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Dipulus norfolkanus, a New Shallow-water Bythitid Fish from Australia (Ophidiiformes)

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Abstract A new bythitid fish species, *Dipulus norfolkanus*, is described from 27 specimens from Norfolk Island, Australia. The new species differs from *D. caecus*, the only known species in the genus, in the following characters: head length, predorsal length, preanal length, precaudal vertebrae, and male intromittent organ.

A small, free-tailed bythitid fish genus, *Dipulus*, which has been known only from the shallow-water of temperate and subtropical Western Australia (Hoese and Hanley, 1989), contains one nominal species, *D. caecus* Waite, 1905 (Cohen and Nielsen, 1978). While examining bythitid fish collections in the Northern Territory Museum (NTM) and the Australian Museum, Sydney (AMS), I found 27 specimens of an undescribed species belonging to the genus *Dipulus*. This species is described herein as *Dipulus norfolkanus* sp. nov.

All measurements are straight-line measurements. Numbers of vertebrae and vertical fin rays were counted on radiographs. The ural centra were not included in the number of caudal vertebrae. Total length, standard length and head length are abbreviated as TL, SL and HL.

Dipulus norfolkanus sp. nov.
(Figs. 1, 2)

Holotype. NTM S. 11422-044, 45.0 mm SL, ♂, Cascade Rocks, 29°15′S, 167°58′E, Norfolk I., depth 0-0.5 m, rotenone, coll. by H. and J. Larson, Apr. 17, 1984.

Paratypes. AMS I.20256-010, 32.4-41.1 mm SL, 1♂ and 5♀, Cooks Landing, 29°00′S, 167°56′E, Norfolk I., depths 0-1 m, rotenone, coll. by H. Larson and G. Anderson, Sept. 8, 1975; AMS I. 20257-017, 28.5-45.5 mm SL, 1♂ and 4♀, Cooks Landing, Norfolk I., depths 0-5 m, rotenone, coll. by D. Hoese, Sept. 8, 1975; AMS I.20260-014, 48.4 mm SL, ♂, Nepean I., 29°04′S, 167°57′E, Norfolk I., depths 15-20 m, rotenone, coll. by G. Anderson et al., Sept. 9, 1975; AMS I. 20264-004, 43.4 mm SL, ♂, Sydney Bay, 29°04′S, 167°57′E, Norfolk I., depths 1-2 m, rotenone, coll. by D. Hoese and H. Larson, Sept. 11, 1975; AMS I.20268-021, 34.5-61.9 mm SL, 4♂ and 9♀, Point Hunter, 29°04′S, 167°57′E, Norfolk I., depths 0-1 m, rotenone, coll. by D. Hoese et al., Sept. 19, 1975.

Diagnosis. A species of *Dipulus* with head length 4.8-5.6 in TL (4.3-5.2 in SL), predorsal length 3.7-4.5 in TL (3.4-4.1 in SL), preanal length longer than one-half of SL, male intromittent organ with a single pair of non-convoluted pseudoclaspers expanded dorsally at its posterior end, and 13-16 precaudal vertebrae.

Description. Counts and measurements are given in Table 1. Body slender, elongate (Fig. 1A), compressed. Head small, compressed. Gill membranes joined to each other and to isthmus anteriorly. Tip of snout with well-developed skin folds (Fig. 1B). Jaws equal in length. Chin barbels absent. Mouth horizontal, large, upper jaw length 45.5-55.6% HL; maxilla not sheathed, elongated posteriorly, extending far beyond rear margin of eye. Anterior nostril tubular, located just above upper lip near snout tip. Posterior nostril tubular, short, located slightly before eye. Eye small, 9.4-13.2% HL, sunk beneath the surface. Interorbital region weakly convex, its width 13.0-17.2% HL. Opercular spine short, strong. No spines on preopercle.

Sensory pores on head as follows: supraorbital pores 3, 1 on edge of upper lip just before anterior nostril, 1 above anterior nostril, and 1 postero-dorsal

