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## THREE NEW LIZARDS OF THE GENUS *EMOIA* (SCINCIDAE) FROM SOUTHERN NEW GUINEA

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ABSTRACT. Three new species of skinks in the genus *Emoia* are described from provinces south of the central mountain range, New Guinea.

### INTRODUCTION

The genus *Emoia* is widespread through much of the Indo-Australian Archipelago and the islands of the Pacific, and ranges into the Philippines in the north and northeastern Australia and New Hebrides in the south. The greatest diversity of species occurs in New Guinea and surrounding smaller islands. The three new species described in this paper are from south of the central mountain range in New Guinea.

One species is based on a series of specimens collected primarily by the junior author in the Fly River and Bamu River drainages, Western Province, Papua New Guinea. The second ranges from Western Province westward through southern Irian Jaya. Both species are in the *E. baudini-submetallica* group as defined by Brown, 1953. The third species which belongs to the *E. physicae* group (Brown, 1953) has a wide range in several provinces of southern Papua New Guinea. The last two, in addition to the series collected by the junior author, are also represented in earlier collections.

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These had been misidentified as juveniles of *E. p. physicae*, *E. p. tropidolepis*, or *E. baudini*.

*Emoia aurulenta* new species

(Fig. 1)

*Holotype*: MCZ 142327, adult male, collected at Migalsimbip in the upper Fly River drainage at an elevation of about 1,200 m, Western Province, Papua New Guinea, Fred Parker Coll., 16 August 1972.

*Paratypes*: The following localities in Western Province, Papua New Guinea, Migalsimbip: SAM 11637; AM 40778; MCZ 142322-26, 142328-30, 152268-71, 152273-75, CAS 154186, AMNH 111718; UPNG 6477-78, 6480, 6483; Derongo: MCZ 131895-900; AMNH 103961; Menemsore: MCZ 131901; Emeti: MCZ 152265-67, 152291, AMNH 111715; Tingkem: MCZ 131894.

*Diagnosis*. This species differs from the other New Guinean species of the *Emoia baudini* section in the following combination of characters: (1) small size, 37+ to 49.5 mm snout-vent length at maturity; (2) pattern of gold-orange markings on the sides of the neck and the lateral surfaces of the body in life (these fade to dirty, silvery-white in preservative); (3) low number of midbody scale rows; 26 to 32 (mean 28+), rarely greater than 30; (4) number of subdigital lamellae, 39 to 48 beneath the fourth toe; and (5) number of paravertebral scale rows between the parietals and base of tail 45 to 52.

*Description*. A small *Emoia*, snout-vent length of 41.3 to 49.5 mm for 16 males and 37.4 to 47.5 mm for eight females; habitus moderately slender; snout moderately tapered, bluntly rounded, its length 35 to 40% of head length and 52 to 60% of head breadth; head breadth 64 to 69% of head length and 15 to 18% of snout-vent length; eye moderately large, its diameter 71 to 85% of snout length and 40 to 45% of head breadth; ear diameter about one third to one half of eye diameter; rostral broader than high, forming long, nearly straight suture with frontonasal; supranasals widely separated, narrowly triangular, in contact with anterior loreal; prefrontals moderately to widely separated; frontal longer than broad, rounded posteriorly, shorter than fused fronto-interparietal shield, in contact with first and second supraoculars; four large supraoculars; parietals large, in contact posteriorly; one pair of nuchals; anterior

