

Catalogue of American Amphibians and Reptiles.

SCHWARTZ, ALBERT. 1974. *Eleutherodactylus planirostris*.*Eleutherodactylus planirostris* (Cope)*Hylodes planirostris* Cope, 1862:153. Type-locality, "New Providence Island, Bahamas." Holotype, "Mus. Salem" (= Peabody Museum, Salem, Massachusetts), now lost.*Lithodytes* (= *Eleutherodactylus*) *ricordii*: Cope, 1875:31. First assignment to genus *Eleutherodactylus*.*Eleutherodactylus ricordii planirostris*: Shreve, 1945:117. First usage of *planirostris* as subspecies of *E. ricordii*.[*Eleutherodactylus*] *planirostris*: Schwartz. 1965:100. Recognition that *ricordii* and *planirostris* are two distinct species.

• CONTENT. Four subspecies are recognized: *planirostris*, *casparii*, *goini*, and *rogersi*; see, however, comments on *casparii* below.

• DEFINITION. A small to moderately sized *Eleutherodactylus*, males reaching a snout-vent length of 34 mm, females 36 mm (both upper extremes in subspecies *goini*); digital discs present, those on digits 3 and 4 best developed and equal to about one-quarter size of tympanum; fingers moderate in length, 3-4-2-1 in order of decreasing length; toes long, unwebbed, 4-3-5-2-1 in order of decreasing length; dorsum irregularly warty with a raised median line from snout to region of sacrum; upper eyelids and top of head distinctly more warty than dorsum; throat and venter smooth; belly disc moderately well developed; tongue elongate oval, free behind, its greatest width about half that of floor of mouth; vomerine teeth in two distinctly bowed series, extending from outside level of choanae and separated medially by a distance equal to about half the diameter of a choana, and almost touching posterior margin of choanae laterally; supra-axillary and inguinal glandular areas present; dorsal coloration and pattern usually a combination of browns and tans (although greens occur in *casparii*), with either a "mottled" or a "striped" pattern.

• DESCRIPTIONS. The original description is brief and non-eclectic insofar as characteristics differentiating this taxon from other "*Hylodes*." The best description is that of Carr and Goin (1955:191-192), although Barbour and Ramsden (1919:102-103), Lynn (1940:48-50), Grant (1941:13-14), Goin (1947, 1951, 1955), Wright and Wright (1949:377-378), Duellman and Schwartz (1958:237-238), and Schwartz (1960:18-26) have commented on various structural and chromatic characteristics of the species and its included subspecies. The voice has been variously described as a "tiny bell" (Barbour and Ramsden, 1919:103), a "twittering" (Deckert, 1921:23), a "put put"

(Dunn, 1926a:156), a "chirping note" (Van Hynning, 1933:4), a "trilling" (Skermer, 1939:107), and "short melodious bird-like chirps, 4 to 6 in a series" (Conant, 1958:261). Carr and Goin (1955:192) stated that the voice is a "faint cheep repeated 1 to 4 times." In general terms, the voice is a diffuse series of irregularly pitched chirps or twittering. Conant's and Carr and Goin's verbal renditions are most correct, and that of Barbour and Ramsden most erroneous; the latter likely is based upon the call of another Cuban *Eleutherodactylus*.

• ILLUSTRATIONS. Barbour and Ramsden (1919) show outline drawings of the dorsal and lateral views of the head and the buccal cavity. Lynn (1940) has drawings of the dorsa of the two pattern morphs (mottled, striped), as well as a ventral view of the entire frog, palmar and plantar surfaces, lateral view of head, and buccal cavity. Goin (1947) illustrates both pattern morphs, the egg, early cleavage stages, and a "mutant" by drawings, and has photographs of a freshly deposited clutch of eggs, and dorsal views of individuals from throughout the range of the species. Goin (1955) also illustrates the holotype of *E. p. rogersi* in dorsal view, and Lynch (1971) has line drawings of dorsal and lateral views of the skull. Conant (1958) has colored photographs of both pattern morphs, and Carr and Goin (1955) have a black-and-white photograph of the striped morph. Wright and Wright (1949:369) have black-and-white photographs of both morphs and drawings of larval development.

