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Paracheilinus nursalim, a new species of flasher wrasse (Perciformes: Labridae) from the Bird's Head Peninsula of western New Guinea with a key to the species of *Paracheilinus*

Gerald R. Allen[1] and Mark V. Erdmann[2]

1) Western Australian Museum, Locked Bag 49, Welshpool DC, Perth, Western Australia 6986.
E-mail: tropical_reef@bigpond.com
2) Conservation International Indonesia Marine Program, Jl. Dr. Muwardi No. 17, Renon, Denpasar 80235, Bali, Indonesia

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nAbstract

Paracheilinus nursalim is described from 16 male specimens, 39.4-51.0 mm SL, and three females, 20.9-28.9 mm SL, collected at the Fak Fak Peninsula and Triton Bay area of western New Guinea. It is distinguished from all other members of the genus on the basis of coloration of adult males, particularly the presence of a pair of prominent blackish patches, one below the anterior dorsal fin and another covering the ventral half of the caudal peduncle. Males also possess unusually long caudal fin filaments, which extend for about 50% of the standard length in some individuals. The new species most closely resembles the sympatric *P. cyaneus* (northeast Kalimantan, Sulawesi, and western New Guinea), but is easily distinguished on the basis of the previously mentioned features as well as its predominately orange ground colour compared to the magenta or reddish coloration of *P. cyaneus*. The latter species further differs in having a dark triangular marking on the spinous dorsal fin, red dorsal and ventral margins on the caudal fin, which extend onto the filamentous lobes, and a blue band below the eye that is about twice the width of a similarly-positioned band in *P. nursalim*. A key is provided for distinguishing the 16 species of the genus.

Zusammenfassung

Paracheilinus nursalim wird auf der Grundlage von 16 männlichen Exemplaren mit 39,4-51,0 mm SL und drei Weibchen mit 20,9-28,9 SL beschrieben, die aus der Gegend der Fak-Fak-Halbinsel und der Triton-Bucht am westlichen Neuguinea stammen. Von allen anderen Arten der Gattung unterscheidet sich die neue Art durch die Farbgebung der erwachsenen Männchen, insbesondere das Vorhandensein eines Paares auffallender schwärzlicher Flecken, von denen einer unterhalb der vorderen Rückenflosse liegt, während der andere die ventrale Hälfte des Schwanzstiels einnimmt. Auch besitzen die Männchen ungewöhnlich lange Fadenanhänge an der Schwanzflosse, die bei manchen Einzeltieren 50% der Standardlänge entsprechen. Am meisten ähnelt die neue Art dem sympatrischen *P. cyaneus* (nordöstliches Kalimantan, Sulawesi, und westliches Neuguinea), lässt sich aber anhand der genannten Merkmale leicht unterscheiden und auch durch die überwiegend orange Grundfarbe im Unterschied zu der magentaroten oder rötlichen Färbung von *P. cyaneus.* Diese zuletzt genannte Art unterscheidet sich außerdem durch ein dunkles, dreieckiges Zeichen auf der stachelartigen Rückenflosse, rote dorsale und ventrale Ränder auf der Schwanzflosse, die sich auf die fädigen Lappenanhänge erstrecken, und ein blaues Band unter dem Auge, das etwa doppelt so breit ist wie das Band an entsprechender Stelle bei *P. nursalim.* Den Abschluss bildet ein Bestimmungsschlüssel für die 16 Arten der Gattung.

Résumé

Paracheilinus nursalim est décrit sur bas de 16 spécimens mâles, de 29,4 à 51,0 mm de LS, et de trois femelles, de 20,9 mm de LS, collectés près de la péninsule Fak Fak et dans la région de Triton Bay de la Nouvelle-Guinée occidentale. L'espèce se distingue de tous les autres représentants du genre par la coloration des mâles adultes, surtout par la présence d'une paire de taches noirâtres bien marquées, l'une sous la dorsale antérieure et 'autre couvrant la moitié abdominale du pédoncule caudal. Les mâles disposent aussi de filaments exceptionnellement longs à la caudale qui s'étendent à près de 50% de la longueur standard chez certains individus. La nouvelle espèce ressemble le plus au *P. cyaneus* sympatrique (nord-est de Kalimantan, Sulawesi et Nouvelle-Guinée occidentale), mais se distingue facilement par les donnérs mentionnées ci-dessus ainsi que par sa couleur orange dominante, alos que *P. cyaneus* a une couleur magenta ou rougeâtre. Cette dernière espèce diffère encore par une marque triangulaire sombre sur la dorsale épineuse, des liserés rouges dorsaux et abdominaux sur la caudale qui s'étendent sur les lobes filamenteux, et par une bande bleue sous l'oeil qui a à peu près le double de la largeur de la bande de *P. nursalim* située au même endroit. Une clé est fornie pour la détermination des 16 espèces du genre.

