

SOME NEST-ASSOCIATED ACTIVITIES OF THE
RED-EYED VIREO

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Some Nest-associated Activities of the Red-eyed Vireo.

Introduction

The red-eyed vireo according to such authorities as Chapman, Roberts, Bergtold and others, builds pensile nests in trees and shrubs from 10 to 20 feet above the ground. It lays from 3 to 4 eggs which are white and sparsely speckled with black and umber more or less concentrated at the larger end. The size of the eggs averages .85 x .55 inches. The size of the eggs of the cowbird which lays in the vireos' nest is .86 x .65 inches. The incubation period of the vireo's egg is from 12 to 14 days; that of the cowbird's is from 10 to 11 days.

In the study, I selected two nests to observe more or less completely. One, the earlier of the two, contained two vireo eggs and two cowbird eggs, and the other contained three vireo eggs. In both cases the nests were completed and the eggs were being incubated at the time of discovered, so I had no record of the time the nests were built or of the time the eggs were laid. Neither did I see any mating activities.

Activities Centered about the Nest Discovered June 26th.

This nest was pensile, well made of strips of bark, bark fibers and spider cocoons. It was situated in the fork of a limb of a small maple tree 4 feet from the ground. The limb extended outward to the south from the small main trunk and the nest occupied a position 2 feet out on it. At the time of discovery the eggs had apparently been

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incubated only a day or so as the cowbird eggs hatched during the ninth day after the discovery.

To me the most striking thing about the activities centered about this nest was the apparent absence of the male. On no occasion did I see any other viro about the nest except the one who incubated the eggs and cared for the young. This one was identified by an ink spot made on her breast when she settled on the nest after a cord soaked in eternal ink had been placed on the inside of the rim. Males were heard singing in the locality, but as far as I could determine not one came close enough for me to link it with the nest.

During the incubation period the female left the nest only occasionally and for very short intervals of a few minutes usually. One of the measured intervals reached 25 minutes. She always maintained the same relative position on the nest facing the trunk of the tree, and always entered the nest by approaching from the direction which she faced while on the nest. Upon entering the nest, she would turn 180 degrees before settling down. On all occasions observed excepting one, the turning was clockwise. There was no change in position or turning when the blind was put in place 6 feet away.

The presence of two eggs of two different kinds permitted the study of the frequency of the turning of the eggs. It was found that the eggs were changed at least once a day and sometimes more often. On one occasion I saw the adult turning the eggs. She rose up off the eggs and, by standing in the nest, moved them with her beak.

The female was quite easily approached while incubating the eggs. On more than one occasion I got within $1\frac{1}{2}$ feet of her without

flushing her and the placing of the blind 6 feet away was almost completed before she was frightened from the nest. Toward the end of the period, however she became a little more nervous. The only call which I heard during the whole of the incubation period was the cat-like meow which some authors call the distress note.

On July 5th after having visited the nest quite late the evening before, I returned from an all day field trip to find both cowbird eggs hatched. One of the ^{Young} was killed and the other weighed and returned to the nest. This bird weighed 4.2 grams at that time. Two days later one vireo egg hatched and the other egg disappeared. On that day the cowbird young weighed 8.14 grams , and the young vireo weighed 1.48 grams. The next day the young vireo was found dead in the nest and the day following it was gone from the nest. I was unable to find any evidence of egg shells about the nest, the egg which disappeared, or of the dead young taken from the nest.

On the day the young cowbird hatched, I say the adult make 22 successive attempts to feed it a green insect larva, and after the 22nd unsuccessful attempt , eat it herself. She made other attempts to feed the young on that day but not until the next did I see the young take the offered food. On that day I noticed the adult massage the posterior portion of the young's body with her beak and thus get it to produce fecal sacs which she ate. Later on I saw her repeat the process many times, but after two days she carried the fecal material away.

The female covered the young for the most of the nights and for the first few days while not seeking food. She did not give any call while on the nest but upon returning with food would make one, two or

three distinct calls or repetitions of one or two of them. One of the calls was the cat-like meow, the other a short cheep or chirp and the third a che^h-buh. She would quite often alternate these calls with the feeding attempts as she stood on the edge of the nest or on the limb supporting the nest. The usual number of attempts at feeding the young with one larva was two although she was sometimes successful with one and quite often only with 4 or 5.

