

# *Microphis cruentus*, a New Doryrhamphine Pipefish (Syngnathidae) from New Caledonia

C. E. DAWSON

*Gulf Coast Research Laboratory Museum, Ocean Springs,  
Mississippi, 39564*

and

P. FOURMANOIR

*ORSTOM, B. P. A5, Noumea, New Caledonia*

**Abstract**—*Microphis cruentus*, a freshwater doryrhamphine (trunk-pouch) pipefish, is described from the Dumbéa River. This apparent New Caledonian endemic is characterized by having a single opercular ridge, the lateral trunk ridge confluent with the inferior tail ridge, a modal count of 17 trunk rings and by the presence of ocelli on the lateral trunk ridge.

## Introduction

In continuation of studies on Indo-Pacific pipefishes, the senior author has been accumulating material leading to a review of the 15 or more nominal species which have been referred to the doryrhamphine (trunk-pouch) genera *Microphis* Kaup 1853, *Oostethus* Hubbs 1929 and *Paramicrophis* Klausewitz 1955. These pipefishes typically have one or more ridges on the opercle, have the lateral trunk ridge confluent with the inferior tail ridge, have modally 9 caudal-fin rays and, at least as subadults or adults, inhabit freshwater or estuarine environments. Except for the polytypic *Oostethus brachyurus* (Bleeker) which occurs in both the Atlantic and Pacific oceans (Dawson, 1979), all nominal species are restricted to the subtropical-tropical Indo-Pacific region. Since some delay is anticipated in completing the review of these genera, we here describe a new species which is apparently endemic to New Caledonia. This species has been compared to all taxa originally described in or subsequently referred to the aforementioned genera and it is provisionally referred to the genus *Microphis*.

## Methods

Measurements are in millimeters (mm), SL = standard length, HL = head length, other methods are those of Dawson (1977). Materials examined are deposited in the following institutions: Australian Museum, Sydney (AMS); Bernice P. Bishop Museum, Honolulu (BPBM); California Academy of Sciences, San Francisco (CAS); Gulf Coast Research Laboratory Museum (GCRL); Muséum National d'Histoire Naturelle, Paris (MNHN); National Museum of Natural History, Smithsonian Institution, Washington, D. C. (USNM).

*Microphis cruentus* n. sp.

Figs. 1–2

**HOLOTYPE:** MNHN 1980–1533 (130 mm SL, brooding male), New Caledonia, Dumbéa River, “Trou des Nurses,” ca. 8 km upstream from mouth, elevation ca. 8 m, freshwater, depth 2–3 meters, 1 May 1980, P. Laboute and J.-L. Menou.

**PARATYPES:** New Caledonia, Dumbéa River and tributaries: CAS 19930 (3, 99–145), 24 Mar. 1944, W. M. Chapman and pty. CAS 19931 (3, 121–130), 26 Jan. 1944, W. M. Chapman and pty. AMS I. 21895–001 (1, 99), BPBM 26381 (1, 92), GCRL 17001 (3, 82–125) and USNM 224025 (1, 135), 13 Feb. 1980, P. Laboute and J.-L. Menou. GCRL 17000 (1, 128.5), taken with holotype. Loc. uncertain, possibly Dumbéa River: CAS 19928 (11, 122–155) and GCRL 17002 (2, 127.5–144), Lt. Schaeffer, no other data. MNHN 87–373 (1, 105), Vimont, no other data.

**DIAGNOSIS:** Lateral trunk ridge confluent with inferior tail ridge; opercle with a complete longitudinal ridge, without supplemental ridges; scutella without keels; brood-pouch plates not convergent in brooding fish; trunk rings modally 17; total rings usually 48–49; dorsal-fin rays usually 33–35; subdorsal trunk rings 1.5–0.25; ocelli present on lateral trunk ridge.