Sommario

Paracheilinus nursalim è descritto in base a 16 esemplari maschi di 39.4-51.0 mm SL e tre femmine di 20.9-28.9 mm SL raccolti presso la penisola Fak Fak e la baia del

Tritone della Nuova Guinea occidentale. Si distingue da tutti gli altri membri del genere sulla base della colorazione del maschio adulto, in particolare per la presenza di un paio di evidenti chiazze nerastre, una sotto la pinna dorsale anteriore e un'altra che copre la metà ventrale del peduncolo caudale. I maschi possiedono anche lobi caudali con filamenti eccezionalmente lunghi, che in alcuni individui si estendono per circa il 50% della lunghezza standard. La nuova specie assomiglia moltissimo alla simpatrica *P. cyaneus* (Kalimantan nordorientale, Sulawesi e Nuova Guinea occidentale), ma è facilmente distinguibile sulla base delle caratteristiche precedentemente menzionate e anche per la sua colorazione di fondo prevalentemente arancione rispetto a quella magenta o rossastra di *P. cyaneus*. Quest'ultima differisce inoltre per avere un'impronta scura triangolare sulla porzione spinosa della pinna dorsale, la pinna dorsale rossa e rossi anche i margini ventrali della pinna caudale che si estendono sui lobi filamentosi, una banda blu sotto l'occhio larga circa due volte l'ampiezza di una banda posizionata in modo simile in *P. nursalim*. Per distinguere le 16 specie che compongono il genere è fornita una chiave dicotomica.

INTRODUCTION

The labrid genus *Paracheilinus* Fourmanoir, 1955 ranges across the Indo-Pacific region from the Red Sea and East Africa to the islands of Micronesia and Melanesia. Members of the genus are commonly referred to as flasher wrasses due to their vivid colours, which are instantaneously "flashed" by adult males during daily courtship episodes. This behaviour is greatly enhanced by bouts of rapid swimming interspersed with stationary displays featuring full erection of the dorsal and anal fins. Moreover, one or more dorsal fin rays have spectacular filamentous extensions in many species.

For many years the genus contained just a single species, *P. octotaenia* Fourmanoir, 1955, from the Red Sea. It remained poorly documented until the widespread use of scuba-diving equipment by scientists. Despite their brilliant colours, they are easily overlooked due to a relatively small size (usually under about 8 cm TL) and affinity for deeper rubble habitats and *Halimeda* algal beds. Moreover,

