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A Record of *Nematops macrochirus* (Pleuronectidae) from Australia, with Comments on its Sexual Dimorphism

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There are four poorly known species of the genus *Nematops* (Norman, 1934; Fowler, 1934). They are apparently restricted to rather deep water (ca. 110–440 m) and, except for one record from St. Helena (Nielsen, 1961), have been recorded only from the Indo-Pacific. I examined fifteen specimens of *N. macrochirus* captured from a depth of 438 m, northeast of North Solitary Island, New South Wales, Australia. This species was described from a single specimen taken at Bali, Indonesia, in 1929 (Norman, 1931), and a second specimen was reported from St. Helena, southeastern Atlantic, in 1930 (Nielsen, 1961). In the present paper these Australian specimens are described and a revised key to the species of *Nematops* is given.

Counts and measurements follow the method of Hubbs and Lagler (1958). Radiographs were used to count fin rays and vertebrae. Institutional abbreviations follow Leviton et al. (1985).

Nematops macrochirus Norman, 1931 (Fig. 1)

Material. AMS I. 20435-013, 15 specimens (5 females, 10 males; 2 dissected, 3 stained), 76.0–95.2 mm in standard length (SL), northeast of North Solitary Island, New South Wales, Australia, 438 m, 17:00–18:00, 2 Aug. 1978, FRV Kapala.

Description. Counts and proportional measurements are shown in Table 1. Body rather slender,

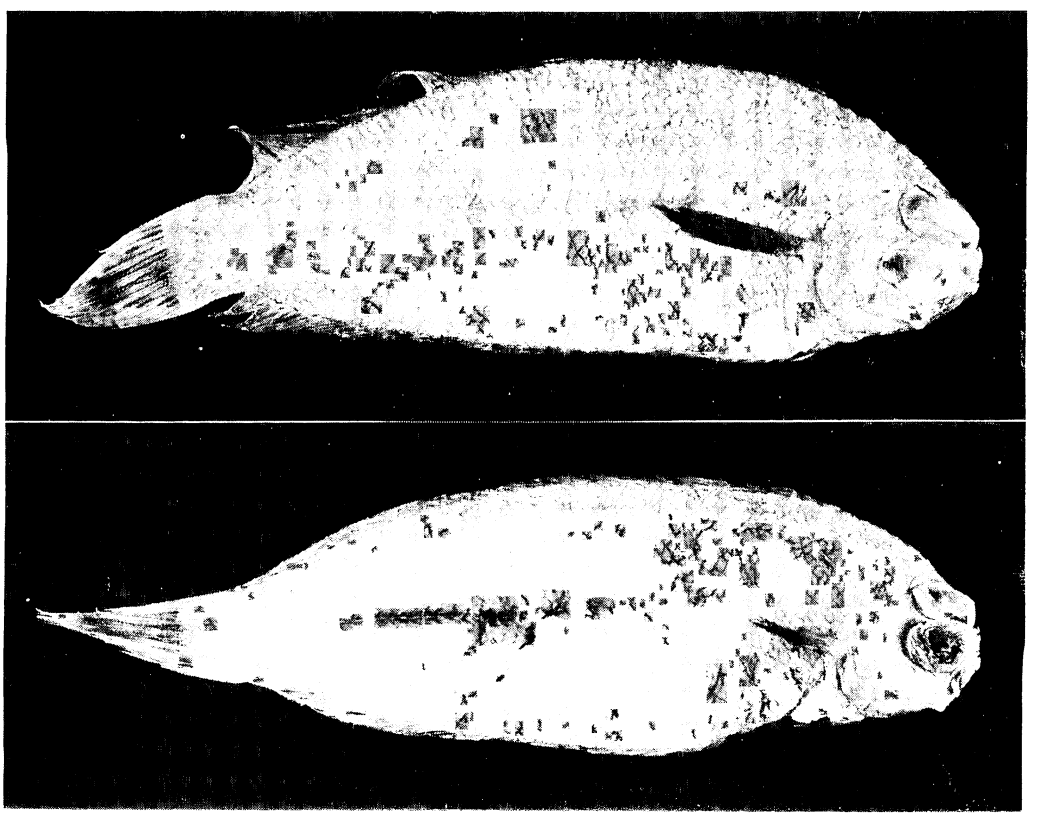

Fig. 1. *Nematops macrochirus*, AMS I. 20435-013. *Upper*—male, 80.1 mm SL; *lower*—female, 80.9 mm SL.

