

First Record of *Platyberyx rhyton* (Teleostei: Perciformes: Caristiidae) Outside of Japanese Waters and Description of Juvenile Morphology

Benjamin W. Frable^{1,3} and Duane E. Stevenson²

¹ Marine Vertebrate Collection, Scripps Institution of Oceanography, University of California San Diego,
9500 Gilman Drive, La Jolla, CA 92093-0244, USA
E-mail: bfrable@ucsd.edu

² National Marine Fisheries Service, Alaska Fisheries Science Center, Resource Assessment and Conservation Engineering Division,
7600 Sand Point Way NE, Seattle, Washington 98115, USA

³ Corresponding author

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While examining specimens identified as *Paracaristius maderensis* (Maul, 1949) at the Scripps Institution of Oceanography Marine Vertebrate Collection, we encountered an individual of the genus *Platyberyx* Zugmayer, 1911. This specimen was collected in the Central Pacific Ocean, 900 km east of Wake Atoll during the Naga Expedition 1959–1961. We identified the specimen as *Platyberyx rhyton* Stevenson and Kenaley, 2013, and it represents the first record of this species outside of Japanese waters. This is a range extension of around 3400 km east for this species, as well as the first record of a juvenile individual and the fourth record of the species overall. We provide a morphological description and comparisons to the three previously known adult specimens.

Key Words: manefish, Naga Expedition, rare species, range extension.

Introduction

The manefish genus *Platyberyx* Zugmayer, 1911 includes six species of rarely encountered mesopelagic fishes found in all tropical, subtropical and temperate oceans (Kukuev *et al.* 2012; Stevenson and Kenaley 2013). Of these species, four are known from the Pacific Ocean: *Platyberyx andria-shevi* (Kukuev, Parin, and Trunov, 2012); *Platyberyx paucus* Stevenson and Kenaley, 2013; *Platyberyx pietschi* Stevenson and Kenaley, 2013; and *Platyberyx rhyton* Stevenson and Kenaley, 2013. Only *P. rhyton* is known exclusively from the Pacific and more specifically from Japanese waters (Stevenson and Kenaley 2013; Okamoto *et al.* 2014; Okamoto and Stevenson 2015). *Platyberyx* is distinguished from the subfamily Paracaristiinae (including the genera *Neocaristius* Stevenson and Kenaley, 2011 and *Paracaristius* Trunov, Kukuev, and Parin, 2006) by having a narrow suborbital series and relatively large mouth, and from the genus *Caristius* Gill and Smith, 1905 by the presence of a conspicuous lateral line with large scales.

We encountered a distinctive specimen while re-examining material identified as *Caristius maderensis* Maul, 1949 (currently *Paracaristius maderensis*) at the Scripps Institution of Oceanography Marine Vertebrate Collection (SIO), following major revisions of the group (Stevenson and Kenaley 2011, 2013). We reidentified many specimens from the eastern and central North Pacific as *Paracaristius nudarcus* Stevenson and Kenaley, 2011. The distinctive specimen, SIO 61-593, has a distinct lateral line with large scales, a

distinguishing character of *Platyberyx* that is absent in *Caristius* and *Paracaristius* (Stevenson and Kenaley 2011, 2013). Upon further examination, this specimen matches the description of *P. rhyton* but was collected in the central North Pacific during the initial phase of the Naga Expedition of 1959–1961 between the Hawaiian Islands and Wake Atoll. This specimen represents the first record of *P. rhyton* outside of Japanese waters, a range extension of some 3400 km into the central Pacific Ocean and the fourth overall record of the species. It is also unique in that it is a juvenile specimen, and therefore provides the first opportunity to describe the juvenile morphology of the species.

Materials and Methods

Counts and measurements follow Hubbs and Lagler (1958) except body depth, which is measured through the dorsal insertion of the pectoral fin. Measurements were taken with digital calipers to the nearest 0.1 mm. Vertebral and fin ray counts were taken from radiographs. Gill raker counts are presented as upper (epibranchial)+lower (ceratobranchial) gill rakers on the anterior face of the first arch; angle raker is included in the lower count. Standard length and head length are expressed as SL and HL, respectively. Counts and morphometrics are presented in Table 1. The specimen is deposited at SIO; institutional abbreviation follows Sabaj (2019).