• DISTRIBUTION. *E. planirostris* occurs in Cuba, the Isla de Pinos, the Cayman Islands (Grand Cayman, Cayman Brac), the Bahama Islands (Grand Bahama, Great Abaco, New Providence, Eleuthera, Andros, the Berry Islands, the Bimini Islands, the Exuma Cays, Green Cay, Cat, Long, San Salvador), and the Caicos Islands (North Caicos); introduced in Jamaica where widespread and island-wide; introduced in Florida where found from Leon, Duval, and Alachua counties south to Key West (Tallahassee record—one specimen—6-3912 in collection of Lewis D. Ober, taken 17 July 1965 by R. Love); possibly occurring on Great Inagua Island in the southeastern Bahamas (Schwartz, 1968:268); introduced in Mexico (Veracruz—one specimen—Univ. Michigan Mus. Zool. 122082). Altitudinal distribution from sealevel to 3500 feet (1068 meters) in the Sierra de la Gran Piedra in Cuba.

• FOSSIL RECORD. None.

• PERTINENT LITERATURE. English (1912) noted the call of Cayman Island individuals, and Barbour and Ramsden (1919:203) briefly discussed the habits, habitat, and voice of Cuban *E. planirostris*. Deckert (1921:23) commented on the habitat and two clutches of eggs in Florida. Dunn (1925:163) briefly noted Cuban distributional data, and later (1926a) discussed habits, habitat, eggs and hatchlings. Van Hynning (1933:4) noted the habitat and call of individuals at Gainesville, Florida, and Carr (1934:22) commented on the same topics for the same

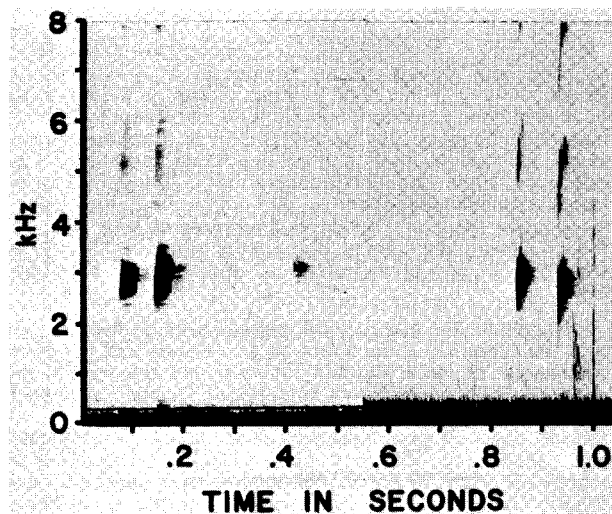
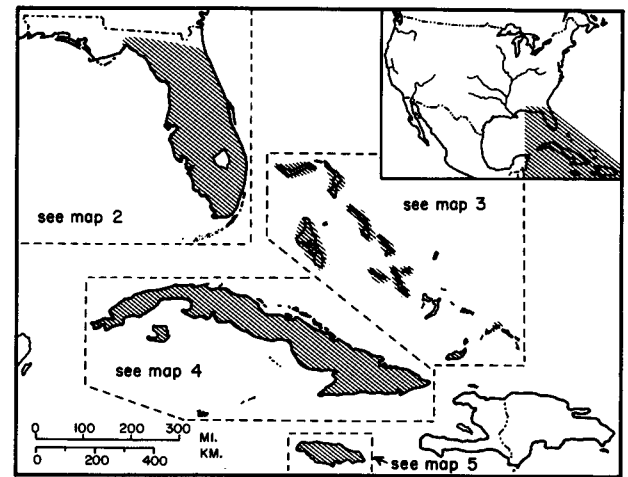
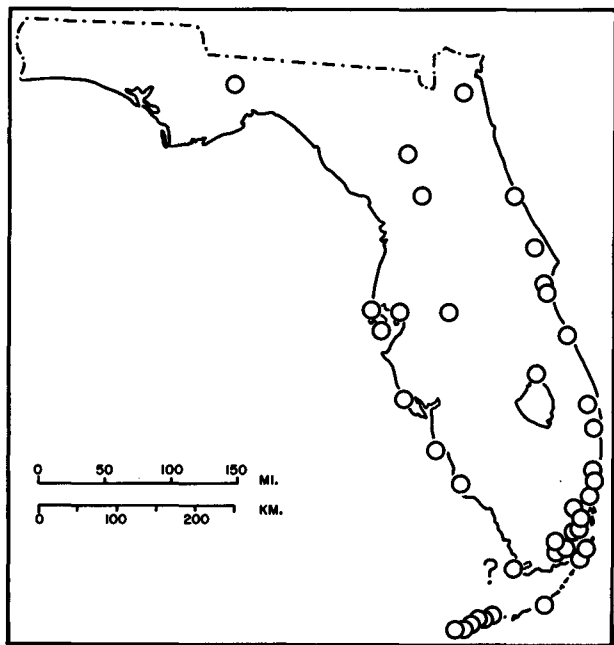


