

***Pseudochromis erdmanni*, a new species of dottyback with medially placed palatine teeth from Indonesia (Teleostei: Perciformes: Pseudochromidae)**

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Abstract

Pseudochromis erdmanni is described from eight specimens from Halmahera, Ambon and the Raja Ampat Islands, Indonesia. It is also recorded from Lembeh Strait, Sulawesi, on the basis of photographs. *Pseudochromis erdmanni* belongs to a clade of species with medially placed palatine tooth patches, which also includes *P. colei* Herre, *P. howsoni* Allen, *P. moorei* Fowler, *P. quinquedentatus* McCulloch, *P. perspicillatus* Günther and *P. steenei* Gill & Randall. Based on derived coloration characters, *P. erdmanni* is nested within this group as the sister to *P. steenei*.

Key words: Pseudochromidae, *Pseudochromis*, new species, Indonesia

Introduction

The bulk of species in the pseudochromid subfamily Pseudochrominae are placed in the genus *Pseudochromis* Rüppell. However, there are no synapomorphies to diagnose the genus as monophyletic and it effectively serves as a catchall for species that cannot be placed in the remaining nine genera (Gill 2004). Within the genus are several demonstrably monophyletic groups of species. One such group consists of six described species characterised by a single synapomorphy (palatine tooth patches inserted medially behind (rather than more or less in line with) the vomerine tooth patch; see Gill 2004: fig. 23A): *P. colei* Herre (1933) from Culion, Philippines, *P. howsoni* Allen (1995) from northwestern Australia, *P. moorei* Fowler (1931) from the Philippines, *P. perspillatus* Günther (1862) from Indonesia and the Philippines, *P. quinquedentatus* McCulloch (1926) from northern Australia, and *P. steenei* Gill and Randall (1992) from Indonesia. We refrain from allocating subgeneric status to the group (though a name is available, *Devisina* Fowler, 1931, with type species *P. quinquedentatus*), pending the completion of phylogenetic studies of the Pseudochromidae currently in progress by the first author. This group may be further divided into two phenetic groups, one characterised by species with a dark longitudinal or oblique stripe on the body (*P. colei* and *P. perspicillatus*) and the other by species without a stripe (*P. howsoni*, *P. moorei*, *P. quinquedentatus* and *P. steenei*). We herein describe a new species in the latter group, based on material from Halmahera, Ambon and the Raja Ampat Islands, Indonesia. We also record the species from Lembeh Strait, Sulawesi, Indonesia, based on underwater photographs in Kuiter and Tonozuka (2001) and Kuiter and Debelius (2006).

Material and methods

Methods of counting and measuring follow Gill (2004). Type specimens of the new species are deposited in the Australian Museum (AMS), Pusat Penelitian dan Pengembangan Oseanologi, Jakarta, Indonesia (NCIP) and the Western Australian Museum (WAM). Comparisons with related species are based on specimens listed in Gill (2004).

***Pseudochromis erdmanni* new species**

Erdmann's Dottyback

Figures 1–3, Table 1

Pseudochromis moorei [non Fowler 1931]. Kuiter and Tonozuka, 2001: 137, fig. C (colour photograph, northern Sulawesi); Kuiter and Debelius, 2006: 238, unnumbered fig. (same colour photograph as Kuiter & Tonozuka (2001), but locality clarified as Lembeh Strait, Sulawesi, Indonesia).

Holotype. NCIP 6344, 81.5 mm SL, Indonesia, North Maluku Province, Halmahera, Loloda Selatan, Pulau Taunalu (01°40.488'N 127°31.720'E), fringing reef, 66 m, clove oil, M.V. Erdmann, 15 April 2008.

Paratypes. NCIP 6345, 3: 48.7–66.1 mm SL, Indonesia, Papua Barat Province, Raja Ampat Islands, northwest Batanta Island (00°47.752'S 130°009'E), 42 m, clove oil, M.V. Erdmann, 20 March 2008; WAM P.32911-002, 2: 68.3–74.7 mm SL, Indonesia, Papua Barat Province, Raja Ampat Islands, west Batanta Island (00°47.100'S 130°29.963'E), 59 m, spear, M.V. Erdmann, 19 August 2007; AMS I.45740-001, 71.3 mm SL, Indonesia, Ambon Island, Tulehu harbour (03°34'S 128°19'E), 45 m, M.V. Erdmann, 14 March 2009; WAM P.33082-002, 71.3 mm SL, collected with AMS I.45740-001.

