

***Pentapodus numberii*, a New Species of Whiptail (Pisces: Nemipteridae) from Eastern Indonesia**

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Gerald R. Allen and Mark V. Erdmann (2009) *Pentapodus numberii*, a new species of whiptail (Pisces: Nemipteridae) from eastern Indonesia. *Zoological Studies* 48(2): 280-286. *Pentapodus numberii* is described from 4 specimens, 149.0-160.5 mm in standard length, collected in eastern Indonesia at Batanta I. (Papua Barat Province) and Halmahera. It was also observed at Misool I. and Triton Bay (Papua Barat Province). The depth of capture and observation range were 12-60 m. Diagnostic features include forked caudal fin with upper and lower rays produced into long trailing filaments; a single dusky (blue in life) stripe on side of snout; a pale yellow stripe in life on middle of side that can be instantly "switched" on or off; predorsal scales reaching forward to level between posterior margin of posterior nostrils; scaled suborbital; lower limb of preopercle with 3 rows of scales; lateral-line scales 45 or 46; pectoral-fin rays 15 or 16; and pelvic fins moderately long, reaching to level of anus in adult males. It is most similar to the sympatric *P. emeryii*, the only other species of *Pentapodus* possessing long filaments on both the upper and lower caudal lobes of adult males. *Pentapodus numberii* sp. nov. is a comparatively drab-colored fish and lacks the pair of bright yellow stripes that are diagnostic for *P. emeryii*. It also differs in having a scaly suborbital bone compared to the scaleless condition in *P. emeryii* and has a lower lateral-line scale count (45 or 46 vs. 51-55). <http://zoolstud.sinica.edu.tw/Journals/48.2/280.pdf>

Key words: Taxonomy, Marine fish, Coral reefs, New Guinea, Halmahera.

The whiptail breams of the genus *Pentapodus* Quoy and Gaimard, 1824 are common inhabitants of sand-rubble bottoms near coral and rocky reefs, primarily in the western Pacific Ocean. Russell (1990) recognized 10 species, including 1 as *Pentapodus* sp., which he described as *P. aureofasciatus* in 2001. The most diverse area for these fishes includes eastern Indonesia, Papua New Guinea, and Australia, where all the known members of the genus have been recorded except for *P. bifasciatus* (Bleeker, 1848) of western Indonesia and the Philippines.

The present paper describes a new *Pentapodus* that was first encountered by the authors in Apr. 2006 during a Conservation International-sponsored marine biological

expedition at Triton Bay, Papua Barat Province, Indonesia (Fig. 1). A single adult specimen was sighted and photographed underwater at 12 m in depth. Subsequent attempts to collect this individual were unsuccessful, but a specimen was eventually speared 1 yr later by the 2nd author near the northwestern end of Batanta I. in the Raja Ampat Group of West Papua. Three additional specimens were collected at eastern Halmahera during Apr. 2008. We have also observed the species at Misool I. in the Raja Ampat Group.

MATERIALS AND METHODS

Methods of counting and measuring follow

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those described and illustrated by Russell (1990). The length is 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) was measured from the same anterior point to the posterior edge of the opercle flap; 2 values are given for body depth, one taken vertically at the origin of the dorsal fin and the other for maximum depth, taken vertically between the belly and base of the dorsal spines; body width is the maximum width just posterior to the pectoral fin base; snout length was measured from the anterior end of the upper lip to the anterior edge of the eye; predorsal length was measured from the anterior end of the upper lip to the dorsal fin origin; preanal length was measured from the anterior end of the upper lip to the anal fin origin; prepelvic length was measured from the anterior end of the upper lip to the base of the pelvic spine; prepectoral length was measured from the anterior end of the upper lip to the base of the uppermost pectoral-fin ray; eye diameter is the horizontal fleshy diameter, and interorbital width the least bony width; suborbital depth is the distance between the lower edge of the preorbital bone and the lower edge of the eye; 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 was 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; the circumpeduncular count is the number of horizontal scale rows around the middle of the caudal peduncle; transverse scale counts above the lateral line were taken between the lateral line and dorsal fin origin; transverse scale counts below the lateral line were taken between the lateral line and anal fin origin; the value “.5” appearing in the transverse scale counts refers to a small truncate scale at the base of either the dorsal or anal fin; and the transverse scale row count on the preopercle is given as 2 counts (4 + 3), one for the number of rows on the central portion of the preopercle and the other for its lower limb.