Table 1. Proportional measurements and counts in *Nematops macrochirus*. Numerals in parentheses after gill raker counts indicate number of specimens examined

Locality	Australia (Present study)		Bali (Norman, 1931)	St. Helena (Nielsen, 1961)
Number of specimens	5 females	10 males	holotype	1
Standard length (mm)	76.0–80.9	77.5–95.2	ca. 85	82
In standard length:				
Head length	4.51–4.90	4.53–4.95	4.33	4.17
Body depth	2.57–3.05	2.64–2.91	nearly 3	2.78
In head length:				
Snout length	6.58–8.89	6.54–9.39		5.79
Upper eye diameter	2.03–2.36	2.16–2.49		
Lower eye diameter	2.03–2.36	2.19–2.46	2.25	2.46
Upper jaw length on ocular side	2.72–3.28	2.75–3.16	3	3.28
Upper jaw length on blind side	2.84–3.48	2.85–3.46		
Lower jaw length on ocular side	2.19–2.32	2.22–2.43	2.25	2.46
Lower jaw length on blind side	2.19–2.32	2.22–2.43		
Depth of caudal peduncle	1.81–1.87	1.73–1.96	ca. 2	
Length of longest dorsal fin ray	1.79–1.90	1.65–1.98	ca. 2	
Length of longest anal fin ray	1.78–1.98	1.64–2.02		
Length of pectoral fin on ocular side	1.63–1.88	0.90–1.04	longer than HL	longer than HL
Length of pectoral fin on blind side	1.76–2.18	1.73–2.07		
Length of pelvic fin on ocular side	2.19–2.62	2.18–2.82		
Length of pelvic fin on blind side	1.90–2.39	2.11–2.43		
Length of caudal fin	0.86–0.92	0.85–0.92		
In eye diameter:				
Tentacle length on upper eye	0.22–0.34	0.21–0.43	ca. 0.25–0.33	0.25–0.33
Tentacle length on lower eye	0.27–0.47	0.22–0.72		
Counts:				
Dorsal	63–66	64–67	64* (65)	63* (62)
Anal	54–56	53–58	53* (55)	53* (53)
Pectoral on ocular side	8–9	7–8	7	7
Pectoral on blind side	6–8	5–7		
Pelvic on ocular side	6	6		
Pelvic on blind side	6	6		
Caudal	20 (rarely 19)	20	20* (18)	20* (18)
Scales in lateral line	ca. 62–64	ca. 60–66	68	ca. 65
Gill raker on ocular side	6+11 (1)	6–8+10–12 (4)	10 (lower limb)	10–11 (lower limb)
Gill raker on blind side	7+10 (1)	7–8+10–11 (4)		
Vertebrae	10+28–30=38–40	10+28–29=38–39	10+29=39	10+30=40

* Counted using radiographs; counts in parentheses taken from descriptions cited.

compressed, deepest portion slightly in front of middle part of body, depth 0.57–0.62 in head length (HL). Dorsal and ventral contours evenly and slightly arched except for more hightly arched dorsal profile of head. Caudal peduncle short.

Head length moderate, 1.67–1.77 in body depth; upper profile with slight notch just in front of upper eye. Snout very short, much shorter than eye diameter. Eyes large, nearly contiguous with each other, diameters greater than length of ocular-side upper jaw; anterior eye margins nearly at same transverse level, upper eye enters dorsal profile; each with short tentacle. Nostrils on ocular side in front of interorbital area; anterior nostril tubular with rather enlarged rim; posterior nostril located in front of lower eye, larger than anterior one, pointing downward, not tubular, with only small flap on dorsal edge; nostrils on blind side located just below dorsal margin of snout, similar to those on ocular side in structure, except posterior nostril without flap.

Mouth oblique, rather small and almost symmetrical. Maxilla extending to below anterior margin of lower eye. Lower jaw not projecting. Teeth small, resembling feeble canines; those on ocular side in two irregular rows anteriorly, a single row posteriorly; teeth on blind side in two or three irregular rows, rather better developed than teeth on ocular side. Gill rakers slender, moderately long, pointed at tips, but not serrate. Branchiostegal rays very thin, sword-like, feeble, seven in number.

Scales rather small, deciduous, ctenoid on ocular side and cycloid on blind side. Snout, eyes, jaws, dorsal and anal fins naked. Bases of ocular-side pectoral and pelvic and caudal fins scaled; posterior interorbital area scaled. Lateral line on ocular side strongly curved above pectoral fin, no supratemporal branch, absent on blind side.

Origin of dorsal fin slightly behind middle of upper eye. Anal fin originating slightly behind base of pectoral fin, similar to dorsal in shape and structure. Several fin rays branched at anterior end of dorsal fin and posterior ends of dorsal and anal fins. Pectoral fin on ocular side much longer (in male) and a little longer than or nearly as long as (in female) that on blind side, almost all rays branched on ocular side, all rays simple on blind side. Pelvic fin bases subequal in size, that on ocular side a little in advance and nearer median line than that on blind side; all or several rays branched on ocular side, all rays simple or some branched on blind side. Caudal fin pointed, inner 13–14 rays branched, other rays simple; upper- and lowermost rays small and unsegmented.