Diagnosis. A species of *Pseudochromis* with the following combination of characters: palatine tooth patches inserted medially behind vomerine tooth patch; large dark grey to black spot on posterodorsal corner of operculum; pale blue curved bar behind eye; and anal fin without broad dark distal stripe.

Description (based on eight specimens, 48.7–81.5 mm; data for all types followed, where variation was noted, by data for holotype in parentheses): Dorsal-fin rays III,25–27 (III,26), all or all but first (all) segmented rays branched; anal-fin rays III,13–14 (III,14), all segmented rays branched; pectoral-fin rays 17–19 (18/18); upper procurrent caudal-fin rays 6; lower procurrent caudal-fin rays 5–6 (5); total caudal-fin rays 27–28 (28); scales in lateral series 40–45 (43/43); anterior lateral-line scales 33–36 (35/35); anterior lateral line terminating beneath segmented dorsal-fin ray 19–21 (20/20); posterior lateral-line scales 5–9 + 0–2 (9 + 0/9 + 1); scales between lateral lines 3–4 (4/4); horizontal scale rows above anal-fin origin 13–16 + 1 + 3–4 = 17–20 (15 + 1 + 3/14 + 1 + 3); circumpeduncular scales 20; predorsal scales 17–21 (17); scales behind eye 3–4 (4); scales to preopercular angle 6–8 (8); gill rakers 5–6 + 11–12 = 16–18 (5 + 12); pseudobranch filaments 13–16 (15); circumorbital pores 26–35 (35/32); preopercular pores 12–14 (14/14); dentary pores 4; posterior interorbital pores 1–2 (1).



FIGURE 1. *Pseudochromis erdmanni* new species, female individual, ca. 60 mm SL, Pulau Taunalu, Loloda Selatan, Halmahera, North Maluku Province, Indonesia (photo by G.R. Allen).



FIGURE 2. *Pseudochromis erdmanni* new species, male holotype, NCIP 6344, 81.5 mm SL, Pulau Taunalu, Loloda Selatan, Halmahera, North Maluku Province, Indonesia (photo by G.R. Allen).

Lower lip varying from incomplete with weak symphyseal interruption to complete; dorsal and anal fins without scale sheaths, although sometimes with intermittent scales overlapping fin bases; predorsal scales extending anteriorly to point ranging from posterior AIO to mid AIO pores; opercle with 4–6 large, distinct serrations, sometimes with additional small serration below subopercle junction; teeth of outer ceratobranchial-1 gill rakers varying from well developed on distal tips of rakers only, to well-developed along most of raker lengths; anterior dorsal-fin pterygiophore formula S/S/S + 3/1 + 1/1/1 + 1*/1 (S/S/S + 3/1 + 1/1/1 + 1/1); dorsal-fin spines stout and pungent; anterior anal-fin pterygiophore formula 3/1 + 1*/1/1/1 + 1 (3/1 + 1/1/1/1 + 1); anal-fin spines stout and pungent, second spine stouter than third; pelvic-fin spine stout and pungent; second segmented pelvic-fin ray longest; caudal fin emarginate to deeply emarginate (almost lunate); vertebrae 10 + 15–16 (10 + 16); epineurals 14–15 (15); epurals 3.

Upper jaw with 2–3 pairs of curved, enlarged caniniform teeth, and 4–6 (at symphysis) to 2–3 (on sides of jaw) inner rows of small conical teeth, outermost of rows of conical teeth much larger and more curved than inner rows; lower jaw with 2–3 pairs of curved, caniniform teeth, and 3–5 (at symphysis) to 1 (on sides of jaw) inner rows of small conical teeth, teeth on middle of jaw larger and curved; vomer with 2 rows of small conical teeth, forming chevron; palatine with 1–3 irregular rows of small conical teeth arranged in elongate patch, anterior tip of patch directed medially behind posterolateral arm of vomerine tooth patch; ectopterygoid edentate; tongue moderately pointed and edentate.