FIGURE. Audiospectrogram of two successive calls of *E. planirostris* (narrow band, 45 Hz on left; wide band, 300 Hz on right): Miami, Dade Co., Florida, recorded 24 May 1950 by Peter Paul Kellogg (from Voices of the Night, courtesy of Cornell Laboratory of Ornithology).

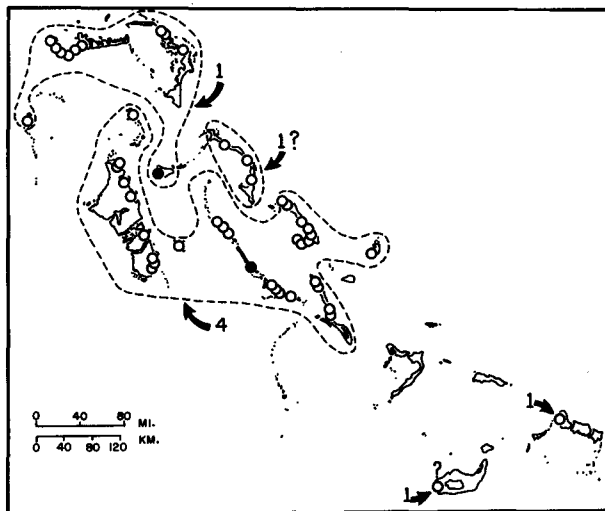


MAP 1. Distribution of *Eleutherodactylus planirostris* and key to detailed distribution maps (see maps 2-5; also introduced at Veracruz, Mexico, not mapped).



MAP 2. Distribution of *E. p. planirostris* in Florida (introduced); circles mark known localities of occurrence.