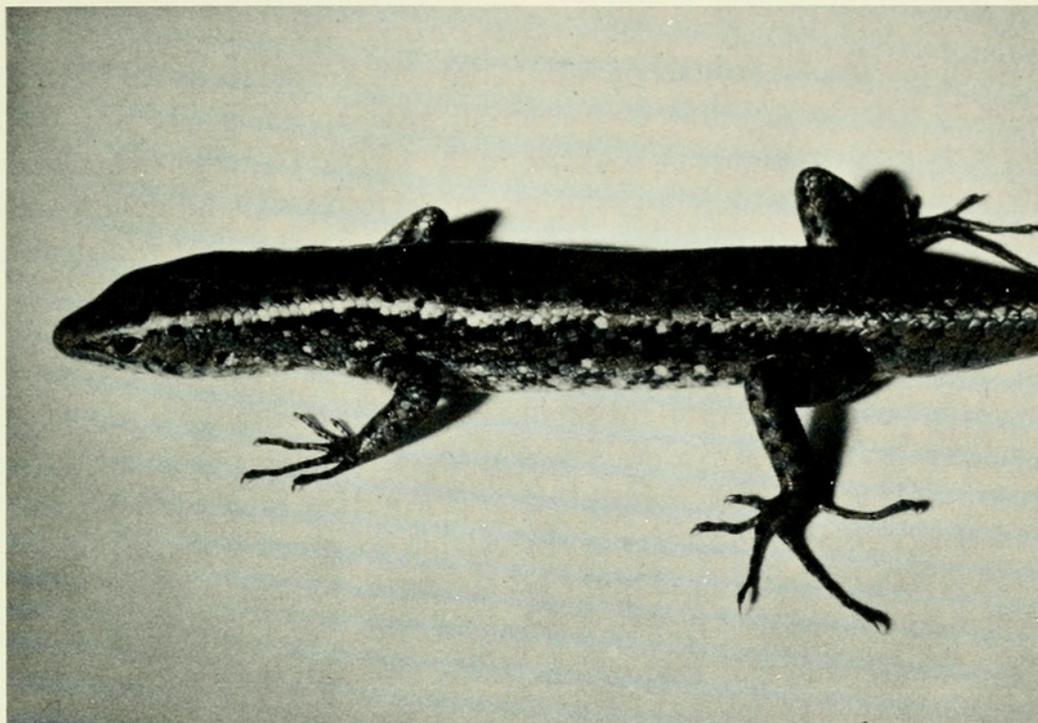


Figure 1. An adult *E. aurulenta*.

loreal higher and shorter than posterior, in contact with second, or first and second supralabials; six to seven upper labials, fifth (very rarely sixth) enlarged and beneath eye; six to seven lower labials; dorsal scales smooth, vertebral rows not distinctly enlarged; 26 to 32 (usually 28 to 30) midbody scale rows; 45 to 52 (mean 48.3) paravertebral rows between parietals and base of tail, ventrals about same size as dorsals; preanals somewhat enlarged; limbs well developed, length of extended hind limb 90 to 110% of axilla-groin distance and 47 to 54% of snout-vent length; 39 to 48 (mean 42.6) smooth, rounded lamellae beneath fourth toe; 10 to 14 lamellae under first toe; rank of adpressed toes from longest to shortest four, three, two to five, one; tail slender and much longer than body.

*Measurements (in mm) of Holotype.* Snout-vent length 49.0; axilla-groin distance 24.8; hind limb length 24.1; head length 11.9; head breadth 8.1; snout length 4.35; eye diameter 3.4; ear diameter 1.5; tail length 76.4.

*Color in Preservative.* The basic ground color on the dorsum ranges from light olive greenish-brown to brown marked by lighter and darker blotches, usually involving all dorsal scale rows (or occasionally not including the paravertebral rows). The light and dark

blotches may occupy alternate scales or involve two or more scales. The upper lateral surfaces are dark brown, bordered dorsally by a row of scattered, single or clustered, pale scales. There are also scattered pale scales between and on the limbs. The neck is marked by pale and dark blotches, and the posterior labials by dark bars. The venter is dirty white to grayish, lightest on the chin and in the limb regions.

In life, the top of the head is bronze with a lighter line from above the eye to the nuchals or for a few specimens extending further posterior onto the neck. The dorsum is gray or brown with alternate black scales or paravertebral rows of black spots in a checkerboard pattern. The upper flanks are black or mottled black and brown. The lower flanks and usually the side of the neck are marked by golden yellow spots. The venter is yellowish to cream.

*Comparison.* *Emoia aurulenta* is related to Papuan species of the *E. baudini-submetallica* group, but is readily distinguished in life by such features of the color pattern as the checker-board pattern on the dorsum and the prominent golden yellow spots on the sides. It also is characterized by a lower number of midbody scale rows than other known species of this section. Also, the number of subdigital lamellae is greater than for most other species of this group, only overlapping slightly with *E. s. popei* and two other undescribed species (Table 1).

*Etymology.* The name *aurulenta* refers to the golden yellow spots on the sides.

*Note on Reproduction.* No data are available for this species.

*Note on Habitat.* This is a diurnal species which is active on the rain forest floor beneath the unbroken canopy.

*Range.* *Emoia aurulenta* is known only from the Fly and Bamu River drainages in the Western Province, Papua New Guinea.

