

FOOD HABITS OF THE COYOTE (*CANIS LATRANS*) IN WESTERN TENNESSEE

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ABSTRACT

Digestive tracts of 54 western Tennessee coyotes (*Canis latrans*) were examined for food habits from the fall of 1979 through the summer of 1981. The nine food items detected and percent occurrence were: rodent (48.1), livestock (35.2), plant (27.8), rabbit (24.0), bird (16.7), insect (14.8), white-tailed deer (13.0), woodchuck (7.4), and reptile (3.7).

INTRODUCTION

Food habits of the coyote (*Canis latrans*) have been studied in several states. Bekoff (1977) summarized much of the available literature concerning coyote food habits and other aspects of the natural history of this species. However, at present, little information is available concerning *C. latrans* in Tennessee. Rhoads (1896) and Kellogg (1939) were among the first to record the presence of this species in the state, but reports of occurrence in the literature (1940-1970) have been few. However, in the last decade, reports to the authors and to the Tennessee Wildlife Resources Agency of wild canids (coyote-like) have increased steadily. The authors have examined taxonomic status of the Tennessee canid in other studies and determined it to be primarily *C. latrans*. At present, coyote occurrences are common in many parts of the state, and all indications are that *C. latrans* has become a permanent member of the fauna of Tennessee. This being the case, there is a need to better understand the biology of this species within the state.

The purpose of this study was to examine the food habits of *C. latrans* in western Tennessee. This investigation should provide a preliminary base for the understanding of Tennessee coyotes in relation to native fauna and livestock within the state.

MATERIALS AND METHODS

Fifty-four *C. latrans* digestive tracts (25 male; 29 female) were studied from the fall of 1979 through the summer of 1981. Counties from which specimens were examined and

sample sizes were as follows: Crockett Co., 1; Decatur Co., 1; Fayette Co., 7; Gibson Co., 4; Hardeman Co., 7; Henry Co., 1; Lauderdale Co., 3; Shelby Co., 17; Tipton Co., 12. Most specimens were collected by trappers, hunters, and Tennessee Wildlife Resources Agency personnel. Animals were transferred to the Department of Biology at Memphis State University where they were stored and later examined. Procedures for analyzing food content followed those of Korschgen (1969). Data were analyzed on the basis of percent occurrence. Hair samples were identified using the key of Moore et al. (1974). Food volumes were not taken since it was impossible to examine the specimen at the time of harvest. Gier (1968) has shown that items in coyote stomachs for more than 5 hours are not accurate indicators of proportional intake.

After examination, food material and digestive tracts were stored in 10% formalin. These materials are presently housed within the Memphis State University Museum of Zoology. Seasons implied in the study are those of the calendar year.

RESULTS

Results of the examination of 54 digestive tracts are presented as Table 1. Ten coyotes were taken in the spring, 27 in the fall, 15 in the winter, and 1 in the summer. All digestive tracts, except one, contained food material. Rodents were found to be the most frequently occurring food item and included hispid cotton rats (*Sigmodon hispidus*), deer mice (*Peromyscus* sp.), and voles (*Microtus* sp.). Livestock remains were present in samples in the form of cattle (16 specimens) and hogs (3 specimens). Rabbits detected in the samples were taken to represent primarily eastern cottontails (*Sylvilagus floridanus*). Other mammals included as food sources were white-tailed deer (*Odocoileus virginianus*) and woodchucks (*Marmota monax*). One chicken and several songbirds were the only avian remains present. Additionally, the only reptilian remains detected were one snake and one lizard. The only invertebrates found in the digestive tracts were insects, and persimmons was the only plant material determined.

TABLE 1. Food items found in the digestive tracts of 54 coyotes (*Canis latrans*) from western Tennessee.

	Number of occurrences (of 54 samples)	Percent occurrences (of 54 samples)	Number of times occurring ¹			
			Spring	Fall	Winter	Summer
Rodent	26	(48.1)	5(19.2)	16(61.5)	4(15.4)	
Livestock	19	(35.2)	2(10.5)	9(47.4)	8(42.1)	1(3.9)
Plant	15	(27.8)	1(6.7)	12(80.0)	2(13.3)	0(0.0)
Rabbit	13	(24.0)	4(30.8)	4(30.8)	5(38.4)	0(0.0)
Bird	9	(16.7)	1(11.1)	2(22.2)	5(55.6)	1(11.1)
Insect	8	(14.8)	4(50.0)	4(50.0)	0(0.0)	0(0.0)
White-tailed Deer	7	(13.0)	1(14.3)	6(85.7)	0(0.0)	0(0.0)
Woodchuck	4	(7.4)	2(50.0)	1(25.0)	1(25.0)	0(0.0)
Reptile	2	(3.7)	2(100.0)	0(0.0)	0(0.0)	0(0.0)

¹Values in parentheses represent the seasonal percentage of particular food items.

Percentage of occurrence for each food item varied over different seasons. Reptile, woodchuck, and insects had highest occurrence in the spring, and deer, plant, rodent, livestock, and insect appeared most often in fall specimens. Bird and rabbit remains occurred most frequently in winter samples. Bird and rodent material were the only food items determined in the one summer sample.