region. Harper (1935:299) discussed the habitat in southern Florida. Lynn (1937:88) first reported the species from Jamaica. Skermer (1939:107-108) mentioned young frogs from Tampa. Carr (1940:63) described habits and habitat of Florida individuals. Lynn (1940:48-50) amplified the data on distribution in Jamaica, and Grant (1941:13-14) noted the occurrence on Grand Cayman and Cayman Brac. Lewis (1943:35) described egg deposition in Jamaica, and Lynn and Dent (1943:239) added additional Jamaican distributional data. Goin (1944:192) reported eggs from Jacksonville, Florida, and Allen and Slatten (1945:25) recorded the species from Key West, Florida. Although Goin's (1947) paper deals primarily with genetics of the two pattern morphs, it contains a wealth of other data, including those on eggs, egg culture, habitat, behavior, breeding habits and amplexus, embryology, feeding habits, and geographic distribution and variation; this paper is the single best source for any sort of information on the various aspects of the study of *E. planirostris*. Wright and Wright (1949:377-382) gave information on morphology, life history, habitat, and distribution. Goin and Cooper (1950:7) reported eggs from Jamaica, and Goin (1951:200) commented briefly on Bahamian distribution and variation in the species. Later, Goin (1955) named a new subspecies from the Bahama Islands, discussed variation, and proposed a history to account for the peculiarities of the Bahamian distribution of the subspecies. Alayo (1955) considered *E. planirostris* island-wide in Cuba and everywhere abundant, but recognized *casparii* as a distinct species. Schwartz and Ogren (1956:95-96) noted variation, measurements, and habitat at two Cuban localities. Lynn (1957:57) added a new Cuban locality. Duellman and Schwartz (1958:237-238) discussed the variation, habits, food items, and hatchling size in individuals from southern Florida. Carr and Goin (1959:191-192) gave a description of physical characters, pattern, and voice. Goin (1959:136) listed the number of maxillary teeth in a comparative table of maxillary teeth number in many species of *Eleutherodactylus*, and Telford (1959:111) briefly mentioned the habitat of the species in Florida. Schwartz (1960:18-28) gave mensural and chromatic data on Cuban, Floridian, and Bahamian populations. Shreve and Williams (1963:332-334) discussed the relationships of the species to its relatives (*ricordi* Duméril and Bibron, *goini* Schwartz, *bresslerae* Schwartz, and *acmonis* Schwartz). Schwartz (1965:99-101) separated *E. ricordi* as a species distinct from *E. planirostris* after finding the two syntopic in and near the Sierra de la Gran Piedra in eastern Cuba. Gorham (1966:97-98) listed (under *E. ricordi*) the subspecies, their type localities, synonyms, and distributions. Goin, Goin, and Bachman (1968:535) gave the nuclear DNA value for *E. p. planirostris* in absorption units/nucleus. Garrido and Schwartz (1968:7-8) noted the apparent absence of *E. planirostris* from the extreme eastern Cuban Peninsula de Guanahacabibes and gave data on the



MAP 3. Distribution of *E. p. planirostris* (1) and *E. p. rogersi* (4) in the Bahama Islands. Solid circles indicate type-localities, open circles mark other localities. Subspecies occurring on Eleuthera and presence of *planirostris* on Great Inagua are uncertain.

habitat of the species in Cuba. Lee (1969:71) reported the species occurring in dead pendant *Sabal* fronds in Florida, whereas Neill (1951:143) noted the capture of *E. planirostris* in low-growing bromeliads and (1958:18) under stones immediately adjacent to the sea on the Florida Keys. Elias and Shapiro (1957) discussed histology of the skin. Hughes (1959) and Hughes and Reier (1972) treated embryological topics. Petrovic (1973) recorded albinism.

• **ETYMOLOGY.** The name *planirostris* is from the Latin "rostrum" (snout) and "planum" (level, flat) in allusion to the flattened snout. The subspecific names are derived as follows: *casparii*—in honor of "Mr. Caspari" of Mina Carlota, Cuba; *goini*—in honor of Coleman J. Goin; *rogersi*—in honor of J. Speed Rogers.

1. *Eleutherodactylus planirostris planirostris* (Cope)

Hylodes planirostris Cope, 1862:153. See species account.

Eleutherodactylus [ricordi] planirostris: Shreve, 1945:117.

First (implied) combination of *ricordi* and *planirostris*.

Eleutherodactylus planirostris: Schwartz, 1965:99-100. First modern usage of binomial.

[*Eleutherodactylus planirostris*] *planirostris*: Schwartz, 1965:100. First (implied) nominate trinomen.

• **DEFINITION.** A subspecies of *E. planirostris* characterized by small size (gravid Cuban females to 27 mm snout-vent length, males to 20 mm; Isla de Pinos females to 28 mm, males to 22 mm; New Providence females to 28 mm, males to 21 mm), both striped and mottled morphs present in a theoretical ratio of 3:1, no green in dorsal pattern, and femur/snout-vent length ratio ($\times 100$) of 42.0-46.3 in Cuban males, 39.4-49.6 in Cuban females (means 43.1 in males, 42.9 in females) with comparable ratios for New Providence specimens of both sexes, although Isla de Pinos males have a mean ratio of 45.0 (in contrast to 43.1 in Cuban males and 42.6 in New Providence males).