Another undescribed species represented by samples from several populations south of the central mountain range between Western Province in Papua New Guinea and the Jamur Lake area in western Irian Jaya can not be identified with any previously described species of *Emoia*. Four specimens from various localities in Western Province, Papua New Guinea were collected by Fred Parker in 1969 and 1971. A series of specimens in the Leiden Museum collected during a 1955 survey and the 1959 expedition along the Digul River and several of its tributaries in southeast Irian Jaya and several collected earlier at more westerly locations (identified as *E.*

*baudini*) also belong to this species. These were collected in part by the British Ornithological Expedition in the Mimika River area in 1913 and in part by the Royal Netherlands Geographical Society Expedition in the Jamur Lake area in 1959.

*Emoia aenea* new species  
(Fig. 2)

*Lygosoma baudini*, (part) Boulenger, 1914, Trans. Zool. Soc. London, **20**: 259.

*Holotype*: MCZ 131949, adult male, collected at Menemsore, Western Province, Papua New Guinea, Fred Parker coll., 30 March 1969.

*Paratypes*: The following localities in Western Province, Papua New Guinea, Matkomrae: MCZ 144393, Emeti: MCZ 144386, Kiunga: MCZ 131948; the following localities in Irian Jaya, Mimika River area: BMNH 1913.11.1.81-82, 1913.10.31.164F; Gariau, Jamur Lake area: RMHN 21278; lower Digul River, Tanah Merah: RMHN 21180-85, 21273-74, 21276-77; 21279; Tanah Tinggi: RMHN 21275, 21280-82; Kouh: RMHN 21186-89; CAS 156680; Mariang: RMHN 21190-94.

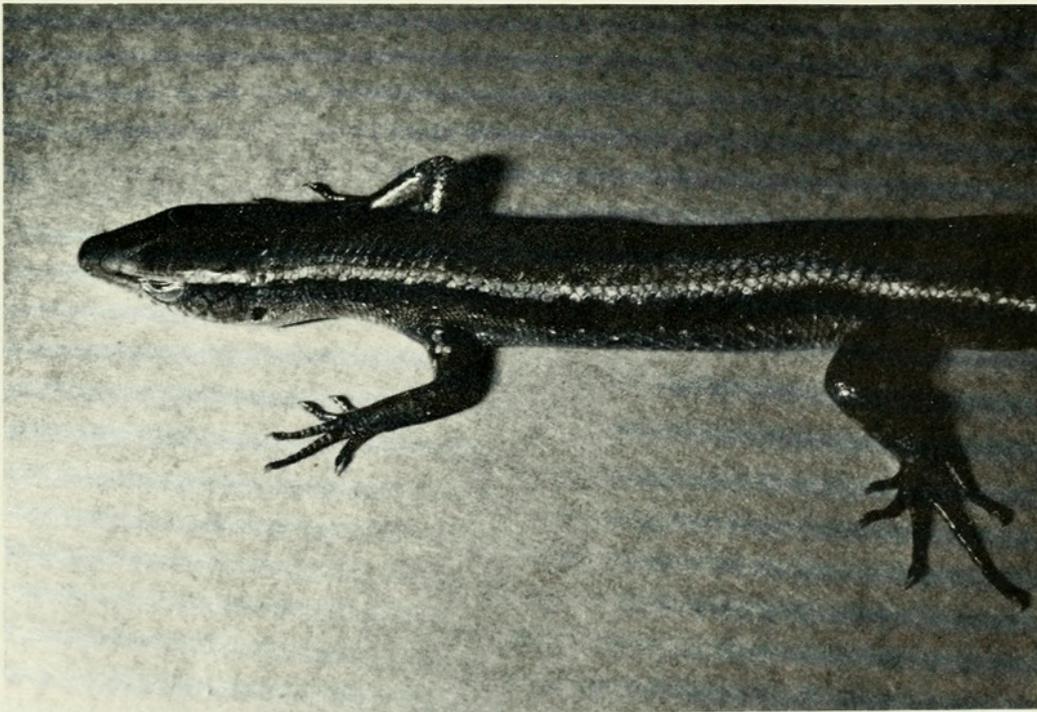


Figure 2. An adult *E. aenea*.

Table 1. Pertinent scale counts and measurements of the species of *Emoia* described in this paper and related species.

