aqua, International Journal of Ichthyology

A new species of *Pseudochromis* (Pisces: Pseudochromidae) from Papua Barat Province, Indonesia

Gerald R. Allen[1*], Anthony C. Gill[2] and Mark V. Erdmann[3]

1) Western Australian Museum, Locked Bag 49, Welshpool DC, Perth, Western Australia 6986.
*corresponding author: E-mail: tropical_reef@bigpond.com
2)International Institute for Species Exploration, School of Life Sciences, PO Box 874501, Arizona State University, Tempe, AZ 85287-4501, U.S.A.
3) Conservation International Indonesia Marine Program, Jl. Dr. Muwardi No. 17, Renon, Denpasar 80235, Bali, Indonesia

Received: 05 July 2007 – Accepted: 17 October 2007

Abstract

Pseudochromis jace is described from three specimens, 37.9-62.5 mm SL, collected in the vicinity of Triton Bay, Papua Barat Province (western New Guinea), Indonesia. It is most similar to *P. pictus* from the Indonesian island of Alor, which lies about 1130 km southwest of Triton Bay, and to *P. reticulatus* from off north-western Australia. The three species are easily separated on the basis of colour pattern, particularly dorsal coloration, and degree of development of a dark stripe on the upper body. The new species is also similar in coloration to *P. perspicillatus* from the Indo-Malayan region, although the latter fish has prominent dark spots on the nape area and has a different palatine tooth patch structure.

Zusammenfassung

Pseudochromis jace wird auf der Grundlage von drei Exemplaren beschrieben, die mit 37.9-62.5 mm SL in der Nähe der Triton-Bucht an der Provinz Papua Barat (westliches Neuguinea), Indonesien, gefangen wurden. Diese neue Art ähnelt stark *P. pictus* von der indonesischen Insel Alor, die etwa 1130 km südwestlich der Triton-Bucht liegt, sowie *P. reticulatus* mit einem Verbreitungsgebiet nordwestlich von Australien. Die drei Arten lassen sich leicht am Farbmuster unterscheiden, besonders an der Rückenfarbe, sowie am Grad der Ausprägung eines dunklen Streifens in der oberen Körperhälfte. Die neue Art ähnelt in der Farbgebung auch *P. perspicillatus* aus der indo-malaiischen Region, deren Vertreter allerdings auffällige dunkle Flecken im Nackenbereich und eine andersartige Bezahnung am Gaumenbein zeigen.

Résumé

Pseudochromis jace est décrit sur base de trois spécimens, de 37,9 à 62,5 mm de LS, collectés au voisinage de Triton Bay, province de Papua Barat (Nouvelle-Guinée occidentale), Indonésie. L'espèce ressemble le plus à *P. pictus*, de l'île indonésienne d'Alor, qui se trouve à environ 1.130 km au soud-ouest de Triton Bay, et à *P. reticulatus* qu'on trouve au large du nord-ouest de l'Australie. Les trois espèces sont faciles à distinguer par leur coloration, surtout celle du dos, et par le développement relatif d'une ligne sombre sur le haut du corps. La nouvelle espèce évoque aussi la couleur de *P. perspicillatus* de la région indo-malaise, même si ce dernier a des taches foncées marquées sur la région dorsale de la tête et présente une structure différente des dents palatines.

Sommario

Pseudochromis jace è descritto sulla base di tre esemplari di 37.9-62.5 mm SL raccolti in prossimità della baia del Tritone, provincia di Papua Barat (Nuova Guinea occidentale), Indonesia. È molto simile a *P. pictus* dell'isola indonesiana di Alor, che si trova a circa 1130 km sudovest della baia del Tritone, e a *P. reticulatus* delle coste nordoccidentali dell'Australia. Le tre specie sono facilmente distinguibili sulla base della colorazione, specialmente della regione dorsale, e per il grado di sviluppo di una banda scura sulla parte superiore del corpo. La nuova specie è simile per la colorazione anche a *P. perspicillatus* che abita la regione Indo-Malese, sebbene quest'ultima abbia una distinta macchia scura sulla nuca e una diversa struttura della placca dei denti palatini.

