

## *Pterocaesio monikae*, a new species of fusilier (Caesionidae) from western New Guinea (Papua and Papua Barat provinces, Indonesia)

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### Abstract

A new species of caesionid fish, *Pterocaesio monikae*, is described on the basis of 21 specimens, 51.8-97.5 mm SL, collected at Cenderawasih Bay, Papua and Papua Barat provinces, Indonesia during February 2006 and October 2007. It was observed in large schools containing up to several hundred individuals along the upper edge of seaward reef slopes at depths ranging from the surface to 55 m. It is closely related to *P. lativittata*, which is widely distributed in the Indo-west and central Pacific region. The two species share an unusually slender body shape and colour pattern consisting of a single, relatively broad yellow stripe on the upper side. However, the centre line of the stripe on *P. lativittata* is positioned below the lateral line, whereas in *P. monikae* it is above the lateral line. Moreover, the stripe extends farther forward in *P. lativittata*, usually tapering to a point above the centre of the eye. In *P. monikae*, the stripe terminates well behind the eye, generally above the posterior margin of the operculum. The two species are also readily distinguished on the basis of transverse scale row counts above and below the lateral line: *P. monikae* usually has 7 (rarely 6) rows above and 13 (occasionally 12, rarely 14) rows below compared to 9-11 rows above and 15-19 below for *P. lativittata*. Moreover, there are modal differences in the number of lateral-line scales, circumpeduncular scales, and pectoral-fin rays, with *P. monikae* exhibiting a trend of lower counts. Finally, *P. monikae* is a much smaller fish, attaining a maximum size of about 130 mm total length compared to an approximate total length of 200-250 mm for *P. lativittata*.

### Zusammenfassung

Eine neue Art der Caesioniden: *Pterocaesio monikae*, wird auf der Grundlage von 21 Exemplaren mit 51,8-97,5 mm SL beschrieben, die an der Cenderawasih-Bucht bei den Provinzen Papua und Papua Barat, Indonesien, von Februar 2006 bis Oktober 2007 gesammelt wurden. Die Vertreter dieser neuen Art wurden in großen Schulen von bis zu mehreren hundert Einzeltieren am oberen Rand meeresseitiger Riffhänge in Tiefen beobachtet, die von der Oberfläche bis zu 55 m hinabreichen. Die Ähnlichkeit zu der Art *P. lativittata* ist groß, die im indo-westlichen und zentralen Pazifik weit verbreitet ist. Gemeinsam ist beiden Arten die ungewöhnlich

schlanke Körperform und die hauptsächliche Farbgebung, die durch einen einzelnen, relativ breiten gelben Streifen auf der Oberseite gekennzeichnet ist. Doch liegt bei *P. lativittata* die Mittellinie des Streifens unterhalb der Seitenlinie, bei *P. monikae* hingegen oberhalb. Außerdem erstreckt sich der Streifen bei *P. lativittata* weiter nach vorne, normalerweise läuft er an einem Punkt über der Augenmitte aus. Bei *P. monikae* endet der Streifen hingegen deutlich hinter dem Auge, im allgemeinen oberhalb vom Hinterrand des Kiemendeckels. Leicht lassen sich die beiden Arten auch anhand der Zahl der quer verlaufenden Schuppenreihen ober- und unterhalb der Seitenlinie unterscheiden. *P. monikae* zeigt gewöhnlich 7 (selten 6) Reihen oberhalb und 13 (gelegentlich 12, selten 14) Reihen unterhalb; *P. lativittata* aber 9-11 Reihen oberhalb und 15-19 unterhalb. Weitere Unterschiede betreffen die mittlere Zahl der Seitenlinien-Schuppen, der circumpeduncularen Schuppen und der Brustflossenstrahlen, wobei *P. monikae* zu niedrigeren Zahlen tendiert. Schliesslich ist *P. monikae* insgesamt ein viel kleinerer Fisch mit einer maximalen Länge von rund 130 mm, im Gegensatz zu einer Gesamtlänge von etwa 200 bis 250 mm bei *P. lativittata*.

