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Parioglossus galzini, a new species of ptereleotrid dartfish from Rapa Island (Teleostei: Gobioidei: Ptereleotridae)

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Abstract

A new species of dart fish, *Parioglossus galzini* sp. nov., is described based on specimens collected in Haurei Bay, Rapa Island (French Polynesia). It is distinguished from all other described species of *Parioglossus* as follows: dark lateral body stripe absent, 100 or more scales in longitudinal series from above pectoral-fin base to base of caudal fin, pectoral-fin rays 19–21, membrane of first dorsal fin attached to second dorsal fin in males and females, mature males with dorsal-fin spines 3–5 filamentous and about equal in length, fresh males with narrow yellow stripe running dorsolaterally along body from head to caudal fin.

Key words: Gobioidei, Ptereleotridae, *Parioglossus galzini*, Rapa Island, French Polynesia

Introduction

The first expedition of a comprehensive survey of the marine biodiversity of the fauna and flora of French Polynesia was conducted at Rapa Island (Fig. 1), Austral Archipelago, in 2002, by an International group of scientists working with the French Polynesian Government. The scientific team included scientists from Fiji, France, Italy, and the United States. The goal of the initial survey, which began in late October and ended in early December 2002, was to study the biodiversity of algae, corals, fishes and mollusks.

Prior to 1971, there were a few scattered reports of fish species from Rapa: *Anguilla obscura* by Schmidt (1925), *Epinephelus merra* by Schultz (1945), *Phaethonichthys tuberculatus* by Nichols (1923), and, in 1970, a limited collection made by C.L. Smith included 85 species that were listed in Randall (1978). In 1971, Randall spent about a month collecting fishes at Rapa and published the first list (Randall, 1978), which included 220 species. Randall, Smith and Feinberg (1990) subsequently published a combined list

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including 274 fish species. Mooi (1998) described *Pempheris rapa*, which had been referred to by Randall *et al*. (1990) as *Pempheris* sp., as a marine endemic from Rapa. Among the freshwater crustaceans and fishes occurring at Rapa, Keith *et al*. (2002) list two endemic freshwater gobies, *Sicyopterus rapa* Parenti and Maciolek, and *Stiphodon julieni* Keith, Watson and Marquet.

FIGURE 1. Rapa Island, Austral Archipelago. Photo by J.T. Williams.

During the 2002 Rapa expedition, fish surveys sampled specimens from the bays and rocky shores out to the outer slope and deep shelf around the island to a depth of 78 m. Specimens were recorded visually and/or collected at 66 collecting stations using rotenone, hook and line, and spear fishing. Combining these fish records with the earlier list of Randall *et al*. (1990) brings the number of marine and estuarine species known from Rapa to over 369 species (Galzin *et al*., in preparation). At least 10 undescribed species are represented among the specimens collected during the 2002 expedition, including a new species described herein belonging to the ptereleotrid (family name based on Thacker, 2003) genus *Parioglossus.*

In their review of the Indo-West Pacific genus *Parioglossus*, Rennis & Hoese (1985) recognized 13 valid species, including six species they described as new: *P. aporos* Rennis and Hoese, *P. dotui* Tomiyama, *P. formosus* (Smith), *P. lineatus* Rennis and Hoese, *P. marginalis* Rennis and Hoese, *P. nudus* Rennis and Hoese, *P. palustris* (Herre), *P. philippinus* (Herre), *P. rainfordi* McCulloch, *P. raoi* (Herre), *P. taeniatus* Regan, *P. triquetrus* Rennis and Hoese, and *P. verticalis* Rennis and Hoese. Since this review, three additional new species have been named, *P. neocaledonicus* Dingerkus & Seret (1992), *P. interruptus* Suzuki & Senou (1994), and *P. sinensis* Zhong (1994). A fourth species referred to by Suzuki *et al.* (1994) as "*P.* sp." has been recorded from Iriomote Island, but has yet to be named. Thus there are currently 16 valid recognized species and one which has yet to be formally described. Five *Parioglossus* specimens collected at Rapa are not referable to any of the known species and represent a new species described herein.

