

Foods of the White-footed Mouse, *Peromyscus leucopus noveboracensis*, from Pike County, Indiana¹

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Abstract

During a faunal study of a strip-mined area in Pike County, Indiana, the stomachs of 489 white-footed mice (*Peromyscus leucopus noveboracensis*) were examined to determine food preferences. The stomach contents were identified by comparison with seeds, arthropods, and other materials collected on the study plots where the mice were trapped. The average % volume of each food was estimated for each stomach. Of the 68 different materials identified, undifferentiated starchy substance and invertebrates were the most common. Wild cherry (*Prunus* sp.), blackberry (*Rubus* sp.) and wood sorrel (*Oxalis* sp.) were the most abundant identifiable plant foods. The average % volumes of food types (i.e. plant, animal, and "other") were computed for each season. The results showed that plant foods are dominant throughout the year, but increase noticeably during the fall and winter.

Introduction

As part of a faunal study of a strip-mined area (6), stomachs of all white-footed mice captured during a trapping program were examined to determine food preferences of the species. This paper summarizes the findings of the study.

Study Area

The study area covers approximately 7½ square miles in Monroe and Lockhart Townships (R7W and R8W, T3S), Pike County, Indiana. About ½ of the area has been strip-mined for coal. The topography resulting from the strip-mining is either pyramidal, parallel ridges ranging in height to 75 feet, or extensive flat areas with intermittent small hills. The stripping began in 1921 and ended in 1961. The unstripped half of the area has rolling topography with intermittent low, wet areas.

The vegetation was divided into nine distinct cover-types based on dominant species. Pines, mixed pine-hardwoods, pine-hardwood saplings, and black locust occurred only on the stripped portions. Hardwoods, brush and weeds occurred on both stripped and unstripped land, and bottom-land hardwoods and crops occurred only on the unstripped land. Except for brush and weeds, all cover types on the stripped land had been planted.

Methods

The food habits study was based on mice that were captured during a population study which employed 100 plots randomly selected from a gridded map of the area. The plots were 125 feet square and contained 18 trapping sites of 3 traps each. Each plot was set for three nights. The stomachs of the captured mice were removed as soon as possible and preserved in 70% alcohol. During trapping all plants found on each plot were recorded and samples of their seeds and fruits collected.

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After the trapping program was completed, the stomachs were dissected and the contents washed into a dish of alcohol. The contents were then identified by comparison with the sample collections of seeds and animal matter. The volume of each food was estimated according to the methods of Hamilton (4) and Whitaker (9). Every effort was made to identify all stomach materials. However, some unidentifiable contents were listed as unidentified plant or animal materials, or unknown, depending upon their nature. The data were programmed and analyzed by computer. Because the study emphasized plant materials, arthropod remains were identified only to general classifications.

Results

The most prevalent year-round food eaten by the white-footed mouse was undifferentiated, starchy material. Insects and Lepidoptera or Hymenoptera larvae were other preferred foods. Unidentified seeds ranked below starchy material and insects. Of the identifiable seeds, those with the highest volumes were wild cherry (*Prunus serotina*), blackberry (*Rubus* sp.), and yellow wood sorrel (*Oxalis* sp.). All stomach items except those in the next paragraph are listed in Table 1.

The following foods were found in quantities of less than 0.1% volume: Compositae seeds, 0.8% frequency; crowfoot (*Ranunculus*) seeds, Annelida, and touch-me-not (*Impatiens*) seeds, 0.6% frequency; pupae cases, pokeberry (*Phytolacca*) seeds, tick trefoil (*Desmodium*) seeds, and metal, 0.4% frequency; trumpet creeper (*Campsis*) seeds, Coleoptera larvae, flower petals, bones, redbud (*Cercis*) seeds, oxeye daisy (*Chrysanthemum*) seeds, avens (*Geum*) seeds, sedge (*Scirpus*) seeds, daisy fleabane (*Erigeron*) seeds, lettuce (*Lactuca*) seeds, bluets (*Houstonia*) seeds, St. John's-wort (*Hypericum*) seeds, and plantain (*Plantago*) seeds, 0.2% frequency.

The seeds of planted trees consumed by the white-footed mouse were maple (*Acer*), pine (*Pinus*), ash (*Fraxinus*), elm (*Ulmus*), and black locust (*Robinia*). Of the planted species, maple had the highest average volume and % frequency, but these values were only 1.2% volume and 8.3% frequency.

A consideration of the seasonal preferences indicates that plant foods are dominant throughout the year but increase noticeably during the fall and winter, after the plants have dropped their fruits and arthropods have become scarce.

TABLE 1. Average percent volume and percent frequency of foods found in 489 white-footed mice (*Peromyscus leucopus*) stomachs from September, 1965, to August, 1966, in Pike County, Indiana.