Species	Number in sample	Snout-vent length adults (in mm)	Keels on scales		Upper labial beneath eye		Midbody scale rows	Scale rows		Fourth toe lamellae
			present	absent	5th	6th		between parietals and tail	R=	
<i>E. aurulenta</i> new sp.	28	37.0- 49.5		x	20		R=26-32	R=45-52	R=39-48	
<i>E. aenea</i> new sp.	27	53.5- 71.0		x	3	15	R=31-36	R=49-54	R=39-46	
<i>E. s. popei</i>	29	44.9- 65.0		x	5	21	R=34-42	R=44-52	R=37-44	
<i>E. s. obscura</i>	75	43.9- 63.5		x	68	9	R=30-39	R=43-55	R=30-41	
<i>E. physicina</i> new sp.	38	39.0- 50.4	x		25	2	R=30-38	R=45-54	R=34-43	
<i>E. physicæ</i>	108	48.9- 74.3	x		11	92	R=34-43	R=45-58	R=32-42	

*Diagnosis.* This species can be differentiated from other species of the *E. submetallica* complex on the basis of the following combination of characters: (1) 31 to 36 midbody scale rows; (2) 49 to 54 paravertebral scale rows between the parietals and the base of the tail; (3) 39 to 46 rounded lamellae under the fourth toe; (4) sixth (rarely fifth) upper labial enlarged and beneath the eye; (5) snout-vent length at maturity 53.5 to 71.0 mm; (6) such features of the color pattern as dorsum medium brown (in life bronzy anteriorly), sometimes with darker blotches in longitudinal series mostly lateral to the paravertebral scale rows; upper lateral surfaces (two or three rows of scales) darker brown to blackish, lower lateral surfaces grayish slate; venter whitish to ivory, occasionally more grayish on head and abdominal regions, pale spot on neck absent.

*Description.* An *Emoia* of intermediate size, snout-vent length 53.5 to 71.8 mm for 11 males and 59.6 to 69.5 mm for three females; habitus moderately robust, limbs well developed; snout moderately tapered, bluntly rounded, its length 54 to 62% of head breadth and 34 to 39% of head length; head breadth 58 to 69% (rarely less than 60%) of head length and 14 to 17% of snout-vent length; eye relatively large, its diameter 67 to 90% of snout length and 36 to 50% of head breadth; ear diameter one quarter to nearly one half of eye diameter; rostral broader than high, forming long, nearly straight suture with frontonasal; supranasals narrow, elongate, in contact with anterior loreal; prefrontals moderately to widely separated; frontal longer than wide, about same length as fused fronto-interparietal shield, broadly rounded posteriorly, in contact with first and second supraoculars; four large supraoculars; seven or eight supraciliaries; parietals large, in broad contact posteriorly; one pair of nuchals; anterior loreal shorter and higher than posterior, in contact with first and second, second, or second and third upper labials; usually six to eight upper labials, sixth (occasionally fifth) enlarged and beneath eye; seven or eight lower labials; dorsal scales smooth, paravertebral scales not or scarcely enlarged; midbody scale rows 31 to 36; paravertebral scale rows between parietals and base of tail 49 to 54; preanals not or slightly enlarged; limbs well developed, length of extended hind limb 91 to 120% of axilla-groin distance and 45 to 54% of snout-vent length; 39 to 46 rounded lamellae under fourth toe; 10 to 14 lamellae under first toe; rank of adpressed toes from longest to shortest four, three, two, five, one; tail longer than body.

*Measurement (in mm) of Holotype.* Snout-vent length 71.0; axilla-groin distance 34.7; hind limb length 31.7; head length 17.8; head breadth 10.0; snout length 6.2; eye diameter 5.7; ear diameter 1.5; tail length 104±.

*Color in Preservative.* The dorsal ground color ranges from tan to a vaguely grayish-brown or a light brown. It may be nearly uniform or be marked by a longitudinal row of dark brown blotches or sometimes dark brown, narrow, marginal lines on the scale rows lying lateral to the paravertebral rows. The top of the head, except sometimes the margins of the scales is relatively uniform. The upper lateral surface is marked by a narrow, darker brown band varying from one or two to three or four scale rows in breadth, narrowing on the neck and head and scarcely evident on the snout. This band is sometimes bordered by scattered, pale scales along its dorsal margin and there are numerous pale scales on the lower lateral surfaces, but the dark band itself is usually unmarked. The upper part of the upper labials are dusky, and there are some dark marks on some of the lower labials. The venter is whitish ivory, unmarked, and the undersurface of the tail has scattered, small, blackish or grayish spots.

In life the head and neck are bronzy, the belly white. The Kiunga specimen has a patch of pink just anterior to the vent, the Menem-sore specimen a patch of orange. The dorsal scales are smooth and iridescent.

*Etymology.* The name *aenea* refers to the bronzy coloration on the top of the head and anterior body.

