

Ecsenius caeruliventris* and *E. shirleyae*, two new species of blenniid fishes from Indonesia, and new distribution records for other species of *Ecsenius

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Abstract

Ecsenius caeruliventris is described from the Banggai and Togean islands, closely adjacent to the mid-NE coast of Sulawesi. *Ecsenius shirleyae* is described from various islands situated between 106°–02° E and 05°–08°S. Both species are members of the Prooculis species group of *Ecsenius*, which now comprises eight species and which are differentiated from each other solely on the basis of color patterns. All of the species are distributed allopatrically except for *E. bimaculatus*, which, in the southern part of its range, occurs sympatrically with *E. caeruliventris* and, probably, *E. shirleyae*. New distributional records are provided for several species of *Ecsenius*.

Key words: Blenniidae, *Ecsenius*, *Ecsenius shirleyae*, *Ecsenius caeruliventris*, fishes, Indonesia, new species, Prooculis species group

Introduction

This study is the fifth update on the blenniid fish genus *Ecsenius* since Springer's (1988) revision of the genus (Springer, 1991, 2002; Springer and Randall, 1999; Springer and Allen, 2001). The purposes of the present paper are to describe two new species in the Prooculis species group (Springer, 1988:105) and report new distribution records for other species of *Ecsenius*. *Ecsenius* now comprises 53 species, more than twice as many as the next speciose blenniid genus, *Meiacanthus* Norman.

The Prooculis species group is defined by a combination of characters, only one of which appears to be synapomorphic: presence on ventral surface of head of two bilateral pairs of small dark spots (Figure 1a, b; also Springer, 1988:figure 57) or single bilateral pair of elongate dark crescentic marks (Springer, 1988:figure 58) in at least some males, or two pairs of pale, round spots (Figure 2c; also Springer, 1988:figure 56; 1991:figure 8) or

single pair of pale crescentic marks in some females and dark crescentic marks in some males. The central portions of the crescentic dark marks are absent in some specimens of one species (*E. prooculis*) that exhibits crescentic markings, thus duplicating the dark spots of other species, and it is inferred from this that the character states are homologs. The positions of the dark or pale spots on the ventral surface of the head are the same in both sexes of the same species and occupy the same relative positions in all species that have them. The anterior and posterior ends of the crescentic marks occupy the same positions as the spots. The anterior spot on each side is associated with the anteriormost sensory pore of the mandibular series. The posterior spot is in the area external to the attachments of the branchiostegals to the anterior ceratohyal, which attachments can be seen through the skin.

The presence of these markings appears to be related to size or sexual maturity of individuals, but apparently sexually mature individuals may also fail to exhibit them. Even though these markings are not exhibited by every specimen, or even most of the specimens of any of the species, their presence in some specimens of each species and not, with one exception, in any other *Ecsenius* species, suffices our hypothesis of synapomorphy. The exception is *E. isos* McKinney & Springer, one of the three species of the Trilineatus species group. In *E. isos*, there is a dark spot (Springer, 1988, figure 53) in the same area as the posterior spot of the Prooculis group species. This spot appears to be an isolation of the ventral end of a dark crescentic marking that begins dorsally on the opercle and curves ventroanteriorly, ending on the ventral surface of the head in the other two species of the group. There may be other isolated spots continuing dorsal to the ventral one in *E. isos*; these represent positions along which the dark crescent mark lies in the other two species (Springer, 1991: figure 2).

The validity of the Prooculis group is supported by the distributions of its component species. Seven of the eight species are allopatrically distributed; the eighth species, *E. bimaculatus* Springer, has a partially allopatric distribution, but overlaps the distributions of two of the other species (Figure 3).

Other characters defining the group within *Ecsenius*: Small species (largest known specimen 40 mm SL, attained by only one species, *E. prooculis* Chapman & Schultz other species not exceeding 34 mm SL); dorsal-fin spines XI–XIII (strongly modally XII), segmented rays 13–15 (strongly modally 14), deeply notched between spines and segmented rays; anal fin II, 15–17 (modally 16); pectoral-fin rays 12–14 (strongly modally 14); segmented caudal-fin rays 13, third from dorsalmost and third from ventralmost filamentous in adult males; vertebrae 10 + 21–23 (strongly modally 22); total dentary teeth (including anterior canines, but excluding posterior canines) 39–50, posterior canine teeth 1 on each side; lateral-line a continuous tube extending posteriorly to vertical from 8th to 11th dorsal-fin spine (to 11th in only one specimen of *E. bimaculatus*); nasal cirrus minute; no distinct dark stripes or spots on fleshy pectoral-fin base.