As percentage of SL: Head length 23.3–26.1 (24.9); orbit diameter 7.1–8.8 (7.2); snout length 6.0–7.0 (7.0); fleshy interorbital width 5.1–6.0 (5.8); bony interorbital width 4.1–4.9 (4.9); body width 12.3–13.9 (13.9); snout tip to posterior tip of retroarticular bone 15.1–16.6 (15.7); predorsal length 31.7–35.7 (33.1); prepelvic length 28.8–32.5 (30.6); posterior tip of retroarticular bone to pelvic-fin origin 14.9–17.8 (17.8); dorsal-fin origin to pelvic-fin origin 27.8–32.6 (28.7); dorsal-fin origin to middle dorsal-fin ray 32.6–37.5 (36.1); dorsal-fin origin to anal-fin origin 41.7–44.4 (42.1); pelvic-fin origin to anal-fin origin 28.1–34.1 (28.1); middle dorsal-fin ray to dorsal-fin termination 24.6–26.3 (26.3); middle dorsal-fin ray to anal-fin origin 26.1–30.0 (26.4); anal-fin origin to dorsal-fin termination 34.3–36.0 (36.0); anal-fin base length 25.5–28.0 (27.4); dorsal-fin termination to anal-fin termination 16.3–17.3 (17.3); dorsal-fin termination to caudal peduncle dorsal edge 11.5–12.3 (12.0); dorsal-fin termination to

caudal peduncle ventral edge 19.5–20.9 (20.6); anal-fin termination to caudal peduncle dorsal edge 21.4–22.2 (21.8); anal-fin termination to caudal peduncle ventral edge 12.1–13.5 (12.9); first dorsal-fin spine 1.7–2.8 (2.7); second dorsal-fin spine 4.0–5.6 (5.3); third dorsal-fin spine 6.0–7.3 (6.7); first segmented dorsal-fin ray 9.3–11.2 (10.8); fourth last segmented dorsal-fin ray 14.1–17.8 (17.8); first anal-fin spine 1.7–3.2 (2.7); second anal-fin spine 4.7–5.8 (5.6); third anal-fin spine 6.2–7.4 (7.0); first segmented anal-fin ray 9.5–11.4 (10.6); fourth last segmented anal-fin ray 14.3–17.2 (17.2); third pectoral-fin ray 13.6–15.0 (14.7); pelvic-fin spine 8.6–10.2 (10.2); second segmented pelvic-fin ray 21.1–34.1 (34.1); caudal-fin length 19.6–21.5 (21.1).