### Résumé

Une nouvelle espèce de Caesionidé, *Pterocaesio monikae*, est décrite sur base de 21 spécimens, de 51,8 à 97,5 mm de LS, collectés à Cenderawasih Bay, provinces de Papua et de Papua Barat, Indonésie, en février 2006 et octobre 2007. Elle a été observée en grands bancs de plusieurs centaines d'individus, le long du bord supérieur de récifs en pente vers la mer, à des profondeurs variant entre la surface et 55 m. Elle est étroitement apparentée à *P. lativittata* qui connaît une vaste distribution dans la région indo-occidentale et centrale du Pacifique. Les deux espèces ont en commun une forme du corps inhabituellement élancée et une coloration consistant en une seule ligne jaune plutôt large sur le haut du corps. Néanmoins, l'axe central de la ligne de *P. lativittata* se situe sous la ligne latérale, alors que *P. monikae* la porte au-dessus de la ligne latérale. En outre, la ligne s'étend plus en avant chez *P. lativittata*, se terminant généralement en pointe en un endroit situé au-dessus du centre de l'oeil. Chez *P. monikae*, la ligne s'arrête bien derrière l'oeil, généralement au-dessus de la marge postérieure de l'opercule. Les deux

espèces se distinguent donc aisément par le nombre de rangées d'écaillés transversales au-dessus de et sous la ligne latérale. De plus, *P. monikae* a souvent 7 (rarement 6) rangées au-dessus et 13 (parfois 12, rarement 14) rangées en dessous contre 9-11 rangées au-dessus et 15-19 en dessous pour *P. lativittata*. En outre, il y a des différences modales dans le nombre d'écaillés de la ligne latérale, des écaillés circumpédonculaires et des rayons de la pectorale, où *P. monikae* présente généralement un nombre inférieur. Enfin, *P. monikae* est un poisson bien plus petit, d'une taille maximale d'environ 130 mm de longueur totale contre une longueur totale d'environ 200-250 mm pour *P. lativittata*.

### Sommario

Una nuova specie di cesionide, *Pterocaesio monikae*, è descritto sulla base di 21 esemplari di 51.8-97.5 mm SL raccolti nel febbraio 2006 e in ottobre 2007 nella baia di Cenderawasih, province di Papua e Papua Barat, Indonesia. La specie forma grandi banchi di centinaia di individui che prediligono il margine superiore del pendio di scogliera rivolto al mare aperto a profondità comprese tra la superficie e 55 m. Sembra imparentata con *P. lativittata*, una specie largamente distribuita nell'Indo-Pacifico occidentale e nel Pacifico centrale. Le due specie hanno in comune un eccezionale corpo affusolato marcato da una singola e relativamente ampia stria gialla sulla regione dor-

sale. Tuttavia, il centro della stria di *P. lativittata* è posizionato sotto la linea laterale, mentre in *P. monikae* è sopra. Inoltre, la stria si estende ben più in avanti in *P. lativittata*, di solito assottigliandosi fino a terminare in un punto sopra il centro dell'occhio. In *P. monikae* la stria termina molto dietro l'occhio, generalmente sopra il margine posteriore dell'opercolo. Le due specie sono anche facilmente distinguibili in base al numero di file di scaglie trasversali sopra e sotto la linea laterale: *P. monikae* ha di solito 7 file sopra (raramente 6) e 13 file sotto (occasionalmente 12, raramente 14) rispetto a 9-11 file sopra e 15-19 sotto per *P. lativittata*. Inoltre, ci sono differenze modali nel numero delle scaglie della linea laterale, delle scaglie circumpeduncolari e dei raggi pettorali, dove *P. monikae* tende a valori più bassi. Infine, *P. monikae* è una specie molto più piccola che raggiunge al massimo 130 mm di lunghezza totale rispetto ai 200-250 mm per *P. lativittata*.

### INTRODUCTION

Members of the family Caesionidae, known as fusiliers, are common inhabitants of coral reefs from the western Indian Ocean to the central Pacific. They form conspicuous shoals that feed on zooplankton in both inshore areas and exposed outer-reef habitats that are periodically exposed to strong