Methods

Methods and abbreviations are those of Springer (1988), except that tooth counts are provided for all specimens of the new species regardless of size.

Key to the species of the *Prooculis* group

- 1 Two linearly arranged dark spots present on side of abdomen *bimaculatus*
- No dark spots on abdomen 2
- 2 Two linear rows of dark spots on body at least in area ventral to segmented-ray portion of dorsal fin 3
- No rows of dark spots on body 4
- 3 Black stripe extending posteriorly from orbital margin across opercle; one to three fine dark vertical bands present or absent on body anterior rows of dark spots *randalli*
- No black stripe extending posteriorly from orbital margin; dark spot present dorsally on opercle; no dark vertical bands on body..... *collettei*
- 4 Body with pale stripes alternating with broader dark stripes 5
- Body without distinctive markings 6
- 5 Pale stripes narrow, depth much less than one-fourth orbital diameter; dorsal pale stripe on body at or dorsal to level of lateral line; ventral pale stripe on body midline; dusky spot on post-orbital margin indistinctly, if at all, leading to stripe across head ...
..... *taeniatus*
- Pale stripes deeper, about one-third orbital diameter; dorsal pale stripe on body ventral to level of lateral line; ventral pale stripe on body ventral to body midline; dusky stripe extending posteriorly from orbital margin across head..... *prooculis*
- 6 No dark stripe extending posteriorly from orbital margin across head (a dark spot may be present on postorbital margin)..... *caeruliventris*
- Dark stripe extending posteriorly from orbital margin across head..... 7
- 7 Dark stripe on head narrower (Figures 1d, 2b), bordered ventrally by pale white stripe in life; in life, stripes in interorbital area and iris of eye white or faintly tinged with yellow
..... *shirleyae*
- Dark stripe on head deeper (Figures 1e, 2d), bordered dorsally and ventrally by bright yellow in life; in life, stripes in interorbital area and iris of eye bright yellow.....
..... *bandanus*

Ecsenius caeruliventris, new species

Bluebelly blenny

(Figures 1a–c, 2 a, 3; Table 1)

Ecsenius bandanus (not Springer), in part, Kuiter & Tono-zuka, 2001:605 (Sangihe Islands).

E. sp. Allen & Adrim, 2003:54 & 19, fig. 71 (Togean & Sangihe islands).

Holotype: MZB 12094, male, 24.3 mm SL, S entrance to Batudak Passage, Togean Islands, Sulawesi, Indonesia (00.27'S, 121°56.18'E, 3–5 m, quinaldine, G. Allen, 31 Oct 1998. *Paratypes* (five specimens, all with same collection data as holotype): WAMP P 31492-001 (2 females, 22.8–23.0; 2 males, 15.6–20.1) and USNM 379435 (1 female, 23.7).

Diagnosis. A species of the Prooculis group of *Ecsenius* with the following combination of characters: Body without alternating dark and pale stripes or distinct dark spots; dark stripe extending posteriorly from orbital margin across head and variably for short distance onto body anteriorly. In life, dark post-orbital stripe bordered ventrally by bright white stripe; other bright markings on head, white with at most a very faint tinge of yellow; belly bluish.

TABLE 1. Frequency distributions for selected characters in *Ecsenius* species of the Prooculis group.

Species	Segmented dorsal-fin rays				Segmented anal-fin rays				Caudal vertebrae			
	13	14	15	\bar{X}	15	16	17	\bar{X}	21	22	23	\bar{X}
<i>caeruliventris</i>	2	4*		13.7	2	4*		15.7	1	5*		21.8
<i>shirleyae</i>	25	53*		13.7	16	54*		15.8	15	49*	3	21.8
<i>bandanus</i>	3	45*	2	14	1	47*	4	16.1	6*	43	5	22
<i>bimaculatus</i>	5	10*		13.7	3	11*	1	15.9	2	12*		21.9
<i>collettei</i>		6*	2	14.2		8*		16	2	6*		21.8
<i>prooculis</i>	1	66*	7	14.1	5*	60	3	16	10*	58	6	21.9
<i>randalli</i>	1*				1*					1*		
<i>taeniatus</i>		3*		14		3*		16		2*	1	22.3

