

Festucalex rufus, a new species of pipefish (Syngnathidae) from Milne Bay Province, Papua New Guinea

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Abstract

A new species of syngnathid pipefish, *Festucalex rufus* is described from Milne Bay Province, Papua New Guinea on the basis of four specimens, 26.5-37.8 mm SL collected from coral reef habitat in 10-20 m depth. It is distinguished from other members of the genus on the basis of a combination of features including a short snout (2.8-3.2 in head length), relatively low pectoral-ray count (10-11), and a lateral trunk ridge that terminates on the penultimate trunk ring. It is a small species with observed and collected individuals generally less than 40 mm SL and the single brood-pouch male collected measures 36.3 mm SL.

Zusammenfassung

Beschrieben wird eine neue Art der Seenadeln, *Festucalex rufus*, auf der Grundlage von vier Exemplaren mit 26,5 bis 37,8 mm SL, die in der Provinz Milne-Bucht, Papua-Neuguinea, über einem Korallenriff in 10 bis 20 m Tiefe gefangen wurden. Sie unterscheiden sich von anderen Arten der Gattung durch eine Kombination von Merkmalen, darunter eine kurze Schnauze (2,8-3,2 der Kopflänge), relativ wenige Brustflossenstrahlen (10-11) sowie einen seitlichen Grat auf dem Rumpf, der auf dem vorletzten Rumpfring endet. Die Vertreter der neuen Art sind klein, die beobachteten und gesammelten Individuen maßen grundsätzlich weniger als 40 mm SL, und das einzelne Männchen mit Bruttasche unter den gefangenen Tieren hatte eine Länge von 36,6 SL.

Résumé

Une nouvelle espèce de Syngnathidé, *Festucalex rufus*, est décrite provenant de Milne Bay Province, Papouasie-Nouvelle-Guinée, sur base de quatre spécimens, de 26,5 - 37,8 mm LS, collectés dans un récif corallien, à une profondeur de 10 - 20 m. Elle se distingue des autres membres du genre par une combinaison de caractéristiques comprenant un rostre court (2,8 - 3,2 de la longueur de la tête), un nombre re-

lativement réduit de rayons pectoraux (10 - 11) et une crête de tronc latérale qui s'achève sur l'avant-dernier anneau de tronc. C'est une petite espèce dont les individus collectés et observés font généralement moins de 40 mm de LS et le seul mâle en incubation collecté faisait 36,3 mm de LS.

Sommario

Una nuova specie di pesci ago, *Festucalex rufus* è descritta dalla provincia di Milne Bay, Papua Nuova Guinea, sulla base di quattro esemplari di dimensioni 26,5-37,8 mm SL raccolti lungo la barriera corallina a 10-20 m di profondità. Si distingue dagli altri membri del genere sulla base di una combinazione di caratteri, tra cui: un muso breve (2,8-3,2 in lunghezza della testa), numero di raggi pettorali relativamente basso (10-11) e una cresta laterale sul tronco che termina sul penultimo anello del tronco stesso. Si tratta di una piccola specie: gli individui osservati e raccolti in genere erano inferiori a 40 mm SL e l'unico maschio con tasca ventrale raccolto misurava 36,3 mm SL.

INTRODUCTION

The syngnathid genus *Festucalex* Whitley 1931 was reviewed by Dawson (1985) and further discussed by Fricke (2004). The group is distinguished from other family members by a combination of features that include the presence of a tiny caudal fin (containing 10 rays), both superior and inferior trunk and tail ridges continuous, anal fin present (with 4 rays), lateral trunk ridge more or less straight (not deflected ventrally near anal ring), dorsal-fin origin on the trunk, principal tail ridges lacking prominent hook-like projections on the posterior angles of each tail ring, and the median dorsal snout ridge low without projections, more or less concave in lateral profile. The group was previously known to contain

seven species, which are restricted to the tropical and temperate Indo-Pacific region: *F. cinctus* (Ramsay 1882) from eastern and northern Australia, *F. erythraeus* (Gilbert 1905), which is widely distributed from Mozambique to Hawaii, *F. gibbsi* Dawson 1977 from Indonesia and the Great Barrier Reef, *F. kulbickii* Fricke 2004 from New Caledonia, *F. prolixus* Dawson 1984 from Indonesia and the Philippines, *F. scalaris* (Günther 1870) from Western Australia, and *F. wassi* Dawson 1977 from Fiji and Samoa.

The present paper describes the eighth known member of the genus. The species was initially photographed *in situ* by Ned DeLoach in 2008 at Milne Bay Province, Papua New Guinea. Additional observations at Indonesia (Bali and Ceram) and the Solomon Islands indicate that it is relatively widespread, although inconspicuous due to its small size and cryptic habits. Underwater photographs appeared in several recent publications (Kuitert 2009; Allen et al. 2010; Allen & Erdmann 2012), invariably misidentified as a variant of *Micrognathus pygmaeus* Fritzsche 1981. Four specimens were finally obtained by the authors during visits to Milne Bay in 2013-2014 and form the basis of the present description.

