ONIGOCIA BIMACULATA, A NEW SPECIES OF FLATHEAD FISH (SCORPAENIFORMES: PLATYCEPHALIDAE) FROM THE INDO-PACIFIC

by

Leslie W. Knapp, Hisashi Imamura, and Mitsuhiro Sakashita

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Leslie W. Knapp¹, Hisashi Imamura², and Mitsuhiro Sakashita³

ABSTRACT

A new platycephalid, Onigocia bimaculata, is described from 67 specimens collected from across the Indo-Pacific. This wide-ranging species has been taken in shorefish collections from southern Japan to American Samoa, Australia, Mauritius, Comoro Islands and Gulf of Aqaba. It is distinguished from known congeners by the following combination of characters: presence of a broad interopercular flap; lateral-line scales 32-39 (mean 35.7), anterior 2-4 scales bearing a spine; anal-fin rays usually 11; total gill rakers on first arch 6-9; interorbital width 0.5-1.9 % SL; no ocular flaps; iris lappet bilobed; two small blackish spots near margin of first dorsal fin; and pelvic fin with a large black spot on upper surface near base and usually one or two small black spots or bands distally.

INTRODUCTION

The genus Onigocia (from the Japanese word meaning "devil flathead") was erected by Jordan & Thompson (1914) for those species of Platycephalidae with large scales (29-41 in the lateral-line). The authors designated Platycephalus macrolepis Bleeker as the type-species. In 1925, Onigocia was restricted by Jordan & Hubbs, who described the genus Wakiyus with P. spinosus Temminck & Schlegel as its type. Imamura (1996) and most other recent authors regard Wakiyus as a junior synonym of Onigocia.

With the advent of rotenone ichthyocides and collecting techniques using SCUBA, shorefish collecting became greatly enhanced in efficiency and scope. Many small, cryptic, bottom-dwelling fishes previously unknown to science, such as Onigocia bimaculata, could now be captured at some depth. The first specimens of O. bimaculata recorded here were collected with rotenone and SCUBA by the George Vanderbilt Expedition to the Caroline Islands in 1953 and all subsequent captures listed below employed similar methods.

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METHODS AND MATERIALS

Counts and measurements were taken according to Hubbs and Lagler (1949). Measurements were made with calipers to the nearest 0.1 mm. Vertebrae were counted from radiographs. Terminology of head spines follows Knapp (1986) except for the following (Fig. 1): the ethmoid spines are located between the posterior nostrils; the postorbital spine is the spine on fourth infraorbital (*sensu* Imamura, 1996); and the frontal spines are on the area between the supraorbital spine series and the parietal spine series, following Imamura and Knapp (1999). Institutional acronyms follow Leviton et al. (1985). Standard length and head length are abbreviated as SL and HL.

Figure 1. Head spines of *Onigocia bimaculata*, holotype, 58.6mm SL.

ET – ethmoids; FRO – frontals; LAC – lachrymals; LO – lower opercular; NA – nasal; NC – nuchals; PA – parietals; PO – preopercular (uppermost); POC – preoculars; PSOC –1 postoculars; PT – pterotics; SBO – suborbitals; SPO – supraorbitals; SS – supplemental preopercular; UO – upper opercular.
Onigocia bimaculata
(New Japanese name: Sehoshi-omigochi)
Two-spotted flathead

Platycephalus oligolepis (non Regan, 1908): Wass, 1984: 11.

Figure 2. Lateral and dorsal views of Onigocia bimaculata, holotype, 58.6mm SL.

Figure 3. Onigocia bimaculata, paratype, USNM 345475, 60 mm SL, Gulf of Aqaba at El Hamira, Egypt. Drawn by Frances W. Zweifel.
HOLOTYPE: NSMT-P 54247 (58.6 mm SL), Minna I., Ryukyu Is., Japan, 8-10 m depth, M. Sakashita, 13 June 1996.

