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OBSERVATIONS
on
THE LIFE HISTORY
of
THE RUBY-THROATED HUMMINGBIRD

by

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INTRODUCTION

During the summer of 1943 while at the University of Michigan Biological Station in Cheboygan County, Michigan, I was afforded the opportunity of making some observations on the nesting habits of the Ruby-throated Hummingbird (Archilochus colubris). Observations were carried on for a two week period starting July 7 when a nest with two young was discovered and terminating on July 21, on which day the young left the nest. Although observations on a number of nests would have been more satisfactory, no attempt was made to find additional nests both because of the lateness of the season and the unlikelihood of finding any within the Station area.

The purpose of this study has been to gain further information on a necessarily limited phase of the life history of the Ruby-throated Hummingbird which would contribute in a small way to a better understanding of its habits and behavior.

Observations were made almost exclusively from a tower blind whose floor was located four feet from the nest. A limited amount of observation was done outside of the blind with a pair of eight power binoculars.

Nest

The nest was located in a small White Birch (Betula alba) about 22 feet from the ground and placed four feet out on a limb which was one-half inch in diameter. It was saddled

on a smooth portion of the branch with no apparent irregularity or projection to aid in stabilizing or keeping it upright. It was composed chiefly of plant down and spider webs being covered on the outside as well as on the rim with small bits of lichen. The lining of the nest appeared to be the same as the main body of the nest, the whole of which was soft and flexible.

The dimensions of the nest were as follows: outside diameter 3.5 cm.; inside diameter 2.2 cm.; depth 2.1 cm.; and height measuring from the bottom of supporting branch 3.8 cm. The nest when first seen was quite cup-shaped but as nesting progressed and the young birds grew larger it became flattened and lost some of its neat appearance. To aid in visualizing the small size of the nest it might be mentioned that the opening of the nest could be completely covered with the ball of the thumb.

It was noted that the rim of the nest was turned in suggesting a flanged or rolled appearance, and resulting in a smaller opening than the actual diameter further down in the nest. This might be considered as an adaptation for retaining the contents of the nest in the early stages. Later on this edge is rolled back and out as the nest stretches and the young require more room.

Habitat

The wooded flora of the area surrounding the Biological Station is a secondary growth which has come in since this

region was burned over almost 60 years ago. The drier parts are covered with a dense growth of large sapling-size poplars and birches, and the more swampy areas with spruces and cedars. The nesting site was made up of small birches, maples and poplars. The following trees were the most common in the vicinity adjacent to the nest:

Acer rubrum

Betula alba

Populus grandidentata

Quercus rubra

Populus tremuloides

Prunus pennsylvanica

The herbaceous flora in the same immediate vicinity was made up chiefly of the following:

Diervilla Lonicera

Clintonia borealis

Hieracium auranticum

Gaultheria procumbens

Apocynum androsaemifolium

Vaccinium pennsylvanicum

Pteris aquilina

Cornus canadensis

Trifolium pratense

Aralia nudicaulis

Trifolium hybridum

The nesting tree was located 12 feet from "D" Street and about equidistant from Upper Drive East and East State Street. The whole station area slanted toward Douglas Lake, the shore of which was 200 feet from the nest. Although the above streets had considerable traffic during the time the study was in progress, there was little activity or disturbance at the time the nesting site was being chosen. Therefore it can be considered a fairly typical site for a Hummingbird nest in this region. According to Bents, (1940) the

Ruby-throated Hummingbird shows a preference for building its nest above open lanes or above water. In this instance it was not found to be so although both conditions were available in the immediate area.

The food supply (speaking chiefly of nectar) could be considered as being scant in the area adjacent to the nest. The Bush Honeysuckle, Hawkweed and Clover made up the greater part of the plants flowering at the time the study was being made. It is doubtful if they furnished any of the food necessary for the maintenance of the young and the parents. Hummingbirds were never observed feeding in the vicinity of the Station.

Development of Young

On July 7, when the nest was found, the young were estimated (according to Forbush 2:1927) to be six or seven days old. Their eyes were just beginning to open and they were naked except for quite conspicuous down on the spinal tract. The response to the parent bird at feeding time was rather feeble and they generally did not open their mouths until the parent presented her bill. Their weights at this time were, Number 1, 2.13 grams and Number 2, 2.15 grams. When placed on the scales on their backs they were unable to right themselves but made ineffectual grabbing motions with their feet. Fecal material at all times was disposed of by forcible ejection over the side of the nest.

On July 10, when the young were ten days old, it was noticed that the bills were beginning to lengthen. Previous to this their bills were not noticeably longer than that of the young of other families such as *Compsothlypidae*. The first

flutterings of the wings was also seen at this time.

The young were weighed again on July 11 (11 days old) and at that time Number 1 weighed 3.5 grams and Number 2, 3.7 grams. The outermost primaries measured 0.5 cm. long. When placed on the scales they were able with some difficulty to right themselves. Their grasping powers were more developed for when they were taken from the nest, they tenaciously hung fast to the lining, tearing some of it out as they were removed.

At this stage the young were beginning to move around more in the nest. The nest which had been quite ample in size until this time was now well filled and it was necessary for the two young to sit side by side in order to fit in comfortably.

When thirteen days old, on July 13, the young were noted as being quite aware of their surroundings. Fear was well developed at this time as evidenced by a sort of cringing when the observer's hand was brought near the nest.

