

THE SYSTEMATIC STATUS OF THE LIZARD *BACHIA BLAIRI* (DUNN) 1940 (REPTILIA:TEIIDAE) AND ITS OCCURRENCE IN COSTA RICA

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ABSTRACT

The microteiid lizard *Bachia blairi* (Dunn) is reported for the first time from Costa Rica in lowland wet forest near Rincón de Osa. Comparison of the seven known specimens of *B. blairi* to specimens of *B. pallidiceps* (Cope), its closest relative from eastern Panamá, supports recognition of two species. *Bachia blairi* is a sublitter inhabitant of the wet forests of the Golfo Dulce area of southwestern Costa Rica and adjacent Panamá. Eggs were found in the leaf litter in July. Hatchlings measuring 27 and 28 mm snout-vent length, respectively, were taken early in the wet season in May and in August. One female collected in July contained two developing ova. Adults are insectivorous.

The vertebrate fauna of tropical forest litter has received some attention in the recent literature (Scott, 1976). Even with his recent collecting, however, many species of vertebrates, especially reptiles, remain rare in collections. During the course of a field project with the "Organization for Tropical Studies course in Vertebrate Ecology" in 1971, a small specimen of an attenuate microteiid was collected in deep litter between the buttresses of a large tree in tropical wet forest near Rincón de Osa, Costa Rica. Four additional specimens of this lizard and an egg, which subsequently hatched, were found in the same general area in June, 1973, by a field party from the University of Southern California. Comparison of these specimens with the type specimen of *Bachia blairi* (Dunn) 1940 indicated that the new Costa Rican material is representative of Dunn's species previously known only from Puerto Armuelles, Chiriquí, Panamá. As these specimens represent the first records from Costa Rica and the only known specimens other than the type, they are worthy of detailed consideration. In addition, Dixon (1973), in a review of the genus, placed *B. blairi* in the synonymy of *B. pallidiceps*, (Cope) 1862, although the two taxa were not compared in detail.

Herein we attempt to clarify the systematic relationships between *B. blairi* and *B. pallidiceps*, to provide specific habitat data for the species, and to facilitate the completion of a distributional checklist and key to the Costa Rican herpetofauna (cf. Savage, 1973).

Systematic Relationships

Dunn (1940) described *Scolecosaurus* (= *Bachia*) *blairi* from a single, adult male (ANSP 21773) collected 27 July 1939, at Puerto Armuelles, Chiriquí Province, Panamá. He stated that *blairi* was close to *pallidiceps* but differed primarily in coloration. Adult *Bachia blairi* are dark gray to black dorsally and ventrally without light, lateral stripes. Hatchlings are brown in life and fade to light brown in preservative. Specimens of *B. pallidiceps* (KU 96868–78) have a mid-dorsal (3–4 scales wide), dark brown stripe bordered laterally by a yellowish-tan stripe (1–2 scales wide) on the nape and continuing uninterrupted well onto the tail. Laterally and ventrally *pallidiceps* is dark brown. These differences in coloration are shown in figure 1.

The twenty-three characteristics used by Dixon (1973) in his revision of *Bachia* were scored for all known specimens of *B. blairi* and a series of 11 *B. pallidiceps* (KU 96868–78) from Río Tuira at Río Mono, 130 m, Darién Province, Panamá. This series was selected because it is the largest sample available from a single population and from the northwestern range of *pallidiceps*. In most characteristics *Bachia blairi* and *B. pallidiceps* are similar. Dunn's (1940) description of *B. blairi* and Dixon's (1973) summary of *B. pallidiceps* are adequate to characterize the species. One correction of Dunn's description is required; the holotype, and, for that matter, all known specimens of *B. blairi* have five infralabials, not four as reported by Dunn (1940). Outline drawings of the head and limbs of *B. blairi* are shown (Fig. 2) in the same format as those presented by Dixon (1973) of all other species of *Bachia*.