Live coloration: Females (based on photographs of live individuals in Lembeh Strait and Halmahera and a photograph of a paratype from Batanta Island when freshly dead; Figure 1): head and body greyish brown to dark grey, becoming pale grey to pale pinkish grey on lower head and abdomen and yellowish grey on posterior body; scales of dorsal half of head and body, and of anterior part of cheek each with dark grey to black basal spot; posterodorsal part of operculum with two or three large irregular dark grey to black spots, spots decreasing in size ventrally, the largest about as large or larger than pupil; posterior part of cheeks and anterior half of operculum pale blue to pale bluish grey; vertical portion of preopercle dark grey to black; snout, lips and suborbital region dark grey; small dark grey bar in front of each anterior nostril; orbital rim black; bright bluish white to bright blue streak extending along posterior edge of eye to posterior edge of maxilla; iris dark reddish grey, with bright blue suboval ring around pupil; caudal peduncle yellowish grey to bright yellow; dorsal fin greyish to yellowish hyaline, darker grey basally, with one (anteriorly) to about six to eight (posteriorly) grey spots on middle of each interradial membrane, these forming indistinct broken stripes; distal margin of dorsal fin narrowly blue; anal fin greyish to yellowish hyaline, with narrow blue distal margin; caudal fin yellowish grey to grey, darker on dorsal and ventral margins, sometimes with two columns of grey spots on middle of fin; pectoral fins greyish to pinkish hyaline, with dark grey curved bar extending around fin base; pelvic fins pale pink, sometimes with anterior margin narrowly dusky grey. Males (based on photographs of live individuals in Ambon and Lembeh Strait and the holotype from Halmahera, and of a paratype from Batanta Island when freshly dead; Figure 2): head and anterior part of body yellowish orange to bright orange, paler ventrally, becoming dark grey posteriorly on body; scales of dorsal half of head and body, and of anterior part of cheek each with dark grey basal spot; posterodorsal corner of operculum with large (about size of pupil) irregular dusky grey to black spot, sometimes with smaller, less-distinct spot immediately below; lower part of operculum and cheek with pinkish or bluish white hue; vertical portion of preopercle dusky grey; small dark grey bar in front of each anterior nostril; bright bluish white streak extending from posterior edge of orbit along posterior edge of maxilla; suborbital area grey to greyish orange; iris bright orange, with bright blue suboval ring around pupil; dorsal fin orangish hyaline anteriorly, becoming greyish hyaline posteriorly, darker grey basally, with one (anteriorly) to about six (posteriorly) grey spots on middle of each interradial membrane, these forming indistinct broken stripes; distal margin of dorsal fin narrowly blue; anal fin greyish hyaline to yellowish hyaline, with narrow blue distal margin; caudal fin greyish to yellowish hyaline, darker on dorsal and ventral margins; pectoral fins pinkish hyaline, with orange curved bar extending around fin base; pelvic fins pale blue to white, edged narrowly with dusky grey to blue.

Preserved coloration: Females: pattern similar to live coloration, head and body becoming dark brown; white markings on head becoming pale brown; dark grey to black markings on head, body and fins becoming dark grey-brown; yellow markings on caudal fin becoming pale yellow to pale brown. Males: pattern similar to live coloration, white, yellow, orange and pink markings on head, body and fins becoming pale yellow to pale brown; bluish grey and purple areas becoming dark brown; dark grey to black markings on head, body and fins becoming dark grey-brown.

Habitat and distribution. Known only from north-eastern Indonesia, from North Sulawesi to Papua and extending southwards at least to Ambon (Figure 3). It is a relatively deep-dwelling reef species, having been recorded in depths of 45–66 m in soft bottom habitats below the base of shallower-growing coral reefs. The species is not homogenously distributed over its range, but seems to occur in a very specific microhabitat, which consists of fine silty-sand bottoms with widely-scattered coral rubble and small barrel sponges; the fish invariably take up residence in burrows under the barrel sponges or in large cavities in a coral rubble piece. Another common factor observed at each of the sites from which this species has been recorded is the presence of significant freshwater input from small streams in the nearby vicinity; these streams deposit fine terrigenous sediments that mix with reef carbonate sands to form the silty-sand substrates on which this species is invariably found. Large males and females are generally found in a mated pair, though solitary individuals are also commonly observed, particularly smaller individuals.