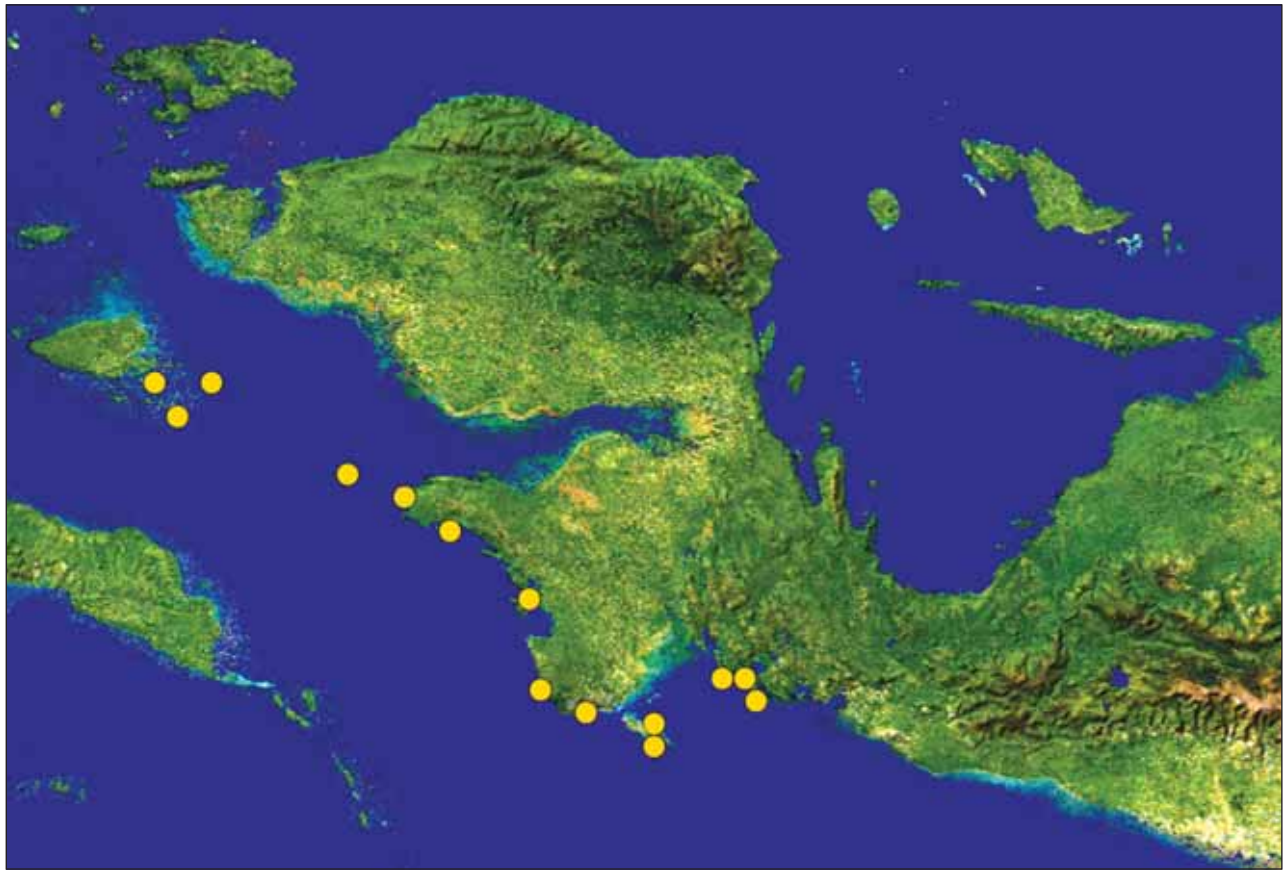

Fig. 1. Satellite map of Bird's Head Peninsula, western New Guinea with distribution of *Paracheilinus nursalim* indicated by yellow circles.

the colours are drastically muted at depth under ambient light conditions. They are most conspicuous during courtship when individual males repeatedly exhibit their seemingly neon-charged display. This behaviour has been observed during most hours of daylight, but appears to be most common about one hour prior to sunset.

There was a 19 year interval between the original account of *P. octotaenia* (Fourmanoir in Roux-Estève & Fourmanoir 1955) and the description of *P. filamentosus* Allen, 1974 from New Guinea. Since that time, there has been a more or less steady progression of new discoveries discoveries (Randall & Harmelin-Vivien 1977; Randall & Lubbock 1981; Cornic 1987; Randall 1988, 1999; Kuiter & Allen 1999; Randall & Allen 2003; Allen & Erdmann 2006) as a result of deliberate targeting of typical *Paracheilinus* habitat at preveiously unsurveyed locations. Most of the currently known species inhabit the mega-diverse Indo-Australian Archipelago, including *P. angulatus* Randall & Lubbock, 1981; *P. carpenteri* Randall & Lubbock, 1981; *P. cyaneus* Kuiter & Allen, 1999; *P. filamentosus*; *P. flavianalis* Kuiter & Allen, 1999; *P. lineopunctatus* Randall & Lubbock, 1981; *P. togeanensis* Kuiter & Allen, 1999; and *P. walton* Allen & Erdmann, 2006. Four species are known from the Red Sea and western Indian Ocean: *P. attenuatus* Randall, 1999; *P. hemitaeniatus* Randall & Harmelin-Vivien, 1977; *P. octotaenia;* and *P. piscilineatus* (Cornic, 1987). *Paracheilinus mccoskeri* Randall & Harmelin-Vivien, 1977 ranges westward across the Indian Ocean from the Persian Gulf and Comoro Islands to the Andaman Sea. The remaining two species, *P. bellae* Randall, 1988, and *P. rubricaudalis* Randall & Allen, 2003 are confined to the islands of western Oceania.

The present paper describes the sixteenth member of the genus, which we discovered during a Conservation International survey of the southern Bird's Head Peninsula of western New Guinea (Papua Barat Province of Indonesia) during April 2006. It was first sighted on coral reefs of the Fak Fak Peninsula (Fig. 1) and was commonly seen on most dives that included rubble habitat.

MATERIALS AND METHODS

Lengths given for specimens are standard length (SL), the straight-line distance from the front of the upper lip to the base of the caudal fin (posterior end of the hypural plate). Head length (HL) is measured from the same median anterior point to the end of the opercular membrane, and snout length from the same point to the fleshy edge of the orbit. Body depth is the maximum depth, and body width the greatest width just posterior to the gill opening. Orbit diameter is the greatest fleshy diameter, and interorbital width the least bony width. Caudal-peduncle depth is the least depth. Caudal-peduncle length is measured horizontally from the rear base of the anal fin to the caudal-fin base. Spines and rays are measured to their extreme base. Pectoral-ray counts include the uppermost rudimentary ray. Gill-raker counts were made on the first gill arch and include rudiments.

Proportional measurements are presented in Table I as percentages of the standard length. Data in parentheses in the description refer to the range for paratypes if different from that of the holotype. Type specimens are deposited at the Australian Museum, Sydney (AMS), Bishop Museum, Honolulu (BPBM), Pusat Penelitian dan Pengembangan Oseanologi, Jakarta, Indonesia (NCIP), Western Australian Museum, Perth (WAM), and United States Natural History Museum, Washington, D.C. (USNM).