**DESCRIPTION:** Rings  $16-18+30-33=47-50$  ( $17+31-32$  in 65% of counts);

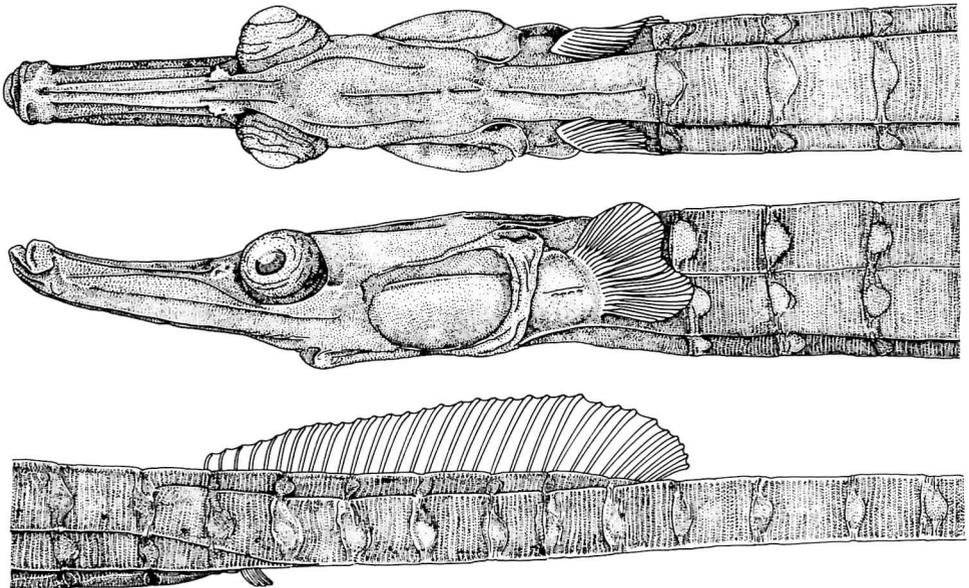


Fig. 1. *Microphis cruentus*. Dorsal and lateral aspects of head and anterior trunk rings, together with section of body illustrating ridge configuration and dorsal and anal fins. From 129 mm SL adult female paratype (CAS 19928).

dorsal-fin rays 31–36 (33–35 in 93%); pectoral-fin rays 18–20, modally 19; subdorsal rings  $1.5-0.25+5.75-7.5=6.75-8.0$ ; anal-fin rays 4; caudal-fin rays modally 9. Counts and measurements (mm) of the 130 mm SL, adult male, holotype follow: rings  $17+32$ , dorsal-fin rays 34, pectoral-fin rays  $19 \times 19$ , subdorsal rings  $1.25+6.25$ , HL 12.8, snout length 5.7, snout depth 1.2, length of dorsal-fin base 13.7, anal ring

