

THE ARIZONA BROAD-BILLED HUMMINGBIRD¹

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WHEN *Cyananthus latirostris propinquus* was described (Proc. Biol. Soc. Washington, 52: 57-60, April 27, 1939), I expressed the belief that the birds from southwestern United States are approximately the same size as the birds of northwestern Mexico and of the same coloration. Since that time, thanks to the courtesy of George Willett and the Los Angeles Museum, a much larger series has been examined and confirms this belief. With the specimens which I collected in Arizona several years ago, I have compared twenty adults, comprising thirteen males and seven females, as well as several juveniles, all of them taken in southern Arizona and extreme northern Sonora, Mexico. Two males and four females from Saric were collected only eighteen miles from the United States border, not far from Nogales, Arizona, and are identical with birds of Ft. Lowell of the Tucson region. As a matter of fact, the Arizona birds resemble almost precisely a series of eighteen males and thirteen females in the Moore and Dickey Collections, taken from representative points all over Sonora, and also with seventeen males and twenty-one females in the Moore Collection from Sinaloa. There is not the least difference in coloration, and only a very slight tendency toward larger size in the birds of northern Sonora and Arizona. As will be seen by reference to the table of measurements, even this slight increase leaves the Arizona bird closer to *Cyananthus latirostris magicus* (Mulsant and Verreaux) of Sinaloa. Like *magicus*, it has definitely whiter under tail-coverts and darker green posterior under parts, as compared with the gray abdomens, only partially suffused with lighter green of typical *Cyananthus latirostris* of the Valley of Mexico. Furthermore, the Arizona bird is separated from true *latirostris* by the range of *propinquus*, a blue-bellied bird darker than either, which occupies the high plateau of Guanajuato.

In regard to nomenclature (*loc. cit.*) only the name *Hylocharis magica* needs to be considered. The Arizona bird should, therefore, be known as *Cyananthus latirostris magicus* (Mulsant and Verreaux). Its range extends from Arizona south on both sides of the Sierra Madre of northwestern Mexico, on the western side through the States of Sonora, Sinaloa, and Nayarit, probably to Colima and Guerrero; on the eastern side through Chihuahua to Durango. From all these States, with the exception of Colima and Guerrero, the Moore Collection has specimens which are identical with a typical series from near the type locality at Mazatlan, Sinaloa. It is worth noting that in spite of our exceedingly large series from Sinaloa, not one specimen

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has actually come from the type locality, and it is possible it may not frequent the gardens of Mazatlan, which is built out on a point extending into the Gulf of Lower California. In fact, it does not seem to be common on the coast of Sinaloa, for our nearest coastal station where it has been taken, is El Molino, one hundred and fifty miles to the north of Mazatlan. However, we have secured it at Rosario, thirty-seven miles southeast of Mazatlan and only ten miles from the coast. It is quite probable that the type came from the foothills a few miles east of this city. The majority of our specimens have been obtained at altitudes from 500 to 10,000 feet.

AVERAGE MEASUREMENTS OF *Cyananthus latirostris magicus* AND *C. l. latirostris*

			<i>Exposed</i>
<i>Males</i>	<i>Wing</i> ¹	<i>Tail</i>	<i>Culmen</i>
8 adults <i>latirostris</i> , Valley of Mexico.....	54.8	33.0	21.1
28 adults <i>magicus</i> , Sinaloa and S. Sonora.....	49.6	29.8	19.6
13 adults <i>magicus</i> , Arizona and extreme northern Sonora	51.0	30.8	20.0
<i>Females</i>			
2 adults <i>latirostris</i> , Valley of Mexico.....	53.2	31.1	21.3
19 adults <i>magicus</i> , Sinaloa and S. Sonora.....	47.9	27.5	20.1
7 adults <i>magicus</i> , Arizona and northern Sonora.....	49.9	28.4	21.6

My first acquaintance with the Broad-billed Hummingbird was made at the base of the great butte at Peña Blanca Spring, southern Arizona. A large group of *ocatillos* fringed the eastern ledges below the cliff, their red pennants proving an irresistible attraction. The birds did not seem to be interested in any other flowers and, although this species probably frequents other conspicuous colors, a six-years' observation of their habits indicates that red, or red-and-yellow flowers have been the ones that lured them. Mr. W. W. Brown writes me that in eastern Mexico, *Cyananthus latirostris latirostris* was particularly fond of a blue flower. A better knowledge of the habits of this hummingbird has been acquired in the States of Sonora, Sinaloa and Chihuahua of northwestern Mexico since 1932.