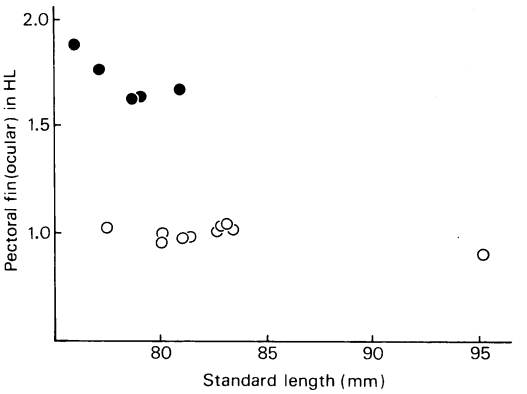

Fig. 2. Relationship of length of pectoral fin on ocular side in head length and standard length in male (○) and female (●) *Nematops macrochirus*.

Vent located on mid-ventral line, just in front of anal fin and on vertical through base of pectoral fin. Genital papilla displaced on ocular side.

In alcohol, general ground color on ocular side brownish; indistinct dusky blotches on all fins, darker blotches on distal area of pectoral and middle part of cauaudal fin. On blind side, body and all fins yellowish white; in most specimens, slightly dusky blotches on medial surface of pelvic fin (those blotches rather darker in largest specimen, 95.2 mm SL). Tentacles on eyes dark.

Remarks. Counts and proportional measurements for the specimens obtained from Australia are close to those in the descriptions of Norman (1931) from Bali and Nielsen (1961) from St. Helena (Table 1, several counts were re-examined using radiographs). Differences in dorsal and anal counts are minimal; the 18 caudal rays in their descriptions are probably due to the exclusion of very small unsegmented rays located at the upper- and lowermost portions of the caudal fin.

As shown in Table 1 and Figure 2, male *N. macrochirus* have longer pectoral fins on the ocular side than females. In pleuronectiforms, morphological differences between the sexes are observed in many species, especially in the family Bothidae (Norman, 1934; Amaoka, 1969). Although some species in the Pleuronectidae display sexual dimorphism (e.g., Norman, 1934; Matsubara, 1955), sexual differences in the fins have been reported only in *Marleyella*

bicolorata, which is in the same subfamily as *Nematops*, i.e. Poecilopsettinae. In that species, the anterior rays of the dorsal fin as well as those of the pelvic fin on the ocular side are much longer in males. However, there is no sexual dimorphism in length of the pectoral fin of the ocular side in *M. bicolorata*. Consequently, the sexual dimorphism found in *N. macrochirus* is unique among pleuronectids in being restricted to the length of the pectoral fin on the ocular side.

A long ocular-side pectoral fin has been used as one of several characters to separate *N. macrochirus* from congeners. Judging from the long pectoral fins on the ocular side, it is likely that the specimens examined by Norman (1931) and Nielsen (1961) were males.

Key to species of *Nematops*

1A. Tentacle only on lower eye ..... *N. chui* Fowler, 1934
1B. Tentacle on each eye 2
2A. 44–48 scales in lateral line ..... *N. grandisquama* Weber et de Beaufort, 1929
2B. 60–68 scales in lateral line.....3
3A. Body depth 2.33 in SL. Caudal rays 22 .....*N. microstoma* Günther, 1880
3B. Body depth 2.57–3.05 in SL. Caudal rays 20 (rarely 19) ....*N. macrochirus* Norman, 1931

Comparative material. *Nematops macrochirus*: BMNH 1931.7.23.1, holotype, ca. 85 mm SL, Bali Strait, 8°29′S, 114°40′E, 200 m, 15 Apr. 1929, Mortensen (Hardenberg), radiograph; ZMUC P853081, 82 mm SL, Jamestown, St. Helena, Feb. 1930, radiograph. *N. grandisquama*: ZMA 112.647, 4 syntypes, 40.5–69.5 mm SL, St. Nikolass Bay, Bali, Indonesia, 7 Sept. 1909, "Gier." *N. microstoma*: BMNH 1879.5.14.19, holotype, ca. 76 mm SL, Nares Harbour, Admiralty Is., 152 fms, "Challenger," radiograph. *N. chui*: USNM 93087, holotype, 66.5 mm SL, off southern Luzon, South China Sea, 135 fms, 15 Jan. 1908, "Albatross," radiograph.

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Nematops macrochirus（カレイ科）のオーストラリアからの記録と性的二型

坂本一男

オーストラリアの New South Wales, North Solitary Island の北東，水深 438 m より得られたカレイ科カワラガレイ亜科に属する *Nematops macrochirus* の標本 15 個体を調査する機会を得た．本種はこれまで Bali（模式産地）と St. Helena から 1 個体ずつ報告されているにすぎないので，これらのオーストラリア産の標本を詳細に記載した．本研究の結果，有眼側の胸鰭長に性的二型が認められた．いくつかのカレイ科魚類において性的二型が知られているが，胸鰭に性的二型が確認されたのは本種が初めてである．

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