DISCUSSION

Small sample sizes in the present study make it difficult to draw final conclusions concerning coyote food habits in Tennessee. However, some similarities are seen between the results of this work and previous investigations. Sperry (1941), Korschgen (1957), and Bekoff (1977) summarized much of the available literature concerning coyote food habits. Similarities and dissimilarities between the present study and other investigations can be drawn from these works as well as from Gipson (1974) who summarized coyote food habit studies in areas of the original range of the species. A complete review of coyote food habits is beyond the scope of this work; however, comparisons can be made between the present study and others conducted in areas of proximity to Tennessee. Gipson (1974) reported eight of the nine food items found in the present study to also be among the important food items of Arkansas coyotes. He did not find any reptilian remains. Poultry, persimmons, insects, rodents, and songbirds were the most common Arkansas food items. Rabbits, poultry, livestock, and small rodents were the most common food items reported in Missouri by Korschgen (1957). He found representatives of all the groups reported in the present study. In northern Louisiana, rodents, rabbits, cattle material, and plant material were found among the important food items (Wilson, 1967), and, in northwestern Louisiana, Michaelson and Goertz (1977) reported mammals, plant foods, and birds to be the most important. Wilson (1967) and Michaelson and Goertz (1977) reported all food items noted in the present study except woodchuck and reptile. Both studies also reported additional food items to those found in the present study. It is of interest that the frequency of occurrence of persimmons in Arkansas (23.0%) and northern Louisiana (23.2) is very similar to that in Tennessee (27.8).

While there appears to be some geographic variation in the importance of food items, most of the foods determined in the present study appear at some level of importance in other studies conducted in the southeastern United States and indicate, as other studies do, a seasonal shift in utilization of some food items as well as a shift toward some food sources, such as persimmons, which are not found in the western states. Foods eaten by coyotes in Tennessee are a matter of concern to stockmen, farmers, hunters, and other groups because of the possible effects exerted by these mammals on domestic and game species. The relative importance of various items in the diet of coyotes given some insight into the possible economic impact of this species upon livestock and native fauna.

Livestock and white-tailed deer are among the most economically important food items detected to date in Tennessee coyotes. However, results relating to these food items in the present study should be interpreted cautiously for they could be misleading. For example, nineteen coyotes sampled in this study contained livestock remains. However, four of these samples contained maggots indicating possibly that the food source was dead before the coyote arrived. It is probable that this category was over-rated, and some or many occurrences should properly be classified as carrion but could not be so identified from the stomach contents. The level of occurrence of this food item could also be inflated since all seasons are not represented equally in the samples. Specimens could be from a time when predation on livestock is the greatest. Wilson (1967) and Gipson (1974) reported cattle to occur most frequently as a coyote food item in winter and spring in Louisiana and Arkansas, respectively. Additionally, 85.7% of the samples containing remains of white-tailed deer in the present study were taken in the fall season, which corresponds to the hunting season. This, coupled with the fact that several coyote digestive tracts contained remains of internal organs of deer, suggests scavaging of wounded deer or the remains of field-dressed deer which are usually left in the woods by hunters and not the taking of healthy deer. However, our findings do include economically important items in the digestive tracts of western Tennessee coyotes at a level which should be noted. Additional studies are needed to more completely determine the real impact of coyotes on these species and others.

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LITERATURE CITED

- Bekoff, M. 1977. *Canis latrans*. Mammalian Species, 79:1-9.
- Gier, H. T. 1968. Coyotes in Kansas. Agric. Exp. Stat., Kansas St. Univ., Coll. Agric. Appl. Sci., 118 pp.
- Gipson, P. S. 1974. Food habits of coyotes in Arkansas. J. Wildl. Mgmt., 38:848-853.
- Kellogg, R. 1939. Annotated list of Tennessee mammals. Proc. U. S. Nat. Mus., 86:245-303.
- Korschgen, L. J. 1957. Food habits of the coyote in Missouri. J. Wildl. Mgmt., 21:424-435.
- . 1969. Procedures for food-habits analyses. Pages 233-250 in R. H. Giles, Jr., ed. 1969. Wildlife management techniques. The Wildlife Society, Washington, D.C., 623 pp.
- Michaelson, K. A. and J.W. Goertz. 1977. Food habits of coyotes in northwest Louisiana. Louisiana Acad. Sci., 40:77-81.
- Moore, T. D., L. E. Spence, and C. E. Dugnon. 1974. Identification of the dorsal guard hairs of some mammals of Wyoming. Wyoming Game and Fish Department Bull., 14:1-177.
- Rhoads, S. 1896. Contributions to the zoology of Tennessee, No. 3: Mammals. Proc. Acad. Nat. Sci. Philadelphia, 48:175-205.
- Sperry, C. C. 1941. Food habits of the coyote. U. S. Dept. Int., Fish and Wildlife Service, Wildl. Res. Bull., 4:1-70.
- Wilson, W. C. 1967. Food habits of the coyote, *Canis latrans*, in Louisiana. M.S. thesis, Louisiana State University, 49 pp.