PARATYPES (66): Japan: NSMT-P 54248 (26.2) collected with holotype; NSMT-P 45638 (36.8) Minna I., Ryukyu Is., 7-10 m, M. Sakashita, 28 March 1993; NSMT-P 54249 (formerly URM-P21258) (23.2) Minna I., Ryuku Is., M. Sakashita, 18 June 1989. Philippines: BPBM 28553 (62) Negros, Dumaguete, artificial reef off South Seas Resort Hotel, 15-21 m, J.E. Randall, 4 June 1981; FMNH 108805 (4, 32-43) Maestre de Campo I, off Batuanan Pt., 14 m, M. Westneat et al., 29 May, 2000. Caroline Is: CAS 95492 (2, 43.5-56.8) Ifaluk Atoll, 7°15'8"N, 144°25'55"E, 2-3 m, R.R. Harry, 20 Oct 1953. Coral Sea: WAMP29637.038 (2, 24-27) Lihou Reef, Georgina Cay, 17°37'S, 151°26'E, 18-20 m, G. Allen, 12 Nov 1987. New Caledonia: MNHN 1997-3920 (57.2) R/V ALIS, Sta. D, 22°01.TS, 165°55.5'E, 10 m, 25 March 1990. Fiji: USNM 235934 (2, 12.7-31), Ono-Ilua, 21°38'S, 178°45'W, 14-17 m, V.G. Springer et al., 1 May 1982; USNM 235933 (52.6) northwest of Malolo Barrier Reef, 17°44'S, 177°03'E, 21-29 m, V.G. Springer et al., 26 May 1982; USNM 345477 (34.5) Navuta Ira I., 18°55'S, 178°33'W, 30.5-36.5 m, V.G. Springer et al., 3 May 1982; USNM 345476 (51.6) Matuku, south arm of harbour entrance, 19°09'38"S, 179°45'23"E, 7.5-12 m, V.G. Springer et al., 26 April 1982; USNM 345481 (33.7) R/V TE VEGA Sta. 295, Wailangilala I., 16°45'S, 178°47'W, 0-6 m, R. Bolin et al., 26 May 1965; ROM 51813 (49) Kandavu I., Astrolabe Reef, 18°44'18"S, 178°29'6"E, 5-8 m, R. Winterbottom et al., 31 March 1983. Tonga: USNM 344837 (56.3), R/V TE VEGA Cr. 8, Sta. 308, Neiafu I., 18°39'S, 174°00'30"W, 0-15 m, R. Bolin et al., 28 June 1965; USNM 333507 (2, 33-34.8), Eua I., 21°20'15"S, 174°58'14"W, 3-13.5 m, J.T. Williams et al., 2 Nov 1993; USNM 333624 (3, 33-43) Malinda I., 21°02'25"S, 175°08'W, 7.5-10.5 m, J.T. Williams et al., 23 Oct 1993. American Samoa: BPBM 18721 (60.9) Tutuilla I., R.C. Wass, 1974; USNM 344836 (57.3) Tutuilla I., Taema Bank, 30.5 m, R Wass, ca. 1974. Society Is: ROM 66159 (2, 33.3-43.5) Moorea off NE tip, 17°29'13"S, 149°45'49"W, 18.3-24.4 m, R. Winterbottom & R. Mooi, 12 Dec 1989; BPBM 5883 (36.4) Tahiti, SE side of Teavaroa Pass at Papara, 21.3-27.4 m, J.E. Randall & C.K. Walters, 29 Aug 1967. Mauritius: USNM 346058 (2, 40.2-53.8) Baie de la Petite Riviere, 20°12'30"S, 57°23'20"E, 30 m, P.C. Heemstra et al., 26 May 1995. Comores: RUSI 397171 (4, 46.8-65.3) Grande Comore, N end off Le Galawa Beach Hotel, P.C. Heemstra et al., 23 Nov 1991; USNM 345474 (2, 37.2-50.2) Grande Comore, west side, 11°41'33"S, 43°14'27"E, 0-24.4 m, H.A. Fehlmann et al., 27 Nov 1964; CAS 32564 (35) Grande Comore, ca. 5 km N of Hotel Itsandra, 25-30 m, J.E. McCosker et al., 7 March 1975; USNM 344835 (2, 59-64.1) Grande Comore, off Hotel Itsandra, 20-25 m, P.C. Heemstra et al., 15 Oct 1986; CAS 95493 (45) Grande Comore, N of Hahaia, 20 m, J.E. McCosker et al., 23 Feb 1975; CAS 35480 (5, 40.7-66.3) N of Hotel Itsandra, 20-30 m, J.E. McCosker et al., 19 Feb 1975. Gulf of Aqaba: MNHN 1977-0978 (2, 30-36.6) ca. 5 km S of Elat, M.L. Bauchot et al.; BPBM 19891 (2, 44-57) Elat, off desalination plant, 15 m, J.E. Randall et al., 3 Nov 1975; USNM 345480 (2, 37-55.6), 1 mi N of Ras Umm Burqa, 0-7.6 m, V.G. Springer et al., 21 July 1969; USNM 345479 (4, 35.5-57.5) off Ras Umm Burqa, 9-15 m, V.G. Springer et al., 21 July 1969; USNM 345478 (6, 52.6-61) bay at El Hamira, 9-12 m, V.G. Springer et al., 8 Sept 1969; USNM 345475 (60) same data as USNM 345478; HUJ 11064 (64.4) Ras Mukebla, A. Ben-Tuvia et al., 29 June 1980.

