

A New Species of *Manonichthys* Gill, 2004 (Pisces: Pseudochromidae) from Irian Jaya Barat Province, Indonesia

Gerald R. Allen^{1,*} and Mark V. Erdmann²

¹Western Australian Museum, Locked Bag 49, Welshpool DC, Perth, WA 6986, Australia

²Conservation International, Jl. Dr. Muwardi No. 17, Renon, Denpasar 80235, Indonesia. E-mail:mverdmann@attglobal.net

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Gerald R. Allen and Mark V. Erdmann (2007) A new species of *Manonichthys* Gill, 2004 (Pisces: Pseudochromidae) from Irian Jaya Barat Province, Indonesia. *Zoological Studies* 46(5): 541-546. *Manonichthys jamali* sp. nov. is described from 11 specimens, 13.3-58.4 mm standard length (SL), collected in the Fak Fak Peninsula region of Irian Jaya Barat Province (western New Guinea), Indonesia. It was observed on coral reefs at depths of 9-16 m and was occasionally seen entering sponges of the genus *Callyspongia*. It apparently mimics *Chromis retrofasciata* Weber, 1913, a small pomacentrid fish that exhibits a similar color pattern. The new taxon is most similar to *M. alleni*, *M. polynemus*, and *M. splendens* from the Indo-Malay Archipelago, but is distinguished from those species and all other pseudochromines on the basis of the color pattern, particularly the presence of a prominent black bar across the anterior caudal peduncle and adjacent posterior body extending onto the basal 1/2 of the last 6-8 dorsal and anal fin rays. Additionally, adults have fewer predorsal scales than *M. polynemus* (20-24 vs. 25-30) and a different caudal-fin shape than *M. alleni* and *M. splendens* (emarginate rather than rounded to truncate). <http://zoolstud.sinica.edu.tw/Journals/46.5/541.pdf>

Key words: Pseudochrominae, Species key, Coral reefs, Mimicry, Indo-Australian Archipelago.

Dottybacks of the family Pseudochromidae are common inhabitants of coral reefs throughout the tropical Indo-west Pacific. The subfamily Pseudochrominae was comprehensively reviewed by Gill (2004), who recognized 80 valid species belonging to 10 genera. Gill's revision contained a description of the new genus, *Manonichthys*, which differs from other pseudochromid genera in having the combination of an incomplete lower lip and an anterior dorsal-fin pterygiophore formula of S/S/S + 3 + 1/1 + 1. The following 5 species, all from the Indo-Australian Archipelago, were recognized: *M. alleni* Gill, 2004 from northeast Borneo; *M. paranox* (Lubbock and Goldmann, 1976) from the northern Great Barrier Reef, Bismarck Archipelago, and Solomon Is.; *M. polynemus* (Fowler, 1931) from northern Sulawesi and Palau; *M. splendens* (Fowler, 1931) from the Flores and Banda Seas to western New Guinea; and *M. winterbottomi* Gill, 2004 from Cebu, the Philippines.

Species of *Manonichthys* are medium-sized pseudochromines (maximum standard length (SL) ranging about 50-80 mm) with relatively tall dorsal and anal fins. Several species exhibit ornate color patterns which change significantly from the juvenile to adult stages. They generally inhabit sheltered coastal and seaward reefs at depths ranging about 1.5-50 m. All species have been observed to shelter in tubular sponges, which appears to be a facultative behavioral trait.

The present paper describes a new species of *Manonichthys* that was observed and collected by the authors during a marine biological survey by Conservation International in western New Guinea (Irian Jaya Barat Province, Indonesia) during Apr.-May 2006. Although the survey covered 2 major areas (Fak Fak Peninsula and Triton Bay vicinity) along the southern coast of the Bird's Head region, the species was only found along the southern coast of the Fak Fak Peninsula. The fish

*To whom correspondence and reprint requests should be addressed. Dreyer Road, Roleystone WA 6111, Australia. Tel: 61-8-94961143. Fax: 61-8-93976985. E-mail:tropical_reef@bigpond.com.au

was locally common and immediately recognized as new. It apparently mimics *Chromis retrofasciata* Weber, 1913, a small pomacentrid that exhibits a similar color pattern.

MATERIALS AND METHODS

Type specimens are deposited in the Bernice P. Bishop Museum, Honolulu, HI, USA (BPBM), California Academy of Sciences, San Francisco, CA, USA (CAS), National Museum of Natural History, Washington, DC, USA (USNM), Pusat Penelitian dan Pengembangan Oseanologi, Jakarta, Indonesia (NCIP), and Western Australian Museum, Perth, Australia (WAM).

