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Eviota pictifacies, a new dwarfgoby from Sumbawa, Indonesia (Teleostei: Gobiidae)

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Abstract

A new species of dwarfgoby, *Eviota pictifacies*, is described from Sumbawa in Indonesia. The new species is distinguished by having the cephalic sensory-canal pore system complete (pattern 1), with the PITO pore very small; the dorsal/anal fin-ray formula 9/8; some pectoral-fin rays branched; a 5th pelvic-fin ray present; a distinct dark occipital spot, no series of small dark spots along the dorsal-fin base, two separate orange spots behind the eye, distinctive black marks on the underside of the head, the side of the head with large round red spots, and the scleral surface of the eye with bold dark-brown-and-white markings. The new species is compared in detail to other *Eviota* species that share the cephalic sensory-canal pore system pattern and dorsal/anal fin-ray formula and also have an occipital spot, i.e. *E. fallax*, *E. karaspila*, *E. melasma*, and *E. smaragdus*.

Key words: taxonomy, systematics, ichthyology, coral-reef fishes, gobies, Pacific Ocean.

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Introduction

The dwarfgoby genus *Eviota* is currently represented by 112 described species from throughout the Indo-Pacific Ocean, with many more known but yet undescribed species. These tiny fishes (usually < 18 mm SL) are primarily coral-reef inhabitants, forming an important part of that ecosystem because of their abundance and as an ecological link between small invertebrates and larger piscivorous fishes. While conducting whale-shark surveys with local fisheries department officials at Teluk Saleh in northwestern Sumbawa, Indonesia, the second author observed a dwarfgoby species that he did not recognize, and photographed and collected the specimen. Subsequently, after determining that it was undescribed, he returned at a later date and collected more specimens that are described herein as a new species.

Materials and Methods

Counts and measurements, descriptions of fin morphology, and the cephalic sensory-canal pore patterns follow Lachner & Karnella (1980) and Jewett & Lachner (1983). Postanal ventral-midline spots begin at the anal-fin origin and extend to a vertical about 2–3 scale rows anterior to the end of the hypurals, the additional smaller spot posterior to this, if present, is not counted. We follow Lachner & Karnella (1980:4) in describing the membranes joining the first 4 pelvic-fin rays, which “...are considered to be well developed when the membranes extend beyond the bases of the first branches; they are considered to be reduced when they are slightly developed, not extending to the bases of the first branches”. Dorsal/anal fin-ray formula counts (eg. 9/8) only include segmented rays. Measurements were made to the nearest 0.1 mm using an ocular micrometer or dial calipers, and are presented as percentage of standard length (SL). All specimen lengths are SL in mm. Cyanine Blue 5R (acid blue 113) stain and an airjet were used to make the cephalic sensory-canal pores more obvious (Akihito *et al.* 1993, 2002, Saruwatari *et al.* 1997). For measurements, values for the holotype are given first, followed by the range and mean for all type specimens in parentheses.

Eviota pictifacies, n. sp.

Paintedface Dwarfgoby

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Figures 1–6, 7A & 8A.

Holotype. MZB 23883, 14.9 mm SL, female, Indonesia, Sumbawa, Tanjung Ntjanga, Teluk Saleh, 08°27.980' S, 117°58.717' E, 5 m, field number MVE-16-044, M.V. Erdmann, 4 August 2016.