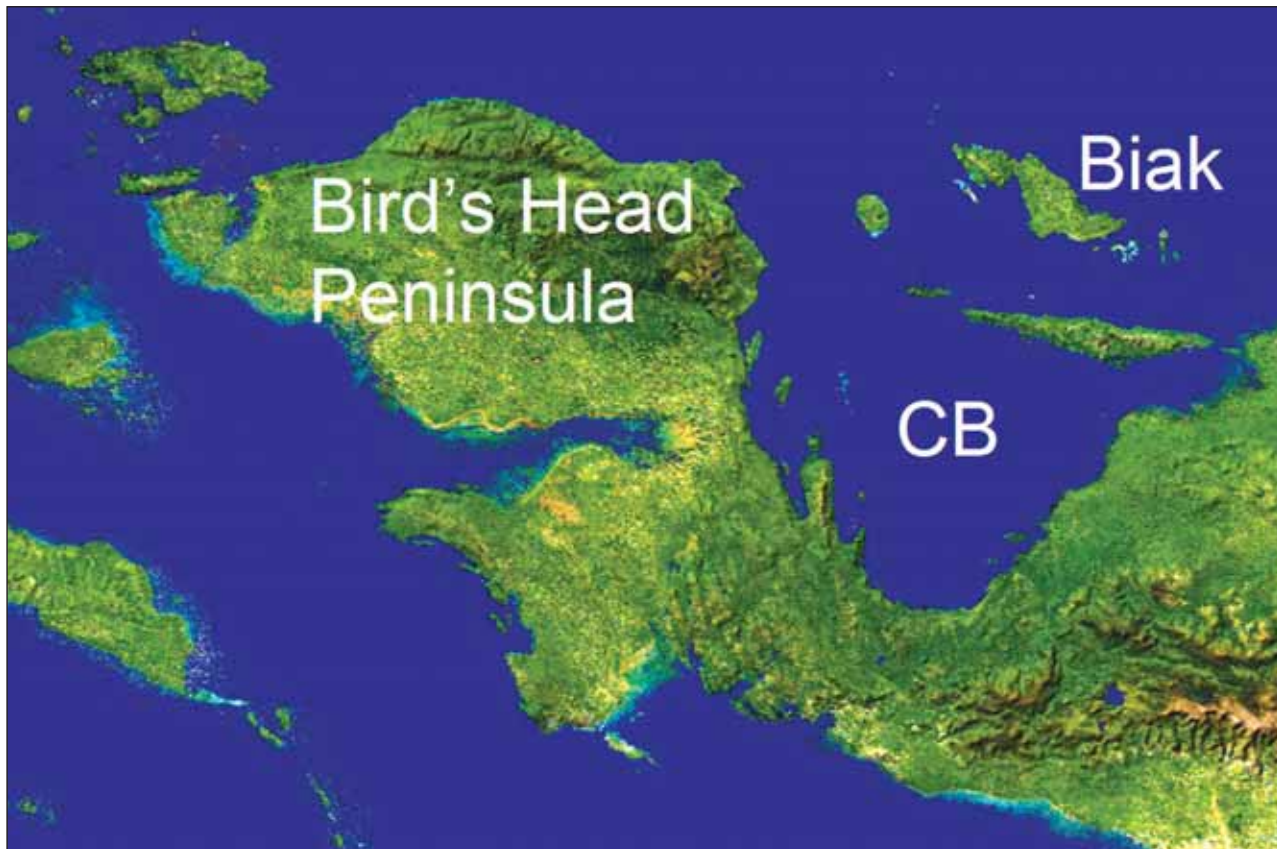


Fig. 1. Map of western New Guinea showing location of Cenderawasih Bay (CB).

currents. The family was revised by Carpenter (1987) and also reviewed by the same author (1988), who recognized 20 species in *Caesio*, *Dipterygonatus*, *Gymnocaesio*, and *Pterocaesio*. Allen & Erdmann (2005) described an additional species, *P. flavifasciata*, from western Sumatra.

The present paper describes a new species that superficially resembles *Pterocaesio lativittata* Carpenter, 1987, but is much smaller and exhibits consistent meristic and colour pattern differences. It was first collected by the authors in February 2006 during a Conservation International sponsored marine biological survey of Cenderawasih Bay, western New Guinea (Papua and Papua Barat provinces, Indonesia). This location is situated on the north coast of New Guinea, immediately east of the Bird's Head Peninsula (Fig. 1). It contains a highly diverse reef fish community with unique peculiarities suggesting previous geological isolation. The fauna includes at least seven reef fishes that appear to be endemic to the bay, additional species that occur widely in neighbouring regions, but exhibit unusual colour variation, and several deep-reef species that occur in unusually shallow water. Based on palaeogeographical reconstructions of the southwest Pacific (Hill & Hall 2003), we hypothesized (Allen & Erdmann 2006) that the bay was essentially isolated for a substantial period over the past five million years, and present day geographic/oceanographic conditions continue to provide a degree of isolation. According to reconstruction evidence, the Tosem Block of the South Caroline Arc slid across the entrance of Cenderawasih Bay about 3 to 5 million years ago before finally docking along the northern edge of the Bird's Head Peninsula. This formidable barrier could have provided an isolating mechanism to account for substantial endemism and other faunal peculiarities mentioned above. The case for isolation is further strengthened by approximately 14-20 new corals (including at least one new endemic genus) and 5 new stomatopods discovered during our 2006 expedition.