INTRODUCTION

Dottybacks of the family Pseudochromidae are common inhabitants of coral reefs throughout the tropical Indo-West Pacific. The subfamily Pseudochrominae was reviewed by Gill (2004), who recognized 80 valid species belonging to 10 genera. *Pseudochromis* Rüppell, 1835 is by far the largest genus in the family. Gill provided a comprehensive key to the 57 species in this genus, which ranges widely in the Indo-Pacific from the Persian Gulf, Red Sea, and East African coast to Tonga and the islands of Micronesia. Gill & Allen (2004) subsequently described two additional *Pseudochromis* species from Indonesia and Papua

New Guinea, and additional recently discovered new species await description. Despite the relatively good species-level knowledge within *Pseudochromis*, phylogenetic relationships are yet to be established satisfactorily.

The present paper describes a new *Pseudochromis* that was observed and collected by G. R. Allen and M. V. Erdmann during a brief visit to the Triton Bay region of western New Guinea (Papua Barat Province, Indonesia) during January 2007. The new species was observed on two occasions at depths between 38 and 52 m. We had previously conducted a biological survey for Conservation International (CI) in this area during April-May 2006, but failed to record the species despite extensive diving.

MATERIALS AND METHODS

Type specimens are deposited in the National Museum of Natural History, Washington, D.C. (USNM), Pusat Penelitian dan Pengembangan Oseanologi, Jakarta, Indonesia (NCIP), and Western Australian Museum, Perth (WAM). The descriptive format, terminology, and methods of counting and measuring follow those of Gill (2004). Standard length (SL) is the straight-line distance from the front of the upper lip to the base of the caudal fin (posterior end of the hypural plate). AIO refers to the anterior interorbital pores. Minimum and maximum value ranges are given first for all type specimens, followed, where different, by values for the holotype enclosed in parentheses.

Pseudochromis jace n. sp.

(Figs 1-2; Table I)

Holotype: NCIP 6320, 62.5 mm SL, northwest entrance to Selat Iris, 03°53.757'S 134°06.638'E, Triton Bay, Papua Barat Province, Indonesia, 52 m depth, clove oil, M. V. Erdmann, 30 January 2007. Paratypes: USNM 390773, 37.9 mm SL, off southeast side of Aiduma Island, 04°00.846'S 134°09.522'E, Papua Barat Province, Indonesia, 38 m depth, clove oil, M. V. Erdmann, 27 January 2007; WAM P.32891-001, 45.6 mm SL, collected with USNM 390773.

Diagnosis: *Pseudochromis jace* is distinguished from congeneric species by the following combination of characters: dorsal-fin rays III,26, all segmented rays branched; anal-fin rays III,15; scales in lateral series 30-34; circumpeduncular scales 18-20; gill rakers 6 + 13; teeth of outer ceratobranchial-1 gill rakers well developed on raker tips only; caudal fin rounded with pointed tip; and basal one-fifth to one-third of dorsal fin with dark stripe.

Description (based on three specimens, 37.9-62.5 mm SL): dorsal-fin rays III,26, all segmented rays branched; anal-fin rays III,15, all segmented rays branched; pectoral-fin rays 18, all rays branched except uppermost 2 and lowermost 1; upper procurrent rays 6; lower procurrent caudal-fin rays 6; total caudal-fin rays 29; scales in lateral series 30-34 (34/33); anterior lateral-line scales 24-26 (26/25); anterior lateral line terminating beneath segmented

Fig. 1. Underwater photograph of *Pseudochromis jace*, adult approximately 80 mm TL, 45 m depth, Pulau Aiduma, Papua Barat Province, Indonesia. Photo by G. R. Allen.

Table I. Comparison of selected morphometric characters of *P. jace*, *P. pictus* and *P. reticulatus*. With the exception of standard length (SL), which is given in mm, all values are given as percentages of SL.