In addition to coloration, *B. blairi* can be distinguished from *B. pallidiceps* by the more robust size of the former. The differences in habitus are best expressed by four characteristics: number of dorsal scales, number of ventral scales, number of scales around the body (SAB), and body volume. The three characteristics of scalation are compared in table 1. For comparison, Dixon's data for *B. pallidiceps*, which include the KU series, are included. Although Dixon listed the holotype of *B. blairi* under *B. pallidiceps* in his "Specimens Examined" section, he apparently did not include it in the scale counts present (Dixon, 1973: table 3) because the holotype of *B. blairi* has 29 ventrals and the lowest ventral count listed for *B. pallidiceps* is 30.

These three characteristics reflect the more robust size of *B. blairi*. A comparison of the Panamá sample of *pallidiceps* to the sample of *blairi* shows highly significant

differences ($P < .01$) between them in all three traits (t values = 5.9806 for SA8, 3.8744 for Dorsals, 3.7677 for Ventrals; $df = 16$). Because of the inherent redundancy and the lack of original counts for all the specimens included in Dixon's sample, a statistical comparison of the entire sample ($N = 18$) to the single population sample of *pallidiceps* ($N = 11$) was not attempted. However, we believe the differences established by our analysis between *blairi* and *pallidiceps* would hold.

A fourth approach comparing the body sizes of the two species using volume displacement supported our earlier finding. Because some specimens had broken tails, only body displacement was used. Each adult specimen was submerged in a graduated cylinder of alcohol to the level of the anal opening, and the volume (ml = cc) of liquid displaced was measured. A graphic representation (Fig. 3) of these results shows complete separation of *blairi* and *pallidiceps* with differences between animals of the same length ranging from a low of 1.7 cc (27% of the smaller's body volume) to a high of 5.5 cc (87% of the smaller's body volume). The holotype of *B. blairi* has the lowest volume recorded for that species, probably because the body cavity has been opened; thus, comparable and accurate displacement measurements were difficult to obtain. Even with this problem, adults measured do not overlap in volume. This volumetric separation compliments the scalation data (Table 1) and reflects the differences in habitus between the two species.

Specimens of *B. blairi* are distinguished easily from *B. pallidiceps* on the basis of coloration and habitus. These characteristics, together with the data presented on scalation, lead us to conclude that *Bachia blairi* is a species distinct from *B. pallidiceps*. As currently understood, *B. blairi* occurs only in extreme western Panamá and adjacent southwestern Costa Rica (Fig. 4). *Bachia pallidiceps* is known from eastern Panamá and adjacent northwestern Colombia.

The series of *B. pallidiceps* from Río Mono, Panamá was collected in trench traps dug in the forest floor by Dr. Charles W. Myers who allowed us to use his field observations and notes. All specimens except one were collected at night, often in the vicinity of a heavy *Ananas* growth. Apparently the species is nocturnal as none was seen moving on the leaf litter during the day. In life, these *B. pallidiceps* were shiny black above and below; the tip of the snout and chin were gray; dorsolateral stripes begin on the nape and extend onto the tail; the stripes were orange-tan or tan and often faded on the tail; none extended to the tail tip; the tongue was whitish. In preservative, the lizards are dark brown laterally and ventrally with light tan stripes. In several specimens the dorsal coloration between the stripes is distinctly lighter brown than that on the sides.

Natural History

The holotype of *B. blairi* was collected by E. R. Dunn on 27 July 1939 ". . . under debris on the bank of the small stream near the Chiriquí Land Company Hospital."

All Costa Rican specimens were collected in deep leaf litter (10–30 cm) between the buttresses of large trees in the forest near the old Tropical Science Center Field Station located near the air field, 3 km WSW Rincón de Osa, 40 m, Puntarenas Province, Costa Rica. This area is part of a broad leaf evergreen lowland forest that was described as the rainforest of Golfo Dulce by Allen (1956) and as tropical wet forest by Tosi (1967) using the Holdridge system.