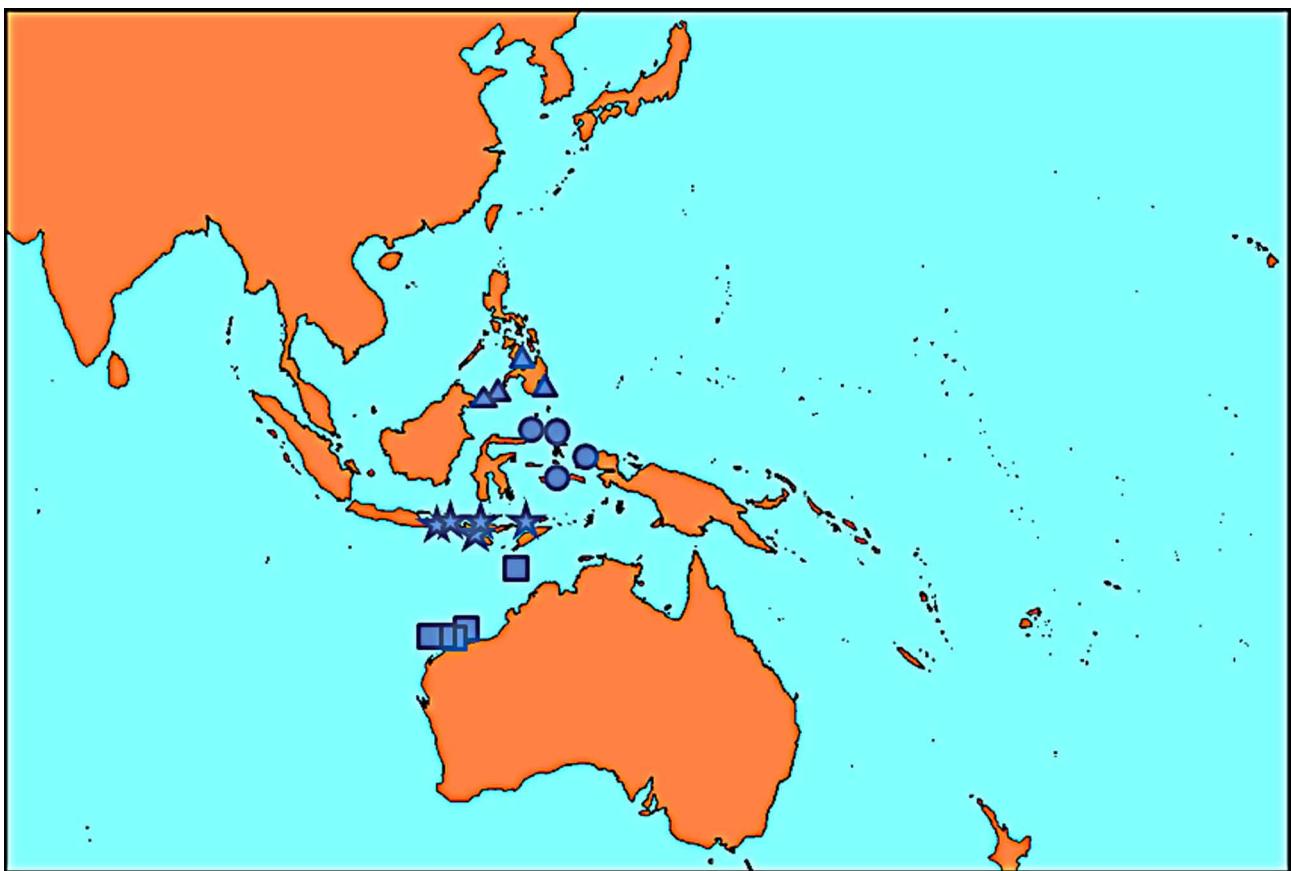


FIGURE 3. Distribution records for *Pseudochromis erdmanni* (filled circles), *P. howsoni* (squares), *P. moorei* (triangles) and *P. steenei* (stars).

Comparisons and relationships. As noted in the introduction, *P. erdmanni* belongs to a clade characterised by a single synapomorphy: palatine tooth patches inserted medially behind (rather than more or less in line with) vomerine tooth patch. Within that clade, it belongs to phenetic group of species that lack a dark stripe on the body. The five species are very similar in meristic and morphometric characters, but differ in caudal-fin shape and live coloration (see Table 1). Two coloration synapomorphies diagnose a clade of four species (*P. erdmanni*, *P. howsoni*, *P. moorei* and *P. steenei*) that are allopatrically distributed throughout the Philippines and Indonesia to north-western Australia (Figure 3): dark bar in front of anterior nostril; dark spot on operculum. Relationships within this clade are as follows: *Pseudochromis erdmanni* + *P. moorei* + *P. steenei* (synapomorphy: preopercle with dark edge); *P. erdmanni* + *P. steenei* (synapomorphy: pale blue bar behind eye). *Pseudochromis erdmanni* differs from its sister species (*P. steenei*) in lacking both a broad dark grey to black distal stripe on the anal fin and a similar marking on the anterior part of the pelvic fins.

