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TWO NEW SPECIES OF *ELEUTHERODACTYLUS* FROM PUERTO RICO

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Some years ago Dr. J. A. Ramos of the Biology Department of the University of Puerto Rico collected, at the Cambalache Forests, a small frog that differed strikingly from the *Eleutherodactylus cramptoni* collected at the same locality and date, by the very short length of the fingers and relatively short, thick hind limbs. The specimen was said to have been collected in bromeliads but no voice record was taken, so that the description of the apparently new species was postponed until more paratypes could be obtained and the voice recorded. So far, four more trips have been made to the same locality, at night and during the daytime, but all of them have been unsuccessful, although a strange voice that could have been of frog or insect was heard on several occasions. The Cambalache Forests are of the semiarid, deciduous type, and spiny trees and bushes are common, so that catching a calling frog at night is not an easy matter.

More recently, another apparently new frog was collected at Doña Juana Forests and, although this first collection consisted of 40 individuals, the animal was not heard to produce any voice in spite of the fact that all the specimens were caught at night and enough time was given each one to call. The description of this form was likewise postponed and, in the month following the first collection, 16 other individuals of the same species were collected at El Yunque, on the other end of the island. No voice

was heard to come from any of these animals, so that it was tentatively concluded that the species is mute. Since well developed gonads are found in both sexes, the lack of voice cannot be attributed to immaturity, especially if it is considered that frogs of the genus *Eleutherodactylus* seem to call throughout the year in Puerto Rico.

Descriptions of both species have been prepared in the belief that they should be recorded and that their publication may be of help in determining distribution and habits.

The author wishes to express his appreciation to Mr. Jorge Rivera Lopez, to Dr. Ruth Turner, and to his wife, Mrs. Eneida B. Rivero, who helped him collect in the field.

ELEUTHERODACTYLUS RAMOSI sp. n.

Type. Museum of Comparative Zoology No. 30428, a ♀ from Cambalache Forests, n. Puerto Rico, Coll. J. A. Ramos, Aug. 1952.

Diagnosis. A small *Eleutherodactylus* with uniform coloration, very short fingers and short limbs, the heel and elbow of which do not meet when adpressed along the side of the body.

Description. Head broader than long; snout subovoid; tongue large, $\frac{2}{3}$ free and nicked behind; vomerine odontoids in two strong oblique series behind and between the choanae; eyes of moderate size, their diameter equal to distance between eye and nostril; interorbital space broader than an upper eyelid; canthus rounded; loreal little inclined, not concave; tympanum moderately distinct, covered above by a supratympanic fold, $\frac{1}{2}$ the eye diameter; fingers strikingly short, the longest not longer than the orbital diameter; no definite palmar tubercles; larger disks smaller than the tympanum; no apparent metatarsal tubercles; toes free, the first well separated from the others; disks of toes smaller than those of fingers; heel of the adpressed hind limb extends to the posterior margin of the tympanum; heels overlap when legs are placed at right angles to the body; heel and elbow do not meet when adpressed along the flank.

Skin above, smooth. Ventral surfaces smooth except on the posterior part of the belly, where slight rugosities or granulations can be seen under a lens; posteroventral aspect of thighs, granular.

Color. Above, uniform brown, with minute dots (melanophores) under a lens; no apparent canthal or supratympanic streaks. Below, infuscated white, the melanophores being scattered and sparser than on the upper surfaces.

Measurements. (mm.) ♀ snout-vent 22; head length 7.3; head breadth 8.3; femur 8.2; tibia 9.6.

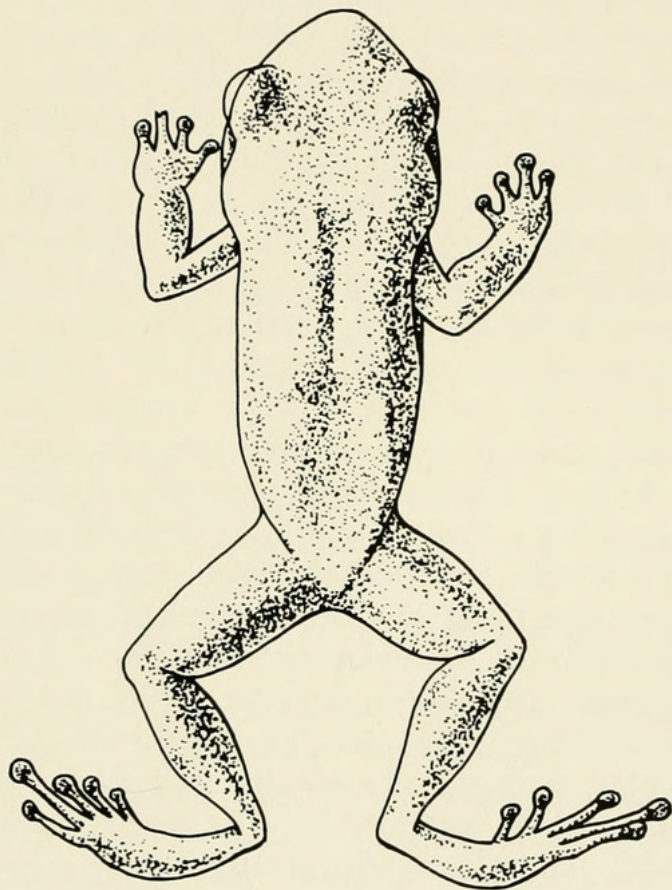


Fig. 1. *Eleutherodactylus ramosi* Type, MCZ 30428 (M. Estey del).