Paracheilinus nursalim n. sp.

(Figs 2-4; Table I)

Holotype: NCIP 6327, male, 50.1 mm SL, Pulau Semisarom, 3°51.292'S 134°0.934'E, Triton Bay, Papua Barat Province, Indonesia, 25 m depth, spear, G. R. Allen, 22 April, 2006.

Paratypes: AMS I.44190-001, 2 males, 42.2-46.7, Pulau Panjang, 2°58.560'S 132°17.732'E, Fak Fak Peninsula, Papua Barat Province, Indonesia, 35 m depth, spear, M. V. Erdmann, 18 April 2006; BPBM 40658, 2 males, 44.8-47.2 mm SL, collected with AMS paratypes; NCIP 6328, 3 males, 41.9-46.8 mm SL, collected with AMS paratypes; WAM P.32788-001, 2 males, 42.6-49.2 mm SL, collected with AMS paratypes; WAM P. 32789-004, male, 43.4 mm SL, Teluk Sanggala, 3°56.188'S 132°49.930'E, Fak Fak Peninsula, Papua Barat Province, Indonesia, 25-32 m depth, spear, M. V. Erdmann, 19 April 2006; WAM P. 32792-004, female and male, 27.2 and 42.9 mm SL respectively, patch reef off Pulau Adi, 4°6.796'S 133°28.702'E, Fak Fak Peninsula, Papua Barat Province, Indonesia, 15 m depth, spear, M. V. Erdmann, 20 April 2006; WAM P.32794-001, male, 39.4 mm SL, Pulau Awarawis, 3°51.831'S

Fig. 2. *Paracheilinus nursalim*, freshly collected male holotype, 50.1 mm SL, Triton Bay, Papua Barat Province, Indonesia. Photo by G. R. Allen.

Fig. 3. Underwater photograph of *Paracheilinus nursalim*, male approximately 80 mm TL, in courtship colour, Triton Bay, Papua Barat Province. Photo by G. R. Allen.

Table I. Proportional measurements of type specimens of *Paracheilinus nursalim* expressed as percentage of the standard length.

Character	Holotype NCIP 6327	Paratype WAM P.32788	Paratype AMS I.44190	Paratype WAM P.32792	Paratype USNM 390775	Paratype USNM 390775	Paratype WAM P.32792
Sex	male	male	male	male	male	female	female
Standard length (mm)	50.1	49.2	46.7	42.9	39.4	28.9	27.2
Body depth	34.5	29.5	33.6	31.2	30.2	28.7	33.1
Body width	15.0	13.2	12.2	14.2	12.2	13.5	14.3
Head length	31.3	30.7	31.7	32.2	33.5	34.3	35.7
Snout length	8.2	7.7	7.7	8.2	8.4	8.0	7.4
Eye diameter	8.2	7.3	7.5	7.7	9.1	11.1	11.8
Interorbital width	6.8	7.3	6.2	6.5	6.3	7.3	8.5
Upper jaw	7.4	7.3	7.5	7.7	8.1	8.3	8.1
Caudal peduncle depth	14.6	15.0	13.9	15.9	14.0	13.5	15.4
Caudal peduncle length	20.4	18.7	21.2	19.6	17.3	17.0	15.8
Predorsal length	32.9	30.9	43.7	33.3	32.7	35.3	37.1
Preanal length	54.3	51.0	57.0	55.9	56.1	60.2	59.6
Prepelvic length	32.7	33.1	34.7	35.2	34.0	34.6	35.7
Length dorsal fin base	53.7	56.5	79.2	50.8	53.8	52.6	51.5
Length 1st dorsal spine	6.6	6.1	4.9	4.9	4.6	3.8	4.4
Length last dorsal spine	14.8	16.7	16.1	15.9	15.7	17.3	14.3
Length longest dorsal ray	54.9	53.7	56.5	52.9	47.0	14.2	20.6
Length anal fin base	29.5	30.7	30.2	30.3	26.9	24.6	22.8
Length 1st anal spine	7.6	7.5	8.4	6.5	6.3	4.8	4.4
Length 2nd anal spine	9.4	8.3	9.0	9.1	8.1	7.6	8.1
Length 3rd anal spine	10.0	9.1	10.5	10.3	10.2	8.7	9.6
Length longest anal ray	19.6	18.3	18.4	17.7	17.3	12.5	12.5
Length caudal fin	62.1	43.1	57.4	42.4	43.1	27.3	29.4
Length pectoral fin	22.6	20.7	22.1	21.4	22.8	20.1	22.1
Length pelvic fin spine	10.6	11.4	10.9	11.4	12.7	12.1	11.8

133°58.172'E, Fak Fak Peninsula, Irian Jaya Barat Province, Indonesia, 25-30 m depth, spear, G. R. Allen, 22 April, 2006; WAM P.32795-001, 51.0 mm SL, collected with holotype; USNM 390775, 2 females and 2 males, 20.6-28.9 and 39.4-47.9 respectively, Tanjung Soakasekai, 3°57.629'S 134°21.283'E, Triton Bay, Irian Jaya Barat Province, Indonesia, 45 m depth, spear, M. V. Erdmann, 26 April, 2006.