The descriptive format, terminology, and methods of counting and measuring follow those of Gill (2004). The initials AIO and PIO are used for the anterior interorbital and posterior interorbital pores, respectively. Caudal concavity, a measurement not used by Gill, is the horizontal distance between the verticals at the tips of the shortest and longest caudal rays.

SYSTEMATIC ACCOUNT

Manonichthys jamali sp. nov. (Figs. 1-3)

Materials: Holotype: NCIP 6318, 58.4 mm SL, NW side of Pulau Tumbu Tumbu ($4^{\circ}19.386'S$,



Fig. 1. *Manonichthys jamali* sp. nov. freshly collected holotype, 58.4 mm SL, Pulau Tumbu Tumbu, Irian Jaya Barat Province, Indonesia (M.V. Erdmann photo).

$133^{\circ}30.026'E$), Irian Jaya Barat Prov. (W New Guinea), Indonesia, 8-12 m, spear and clove oil, G. Allen, 2 May 2006. Paratypes (collected with holotype unless stated otherwise): BPBM 40507, 2 specimens, 38.7-42.4 mm SL; CAS 224635, 2 specimens, 36.7-40.6 mm SL; NCIP 6319, 2 specimens, 13.3-42.4 mm SL, NE side of Pulau Pisang ($2^{\circ}37.067'S$, $131^{\circ}39.977'E$), Irian Jaya Barat Prov. (W New Guinea), Indonesia, 12 m, spear, G. Allen, 7 May 2006; USNM 389145, 2 specimens, 24.8-45.7 mm SL; WAM P.32854-001, 2 specimens, 43.9-53.4 mm SL.

Diagnosis: *Manonichthys jamali* sp. nov. is distinguished from congeneric species in having



Fig. 2. Underwater photograph of *Manonichthys jamali* sp. nov. adult, approximately 75 mm TL, from 12 m in depth, Pulau Tumbu Tumbu, Irian Jaya Barat Province, Indonesia (G.R. Allen photo).



Fig. 3. Underwater photograph of a *Manonichthys jamali* sp. nov. juvenile, approximately 40 mm TL, from 12 m in depth, Pulau Tumbu Tumbu, Irian Jaya Barat Province, Indonesia (G.R. Allen photo).

the following combination of characters: hyaline pectoral fins; at least some ctenoid cheek and opercular scales; caudal-fin rounded to truncate in young fish to strongly emarginate or lunate in adults; 17-22 predorsal scales, extending anteriorly to point ranging from slightly posterior to slightly anterior to PIO pores; and a prominent dark bar across anterior caudal peduncle and adjacent posterior body extending onto basal 1/2 of posterior dorsal and anal fin rays

Description (based on 9 specimens, 36.7-58.4 mm SL): minimum and maximum value ranges given first for all type specimens, followed, where different, by values for holotype (enclosed in parentheses): dorsal-fin rays III, 28 or 29 except IV, 24 in 1 paratype (III, 29), last 5-11 (11) segmented rays branched; anal-fin rays III, 15 (III, 16), all or last 8-14 (all) segmented rays branched; pectoral-fin rays 16 or 17, usually 17 (17); upper procurrent caudal-fin rays 6; lower procurrent caudal rays 5 or 6 (6); total caudal-fin rays 27 or 28 (29); scales in lateral series 42-45 (42); anterior lateral-line scales 23-29 (27); anterior lateral line terminating beneath segmented dorsal-fin ray 15-20 (19); posterior lateral-line scales 7-11 + 0-2 (8 + 2); scales between lateral lines 1-5 (3); horizontal scale rows above anal fin origin 12 + 1 + 2 = 15 (11 + 1 + 2 = 14); cir-

cumpeduncular scales 16 or 17 (16); predorsal scales 20-24 (21); scales behind eye 3; scales to preopercular angle 5 or 6 (5); gill rakers 4 or 5 + 12 = 16-18, usually 17 (5 + 12); pseudobranch filaments 9 or 10 (11); circumorbital pores 15-20 (20); preopercular pores 9 or 10 (11); dentary pores 4; anterior interorbital pores 3; posterior interorbital pores 1.