Food	Volume	Frequency
Starchy material	30.1	77.3
Insects	14.5	78.6
Lepidoptera or Hymenoptera larvae	9.2	42.2
Unidentified seeds	7.5	41.0
Wild cherry (<i>Prunus</i>) seeds	5.3	21.4
<i>Rubus</i> (sp.) seeds	3.7	10.0
Yellow wood sorrel (<i>Oxalis</i>) seeds	3.6	9.4
Unidentified plant	3.3	23.3
Hair	2.2	41.2
Chilopoda	1.9	13.7
Green vegetation	1.8	12.7
Indian hemp (<i>Apocynum</i>) seeds	1.6	7.9
Cranesbill (<i>Geranium</i>) seeds	1.5	5.0
Mollusca	1.2	8.9
Maple (<i>Acer</i>) seeds	1.2	8.3
Unknown	0.9	8.3
Arachnida	0.8	9.8
Flesh	0.8	4.8
Pine (<i>Pinus</i>) seeds	0.8	4.8
<i>Endogone</i>	0.7	6.0
Ash (<i>Fraxinus</i>) seeds	0.7	4.4
Sumac (<i>Rhus</i>) seeds	0.6	2.3
Elm (<i>Ulmus</i>) seeds	0.5	3.3
Bush clover (<i>Lespedeza</i>) seeds	0.5	3.1
Rose (<i>Rosa</i>) seeds	0.5	2.9
<i>Rumex</i> (sp.) seeds	0.4	3.7
Bittersweet (<i>Celastrus</i>) seeds	0.4	2.9
Cottonwood (<i>Populus</i>) seeds	0.4	2.5
Poison ivy (<i>Rhus</i>) seeds	0.4	2.5
Sassafras (<i>Sassafras</i>) seeds	0.4	1.5
Pebbles	0.3	7.3
Honeysuckle (<i>Lonicera</i>) seeds	0.3	1.5
Unidentified grass seeds	0.2	3.3
Panic grass (<i>Panicum</i>) seeds	0.2	2.7
Dogwood (<i>Cornus</i>) seeds	0.2	2.1
Unidentified animal	0.2	1.5
Everlasting pea (<i>Lathyrus</i>) seeds	0.2	0.6
Unidentified fungus	0.1	3.5
Grape (<i>Vitis</i>) seeds	0.1	1.5
Greenbriar (<i>Smilax</i>) seeds	0.1	1.2
Sedge (<i>Carex</i>) seeds	0.1	1.2
Feathers	0.1	1.0
Peppergrass (<i>Lepidium</i>) seeds	0.1	1.0
Foxtail (<i>Setaria</i>) seeds	0.1	0.6
Black locust (<i>Robinia</i>) seeds	0.1	0.6
Sweet clover (<i>Melilotus</i>) seeds	0.1	0.6
Apple (<i>Pyrus</i>) seeds	0.1	0.2

Discussion

I agree with Hamilton (4) that the starchy material, called mast by Whitaker (9), is composed of many different materials (such as mast, root tips, and seeds) which cannot be separated by observation. Hamilton (4) found stomachs containing nothing but starchy material. Such was the case in this study. Undoubtedly some of the starchy material was composed of acorns (*Quercus*), hickory nuts (*Carya*), and other such fruits. Whitaker (personal communication) indicates that he has found portions of the exocarp of such fruits still clinging to the material. Such was not the case in this study.

Green vegetation was separated from unidentifiable plants because this material is composed of leaves, buds, or other vegetative plant parts. This is supported by Hamilton's (4) contention that the remains of buds, and Jameson's (5) conclusion that cotyledons of sprouting seeds, when eaten by mice, retain their green color. By my methods it was impossible to determine the origin of the plants or the parts. The unidentified plant material was thought to be fragments of xylem or phloem (2).

The fungus *Endogone* was a common item in the stomachs of many small mammals by a number of investigators (1, 2, 3, 4, 7, and 11). However, it was not a common food of the white-footed mouse in this study, ranking 20th in volume with a frequency of 0.7%.

Although insects were a major food, they never surpassed plant food in volume or frequency. Similar observations were reported by Hamilton (4), Jameson (5), Williams (10), and Whitaker (8, 9).

Hair, found in 41.5% of the stomachs, was often in the form of balls, suggesting that it resulted from the grooming habits of the mice. Some hair undoubtedly accompanied ingested flesh which was found in 4.8% of the stomachs.

Stomach analyses admittedly provide only an indication of food preferences. However, they provide some information concerning the ecology of the mammal and indicate what plants it eats. Although some believe that enough food habits work has been done for *Peromyscus*, of the 68 foods identified, seeds of 27 plant species were new foods for the species. To the author's knowledge none has been reported before. The most common of these were Indian hemp (*Apocynum*) and cranesbill (*Geranium*) with frequencies of 7.9% and 5.0%, respectively.

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