#### MATERIALS AND METHODS

Lengths of specimens are given as standard length (SL) measured from the anterior end of the upper lip to the base of the caudal fin (posterior edge of hypural plate); head length (HL) is measured from the same anterior point to the posterior edge of the opercle flap; body depth is the maximum depth taken vertically between the belly and base of the dorsal spines; head depth was measured from a verti-

cal at the posterior median supratemporal band epidermis; body width is the maximum width just posterior to the pectoral fin base; snout length is measured from the anterior end of the upper lip to the anterior edge of the eye; orbit diameter is the horizontal fleshy diameter, and interorbital width the least bony width; upper jaw length is taken from the front of the upper lip to the posterior end of the maxilla; caudal peduncle depth is the least depth, and caudal peduncle length is the horizontal distance between verticals at the rear base of the anal fin and the caudal fin base; caudal fin length is the horizontal length from the posterior edge of the hypural plate to a vertical at the tip of the longest ray; caudal concavity is the horizontal distance between verticals at the tips of the shortest and longest rays; pectoral fin length is the length of the longest ray; pelvic fin length is measured from the base of the pelvic spine to the tip of the longest soft ray; gill raker counts are presented as separate counts for the upper and lower limbs; similarly, the circumpeduncular counts are presented as two separate counts for the dorsal and ventral half of the peduncle (lateral-line scale included in ventral count); the last fin ray element of the dorsal and anal fins is usually split near the base and is counted as a single ray. Methodology related to scale counts is explained in detail by Carpenter (1987).

Type specimens are deposited at the Australian Museum, Sydney (AMS), Bernice P. Bishop Museum, Honolulu (BPBM), Pusat Penelitian dan Pengembangan Oseanologi, Jakarta, Indonesia (NCIP), National Museum of Natural History, Washington, D.C. (USNM), and Western Australian Museum, Perth (WAM). Counts and proportions appearing in parentheses apply to the range for the paratypes if different from the holotype. Proportions for dorsal and anal spines are highly variable due to the damaged condition of most specimens. Proportional measurements expressed as percentage of the standard length are provided in Table I. Counts for *Pterocaesio lativittata* presented in Tables II-V are from Carpenter (1987, 1988), supplemented with data from three specimens (WAM P.32910-001), 82.3-148.5 mm SL, collected at the Raja Ampat Islands, Indonesia.

#### *Pterocaesio monikae* n. sp.

(Figs 2-3 and 5; Tables I-V)

**Holotype:** NCIP 6309, 80.9 mm SL, northeast Mamboor, 3°04.249'S 135°36.160'E, Cenderawasih

Bay, Papua Province, Indonesia, 10 m depth, spear, M.V. Erdmann, 19 February 2006.

**Paratypes:** AMS I.44180-001, 87.8 mm SL, Tridacna Atoll, 2°29.672'S 134°58.990'E, Cenderawasih Bay, Papua Barat Province, Indonesia, 18 m depth, spear, M.V. Erdmann, 20 February 2006; BPBM 40657, 87.6 mm SL, Pulau Rouw, 2°09.128'S 134°44.016'E, Cenderawasih Bay, Papua Barat Province, Indonesia, 15 m depth, spear, M. V. Erdmann, 21 February 2006; NCIP 6310, 97.5 mm SL, same data as BPBM paratype; USNM 390775, 84.3 mm SL, same data as AMS paratype; WAM P.32892-001, 82.2 mm SL, collected with holotype; WAM P.32909-001, 15 specimens, 51.8-89.9 mm SL, Tridacna Atoll, 2°29.672'S 134°58.990'E, Cenderawasih Bay, Papua Barat Province, Indonesia, 8-35 m, spear, M. V. Erdmann, 22 October, 2007.