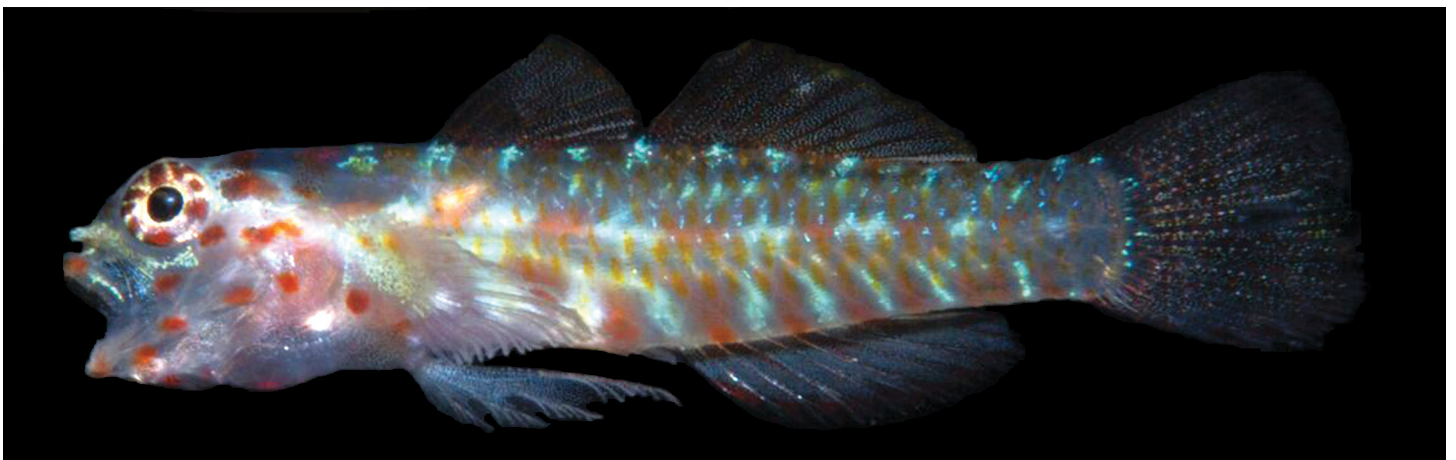


Figure 1. *Eviota pictifacies*, freshly anesthetized specimen from the type series (M.V. Erdmann).



Figure 2. *Eviota pictifacies*, preserved holotype, MZB 23883, 14.9 mm SL, female, Sumbawa, Indonesia (D.W. Greenfield).

Paratypes. CAS 243848, 2 males, 13.4 & 15.6 mm SL, 3 females, 14.6–17.0 mm SL, Indonesia, Sumbawa, Tanjung Ntjanga, Teluk Saleh, 08°27.980' S, 117°58.717' E, 5–6 m, field number MVE-17-005, M.V. Erdmann 8 April 2017.

Diagnosis. A species of *Eviota* with cephalic sensory-canal pore system complete (pattern 1), with the PITO pore very small; dorsal/anal fin-ray formula 9/8; some pectoral-fin rays branched; 5th pelvic-fin ray present; a distinct dark occipital spot (intense in preservative, but visible in life); no series of small dark spots along dorsal-fin bases; two separate orange spots behind eye; distinctive black marks on underside of head; side of head with large round red spots; scleral surface of eye with bold dark-brown-and-white markings.

Description. Dorsal-fin elements VI+I,9, first dorsal fin semi-triangular, 4th spine reaching to origin of second dorsal fin when adpressed, no spines filamentous, all second-dorsal-fin soft rays branched except first, last ray branched to base; anal-fin elements I,8, all soft rays branched, last ray branched to base; pectoral-fin rays 16 (15–17, usually 16), branched, pointed, reaching to below middle of second dorsal fin; 5th pelvic-fin ray present but poorly developed (Fig. 3), 5 branches on 4th ray, 3 segments between consecutive branches of 4th pelvic-fin ray, pelvic-fin membrane relatively well developed, no basal membrane; caudal fin with 12 branched and 17 segmented rays; lateral-line scales 23 (23 or 24); transverse scale rows 7; front of head rounded with an angle of about 70° from horizontal axis; mouth slanted obliquely upwards, forming an angle of about 55° to horizontal axis of body, lower jaw slightly projecting; maxilla extending posteriorly to front of pupil; anterior narial tube short, not reaching posterior margin of upper lip; gill opening extending forward to below posteroventral edge of vertical limb of preoperculum; cephalic sensory-pore system complete (pattern 1, PITO very small), cutaneous sensory papilla pattern A; urogenital papilla of male with straight smooth sides with many small papilla on end (Fig. 3), female urogenital papilla smooth and bulbous, with short finger-like projections on end.