	P. jace	*P. pictus*	*P. reticulatus*
mm SL (n)	37.9-62.5 (n = 3)	50.3-66.5 (n = 2)	36.0-55.6 (n = 7)
Dorsal-fin origin to pelvic-fin origin	29.1-30.9	30.5-31.2	25.6-27.8
Middle dorsal-fin ray to anal-fin origin	28.1-28.8	28.9-30.9	24.2-27.4
Dorsal-fin origin to middle dorsal-fin ray	35.7-36.9	38.0-38.5	34.3-37.4
Anal-fin origin to dorsal-fin termination	34.9-36.4	37.1-38.0	32.8-34.9
Dorsal-fin termination to anal-fin termination	16.3-17.3	16.7-18.1	14.7-16.2
Anal-fin base length	26.4-28.1	28.9-29.4	25.0-27.5
Bony interorbital width	4.2-4.5	4.2-4.4	3.6-4.0
Fourth last segmented dorsal-fin ray	17.7-18.9	19.8-23.9	17.5-19.5
Fourth last segmented anal-fin ray	16.9-17.4	17.9-20.3	15.2-17.4

dorsal-fin ray 20-22 (20/21); posterior lateral-line scales 8-11 + 0-2 (10 + 2/8 + 2); scales between lateral lines 3-4 (3/4); horizontal scale rows above anal fin origin 13-14 + 1 + 3 = 17-18 (13 + 1 + 3/14 + 1 + 3); circumpeduncular scales 18-20 (19); predorsal scales 19-22 (20); scales behind eye 2-3 (3); scales to preopercular angle 4-5 (4); gill rakers 6 + 13; pseudobranch filaments 11-12 (12); circumorbital pores 27-36 (36/34); preopercular pores 10-15 (14/14); dentary pores 4-5 (4/5); posterior interorbital pores 1-3 (3).

Lower lip incomplete; dorsal and anal fins without scale sheaths, although sometimes with intermittent scales overlapping fin bases; predorsal scales extending anteriorly to point ranging from midway between anterior AIO and posterior nasal pores to posterior nasal pores; opercle with 4 or 5 small to relatively distinct serrations; teeth of outer ceratobranchial-1 gill rakers well developed on tips only; anterior dorsal-fin pterygiophore formula S/S/S + 3/1 + 1/ 1/1/1/1 + 1*/1/1 + 1* (S/S/S + 3/1 + 1/1/1/1/1/1 + 1/1); dorsal-fin spines moderately stout and pungent; anterior anal-fin pterygiophore formula 3/1 + 1/1/1 + 1*/1 + 1* (3/1 + 1/1/1 + 1/1); anal-fin spines moderately stout and pungent, second spine stouter than third; pelvic-fin spine moderately stout and pungent; second segmented pelvic-fin ray longest; caudal fin rounded with pointed tip; vertebrae 10+ 16; epineurals 13-14 (13); epurals 3.

Upper and lower jaws with enlarged caniniform teeth at front of jaws, but arrangement variable in

Fig. 2. *Pseudochromis jace*, freshly collected holotype, 61.8 mm SL, Triton Bay, Papua Barat Province, Indonesia. Photo by G. R. Allen.

each type specimen: upper jaw of holotype and largest paratype with enlarged caniniform tooth at front corner of each side and pair of smaller canines at symphysis, that of smallest paratype with pair of enlarged caniniform teeth at front corner of each side and pair of smaller canines at symphysis (also solitary enlarged canine laterally on right side); all specimens with 6-7 (at symphysis) to 2-3 (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 of holotype with 3 pairs of curved, enlarged

Fig. 3. Underwater photograph of *Pseudochromis pictus*, adult 50.3 mm SL, 30 m depth, Alor, Indonesia. Photo by J. E. Randall.

Fig. 4. Underwater photograph of *Pseudochromis perspicillatus*, adult approximately 85 mm TL, 15 m depth, Pulau Aiduma, Papua Barat Province, Indonesia. Photo by G. R. Allen.

caniniform teeth, the outer pair more stout and elongate, that of largest paratype with 2 pairs of canines, and that of smallest paratype with single pair of canines; all specimens with 4-5 (at symphysis) to 1 (on sides of jaw) inner rows of small conical teeth, teeth on middle of jaw larger and curved slightly posteriorly; vomer with 1-2 rows of small conical teeth, forming chevron; palatine with 1-4 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; ectopterygoid edentate; tongue moderately pointed and edentate.