**Diagnosis:** Two post-maxillary processes; dorsal rays X,14-15 (usually 15); anal rays III, 11-12 (usually 12); pectoral rays 20-21(usually 20); lateral-line scales 72-80 (modally 74); scales above lateral line to origin of dorsal fin 6-7 (usually 7); scales below lateral line to origin of anal fin 12-14 (usually 13); anterior circumpeduncular scales modally 12.14, ventral circumpeduncular scales modally 14.71; body fusiform and extremely elongate for the genus, its greatest depth 4.3-5.1 in SL; HL 3.2-3.6 in SL; snout 4.0-5.2 in HL; eye 2.9-3.6 in HL; pectoral-fin length 1.2-1.4 in HL; colour in life: blue, grading to silvery white on belly, with prominent, broad yellow stripe on upper side from dorsal posterior margin of operculum to upper half of caudal peduncle, covering maximum of four scale rows, centred just above lateral line, except entirely above it on caudal peduncle; tip of each caudal-fin lobe with reddish spot

(often appearing black underwater), preceded by whitish area.

**Description:** Dorsal rays X,15 (usually 15, except two paratypes each with 14 and 16); anal rays III,12 (12, except two paratypes with 11); pectoral rays 21 (20-21); gill rakers 8 + 24 (7-8 + 22-25); lateral-line scales 74 (72-80); lateral-line scales anterior to origin of dorsal fin 10 (9-10); lateral-line scales anterior to origin of pelvic fin 7; scales above lateral line to origin of dorsal fin 7 (6-7); scales below lateral line to origin of anal fin 12 (12-14); scales below lateral line to origin of pelvic fin 11 (11-12); circumpeduncular scales 12 + 14 (11-13 +12-16); transverse scale rows on cheek 4 (3-5); transverse supratemporal scales 6 (6-8); longitudinal supratemporal scales 6 (6-8); supratemporal band of scales confluent at dorsal midline; predorsal scales 18 (17-20); dorsal and anal fins scaled over most of their surface.

Body fusiform and elongate, its greatest depth 4.6 (4.3-5.1) in SL; body moderately compressed, its width 1.5 (1.3-1.7) in depth; HL 3.5 (3.2-3.6) in SL; caudal peduncle depth 4.1 (3.5-4.8) in HL; caudal peduncle length 1.5 (1.5-1.9) in HL.

Dorsal and ventral profile of head equally sloping, its greatest depth 1.5 (1.5-1.8) in HL; depth of head at centre of orbit 2.0 (2.0-2.2) in HL; depth of head at anterior nostril 3.6 (3.2-4.1) in HL; snout 4.0 (4.0 -5.2) in HL; cheek width 3.4 (2.8-3.8) in HL; interorbital space convex, its bony width 4.6 (3.9-4.9) in HL; margin of opercle with a dorsoposterior flap.

Anterior nostril with a low membranous rim (slightly elevated posteriorly), closer to orbit than snout tip, the prenostril length 7.1 (6.4-7.5) in HL; distance between anterior and posterior nostrils 5.4



**Fig. 2.** *Pterocaesio monikae*, freshly collected holotype, 80.9 mm SL, Cenderawasih Bay, Papua Province, Indonesia. Photo by G. R. Allen.

**Table I.** Proportional measurements of selected type specimens of *Pterocaesio monikae* expressed as percentage of the standard length.