Table 1. Meristic and morphometric characters of *Platyberyx rhyton*.

	Previous specimens*	
	Present study	Previous specimens*
	<i>n</i> =1	<i>n</i> =3
	Central Pacific Ocean	Japan
Standard length (mm)	36	88–146
Vertebrae	16+18	15–16+18–19 (33–34)
Dorsal-fin rays	31	30–31
Anal-fin rays	19	18–19
Pectoral-fin rays	18	17–18
Vomerine teeth	10	6–17
Palatine teeth	15	10–17
Upper jaw teeth	36	30–40
Lower jaw teeth	32	34–40
Gill rakers	6+15	6+15 (21)
As % SL		
Body depth	57.1	45.3–52.5
Head length	43.4	30.4–33.9
Predorsal length	23.9	14.9–22.6
Prepectoral length	46.4	31.4–34.0
Prepelvic length	36.8	27.4–28.5
Pectoral-fin base	10.7	7.2–8.4
Preanal length	63.1	52.4–54.6
Dorsal-fin base	71.1	76.0–79.0
Anal-fin base	35.2	36.8–39.5
Peduncle length	13.7	13.3–13.5
Peduncle depth	13.5	12.8–14.0
As % HL		
Upper jaw length	61.3	56.0–59.4
Lower jaw length	46.8	50.8–57.6
Bony orbit width	47.5	43.8–47.2

* Data on previous specimens from Okamoto and Stevenson (2015).

Platyberyx rhyton Stevenson and Kenaley, 2013

[Japanese name: Sanriku-yaegisu]

(Fig. 1)

Platyberyx rhyton Stevenson and Kenaley, 2013: 424 (type locality: off Iwate Prefecture, northeastern Japan); Okamoto *et al.* 2014: 26 (off northeastern Japan); Okamoto and Stevenson 2015: 15 (off the Ogasawara Islands, Japan).

Caristiis macropus (not Bellotti, 1903): Tatsuta *et al.* 2014: 52 (Ogasawara Islands, Japan, in part).

Material examined. 1 specimen, SIO 61-593 (previously GVF 60-526), 36 mm SL, Naga Station 27: Biological Station 59-8, about 900 km east of Wake Atoll, central North Pacific, 21°07.00'N, 175°07.25'E, 100–200 m wire out, 2 m stramin net, 11 July 1959, R/V *Stranger*.

Diagnosis. A species of *Platyberyx* distinguished from almost all other congeners (*P. andriashevi*, *P. mauii* Kukuev, Parin, and Trunov, 2012, *P. opalescens* Zugmayer, 1911, and *P. paucus*) by the following combination of meristic characters: 30–31 dorsal-fin rays, 18–19 anal-fin rays, and 33–34 vertebrae. It is distinguished from *P. pietschi* by mouth size (upper jaw extending to posterior margin of orbit in *P. rhyton* and only to midorbit in *P. pietschi*), and by caudal fin

morphology (caudal spur absent and ventral procurrent rays cylindrical in *P. rhyton* vs. caudal spur present and ventral procurrent rays flattened in *P. pietschi*).

Description. Dorsal-fin rays 31; anal-fin rays 19; pectoral-fin rays 18; gill rakers 6–7+14–15, total 21; lateral line scales approximately 20, vertebrae 16+18; vomerine teeth 10; palatine teeth 15. Head rounded; snout very short; eye moderately large, slightly less than half head length; mouth slightly oblique; upper jaw long, extending to posterior margin of orbit. Oral jaw teeth sharp, conical, curved slightly inward, moderate in size; vomerine and palatine teeth similar to jaw teeth in size and shape; palatine teeth in single transverse row. Pharyngeal papillae small, nodular, in single row. Gill rakers elongate, narrow, bladelike, with one or two bristles at tip.

Body deep and compressed. Dorsal-fin origin just anterior to pelvic-fin origin and just posterior to orbit; anal-fin origin in line with 14th dorsal-fin ray; pectoral fin slightly shorter than head, extending to 21st dorsal-fin ray; pelvic fins long, origin behind opercle extending to posterior half of anal fin; caudal peduncle short, its length slightly shorter than its depth; caudal fin badly damaged, with ventralmost primary and all ventral procurrent rays missing. Scales absent, except for lateral line, which consists of approximately 20 large, conspicuous, pore-bearing scales.

