

## LIFE HISTORY OF THE WHITE-CRESTED COQUETTE HUMMINGBIRD

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AT the end of October 1936, the *Inga* trees that shaded the small coffee groves in the narrow valley of the Río Buena Vista in southern Costa Rica flowered profusely. The fluffy stamen-clusters of the spreading leguminous trees attracted many hummingbirds of several kinds, among which I glimpsed a crested species new to me. Hoping for a better view of this exciting stranger, I watched in the grove on a sunny morning when the hummingbirds were very active; but to my great exasperation, every time the plumed bird came in sight one of the larger kinds drove him away. Finally, I discovered that after each round of visits to the *Inga* flowers he returned to rest and preen on the same exposed twig of a coffee bush, only five feet above the ground. Here on his favorite perch he permitted me to examine him within arm's length at my leisure. Never before had I met a hummingbird at once so ornate, so small, and so confiding.

I had no difficulty in identifying him as a White-crested Coquette (*Paphosia adorabilis*). In the same coffee grove were a number of females of the same species, and a young male just beginning to acquire the adult plumage.

The White-crested Coquette has a restricted range from central Costa Rica to western Panamá. It appears to be confined to the Pacific slope except in central Costa Rica, where the low continental divide permits it to cross to the Caribbean slope, on which it has been found around 3,000 feet above sea level. Its altitudinal range is from about 1,000 to 4,000 feet. If it enters the forest, it evidently remains high in the treetops where it is rarely noticed. I have seen few of these readily identified hummingbirds except where there is a profuse display of flowers attractive to them. Among these are the *Inga* trees planted as shade for the coffee, as already mentioned. Near the plantation where I met my first adult male was another small grove where, in early November, I found a number of others, some of whom were scarcely less confiding. During the years when I had a hedge of *Stachytarpheta* along two sides of my dooryard, many Coquettes came, along with a multitude of other hummingbirds, to sip nectar from the small purple flowers of this straggling shrub of the verbena family.

At this hedge I recorded males in full breeding plumage chiefly from August to March. Males in various stages intermediate between the juvenal plumage, which resembles that of the female, and the ornate nuptial attire were seen from late May to the beginning of October. I hesitate to conclude from these observations that the males lose their head plumes and go into "eclipse" after the breeding season. Since, as in many other hummingbirds,



WHITE-CRESTED COQUETTE (*Paphosia adorabilis*)

Males and female (lower), life-size, from a watercolor painting by Don R. Eckelberry.

the Coquettes appear to wander widely in search of plants that blossom profusely, it may be that the adult males went elsewhere from mid-March to late August, in which five-month interval I recorded only one at my house, in June; although females and males in transitional plumage were present in this period, and females visited the *Stachytarpheta* throughout the year.

#### COURTSHIP

Toward the end of October, I watched a male Coquette in full regalia display to a female who rested on a low, slender twig close by the flowering hedge. Hovering in front of her, he oscillated rapidly from side to side, in a most peculiar lateral flight such as only hummingbirds, of all feathered creatures, appear to be capable of performing. Always keeping his breast toward the quiescent female, he swung now toward his left wing and now toward his right, alternating his direction with surprising swiftness. The length of his sideward swing between the opposite turning points seemed not to exceed one foot. The female always kept her bill pointed directly toward the displaying male. Soon she rose slowly above her perch, hovering on wing as only a hummingbird can; and he continued to float in front of her, now oscillating more slowly than before. A few seconds later they separated.

At the end of April, when the only Coquettes at the hedge were in female attire without head plumes, one of these unornamented individuals perched on a *Stachytarpheta* bush, while another, equally plain, hovered in the air, facing it, a few inches away. After this had continued for less than a minute, the first hummingbird left its perch and slowly rose into the air; and the one that had been hovering ascended with it, still facing it, and now began to oscillate rapidly from side to side, in a movement with an amplitude of only a few inches. After a few seconds, the display ended and the birds flew off in different directions. This performance resembled that of the adult male that I had earlier watched, but the lateral oscillation was shorter and less regular. I wondered whether the performer was an adult male in eclipse plumage or an immature individual.

Although hummingbirds of many kinds sing persistently and more or less melodiously from stations where they are to be found day after day in the breeding season, I have not discovered the White-crested Coquette behaving in this way.

#### NEST AND EGGS

On our farm at Quizarrá, in the basin of El General at about 2,500 feet above sea level, I have seen four nests of the White-crested Coquette. Two of these nests held eggs at the beginning of January and had evidently been built in the preceding month. In another nest the eggs hatched about 5 February and the young flew at the end of the month. The latest nest held eggs at the

end of February, and in early March they were deserted. These few records indicate that this hummingbird, like a number of other species, breeds early in the dry season, when flowers are abundant. The latest nest was apparently abandoned because of the increasing dryness and paucity of blossoms.