From this point on the development of the young proceeded rapidly. Primaries and rectrices were developing rapidly and the body feathers were beginning to come out. The increase in size necessitated keeping their heads up against the rim of the nest and their bills almost perpendicular.

On the fifteenth day (July 15) the first instance of attempts at preening were noted. It consisted of a few ineffectual jabs at the base of the tail by bird Number 2. Activities such as turning in the nest and moving the head about (the eyes were fully open at this time) were gradually increasing. A suggestion of the green-bronze color which is characteristic of the

adults was detected on the backs of the young. The progress toward an appearance resembling that of the adult birds from here on was rapid.

At the age of 17 days, weights were as follows: Number 1 3.6 grams and Number 2, 4.15 grams. The difference in weight is considerable for a bird of such small size. A possible explanation that might be offered would be a difference in feeding. It had been consistently noted up to this time that Number 2 always opened its mouth when the parent bird approached the nest but Number 1 generally waited until the bill was presented. Consequently Number 2 was always fed first, and therefore might have received a larger share of the food. They were both considered to be females because no dusky markings (Roberts 2:1936) were to be seen on their throats. If such was the case, the variation in weights could not be attributed differences in sex.

At this time much active preening went on together with frequent exercising of the wings. The wing beatings did not appear effective in lifting the young up from the nest. Primaries measured from 1.3 cm. to 1.5 cm., the rectrices 0.8 cm. and the bill 0.8 cm. The bill had now more of the appearance of the adults although much shorter than the average (1.4 cm.) of three specimens measured in the Biological Station collection.

The juvenal plumage was nearing completion and their appearance was quite adult-like. The green-bronze coloration

covered the entire upperparts but it was not as intense as in the adult.

A great increase in awareness was evident at this stage. Insects flying about the nest were watched closely as were other birds which might pass by. Noises in the blind such as the rustling of paper also caught their attention. A belligerent attitude toward a foreign object brought near the nest was revealed. When the observer's hand was brought near the nest, the larger of the two raised the feathers on its back but did not attempt to peck.

The last observations were made when the young were 19 days old on July 19. All activities of the young were greatly increased such as preening, beating the wings, standing up in the nest and so on. Both young were seen to pick at the nest and the branch immediately outside the nest. An increase in the frequency of feeding was also noted.

On the twenty-first day, when I came to weight them, my observations were cut short, for as I reached my hand out to the nest, the young without a moment's hesitation flew directly from the nest with a speed and directness fairly equal to that of the adult birds. Due to dense foliage and a limited view from the blind, I was unable to follow their movements. Attempts were made later to locate them in the vicinity but without success.

Attentiveness

Apart from feeding periods, observations on attentiveness were limited to the first day. During the time observed,

the female spent 86 minutes on the nest and 144 minutes off or approximately 58% of the time was spent on the nest. What would have been a normal tapering off of attentiveness was disrupted by the setting up of the blind for the bird was never seen to brood afterwards and the only time spent at the nest was during the actual feeding.

The male was never seen to help in feeding the young nor was he seen anywhere near the nest or within the Station area.

Feeding

The actual feeding was an interesting process. After making a few preliminary inspection flights around the blind, the parent would alight on the edge of the nest and sit quietly for fully a half a minute. When ready, she stretched her neck, pointing her bill down more or less parallel with her body, and inserted its full length into the throat of the waiting youngster. Then in unison there would take place a rapid up and down motion together with simultaneous rotation back and forth of the young one's hand about the long axis of the female's bill. After about five seconds of this the bird would draw her bill partially out and pause another five seconds or so before slowly withdrawing the bill entirely. At no time was the observer able to see any food passing from one to the other. It is probable that the food was passed after the violent pumping during the slow withdrawal of the bill and at the pause preceding the complete withdrawal. The bird was never observed

bringing any solid food to the young such as insects. They were apparently fed exclusively by regurgitation.

The order of feeding the greater part of the time was for each bird to be fed twice in succession, although several instances were seen when the two were fed alternately. The maximum number of feedings given to a bird at one visit to the nest was three. The total number of feedings by the female per visit to the nest ranged from one to five with four as a quite consistent number. The feeding procedure was watched a total of 22 times with an average interval between feedings of 51 minutes. The female had an interesting habit of extending and retracting her tongue several times after each feeding. During the last week of nest life, the young also developed this habit.

Interrelationship

The following birds were known to be nesting within 150 feet of the study nest: Kingbird (Tyrannus tyrannus), Robin (Turdus migratorius) and a Least Flycatcher (Empidonax minimus). Only one instance of friction between species was observed. While watching the nest from the blind a Least Flycatcher lit on the branch next to the nest and after a momentary pause reached over and pecked one of the young three times quite sharply about the head and then flew away. This might have been a chance happening near the nest and a more or less inquisitive pecking rather than a deliberate attempt to cause injury.

Because of its feeding habits, the Ruby-throated Hummingbird could not be considered to be in direct competition for feeding territory with any of the other birds common to the area.

Summary

1. One nest was observed over a period of 14 days.
2. The nest was located in secondary growth of deciduous trees.
3. Food supply was scant in the immediate area.
4. The male bird did not help with the care of the young, nor was he seen in the area.
5. Brooding time was reduced from 58% of the time to no percent when the blind was set up.
6. The young were fed regurgitated food exclusively with an average interval between feedings of 51 minutes.
7. Total days of nestling life were 21.
8. No friction existed between the Hummingbird and other species nesting in the same territory.
9. Nestlings were attacked once by a Least Flycatcher.

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