The finding of my first nest at the Guirocoba Ranch, Sonora, was a welcome goad to a brain completely fagged by the terrific heat. The tropical sun was desiccating a tiny arroyo with relentless power. The unearthly stillness and the buzzing in my ears gave queer thoughts of an earthquake or miracle to come. It came! But it did not come in the form of earthquake or wind. Instead, a glittering spirit seemingly from another world darted into our dry wash, and with its tiny bit of iridescent blue-and-green fire brought a spiritual quickening to a dulled mind, overpowered by torrid heat. Later a female propelled its tiny atom of a body straight to a nest on

¹ Wing measured from anterior point of metacarpus.

the branch of a small tree, overhanging the bank of the arroyo and not five feet from the ground. It was an unusual demonstration of courage and confidence in human beings, for the nest on May 2, 1934, contained no eggs, being only half finished. I have known many Ruby-throated Hummingbirds to desert an unfinished home, if one climbed the nest-tree, and never in my experience with some dozen of them has a single male or female protected an egg-less nest, as this tiny parent did repeatedly during the next few days. It is true that her little majesty was never really rude about it, for when I set up my camera without camouflage, this bit of animated lightning betrayed no resentment, flew straight to the nest, twirled about on it two or three times and showed no irritation because of the huge eye of the graflex! Curiously enough, the only time she really attacked was when I photographed her with moving-picture camera twenty yards from the nest, as she fed from the scarlet flowers of the *tavachin*. A formal visit to her home seemed perfectly proper, but an intrusion at the dinner hour was the epitome of rudeness. Even then, the attack was only half-hearted and chronic good nature took possession immediately, as she whirled from one brilliant flower to another.

A small shrub, the *tavachin*, flaunts an extraordinary flower, resembling the royal poinciana, and fairly startles one with its scarlet glory. Belonging to the genus *Caesalpinia* or *Poinciana*, it provided the favorite rendezvous for *Cynanthus*, as well as many species of butterflies. The tiny homesteader made many excursions to obtain insects from this plant, whose vivid red-and-yellow flowers flamed in the sunlit spaces across the sandy arroyo. She apportioned part of her time to the yellow flowers of a huge *opuntia*, which hung out perilously over her side of the arroyo. During the hottest period of the day, she drowsed on a branch of the nesting tree, within ten feet of the nest, not usually making food-rounds until 3.30 in the afternoon. After each round she would spend several minutes resting in the nest-tree. I timed the average of inception at the beginning of each circuit, which was approximately fifteen minutes, and each time she visited every flower over again. A few less conspicuous blooms of other species were also probed.

A male Broad-bill was observed feeding from the *tavachin* and, although he several times flew within ten feet of the nest-tree, he never landed on it, nor did the female appear to object to his feeding twenty feet away across the sandy wash. The Broad-bill is a common bird of the region and the male might not have been the 'mate'. Although the males of United States hummingbirds do not make a practice of assisting about the nest, southern species often do. In Ecuador I have observed the male and female Violet-ear take turns incubating at the same nest and collected both sexes to substantiate this observation. I doubt if the Broad-bill male assists in incubation. Such evidences of anger as the female exhibited, were directed

not so much at me as at the large blue swallowtail, which insisted on appropriating the sweets from her flower garden. Several times she, as well as the male, chased it away, but did not attempt to pursue the smaller butterflies. The flight of this bird from flower to flower is so characteristic that it can be recognized at some distance. Instead of darting straight to its object, as many hummingbirds do, *Cynanthus* progresses with a somewhat jerky, irregular flight. At least its short flight has an exceedingly nervous kind of movement, the tail bobbing up and down, lacking the precision of the Rivoli's undeviating course.

When it came to the more arduous operation of nest-building, involving the carrying of material and weaving instead of resting, she preferred the cooler hours of the day from 3.30 p.m. until dark, and did a prodigious amount of work. A red-letter day of accomplishment was May 2! At 5.30 p.m., the nest had attained one-half its final height, but at 9 o'clock the next morning, the complete altitude of the walls had been erected. As the nest, now before me, is approximately one inch high on the outside, the above statement means that the bird built a half-inch of wall material during the late afternoon and early morning hours! In addition, she added the lining and attached a considerable number of white cobweb strands, completely swathing the bottom of the nest with them and supporting and connecting its outer rim to the leaves and tiny branchlets in the vicinity. However, free access to the nest was not obstructed.

The most interesting nest-building technique was displayed a number of times when I was within a few feet of the nest. The bird moulded the bottom of it with quivering, caressing motions of the body. Often in the process, the wings revolved at almost full velocity, certainly until they were blurred to sight, and yet the body of the bird appeared to be sitting in the nest throughout the action. I saw this maneuver performed a number of times; sometimes it gave the impression of a swaying motion from one side to the other, without the body leaving the nest or the wings ceasing to revolve. When the wings did not revolve, the bill moved rapidly along the outside of the abode, tucking in protruding ends of grasses. The bulk of the nest is composed of exceedingly fine material, mostly tiny shreds of buff-colored or brownish bark, grasses and bits of dried leaves. The only larger pieces are three strips of bark placed upright, parallel with the tiny twig on which the nest is placed. I imagine these come from the *sabina*, a species of cypress, which grows to a great height along a small stream not far away. Part of the inside of the nest is lined with a white material, either some kind of minute plant down or cotton of fine texture. All these materials could be obtained from the fields nearby, which are cultivated by the Indians of the Guirocoba plantation.