The highest of these four nests was situated about 60 feet up in a dead tree at the forest's edge. A dying orchid plant hung below a mossy branch of this tree, and to the upper side of a slender stem of the orchid the nest was attached. The other three nests were in guava trees (*Psidium guajava*) growing near our house, at heights of about 16 to 21 feet above the ground. They were built upon slender twigs far out from the trunk, where they were only slightly shaded and screened by the terminal foliage and would have been conspicuous if they had not been so small. One nest was placed in an open V-shaped crotch. Another was supported at its base by a thin lateral twig, but its upper portion was quite unattached. Each nest was a tiny open chalice of downy materials, well covered on the outside with gray or greenish gray foliaceous lichens.

The contents of the three low nests could be seen in a mirror raised on a long pole. Each of them contained two minute white eggs when they were found.

#### INCUBATION

Nest 2 was situated close by the house, where it could be conveniently watched from a window. On 30 January 1947, when the incubation period was drawing to an end, I watched from 5:35 to 11:35 AM, and on the following day my vigil extended from 11:52 AM until 5:30 PM, when the light was growing dim. The morning of 30 January was sunny and cool, and the afternoon of 31 January was lightly clouded, with intermittent sunshine. Only the female attended the nest, and I saw no male of the species in the vicinity. In nearly 12 hours of watching, I timed 38 sessions on the eggs, ranging from about 1 to 34 minutes and averaging 10.4 minutes. There were 39 recesses ranging from less than 1 to 23 minutes and averaging 7.1 minutes. The female Coquette spent 59.4 per cent of the day on her nest.

In the morning the hummingbird was more active than in the afternoon, and both her sessions and recesses averaged shorter. Her 23 sessions in the forenoon averaged 9.5 minutes, whereas her 15 sessions in the afternoon averaged 11.9 minutes. Her 23 recesses before noon averaged 6 minutes and her 16 recesses after noon averaged 8.7 minutes. Although she came and went more often in the morning than in the afternoon, the range of her sessions and absences was nearly the same in both parts of the day. In both the forenoon and the afternoon she took one session that lasted 34 minutes. Her longest absence in the morning was 23 minutes and her longest in the afternoon was 22 minutes. In both parts of the day, her shortest sessions, like her shortest recesses, were one or two minutes.

As she approached and left the nest, the hummingbird's flight was slow and irregular, with short advances separated by momentary pauses, when she hovered on wings vibrating too rapidly to be visible, and much jerky up-and-down movement caused by raising and lowering her tail. Like other incubating hummingbirds, she often brought material to add to her nest. Between 6:30 and 7:45 AM, she brought nine small pieces of lichen or similar material, which she stuck to the outside of the cup, although it was already so well covered that there seemed not to be space for another piece. After 7:45, I could detect nothing in her bill as she returned, but the way she wiped her bill over the outside of the nest after settling in it suggested that she had brought cobweb and was spreading it over the outer surface. She continued this until 1:25 in the afternoon.

A Snowy-breasted Hummingbird (*Amazilia edward*) often came to rest in the nest tree, which appeared to be his preferred station. Whenever he ventured close to the nest, the much smaller Coquette chased him away without much difficulty. Apparently maternal solicitude gave her the force to drive off this larger and rather aggressive hummingbird. In the coffee grove where I found my first male White-crested Coquette, the Snowy-breasted Hummingbirds were numerous and often chased the Coquettes from the white flowers of the *Inga* trees. Once a Snowy-breasted darted up and struck a perching Coquette with his breast, but the latter did not even shift his position on the twig.

On 7 January 1955, my wife and I, watching by turns, made a continuous record of activities at Nest 4 from 5:25 AM until 5:40 PM. The morning was brilliantly clear; but after noon clouds began to gather and soon the sky was almost wholly overcast, although no rain fell during the day. The female hummingbird alone attended her two eggs, taking 37 sessions which ranged from less than 1 to 78 minutes and averaged 13.4 minutes. Her 38 recesses varied in length from less than 1 to 22 minutes and averaged 5.7 minutes. She incubated with the high constancy of 70.2 per cent. Her attentiveness, however, fluctuated considerably with the time of day and was especially low between 8:00 and 10:00 AM, when she devoted much time to the nest itself, sometimes sitting for a minute or even less, flying off to search for material, then returning in a minute or so to add it to her structure. Her 30 sessions before noon averaged only 8 minutes in length and her 31 recesses averaged 4.7 minutes. In striking contrast to this, her seven sessions after noon averaged 36.1 minutes and her seven recesses averaged 10 minutes.

In the hour and a half between 8:30 and 10:00 AM, this hummingbird seemed to bring something to her nest at least 11 times. Although once she came with a tuft of seed down almost as big as herself, most of the material was in small pieces, and usually it was invisible to us. But frequently when

we could detect nothing in her bill, after settling in the nest she bent over and rubbed her bill carefully over the outer surface, evidently applying cobweb. As she did this, she spread her wings over the nest's rim. At other times she seemed to knead the material in the bottom of the cup with her feet. She was last seen to add cobweb at 12:50 PM, after which she gave no more attention to the nest itself and attended her eggs far more steadily.