*Comparisons.* This species is close to *E. submetallica obscura* and *E. submetallica popei* in scale counts. In color *E. aenea* is more similar to *E. s. obscura* than to *E. s. popei*, lacking the small, whitish blotch on the side of the neck which is typical of the latter. *E. aenea* also appears to be slightly larger in size and the number of subdigital lamellae may be slightly greater than for either of the two subspecies of *submetallica* (Table 1), although it is closest to *E. s. popei* in this character. Also the sixth upper labial is usually the one which is enlarged and beneath the eye for *E. s. popei* and *E. aenea*, whereas it is the fifth for *E. s. obscura*.

*Note on Reproduction.* RMHN 21281, a gravid female measuring 62.2 mm snout-vent length, has two eggs in the oviducts.

*Habitat Note.* Parker's specimens were found in primary forest in areas of high rainfall. All localities are at low elevation between sea level and 100 m.

*Range.* Known from Western Province, Papua New Guinea, and Mimika River, Digul River and Jamur Lake areas in southern Irian Jaya.

*Emoia physicina* new species  
(Fig. 3)

*Holotype.* MCZ 152287, adult male, collected near Emeti, Western Province, Papua New Guinea at an altitude of about 100 m, Fred Parker coll., October 1971.

*Paratypes.* Same locality as holotype: MCZ 142567-72, 152283-86, 152288, 152290, AMNH 111713-14; other localities in Western Province, Menemsore: MCZ 131945-46, 152280; Kiunga: MCZ 152281-82; Derongo: AMNH 111712, MCZ 131938-39, 131942; Matkomrae: MCZ 131943-44; localities in other provinces of Papua New Guinea, Chimbu Province, Karimui: MCZ 97308-09, 99193-96, 109579-82, 109584-96, CAS 117731, 117750, 118769-70, 118807; Soliabeda: CAS 117733-34, MCZ 109509, 109589-96, 109598-99; Dege: MCZ 90750; Bomai: MCZ 90478-501; Eastern Highlands Province; AMNH 98570a-b; Gulf Province, Pio River: AMNH 102233, CAS 118871-72; MCZ 109601-03; Koni: CAS 117726-27; MCZ 109514, 109529, 109532; Uraru: CAS 117753-54, MCZ 109572-75, 109577-78; Oroi: MCZ 109833; Weiana: MCZ 109521-23; localities in Irian Jaya, Assike on the Digul River: RMHN 5081a-b.

*Diagnosis.* This species can be distinguished by the following combination of characters: (1) relatively weak keels on the dorsal scales, especially on the posterior half of the body; (2) small size, 39.0 to 50.7 mm snout-vent length; (3) relatively low midbody scale count 30 to 38; (4) fifth upper labial enlarged and beneath the eye; (5) number of vertebral scale rows between the parietals and base of tail 45 to 54, and (6) number of fourth toe lamellae 34 to 43.

*Description.* A relatively small *Emoia*, snout-vent length 39.0 to 50.7 mm for twelve mature males and 43.3 to 50.0 mm for fourteen mature females; habitus moderately slender with well-developed limbs; snout moderately tapered, broadly rounded at tip, its length