As percentage of SL: head length 24.6-28.0 (24.6); orbit diameter 8.8-10.8 (8.8); snout length 6.4-6.7 (6.7); fleshy interorbital width 5.8-6.1 (6.1); bony interorbital width 4.2-4.5 (4.5); body width 12.2-12.7 (12.2); snout tip to posterior tip of retroarticular bone 14.7-15.6 (14.7); predorsal length 32.5-36.1 (32.5); prepelvic length 31.6-33.5 (31.6); posterior tip of retroarticular bone to pelvic-fin origin 18.6-19.5 (19.5); dorsal-fin origin to pelvic-fin origin 29.1-30.9 (29.1); dorsal-fin origin to middle dorsal-fin ray 35.7-36.9 (35.7); dorsal-fin origin to anal-fin origin 42.8-44.8 (44.6); pelvic-fin origin to anal-fin origin 25.6-30.7 (30.7); middle dorsal-fin ray to dorsal-fin termination 24.0-26.1 (25.8); middle dorsal-fin ray to anal-fin origin 28.1-28.8 (28.5); anal-fin origin to dorsal-fin termination 34.9-36.4 (34.9); anal-fin base length 26.4-28.1 (26.4); dorsal-fin termination to anal-fin termination 16.3-17.3 (16.3); dorsal-fin termination to caudal peduncle dorsal edge 11.1-11.8 (11.8); dorsal-fin termination to caudal peduncle ventral edge 19.5-19.8 (19.5); anal-fin termination to caudal peduncle dorsal edge 20.2-22.2 (20.2); anal-fin termination to caudal peduncle ventral edge 12.5-13.5 (12.6); first dorsal-fin spine 2.7-4.0 (2.7); second dorsal-fin spine 6.4-6.9 (6.4); third dorsal-fin spine 8.6-9.5 (8.6); first segmented dorsal-fin ray 11.8-13.2 (12.3); fourth last segmented dorsal-fin ray 17.7-18.9 (17.9); first