	Total dentary teeth (excluding posterior canines)											\bar{X}		
	39	40	41	42	43	44	45	46	47	48	49		50	
<i>caeruliventris</i>	1	1	-	3	-	-	1*							41.7
<i>shirleyae</i>														
Males	1	2	3*	9	7	6	1							42.4
Females		1	1	1	4	6	7	5	1					44.3
<i>bandanus</i>														
Males		1	3	9	4*	4	1							42.4
Females					2	4	5	2	1					44.7
<i>bimaculatus</i>			2	5*	2	2	2							42.8
<i>collettei</i>							2	2	-	2*	1	1		47.1
<i>prooculis</i>	1	2	7*	12	11	13	5	5	8	3				43.7
<i>randalli</i>							1*							
<i>taeniatus</i>						1	-	1	1*					45.7

*includes holotype

Description (only differentiating characters or characters not otherwise mentioned in the introduction, identification key, and Table 1 are discussed). Preserved specimens (Fig-

ure 1a–c) are most noteworthy for their general lack of distinguishing characters. There is a diffusely dusky spot on the orbital margin at about the three o'clock position. On each side of the ventral surface of the head of the male holotype (Figure 1b), there is a small dark spot, surrounded by a pale halo, in the area external to articulations of the anterior branchiostegals with the ceratohyal. A second, inconspicuous, faintly dusky spot is present near the anteriormost mandibular sensory pore. The body is darkly dusky anteriorly below the spinous dorsal fin, but becomes gradually paler posteriorly. The fins are unremarkable except for an immaculate basal stripe-like area in the segmented-ray portion of the dorsal-fin rays (fine melanophores are on the fin rays dorsal to the stripe, and in the posteriormore interradiial membranes) and the anal fin has a general covering of fine melanophores. The other two, smaller, males lack ventral head markings and the immaculate basal area in the segmented-ray portion of the dorsal fin. Females also lack the fin stripe, and the dark spots on the ventral head surface are replaced by one or two pairs of larger, pale spots (Figure 1c) in the positions occupied by the dark spots of the male.

In life (Figure 2a), the most obvious color markings are the deep blue of the abdominal area, a vertical pair of white stripes extending through the orbit dorsal and ventral to the pupil, a pair of small white spots in the interorbital region anteriorly, and a small, mid-dorsal white spot between the dorsoposterior margins of the orbits. The dusky post-orbital spot is bordered dorsally by a fine white spot and ventrally by a fine, pale, whitish stripe that continues faintly across the head and separates the pale yellowish cheeks dorsally from the brownish color of the head dorsally. The blue of the abdomen pales posteriorly and the body becomes faintly yellow similar to the cheeks. Specimens may or may not bear evidence of broad dusky bands on the body (see Allen & Adrim, 2003: figure 71).

Comparisons. Within the Prooculis group, *Ecsenius caeruliventris* appears to be most similar to *E. shirleyae* and *E. bandanus* in having a blue abdomen, in that some specimens have broad, very faintly dusky bands on the body, and in lacking distinct dark spots or stripes on the body. It differs from both species in lacking a distinct dark stripe that extends posteriorly from the posterior margin of the orbit across the head. It further differs from *E. shirleyae* in that the pale stripe margining the dusky postorbital spot is not intensely white and does not clearly extend across the head and enter the body, and in the more intense manifestation of the blue color of the abdomen. It further differs from *E. bandanus* in that the pale markings on the head and iris are white rather than bright yellow.

Remarks. This is one of the smallest species of *Ecsenius*; the 23.7 mm female has well-developed, apparently ripe, ovaries. The 15.6 mm male has well-developed dentary teeth, including obvious posterior canines. In most *Ecsenius* species this size, the posterior canines are not present and the number of other dentary teeth does not appear to have been completely established.

Etymology: The specific name is derived from the Latin *caeruleus* (sky-blue) + *ventris*, (belly), and refers to the blue abdominal area of the species; used here as a noun in apposition.