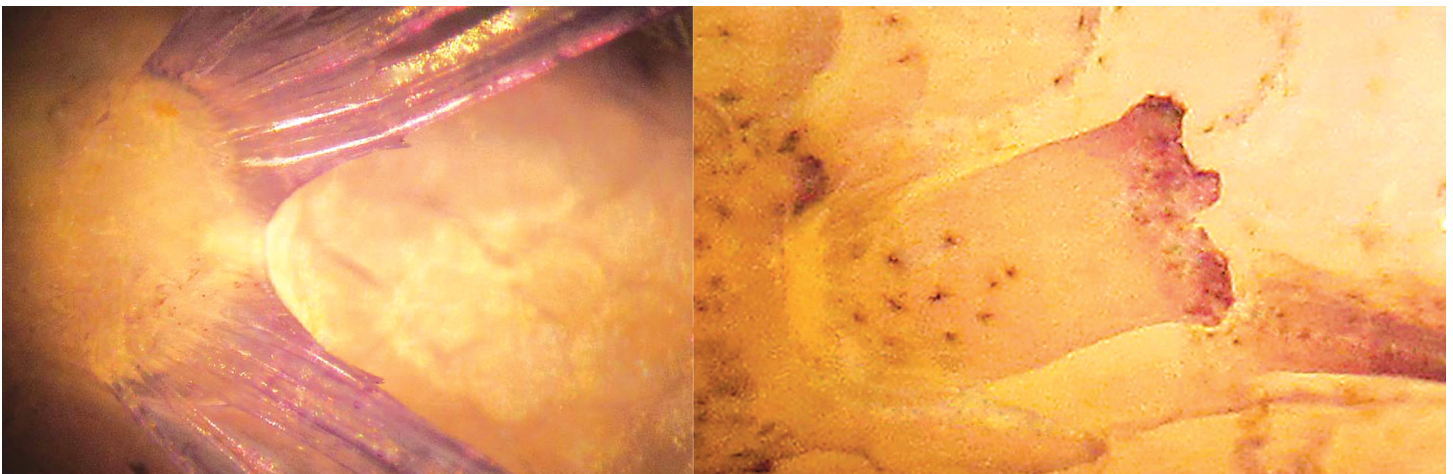


Figure 3. *Eviota pictifacies*, left: poor development of the 5th pelvic-fin ray, paratype, CAS 243848, 17.0 mm SL, female; right: male urogenital papilla, paratype, CAS 243848, 15.6 mm SL; Sumbawa, Indonesia (D.W. Greenfield).



Figure 4. *Eviota pictifacies*, underwater photograph from type series, Teluk Saleh, Sumbawa, Indonesia (M.V. Erdmann).

Measurements (percentage of SL): head length 28.8 (27.4–30.5, 28.4); distance to origin of first dorsal fin 33.2 (32.2–34.9, 33.5), first-dorsal-fin origin lying behind posterior margin of pectoral-fin base; distance to origin of second dorsal fin 53.0 (52.7–55.0, 53.7), second-dorsal-fin origin well in advance of anal-fin origin; distance to origin of anal fin 58.0 (56.5–59.4, 57.8); caudal-peduncle length 23.1 (22.9–28.1, 24.6); caudal peduncle depth 14.8 (12.3–14.8, 13.3); body slender, its depth 20.8 (19.4–21.9, 20.8); eye diameter 9.4 (9.4–10.8, 9.8); snout length 3.7 (2.4–4.1, 3.4); pectoral-fin length 33.6 (32.3–39.0, 35.3); pelvic-fin length 28.2 (27.6–32.9, 30.3), reaching urogenital papilla; 5th pelvic-fin ray 7.8–12% of length of 4th ray, but internal structure of the ray is weak.

Color in life. (Figs. 1 & 4) Background color of head and body translucent gray, with bluish tinge on lower half of head and ventral side of body. Dorsal half of body with scattered irregular orange marks interrupted by irregular silver-white marks, 12 spaced along dorsal surface; 8 orange spots, starting with one at occipital spot overlaid with melanophores, above vertebral column, extending posteriorly to caudal-fin base, separated by 7 silver-white spots; narrow orange line running length of vertebral column; 9 distinct reddish orange bars extending down from vertebral column to ventral surface, first behind pectoral-fin base, extending back to caudal-fin base, each separated by silver-white line. Pectoral-fin base silver at center overlaid with scattered melanophores, small yellow-orange area at top of base, distinct round red spot on ventral surface. Side of head with large round red spots, about half size of pupil: three spots spaced across cheek behind eye at 4 o'clock position; spot below posteriormost of these at lower edge of operculum; another anterior to this under first spot behind eye; two spots under eye at 6 o'clock position, and two more below under head. Smaller round red spots on upper and lower jaws. Top of head and nape with several irregular reddish orange spots, another behind eye at 2 o'clock position, and occipital spot, all overlaid with peppering of melanophores. Tubular naris, snout, and cheek with silver-white markings. Pupil of eye black surrounded by gold ring, iris white with bold brown-to-reddish irregular markings. Rays of all fins with orange tinge, melanophores on membranes as described for preserved holotype (Fig. 2).