Two hatchlings are available for study. One, the first specimen collected in Costa Rica, was taken in a litter plot on 10 May 1971. This specimen (RWM 6614) is typical of the adults in all respects except for the presence of 5 supralabials on the left side and, like all other specimens, 6 on the right. It measures 27 mm snout-vent length, 33 mm tail length, and 1.4 cc in body volume. The second (CRE 9917) was hatched from an egg collected in litter 3.5 km WSW Rincón de Osa between 4–10 July 1973. The egg hatched 29 days later. This specimen measures 28 mm snout-vent length, 34 mm tail length and 1.7 cc in body volume. The egg was small and elongate. Four or five similarly-shaped eggs were found in leaf litter during the same period. The yolk sac was attached between ventrals 20–21 in the first specimen and between 21–22 in the second. The attachment point is more obvious in the larger specimen which was preserved 1 day after hatching. One female (CRE 9429) collected on 4 July 1973 and measuring 61 mm snout-vent length contained two developing ova; the left measured 2.9 mm and the right 3.1 mm along the greatest dimension. A male (CRE 9428) collected on 4 July 1973 measured 58 mm snout-vent length. His testes measured 2.9 mm each in length; the preanal pores (one on each side) were obvious. The stomach from CRE 9429 contained the remains of a beetle and a lepidopteron larva.

Specimens Examined

Bachia blairi

Costa Rica — Puntarenas Province: vicinity of air field, Rincón de Osa. RWM 6614 (juv), 10 May 1971; CRE 9406 (♀), 3 July 1973; CRE 9428 (♂), 4 July 1973; CRE 9429 (♀), 4 July 1973; CRE 9457 (♀), 5 July 1973; CRE 9917 (juv), hatched from egg collected between 4–10 July 1973.

Panamá — Chiriquí Province: Puerto Armuelles. ANSP 21773 (♂), holotype, 27 July 1939.

Bachia pallidiceps

Panamá — Darién Province: Río Tuira at Río Mono, 130 m KU 96868–78 (3♀♀, 7♂♂, 1 juv ♀), 17–23 July 1965.

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Resumen

Se comunica por primera vez la existencia del lagartillo *Bachia blairi* (Dunn) en Costa Rica. Se lo compara con *Bachia pallidiceps* (Cope) de Panamá, la especie con la cual tiene la mayor afinidad aunque se lo considera y mantiene como una especie distinta. Se tratan varios aspectos de su ecología en el bosque húmedo de las tierras bajas de Costa Rica.

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Table 1. Comparison of scale characteristics of *Bachia blairi* and *Bachia pallidiceps*.

Species		Scales Around Body	Dorsals	Ventrals
<i>blairi</i> (N = 7)	$\bar{X} \pm SE$	24.3 ± 0.18	43.9 ± 0.34	29.7 ± 0.29
	SD	0.49	0.90	0.76
	Range	24–25	43–45	29–31
<i>pallidiceps</i> ¹ (N = 11)	$\bar{X} \pm SE$	22.5 ± 0.21	45.8 ± 0.33	31.45 ± 0.34
	SD	0.69	1.08	1.13
	Range	22–24	45–48	30–33
<i>pallidiceps</i> ² (N = 18)	$\bar{X} \pm SE$	22.9 ± 0.22	45.3 ± 0.33	31.6 ± 0.27
	SD	0.91	1.35	1.15
	Range	21–25	43–48	30–34

1. all specimens from Río Tuira at Río Mono, Darién Prov., Panamá, 130 m.

2. data from Dixon (1973: table III); includes 11 specimens of *pallidiceps* of row 2 plus other specimens from Panamá, Colombia, and an unspecified locality.

Fig. 1. Dorsolateral views of adult *Bachia blairi* (above) from Rincón de Osa, Puntarenas Province, Costa Rica. and *Bachia pallidiceps* (below) from Río Tuira at Río Mono, Darién Province, Panamá, showing differences in habitus and coloration.