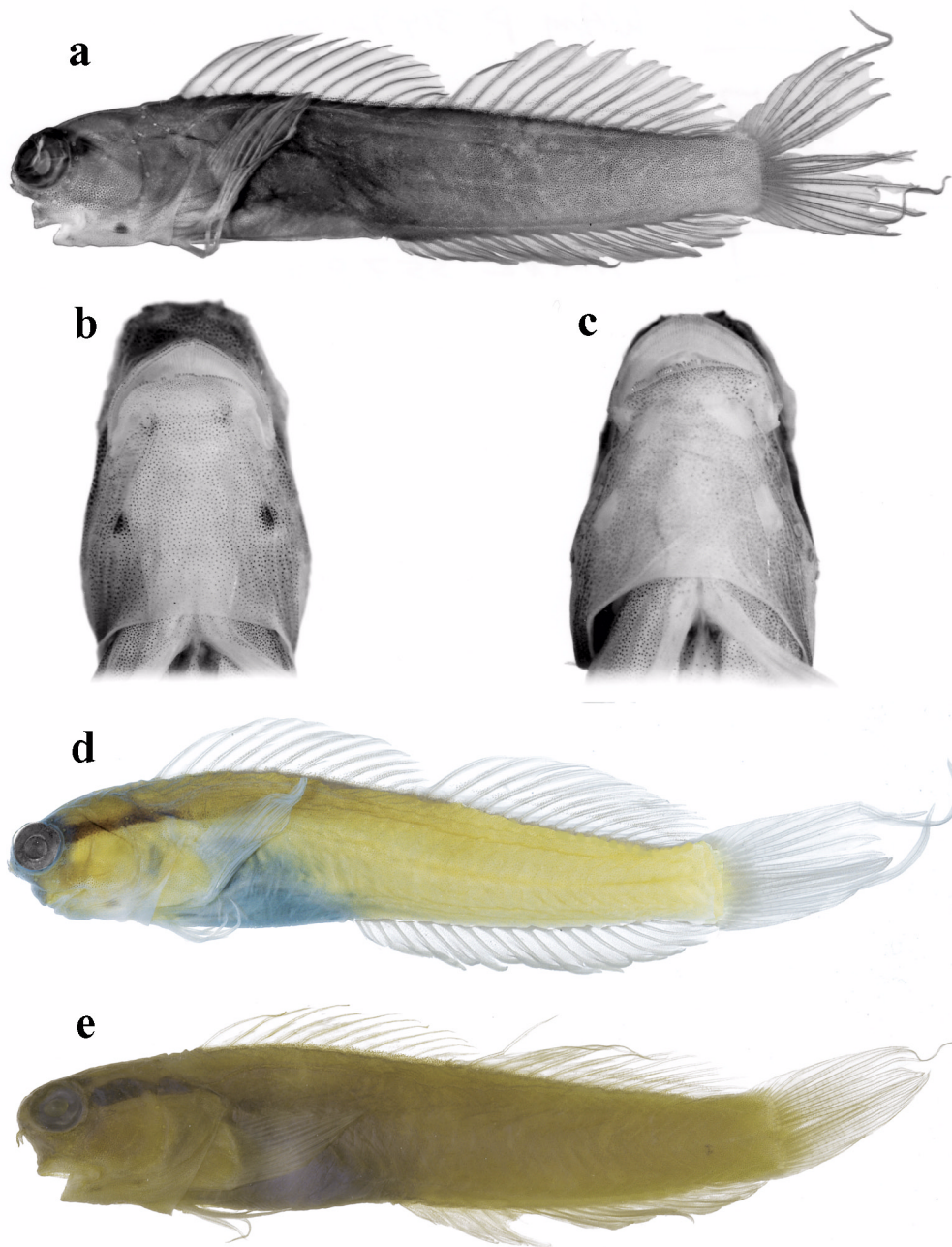


FIGURE 1. Photographs of preserved specimens of three similar *Ecsenius* species. a–c, *Ecsenius caeruliventris*: **a,b**, MZB 12094, holotype, male, 24.3 mm SL (**b**, ventral surface of head); **c**, USNM 379435, female, 23.0 mm SL, ventral surface of head (note pale spots). **d**, *Ecsenius shirleyae*, USNM 211996, holotype, male, 28.4 mm SL; **e**, *Ecsenius bandanus*, USNM 221236, male, 31.7 mm SL, Biak, Irian Jaya, Indonesia.