Diagnosis: Pored lateral-line scales 11-16+3-10, usually 16+5-7; gill rakers usually 12-13 (occasionally 14-15); body depth 2.9-3.5 in SL; usually 4-6 (rarely 3) dorsal soft rays of males prolonged as narrow, tapering filaments that are erected during courtship; caudal fin strongly lunate in males, the length 1.6 (1.7-2.4) in SL and caudal concavity 0.8-1.5 in HL; pelvic fins 1.6-1.8 in males and 2.0-2.2 in females, both in HL; live colour of male differs from all other *Paracheilinus* in having a pair of rectangular blackish patches, one on ventral half of caudal peduncle and adjacent body, and second, often less distinct, on upper back, below middle of spinous dorsal fin.

Description: Dorsal rays VIII,11 (usually IX,11 except two paratypes with VIII,11); anal rays III,9 (usually III,9 except four paratypes with III,10 and one with III,8); pectoral rays (including upper rudimentary ray) 14 (one paratype with 15); lateral-line interrupted, the pored scales 15 + 6, including pored scale on base of caudal fin (11-16 + 3-10, usually 16 + 5-7); scales above lateral line to origin of dorsal fin 2; scales below lateral line to origin of anal fin 6 ; median predorsal scales 4 (5); median preventral scales 5 (5-6); rows of scales on cheek 2; circumpeduncular scales 15 (15-16); gill rakers 12 (usually 12-13 except two paratypes with 14 and one with 15).

Body depth 2.9 (3.0-3.5) in SL; body width 2.3 (2.1-2.8) in body depth; HL 3.2 (2.8-3.3) in SL; snout short, 3.8 (3.9-4.9) in HL; orbit diameter 3.8 (3.0-4.2) in HL; interorbital width 4.6 (4.2-

5.3) in HL; least depth of caudal peduncle 2.2 (2.0-2.5) in HL; caudal-peduncle length 1.5 (1.5-2.3) in HL.

Mouth small, oblique, the maxilla nearly reaching a vertical at front edge of orbit; three pairs of curved canine teeth anteriorly in upper jaw, progressively more laterally projecting, the third (posteriormost) pair much the largest; a single pair of canine teeth anteriorly in lower jaw, very strongly curved laterally; jaws behind anterior canines with a single row of small close-set conical teeth; no canine tooth at corner of mouth; no teeth on palate; a fleshy flap on side of lower lip; gill rakers short, the longest about one-third length of longest gill filaments on first gill arch; posterior nostril an oval opening about 2-3 times size of sensory pores anterior to fleshy upper edge of orbit and on a vertical at anterior bony edge of orbit; anterior nostril small with a short fleshy rim anterior and slightly ventral to posterior nostril and preceded by first sensory pore of supraorbital series; internarial space about 3.3 (3.3-3.5) in orbit diameter; a row of 12 prominent circumorbital pores; four mandibular pores, followed by five preopercular pores.

Head scaled except for interorbital space, snout, and chin; a row of pointed scales on base of dorsal and anal fins; basal half of caudal fin with large scales; axillary scale of pelvic fin slightly shorter than pelvic spine; midventral scaly process of pelvic fins slightly shorter than pelvic spine.

Free ventral margin of preopercle extending to a vertical at center of eye, the vertical margin to level of lower edge of pupil; exposed bony edge of preopercle smooth but with hint of very tiny serrae in smaller individuals.

Origin of dorsal fin above third lateral-line scale, the predorsal length 3.0 (2.7-3.3) in SL; dorsal spines progressively longer, the first 4.8 (5.0-9.0) in HL, the ninth 2.1 (1.8-2.5) in HL; first, third, fifth, and seventh dorsal rays of male holotype filamentous (first, third, fifth, and seventh nearly always filamentous in male paratypes, but sixth, eighth, and ninth also filamentous in several others), the first ray longest 1.8 (1.8-2.1) in males, longest ray of female paratypes 4.9-7.0, both in SL; origin of anal fin below base of last dorsal spine, the preanal length 1.8 (1.7-2.0) in SL; first anal spine 4.1 (3.8-8.1) in HL; second anal spine 3.3 (3.3-4.5) in HL; third anal spine 3.1 (2.8-4.0) in HL; longest (penultimate) soft anal ray 1.8 (1.6-1.9 in males, 2.8-2.9 in females) in HL; caudal fin strongly lunate in males, 1.6 (1.7-2.4) in SL; caudal concavity of males 0.8 (1.0-1.5) in HL; caudal fin truncate in females, 3.4-3.7 in SL; pectoral-fin length 1.4 (1.4-1.7) in HL; pelvic-fin length of males 1.6 (1.6-1.8), of females 2.0-2.2, both in HL.