Color in life: unknown.

Color in alcohol: tan with five dark brown bars, anterior-most on head through posterior margin of orbit, three on body, and posteriormost on caudal peduncle; fins apparently without pigment, except dorsal fin, which has some sparse light brown pigmentation anteriorly.

Remarks. SIO 61-593 is considerably smaller than all previously identified *Platyberyx rhyton* specimens (36 mm SL vs. 88–164 mm SL) and exhibits a transitional juvenile morphology similar to other caristiids (Moser 1996; Angulo *et al.* 2014). This specimen shows a different morphology than adult *P. rhyton* with a deeper body (57% SL vs. 45–52% SL); a longer head length (43% SL vs. 30–34% SL) and upper jaw length (61% HL vs. 56–59% HL); longer predorsal, prepectoral and preanal lengths; a longer pectoral-fin base (11% SL vs. 7–8% SL) and a slightly shorter dorsal-fin base (71% SL vs. 76–79% SL). However, it has no meristic differences from the larger specimens (Table 1) and is within the diagnostic ranges for the species. This specimen further matches *P. rhyton* in that palatine teeth are present (vs. absent in *P. paucus*), mouth is large, extending near posterior margin of orbit (vs. extending to mid-orbit in *P. pietschi* and *P. opalescens*; Fig. 1) and gill rakers are narrow and blade-like, with one or two small bristles near the tips (vs. stout and rounded in *P. mauii*; small bristles in *P. opalescens*; or small bristles and large spikes in *P. pietschi*). Because the lower portion of the caudal fin is damaged, the presence of the ventral caudal spur and the condition of the ventral procurrent caudal rays cannot be determined. Unlike the adult *P. rhyton* specimens that are uniformly dark, SIO 61-593 has five dark transverse bars along the body; the first behind the orbit, second at the origin of the dorsal fin, two on the body and the last on the anterior two-thirds of the caudal peduncle (Fig. 1). Similar



Fig. 1. *Platyberyx rhyton*, SIO 61-593, 36 mm SL, Naga Station 27, ca. 900 km east of Wake Atoll, central North Pacific.

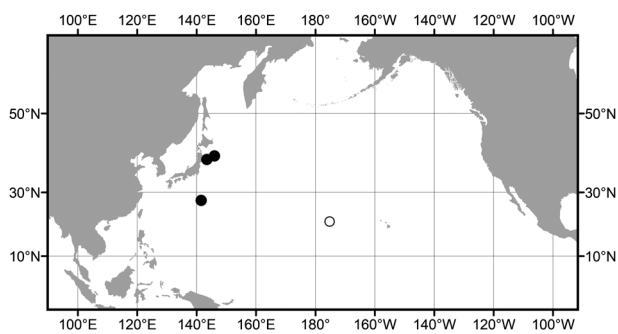


Fig. 2. Distributional records of *Platyberyx rhyton* [open circle=present study; closed circles=previous known specimens: Stevenson and Kenaley (2013), Okamoto *et al.* (2014), Okamoto and Stevenson (2015)].

barring is noted in juvenile and smaller *Caristius*, *Paracaristius* and *Platyberyx* (Okamoto *et al.* 2010; Angulo *et al.* 2014; Mincarone *et al.* 2019).

The previously reported specimens of *P. rhyton* were collected in the western North Pacific off northeastern Japan and around 1400 km south off the Ogasawara Islands (Fig. 2; Okamoto and Stevenson 2015). This specimen, SIO 61-593, extends the known range of *P. rhyton* some 3400 km east into the northern Central Pacific and some 600 km south (Fig. 2). Given the broad distributions of congeners, it is reasonable that *P. rhyton* is wide-ranging as well. Although no depth record is provided for the collection event, Naga Station 27/Biological Station 59-8, Faughn (1974) notes that 2 m stramin nets were towed with 100–200 m of wire out. Therefore, this specimen was likely collected in the upper 100 m or so of the water column.

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