Counts and proportions are given for the holotype, followed by the range of values (if differing from the holotype) for the paratypes

in parentheses. Proportional measurements expressed as percentages of the SL are provided in table 1. Type specimens are deposited at Pusat Penelitian dan Pengembangan Oseanologi, Jakarta, Indonesia (NCIP), the National Museum of Natural History, Washington, DC (USNM), and the Western Australian Museum, Perth (WAM).

SYSTEMATIC ACCOUNT

Pentapodus numberii sp. nov.

(Figs. 2, 3)

Materials: Holotype: NCIP 6341, male, 160.5 mm SL, northwestern end of Batanta near Dayang I., 00°47.686'S, 130°29.418'E, Raja Ampat Is., Papua Barat Province, 12 m, spear, M. Erdmann, 11 Aug. 2007. Paratypes: NCIP 6342, 149.0 mm SL, Karang Utara Ronde, 00°50.511'N, 128°26.755'E, small coral islet in middle of Buli Bay, eastern Halmahera, Indonesia, 18-50 m, spear, M. Erdmann, 26 Apr. 2008; USNM 391631, 160.5 mm SL, collected with NCIP paratype; WAM P.32992-001, 149.2 mm SL, collected with NCIP paratype.

Diagnosis: Caudal fin forked with upper and lower rays produced into long trailing filaments; single dusky (blue in life) stripe on side of snout; a pale-yellow stripe in life on middle of side that can be instantly “switched” on or off; predorsal scales reaching forward to level between posterior margin of posterior nostrils; suborbital scaled; lower limb of preopercle with 3 rows of scales; lateral-line scales 45 or 46; pectoral-fin rays 15 or 16; pelvic fins moderately long, reaching level of anus in adult males.

Description: Dorsal-fin rays X,9; anal-fin rays III,7; pectoral-fin rays 15 (16), all rays branched except lowermost and two uppermost; pelvic-fin rays I,5; lateral-line scales 45 (45 or 46); transverse scale rows above lateral line 2.5; transverse scale rows below lateral line 11.5; circumpeduncular scales 18 (19); transverse scale rows on preopercle 4 + 3; gill rakers on 1st branchial arch 5 + 6 (5 or 6 + 5 or 6), all low and rudimentary.

Body depth at dorsal fin origin 3.5 (3.6-3.7) in SL; maximum body depth 3.0 (3.1-3.5) in SL; body width 6.7 (6.4-6.6) in SL; HL 3.5 (3.6-3.7) in SL; eye 3.6 (3.0-3.5) in HL; snout 3.0 (2.9-3.5) in HL; interorbital width 3.3 (3.0-3.4) in HL; suborbital depth 8.7 (7.9-9.9) in HL; eye 1.2 (0.9-1.2) in

snout length; suborbital depth 2.0 (2.3-3.2) in eye diameter; caudal peduncle depth 1.9 (1.9-2.0) in caudal peduncle length; caudal peduncle length 1.4 (1.3-1.5) in HL; predorsal length 3.2 (3.1-3.2) in SL; preanal length 1.6 (1.5-1.6) in SL; prepelvic

length 2.7 (2.7-2.8) in SL; prepectoral length 3.5 (3.3-3.5) in SL; dorsal-fin length 1.8 (1.9-2.0) in SL; 5th dorsal spine longest, 1.8 (1.7-1.9)-times length of 1st dorsal spine; 6th dorsal ray longest, 1.1 (1.0)-times length of longest dorsal spine;



Fig. 1. Satellite map of eastern Indonesia. Collection locations and visual records for *Pentapodus numberii* sp. nov. are respectively indicated by stars and a solid circle.



Fig. 2. *Pentapodus numberii* sp. nov., holotype, 160.5 mm SL, Batanta I., Raja Ampat Is., Papua Barat Province, Indonesia. GR Allen photo.

anal-fin length 6.2 (6.1-6.2) in SL; 1st anal spine 1.9 (1.9-2.3) in length of 2nd anal spine; 2nd anal spine 1.3 (1.0-1.3) in length of 3rd anal spine; 3rd anal spine 3.3 (2.9-3.2) in HL; pectoral-fin length 1.5 (1.3-1.4) in HL; pelvic-fin length 1.3 (1.1-1.3) in HL; pelvic-spine length 1.7 (1.4-1.7) in pelvic-fin length; caudal fin length 1.9 (2.1-3.7) in SL; caudal concavity 2.6 (2.8-7.2) in SL.