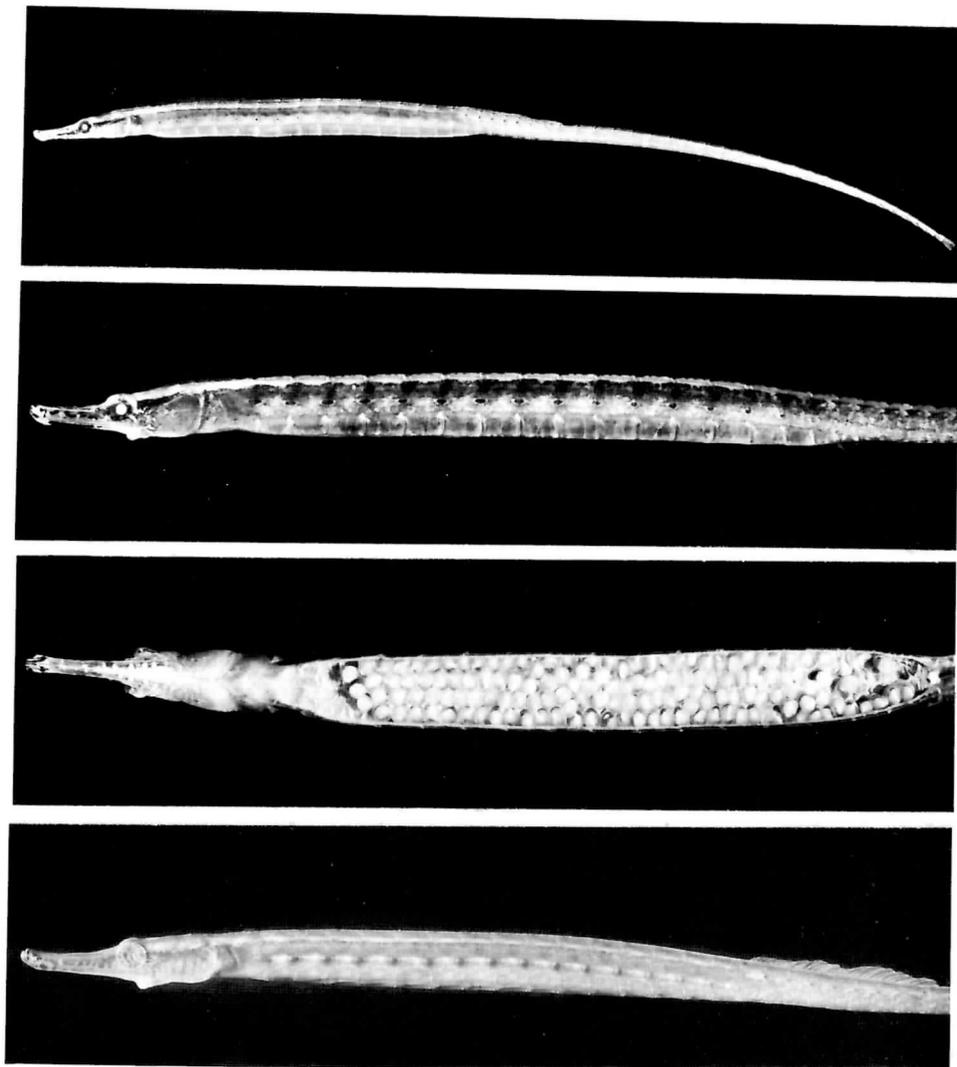


Fig. 2. *Microphis cruentus*. Upper pair: Top. GCRL 17000 (paratype, brooding male, 128.5 mm SL), taken with holotype. Bottom. MNHN 1980-1533 (holotype, brooding male, 130 mm SL). Lower pair: Top. GCRL 17001 (paratype, brooding male, 125 mm SL), ventral aspect illustrating brood pouch and in situ eggs. Bottom. GCRL 17002 (paratype, adult female, 127.5 mm SL).

depth 3.2, trunk depth 4.4, pectoral-fin length 2.4, length of pectoral-fin base 2.0.

Snout length averages 2.2 in HL, its dorsal margin a little concave in lateral profile; snout depth averages 5.2 in snout length; median dorsal snout ridge entire, ends near vertical through nares; lateral snout ridge arched; median dorsal head ridges low, usually distinct in dorsal aspect; usually with an indistinct supraopercular ridge and an arched ridge above gill opening; opercle with a complete longitudinal ridge (Fig. 1), otherwise ornamented with faint striae but typically without supplemental ridges; pectoral-fin base protrudes a little laterad, superior and inferior ridges present; superior body ridges a little elevated, with dorsum depressed between; venter of trunk V-shaped, the median ridge distinct but not clearly enlarged or keel-like in mature females; lateral trunk ridge typically confluent with inferior tail ridge on 1st tail ring, may fall short of inferior ridge in males with well-developed pouch plates; scutella without longitudinal keels; principal body ridges indented between trunk rings, usually with faint indentations between tail rings; ridge margins essentially entire under X30 magnification in subadults and adults; principal ridges of tail rings angled slightly laterad, the posterior angles of rings not produced to spine-like points. Dorsal-fin base not elevated; pectoral fins emarginate; anal-fin not separated from anus by a prominent bony septum; caudal fin rounded in subadults and adults. Brood pouch begins near rear of 1st trunk ring; membranous egg-compartments begin on 2nd–4th ring; pouch plates essentially vertical in brooding males (Fig. 2), sometimes margined with a narrow membranous fold but not converging toward ventral midline; pouch depth about equal to maximum diameter of eggs; eggs small, deposited in a single layer.

**COLOR IN ALCOHOL:** Ground color tan in recently preserved fish, markings in shades of brown, the dorsum usually lighter than sides and venter. Head usually with a brown stripe on side of snout and another crossing the postorbital and posterodorsal part of opercle, the snout stripe sometimes incomplete or replaced by irregular dark blotches; eye with a circlet of short dark bars radiating from pupil; head otherwise variously blotched or shaded with brown. Side of trunk usually with a pale stripe on the lateral ridge and with a small ocellate spot located, on or just below the lateral ridge, between most rings (Fig. 2); upper part of side with a broad dark stripe above the lateral ridge, the lower part plain or mottled brown. Tail plain, blotched or mottled with brown. Dorsal-, pectoral- and anal-fin rays narrowly edged with brown; caudal fin plain or mottled brown, sometimes margined with pale.