Lower lip incomplete; dorsal and anal fins without scale sheaths, although sometimes with intermittent scales overlapping fin bases; predorsal scales extending anteriorly to level of middle of interorbital (point ranging slightly posterior or slightly anterior to posterior AIO pores using terminology of Gill 2003); opercle without externally visible serrations; teeth of gill rakers of outer ceratobranchial 1 well developed on tips only; dorsal and anal-fin spines moderately stout and pungent, 2nd anal spine much stouter than 3rd; pelvic-fin spine moderately stout and pungent; 2nd or 3rd segmented pelvic-fin ray longest; caudal fin truncate to weakly emarginate in smaller specimens (< 30 mm SL), becoming strongly emarginate or lunate in larger specimens; vertebrae 10 + 16; epineurals 13 or 14; epurals 3.

Upper jaw with 1 or 2 pairs of enlarged caniniform teeth anteriorly, and 4 or 5 (at symphysis) to 2

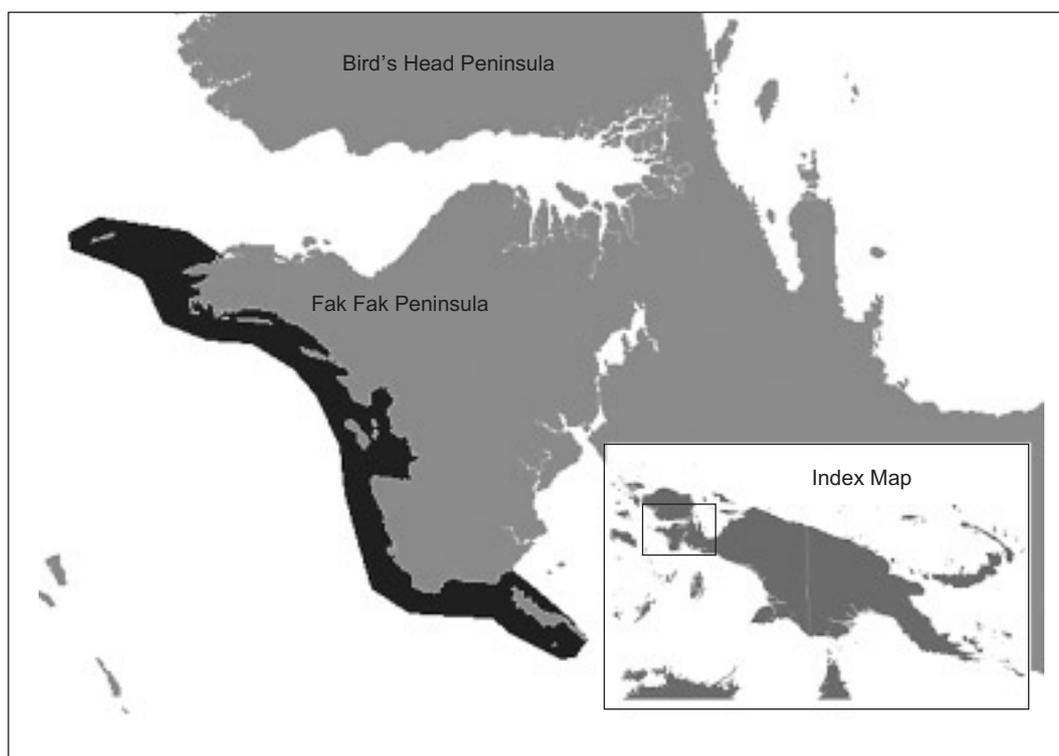


Fig. 4. Map of western New Guinea showing the distributional range (black shading) of *Manonichthys jamali* sp. nov.

or 3 (on sides of jaw) inner rows of small conical teeth, outermost rows of conical teeth much larger and more curved than inner rows; front of lower jaw with 2 pairs of curved, enlarged caniniform teeth, the outer member of each pair stouter and more elongate, and 4-6 (at symphysis) to 1 (on sides of jaw) inner rows of small conical teeth, teeth in middle of jaw larger and slightly curved posteriorly; vomer with 1 or 2 rows of small conical teeth, forming chevron; palatine with 3-5 rows of small conical teeth arranged in elongate, suboval patch, anterior part of tooth patch more or less continuous with posterolateral arm of vomerine tooth patch; ectopyergoid edentate; tongue moderately pointed and edentate.