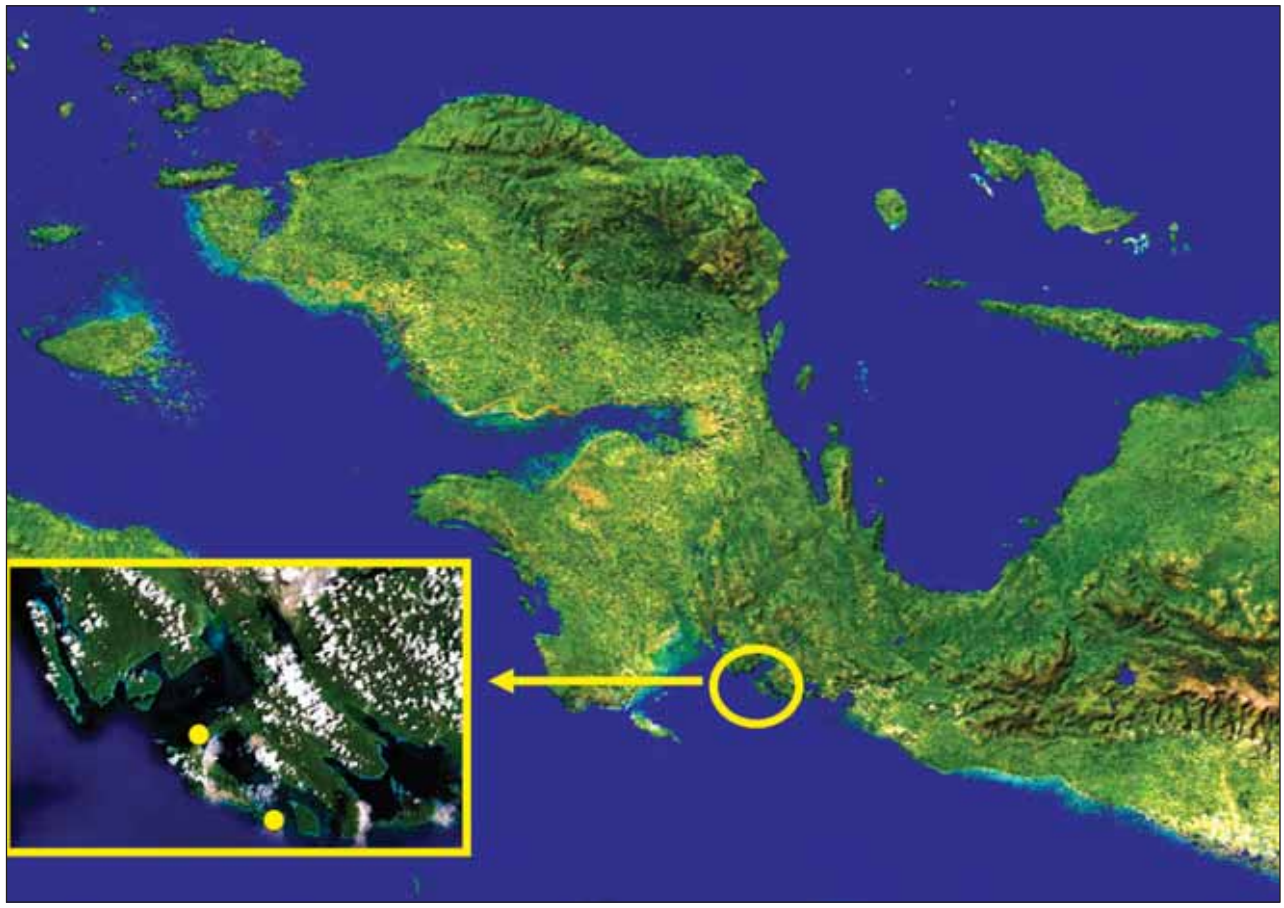

Fig. 5. Satellite map of western New Guinea showing enlargement of Triton Bay (inset at left) with collecting locations indicated by yellow circles.

anal-fin spine 2.1-2.9 (2.1); second anal-fin spine 5.1-6.1 (5.1); third anal-fin spine 7.4-9.0 (7.4); first segmented anal-fin ray 11.2-12.7 (11.4); fourth last segmented anal-fin ray 16.9-17.4 (17.0); third pectoral-fin ray 15.1-16.6 (15.4); pelvic-fin spine 10.4-11.6 (10.4); second segmented pelvic-fin ray 21.9-25.0 (21.9); caudal-fin length 32.2-37.4 (37.4).

Live coloration (from underwater photograph, Fig. 1): generally pinkish-white with broad dark grey to black stripe from snout to anterior edge of eye, continued behind eye to upper back, extending immediately above anterior lateral line to upper edge of caudal peduncle; stripe becoming paler grey-brown and less distinct posteriorly; stripe punctuated by darker spots on scales dorsally; anterior lateral-line scales each with large basal pinkish to brownish white spot, and dark grey-brown to black basal bar, which extends dorsally to dark body stripe and ventrally to prominent black spot on scale row immedately below anterior lateral line; dark stripe and adjacent scale marking combining to give overall "herring-bone" or "zipper" appearance; dorsal surface of snout, interorbital, and nape slightly paler brown; operculum and adjacent pectoral-fin base with pale yellow hue; upper lip mainly brown and lower lip greyish; lower margin of eye pale yellow; iris of eye blue, the pupil edged with orange; anterior part of operculum with several short, grey vermiculate lines on yellowish-white background; basal one-fifth to one-third of dorsal fin with dark grey to black stripe, bordered proximally with narrow yellow stripe; remainder of dorsal fin yellow; anal, pectoral, and pelvic fins translucent whitish; grey-brown stripe on dorsal edge of caudal peduncle extending obliquely onto middle portion of caudal fin; lower half of caudal-fin base broadly greyish, this coloration extending obliquely towards middle portion of fin; dorsal margin of upper caudal lobe broadly translucent whitish, and ventral margin of lower lobe narrowly translucent.

Colour of holotype when fresh (Fig. 2): similar to live coloration except generally more pink and the anal-fin base is grey.

Preserved coloration: generally white or yellowish tan with dark brown area covering snout, interorbital, forehead, and narrow zone along back, above anterior lateral line, that extends on to basal third of dorsal fin and continues on dorsal edge of caudal peduncle, gradually fading onto upper caudal-fin rays; most of scales in lateral row immediately below lateral line with dark brown spot; outer portion of dorsal fin whitish; anal fin dusky pale grey; caudal fin mainly dusky grey except for broad translucent area on dorsal margin; pectoral and pelvic fins whitish.