Maxilla reaching almost anterior margin of eye; pelvic fins reaching anal opening; predorsal scales 31 (30-33), reaching forward to level of posterior margin of posterior nostrils; suborbital scaled; lower limb of preopercle scaly; 2 pairs of moderately large canines at front of upper jaw and another pair at front of lower jaw.

Color of holotype in alcohol (Fig. 2): Body pale brown, lighter below; dusky-brown band from tip of snout to middle of anterior margin of eye; fins translucent tan.

Color in life (from underwater digital photographs, Fig. 3): Upper 1/2 of head and body medium to dark gray, grading to yellowish-white or bluish-white on lower 1/2; pale-yellow mid-lateral stripe, gradually rising posteriorly, from rear edge of eye, usually terminating anterior to caudal peduncle region, generally more vivid anteriorly, but variable and frequently absent (can be instantly “switched” on or off); a 2nd barely visible yellowish stripe sometimes present from upper rear corner of eye to middle of back; sky-blue stripe, about 1 scale wide, usually evident on lowermost portion of side, from belly region to caudal-fin base; a blue band from upper lip, passing through lower iris of eye to rear edge of operculum (at level of upper pectoral fin base); a pair of sky-blue stripes across upper and lower portions of iris, which is narrowly rimmed with orange; dorsal and anal fins translucent, frequently with reddish hue; caudal

Table 1. Proportional measurements of type specimens of *Pentapodus numberii* sp. nov. as a percentage of the standard length

Character	Holotype	Paratype	Paratype	Paratype
	NCIP 6341	WAM P.32992	USNM 391631	NCIP 6342
Standard length (mm)	160.5	158.3	149.2	149.0
Body depth (maximum)	33.1	31.9	29.2	28.3
Body width	15.0	15.2	15.6	15.6
Head length	28.8	28.4	27.2	28.1
Snout length	9.6	9.5	9.4	8.1
Orbit diameter	7.9	8.1	8.8	9.5
Interorbital width	8.8	8.7	8.0	9.4
Suborbital depth	3.3	3.6	2.7	3.2
Caudal peduncle depth	10.6	10.4	10.6	10.2
Caudal peduncle length	20.2	19.6	20.8	20.5
Predorsal length	31.3	32.2	31.7	31.9
Preanal length	64.2	64.6	64.1	65.0
Prepelvic length	37.4	36.3	36.7	36.2
Prepectoral length	28.7	28.7	29.8	29.9
Dorsal-fin base length	54.6	52.6	52.3	51.1
Length of 1st dorsal spine	6.5	6.5	7.2	7.1
Length of 6th dorsal spine	12.1	12.1	12.3	12.8
Length of longest dorsal ray	12.8	12.3	12.1	12.8
Anal-fin base length	16.1	16.3	16.0	16.1
Length of 1st anal spine	3.4	3.9	3.7	4.2
Length of 2nd anal spine	6.5	9.0	7.4	8.1
Length of 3rd anal spine	8.8	8.8	9.4	9.3
Length of longest anal ray	13.5	13.0	9.4	10.1
Length of pectoral fin	19.8	20.7	21.0	21.1
Length of pelvic fin	22.8	24.1	24.1	21.2
Length of pelvic spine	13.2	13.9	14.9	15.6
Length of caudal fin	52.3	48.3	26.9	36.0
Caudal concavity	38.5	35.9	13.9	22.1