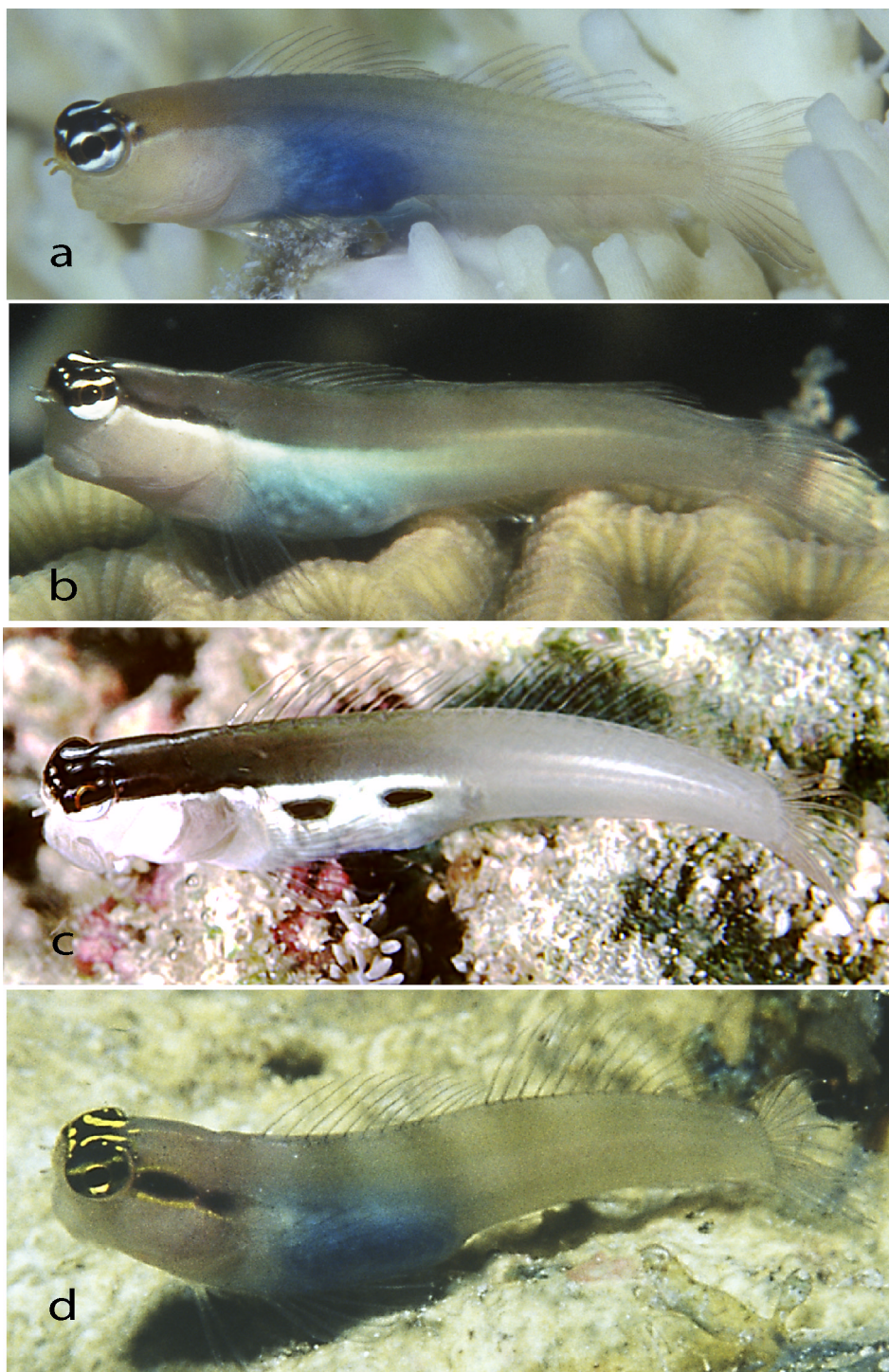


FIGURE 2. Photographs in nature of four similar *Ecsenius* species of the Prooculis group. **a**, *Ecsenius caeruliventris*, Togean Islands, Sulawesi (G.R. Allen); **b**, *Ecsenius shirleyae*, off Ujung Padang, Sulawesi (J.E. Randall); **c**, *Ecsenius bimaculatus*, Batangas, Luzon, Philippine Islands (J.E. Randall); **d**, *Ecsenius bandanus*, Rani Island, off Biak, Irian Jaya (G.E. Barrall).