• **REMARKS.** The nominate subspecies occurs throughout Cuba with the exception of the Sierra de los Organos and the Sierra del Rosario in Pinar del Río Province, and the western and southern slopes of the Sierra de Trinidad. In the Bahamas, *E. p. planirostris* occurs on New Providence, islands on the Little Bahama Bank (Grand Bahama, Great Abaco), South Bimini, and (presumably) Eleuthera. Goin (1955) left unresolved the subspecific status of the Bimini, Andros, and Eleuthera populations. There is now sufficient material to show that the Bimini subspecies is *planirostris*, and the Andros subspecies is *rogersi*, but the Eleuthera population's status remains unknown. Introduced in Florida, from Tallahassee, Gainesville, and Jacksonville south to Key West; introduced in Jamaica where now virtually island-wide and at Veracruz, México; possibly introduced on Great Inagua. Occurring naturally (?) on the Cay-



MAP 4. Distribution of *E. p. planirostris* (circles) on Cuba, Cayman Islands and Isle of Pines, and of *E. p. casparii* (2) and *E. p. goini* (3) on Cuba. Solid symbols mark type-localities, open circles mark other localities.

man Islands (Grand Cayman, Cayman Brac, but unknown from Little Cayman) and on the Caicos Islands (known only from North Caicos). Not all populations studied show the theoretical 3:1 pattern morph ratio; this is especially true in Jamaica where the ratio is 1:3 striped:mottled individuals, on the Isla de Pinos and Cuba where the ratio of the two morphs is about 1:1, and on New Providence where the ratio is about 9:1 mottled:striped.

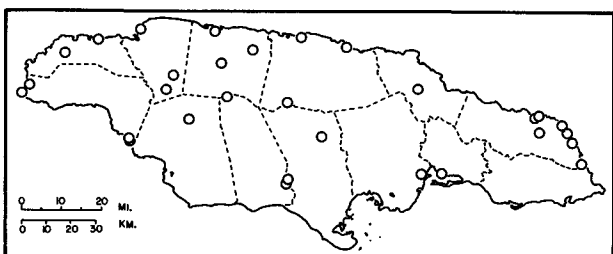
2. *Eleutherodactylus planirostris casparii* Dunn.

Eleutherodactylus casparii Dunn, 1926b:215. Type-locality, "Mina Carlota," Las Villas Province, Cuba. Holotype, Mus. Comp. Zool. 11130, adult female, collected by E. R. Dunn in July 1925 (examined by author).

[*Eleutherodactylus planirostris*] *casparii*: Schwartz, 1965:100. First (implied) usage of this combination.

• DEFINITION. A subspecies of *E. planirostris* characterized by small size (gravid females to 25 mm snout-vent length, one male with snout-vent length of 20 mm), both mottled and striped morphs present in a 2:1 ratio, dorsum dull greenish to tan, snout reddish, a black or brown interocular bar or triangle with its apex pointed posteriorly, a pair of reddish blotches near the sacrum, one or two dark brown spots in the groin, and femur/snout-vent length ratio ($\times 100$) in females 45.6–53.9 (mean 49.9) and 54.5 in male; mottled morph differs from that of *E. p. planirostris* in having vague darker areas in a lighter tan ground rather than being spotted, dotted, or blotched as in *E. p. planirostris*.

• REMARKS. Schwartz (1965:100) expressed doubt that *casparii*, despite its resemblances to *E. planirostris*, is correctly associated nomenclatorially with that species. The greenish dorsum is extremely distinctive, and the dorsal pattern, although reminiscent of that of *E. planirostris*, is somewhat dissimilar. Additionally, all records of *casparii* are from the southern and western sides of the Sierra de Trinidad, whereas north slope



MAP 5. Distribution of *E. p. planirostris* on Jamaica (introduced); circles mark known localities of occurrence.

specimens are clearly *E. p. planirostris*. Syntopy is as yet unknown.

3. *Eleutherodactylus planirostris goini* Schwartz.