	Holotype NCIP 6309	Paratype WAM P.32892	Paratype USNM 390775	Paratype AMS I.44180	Paratype NCIP 6310	Paratype BPBM 40657	Paratype WAM P.32909	Paratype WAM P.32909
Standard length (mm)	80.9	82.2	84.3	87.8	97.5	87.6	76.9	56.2
Body depth	21.5	22.1	21.4	23.5	20.5	20.9	23.1	22.4
Body width	14.0	14.0	14.0	15.4	13.8	14.3	14.8	14.9
Head length	28.2	29.0	29.4	28.4	28.2	27.5	30.4	31.3
Snout length	7.0	6.2	6.0	5.5	6.4	5.8	6.8	6.9
Eye diameter	8.0	8.9	9.6	9.0	8.0	8.1	10.3	9.4
Interorbital width	6.2	6.0	6.5	6.4	7.3	6.1	7.3	6.8
Depth of caudal peduncle	6.9	6.4	6.4	5.9	6.4	6.2	7.4	8.5
Length of caudal peduncle	18.3	18.0	17.9	18.5	16.2	18.0	16.4	18.1
Predorsal distance	36.2	35.6	36.9	37.4	35.5	33.7	38.1	37.9
Preanal distance	60.6	60.2	60.5	62.3	61.9	59.4	61.5	64.2
Prepelvic distance	32.9	33.1	35.3	36.7	33.3	35.2	36.2	37.7
Length of dorsal fin base	49.9	45.6	48.5	46.7	48.7	48.1	50.2	46.1
1 <sup>st</sup> dorsal spine	2.7	2.7	1.8	1.7	2.3	1.8	2.1	2.3
2 <sup>nd</sup> dorsal spine	11.6	11.3	9.5	11.2	10.5	11.2	10.8	12.3
3 <sup>rd</sup> dorsal spine	14.3	10.6	11.3	13.4	13.6	14.6	13.3	12.5
4 <sup>th</sup> dorsal spine	13.8	10.2	9.8	13.2	13.5	12.1	13.0	13.2
Last dorsal spine	6.1	5.7	5.7	5.7	5.7	6.1	6.5	6.8
1st soft dorsal ray	5.9	6.1	5.9	6.7	5.4	5.6	6.4	6.9
Length of anal fin base	22.2	21.3	21.9	23.7	22.6	21.0	22.8	19.9
1 <sup>st</sup> anal spine	1.5	2.1	1.2	1.5	1.2	1.6	2.6	1.8
2 <sup>nd</sup> anal spine	5.9	9.4	8.5	8.9	8.4	9.4	8.7	9.4
3 <sup>rd</sup> anal spine	5.6	9.6	8.1	8.0	8.0	9.1	9.8	10.1
1 <sup>st</sup> soft anal ray	5.2	7.8	8.1	8.0	6.9	8.0	8.6	10.7
Caudal fin length	19.5	22.5	19.5	20.3	20.3	21.5	19.6	21.7
Caudal concavity	9.0	13.0	12.0	10.1	12.6	11.4	9.5	10.5
Pectoral fin length	22.2	21.0	22.2	22.2	22.3	21.5	24.7	23.3
Pelvic fin spine length	10.5	9.6	10.3	10.8	10.3	11.2	11.7	10.7
Pelvic fin length	15.5	14.4	13.6	15.0	14.2	13.9	15.3	15.1

(3.8-6.1) in eye; posterior nostril without rim or flap, its closest distance to orbit 5.4 (4.4-6.2) in eye.

Mouth oblique, forming an angle of about 40 degrees to the horizontal, the lower jaw projecting slightly; length of upper jaw 3.0 (2.8-3.3) in HL; maxilla extending to below anterior edge of pupil; posterior end of maxilla tapering, its greatest depth anterior to posterior end of premaxilla; ascending premaxillary process long, extending to a vertical about midway between anterior rim of orbit and pupil, its length 3.5 (3.3-3.8) in HL; jaws with minute conical teeth; premaxilla mainly devoid of teeth except a few widely spaced conical teeth towards front of jaw on either side of median symphysis; each side of lower jaw with a single row of teeth; vomer and palatines edentate.

Origin of dorsal fin slightly posterior to origin of pelvic fin; predorsal length 2.8 (2.6-3.0) in SL; dorsal-fin base 2.0 (2.0-2.2) in SL; all fin spines slender and weak; first dorsal spine 10.4 (10.8-16.6) in HL, the second 2.4 (2.4-3.1) in HL, the

third usually the longest, although spine tips broken on most types, 2.0 (1.9-2.7) in HL, the fourth 2.0 (2.0-3.0) in HL, remaining dorsal spines gradually shorter, the last 4.7 (4.5-5.2) in HL; first segmented dorsal-fin ray 4.8 (4.1-5.3) in HL, the last segmented dorsal-fin ray longer than penultimate; snout to origin of anal fin 1.7 (1.6-1.7) in SL; anal-fin base 4.5 (4.2-5.0) in SL; length of first anal spine 11.4 (11.9-24.8) in HL, the second (broken in holotype) 4.8 (2.9-3.5) in HL, the third (broken in holotype) 5.1 (2.8-3.6) in HL; first segmented anal-fin ray length 5.4 (2.9-4.1) in HL, the last longer than penultimate; caudal fin deeply forked, its longest ray 1.4 (1.3-1.9) in HL; origin of pectoral fin at a vertical with opercular flap; prepectoral length 3.7 (3.2-4.0) in SL; pectoral fin pointed, its length 1.3 (1.2-1.4) in HL; prepelvic fin length 3.0 (2.7-3.1) in SL; pelvic fin short, 1.8 (1.9-2.2) in HL, the spine 2.7 (2.5-3.0) in HL.