As percentage of SL (based on 9 specimens, 36.7-58.4 mm SL): head length 28.3-32.8 (28.8); orbit diameter 8.5-11.1 (8.0); snout length 5.7-6.7 (6.2); fleshy interorbital width 5.2-6.8 (6.0); bony interorbital width 3.8-4.8 (4.5); body width 11.2-13.7 (11.8); snout tip to posterior tip of retroarticular bone 15.3-17.1 (15.2); predorsal length 30.8-35.1 (31.3); prepelvic length 30.0-33.5 (30.1); posterior tip of retroarticular bone to pelvic-fin origin 15.1-18.5 (16.6); dorsal-fin origin to pelvic-fin origin 30.0-35.4 (33.0); dorsal-fin origin to middle dorsal-fin ray 33.5-36.7 (35.6); dorsal-fin origin to anal-fin origin 41.8-48.3 (46.6); pelvic-fin origin to anal-fin origin 27.2-33.5 (29.1); middle dorsal-fin ray to dorsal-fin termination 27.1-32.3 (30.5); middle dorsal-fin to anal-fin origin 30.0-36.5 (31.7); anal-fin origin to dorsal-fin termination 35.1-39.9 (40.8); anal-fin base length 26.7-30.9 (31.7); dorsal-fin termination to anal-fin termination 15.1-19.1 (17.3); dorsal-fin termination to caudal peduncle dorsal edge 9.9-

12.5 (8.9); dorsal-fin termination to caudal peduncle ventral edge 16.7-19.4 (18.7); anal-fin termination to caudal peduncle dorsal edge 19.5-21.4 (20.0); anal-fin termination to caudal peduncle ventral edge 11.1-14.2 (11.0); 1st dorsal-fin spine 2.8-3.5 (2.9); 2nd dorsal-fin spine 5.6-7.9 (6.8); 3rd dorsal-fin spine 9.0-10.9 (9.2); 1st segmented dorsal-fin ray 11.2-14.2 (12.8); 4th last segmented dorsal-fin ray 15.1-18.2 (22.6); 1st anal-fin spine 3.6-5.7 (4.1); 2nd anal-fin spine 9.8-12.3 (9.9); 3rd anal-fin spine 8.8-11.6 (9.2); 1st segmented anal-fin ray 11.8-13.1 (13.7); 4th segmented anal-fin ray 14.7-21.7 (31.3); 5th pectoral-fin ray 20.2-23.3 (22.9); pelvic-fin spine 11.6-13.9 (11.1); 2nd segmented pelvic-fin ray 27.3-39.4 (46.1); caudal-fin length 21.9-36.9 (42.1); caudal concavity 0.0-12.2 (17.8).

Live coloration: Head generally brown; iris turquoise except partly orange posteriorly; body overall bluish-gray, grading to yellowish-white on ventral parts and pectoral region; each body scale with a yellow spot, giving an overall appearance of a yellow stripe on each horizontal scale row; a prominent black bar across anterior caudal peduncle and adjacent posterior body extending onto basal 1/2 of last 6-8 dorsal and anal fin rays; dorsal fin with 4 or 5 longitudinal rows of small yellow spots on basal 2/3, pale gray distally with narrow blue margin; caudal fin white to translucent; anal fin pale yellow on basal 1/3, whitish on remaining portion except for grayish submarginal band and narrow blue margin; pelvic fins pale yellow with bluish anterior margin; pectoral fins translucent with yellowish base.

Preserved coloration: head generally dark brown; body tan with a narrow brown stripe between each horizontal scale row, becoming whitish or pale tan on ventral parts; a prominent black bar across anterior caudal peduncle and adjacent posterior body extending onto basal 1/2 of last 6-8 dorsal and anal fin rays; dorsal and anal fins with undulating brown and hyaline stripes anterior to black bar; posterior portion of caudal peduncle and adjacent caudal fin whitish, grading to hyaline on posterior portion of fin; outer 1/2 of pelvic fins dusky brown, inner 1/2 mainly hyaline; pectoral fins hyaline. Small juveniles under about 15-20 mm SL mainly tan except for dorsal portion of head and upper back, which is brown. Characteristic black bar beginning to appear between 20-25 mm SL and well developed at 35 mm SL.

Remarks: The color pattern, particularly the distinctive black bar across the posterior body and



Fig. 5. Underwater photograph of *Chromis retrofasciata*, approximately 40 mm TL, at 12 m in depth, Great Barrier Reef, Australia (G.R. Allen photo).

anterior caudal peduncle readily distinguishes this species from all other pseudochromines. Its general morphology is most similar to *M. alleni*, *M. polynemus*, and *M. splendens*. It differs from *M. alleni* and *M. splendens* in the caudal fin shape (strongly emarginate vs. rounded to truncate) and from *M. polynemus* in the number of predorsal scales (20-24 vs. 25-30 for specimens of *M. polynemus* > 30 mm SL). The predorsal scales of *M. jamali* extend forward on the interorbital to a point ranging slightly posterior or slightly anterior to the posterior AIO pores. In comparison, those of *M. polynemus* extend anteriorly to a point ranging from the posterior AIO pores to the anterior nasal pores, those of *M. alleni* to a point ranging from the anterior AIO pores to the posterior nasal pores, and those of *M. splendens* from the mid AIO pores to midway between the anterior AIO and posterior nasal pores. A key to the 6 known species of *Manonichthys* is presented below.