As the young became older the intervals between feeding became greater. The shortest measured interval was just under 2 minutes and the greatest, 46 minutes. The average was around 12 minutes at first, and extending to near 20 towards the last.

On July 13th, eight days after the cowbird hatched, I returned it to the nest after I weighed and measured it at 7:15 P.M. after flushing the female---she usually returned to the nest and sat in it during the time I was weighing the young bird---but had difficulty in getting it to stay in the nest again. I did get it to remain in the nest at that time but at 7:10 the next morning July 14th, nine days after hatching, it was gone. The adult female vireo was in the vicinity giving the distress note but I did not see her with food. By this time the young cowbird's eyes were completely open, the primaries of the wings fairly well developed, and the yellow of the gape partially gone.

Activities Centered about the Nest Discovered July 13th.

This nest was situated on a limb ^{6 1/2} feet south of the main trunk of an aspen tree along an old road bed one mile west of Camp. It

was a pensile structure hung $6\frac{1}{2}$ feet above the ground. During the incubation period the female did the work while the male usually was in evidence in the top of an oak tree about 75 feet west. He sang through out most of the day and his identity with the nest was first determined by the fact that he always stopped singing when I approached the nest in sight of him. However, if I entered the blind, which was set up on July 15th, from the woods he evidently could not see me and would continue to sing.

During the whole period of incubation I saw the female facing only north or toward the trunk of the tree while on the nest. Too, I saw her enter the the nest only from that direction, turn around 180 degrees and face north before settling down. On two occasions, one 3 days and the other 4 days before I discovered the young, she returned from one of her short absences with little strips of spider cocoon which she stuck on the outside of the nest.

She was observed to stand up off of the eggs at intervals on warmer days and then settle back over them. On two occasions I saw her turn the eggs by rising in the nest and using her beak. In the afternoon of July 21st which was more than a day before the eggs hatched she returned from an eight minute absence with a green insect larva in her beak and accompanied by the male. She held the larva over the nest for almost a minute peering down in and then ate it. The male who stood watching her left immediately when she ate ~~the~~ the food material, and one minute later was singing from his tree. On two occasions the male started singing after a period of quietness, the female gave a series of short chuckles or chicks after

one of which she left the nest.

On July 21st and 22nd the female was quite restless. She raised up off of the eggs several times and peered down into the nest. It led me to believe that whs was hearing the young in the eggs. On July 24th I returned from a two day field trip to find all three eggs hatched and three young in the nest. I do not know when the hatching occurred but from the first weights of the two birds selected for weighing and measuring as compared to the first weight of the vireo in the earlier nest, I think that they had hatched at the first of the two-day period. The largest bird, which was marked, weighed 5.85 grams while the smallest weighed 3.76 grams as compared to 1.48 grams---the first weight of the vireo of the other nest. The medium sized bird was not marked, weighed, or measured.

In caring for the young both parents brought food which consisted of insect larvae most of which were green. The male appeared with food as often as the female who could be told by her general dull color and ruffled condition. I never saw him cover the young. At one time the male arrived at the nest just back of the female, both having food. He waited for her to finish the feeding before offering his food to the young. At first the intervals between feedings were quite short but as the young grew larger there were intervals of one half hour or more when neither parent brought food.

At first as with the other nest the female covered the young quite a bit during the day. However from four days before the young left the nest up to that time, I did not see her on the nest. On the 26th of July it rained most of the day, and I was able to get several hours of observation. At that time the female, leaving the nest only once or twice to get food for the young, stayed on the

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nest with wings partially outspread most of the time. The male brought food and gave it to the female who in most cases raised up and fed the young. At other times she took the food from him and ate it herself. It might be stated here that in feeding the approach was from the direction of the attachment of the limb in all cases observed.