MATERIALS AND METHODS

Methods of counting and measuring, and terminology used for trunk and tail ridges follow those of Dawson (1985). Trunk rings are counted from the ring bearing the pectoral fins to the ring bearing the anus. Tail rings begin with the first ring behind the anus to the penultimate ring, excluding the terminal element bearing the caudal fin. Standard length is the straight line distance from the tip of the lower jaw to the base of the caudal fin. Head length is the distance from the tip of the lower jaw to the rear margin of the opercle. Snout length is measured from the tip of the lower jaw to the anterior margin of the eye. Snout depth is the least vertical dimension of the snout. Body depth is the maximum depth, measured at the first trunk ring between the outer margins of the superior and median ventral trunk ridges, and body width is measured between the corresponding lateral trunk ridges of the first trunk ring. Eye diameter is measured horizontally. Predorsal length is measured from the tip of the lower jaw to the dorsal-fin origin. Preanal length is measured from the tip of the lower jaw to the anal opening. Prepectoral length is measured from the tip of the lower jaw to the base of the upper base of the pectoral fin.

Type specimens are deposited at the Western Australian Museum, Perth (WAM) and the United States National Museum of Natural History, Washington, D.C. (USNM). The description of the new species follows the format of Fricke (2004). Counts and proportional measurements include the value for the holotype followed in parentheses by the range for the paratypes if different. Percentage of SL values are also included for each proportional measurement and include the range for all four type specimens.

Festucalex rufus, n. sp.

Pink Pipefish

(Figs 1-5)

Holotype: WAM P. 33884-001, female, 37.8 mm SL, Cheri's Reef dive site, 10° 18.023' S, 150° 57.177' E, about 5.5 km west of Nuakata Island, Milne Bay Province, Papua New Guinea, 18-20 m, hand net, M. V. Erdmann, 16 June 2013.

Paratypes: WAM P. 33884-002, male, 36.3 mm SL, collected with holotype; USNM 432234, 2 specimens, 26.5-37.6 mm SL, Barracuda Point, 10° 15.458' S, 150° 43.458' E, about 16 km west of East Cape, Milne Bay Province, Papua New Guinea, 10 m, hand net, G. R. Allen, 12 September 2014.

Diagnosis: A species of *Festucalex* with 10-11 pectoral fin-rays, 18-19 dorsal-fin rays, 15-16 + 31 body rings (total 46-47), snout length 2.8-3.2 in head length; lateral trunk ridge ending on penultimate trunk ring, no spine-like projections on principle tail ridges, and colour in life generally pinkish red.

Description: Dorsal rays 18 (2 paratypes with 19); anal rays 4; pectoral rays 10 (2 paratypes with 11); caudal rays 10. Trunk rings 15 (16); tail rings 31; total rings 46 (47); subdorsal rings 2 + 4; total subdorsal rings 6.

Head 8.8 (7.5-9.1) in SL (11.0-13.3 % of SL). Median dorsal snout ridge entire, not strongly elevated, without bony knobs or spines, not confluent with orbital ridges. A low, indistinct opercular ridge; operculum with striae. Other head ridges low and indistinct. Snout length 3.0 (2.8-3.2) in head length (3.8-4.2 % of SL). Snout depth 6.2 (6.3-6.8) in head length (1.8-2.0 % of SL). Eye diameter 4.8 (4.4-4.9) in head length (2.4-3.1 % of SL).

Body relatively smooth, without conspicuous ridges and rings. Superior and inferior trunk ridges continuous with their respective tail ridges. Lateral trunk ridge not deflected near anal fin, ends mid-laterally on penultimate trunk ring. Margins of head

and body ridges entire, neither denticulate or serrate. Dermal flaps absent. Body depth 23.6 (20.4-24.1) in SL (4.2-4.9 % of SL). Body width 26.8 (26.3-30.1) in SL (3.3-3.8 % of SL). Preanal length 2.5 (2.4-2.6) in SL (38.3-41.9 % of SL). Principal tail ridges behind dorsal fin without small posterior spine-like projections on each ring. Brood pouch under tail rings 1-12, pouch folds present, semi pouch closure.

Dorsal-fin origin on trunk; dorsal-fin base not elevated. Dorsal-fin base length 10.6 (10.4-12.1) in SL (8.2-9.6 % of SL). Predorsal length 2.6 (2.5-2.6) in SL (37.8-39.3 % of SL). Pectoral-fin length 41.1 (29.5-40.3) in SL (2.4-3.4 % of SL). Prepectoral length 7.9 (7.4-8.5) in SL (11.8-13.6 % of SL). Caudal-fin length 34.4 (25.5-33.2) in SL (2.9-3.9 % of SL).