Ecsenius shirleyae, new species

Shirley's blenny

Figures 1d, 2b, 3

Ecsenius bandanus (not Springer), in part: Springer, 1988:106, fig. 57, pl.13, fig. 5; Kuitert & Tonozuka, 2001:606 (Maumere, Flores); Allen & Adrin, 2003:54 & 18, fig. 65 (Maumere, Flores); Myers, 1999:224 & pl. 146K.

Holotype: USNM 211996, male, 28.4 mm SL, off NW side of Pulau Tikus, Pulau Pari group, Pulau Seribu, Indonesia (ca. 05°51'25" S, ca. 106°34'15" E), to ca. 5 m, rotenone, V.G. Springer, M.F. Gomon, & Sukarno, 5 April 1974; VGS 74-34.

Paratypes: USNM 379409 (15:15.6–33.5) and WAM P32602.001 (2: 22.2–29.1), collected with holotype. AMS I.18490001 (10:17.3–28.6), Tallabassi Bay, just off NW shore of Big Damalawa Islet, Kabaena Island, Celebes, Indonesia (ca. 05°17'20" S, ca. 122°04' E), 4–8 m, rotenone, V.G. Springer, M.F. Gomon, & Indonesians, 24 February 1974, VGS 74-1. USNM 211916 (14:22.5–29.2, includes one specimen now lost), Tallabassi Bay, just off NE tip of Big Damalawa Islet, Kabaena Island, Celebes, Indonesia (ca. 05°17'20" S, ca. 122°04' E), 2–15 m, rotenone, V. G. Springer, M. F. Gomon, & Indonesians, 25 February 1974, VGS 74-2. USNM 211993 (18:13.3–29.2), off W side of Pulau Ajer, Pulau Seribu, Indonesia (ca. 05°46' S, ca. 106°35' E), to ca.19 m, rotenone, V.G. Springer, M.F. Gomon, & Sukarno, 4 April 1974; VGS 74-32. USNM 211979 (11:23.7–31.2), off SW coast Karimunjawa Island, Indonesia, ca. 05°52'30" S, 110°25'40" E, ca. 1–12 m, rotenone, V.G. Springer & Indonesians, 29 March 1974, VGS 74–28.

Additional specimen: AMS I.34501010 (1:15.6), off Wailiti, 11 km NW Sao Wisata Resort, Flores, Indonesia, 08°34.3' S, 122°11.7' E.

Diagnosis. A species of the Prooculis group of *Ecsenius* with the following combination of characters: Body without alternating dark and pale stripes or distinct dark spots; head with dark postorbital stripe extending across head onto body anteriorly. In life, dark postorbital stripe bordered ventrally by bright white stripe; other bright markings on head white or pale yellowish; belly bluish.

Description (only differentiating characters or characters not otherwise mentioned in the introduction, identification key, and Table 1 are discussed). Preserved specimens (Figure 1d) are most notable for the black stripe extending across the head posteriorly from the postorbital margin at about the three o'clock position. The stripe may extend for a variable, usually short, distance, onto the body anteriorly. On each side of the ventral surface of the head of the male holotype there are two pairs of dark spots similar to those of *E. caeruliventris*, although the halo is not evident (presence or absence of the spots varies in other males). The body is not so darkly dusky anteriorly as in *E. caeruliventris*. The fins are similar to those of *E. caeruliventris*, except that an immaculate stripe-like basal area in the segmented-ray portion of the dorsal fin is not evident. Females are generally more pale than males, and the dark spots on the ventral head surface are absent or replaced by one or

two pairs of larger, pale spots (Figure 1c) in the positions occupied by the dark spots of the male.

In life (Figure 2b), the most obvious color markings are the bluish abdominal area, a horizontal pair of white stripes extending through the orbit dorsal and ventral to the pupil, a pair of small white spots in the interorbital region anteriorly, a fine, white mid-predorsal stripe (all of these white stripes may be very faintly tinged with yellow), the black stripe extending posteriorly from the orbit margined ventrally by a bright white stripe, which continues well out onto the body. The head and body are brownish dorsal to the black stripe, and may show indications of a few broad, slightly darker bands anteriorly; posteriorly the body is similar to *E. caeruliventris*.