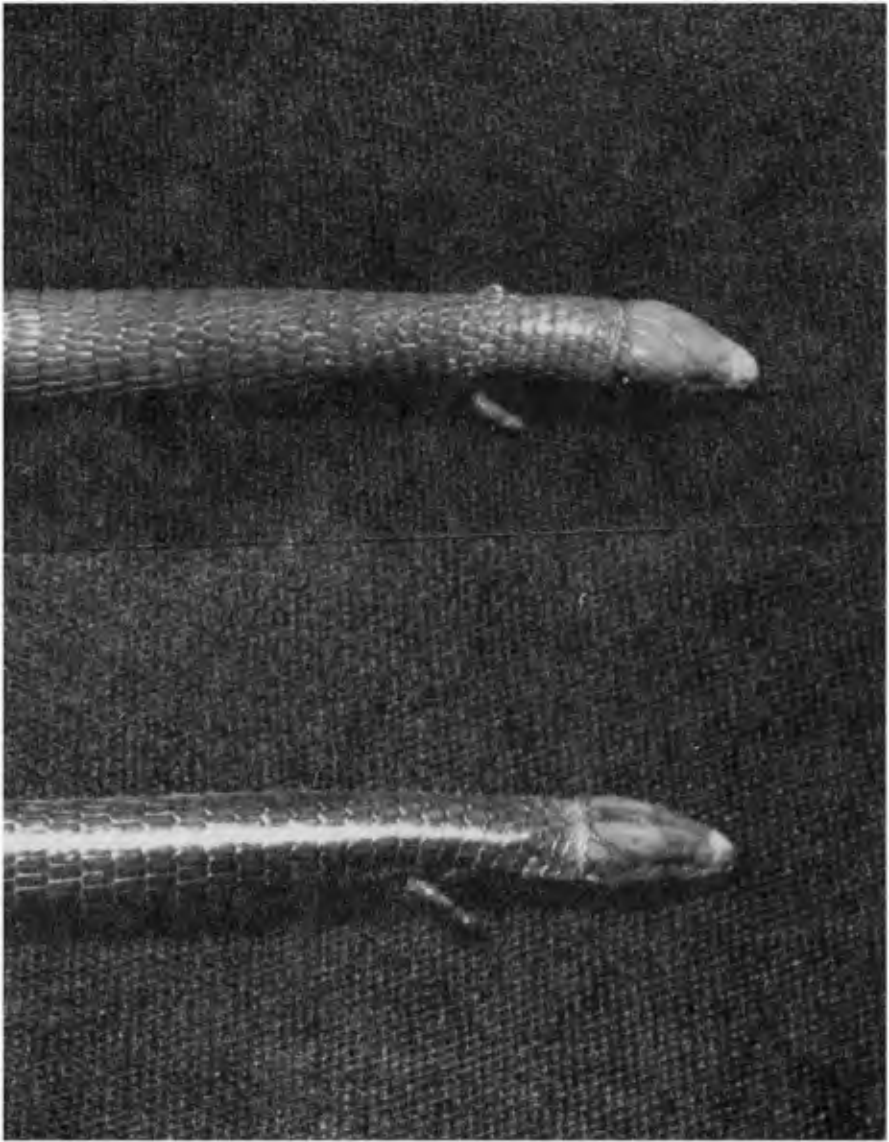
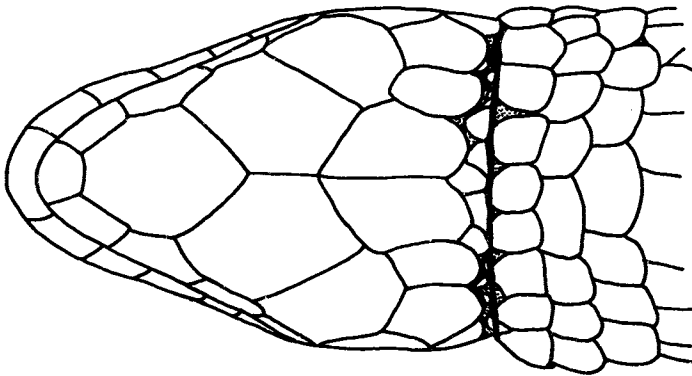
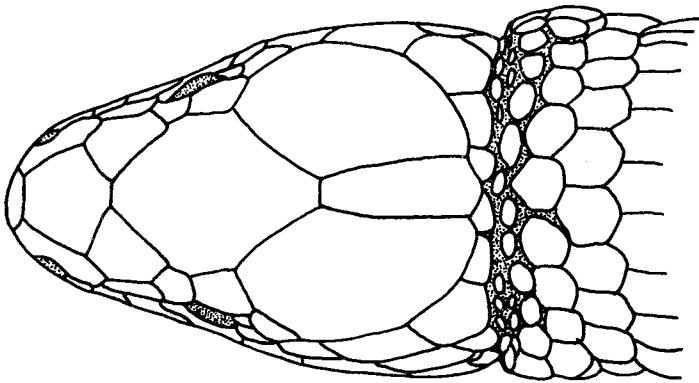
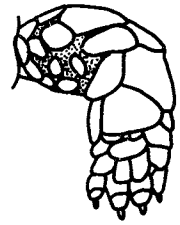
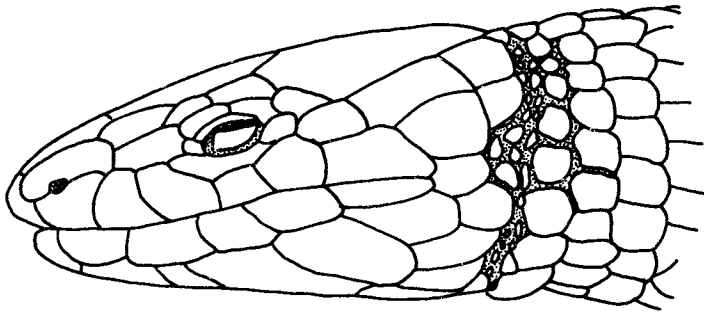


