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A New Lizard of the Genus *Emoia* (Scincidae) from Morobe Province, Papua New Guinea

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ABSTRACT

A new skink of the genus *Emoia* from the vicinity of Wau in the Bulolo River drainage, Morobe Province, Papua New Guinea, is described. Its relationship to the other species in the *E. submetallica* complex is discussed, and a key to the species of *Emoia* occurring in the Wau area is provided.

INTRODUCTION

Collections by the 2nd author from the vicinity of Wau on the upper Bulolo River drainage, Morobe Province, Papua New Guinea, include 7 sympatric species of the scincid lizard genus *Emoia,* 1 previously undescribed. The last, a distinctively colored species, is thus far recorded only from near Wau, whereas the others in the drainage system [*E. caeruleocauda* (de Vis), *E. jakati* superspecies, *E. loveridgei* Brown, *E. pallidiceps* superspecies, *E. physicae* (Dumeril & Bibron), and *E. submetallica popei* Brown] are all relatively widespread on the north and east side of the central mountain range in Papua New Guinea; *E. pallidiceps* and *E. physicae* are also found on the south side.

The new species described herein is probably most closely related to *E. submetallica popei* and *E. s. submetallica* (Macleay). The latter, however, unlike *popei,* is not sympatric with the new species in the Wau region; it occurs to the south in the Waria River drainage between the Chapman and Bowutu ranges, as well as in the mountains in Central Province west of the central mountain range.

The purpose of this paper is to describe the new species and to provide a diagnostic key to the 7 species of *Emoia* thus far recorded from the Wau area.

Emoia guttata Brown & Allison, **new species** Fig. 1

Emoia submetallica: Allison, 1982, p. 810 [not *submetallica* (Macleay)].

This species is a member of the *E. baudini* group (evolutionary line), a group of about 20 species mostly limited to New Guinea and nearby islands. The species of this section are mostly small to intermediate in size; have smooth scales; a short, high, anterior loreal; rounded subdigital lamellae, numbering not more than 50 under the 4th toe; and fronto-parietals and interparietal fused into 1 shield.

Diagnosis. This species of *Emoia* is distinguished from congeners by the following combination of characters: (1) snout–vent length of mature specimens 51–73 mm; (2) midbody scale rows 33–38; (3) paravertebral scales between parietals and base of tail 49–58; (4) 4th-toe lamellae 35–43; (5) prefrontals moderately to widely separated; (6) 6th (rarely 5th) upper labial enlarged and beneath eye; (7) color pattern: dorsum olive to light

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Fig. 1. Photograph of adult *Emoia guttata.*

olive-brown with scattered black and whitish blotches on body and tail; upper lateral surface black, bordered below by an irregular white band; sides of neck and lower lateral surfaces marbled by scattered black and whitish blotches (Fig. 1).

Description. An intermediate sized *Emoia,* snout–vent length 51–73 mm for 407 adult males and 51–69 mm for 339 adult females (Allison 1979); snout moderately tapered, bluntly rounded, its length 43–50% of head breadth and 28–32% of head length; head breadth 63–73% of head length and 15–17% of snout–vent length; eye moderate, its diameter 58–74% of snout length and 25–36% of head breadth; ear diameter ⅓ to ½ of eye diameter; supranasals narrowly triangular, in contact with anterior loreal; rostral broader than high, forming long, relatively straight suture with frontonasal; prefrontals moderately to widely separated; frontal longer than wide, rounded posteriorly, somewhat shorter than to about as long as fused fronto-interparietal shield (rarely slightly longer), in contact with 1st and 2nd supraoculars; 4 large supraoculars; 7 supraciliaries; parietals in contact posteriorly; 1 pair of nuchals; anterior loreal shorter and higher than posterior, in contact with 1st and 2nd, 2nd or rarely 2nd and 3rd upper labials; usually 7 upper labials, 6th (rarely 5th) enlarged and beneath eye; 6 or 7 lower labials; dorsal scales smooth, scarcely larger than ventrals; midbody scale rows 33–38; paravertebral scales between parietals and base of tail 49–58; preanals slightly enlarged; limbs well developed, length of extended hind limb 95–117% (rarely < 100%) of axilla–groin distance and 46–54% of snout–vent length; 35–43 rounded lamellae beneath 4th toe (Table 1); 9–11 beneath 1st toe; rank of adpressed toes, from longest to shortest, 4, 3, 5=2, 1; tail longer than body.

