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Field Notes on Some Amphibians from British Guiana

By STANTON C. CRAWFORD and EDGAR P. JONES

THESE observations on certain amphibian species were made in British Guiana incidental to the collection of herpetological material for histological studies.

1. *Bufo marinus* (Linnaeus)

These very common toads appear as dusk approaches. On rainy nights they make considerable noise flopping on the wet ground. Individuals are frequently well over a pound in weight, and are hence the largest amphibians of the country. The volume of the voice is exceeded only by that of *Hyla maxima*.

Above, the color is a rich brown touched with brighter tones, while large dark spots make a pattern. Young specimens are very variable, but tend to show a darker ground color than the adults. Specimens preserved included one from Matope, one from Amatuk, one from Upper Camaria and 52 from the Kartabo region. Many others were seen, especially in Georgetown, where they gather in the evenings under the street lamps to catch insects.

2. *Bufo typhonius* (Linnaeus)

The angular configuration of the head along with the darkly variegated dorsal coloration make this animal very inconspicuous when it is among fallen leaves. Hence it is commoner than is realized. Its movements seem comparatively awkward and feeble.

Ridges on the head are strongly elevated, and in the adults are very prominent and bony. Above, the general color is some tone of olive or brown, usually dark, with a few darker brown or black spots or bands. Sometimes there is a light vertebral line. Beneath, the general coloration is white, mottled with buff or brown, these darker patches tending to become continuous anteriorly. Twelve specimens, all from the vicinity of Kartabo, were preserved.

3. *Bufo guttatus* Schneider

There is a colony of these animals at Matope under and about the government shelter house erected there. Only two specimens were collected. Others were seen but these were left undisturbed so that there would be no risk of weakening the colony, which is certainly a rare one in British Guiana.

The coloration is brown above, without pronounced markings. Beneath, the smooth skin is diffused grayish, brownish or blackish in color, marked with round light dots. These toads sit rather erectly, and their spotted "vests" present a distinctive appearance.

4. *Leptodactylus pentadactylus* (Laurenti)

A very large specimen was found sitting in the lee of a mangrove root on a mud flat. A small one was accidentally picked up with dead bamboo leaves used to cover the floor of an animal cage.

The animals are brownish above, generally with dark spots arranged in transverse bars. A black stripe runs along canthus and temporal fold.

The limbs are cross-barred and the thighs are marbled behind with black and yellow. Five specimens, all from the Kartabo region.

5. *Leptodactylus mystacinus* (Burmeister)

Most of the specimens were taken about a carrion pile, where they were catching flies. These frogs were small and very quick in movement, after the habit of grasshoppers. When on the ground they took advantage of every irregularity in seeking concealment, hiding under leaves and in the angles against dead branches or stones.

Distinct pores, each surrounded by a whitish halo, occur on the upper surfaces of the legs, while the flanks show oval glands. The dorsal coloration is reddish brown to violet rose, with a deep brown or black streak on either side. There are other dark and light markings. A well-accentuated "moustache" is characteristic, and there is a whitish line between this and a blackish brown line on the upper lip. Spots and bars on the limbs are touched with rose. Beneath, there is a discoidal fold; the skin is white, but is spotted on the throat. Ten specimens, all from the Kartabo region.

6. *Leptodactylus mystaceus* (Spix)

A common form, of rather slender build, with generally smooth skin, and with a fine elevated mid-dorsal line running from snout to vent. The color varies from brown to olive-gray above, with darker markings, which tend to be tinged with white posteriorly. A light-edged dark band lies between the eyes. The broad dark "moustache" stripe on the canthus and running through eye to ear has a prominent white stripe beneath it, and beneath this, in turn, is a dark brown band on the upper lip. The limbs are cross-barred, with a characteristic longitudinal white stripe on the thighs, which are dark brown posteriorly. Beneath, there is a discoidal fold, and the skin is yellowish-white. The lower lip is edged with brown or green. Twenty specimens, all from the Kartabo region.