Fig. 1. *Festucalex rufus*, preserved holotype, 37.8 mm SL, near Nuakata Island, Milne Bay Province, Papua New Guinea. Photo by G. R. Allen.



Fig. 2. *Festucalex rufus*, preserved holotype, 37.8 mm SL, showing close-up view of head. Photo by G. R. Allen.



Fig. 3. Underwater photograph of *Festucalex rufus*, female holotype 37.8 mm SL, Milne Bay Province, Papua New Guinea. Photo by G. R. Allen.

Colour in alcohol (Figs 1-2): Holotype uniformly pale pink. Paratypes ranging from pale pink to pale grey, nearly whitish. Microscopic examination of the type series reveals a pattern of fine, inter-laced greyish striae on the head and body.

Colour in life (Figs 3-5): Overall pinkish red,

covered with matrix of thin white striae on head and body, which closely matches the pattern of spicules evident on the tubular sponge with which it associates.

Sexual dimorphism: The two sexes are similar in general appearance with the exception of the female



Fig. 4. Underwater photograph of *Festucalex rufus*, female, approximately 38 mm SL, East Cape area, Milne Bay Province, Papua New Guinea. Photo by N. DeLoach.



Fig. 5. Underwater photograph of *Festucalex rufus*, approximately 38 mm SL, East Cape area, Milne Bay Province, Papua New Guinea. Photo by N. DeLoach.

brood pouch situated on the tail between rings 1-12, which is present in the 36.3 mm SL paratype (WAM P. 33884-002). The presence of a fully developed pouch with ripe eggs, indicates a small maximum size for this species. All observed specimens have been under about 40 mm SL.

Distribution and habitat: The new species is currently known from several sites in the East Cape area of Milne Bay Province, Papua New Guinea. It has also been observed at Indonesia (northern Bali and Ceram) and the Solomon Islands. It frequents exposed coral reef slopes and is generally encountered solitarily or in pairs at depths ranging from about 10-25 m. The pipefish exhibits highly effective camouflage with regards to its shape and colour, closely matching an unidentified, short tubular sponge among which the fish is invariably found (Fig. 4).

Remarks: *Festucalex rufus* is distinguished from other members of the genus on the basis of a combination of features including a very short snout (2.8-3.2 in head length), relatively low pectoral-ray count (10-11) and a lateral trunk ridge that terminates on the penultimate trunk ring (ends on tail rings in all other species except *F. erythraeus*). It is most similar to *F. erythraeus* and *F. kulbickii*, differing from both species in having a shorter snout (2.8-3.2 in *F. rufus* vs. 2.1-2.6). It further differs from *F. erythraeus* in having fewer tail rings (31 vs. 32-37) and from *F. kulbickii* in having the lateral trunk ridge ending on the penultimate trunk ring (vs. fifth to ninth tail ring) and lacking small posterior spine-like projections on the principle tail ridges of each ring. A key to the species of *Festucalex* is provided below.

**Key to the species of *Festucalex*
(modified from Dawson 1985)**

- 1a. Pectoral rays 10-14, snout length 2.0-3.2 in head length 2
- 1b. Pectoral rays 16-17, snout length 1.7-1.8 in head length *F. wasi*
- 2a. Lateral trunk ridge ends on penultimate trunk ring to fifth tail ring 3
- 2b. Lateral trunk ridge ends on tenth to 13th tail ring *F. proluxus*
- 3a. Total rings 53-59 (usually more than 54) 4
- 3b. Total rings 46-53 6
- 4a. Trunk rings modally 16-17; principal ridges of tail rings with either 1-6 knobs or projections on last 1-2 tail rings or with spine-like projections on each ring 5

- 4b. Trunk rings modally 19; principal ridges of tail rings entire, without knobs or spiny projections *F. scalaris*
- 5a. Trunk rings modally 17; principal ridges of last 1-2 tail rings with 1-6 knobs or projections; typically with narrow pale bar on postorbital *F. cinctus*
- 5b. Trunk rings 15-16; principal tail ridges bearing a small, posterior spine-like projection on each ring *F. kulbickii*
- 6a. Trunk rings modally 15-16; without distinct ridges on pectoral-fin base; lateral trunk ridge ends between penultimate trunk ring and first tail ring 7
- 6b. Trunk rings modally 18; 2 distinct ridges on pectoral-fin base, lateral trunk ridge ends on second to third tail rings *F. gibbsi*
- 7a. Snout length 2.1-2.6 in head length; snout depth 2.5-3.9 in snout length *F. erythraeus*
- 7b. Snout length 2.8-3.2 in head length; snout depth 2.0-2.2 in snout length *F. rufus*

Etymology: The new species is named *rufus* (Latin: red or reddish) with reference to its distinctive colouration.

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