Colour after 12 months in alcohol: holotype overall yellowish tan with two broad, dusky grey blotches (each about 1-2 scales wide),

Fig. 4. Underwater photograph of *Paracheilinus nursalim*, female approximately 40 mm TL, Triton Bay, Papua Barat Province. Photo by G. R. Allen.

one on upper back immediately below dorsal fin and the other on ventral half of caudal peduncle, extending anteriorly to about base of fourth or fifth soft anal ray; pair of grey stripes on side of snout at levels of middle and lower edge of eye; pair of faint diagonal, grey bands radiating from upper and lower, posterior margin of eye, the upper one joining upper body stripe (see below) and the lower extending across cheek to lower edge of operculum; three faint stripes on upper half of side, the uppermost extending along entire length, but two lower ones reaching level of middle of anal fin or anterior to this point; fins mainly translucent whitish, but two posteriormost rays and basal half of inter-radial membranes of anal fin with dense covering of melanophores. Male paratypes with similar coloration, but intensity of darkened areas along back and on lower half of caudal peduncle highly variable, ranging from a faint trace of duskiness to nearly black (especially on lower caudal peduncle). In addition, some male paratypes have a very narrow black distal margin on the spinous dorsal fin and broader black margin on the anal fin. There is also variation in the number and extent of the dark stripes on the side: the lowermost stripe may extend posteriorly to the upper edge of the dark zone on the lower caudal peduncle and there is sometimes an additional short stripe (total of four) on the middle of the sides. Females overall yellowish tan with 3-4 faint, grey stripes on upper half of side and pair of similar stripes radiating from upper posterior margin of eye across upper half of head; fins translucent whitish or tan.

Colour of holotype when fresh (Fig. 2): body dull reddish grading to yellow on belly; a broad (about one scale wide) dusky dark grey zone on uppermost portion of back and intense black rectangular patch covering lower half of caudal peduncle, extending anteriorly to level of fourth soft anal ray; five thin, red-brown stripes on consecutive lateral scale rows, the lowermost from pectoral region to upper anterior corner of black peduncular patch, the second much shorter and broken into spots, extending to about level of third or fourth soft dorsal ray, the third similar in length but forming continuous line, the fourth similar to second, and the fifth more intense, consisting of horizontally elongate spot on each scale, just below dark zone on upper back; an oblique blue or purplish stripe from anterior tip of upper lip, passing across lower edge of eye to lower operculum; a similar, but less distinct stripe from upper edge of preoperculum to upper pectoral-fin base; iris yellow; dorsal fin reddish orange with pinkish red fin rays, the overlapping scales along base dark brown; anal fin red with yellowish overlapping scales along base, and relatively broad, blue distal margin; cau-

Fig. 5. Aquarium photograph of *Paracheilinus cyaneus*, male approximately 70 mm TL, in courtship colour, eastern Indonesia. Photo by H. Tanaka.

dal fin reddish with translucent central area (except for red fin rays); pelvic fins reddish on anterior two-thirds and yellowish posteriorly.

Live colour of courting males (Fig. 3): overall orange, fading to dull whitish or pink on upper half of caudal peduncle and upper back; a rectangular black patch on ventral half of caudal peduncle and adjacent body with sky blue stripe along its dorsal edge; a second, less distinct blackish blotch on upper back, below middle of spinous dorsal fin; faint red stripes on side as described above under fresh coloration; also several sky blue stripes as follows: one along base of dorsal fin, a second from snout to front of eye and continued from upper rear corner of eye to middle of upper side, a third posteriorly on middle of side, ending near middle of caudal peduncle, and fourth from corner of mouth, passing along lower edge of eye and across cheek to side of breast; spinous dorsal fin dull yellowish with narrow sky blue margin; soft dorsal fin mainly pinkish white with blue margin except where interrupted by filamentous rays; anal fin wine red with broad outer margin of sky blue and orange scales along base; caudal fin translucent, dappled with sky blue, and long, trailing filament of pinkish white on each lobe; pelvic fins wine red with yellowish suffusion; pectoral fins translucent yellowish.