7. *Hyla maxima* (Laurenti)

These animals, the largest hylas in the country, also outdo other amphibians in the loudness of their voices, which have almost a mammalian quality. The specimens collected with one exception seemed rather delicate, dying in containers or in the vivaria to which they were transferred. One frog, of which a large portion of the head and the contained eyes was cut off and thrown into fixing fluid, furnished an interesting record. The body, thrown aside as dead in the evening, was quite active the next morning, and lived for eleven days. Apparently the knife had passed just in front of the medulla. The cut surface healed over nicely. The decraniated animal, its lower jaw and tongue alone remaining to mark the outline of the head, showed a perfect sense of equilibrium. It would crawl up on a rotating object so as to remain in normal position on top of it, and would jump normally except that bad landings were made. It made no effort to swallow flies, even when they crawled over the tongue, but would receive them when they were introduced into the oesophagus. Before death the body became strongly twisted to one side.

Above, the ground color is brown or reddish brown, variegated with lighter and darker. The limbs usually show dark crossbars. Sometimes there is a dark vertebral line from the tip of the snout to the sacrum. Beneath, the skin is a uniform light tan.

One frog when collected had a definite tan coloration above, with the vertebral line showing dark brown, black at the snout, and with brown "ribbing" along the sides. The next day the ground color became distinctly coppery. This frog ate some small toads that were sharing the vivarium.

Another specimen exhibited a rich copper tone when caught. Later it appeared more gray than brown. When so colored, close inspection revealed small spots of light green, very light tan, and a somewhat darker tan. Before death it began to change back to the copper hue, and died just as the shade was becoming distinct and the darker rib-like stripes were becoming evident on the sides. After preservation, close inspection revealed small spots of light and dark brown, but no green. Eleven specimens were preserved, two from Matope, the rest from Kartabo.

8. *Hyla granosa* Boulenger

All specimens were captured at night in a swamp upon broad green leaves. The call is a medium-pitched "pink". The eyes are very prominent. This impression is probably accentuated by the pale and fragile appearance of the animal.

These animals are almost colorless, but are faintly green above, with minute yellow and purplish white spots scattered irregularly. The upper eyelid is rose, while the legs and snout are touched with light brown. On the legs the brown increases in intensity as it approaches the phalanges, due to the increasing concentration of tiny brown spots. Beneath, the color is a pale green, shading off to white. Three specimens, all from near Kartabo.

9. *Hyla boans* Daudin

General habit slender, with a pointed nose. The ground color is quite variable from time to time in the same animal, ranging from very light tan through russet to dark brown. There are irregular cross bands of darker brown on body and limbs. A dark brown line, almost black at times, runs through nostril and eye to a point above the arm. A white line above the anus is conspicuous.

Animals in the light phase of color hardly showed the darker pattern, except over the shoulders. Upon assuming the darker phase the pattern also became more distinct, except that if the ground color became very dark, the pattern naturally was less conspicuous through lack of contrast. The skin beneath the body is white, somewhat tinged with yellow. In one specimen this shaded into dark tan on the throat, towards the vent and under the limbs. One specimen was brought from the Penal Settlement and five were picked up at Kartabo.

10. *Hyla marmorata* (Laurenti)

All specimens were caught at night on the green leaves about five feet from the ground, by use of a light. The call is of medium pitch. These

specimens, as reported in earlier papers,¹ afforded the first record of the occurrence in British Guiana of this Ecuadorean species.

The color is reddish brown above, marbled with dark brown. The limbs are cross-banded. Beneath, these animals are bright saffron, with small round black dots. The extremities are sooty black. The somewhat voluminous webs are black and saffron. These bright colors appear in striking contrast. Four specimens were preserved.

11. *Hyla rubra* Daudin

This is the most common hyla of British Guiana. The call is a "quack-quack", quite deep in tone but not of great volume. One frog was collected in the tube formed by a large rolled leaf; another one on a stem. Both of these locations were about two feet above the ground. Several frogs were taken in the bungalow. These animals were seemingly attracted to lights, both of the house and of the electric torch.