Three other nests have been secured by our expeditions in Sinaloa, two

of them in March at Culiacan, and one on January 16, 1936, at San Lorenzo, Sinaloa. Examination of the sex organs of our numerous specimens proves that the birds are apt to breed at any time from January to August. As these last three nests contain two eggs each, it can be presumed that they are finished creations, although some hummingbirds attach ornamental bits of lichen to the exterior even during the period of incubation. Not the slightest indication of this appears in any of these four nests. The January nest was taken at San Lorenzo by Chester C. Lamb, and differs somewhat from the three others. Like the March 1 nest, it was attached to the stalk of a vine. Placed four feet up where the vine climbed over an *espino* tree, the body of the nest is composed almost entirely of cotton, but lined with a glossy white plant down. The base is supported by a dried pod of the vine itself. On the outside are attached pieces of dried leaves and, according to Mr. Lamb, some "short fibers of the Palo Blanco pods." The entire exterior is bound together with spiderwebs. The March 1 and March 7 nests from Culiacan display a lining of white plant down, covered on the periphery with bits of bark and leaves, but the bodies of the nests seem to be made of grasses and exceedingly fine thread-like stalks of dried plants. The March 1 nest was placed in a "dry bush, covered with dry vines," and the March 7 in an *espinosa* tree. In spite of these minor differences, these abodes are so similar that I think I could recognize one at random among a large number of other hummingbird nests. They all have some grass stalks in the body, are lined with white plant down, are adorned with bits of leaves and bark on the outside and not one of them has a single lichen on any part of the nest. In addition, they are all very small with an inside diameter of only about three-quarters of an inch, and all were placed within five feet of the ground. They differ markedly from our nests of other hummingbirds of Sinaloa, such as the White-ear, Azure-crown, and the Violaceous, all of which have lichen adornments.

The eggs are white, two in number, and at least in the case of the San Lorenzo nest, were laid two days apart. They measure as follows: San Lorenzo, January 16, 1936, 12.2 x 8.3 and 12.5 x 8.4; Culiacan, March 1, 1936, 12.1 x 7.9 and 12.8 x 8.1; Culiacan, March 7, 1936, 11.5 x 7.5 and 11.9 x 7.8 mm.

Our four nests have been found at altitudes from forty-five feet at Culiacan, Sinaloa, to 1450 feet at Guirocoba, Sonora. Specimens have been collected at the highest elevations, Palos Verdes Mines, 4900 feet, and taken by myself on the Urique River, Chihuahua, 5000 feet, and even on Mt. Mohinora at nearly 10,000 feet, but no nests have been secured at these altitudes. Although I observed both sexes repeatedly during May on Mohinora, feeding within a few feet of me among the flowers in mammoth beds of paint-brush, they showed no indications of breeding. In Arizona

the nest has been recorded as being found at a high elevation in the Santa Catalina Mountains by Harry S. Swarth (Condor, 12: 109).

The Moore Collection contains no young actually taken from a nest, but a young male, obviously not long out of the nest, was secured at the Guirocoba Ranch in extreme southeastern Sonora on March 26, 1931. The bill is only half the length of the adult's, the tail the same and the wings two-thirds. The postnatal molt is about four-fifths complete, e.g., on wings, tail, entire upper parts, under tail-coverts and portions of the neck. Possessing very loose margins, the remiges are recurved. Two nearly parallel feather tracts on the throat are sharply defined, because the new feathers are still in their sheaths, and areas on throat and breast are bare. As to coloration, it is significant that the tail plainly shows the male characteristics, being almost identically like the fully adult male tail in miniature, revealing no white tips to the lateral rectrices as in the female and having the median pair blue, tipped with gray, instead of entirely bronzy green. The longest upper tail-coverts show full development and might easily be mistaken for the median pair of rectrices. Therefore, it is clear that the sexes can be differentiated in this species, even in the juvenal plumage, when a few weeks old. 'Cinnamon buff' covers a large part of crown and occiput and reveals much wider margins on the back, than in the May, June and September worn juvenal plumage. The lesser and middle wing-coverts show iridescent green, instead of bronzy. On the under tail-coverts, although the plumage is looser than in the first-winter plumage, the general appearance is immaculate white, as in practically all adult *magicus*, contrasting sharply with *Cynanthus latirostris latirostris*. So many spots on the under parts are not feathered that, except for the under tail-coverts, they are blotched with black and light buff. The most interesting peculiarity consists in a prominent white post-ocular streak. This is represented by a narrower streak, half the length, in the adult female and juvenile male in first-winter plumage, and is reduced to a dot or is obsolete in the adult male. This streak consists of non-pennaceous feathers, very loose in texture, as in the juvenile male, and contrasts with the typical feathers of the adult female.

Five representatives of juvenile males in their first-winter plumage, form part of the Moore Collection. They resemble the female in coloration, except that the feathers of the upper parts are margined by buffy, much more narrowly than in the juvenal plumage, and the rectrices are exactly like those of the adult males. A female from Los Leones, Sinaloa, March 22, 1934, which has acquired the complete juvenal plumage, has feathers of upper parts margined just as broadly with 'cinnamon buff,' as in the young male in partial juvenal plumage, but differs in having a fully developed tail, just like the adult females. Consequently, the differences of the sexes can be determined in every plumage.

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