Live colour of females (Fig. 4): overall pinkish red with pale yellowish mottling, particularly along upper back where there is series of about 7 saddle-like blotches just below dorsal fin base; 4-5 bluish or violet stripes on side, usually most pronounced on anterior half of body, with intermediate, irregular rows of small blue or violet spots; a pair of narrow blue or violet stripes radiating from rear edge of eye; light blue band from upper jaw, passing just below eye to side of breast; dorsal and caudal fin yellowish with narrow blue bands and small spots; anal fin red, often with yellow suffusion and 1-2 rows of bluish spots; pelvic fins whitish to slightly pink; pectoral fins translucent with yellow suffusion.

Remarks: The species of *Paracheilinus* are distinguished primarily on the basis of adult male characteristics including colour pattern (particularly during courtship) and shape of the median fins, especially the caudal fin (rounded, truncate, emarginate, lanceolate, or lunate) and number of elongate soft dorsal rays. The new species differs from all other members of the genus with regards to courtship coloration of males. It is the only species that has a prominent, rectangular black marking on the lower half of the caudal peduncle, a feature which also persists, in varying degrees, in preserved specimens. In terms of overall morphology, it belongs to the group of species that includes *P. bellae* (Marshall Islands), *P. cyaneus* (eastern Indonesia), *P. filamentosus* (South China Sea to Solomon Islands), and *P. walton* (Cenderawasih Bay, western New Guinea). Male members of this group are characterised by a strongly lunate caudal fin, with filamentous lobes and the possession of three or more long filamentous soft dorsal rays. The 16 known species of *Paracheilinus* are differentiated in the identification key which appears at the end of this section. The key is based mainly on adult male coloration, which is the best means of separating the various species.

Paracheilinus nursalim is most similar in general appearance to *P. cyaneus* (Fig. 5), which is sympatric with the former species throughout its known range (Misool, Fak Fak Peninsula, and Triton Bay area). The two species are easily distinguished on the basis of male coloration, particularly that associated with courtship displays (compare Figs 3 and 5). *Paracheilinus cyaneus* differs most notably in having a magenta or reddish ground colour compared to the predominately orange colour of *P. nursalim*. It also differs in having a yellowish brown triangular marking on the spinous dorsal fin, red dorsal and ventral margins on the caudal fin which extend onto the filamentous lobes, and it possesses a blue band below the eye that is about twice the width of that present in *P. nursalim*. It also lacks the pair of prominent blackish patches present in *P. nursalim* below the anterior dorsal fin and ventral half of the caudal peduncle. In addition, either one or both of the filamentous caudal-fin lobes of the new species are generally longer than those of *P. cyaneus*, reaching about 50% of the standard length in some individuals. Finally, *P. cyaneus* exhibits a strong turquoise hue over the head, adjacent anterior body, and along the back, extending onto the dorsal fin during the climax of courtship display.

Although the two species exhibit sympatric distributions and are frequently seen in close proximity, *P. nursalim* is considerably more abundant. We have witnessed agonistic encounters between males of the two species on several occasions. The distributional range also overlaps that of *P. flavianalis*, the adult male of which is easily distinguished from *P. nursalim* by its rounded caudal fin, a normal complement of only one to three filamentous dorsal rays, bright yellow anal fin, and lack of dark patches

on the back and tail. The new species is known only from the western Bird's Head Peninsula of New Guinea (Fig. 1). It ranges from southeastern Misool in the Raja Ampat group southeastward to the vicinity of Triton Bay or over a distance spanning approximately 450 km.

The habitat generally consists of semi-sheltered locations that are exposed to periodic strong currents. The species is invariably associated with gradual rubble slopes at depths ranging from about 5 m to at least 50 m, but it is most abundant between about 20 and 35 m. However, large aggregations, containing up to about 30 males and several hundred females, were occasionally encountered in only 6 to 10 m at Triton Bay.

Key to the species of *Paracheilinus* (based on adult males)