Color of holotype in preservative. (Fig. 2) Background color of head and body light yellow. Dorsal half of body with sprinkling of medium-sized melanophores, also extending ventrally on body from anal-fin origin to caudal-fin base. Prominent occipital spot above operculum, slightly larger than pupil of eye. Two clusters of melanophores on pectoral-fin base, one dorsal and one ventral, latter larger and more intense, some scattered melanophores between. Head with concentration of melanophores behind eye at 2 o'clock position. A few scattered melanophores behind eye across cheek at 4 o'clock position. Ventral surface of head with pair of black spots on

isthmus in line with area between front of pupil and front of eye, several scattered melanophores posterior to this and cluster of melanophores just anterior to pelvic-fin base (Fig. 5). Pupil of eye gray, iris silvery, pupil and rim of eye circled with black. Pectoral and pelvic fins with scattered melanophores on rays; anal fin black; caudal fin with peppering of larger melanophores; first dorsal fin with black area along base, distal half black, creating clear band across fin; distal half of second dorsal fin black, basal half with scattered melanophores. Photographs of preserved paratypes, a female (Fig 6A) and a male (Fig. 6B), show variation in preserved markings.

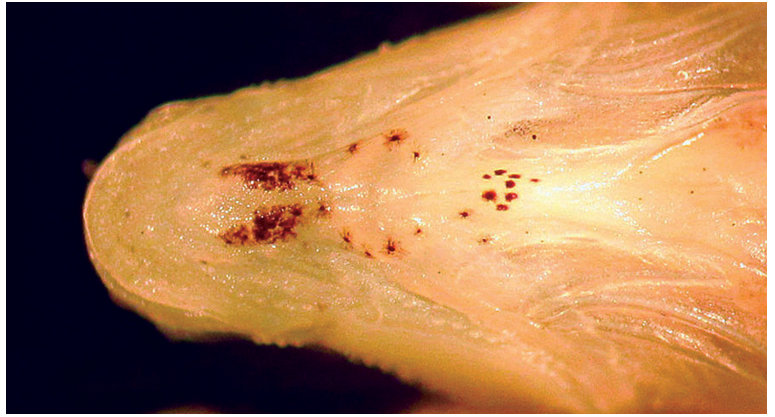


Figure 5. *Eviota pictifacies*, ventral view of head, holotype, MZB 23883, 14.9 mm SL, female, Sumbawa, Indonesia (D.W. Greenfield).

Etymology. The specific epithet is a combination of the Latin adjective *pictus* (painted) and the female noun *facies* (face) referring to the bright red spots on the side of the head, similar to those painted on a clown, treated as a feminine compound adjective.

Distribution. Currently known only from Indonesia in Teluk Saleh, northwestern Sumbawa, although presumably more widespread in the Lesser Sunda Islands of Indonesia. The habitat of the type series was a shallow fringing reef, subject to significant terrigenous sedimentation and relatively warm water due to the limited circulation in the large bay of Teluk Saleh. Individuals were observed in a narrow depth range of 3–8 m, and were frequently seen resting on live massive-coral colonies.



Figure 6. *Eviota pictifacies*, preserved paratypes from CAS 243848: A) 17.0 mm SL female. B) 15.6 mm SL male (D.W. Greenfield).

