A COMPARISON OF THE LATE WINTER FOODS AND PARASITES OF BOBWHITE QUAIL AND BLACK FRANCOLINS IN SOUTHWESTERN LOUISIANA[1]

by

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ABSTRACT

During 1961 and 1962, 311 wild-trapped black francolins *(Francolinus francolinus asiae)* from India were released in the Gum Cove area of Cameron Parish in southwest Louisiana. A substantial bobwhite quail *(Colinus virginianus)* population was present on the release site. In 1967, ten francolins and ten quail were collected for comparison of food habits and parasite fauna. Differences in food habits were noted but an occasional preference of francolins and of bobwhites for the same food items was revealed. This was not believed to be a limiting factor for either population. Parasite burdens were generally low, and the parasite fauna of each species was quite distinct.

INTRODUCTION

During 1961 and 1962, 311 wild-trapped black francolins from India were released by the Louisiana Wild Life and Fisheries Commission in Gum Cove area of Cameron Parish in southwestern Louisiana (Bohl and Bump, 1970). Reproduction has been evident each year since releases were made and natural dispersion has extended the francolins' range some 10-15 miles from the release site.

The release area is bounded on the east, south and west by marshland and is essentially a coastal prairie ridge with the attendant plant communities (Craft, 1966). Land use is devoted mainly to cattle grazing with a portion planted in rice. Many irrigation canals and ditches traverse the area. A substantial acreage is left fallow each year, providing a lush growth of native plants. Dominant plants on the open prairie are carpet grass *(Axonopus compressus)*, wire grass *(Spartina patens)*, bermuda grass *(Cynodon dactylon)* and doveweed *(Croton capitatus)*. Pimple mounds (geological pressure ridges) are scattered over most of the prairie ridge. Vegetation on these mounds, usually tall and dense, includes doveweed, carpet grass, yankeeweed *(Eupatorium capillifolium)*, wax-myrtle *(myrica cerifera)*, bramble *(Rubus* sp.*)*, goldenrod *(Solidago* sp.*)*, hibiscus *(Hibiscus* sp.*)*, and partridge-pea *(Cassia fasciculata)*.

Woody vegetation scattered throughout the area includes Macartney

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Rose *(Rosa bracteata)*, sassafras *(Sassafras albidum)*, prickly ash *(Zanthoxlum clava-herculis)*, yaupon *(Ilex vomitoria)*, tallowtree *(Sapium sebiferum)*, black cherry *(Prunus serotina)* and others.

A substantial bobwhite quail population occupied the area at the time francolins were introduced and questions arose as to the compatibility of the two species. These questions concerned habitat competition as well as disease and parasite loads. Observations several years subsequent to the francolins' establishment showed no apparent decline in the native quail population.

Although this was apparent, the actual food preferences of each species in the same habitat was not known. Many bobwhite quail food habit studies have been conducted throughout the Southeast but little was known about the black francolins' requirements. Although a small number of crops were available for study, it was felt that they reflected the major winter food preferences of the two species. Francolin food habits in India was reported by Bump (1964) but this was in its native habitat. It was felt that additional knowledge of the food preferences of francolins and quail in the same habitat would assist technicians in selecting suitable areas for black francolin releases in the future.

The studies reported here compare francolin and bobwhite food habits and parasites on the Gum Cove area.

METHODS

Between January 31 and February 3, 1967, ten francolins and ten bobwhites were collected by shooting. Two trained pointing dogs were used to hunt both species and only one shooter was used. Quail were collected at random but no more than two were taken from the same covey. Black francolins, being solitary, were also collected at random. Each bird was placed in a plastic bag, packed in crushed ice, and transported to a field laboratory for necropsy.

During necropsy individual crop and gizzard contents were preserved in 10 percent formalin for later study. At the time of analysis ocular estimates were made to determine percentages of green, leafy material. A graduated cylinder was used to determine volume. Crop contents were air dried and weighed. Ten quail crops were used but only six francolin crops were suitable for study. Three of the francolin crops were empty and one was destroyed by gunshot.

Each bird was examined grossly for ectoparasites and the eye area was inspected for eye worms using a dissecting microscope. All birds were then examined for helminth parasites using techniques described by Kellogg and Prestwood (1968). A compound microscope (450X) was used to view intestinal smears for protozoan parasites.

RESULTS AND DISCUSSION

Crop Studies:

Substantial differences in food habits of the quail and fancolins were apparent (Figure 1, Tables 1 and 2). Ninety-one percent of the total volume in the quail's diet was plant material, while it constituted only 38 percent of the francolins' intake. Green leafy matter, including *Geranium, Oxalis,* and *Ranunculus,* was the most important plant material to both quail and francolins.

Seeds made up 36 percent of the quail crop contents but only 13 percent of the francolin crop contents. Black cherry and legume seeds were important in quail diets whereas legumes, mostly *Sesbania macrocarpa,* made up the bulk of the francolins' seed diet.