DIAGNOSIS: A species of Onigocia as defined by Imamura (1996) with a broad interopercular flap; lateral-line scales 32-39, the anterior 2-4 scales bearing a small spine; soft dorsal and anal-fin rays usually 11; gill-rakers on first arch 6-8 (usually 7 or 8); interorbital width narrow (0.5-1.9% SL); and 2 small blackish spots near margin of first dorsal fin.
DESCRIPTION: Data for the holotype are given in parentheses. Dorsal-fin rays VIII-IX (VIII), 10-12 (11); anal-fin rays 10-12 (11); pectoral-fin rays 19-22 (19), mode 21; pelvic-fin with 1 spine and 5 rays, the innermost branched or unbranched; caudal-fin branched rays 8-9 (9), 5 upper + 4 lower; vertebrae 27; gill-rakers 6-9 (8); pored scales in lateral line 32-39 (36), mode 36, the anterior 2-4 (2) scales bearing a distinct spine; and 3 rows of scales between soft dorsal fin and lateral line. Lateral-line scale tubes with two broad openings to exterior, one on dorsal edge and the other on ventral edge of scale (Fig. 4A); lateral-line scales mostly covered by adjacent body scales (Fig. 4B). Body scales large, number of oblique scale rows above lateral line about equal to number of lateral-line scales. First dorsal fin originating slightly posterior to opercular margin.

Figure 4. Scales from Onigocia bimaculata holotype: (A) Lateral view of 15th lateral line scale; arrows indicate openings of sensory canal along dorsal and ventral edges of scale. (B) dorsolateral view of scales on midbody including 13-19th lateral line scales on left side (diagrammatic [ctenii not shown]).

Body depressed, mostly covered with ctenoid scales, some cycloid scales ventrally. Head length 2.4-3.0 (2.8) in SL. Snout shorter than eye diameter, 2.4-4.4 (3.7) in HL, 8.8-12.7 (10.2) % SL; orbit diameter 9.6-13.3 (10.8) % SL; interorbital width 0.5-1.9 (1.2) % SL. Iris lappet bilobed (Fig. 5). Ocular flaps on the upper surface of the eye absent. Interopercular flap well-developed (Fig. 5). Maxilla reaching to below front margin of eye or just beyond. Villiform teeth in bands on jaws and palatines, in two separate patches on vomer. Tooth band on upper jaw with a distinct notch. Lip margins without papillae. Sensory tube branches of suborbital and preopercle canals well-developed, completely covering cheek region (Fig. 5).

Top and sides of head armed with spines (Fig. 1). Supratemporal, posttemporal and supracleithrum each bearing one nuchal spine. Base of opercular spines smooth. Preopercular spines 3; uppermost longest, not reaching opercular margin, bearing a supplementary spine on base; lowest spine the shortest. Suborbital ridge bearing small spines. Two strong spines directed forward on lachrymal. Nasal spine small. Ethmoid with 2-6 small spines. Usually 3 preocular spines. Supraorbital ridge bearing fine serrations. About 6 spines on postocular region of each side. Pterotic with 4-5 spines. Usually 2 frontal spines on each side. Supraoccipital lacking spines or ridges. Postorbital spines absent.
Colour in alcohol: Body light tan above, with 4 or 5 indistinct brown saddles dorsally. Fins mostly clear. Spinous dorsal fin with 2 small black spots near fin margin, the largest behind first long spine, the smallest behind third long spine (Figs. 2 & 3). Caudal fin with a faint submarginal dark band. Pelvic fin with a prominent black blotch on upper surface near base and often 2 or 3 smaller black blotches or bars distally. A specimen of *O. bimaculata* from the Comores (RUSI 39717) has a series of dark spots on the dorsal-fin spines and rays and on the upper rays of the caudal fin.

![Diagram](image.png)

Figure 5. Ventrolateral view of cheek region on right side of *Onigocia bimaculata*, holotype.