Comparisons. There are 40 described *Eviota* species with a pattern I (complete) cephalic sensory-canal pore system as described by Lachner & Karnella (1980); of these, 19 have a dorsal/anal formula of 9/8 as does *E. pictifacies*. Only four of these species have an occipital spot as found in *E. pictifacies*: *E. fallax*, *E. karaspila*, *E. melasma*, and *E. smaragdus*. *Eviota smaragdus* has a series of small dark spots along the dorsal-fin bases that is lacking in *E. pictifacies*. *Eviota karaspila* differs in that the body is very pale in life and the occipital spot very prominent and there is no distinct orange patch behind the eye and no dark patches on the abdomen. *Eviota fallax* has a thickened 4th pelvic-fin ray that is bound together by membranes (Fig. 7), and a single rounded orange spot behind the eye, whereas the rays are more slender with weaker membranes and there are two separate orange spots behind the eye in *E. pictifacies*.

Eviota melasma is most similar to *E. pictifacies*, but the pelvic-fin rays are shorter and stouter in *E. pictifacies*, and are connected by membranes vs. not connected in *E. melasma* (Fig. 7). *Eviota pictifacies*

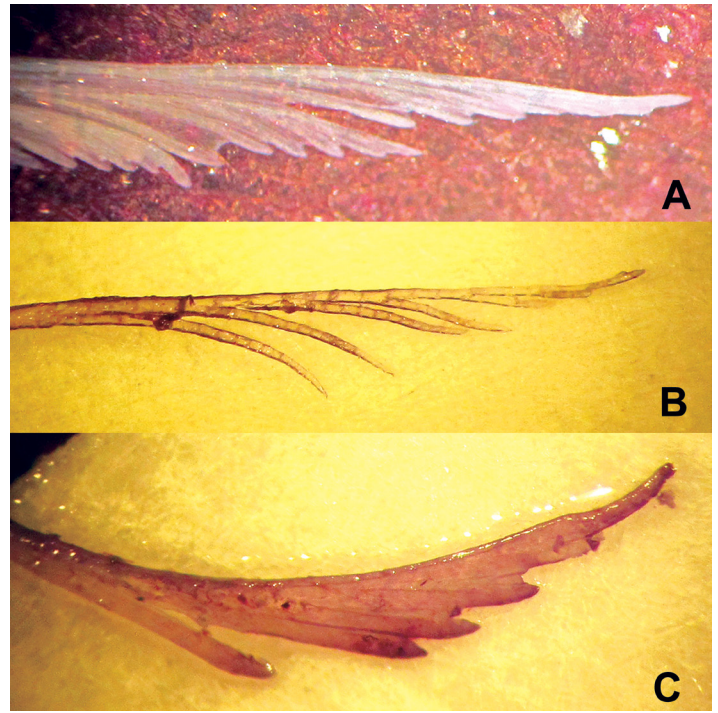


Figure 7. Comparison of pelvic-fin structure: A) *E. pictifacies* holotype, Indonesia; B) *E. melasma* paratype, GBR, Australia; C) *E. fallax* paratype, Indonesia (D.W. Greenfield).