Comparisons. Within the Prooculis group, *Ecsenius shirleyae* appears to be most similar to *E. bimaculatus* Springer, from which it differs mainly in lacking the two black abdominal spots and in that some individuals have a bluish abdomen. It is similar to *E. caeruliventris* and *E. bandanus* in having a bluish abdomen (at least in some specimens), in having broad, faintly dusky bands on the body, and in lacking distinct dark spots or stripes on the entire body. It differs from both species in having a dark postorbital stripe that frequently extends well out onto the body and in having the stripe margined below by a white stripe that also extends well out onto the body. It further differs from *E. caeruliventris* in that the blue of the abdomen is not as strongly manifested, and from *E. bandanus* in that the pale markings on the head and eye are bright white (or very faintly tinged with yellow) rather than bright yellow, and that the head portion of the dark post-orbital stripe is generally less deep (depth measurement is difficult because margins of the stripe are not sharply demarcated, but the difference is usually apparent when specimens of equal size are compared).

Etymology: This species is named for my (VGS) wife, Shirley, in recognition of her unstinting support for my research for the past almost 40 years.

New distributional records and notes for other *Ecsenius* species

Prooculis group

Ecsenius bandanus, AMS I.18469137, male, 27.0 mm SL, Marsegoe Bay, Ceram, Indonesia, 03°01' S, 128°03' E.

Ecsenius prooculis, NSMT P 17432, female 27.9 mm SL, Kavieng, New Ireland, Papua New Guinea.

Ecsenius bimaculatus Springer, Banggai Islands, Indonesia, based on photograph by Gerald R. Allen; Tukangbesi Islands, just SE of Sulawesi, based on photograph by Sarah Curran.

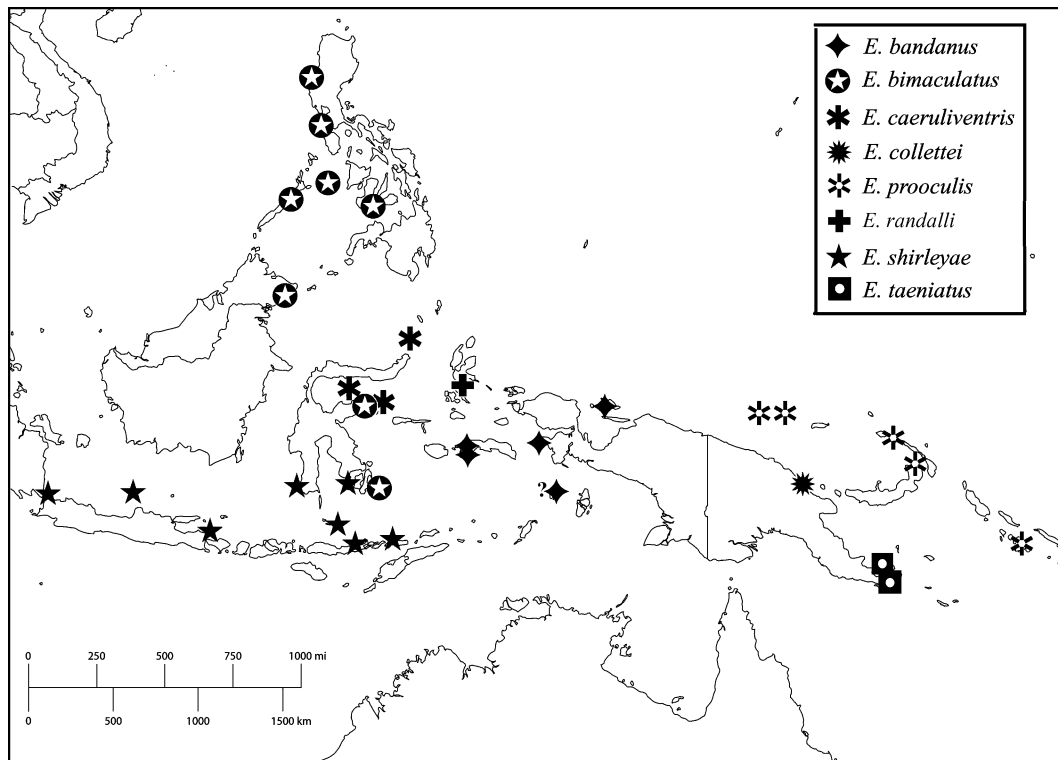


FIGURE 3. Distribution of the *Ecsenius* species of the Prooculis group. Specimen from Kai Islands lost and unavailable for confirmation of identification.