Neither parent showed much concern about the young except for one or two cat-calls when the young were taken out one at a time to the blind. In the evening of August 2nd it was observed that the largest ~~bird~~ ^{bird} was gone from the nest. A search in the locality failed to reveal it so the smallest one was removed, examined and measured. The feather tracts were somewhat obliterated by the growth of feathers in all places on its body except the abdomen. The olive color had appeared in its wing primaries and the coverts of the back *And wing Primaries had broken from their sheaths.* and the white color underneath was quite prominent. The middle sized bird left the nest and dropped to the ground during the measuring activities so it was returned along with the small one at the end of that activity. These two birds almost filled the nest.

On August 3rd at 5:45 A.M., I returned to the nest to find both gone and only the middle sized one in evidence. It was perched on a limb a short distance from the nest giving chirps at intervals. From time to time it moved by use of the feet and wings from limb to limb to a smaller tree farther away. The female came at 5:58 with food which was given to the young. Then she began looking around apparently searching for the missing birds. She repeated the cat calls again and again and soon the male appeared and joined in the search. After 12 minutes of this both left and at 12:40 on the same

day no evidence of any of the birds could be found except that a male was singing in a tree about 100 feet to the northwest.

Activities and Situations Observed More or Less Incidentally.

1. On July 14th and 15th a pair of red-eyed vireos were building a nest. Saw only female actually building. The male usually was singing in a tree to the north. I saw him carrying a strip of birch bark once. For some reason the nest was deserted before it was completed.

2. Three other nests were observed at times while the eggs were being incubated. In all cases, irregardless of the location of the nest limb to the rest of the tree the incubating birds faced the tree trunk.

3. Four nests, in which the birds were incubating only vireo eggs, were found on or after August 14th. On July 31st a nest with a young vireo was found. This young one left the nest on the 2nd of August.

4. On July 8th a nest was found containing a vireo young and a cowbird young. On July 10th only the young cowbird was present. On July 12th it left upon my approach.

5. Two deserted nests containing cowbirds eggs were found during the course of the summer. They may have been last year nest.

6. A male red-eyed vireo was heard giving a whistle similar to that of the great crested flycatcher and a song much like the robins July 5th.

Results of Measurements and Analyses

The average size of nine red-eyed vireo eggs, all of which were white with amber spots more or less concentrated at the larger end, was 21mm. x 15mm. The two cowbird eggs measured 24mm. x 17½mm.

Seven nests were measured with the following averages.

Outside diameter-----	2 5/8	inches
Inside "-----	2	"
Outside depth-----	2½	"
Inside "-----	1½	"

No nest was found higher than 10½ feet above the ground or lower than 4 feet. Two nests were not pensile but more or less supported on the sides. The bulk of three nests examined was made of coarse bark fibers and bark strips held together and attached to the limbs by finer fibers and spider cocoons. The lining material was fine bark fibers while the trimmings were pieces of birch bark and spider cocoons. The results of weighing and measuring the young birds are given in charts on pages 11 and 12.

Miscellaneous

Many questions were brought to my attention throughout the study and many angles developed which might lead to more extensive studies. Not many definite conclusions can be drawn from the study as it was not extensive enough. I do not know as yet what happenings were the usual things and what the exceptions; however, I feel that I am much more familiar with the species.

Summary

1. In some cases only the female red-eyed vireo cared for the young while in other cases both parents did the work.
2. Only the female was found to incubate the eggs.
3. The cowbird eggs hatched before the vireo eggs, and the cowbird young crowded out the young vireos.
4. Cowbirds did not lay in vireo's nest after a certain time in the summer.
5. The females sat on the nest facing the trunk of the supporting tree in all cases observed.
6. The young of the vireo and the cowbird were ready to leave the nest in from 9 to 10 days.
7. The observations were too limited to draw many conclusions, although many questions were brought to my attention.

GROWTH RATE DATA OF THE YOUNG OF THE NEST DISCOVERED JUNE 26, 1937
(Contained at the beginning 2 cowbird and 2 red-eyed vireo eggs)

Data on one of the cowbirds which hatched on July 5th.

