Większa kaloryczność pokarmu mogła być przyczyną wyższego ciężaru myszy w mieście w porównaniu do myszy pochodzących z terenów pozamiejskich.