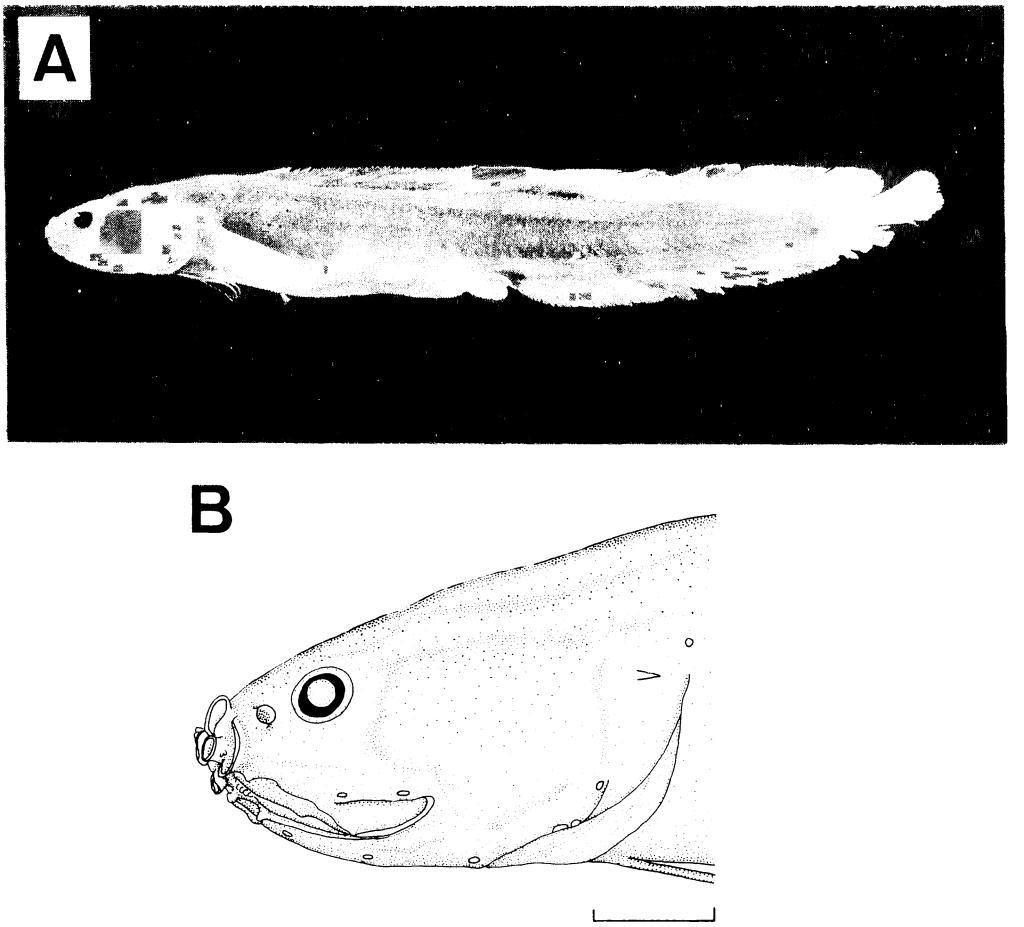

Fig. 1. *Dipulus norfolkanus* sp. nov., holotype, NTM S. 11422-044, 45 mm SL, from Norfolk Island. A) entire body; B) view of head. Scale bar indicates 2 mm.

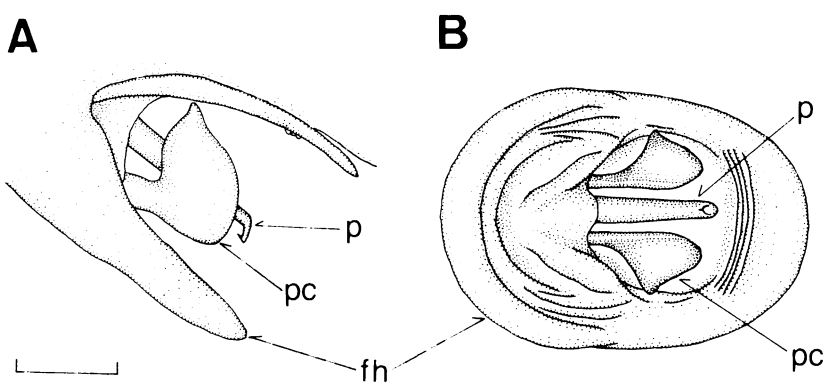

Fig. 2. Male intromittent organ of *Dipulus norfolkanus* sp. nov., holotype. A) lateral view; B) ventral view; *fh*—fleshy hood; *pc*—pseudoclasper; *p*—penis. Scale bar indicates 1 mm.

to rear margin of eye; infraorbital pores 5, 3 on edge of upper lip on snout, 1 below mid-eye, and 1 behind eye on dermal cheek fold; preoperculomandibular pores 7, 3 in skin folds of lower jaw tip, 1 below between posterior nostril and anterior margin of eye, 1 just behind the ventral projection of maxillary, 1 sligthly behind rear margin of maxillary, 1 slightly above lower angle of preopercle; a single lateral line pore located above upper angle of gill opening.

Gill rakers on 1st arch short, 2 or 3 longest on lower arm near angle.

Teeth small, pointed, forming bands on premaxilla, prevomer, palatine and dentary. Teeth in inner tooth rows on premaxilla and dentary enlarged. Head of prevomer V-shaped, with 2–3 tooth rows. Palatine tooth rows 2–3.