The general effect is dark green, or even brownish. Characteristically there is a dark X-shaped figure covering the back. This figure is formed by two dorsal bands, which approach each other and sometimes fuse about the middle of their range. Each side of the body also shows a dark streak, terminating in front of the hind leg. Above, the general ground color ranges from light green to olive. The darker markings range in intensity from time to time, from dark green to almost black. There is a band between the eyes.

The belly and under surfaces of the limbs are light yellow, with a bluish tinge, and the blood vessels show through. There are black bands on the legs, which also show white marbling in front and behind. Twenty specimens were preserved, one from the Penal Settlement, the rest from about Kartabo.

12. *Dendrobates trivittatus* (Spix)

These are small ground frogs, common but hard to catch. They are noisy, the high-pitched "pip-pip" being heard almost continuously throughout the day. This species lives in piles of twigs or among the fallen leaves of the jungle. When pursued, it dodges under a leaf and is not seen again for some minutes, when it reappears a few feet away.

The color is shiny black, with a whitish line, tinged with yellow and orange, on each side of the back and continuing forward on upper eyelid and canthus. Another such line, on the upper lip, extends to the arm. There are yellow-orange spots on the limbs and sometimes beneath the body. Four specimens were collected about Kartabo. One carried seven tadpoles on its back between the stripes.

13. *Rana palmipes* Spix

This frog is found along the shore, also deep in the jungle. Individuals hid under leaves when such cover was available, remaining still when the leaves were moved. Frogs of this species were seen and heard throughout the night.

¹ Crawford, Stanton C. Adaptations to Nocturnal Life Exhibited by Various Animals of British Guiana, with Special Reference to the Anatomical Basis of Night Vision in the Amphibia and Reptilia. *Univ. Pittsburgh Bull.*, 22 (31), 1926: 29-37.

Crawford, Stanton C. Field Keys to the Lizards and Amphibians of British Guiana. *Ann. Carnegie Mus.*, 21 (1), 1931: 11-42.

The ground color is olive or brown above, uniform or with small blackish spots. A dark green stripe runs from snout through eye to rear of body. Spots on the limbs are arranged in cross-bars. The sides of the body are medium brown below the green stripes. Beneath, the skin is yellowish white with small brownish spots and marblings. Two specimens from near Kartabo were preserved.

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A Preliminary List of the Amphibians of Lebanon County, Pennsylvania, with Notes on Habits and Life History¹

By J. WENDELL BURGER

WITH the exception of a few records by Surface (1913), no reports have been submitted on the amphibians of Lebanon County, Pennsylvania. Hence, in order to fill a very slight gap, rather than for the unusualness of the specimens taken, I submit this preliminary list of amphibians based, with the exception of Surface's records, on my own collecting during 1930.

A few words as to the character of the county may be helpful in placing the animals found there. Through the center of the county the Lebanon Valley, a fertile farming land underlaid with limestone, extends from Berks County on the east to the Susquehanna River on the west. The valley drains into the Susquehanna through two branches of Swatara Creek, the larger now polluted by the anthracite coal fields on the north. Conewago Creek drains from the mountainous southern portion. At one time a canal ran through the valley from the Susquehanna. At the southern border of the county lie the South Mountains, a low ridge, and the northern part is filled with numerous ridges of the Blue Mountains. Several artificial lakes and dams exist. These and their creeks in the south-east form the water supply of Lebanon, the county seat, in the center of the valley. The county has been well populated since colonial days.

1. *Triturus viridescens viridescens* (Rafinesque)

Both the aquatic and terrestrial forms have been taken, the former in an overflow pool of Lake Conewago, Mt. Gretna, and the latter on a pine forest floor near Green Point. I could find no suitable pond or lake situated near this latter locality, and evidently the animal has to make rather a long migration when it returns to the water. Of course there is the chance that a nearby pool was overlooked.

2. *Gyrinophilus porphyriticus porphyriticus* (Green)

One medium sized specimen was taken on the summit of Blue Mountain, under a log deeply embedded in leaves in a turbid stream.

¹ Contributions from the Department of Biology, Haverford College, No. 7.