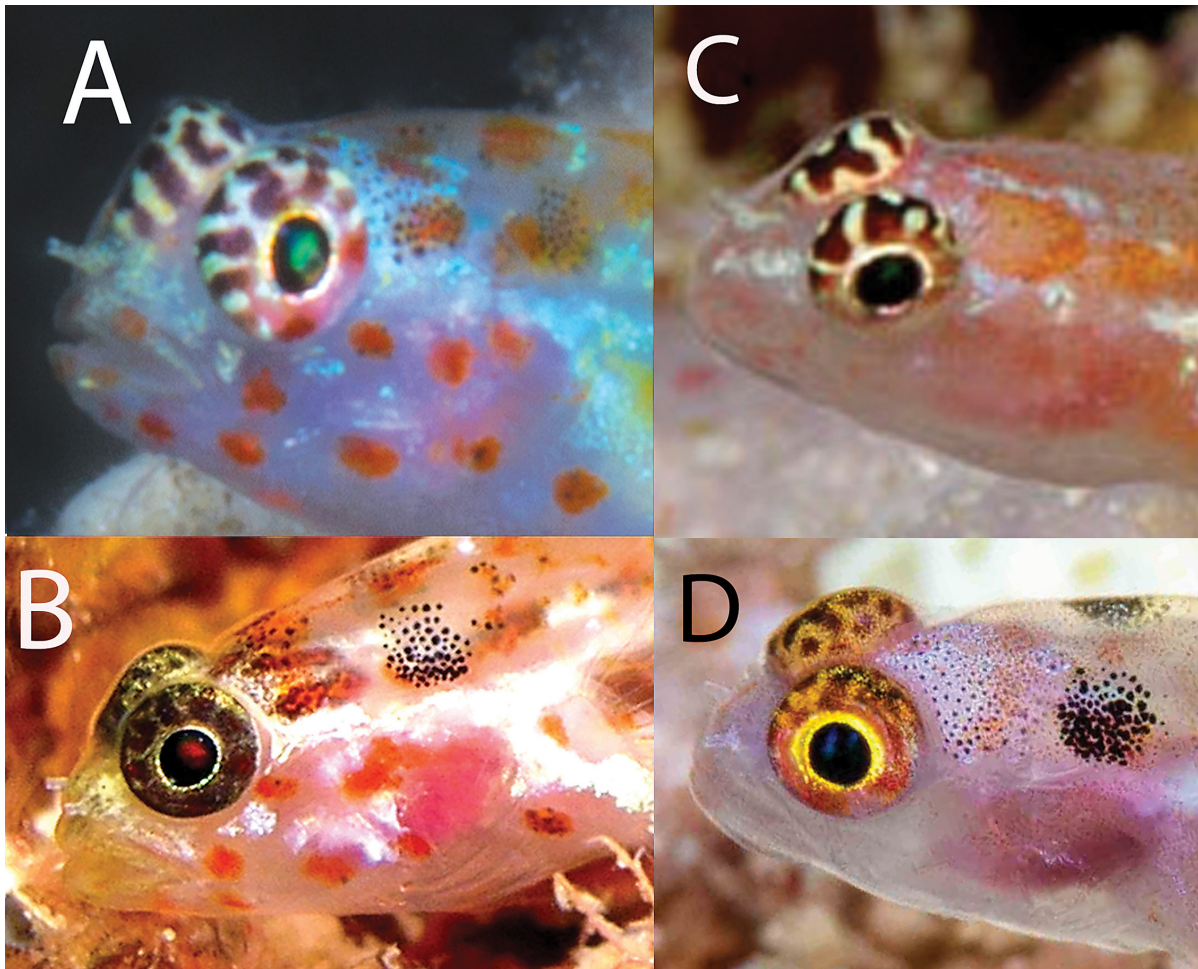


Figure 8. Comparison of live eye color: A) *E. pictifacies*, Sumbawa, Indonesia (M.V. Erdmann), B) *E. melasma*, GBR, Australia (A. González-Cabello), C) *E. fallax*, Cenderawasih Bay, Indonesia (G.R. Allen), D) *E. karaspila*, Fiji (R. Whitworth).

has distinctive black marks on the underside of the head that are lacking in *E. melasma* (Fig. 6). None of the nine paratypes of *E. melasma* examined (CAS 43546) have these markings. Although there are reddish spots on the side of the cheek of *E. melasma* in the same position as on *E. pictifacies*, they are not as bright and distinctive. Because the background color of the head in *E. pictifacies* is translucent gray, with a bluish tinge on the lower half, the red spots appear more intense. The eyes are different between *E. melasma* and *E. pictifacies*, with the scleral area generally dark in *E. melasma* from Australia, as compared to the bold dark-brown-and-white markings in *E. pictifacies* (Fig. 8). The bold eye color of *E. pictifacies* is similar to that found in *E. rubrisparsa*, a species lacking an occipital spot. The importance of live eye coloration in separating different species has been discussed by Greenfield & Randall (2016), Greenfield & Tornabene (2014), and Greenfield, Winterbottom & Suzuki (2014). *Eviota pictifacies* will end at couplets 14a & 14b leading to *E. fallax*, *E. melasma*, and *E. karaspila* in Greenfield and Winterbottom's (2016) comprehensive key to the *Eviota* species. Only *E. melasma* from Australia, the type locality, has the distinctive slender pelvic-fin rays not joined by membranes and a dark scleral area. Other similar species, and those called *E. melasma* from other areas, have stouter rays that are joined by membranes and varying eye colors.

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