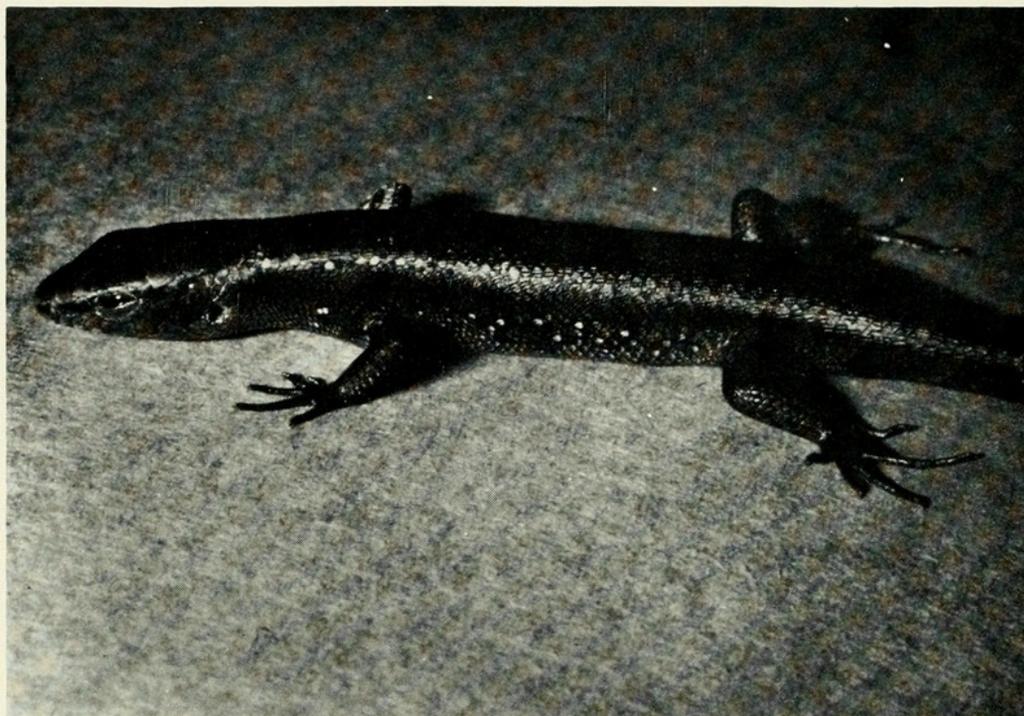


Figure 3. An adult *E. physicina*.

51 to 60% of head breadth and 35 to 39% of head length; head breadth 60 to 72% of head length and 15 to 18% of snout-vent length; eye relatively large, its diameter 72 to 85% of snout length and 39 to 46% of head breadth; ear moderate, its diameter about two fifths to three fifths of eye diameter, usually with two lobules anteriorly; rostral broader than high, forming long, convex or truncate suture with frontonasal; prefrontals moderately to widely separated; frontal slightly longer than broad, about as long as fronto-interparietal shield, in contact with two anterior supraoculars; four large supraoculars; frontoparietals fused with interparietal into one shield; parietals in contact; one pair of nuchals; anterior loreal shorter and slightly higher than posterior loreal, in contact with first or first and second upper labials; seven or eight upper labials, fifth (very rarely sixth) enlarged and beneath eye; six or seven lower labials; dorsal scales, at least posteriorly, with three weak to moderate keels; 30 to 38 scale rows at midbody; 45 to 54 (rarely greater than 53) paravertebral rows between parietals and base of tail; limbs well developed, length of extended hind limb 91 to 105% of axilla-groin distance and 44 to 54% of snout-vent length; 34 to 43 rounded lamellae beneath fourth toe (only one specimen has

more than 40); 8 to 10 beneath first toe; rank of adpressed toes from longest to shortest four, three, five, two, one; tail much longer than body.

*Measurements (in mm) of Holotype.* Snout-vent length 48.1; axilla-groin distance 21.9; hind limb length 22.6; head length 12.9; head breadth 8.3; snout length 4.5; eye diameter 3.4; ear diameter 1.6; tail length 74.8.

*Color in Preservative.* The dorsum (six to eight scale rows) is medium brown, nearly uniform or with rows of darker brown spots marginal to the paravertebral rows. The lateral surfaces, at least five to six upper scale rows, are usually much darker brown, nearly uniform or with scattered single or small groups of pale or whitish scales and often one or two light scales on neck. The upper labials are dusky, at least on the dorsal half, and the lower labials may or may not have dusky blotches. The venter is grayish slate, more dusky tan or ivory in the limb region.

For living specimens, the dorsum is grayish-brown to brown, usually with two rows of paravertebral dark spots. Lateral surfaces are blackish with scattered light spots on the lower flanks. Some specimens have the upper and lower surfaces of the snout suffused with red.

*Etymology.* The name *physicina* refers to the fact that the species has been confused with juveniles of other keel-scaled species such as *E. physicae*.

*Comparisons.* *Emoia physicina* can be distinguished from all other known species of the *E. physicae* section except *E. callistica* (1) on the basis of its small size, (2) the very weak keels which separate it from all but *E. kuekenthali*, (3) in having the fifth instead of sixth upper labial enlarged and beneath the eye. It differs from *E. callistica* in lower number of midbody scale rows and subdigital lamellae, in the distinct nuchals, and in the very weak rather than strong keels on the dorsal scales.

*Note on Reproduction.* Gravid females CAS 110360, 49.3 mm snout-vent length and CAS 118770, 50.0 mm snout-vent length have two eggs in the oviducts. One hatchling (MCZ 90750) measures 24 mm snout-vent length.

*Habitat Note.* This species occupies the rain forest floor in areas shaded by the canopy. Specimens do bask in sunflecked areas, however. It is strictly diurnal.

*Range.* *E. physicina* is known from the following provinces in southern Papua New Guinea: Eastern Highlands, Gulf, Chimbu, and Western.

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