Remarks. Kuiter and Tonozuka (2001) recognised a single species, *P. moorei*, from the Philippines to northern Australia, noting (p. 137): “The Bali and Lombok population was recently described as a separate species *P. steenei* on the basis of colour differences. The Philippine and northern Australian populations lack white bar behind eye, but in Sulawesi [...] it has a short stripe with other body and fin colours identical to Philippine fish.” The implication is that the Sulawesi fish (*P. erdmanni*) are intermediate between *P. steenei*, and that there is a single widespread species (with *P. howsoni* forming the southern form in northern Australia). We interpret the distribution of coloration characters among species in the group as indicating nested sister-group relationships, rather than intermediate forms (see above).

Etymology. Named for Mark Erdmann of Conservation International, Indonesia, who collected the type specimens. Mark has worked closely with the second author for the past six years and is responsible for numerous new discoveries, resulting from his deep scuba collections from the East Indian region, including several new pseudochromids.

TABLE 1. Characters distinguishing *P. erdmanni* from closely related species. Apomorphic characters indicated by *.

	Adult caudal-fin shape	Dark bar in front of anterior nostril	Dark opercular spot	Preopercle with dark edge	Pale blue bar behind eye	Dark edging on anal fin	Dark edging on pelvic fin
<i>P. erdmanni</i>	Emarginate	Present*	Present*: indistinct to distinct in males, distinct in females; greater or equal to pupil	Present* distinct in females, weak in males	Present*	Absent	Absent
<i>P. howsoni</i>	Emarginate	Present*	Present*: indistinct, less than pupil	Absent	Absent	Absent	Absent
<i>P. moorei</i>	Emarginate	Present*	Present*: distinct, subequal to eye	Present*	Absent	Absent	Absent
<i>P. quinquedentatus</i>	Rounded	Absent	Absent	Absent	Absent	Absent	Absent
<i>P. steenei</i>	Emarginate	Present*	Present*: indistinct in males; distinct, greater or equal to pupil in females	Present*: distinct in females, weak in males	Present*	Present*	Present*

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References

- Allen, G.R. (1995) *Pseudochromis howsoni*, a new species of dottyback fish (Pseudochromidae) from Ashmore Reef, Timor Sea. *Revue Française d'Aquariologie Herpétologie*, 21, 83–85.
- Fowler, H.W. (1931) Contributions to the biology of the Philippine Archipelago and adjacent regions. The fishes of the families Pseudochromidae, Lobotidae, Pempheridae, Priacanthidae, Lutjanidae, Pomadasytidae, and Teraponidae, collected by the United States Bureau of Fisheries Steamer "Albatross", chiefly in Philippine seas and adjacent waters. *United States National Museum Bulletin*, 100(11), 1–388.
- Gill, A.C. (2004) Revision of the Indo-Pacific dottyback fish subfamily Pseudochrominae (Perciformes: Pseudochromidae). *Smithiana Monograph*, 1, ii + 1–214, pls 1–12.
- Gill, A.C. & Randall, J.E. (1992) *Pseudochromis steenei*, a new sexually dimorphic dottyback fish from Indonesia (Perciformes: Pseudochromidae). *Revue Française d'Aquariologie Herpétologie*, 19, 41–46.
- Günther, A. (1862) Description of new species of reptiles and fishes in the collection of the British Museum. *Proceedings of the Zoological Society of London*, 1862, 188–194, pls 25–27.
- Herre, A.W.C.T. (1933) Twelve new Philippine fishes. *Copeia*, 1933, 17–25.
- Kuiter, R.H. & Debelius, H. (2006) *World Atlas of Marine Fishes*. IKAN-Unterwasserarchiv, Frankfurt. 720 pp.
- Kuiter, R.H. & Tonozuka, T. (2001) *Pictorial Guide to Indonesian Reef Fishes. Part 1. Eels- Snappers, Muraenidae - Lutjanidae*. Zoonetics, Australia. 302 pp.
- McCulloch, A.R. (1926) Report on some fishes obtained by the F.I.S. "Endeavour" on the coasts of Queensland, New South Wales, Victoria, Tasmania, South and South-Western Australia. Part 5. *Biological Results of the Fishing Experiments Carried on by the F.I.S. "Endeavour,"* 5(4), 157–216, pls 43–56.