Comparisons: The new species appears to be closely related to *P. pictus* Gill & Randall, 1998 from the Indonesian island of Alor and *P. reticulatus* Gill & Woodland, 1992 from off the northwest coast of Australia (Gill & Randall 1998, Gill & Woodland 1992). The three species have similar preserved and probably live coloration (unknown for *P. reticulatus)*, similar morphometric and meristic values, and share an unusual rounded caudal fin with a pointed tip. Comparisons between the three species are tentative owing to the small number of available specimens: three for *P. jace*, two for *P. pictus*, and 12 for *P. reticulatus.* However, *P. reticulatus* is distinctive in having only 16 circumpeduncular scales, versus 18-20 in *P. jace* (see Remarks below) and 20 in *P. pictus.* The three species appear to differ in several morphometric details, as summarised in Table I. Generally, *P. reticulatus* is shallower bodied than either *P. pictus* or *P. jace* (Table I, as reflected by values for dorsal-fin origin to pelvic-fin origin, middle dorsal-fin ray to anal-fin origin, and anal-fin origin to dorsal-fin termination). The caudal peduncle of *P. reticulatus* is also shallower than in the other two species, as reflected in dorsal-fin termination to anal-fin termination values (and possibly in the circumpeduncular scale counts noted above). It also has a narrower bony interorbital. *Pseudochromis pictus* differs from the other two species in having a longer anal-fin base, and longer fourth-last dorsal- and anal-fin rays.

The three species also differ in several coloration details, particularly the development of the irregular dark stripe on the upper body and head. This is best developed in *P. jace* where it is relatively intense in coloration – at least anteriorly – and extends from the upper lip to the eye, then from behind the eye to the dorsal part of the caudal peduncle. In *P. reticulatus* the stripe is relatively indistinct, and broadly interrupted by a pale area between the dorsal edge of the gill opening and the anterior part of the dorsal fin. *Pseudochromis pictus* is intermediate between the two species, with a complete, though indistinct stripe. The degree of intensity of the stripe largely reflects the degree of development of pale spots within the stripe. In *P. reticulatus* and *P. pictus* pale spots are present on most scales within the dark stripe, even extending

ventrally beneath the edge of the stripe, and combining with darker markings around the spots to form a reticulate pattern. In contrast, in *P. jace* pale spots are confined to anterior lateral-line scales, combining ventrally with dark scale spots to form a zipper-like edge to the dark body stripe. Dorsal-fin markings also differ between the three species. In *P. jace* the basal one-fifth to one-third of the entire fin is dark grey to black, edged ventrally with yellow, with the remainder of the fin yellow. In *P. pictus* the fin is yellow anteriorly and distally, becoming grey posteriorly on basal two-thirds, with one (anteriorly) to three (posteriorly) large dark grey to black spots (not apparent in Fig. 3) basally on the soft part of the fin, forming a reticulate pattern. Although the live coloration of *P. reticulatus* is unknown, the pattern of pale and dark markings is generally similar to *P. pictus*: the spinous dorsal is entirely pale rather than dark ventrally, and the basal part of the fin has a reticulate pattern of dark markings rather than a uninterrupted dark stripe (although, unlike *P. pictus*, the markings are present as short oblique bars rather than series of spots). Finally, *P. jace* differs from *P. pictus* in having the snout, lips, interorbital and nape brown rather than yellow in life; these areas are pale in preserved specimens of *P. reticulatus* and therefore are probably similar to *P. pictus* in life.