Details of holotype. Snout–vent length 56.4 mm; axilla–groin distance 27.1 mm; hind limb length 27.3 mm; head length 11.8 mm; head breadth 8.2 mm; snout length 3.6 mm; eye diameter 2.1 mm; ear diameter 0.8 mm; tail length 79.5 mm. Thirty-five midbody scale rows, 58 paravertebral scales between parietals and base of tail, 38 fourth-toe subdigital lamellae.

Color. Dorsal ground color of live or freshly preserved specimens olive to light olive-brown. Top of head and anterior part of neck relatively unmarked except for a few blackish spots on supraoculars for some specimens. Body and tail marked by blackish blotches involving 1 to several scales and scattered whitish scales, the latter most frequent near dorsolateral line. Upper lateral surface marked by uneven black band (with a few whitish specks) 3–4 scale rows in breadth. This extends anteriorly as a narrow band through eye

and along snout onto lateral margin of rostral. Below is a narrower, whitish band; this may be broken by scattered dark, transverse lines and is in turn bordered ventrally by a narrow, irregular blackish band or series of blotches. Sides of neck and lower lateral surfaces blotched with black and whitish patches. Venter greenish blue to light slate.

Type data. Holotype, adult ♀, PAPUA NEW GUINEA: Morobe Prov: 3.5 km NW of Wau, on lower slopes of Mt Kaindi at 1,300 m, 5 May 1980 (A. Allison) [Bernice P. Bishop Museum (BPBM) No. 8345]. Paratypes. Morobe Prov, general area of Wau and Mt Kaindi in the Bulolo Riv drainage, BPBM 8337, 8346–47, 8811–14, 8816, 8818–19, 8822, 8824–25, 8827, 8829, 8833, 8837, 8839, 8843, 8845, 8847–48, 8851, 8856, 8865, 8867, 8870–72, 8874, 8876–77, 8881, 8883, 8886–87, 8889, 8895–96, 8913, 8915–16, 8921–22, 8924, 8926–30, 8932–33, 8938, 8943–44, 8946–49, 9226, 9228–29, 9231–33, 9235–36, 9238, 9241, 9247–48, 9255–56, 9258–60, 9265, 9268, 9275–80, 9282, 9284, 9286–87, 9290–9303, 9305, 9325, 9335, 9970, 9974, 9989–90, 9992, 9999–10000, 10002, 10013–14, 10017–19, 10021, 10027–28, 10031, 10045, 10047, 10049, 10051–56, 10058, 10060–61, 10063, 10070, 10076, 10079, 10081–90, 10092–104, 10106–115, 10117, 10119–21, 10123–32, 10137, 10143–46, 10149–55, 10172, 10190, 10194, 10203, 10212, 10215–17, 10226–31, 10243, 10246, 10259, 10261–62, 10266–67, 10270–71, 10280–83, 10294–95, 10314, 10330–31, 10335, 10349, 10362, 10380, 10410, 10422, 10430, 10441, 10449, 10452, 10456, 10458, 10466, 10474, 10481–83, 10499–507, 10512–19, 10521, 10525, 10527, 10532, 10539, 10541; AMNH 126687–96; CAS 155986–95; MCZ 142638–39.

Etymology. The name *guttata* is Latin for "spotted" and refers to the numerous light spots and blotches on the lateral surfaces.

Reproduction. Allison (1979) studied reproduction in this species at Wau (1,230 m). Most individuals of both sexes reach sexual maturity (as judged by the presence of enlarged follicles or oviducal eggs in females, or by testicular or epididymal sperm in males) at 53 mm snout–vent length, although a few individuals are mature by 51 mm. Reproduction occurs throughout the year. No clear seasonal pattern is evident, although numbers of ovigerous females tend to increase during wet periods. As is true of other species of *Emoia* (Greer 1968), the new species is oviparous and has a clutch size of 2. The 2 eggs are laid in a shallow hole in the ground and take from 95 to 115 days to hatch ($n = 6$). Hatchlings range from 69 to 79 mm in total length and from 25 to 27 mm in snout–vent length ($n = 14$). Hatchlings closely resemble adults in coloration.