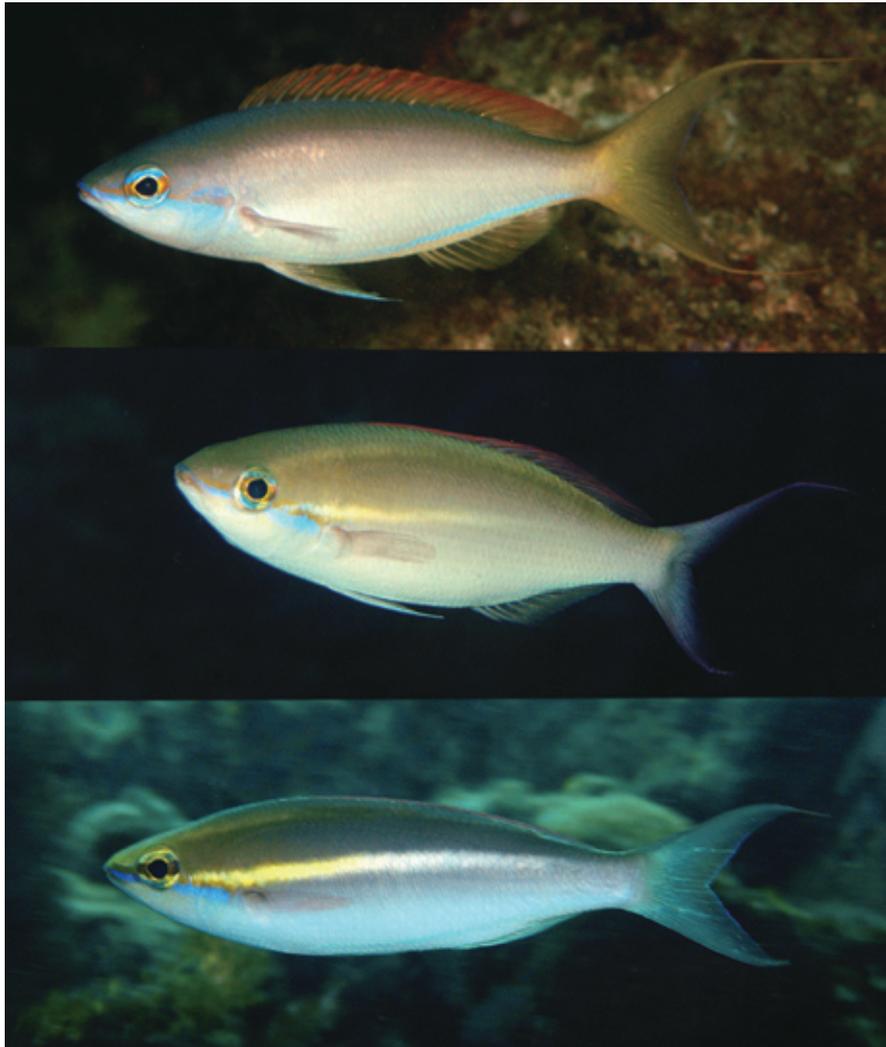


Fig. 3. Underwater photographs showing the variable coloration of *Pentapodus numberii* sp. nov., approximately 170-200 mm TL, 12-22 m depth, Triton Bay, Papua Barat Province (upper) and Buli Bay, Halmahera (2 lower photos), Indonesia. GR Allen photos.



Fig. 4. Underwater photograph of *Pentapodus emeryii* sp. nov. approximately 220 mm TL, 15 m depth, Raja Ampat Is., Papua Barat Province, Indonesia. Note that the trailing tail filaments, although present, are not visible in the photo. GR Allen photo.

fin translucent with yellowish to bluish hue and faint bluish posterior margin; pelvic fins mainly translucent whitish, except anterior edge narrowly blue; pectoral fins translucent whitish.

Distribution and habitat: The known distribution (Fig. 1) of *P. numberii* sp. nov. includes the Bird's Head (Vogelkop) region of western New Guinea (Papua Barat Province, Indonesia) and eastern Halmahera, which lies immediately to the west. Although occasionally seen as shallow as 12 m, this species is usually encountered at depths between about 18 and 60 m. It is usually seen on moderately sheltered outer reef slopes over sand-rubble substrates with occasional coral ridges and sea whips.

Etymology: The species is named *numberii* in honor of Mr. Fredy Numberi, the Indonesian Minister of Marine Affairs and Fisheries. Mr. Numberi, who previously served as an Admiral in the Indonesian Navy and as Governor of Irian Jaya Province, has played a critical role in championing marine conservation initiatives in his native Papua. It is a pleasure to honor him with this name in recognition of his efforts to establish marine protected areas in the Raja Ampat and Kaimana regencies, where this species was first discovered.