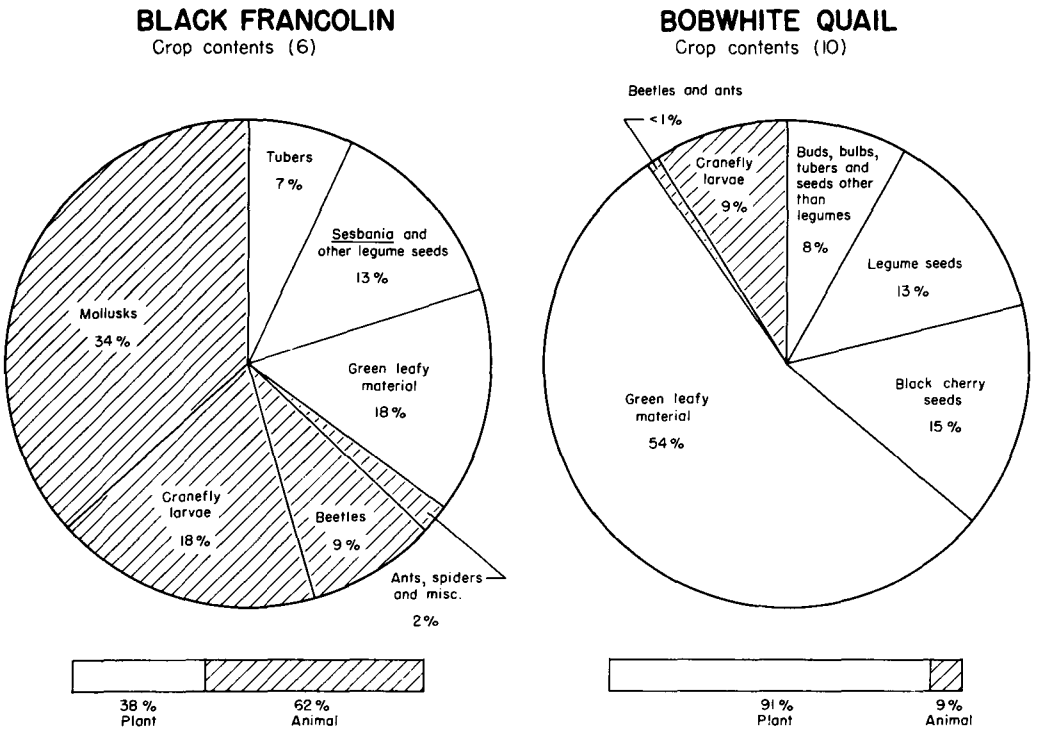
BLACK FRANCOLIN
Crop contents (6)
Tubers
7%
Sesbania and other legume seeds
13%
Green leafy material
18%
Beetles
9%
Ants, spiders and misc.
2%
Cranefly larvae
18%
Mollusks
34%
38% Plant
62% Animal
BOBWHITE QUAIL
Crop contents (10)
Beetles and ants
<1%
Cranefly larvae
9%
Buds, bulbs, tubers and seeds other than legumes
8%
Legume seeds
13%
Black cherry seeds
15%
Green leafy material
54%
91% Plant
9% Animal

Figure 1.

TABLE 1

CROP CONTENTS OF TEN BOBWHITE QUAIL FROM CAMERON PARISH, LOUISIANA.

TYPE FOOD	PER CENT OF OCCURRENCE	VOLUME cc	VOLUME %	WEIGHT gm.	WEIGHT %
ANIMAL					
Insecta					
Coleoptera					
Chrysomelidae					
Diabrotica decimpunctata	20	.1	.27	.02	.25
Tenebrionidae	10	T	T	T	T
Alleculidae	10	T	T	T	T
Diptera					
Tipulidae (larvae)	30	3.3	8.97	.54	6.62
Pupa of Deptera	10	T	T	T	T
Hymenoptera					
Formicidae	10	T	T	T	T
TOTAL ANIMAL MATERIAL		3.4	9.24	.56	6.87