Pseudochromis jace is also similar in general appearance to *P. perspicillatus* Günther, 1862, which is widely distributed in the Indo-Malay and Philippines archipelagoes. They share similar colour patterns although *P. perspicillatus* (Fig. 4) has distinctive dark spots on the nape area and does not possess the "zipper" markings on the upper side. It also has a different palatine tooth structure characterised by a more medial position in relation to the vomerine tooth patch (see Gill 2004: fig. 23). Additionally, the caudal fin is rounded to truncate in small specimens becoming emarginate to lunate in large specimens. It also differs from the new species in various meristic details (e.g., anal-fin rays III,13-14 *versus* III,15; scales in lateral series 38-42 *versus* 30-34; anterior lateral-line scales 28-35 *versus* 24-26). The two species are sympatric in the Triton Bay area, but are separated by depth zonation. *Pseudochromis perspicillatus* is generally found in shallower water at depths between about 3 and 27 m.

Distribution and habitat: *Pseudochromis jace* is known only from the type locality and a nearby location near Triton Bay (Fig. 5) in Papua Barat Province of western New Guinea. About 10 individuals were observed on rubble slopes at depths of 38 to 52 m. The fish were seen solitarily or in pairs around isolated rock-coral outcrops on otherwise low-profile sand/rubble bottoms.

Remarks: The presence of 18 or 19 circumpeduncular scales in the two paratypes of *P. jace* is unusual among pseudochromines in that most large-scaled species consistently have either 16 or 20 scales in the series (see Gill, 2004: Appendix 1j). Typically there are two median scales (one at the dorsal edge and one of the ventral edge of the peduncle), two lateral-line scales (one on each side), and either 3 (for species with 16 circumpeduncular scales) or 4 (for species with 20 circumpeduncular scales) scales separating the lateral-line and median scales. The holotype of *P jace* has the typical arrangement of a species with 20 scales, but in the paratypes the dorsal median scale (for the count of 19) or both median scales (for the count of 18) are missing. Among pseudochromines, only *Assiculoides desmonotus* typically lacks median scales on the caudal peduncle. However, in that case (where the dorsal median scales are missing) this is due to the presence of a low fin membrane connecting the dorsal and caudal fins (Gill & Hutchins 1997). We therefore suspect that the absence of the median scales in *P. jace* may be atypical of the species, and a normal count of 20 circumpeduncular scales should be expected.

Etymology: The new species is named *jace* to honour the request of Lisa and Michael Anderson, who successfully bid to support the conservation of this species at the Blue Auction in Monaco on 20 September 2007 and have given generously to support Conservation International's Bird's Head Seascape marine conservation initiative. The name is composed of the first letter of each of their four children: Jonathan, Alex, Charlie, and Emily. It is treated as a noun in apposition.

ACKNOWLEDGEMENTS

We are grateful to Conservation International and the Indonesian Department of Nature Conservation (PHKA) for sponsoring our investigations of Triton Bay in 2006-2007. We are especially indebted to the Walton Family Foundation for their substantial financial contribution to CI's Bird's Head Seascape marine conservation initiative. We also thank Graham Abbott for assisting with diving activities and the crew of our live-aboard boat *Seahorse*, for their excellent logistic

support. The second author's participation in the study was possible through an Australian Museum Visiting Research Fellowship at the Australian Museum. Amanda Hay provided radiographs.

REFERENCES

GILL, A. C. 2004. Revision of the Indo-Pacific dottyback fish subfamily Pseudochrominae. *Smithiana*. Monograph 1: 1-213. South African Institute for Aquatic Biodiversity.

GILL, A. C. & ALLEN, G. R. 2004. *Pseudochromis lugubris* and *P. tonozukai*, two new dottyback fish species from the Indo-Australian Archipelago (Perciformes: Pseudochromidae: Pseudochrominae). *Zootaxa* 604: 1-12.

GILL, A. C. & HUTCHINS, J. B. 1997. *Assiculoides desmonotus*, new genus and species of dottyback from the Kimberley coast of Western Australia (Teleostei: Perciformes: Pseudochromidae). *Revue française d'Aquariologie*, 24 (1-2): 43-48.

GILL, A. C. & RANDALL, J. E. 1998. Five new species of the dottyback genus *Pseudochromis* from Indonesia (Teleostei: Pseudochromidae), *Revue française d'Aquariologie*, 25 (1-2): 17-26.

GILL, A. C. & WOODLAND, D. J. 1992. Description of a new dottyback of the genus *Pseudochromis* (Pisces: Pseudochromidae) from Western Australia. *Records of the Australian Museum*, 44 (3): 247-251.