Colour of freshly collected holotype (Fig. 2): body overall reddish, grading to pale pink-

**Table II.** Comparison of pectoral ray counts for *Pterocaesio lativittata* and *P. monikae*.

Species	20	21	22	23
<i>P. lativittata</i>		21	43	19
<i>P. monikae</i>	16	5		

ish white on ventral portion of head and body; yellow stripe along side from lateral-line origin to upper half of caudal peduncle, covering maximum of four scale rows, centred just above lateral line, except veering above it below posteriormost dorsal-fin rays; head dark red brown dorsally, bluish laterally, grading to silvery pink ventrally; dorsal and caudal fins translucent with pink suffusion, each lobe of caudal fin with a red spot near tip, preceded by narrow whitish area; remaining fins translucent to whitish.

Colour of holotype in alcohol after 17 months in preservative: brown on upper two-thirds of body with paler scale centres, silvery white on lower third; light blue stripe along side from lateral-line origin to upper half of caudal peduncle, covering maximum of four scale rows, centred just above lateral line, except entirely above it on caudal peduncle; dorsal portion of head dark brown, becoming nearly blackish on snout and tip of lower jaw; ascending process of premaxillary also covered with dark brown epithelium; ventral portion of head silvery white; adipose tissue around eye tan;

**Table III.** Comparison of lateral-line counts for *Pterocaesio lativittata* and *P. monikae* (counted on both sides in four specimens of *P. monikae*, other spear-damaged specimens counted only on one side).

Species	72	73	74	75	76	77	78	79	80	81	82	83	84+
<i>P. lativittata</i>			1	10	8	9	7	9	8	7	5	3	11
<i>P. monikae</i>	1	7	7	1	5	1	1		1				

fins mainly whitish and semi-translucent, except caudal with dusky rays and small, brown spot at tip of each lobe. Paratypes exhibit a similar pattern, although there is considerable variation in the intensity of the pale stripe along the upper side.

Colour in life (Fig. 3): body overall sky blue grading to silvery white on ventral portion of head and body; bright yellow stripe along side from lateral-line origin to upper half of caudal peduncle, covering maximum of four scale rows, centred just above lateral line, except entirely above it on caudal peduncle; scales of supratemporal band with yellow centres, giving impression of scattered yellow spots; similar yellow-centred scales forming faint, pale yellow stripe on upper back midway between main yellow stripe on side and dorsal fin base; pearly band from snout tip to lower anterior corner of eye; iris silvery blue; fins translucent to whitish; each lobe of caudal fin with reddish spot (often appearing black underwater), preceded by whitish area at tip.



**Fig. 3.** Underwater photograph of *Pterocaesio monikae*, approximately 110 mm total length, Cenderawasih Bay, Papua Barat Province, Indonesia. Photo by G. R. Allen.



**Fig. 4.** Underwater photograph of *Pterocaesio lativittata*, approximately 200 mm total length, Christmas Island, Indian Ocean. Photo by G. R. Allen.

**Table IV.** Comparison of dorsal and ventral transverse scale row counts for *Pterocaesio lativittata* and *P. monikae*.

Dorsal rows								
Species	6	7	8	9	10	11		
<i>P. lativittata</i>				12	24	2		
<i>P. monikae</i>	1	20						
Ventral rows								
Species	12	13	14	15	16	17	18	19
<i>P. lativittata</i>				4	7	15	8	1
<i>P. monikae</i>	4	16	1					

**Remarks:** The new species is closely related to *Pterocaesio lativittata*. According to P. Barber (Boston University, unpublished data) there appears to be minimal genetic variation between the two species, based on analysis of tissue samples that were sent to him by the authors. Barber suggests the lack of genetic separation is indicative of relatively recent speciation of the Cenderawasih Bay population.

Both species share an unusually slender body shape and colour pattern consisting of a single, relatively broad yellow stripe on the upper side. However, the centre line of the stripe on *P. lativittata* is positioned below the lateral line, whereas in *P. monikae* it is above the lateral line. Moreover, the stripe extends farther forward in *P. lativittata*, usually tapering to a point above the centre of the eye. In *P. monikae*, the stripe terminates well behind the eye, generally above

**Table V.** Comparison of dorsal and ventral caudal peduncle scale row counts for *Pterocaesio lativittata* and *P. monikae*.