1a. Caudal fin strongly rounded or lanceolate.... 2
1b. Caudal fin slightly rounded, truncate, emarginate, or lunate..... 3
2a. Caudal fin strongly rounded, its margin forming more or less continuous profile with adjacent dorsal and anal fins; no dorsal rays prolonged in adults; body depth 2.7-3.0 in SL; adult males with eight narrow dark-edged blue stripes on body (northern Red Sea) ..... *P. octotaenia*
2b. Caudal fin lanceolate; first dorsal soft ray prolonged to a slender filament in adults; body depth 3.2-3.55 in SL; three pale blue to pink stripes on side of body; head with three narrow stripes extending posteriorly from eye, the lower reaching origin of anal fin (Seychelles and Kenya)..... *P. attenuatus*
3a. Caudal fin truncate, emarginate or lunate.... 4
3b. Caudal fin slightly rounded (may be truncate if not spread) 12
4a. Caudal fin truncate to emarginate; no soft rays of dorsal fin filamentous 5
4b. Caudal fin lunate; filamentous soft rays of dorsal fin present or absent 7
5a. Posterior part of dorsal fin pointed, the penultimate or preceding one or two rays longest; longest anal soft ray nearly as long or longer than HL (Philippines and northern Indonesia) ..... *P. angulatus*
5b. Posterior part of dorsal fin rounded, the rays not longer than middle rays; longest anal soft ray much shorter than HL 6
6a. Longest dorsal soft rays about equal to HL; dorsal fin mainly red; anal fin mainly yellow-orange; 5-6 faint magenta to bluish stripes following scale rows on body (Togean Islands)..... *P. togeanensis*
6b. Longest dorsal soft rays much shorter than HL; dorsal fin mainly yellow; anal fin mainly pink; two well separated blue stripes on body, one following anterior lateral line and continuing along upper part of body, the other from pectoral-fin base across abdomen and lower side to caudal-fin base just below lateral line; a blue stripe from snout across cheek to lower abdomen (Mauritius) .... *P. piscilineatus*
7a. No filamentous dorsal soft rays; first dorsal spine contained 2.3-2.4 in length of longest dorsal spine; six longitudinal purple lines on anterior third of body (Madagascar)..... ..... *P. hemitaeniatus*
7b. Adults with 3-9 filamentous dorsal soft rays; first dorsal spine contained 3-6 times in length of last dorsal spine; several narrow coloured stripes continuing full length of body 8
8a. Body slender, the depth 3.6-3.65 in SL (Marshall Islands)..... *P. bellae*
8b. Body less slender, the depth 2.9-3.5 in SL 9
9a. Filamentous dorsal rays usually 3-4; anal fin mainly yellow-orange; maximum SL about 45 mm (Cenderawasih Bay, Papua, Indonesia)..... *P. walton*
9b. Filamentous dorsal ray usually 5-9; anal fin mainly intense red; maximum SL about 50-70 mm..... 10
10a. Prominent rectangular, black patch on ventral half of caudal peduncle (southwestern New Guinea)..... *P. nursalim* n. sp.
10b. No black patch on ventral half of caudal peduncle 11
11a. Tubed peduncular scales usually 5 (not counting one on base of caudal fin); body depth 2.9-3.1 in SL; fine irregular longitudinal lines between principal coloured stripes on body; males in courtship with bright iridescent blue to white over most of head, nape, and dorsal fin except for red filamentous rays (northeast Kalimantan, Sulawesi, and Raja Ampat Islands) ..... *P. cyaneus*
11b. Tubed peduncular scales usually 6 or 7; body depth 3.1-3.3 in SL; no fine irregular longi-

tudinal lines between principal coloured stripes on body; adult males with six or fewer filaments in soft portion of dorsal fin (except Indonesian population which may have as many as nine); blue courtship colour of male confined to basal portion of dorsal fin (South China Sea, Philippines, and Indonesia to Solomon Islands) ..... *P. filamentosus*

12a. Four or more narrow pale blue to pink stripes on side of body; usually 2-5 filamentous dorsal soft rays 13

12b. Three narrow pale blue to pink stripes on side of body, the middle one on anterior half of body and slightly oblique; usually a single filamentous dorsal soft ray (except *flavianalis* with 1-4)..... 14

13a. Four narrow pale blue to pink stripes on side of body, the middle two on anterior half of body and slightly oblique; gill rakers 14-17; 2-4 filamentous dorsal soft rays; forehead more or less uniform without numerous blue lines and spots (southern Ryukyu Islands, Taiwan, South China Sea, Philippines, and Indonesia)..... *P. carpenteri*

13b. About 10-12 pale blue to pink stripes on side of body; gill rakers 12-16; 4-6 filamentous dorsal soft rays; forehead with numerous blue lines and spots (Philippines)..... ..... *P. lineopunctatus*

14a. First dorsal spine 4.2-6.2 in length of last dorsal spine; 1-4 red filamentous dorsal soft rays; anal fin yellow (southern Indonesia and reefs off northwestern Australia)..... ..... *P. flavianalis*

14b. First dorsal spine 2.9-3.5 in length of last dorsal spine; only first dorsal soft ray filamentous, its colour red or yellow; most of anal fin usually red..... 15

15a. Unscaled part of caudal fin mainly yellowish grey; body depth 3.1-3.4 in SL; pelvic fins 2.0-2.2 in HL (Comoro Islands, Persian Gulf, Maldives Islands, Chagos Archipelago, and Andaman Sea) ..... *P. mccoskeri*

15b. Unscaled part of caudal fin mainly red; body depth 3.4-3.6 in SL; pelvic fins 1.8-2.0 in HL (Fiji to Papua New Guinea)..... ..... *P. rubricaudalis*

Etymology: The new species is named *nursalim* to honour the request of Cherie Nursalim and Michelle Liem 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 in honour of their beloved parents Sjamsul and Itjih Nursalim. It is treated as a noun in apposition.

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