**DISTRIBUTION:** Known from the Gulf of Aqaba, Comoro Islands and Mauritius to southern Japan, the Philippines, Caroline Islands, northeastern Australia, New Caledonia, Fiji, Tonga, American Samoa and the Society Islands (Fig. 6).

**HABITAT:** Frequently taken on coral sand at depths of 3-30m.

**ETYMOLOGY:** The name *bimaculata* refers to the 2 dark spots that are readily visible on the first dorsal fin.

**REMARKS:** *Onigocia bimaculata* is one of the smallest and most wide-ranging of flatheads. A comparison of features in the species of *Onigocia* is given in Table 1. The new species appears to be unique among its congeners in having a well-developed interopercular flap, usually 7 or 8 gill-rakers on the first gill arch, a bilobed iris lappet, the narrowest interorbital width (Fig. 7) and 2 small but consistent black spots on the first dorsal fin. It is also distinguished from *O. grandisquama* (Regan, 1908), *O. macrolepis* (Bleeker, 1854), and *O. spinosa* (Temminck & Schlegel, 1842) in lacking an ocular flap on the eye. *O. pedimacula* (Regan, 1908) differs from *bimaculata* in having 4 preocular spines (instead of 3) and much more dark pigment on the body and fins. The head spines of *O. oligolepis* (Regan, 1908) appear to be larger than those of *O. bimaculata*, and the former also appears to have a submarginal dark band in the spinous dorsal fin.
Figure 6. Distribution of *Onigocia bimaculata*. 
Figure 7. Relationship between least interorbital width expressed as % head length in 6 species of *Onigocia* (value for holotype of *O. bimaculata* shown as a black diamond).

**COMPARATIVE MATERIAL** (87 specimens):


*O. macrolepis* (22): UMMZ 183273 (17, 84-129) Japan, off Miyazu; UMMZ 183271 (5, 104-113) Japan, near Matsue.

*O. oligolepis* (holotype plus 3 collections tentatively referred to this species): BMNH 1908.3.23.208 (holotype, 82) Cargados Carajos; MCZ 13797 (70) Zanzibar; RUSI 39766 (30) Boteler Pt., South Africa; RUSI 28197 (61) off Kosi Bay, Natal.


Table 1. Comparison of features in species of *Onigocia*. Modal counts in parentheses.

<table>
<thead>
<tr>
<th>Character</th>
<th>bimaculata n = 63</th>
<th>grandisquama n = 13</th>
<th>macrolepis n = 22</th>
<th>oligolepis n = 4</th>
<th>pedimacula n = 23</th>
<th>spinosa n = 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>SL (mm)</td>
<td>13–66</td>
<td>52–70</td>
<td>84–129</td>
<td>30–82</td>
<td>17–70</td>
<td>38–95</td>
</tr>
<tr>
<td>Interorbital width</td>
<td>0.5–1.9</td>
<td>2.1–3.0</td>
<td>2.5–3.5</td>
<td>1.3–2.3</td>
<td>1.6–2.8</td>
<td>2.2–3.2</td>
</tr>
<tr>
<td>LL scales with a spine</td>
<td>1–4 (3)</td>
<td>3–7 (4)</td>
<td>2–4 (3)</td>
<td>3</td>
<td>2–4 (3)</td>
<td>7–17 (12)</td>
</tr>
<tr>
<td>Total gill-rakers</td>
<td>6–9 (7–8)</td>
<td>5–6 (5)</td>
<td>5–6 (5)</td>
<td>5–6 (5)</td>
<td>4–5 (4)</td>
<td>5–6 (5)</td>
</tr>
<tr>
<td>Interopercular flap</td>
<td>present</td>
<td>absent</td>
<td>absent</td>
<td>absent</td>
<td>absent</td>
<td>absent</td>
</tr>
<tr>
<td>Ocular flap</td>
<td>absent</td>
<td>present</td>
<td>present</td>
<td>absent</td>
<td>absent</td>
<td>present</td>
</tr>
<tr>
<td>Iris lappet</td>
<td>bilobed</td>
<td>branches</td>
<td>branches</td>
<td>simple</td>
<td>crenate</td>
<td>branches</td>
</tr>
</tbody>
</table>

*As its status is unclear, *O. macrocephalus* (Weber, 1913), whose description is based on 7 specimens from Indonesia is not included here. Compared to *O. bimaculata*, it has fewer gill-rakers, broader interorbital, different colour pattern and an ocular flap.
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