Key to species of *Manonichthys* (adapted from Gill 2004)

- 1a. At least some pectoral-fin rays black.....2
- 1b. Pectoral-fin rays hyaline.....3
- 2a. Pectoral-fin rays 17-19 (usually 18 or 19); horizontal scale rows above anal-fin origin to anterior lateral line 13-17; circumpeduncular scales 18-21; upper opercular scales cycloid (Papua New Guinea, northern Great Barrier Reef, and Solomon Is.)*M. paranox*
- 2b. Pectoral-fin rays 16 or 17; horizontal scale rows above anal-fin origin to anterior lateral line 13-17; circumpeduncular scales 16; at least some upper opercular scales ctenoid (Cebu, the Philippines).....*M. winterbottomi*
- 3a. Dark brown to black bar present, either extending from nape through eye to interopercle or across anterior caudal peduncle and adjacent posterior body.....4
- 3b. Coloration not as in 3a.....5
- 4a. Dark bar across anterior caudal peduncle and adjacent posterior body, extending onto posterior dorsal and anal rays; caudal fin rounded to truncate in small specimens and strongly emarginate in adults (Irian Jaya Barat Province, Indonesia).....*M. jamali* sp. nov.
- 4b. Dark bar extending from nape through eye to interopercle; caudal fin rounded to truncate (southeastern Indonesia).....*M. splendens*
- 5a. Caudal fin rounded to truncate (northern Borneo).....*M. alleni*
- 5b. Caudal fin emarginate in small (< 30 mm SL) specimens, becoming strongly emarginate to lunate in larger specimens (northeastern Indonesia and Palau)...*M. polynemus*

Distribution and habitat: The known distribution of *M. jamali* sp. nov. is indicated in figure 4. It appears to have a highly restricted range on the southern (Fak Fak) portion of Bird's Head (Vogelkop) Peninsula of far western New Guinea (Irian Jaya Barat Province, Indonesia). It is known

only from an approximately 370 km stretch of coastline between Tumbu Tumbu I. (04°19.386'S, 133°30.026'E) and the Pisang Is. (02°37.067'S, 131°39.977'E). Recent surveys by the authors revealed that it does not occur immediately northward at Misool, and it is also absent to the south of Tumbu Tumbu in the Kaimana-Triton Bay area. The habitat frequently consists of dense thickets of staghorn *Acropora* corals, encrusting layers of *Galaxea* corals, or rocky debris at depths of about 9-16 m. Fish are encountered solitarily or in loose groups of 2-4 individuals that range over an area of about 1.5-2 m. The species was observed to occasionally enter sponges of the genus *Callyspongia*.

Mimicry: The color pattern and behavior of *M. jamali* indicate a mimetic relationship with the common damselfish *Chromis retrofasciata* Weber, 1913 (Fig. 5), with which it co-occurs. Gill (2004) suggested that at least four of the 5 known species of *Manonichthys* are possible mimics of certain damselfishes, butterflyfishes, and angelfishes. Although more elongate than the proposed models, the mimicry is effectively enhanced by certain color pattern features and behavioral traits. In the case of *M. jamali* sp. nov., it is invariably found in close proximity to *C. retrofasciata*, which is generally far more abundant. This appears to be a form of aggressive mimicry (Wickler 1965 1968), in which the resemblance to the damselfish enables the pseudochromid to get closer to its prey (i.e., small fishes). Munday et al. (2003) reported a similar relationship involving *Pseudochromis fuscus* and 3 species of damselfishes in the genus *Pomacentrus*. Laboratory experiments revealed that the dottyback preferentially selects habitat patches occupied by similarly colored damselfishes. *Pseudochromis fuscus* is a predator of small fishes, including newly recruited damselfishes. Finally, Randall (2005) provided an extensive review of mimicry in marine fishes including examples of aggressive mimicry in which the juveniles of various serranids and lutjanids mimicked at least 9 different species of pomacentrids.

Etymology: Named *jamali* to honor the memory of Jamal, an enthusiastic and hard-working young crew member of the diving vessel M.V. *Citra Pelangi*, who died as the result of a tragic ship-board accident during our 2006 exploratory survey of the Fak Fak-Kaimana region.

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