Dorsal rows						
Species	11	12	13	14		
<i>P. lativittata</i>		5	22	8		
<i>P. monikae</i>	5	8	8			
Ventral rows						
Species	12	13	14	15	16	17
<i>P. lativittata</i>				4	14	17
<i>P. monikae</i>	1	1	4	12	3	

the posterior margin of the operculum. There is also a difference in the basic shape of the stripe. In *P. lativittata*, it is broadest on the anterior body, then gradually tapers posteriorly where it forms a thin stripe that extends across the upper caudal peduncle to the base of the caudal fin. The stripe of *P. monikae*, by contrast, is more symmetrical, having a more or less uniform width over most of its length, with a relatively abrupt tapering both anteriorly and posteriorly. Furthermore, its posterior termination usually falls well short of the caudal-fin base.

The two species are also readily distinguished on the basis of transverse scale row counts, above and below the lateral line (Table II). *Pterocaesio monikae* usually has 7 (rarely 6) rows above and 13 (occasionally 12, rarely 14) rows below compared to 9-11 rows above and 15-19 below for *P. lativittata*. Moreover, there

**Fig. 5.** Size comparison of mature adults of *Pterocaesio lativittata* (upper), 148.5 mm SL, Raja Ampat Islands and *P. monikae*, 82.2 mm SL, Cenderawasih Bay. Photo by G. R. Allen.

are modal differences in the number of lateral-line scales, circumpeduncular scales, and pectoral-fin rays (Tables III-V) with *P. monikae* exhibiting a trend of lower counts.

We have also noted a basic behavioural difference in *P. monikae* when pursued while collecting. Unlike other caesionids that typically flee into open water, it seeks refuge in nearby crevices and holes within the reef matrix.

*Pterocaesio lativittata* (Fig. 4) is a relatively uncommon species, thus far known only from Chagos Archipelago, Maldives (Kuitert 1998), Cocos-Keeling Islands, Christmas Island, Indian Ocean (Allen et al. 2007), Hermit Islands (Papua New Guinea), Palau, Phoenix Islands, and Line Islands (Randall 2005). There is apparently minimal variation in colour pattern despite its extensive geographic range. Fish from the Maldives (Randall & Anderson 1993: plate 4B) in the central Indian Ocean are very similar in appearance to those from the Phoenix Islands, which lie more than 12,000 km eastward. One major exception is the population from the Line Islands illustrated by Randall (2005), which has a relatively narrow yellow stripe that does not extend above the lateral line on the anterior two-thirds of the body. Typically the stripe includes at least two scale rows above the lateral line and five below it for most of its length (Fig. 4). No specimens have been collected and Randall (pers. comm.) now questions its identification as *P. lativittata*.

*Pterocaesio monikae* is among the smallest members of the family (Fig. 5). The largest of several thousand individuals observed underwater was approximately 100 mm SL. Two paratypes, measuring 87.8 and 97.5 mm SL, are fully mature females with eggs. Only *Dipterygonatus balteatus* (Valenciennes) and *Gymnocaesio gymnoptera* Bleeker are equally diminutive, each reaching a maximum standard length between about 100-135 mm. Although the largest known specimen of *P. lativittata* is only 113.7 mm SL (Carpenter 1987), we have witnessed individuals in the field that were considerably larger, estimated at about 200 to 250 mm total length. The largest specimen we have collected was 148.5 mm SL (WAM P.32910-001, Fig. 5), from the Raja Ampat Islands, which lies 400 km to the west of Cenderawasih Bay.

The new species was commonly encountered in Cenderawasih Bay, occurring in large schools, containing up to several hundred individuals. It was frequently in mixed schools with *Pterocaesio pisanus* and *Gymnocaesio gymnopterus*. The usual habitat consists of the upper edge of seaward reef slopes, commonly

at depths ranging from the surface to about 15 m, but we also sighted schools as deep as 55 m.

**Etymology:** The new species is named *monikae* in honour of Lady Monika Bacardi, an avid marine conservationist who successfully bid to support the conservation of this species at the Blue Auction in Monaco on 20 September 2007 and has given generously to support Conservation International's Bird's Head Seascape initiative.

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