Remarks. *E. ramosi* is most closely related to *E. cramptoni* with which it occurs at the Cambalache Forests. It differs from that species in its very short fingers, smaller disks, broader head and shorter and thicker hind limbs, the heel of which does not even approximate the elbow when both anterior and posterior limbs are adpressed alongside the flank. It was the very short fingers and thick hind limbs that made the author describe this species on the basis of only one specimen.

ELEUTHERODACTYLUS ENEIDAE sp. n.

Type. Museum of Comparative Zoology No. 30429, a ♀ from Doña Juana Forests, Villalba, Puerto Rico. Coll. J. A. and E. B. Rivero, August 1956.

Diagnosis. A medium sized *Eleutherodactylus* with rounded canthus rostralis, interorbital space as broad as an upper eyelid, tubercular dorsum, barely overlapping heels, mottled and variegated dorsal coloration and immaculate ventral surfaces.

Description. Head slightly broader than long; snout short subovoid; tongue oval, $\frac{1}{2}$ free and nicked behind; vomerine odontoids in two oblique series behind the small, oval choanae, their external extremities commencing at level with the vertical of the center of the latter; canthus rounded; loreal sloping; interorbital space as broad as an upper eyelid; eye diameter greater than distance between eye and nostril, almost as long as the snout; tympanum small, not too distinct, $\frac{1}{3}$ the eye diameter; first finger shorter than second, which is longer than last; three metacarpal tubercles and two smaller ones in line behind the wrist, just in back of the central metacarpal tubercle; disks fan shaped, broader than the tympanum; two small metatarsal tubercles; subarticular tubercles distinct; toes free, their disks slightly smaller than those of the fingers; heel of the adpressed hind limb extends to the posterior corner of the eye; heels barely overlap when tibiae are placed at right angles to the body.

Skin above, studded with small, evenly distributed tubercles; eyelids tubercular; a small tubercle at the heel. Below, granular on the belly and thighs, very slightly granular on the throat; a ventral discoidal fold. Male with a slight fold on each side of the throat.

Color. Above, light gray with blotches and mottles of darker gray or brownish gray; eyelids darker than the body color; loreal area whitish gray, with small darker spots along the upper lip; limbs light gray, with brownish gray striations and mottling; loins with a golden brown stain; posterior aspect of the thighs with a diffuse, irregularly margined brownish marking on the distal end. Ventral surfaces immaculate, powdered with brown, except for a thin gray rim along the lower margin of the lip.

Measurements. (mm.) ♀ snout-vent 26.2; head length 10.5; head breadth 10.5; femur 11.9; tibia 12.6.

Remarks. Paratypes include 39 specimens from Doña Juana cloud forests, with the same data as the type (U.P.R. 611-12, 614-51) and 16 from El Yunque (U.P.R. 595-610, El Yunque, sixth rain shelter to Pinnacles, 1 Sept. 1956). All were collected at night on the floor or on the leaves or trunks of bushes, palms or tree ferns at not more than 5 or 6 feet from the ground.

The largest of the 54 paratypes is only 2 mm. larger than the average sized type, an indication of a very uniform size for fully grown individuals. This is contrary to the situation existing in *Eleutherodactylus portoricensis* where considerable variability is found in any collection.

The following variations are found among the paratypes of *Eleutherodactylus eneidae*:

1. In poorly preserved specimens, a slight canthus may be apparent, but ordinarily the snout is rounded in cross-section and there is no angle at the canthal margin. This character easily differentiates this species from *E. portoricensis*, its closest Puerto Rican ally.

2. The heel of the adpressed hind limb may extend to any point on the eye (posterior corner, middle or anterior corner).

3. The golden brown stain of the loins is present in most but not all individuals.

4. A small, black spot or short streak is generally found above the tympanum.

5. The dorsum is always mottled and variegated but the ground color may be lighter or darker than in the type.

Eleutherodactylus eneidae is most similar to *E. portoricensis* from which it can be distinguished by its more uniform, adult size, rounded canthus not bordered by a white line (as in most *E. portoricensis*), absence in most specimens of a well defined interorbital bar; smaller tympanum; dark eyelids; narrower interorbital space (much broader than the upper eyelids in *E. portoricensis*), more tubercular dorsum, different coloration and probable absence of voice.

Some examples of *E. portoricensis* are also mottled above, but the mottling is usually brown, and the well defined canthus, broader interorbital space and persistent interorbital bar make the species easily distinguishable. It can also be said that if a specimen is more than 30 mm. snout-vent length, it is not *E. eneidae*.

Eleutherodactylus eneidae is quite common in the cloud forests of Doña Juana and El Yunque and it is very strange that the species had not been named before. It appears possible, however, that collections of *E. portoricensis* may include this species. This may be the case, for example, with Schmidt's (1928:46) Figure 11c, but this figure may just as well represent a color phase of *E. portoricensis*.

E. eneidae is somewhat similar in coloration to *E. flavescens* from the Dominican Republic, but it differs from that species in many important details. It also looks somewhat like Schmidt's (*op. cit.*:53) figure of *E. locustus* but Dr. R. G. Zweifel of the American Museum compared it with the type of that species and found that three specimens of *E. eneidae* "are very different in size and general appearance from *locustus*." Furthermore, Zweifel found very little difference between *cramptoni* and *locustus*, and suggested that they might be synonyms. Males of *E. cramptoni* have vocal sacs (described as absent by Schmidt) and the proportion of tibia and femur (heels cross in *locustus*, meet in *cramptoni*), mentioned as a difference between the two species, does not, according to Zweifel, seem to exist. On the other hand, Schmidt described the voice of *E. locustus* as the "most distinctive of any noted in Puerto Rico," so that it is perhaps better to keep the two forms separate until more field studies can be made.

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