DISCUSSION

The nemipterid genus *Pentapodus* contains the following 11 species: *P. aureofasciatus* Russell, 2001; *P. bifasciatus* (Bleeker, 1848); *P. caninus* (Cuvier, 1830); *P. emeryii* (Richardson, 1843); *P. nakasakiensis* (Tanaka, 1915); *P. numberii* sp. nov.; *P. paradiseus* (Günther, 1859); *P. porosus* (Valenciennes, 1830); *P. setosus* (Valenciennes, 1830); *P. trivittatus* (Bloch, 1791); and *P. vitta* (Quoy and Gaimard, 1824). The genus can be divided into 2 main groups on the basis of the caudal fin structure. One group containing *P. emeryii*, *P. numberii* sp. nov., *P. paradiseus*, and *P. setosus* is characterized by the possession of long trailing filaments on 1 or both caudal-fin lobes. All other members of the genus lack the filamentous caudal-fin lobes. The new species and *P. emeryii* are the only species that have long filaments on both upper and lower caudal lobes of adult males. They are easily separated despite this similarity. *Pentapodus numberii* sp. nov. is a comparatively drab-colored fish and lacks the pair of bright yellow stripes that are diagnostic for *P. emeryii* (Fig. 4). Moreover, it has a scaly suborbital bone compared to the scaleless condition in *P. emeryii*, and a lower

lateral-line scale count (45 or 46 vs. 51-55).

Key to the species of *Pentapodus* (adapted from Russell 2001)

- 1a. Caudal fin with upper rays or upper and lower rays produced into long trailing filaments 2
- 1b. Caudal fin without long trailing filaments, lobes pointed or falcate 5
- 2a. Both lobes of caudal fin produced into long trailing filaments; lower limb of preopercle scaly, at least posteriorly 3
- 2b. Only upper lobe of caudal fin produced into long trailing filament; lower limb of preopercle scaleless 4
- 3a. Suborbital scaleless; lateral-line scales 51-55 (usually 52-54); vivid yellow stripe just below dorsal fin and another through middle of body in life (the Philippines, Indonesia, and northwestern Australia) *P. emeryii*
- 3b. Suborbital scaly; lateral-line scales 45 or 46; a single pale-yellow mid-lateral stripe sometimes present (Halmahera and West Papua, Indonesia) *P. numberii* sp. nov.
- 4a. Three dusky stripes (blue in life) on snout: 1st from eye to tip of snout, 2nd from eye across snout in front of nostrils, 3rd joining eyes behind nostrils (northeastern Australia, Papua New Guinea, and Solomon Is.) *P. paradiseus*
- 4b. Two dusky stripes (blue in life) on snout: 1st from eye to middle of upper lip, 2nd from eye to tip of snout; no stripe joining eyes (the Philippines and Indo-Malay Archipelago) *P. setosus*
- 5a. Predorsal scales extending forward to or anterior to level of posterior nostrils 6
- 5b. Predorsal scales extending forward to level of anterior margin of eyes or nearly to posterior nostrils 8
- 6a. Predorsal scales reaching level about midway between posterior and anterior nostrils; scaled area between nostrils rectilinear (the Philippines and Indo-Malay Archipelago) *P. bifasciatus*
- 6b. Predorsal scales extending to or just in front of level of posterior nostrils; scaled area between nostrils with a scaleless, medial wedge-shaped notch anteriorly 7
- 7a. Lower limb of preopercle scaly; caudal fin forked, lobes falcate with upper lobe usually longer than lower (the Philippines and Indo-Malay Archipelago) *P. caninus*
- 7b. Lower limb of preopercle scaleless; caudal fin forked, lobes pointed, more or less equal in length (southwestern Australia) *P. vitta*
- 8a. Lower limb of preopercle scaleless 9
- 8b. Lower limb of preopercle scaly 10
- 9a. Snout length greater than eye diameter; body moderately deep (depth 3.0-3.7 in SL); black spot on caudal peduncle (northwestern Australia) *P. porosus*
- 9b. Snout length less than or equal to eye diameter; body slender (depth 3.9-4.5 in SL); no spot on caudal peduncle (Japan, South China Sea, and northern Australia) *P. nakasakiensis*
- 10a. Body pale with 3 dusky stripes (brown in life) along sides; dark bar at base of pectoral fin (Indo-Malay Archipelago, New Guinea, and Solomon I.) *P. trivittatus*
- 10b. Body color not as in 10a; no dark bar at base of pectoral fin (Taiwan southward to northeastern Australia and east to Fiji) *P. aureofasciatus*

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