Nest 3 was found in 1949 by Mr. Darwin E. Norby, who with Barbara Norby made a day-long record of incubation, which they have kindly summarized for me. In 12 hours they timed 49 sessions that ranged from about a quarter of a minute to 18 minutes and averaged 6 minutes. There were 51 absences that varied from three-quarters of a minute to 22 minutes and averaged 8 minutes. The eggs were covered only 42.9 per cent of the day. This abnormally low constancy suggested that the female was now, at the end of the dry month of February, having difficulty in finding enough food. A few days later the eggs were abandoned, as already told.

#### THE NESTLINGS

In the nest in the guava tree close beside the house, the eggs hatched on 5 February or in the following night. From 5:40 to 10:40 AM on 8 February, I watched the female hummingbird attend her two nestlings, to which she brought food 12 times in the course of five hours. Each feeding occupied from 22 to 54 seconds; but since I could see nothing of the young birds except occasionally the tip of a bill, I could learn no further details. The mother brooded for 18 periods ranging from 2 to 19 minutes and averaging 7.1 minutes. Her 17 absences lasted from 3 to 18 minutes and averaged 9.4 minutes. She was at the nest for 43.2 per cent of the five hours, including the time devoted both to feeding and brooding.

On 15 February, when the two nestlings were about ten days old, I again watched from 5:40 to 10:40 AM. Although the morning was cloudy and cool, the hummingbird did not brood after her first morning departure from the nest at 5:42 AM. She brought food to the nestlings nine times in the five hours, and on each of these visits she appeared to regurgitate several times to both of them, alternately. However, from the window I could see little of them until late in the morning, when they often raised their heads well above the nest's rim at mealtime.

By 25 February, the two nestlings, now about 20 days old, were well feathered, and I could see much of their bodies protruding above their nest's rim while I watched from the window from 5:35 to 10:35 AM. On this bright, cool morning the female did not brood. During the five hours she made 12 visits for feeding, on each of which she regurgitated to both nestlings. On some visits she fed both of them twice, alternately; but on others only one

of them was fed twice; and on yet other visits each received a single portion. When the mother regurgitated to a nestling only once, it appeared not to desire more. The young hummingbirds preened much, and from time to time they stood up in the nest and flapped their wings vigorously, an exercise which they often took just after receiving nourishment, first one and then the other.

One of these young White-crested Coquettes left the nest between dawn and 7:45 AM on 27 February, and the other took wing in my presence at 8:25 on the same morning. It appeared to sever contact with the nest quite spontaneously, and soon after leaving it was fed by its mother on a neighboring bough of the guava tree. These young hummingbirds were in the nest 21 or 22 days.

At no time was a male seen to take an interest in any of these four nests. On the morning when I found Nest 4, a male Coquette flew by it without stopping to investigate; but aside from this, none was seen in the vicinity.

#### SUMMARY

The White-crested Coquette is found in clearings on the Pacific slope of southern Costa Rica from about 1,000 to 4,000 feet above sea level. It is not often seen except where a profusion of flowers, such as those of *Inga* or *Stachytarpheta*, attracts a number of individuals to a plantation or dooryard. It is almost fearless of man.

Males in transitional plumage were seen from late May to October. Males in full nuptial regalia were rarely seen between March and August.

A flying male displayed before a perching female by oscillating rapidly sideward through an arc of about one foot, the while keeping his head toward her.

At about 2,500 feet above sea level in southern Costa Rica, nesting occurs in the early part of the dry season, from December through February. Three nests were built in guava trees in clearings, from 16 to 21 feet above the ground, and another was in an orchid plant hanging about 60 feet up at the forest's edge. The minute downy cup is well encrusted with grayish lichens on the outer surface.

In three instances, the set consisted of two white eggs. At these three nests, the females took attentive sessions which ranged from less than 1 to 78 minutes in length, although those in excess of half an hour were rare. Recesses lasted from less than 1 to 23 minutes. In 12 hours of observation at each nest, these three females incubated with a constancy of 59.4, 70.2, and 42.9 per cent; but the last was apparently losing interest, for a few days later her eggs were abandoned. In the morning, the incubating females brought much new material to their nests.

In the first five hours of the morning, one female brought food to her two nestlings 12 times when they were about three days old, 9 times when they were about ten days old, and 12 times when they were about twenty days old. Often she regurgitated to both nestlings twice, alternately, on a single visit. At one nest, the nestling period was 21 or 22 days.

No male was at any time seen to take an interest in nests or young.

EL QUIZARRÁ, SAN ISIDRO DEL GENERAL, COSTA RICA, 22 MARCH 1960