Fig. 2. Outline drawings of lateral, dorsal, and ventral views of the head and the front and hind limbs of an adult female *Bachia blairi* (CRE 9429). Line equals 5 mm.



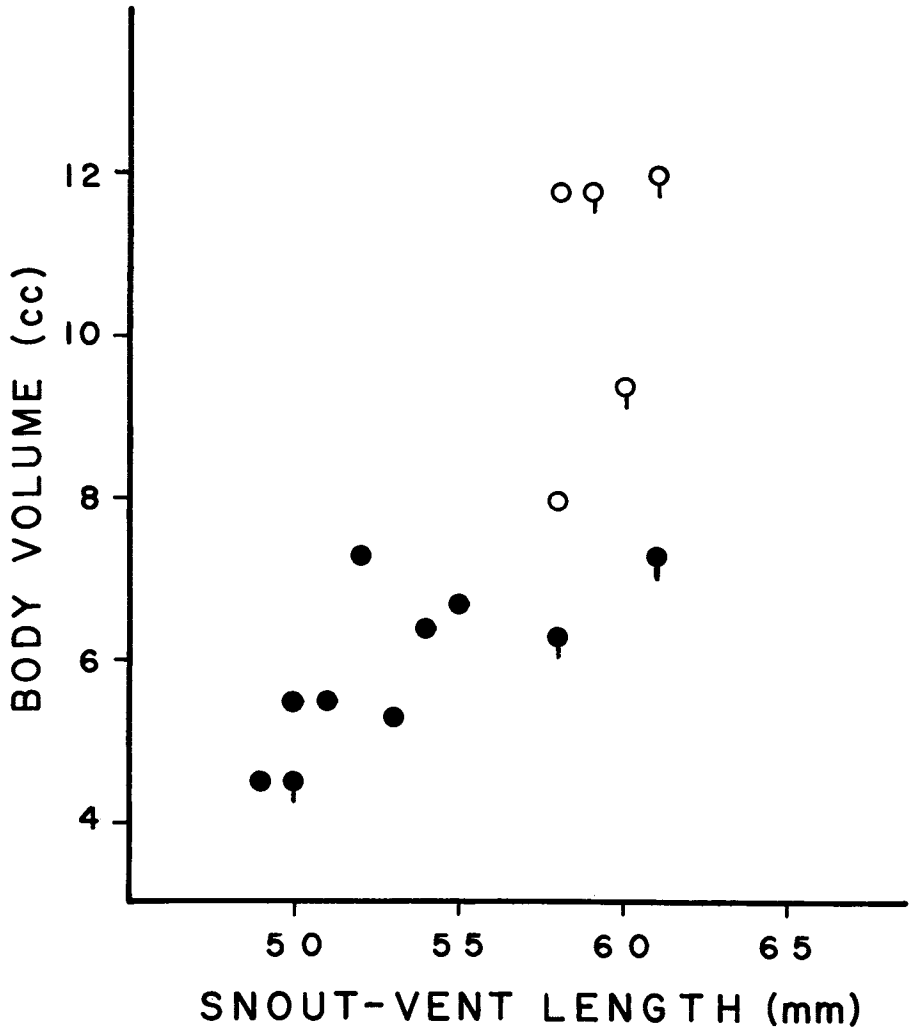


Fig. 3. Relationship between snout-vent length and body