**COLOR IN LIFE:** An underwater color photograph of an adult shows the ground color as greenish-brown. There are two narrow and diffuse brown stripes on the dorsum of head and trunk, the superior trunk ridges are edged with brown and the lateral ocelli appear as greenish-white spots. There is a narrow, dark red, bar crossing the snout just behind the upper jaw and there is a red lateral blotch just behind the angle of gape.

**ETYMOLOGY:** Named *cruentus*, meaning spotted or stained with blood, in

reference to the red markings on the snout of living specimens.

**COMPARISONS:** The combination of single opercular ridge, modally 17 trunk rings, 47–50 total rings, 31–36 dorsal-fin rays and presence of ocelli on the lateral trunk ridge distinguishes *M. cruentus* from all nominal species currently referred to *Microphis*, *Paramicrophis* and *Oostethus*. This species is most similar to *Microphis insularis* (Hora), known only from the Andaman Is., in gross morphology, most meristic features and coloration. However, *M. cruentus* differs in the absence of supplemental ridges below the opercular ridge (1–5 supplementals present in *M. insularis*) and in having fewer trunk rings (16–17 rings in 92% of counts against 18–19 in 98% of examined *M. insularis*).

Adult males of *M. cruentus*, wherein the lateral trunk ridge is not confluent with the inferior tail ridge, could be confused with two species of *Doryichthys* which may have the distal part of the lateral trunk ridge deflected toward the continuous inferior trunk and tail ridges. *Microphis cruentus* differs from *Doryichthys deokhatoides* (Bleeker) in having more subdorsal tail rings (5.75–8.0 against 3.75–6.0), a higher average HL in SL ratio (9.4–6.1) and in lacking large dark spots above the lateral trunk ridge (characteristically present in *D. deokhatoides*). Compared to *D. martensii* (Peters), *Microphis cruentus* usually has one more trunk ring (modally 17 against 16), a higher average HL in SL ratio (9.4 against 8.1) and has ocellate rather than plain dark spots on the lateral trunk ridge. Furthermore, brooding males of *M. cruentus* have 3–6 transverse rows of pouch-eggs whereas there are typically 1–2 rows in compared species of *Doryichthys*.

**REMARKS:** Present specimens exhibit some variation in ridge development and configuration. The supraopercular ridge is most distinct in smaller fish (<125 mm SL) and it may be vestigial or obsolete in large specimens. Two fish (99 and 122 mm SL) have a supplemental ridge located above the opercular ridge on the right side only, but supplemental ridges are otherwise absent in study material. The lateral trunk ridge is confluent with the inferior tail ridge in all juveniles and females but the lateral ridge ends on the last pouch plate, just above the inferior ridge, in several adult males. The inferior trunk and tail ridges are confluent in 37 of 54 configurations examined, whereas the remainder (32%) are discontinuous or interrupted on the 1st tail ring. Despite these variations, it is evident that typical specimens of *M. cruentus* lack supplemental opercular ridges and have the lateral trunk ridge confluent with the inferior tail ridge.

Among present material, the smallest male with developed pouch plates is 92 mm SL. There are 3–6 transverse rows of pouch-eggs or membranous egg-compartments (31–49 in the outer right row) in 7 brooding fish (126–147 mm SL); maximum egg-diameters in four fish are 0.8–1.2 mm. Membranous folds, narrower than the average egg-diameter, margin the free edges of the brood pouch in most brooding males.

There is considerable variation in the preserved coloration of recently collected material and substantial differences may occur among specimens of the same sex and size from the same locality (Fig. 2, upper pair).

This species evidently breeds in freshwater and it is not known from estuarine or marine habitats. The collections of Messrs. Laboute and Menou were from a protected river embayment located well upstream from any tidal influence. The bottom consisted of pebbles and small rocks with sparse algal cover and some detrital vegetation. Two other doryrhamphine pipefishes, *Coelonotus leiaspis* (Bleeker) and *Oostethus brachyurus brachyurus* (Bleeker) are also known from New Caledonian freshwaters; the former has been taken with *Microphis cruentus*.

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