TABLE 1 CONT'D

TYPE FOOD	PER CENT OF OCCURRENCE	VOLUME cc	VOLUME %	WEIGHT gm.	WEIGHT %
PLANT					
Lemguminosae					
Centrosema virginianum	70	1.5	4.08	.77	9.44
Galactia regularis	90	1.0	2.72	.47	5.76
Schrankia sp.	30	.9	2.45	.49	6.00
Sesbania macrocarpa	10	T	T	T	T
Chamaecrista fasciculate	80	1.3	3.53	.70	8.58
Desmanthus sp.	20	.1	.27	.02	.25
Rutaceae					
Xanthoxylum americanum	20	.6	1.63	.25	3.06
Rosaceae					
Prunus serotina	60	5.5	14.95	1.72	21.08
Euphorbiaceae					
Croton capitatus	70	.8	2.17	.33	4.04
Polygonaceae					
Polygonum sp.	30	T	T	.01	.12
Rubiaceae					
Diodia sp.	20	.5	1.36	.23	2.82
Geraniaceae					
Geranium sp.	60	.1	.27	.05	.61
Unclassified					
Tubers	10	.3	.82	.15	1.84
Bulbs and corms	40	.7	1.90	.22	2.70
Buds	10	.1	.27	.01	.12
Seed	10	T	T	T	T
Greens	100	20.0	54.35	2.16	26.47
80% *Geranium* sp. 15% *Oxalis* sp. 5% Others					
TOTAL PLANT MATERIAL		33.4	90.77	7.58	92.89
GRIT	30	T	T	.02	.25
TOTAL ALL FOOD MATERIAL		36.8	100.01	8.16	100.01

TABLE 2

CROP CONTENTS OF SIX BLACK FRANCOLINS FROM CAMERON PARISH, LOUISIANA.

TYPE FOOD	PER CENT OF OCCURRENCE	VOLUME cc	VOLUME %	WEIGHT gm.	WEIGHT %
ANIMAL					
Gastropoda					
Succinea salleana	66.7	6.6	22.60	2.27	19.79
Polygyra jacksoni	16.7	T	T	T	T
Deroceras laeve	33.3	3.2	10.96	1.50	13.08
Diptera					
Tipulidae (larvae)	66.7	5.3	18.15	1.39	12.12
Culicidae	16.7	T	T	T	T
Coleoptera					
Chrysomelidae					
Diabrotica decimpunctata	50.0	2.3	7.88	.53	4.62
Galerucella sp.	16.7	T	T	T	T
Phaedon sp.	16.7	.1	.34	.02	.17
Carabidae	16.7	.1	.34	.03	.26
Elateridae					
Drasterius scutellatus	16.7	T	T	T	T
Hymenoptera					
Formicidae	50.0	.5	1.71	.13	1.13
Solenopsis sp. *Crematogaster* sp. Unclassified ant					
Annelida					
Earthworm parts	16.7	T	T	T	T
Aranеida					
Two unclassified spiders	16.7	T	T	T	T
TOTAL ANIMAL MATERIAL		18.1	61.98	5.87	51.17

TABLE 2 CONT'D

TYPE FOOD	PER CENT OF OCCURRENCE	VOLUME cc	VOLUME %	WEIGHT gm.	WEIGHT %
PLANT					
Leguminosae					
Sesbania macrocarpa	33.3	2.8	9.59	1.91	16.65
Centrosema virginianum	33.3	.7	2.40	.36	3.14
Galactia regularis	33.3	.3	1.03	.12	1.05
Schrankia sp.	16.7	T	T	T	T
Vicia sp.	16.7	T	T	T	T
Euphorbiaceae					
Croton capitatus	33.3	T	T	T	T
Phytolaccaceae					
Phytolacca americana	16.7	T	T	T	T
Polygonaceae					
Polygonum sp.	16.7	T	T	T	T
Greens	83.3	5.4	18.49	2.23	19.44
60% *Geranium* sp. 30% *Oxalis* sp. 5% *Ranunculus* sp. 5% Others					
Unclassified tubers	33.3	1.9	6.51	.98	8.54
TOTAL PLANT MATERIAL		11.1	38.02	5.60	48.82
TOTAL ALL FOOD MATERIAL		29.2	100.00	11.47	99.99

Animal material, primarily cranefly larvae (Tipulidae), comprised 9 percent of the total volume of quail crop contents. These larvae occurred in 30 percent of the crops. Other animal material found in quail crops included beetles and one ant.

Animal material constituted 62 percent of the francolin crop contents. Snails, the most important single food item, were present in two-thirds of the francolin crops and made up 23 percent of the total volume. Slugs were found in one-third of the francolin crops and made up 11 percent of the total volume. Cranefly larvae, the same larvae that were important in quail diets, made up 18 percent of the francolin crop contents. These larvae occurred in two-thirds of the crops, with one crop containing a sixty-three. Other animal food items eaten by francolins included beetles and ants.

A trace of grit occurred in 30 percent of the quail crops but none was found in the crops of francolins. A substantial amount of grit was found in the gizzards of both quail and francolins. Quail gizzard grit was composed almost exclusively of iron compactions and was slightly smaller than the grit found in the gizzards of francolins. Francolin gizzard grit consisted of about 50 percent iron compactions and 50 percent mineral rock.

Parasitologic Studies:

Parasites of the bobwhites and the black francolins are given in Table 3 and Table 4. A nematode, *Trichostrongylus tenuis,* was the only parasite found in both francolins and bobwhites.