Eleutherodactylus ricordi goini Schwartz, 1960:19. Type-locality, "south base of Pan de Guajabón, 3 km. west and 13.5 km. south of Las Pozas, Pinar del Río Province, Cuba." Holotype, Amer. Mus. Nat. Hist. 63212, adult female, one of a series collected by Armando García and George R. Zug on 27 August 1958 (examined by author).

[*Eleutherodactylus planirostris*] *goini*: Schwartz, 1965:100. First (implied) usage of this combination.

• DEFINITION. A subspecies of *E. planirostris* characterized by large size (gravid females to 36 mm snout-vent length, males to 34 mm), both striped and mottled morphs present in a 3:1 ratio, no green in the dorsal coloration which is some shade of tan to brown, and femur/snout-vent length ratios ($\times 100$) are 36.5–52.2 (mean 44.1) in females and 42.4–52.2 (mean 46.7) in males. *E. p. goini* appears much longer-legged than either *planirostris* or *casparii*.

• REMARKS. *E. p. goini* is restricted to the limestone massifs of western Cuba in Pinar del Río Province—the Sierra de los Organos and the Sierra del Rosario to elevations of about 1000 feet (305 meters). Intergradation between *goini* and *planirostris* is suggested by specimens from the Alturas de Pizarras, the pine-clad piedmont of the Sierra de los Organos, but the specimens are closer to *goini* than to *planirostris* in size and leg length and are here considered *goini*.

4. *Eleutherodactylus planirostris rogersi* Goin.

Eleutherodactylus ricordi rogersi Goin, 1955:1. Type-locality, "Darby Island, Exuma Cays, Bahama Islands, latitude 23° 50' S., longitude 76° 11' W." Holotype, Amer. Mus. Nat. Hist. 57564, adult female, taken by George B. Rabb and Leonard Giovannoli on 18 January 1953 (not examined by author).

[*Eleutherodactylus planirostris*] *rogersi*: Schwartz, 1965:100. First (implied) usage of this combination.

• DEFINITION. A subspecies of *E. planirostris* characterized by large size (gravid females to 35 mm snout-vent length, males to 25 mm), mottled and striped morphs present but mottled morph much more abundant than striped (14:1 ratio in 180 specimens), no green in dorsal coloration, but rather usually tan with more or less uniform small darker brown stippling or mottling, chin and throat often essentially immaculate and edge of lower lip pale rather than mottled, and generally stockier build with heavier body and legs; femur/snout-vent length ratios ($\times 100$) are 34.8–43.7 (mean 39.9) in females and 34.9–44.3 (mean 40.9) in males.

• REMARKS. *E. p. rogersi* inhabits the Bahama Islands, occurring on the Berry Islands (Great Harbour Cay), Andros, San Salvador (unknown from adjacent Rum Cay), the Exuma Cays (including Great and Little Exuma), Cat and Long islands, and Green Cay. None of 87 San Salvador frogs is striped, but elsewhere (Andros and Berry Islands, Exuma Cays, Long Island) the ratio is 7:1 mottled:striped.

COMMENT

Two major problems concerning *E. planirostris* remain: the relationships of *casparii* to the species and its distribution in the Sierra de Trinidad, and the details of distribution of *E. p. rogersi* in the Bahama Islands, notably the determination of which subspecies (*rogersi* or *planirostris*) occurs on Eleuthera. Although Shreve and Williams (1963:332-334) suggested that the large Cuban forms (*ricordi*, *goini*, *bresslerae*) and the small Cuban forms (*planirostris* and *acmonis*) be regarded as two species, Schwartz (1965:100-101) disagreed with this division. Among other reasons are the syntopy of *planirostris* and *acmonis* in the Sierra Maestra, and the fact that *goini* appears much more closely related to *planirostris* (being a longer legged and larger version of *planirostris*) than it does to either *ricordi* or *bresslerae*. Many details of distribution and relationships of this complex of frogs must be clarified before definitive statements of intra-Cuban or intra-Antillean relationships of these frogs may be made.

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