Dorsal fin with 89–104 rays (Tables 1, 2), its origin above anterior one-third of pectoral fin; predorsal length 24.4–29.9% SL. Anal fin with 58–65 rays, originating posterior to mid-length of body; preanal length 52.6–58.8% SL. Caudal fin with 15–17 (modally 16) rays; principal rays 14, free from dorsal and anal fins. Pectoral fin with 20–22 (modally 22) rays, long, round, on a deep peduncle nearly equal to snout length. Pelvic fins with one rather thick ray in each, inserted behind lower angle of preopercle, extending beyond rear margin of pectoral fin, but not reaching to middle of the distance from its base to anal fin origin.

Head, body and fins scaleless, covered with a thick mucous coating. No papillae on head. Lateral line on body indistinct.

Precaudal vertebrae 13–16 (modally 14), 1st neural spine lower than 2nd and 3rd neural spines, 4th to 10th neural spines depressed. Total vertebrae 45–49 (modally 47).

Male intromittent organ covered with a thick, fleshy hood (Fig. 2). A single pair of pseudoclaspers flat, not convoluted, dorsally expanded in lateral view at its posterior end. Penis curved ventrally at its distal end, bearing a tiny spine directed upward.

Color in alcohol.—Head and body uniformly light-brown, with small melanophores, lighter on belly. All fins pale.

Distribution. Known only from Norfolk Island, Australia.

Etymology. This species is named *norfolkanus* in reference to its type locality.

Remarks. Following Cohen and Nielsen (1978: 59), the present species fits the genus *Dipulus*: head and body scaleless, gill membranes joined to each

Table 1. Meristic and morphometric characters of *Dipulus norfolkanus*

	Holotype	Paratypes (26 specimens)
Standard length (mm)	45.0	28.5–61.9
Total length (mm)	49.0	31.7–67.9
Counts		
Dorsal fin rays	99	89–104
Anal fin rays	62	58–65
Caudal fin rays	16	15–17
Pectoral fin rays	20	20–22
Pelvic fin rays	1	1
Branchiostegal rays	6	6
Developed gill rakers	2	2–3
Precaudal vertebrae	16	13–15
Caudal vertebrae	33	32–35
In TL		
Head length	5.6	4.8–5.6
Predorsal length	4.3	3.7–4.5
In SL (in mm in parentheses)		
Head length	5.2 (8.7)	4.3–5.2
Predorsal length	3.9 (11.4)	3.4–4.1
Preanal length	1.8 (25.0)	1.7–1.9
Prepelvic length	6.3 (7.2)	5.1–6.0
Maximum body depth	6.6 (6.8)	6.3–8.8
Maximum body width	14.5 (3.1)	10.5–15.4
Pectoral fin length	7.5 (6.0)	6.9–9.0
Pelvic fin length	5.8 (7.7)	5.5–6.5
In HL (in mm in parentheses)		
Snout length	4.1 (2.1)	3.7–5.0
Eye diameter	7.9 (1.1)	7.6–10.6
Interorbital width	5.8 (1.5)	5.8–7.7
Upper jaw length	2.1 (4.2)	1.8–2.2

Table 2. Frequency distributions of dorsal and anal fin rays in *Dipulus norfolkanus*

Dorsal fin rays	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104
	3		3	1	1	3	4	4	4		2	1				1
Anal fin rays	58	59	60	61	62	63	64	65								
	2	1	7	4	6	3	3	1								

other and to isthmus anteriorly, ventral fins falling short of vent, opercle with a sharp spine, anterior nostril close to upper lip, maxilla relatively narrow posteriorly, intromittent organ of male with a single pair of pseudoclaspers, and six branchiostegal rays.

According to Waite (1905) and Cohen and Nielsen (1978), the present species clearly differs from the only other known species, *D. caecus* Waite, 1905: HL 4.8–5.6 in TL vs. 8.3 in *D. caecus* (4.4–5.2 in SL vs. 6.5 or more), predorsal length 3.7–4.5 in TL vs. more than 6, and origin of anal fin closer to caudal fin base than to snout tip vs. closer to snout tip. In addition, Cohen and Nielsen (1978) counted 22 precaudal vertebrae in *D. caecus*, and noted that the pseudoclaspers of *D. caecus* are convoluted, suggesting clear difference between *D. norfolkanus* which has 13–16 precaudal vertebrae and non-convoluted pseudoclaspers.

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オーストラリア産フサイタチウオ科の1新種

町田吉彦

オーストラリアのノーフォーク島の浅海で採集された27標本に基づき，フサイタチウオ科の新種 *Dipulus norfolkanus* を記載した．本種は，全長が頭長の4.8–5.6倍，背鰭前長の3.7–4.5倍，臀鰭前長は標準体長の1/2より長い，腹椎骨数が13–16，pseudoclasperが湾曲せず，真直ぐであることで既知種 *D. caecus* と異なる．

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