TABLE 3

PARASITES OF TEN BOBWHITE QUAIL COLLECTED FROM GUM COVE, CAMERON PARISH, LOUISIANA

Bird Number	1	2	3	4	5	6	7	8	9	10
Sex	M	F	M	M	M	F	M	M	F	F
Age*	J	J	J	J	A	J	A	A	J	A
Weight (Grams)	182	175	180	171	198	173	176	200	170	167
Organ & Parasite	No. Parasites/Bird									
Eyes										
Nematoda										
Oxyspirura matogrosensis	-	4	-	2	-	-	-	-	-	-
Proventriculus										
Nematoda										
Dispharynx nasuta	-	-	-	-	-	-	2	1	-	3
Gizzard										
Nematoda										
Seurocyrnea sp.	-	-	-	-	-	-	-	1	-	-
Ceca										
Nematoda										
Trichostrongylus tenuis	209	35	29	70	248	223	317	348	61	141
Skin & Feathers										
Mallophaga										
*Goniodes ortygis***	-	+	+	-	+	+	+	+	+	+
Acarina										
Amblyomma maculatum	-	+	+	-	+	+	+	-	+	+

*J=Juvenile, A=Adult
** +=positive, -=negative

TABLE 4

PARASITES OF TEN BLACK FRANCOLINS COLLECTED FROM CAMERON PARISH, LOUISIANA

Bird Number	1	2	3	4	5	6	7	8	9	10
Sex	M	F	F	M	M	M	M	M	M	F
Age*	A	J	J	A	J	J	A	A	A	A
Weight (Grams)	392	368	322	381	370	387	454	404	380	366
Organ & Parasite	No. Parasites/Bird									
Small Intestine										
Cestoda										
Cyclophyllidea spp.	3	-	-	2	-	-	-	-	-	-
Nematoda										
Capillaria spp.	1	-	-	-	-	-	-	-	1	-
Ceca										
Protozoa										
Eimeria sp.**	+	+	+	-	+	+	+	-	-	-
Trichomonas sp.	+	+	-	-	-	-	-	-	-	-
Nematoda										
Heterakis gallinarum	-	7	-	-	-	1	-	-	3	-
Subulura sp.	-	10	1	-	-	2	-	-	2	-
Trichostrongylus tenuis	13	19	-	-	1	4	-	22	17	3
Skin & Feathers										
Mallophaga										
Menacanthus pallidulus	Specimens were pooled. Nine of ten birds had lice.									
Goniocotes gallinae										

*J=Juvenile, A=Adult
** +=positive, -=negative

CONCLUSIONS

From the crop analyses it appeared that francolins utilized a much higher protein diet than quail. Seeds and green leafy materials made up the bulk of the quail's diet while a greater percentage of animal material was utilized by francolins. Although food preferences differed between species, some competition was believed to be present, but not enough to be detrimental to either quail or francolins. Parasite burdens were generally low and apparently insignificant to the well-being of either species at the time of study. All observations point to both species capable of thriving in essentially the same habitat in southwest Louisiana.

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WEIGHT AND AGE CHARACTERISTICS AS CRITERIA FOR HARVEST OF BOBWHITES IN NORTH CENTRAL TEXAS[1]

by

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ABSTRACT

Bobwhite age and weight data were collected from 5 study areas in North Central Texas to determine characteristics contributable to optimal harvest. A total of 24,324 bobwhites were aged and 12,735 were weighed and examined during December and January (hunting season), 1962-67. The peak in nesting as shown by molt patterns occurred prior to July 15 each year. The mean weight of all birds was 176.2 - a standard error of .5 grams. Weights increased through December and began to decline during the final 3 weeks of January. Average weights of January-killed birds did not decline below the average weight for the study period.

It is submitted that bobwhite weight and physical condition can be utilized as criteria for harvest and subsequent management of the species. The harvest beginning date should coincide with the average date on which 90 percent of juvenile birds reach the 150 gram acceptable size. This date during the period in North Texas was November 25. Bobwhite weight and physical condition were shown to remain well within acceptable limits during late winter indicating that these factors are not prime considerations for determining the season closing date.

INTRODUCTION

This study was instituted by the Texas Parks and Wildlife Department in November 1962 to determine characteristics of bobwhite quail *(Colinus virginianus)* populations contributable to better harvest. Bird weight and body condition during the open hunting season were prime considerations of the study.

Five areas representing the major habitat types in North Central Texas were selected for the study.

Quail weights during the study could not have been collected without the diligent assistance of game biologists and Game Management Officers headquartered throughout the study area.

Bobwhite sex and age characteristics have been studied in North, East, and South Texas and in other states. Bobwhite weight patterns have also been studied in these same areas of Texas, although weight characteristics have not received thorough treatment.

[1]This study is a contribution of Texas Pittman-Robertson Projects W-73-R and FW-14-C.