volume for *Bachia blairi* (open circles) and *Bachia pallidiceps* (solid circles). Circles with vertical lines indicate females.

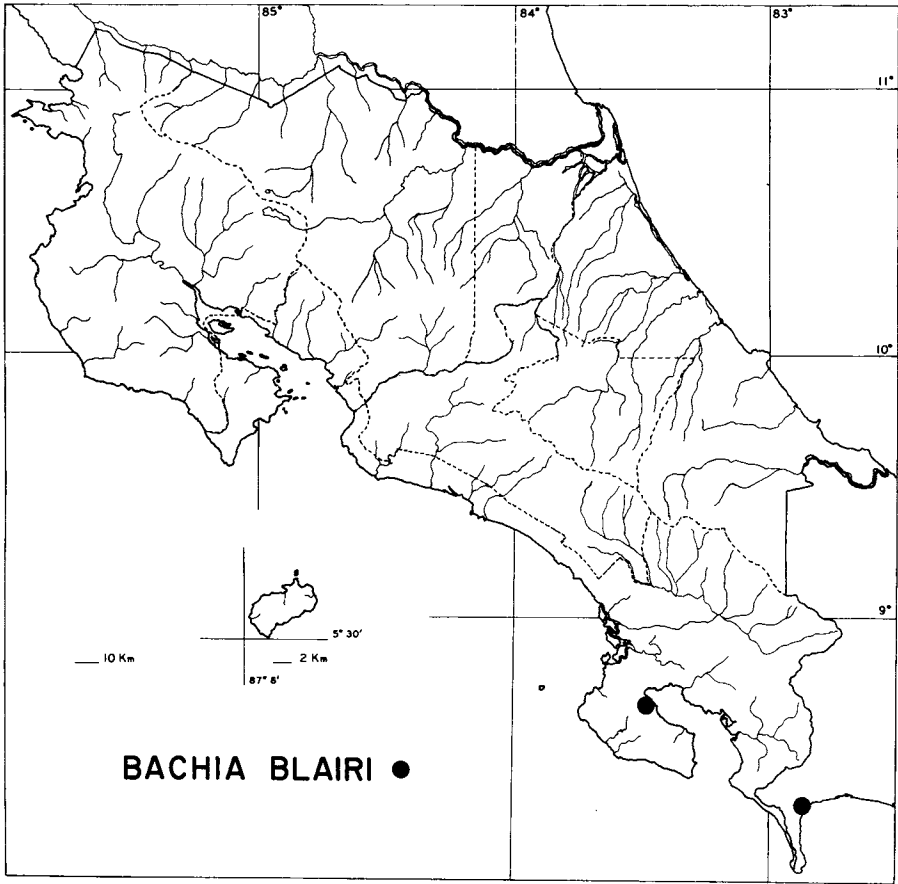


Fig. 4. Map showing the known distribution of *Bachia blairi* in Costa Rica and adjacent Panamá.