Ecology. The new species is terrestrial and occurs in early successional forest and disturbed areas (e.g., roadsides, garden clearings) from ca. 900–1,750 m elevation. It is virtually absent from primary forest and other densely shaded areas.

Individuals emerge in the early morning to bask and are active for about 2 h, foraging mainly in leaf litter. The diet consists mostly of soft-bodied prey (orthopterans, moths, lepidopteran larvae, and spiders). Juvenile lizards (including conspecifics) are occasionally taken. Hard-bodied prey such as beetles and ants are rare in the diet (Allison 1979, 1982, in prep.).

Ecologically the new species is very similar to *Emoia physicae,* which, although slightly larger, occurs in the same general area, is apparently active at the same time of day, and has a similar diet. Both species are abundant.

Range. This species has thus far been recorded only from the upper Bulolo River drainage, Morobe Prov, Papua New Guinea.

Comparisons with other species of *Emoia* found near Wau as well as the related *E. submetallica* are provided in the following diagnostic key and in Table 1.

Table 1. Scale counts and other pertinent characters for *Emoia guttata* and other related or sympatric species of similar size with which it might be confused.

	Snout–vent length at maturity (mm)	No. in sample for scale counts	$\bar{x}$ no. midbody scale rows (range)	$\bar{x}$ no. scale rows between parietals and base of tail (range)	$\bar{x}$ no. 4th-toe lamellae (range)	Large upper labial under eye
E. guttata	51.0–73.0	25	35.4 (33–38)	53.0 (49–58)	37.7 (35–43)	6th
E. submetallica popei	44.9–65.0	28	38.2 (34–42)	48.4 (45–52)	40.6 (37–44)	6th
E. s. submetallica	44.4–64.7	35	37.6 (34–41)	57.0 (54–62)	33.3 (30–37)	5th
E. pallidiceps	33.6–61.5	30	34.3 (30–36)	50.6 (46–55)	34.6 (32–41)	5th

Diagnostic Key to Species of *Emoia* in the Vicinity of Wau, Upper Bulolo River Drainage

1. Most dorsal and upper lateral scales with 3–5 moderate to sharp keels ..... **Emoia physicae**
   Dorsal and upper lateral scales smooth (rarely some scales of immature specimens with weak keels) 2
2. Sixth (rarely 5th) upper labial enlarged and under eye 3
   Fifth (rarely 6th) upper labial enlarged and under eye 4
3. Number of paravertebral scale rows between parietals and base of tail 45–52; upper lateral surfaces medium to dark brown, sometimes bordered ventrally by a pale white line; side of neck brown, marked by a prominent pale white spot (not a line from ear to forelimb) ..... **Emoia submetallica popei**
   Number of paravertebral rows between parietals and base of tail 49–58; upper lateral surfaces dull black (fading to brown in preservative) marked by numerous, scattered pale white scales and usually bordered below by a narrow, broken light band and dark blotches ... . **Emoia guttata, n. sp**
4. Number of lamellae under 4th toe 23–30 (rarely > 28); snout–vent length at maturity 29–48 mm; color in preservative medium brown to brown, nearly uniform or with a rather faint, narrow light line or row of small spots on lateral surface from ear to groin .... **Emoia loveridgei**
   Number of lamellae under 4th toe 30–38; other characters noted above variable 5
5. Number of midbody scale rows 28–32; dorsal ground color black to brown, nearly always with a narrow, pale brown to light-blue vertebral line (prominent or vague) continuous on head to tip of snout ..... **Emoia caeruleocauda**
   Number of midbody scale rows 30–38 (rarely < 32 or > 36); narrow light vertebral stripe may or may not be present but never on head 6
6. Dorsal ground color green-brown to brown, with some dark spots widely separated or more or less fused (never a distinct light vertebral line); on lateral surface a pale white narrow line at limb level, extending from forelimb to ear but not anterior to ear .... **Emoia pallidiceps**
   Dorsal ground color a distinct striped pattern: a moderately narrow, light vertebral stripe bordered on either side by a wider, dark brown band followed by a narrow pale white dorsolateral line; on lateral surface, a pale white lateral line at limb level extending anterior to forelimb and passing over ear and along upper labials ..... **Emoia mivarti** superspecies

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