	July 5th.	July 7th.	July 9th.	July 11th	July 13th	Units Grams	
Weight	4.20	8.14	19.36	27.52	32.24		
Length			72	89	103	mm.	
Length of tail			0	7	12	" "	The eyes of the cow- bird open partially on the 7th. day.
Wing spread			129	182	228	" "	
Length of Rt. Wing			61	84	103	" "	Wing primaries well developed at that time
Bill			10	10	12	" "	
Bill-eye			11.5	12	14	" "	Eyes completely open on the ninth day and the primaries and coverts much more dev- eloped. The young much more restless than at any other time.
Bill-gape			12.5	13	15	" "	
Eye			5	5.5	6	" "	
First toe			18	15	16	" "	
First toenail			5	6	6.5	" "	
Second toe			13.5	14	17	" "	Left the nest some time between 7:30 P.M. of the 9th. day and 7:15 A.M. of the 10th. day.
Second toenail			3	4.5	5	" "	
Third toenail			16	16	19	" "	
Third toenail			3	4	5	" "	
Fourth toe			12	14	16	" "	
Fourth toenail			3	4	4.5	" "	
Tarsus-toe			39	47	53	" "	

Data on the one red-eyed vireo young which hatched on July 7th.
This bird died on the 8th. of July (in the afternoon) so we have
data only for the one time. -----July 7th.

Weight	1.48 Grams.	Bill-eye	7 mm.
Length	24 mm.	Bill-gape	6 "
Length of tail	0 "	Eye	0 "
Wing spread	26 "	First toe	4.5 "
Right wing	9 "	First toenail	1.5 "
Bill	6 "	Second toe	4 "
		Second toenail	1.5 "
		Third toe	5 "
		Third toenail	1 "
		Fourth toe	4.5 "
		Fourth toenail	1 "
		Tarsus-toe	11.5 "

GROWTH RATE DATA ON TWO YOUNG VIREOS OF THE NEST DISCOVERED ON JULY 13th.
Nest contained three red-eyed vireo eggs at the beginning)

Data on two of the young which were hatched when I returned on July 24th.

Larger of two	July 24th	July 26th	July 28th	July 30th	Aug. 2nd.
Weight (g)	5.85	7.83	14.14	15.97	
Length (mm)	49	55	77	81	g. M
Tail	0	0	1	4	mm. I
Bill	5.5	6	7	8	S
Bill-eye	8	9	11	13	S
Bill-gape	9	11	12	14	I
Eye-diam.	3	3	4	5	N
Extent	53	71	115	148	G
Right wing	23	32	52	68	
Primary	0	1	10	27	A
Tarsus-toe	18	22	31	34	T
First toe	7	7	10	11	T
First toenail	2	2.5	4	5	H
Second toe	5	6	9	9	I
Second toenail	1	1	3	3	S
Third toe	6	9	11	11	
Third toenail	1	2	3	4	T
Fourth toe	5	7	8	9	I
Fourth toenail	1	1	2	3	M

July 24th.
Very little down.
Primaries showing under skin.
Eyes closed.
Feet possess grasping tendency.
Food taking reaction.

July 26th.
Eyes beginning to open - small slit.
Wing primaries about ready to emerge.
Chirping - probably concerned with food getting not fright.
Smallest could support weight with one foot.

July 28th.
Larger had eyes wide open smaller ones open some.
Primaries exposed as were tail feathers.
Both quite active.

July 30th.
Both had eyes completely open.
Coverts on top of head and back exposed.
Both quite active.
Could hardly get them into nest.

August 2nd.
Largest one missing
Small one had well developed cover. Olive color on back wings and top of head, White line over the eye and white on throat breast and abdomen. Could hardly find room for the two remaining ones.

Smaller of two	July 24th	July 26th	July 28th	July 30th	Aug. 2nd.
Weight	3.76	4.84	10.85	13.75	-----
Length	49	54	68	78	78
Tail	0	0	0	2	7
Bill	5.5	6	7	7	8
Bill-eye	8	9	11	13	14
Bill-gape	9	10	12	14	15
Eye-diam	3	3	4	4	5
Extent	53	58	90	134	165
Right wing	23	26	40	58	76
Primary	0	?	4	18	34
Tarsus-toe	18	20	25	30	35
First toe	5	6	8	10	12
First toenail	2	1	3	4	5
Second toe	4	5	7	8	9
Second toenail	1	1	2	3	3.5
Third toe	3	8	9	9	11
Third toenail	1	1	3	3.5	4.5
Fourth toe	4	6	7	7	9
Fourth toenail	1	1	2	2	3.5