Stigmatura group

This group was last treated by Springer & Allen (2001), who mapped the distribution of the species (their figure 2). The following two distributional records, although extending the ranges of the two species, continue to emphasize the essential allopatry of the the four species in the group and the division of the group with two species occurring on each side of Huxley's line.

Ecsenius stigmatura Fowler, Misool, Indonesia, based on photograph by Max Gibbs.

Ecsenius ops Springer & Allen, Manado, Sulawesi, based on photograph by Mike. Severns.

Frontalis group

Ecsenius frontalis (Ehrenberg), frontalis form, Gulf of Aden at B'ir Ali, Yemen, ca. 14° S, 48° E, based on photograph by Jerry Kemp.

Lineatus group

Ecsenius lineatus Klausewitz, Tulamben, Bali, and Maumere, Flores, Indonesia, based on photographs in Kuitert & Tonozuka (2001:601); Gulf of Aden at B'ir Ali, Yemen, ca. 14° S, 48° E, based on photograph by Jerry Kemp.

Trilineatus group

Ecsenius lubbocki Springer, Tulamben, Bali, based on photograph in Kuitert & Tonzuka (2001:607). Previously known only from area of Phuket, Thailand. First record of two species of Trilineatus group occurring sympatrically (see next species).

Ecsenius trilineatus Springer, Tulamben, Bali, Indonesia, based on photographs in Kuitert & Tonzuka (2001:607). See remark in *E. lubbocki* above.

Oculus group

Ecsenius portenoyi Springer, USNM 364017 (9 specimens), Wallis Islands, Ile Uvea, 13°23'95" S, 176°14'15" W. The additional character given by Springer and Randall (1999:42) to distinguish *E. portenoyi* from *E. pardus* McKinney & Springer is erroneous. It should read, "The interspace between the first and second or second and third spots in *E. pardus* is equal to or more than 1.5 X the diameter of one of the spots, whereas in *E. portenoyi* it is almost always less than the diameter of any of the three spots."

Yaeyamaensis group

Ecsenius nalolo Smith, Gulf of Aden at Bîr Ali, Yemen, ca. 14° S, 48° E, based on photograph by Jerry Kemp.

Opsifrontalis group

This group was last discussed by Springer (2002), who gave a distribution map. The records for the following two species extend their distributions slightly. All ten species in the group are allopatrically distributed, although the limits of the ranges of several species almost abut.

Ecsenius bathi Springer, Makailu Id, Banggai Ids, Sulawesi, Indonesia, WAM P31505-014 (6:17.6–28.0).

Ecsenius dilemma Springer, Spratly Islands, South China Sea, based on color photo taken by G. R. Allen

Ecsenius opsifrontalis Chapman & Schultz, USNM 377567, male, 35.8 mm SL, Majuro, Marshall Islands. This specimen has an unusually well-developed dusky to almost black color pattern, which is most similar to that of one of the males illustrated by Springer (1988:figure 50d) from Rotuma, but the pattern of the Majuro specimen is even more striking. An underwater color photograph taken by Satoshi Yoshii of another specimen at Majuro exhibits the orangish stripes and bars on the body typical of *E. opsifrontalis*.

Mandibularis group

Ecsenius aequalis Springer, Pompey Reef, Great Barrier Reef (20°58' S, 150°40' E), based on specimens not seen by us, but identified by A. C. Gill: BMNH 2002.10.26.69–70, 287–290, 400–402. These represent a considerable range extension for the species, which was previously reported from the GBR only as far south as Escape Reef (15°50' S, 145°50' E).

Ecsenius schroederi McKinney & Springer, Derawan, Kalimantan, Indonesia, and Mabul, [Sabah] Malaysia (04°15' N, 118°37' E), based on photographs in Kuitert & Tonzuka (2001:607)

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