Methods. Methods and counts follow Rennis and Hoese (1985). Body scales are very small, nonimbricate, and require high magnification and a good quality binocular stere-

omicroscope to obtain accurate counts. The word stripe is used in reference to horizontal lines, and bars or bands are used for vertical.

***Parioglossus galzini* new species (Figs. 2–5)**

HOLOTYPE: USNM 375190, male, 23.5 mm SL, French Polynesia, Rapa Island, near Isle Tapui in Haurei bay on shallow mud and rubble bottom with some sargassum (27º36.3' S, 144º20.65' W), 1–1.5 m, field number JTW 2002-53, collected with rotenone by J.T. Williams and R. Galzin, 22 November 2002.

PARATYPES: USNM 375191, female, 22.1 mm; male, 16.5 mm, collected with holotype. MNHN 2003-2680, 2 males, 24.7 mm and 20.7, collected with holotype.

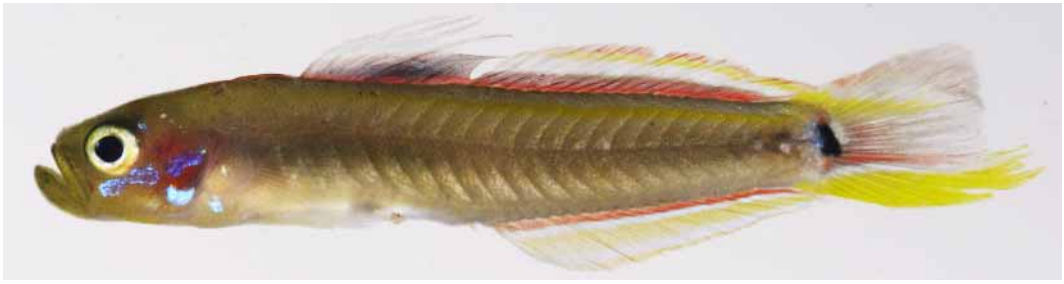

FIGURE 2. *Parioglossus galzini* sp. nov., holotype, USNM 375190, male, 23.5 mm SL. Colour of fresh material. Photo by J.T. Williams.

FIGURE 3. *Parioglossus galzini* sp. nov., paratype, USNM 375191, female, 22.1 mm SL. Colour of fresh material. Photo by J.T. Williams.

Diagnosis. A species of *Parioglossus* as diagnosed by Rennis & Hoese (1985) distinguished from all described species of *Parioglossus* by the following combination of characters: dark lateral body stripe absent, preopercular pores absent, 100 or more scales in longitudinal series from above pectoral-fin base to base of caudal fin, pectoral-fin rays 19–21, segmented caudal-fin rays 7+6, scales nonimbricate, black caudal spot usually sub-triangular (one specimen with spot roughly rectangular), membrane of first dorsal fin attached to second dorsal fin in males and female, mature males with dorsal-fin spines 3–5 filamentous and about equal in length, fresh males with narrow yellow stripe running dorsolaterally along body from head to caudal fin.

Description [holotype values in brackets]**.** Dorsal fin VI + I, 17–18 (three with 17, two with 18) [VI + I, 18]; anal fin I, 17–18 (two with 17, three with 18) [I, 18]; pectoral fin

19–21 (two with 19, two with 20) [20 on left and 21 on right side]; pelvic fin I,4; dorsal + ventral procurrent rays 7–9 + 8–9 (two with 7+7, two with 8+7) [9+8], branched caudal rays 7+6; longitudinal scale count 100–112 (no count taken from the smallest specimen) [112]; vertebrae 10+16; branchiostegals 5. Head and body compressed; body elongate; preopercle naked; scales nonimbricate, scales present on pectoral-fin base, on belly, and from opercular margin to base of caudal fin; mouth terminal, highly protractile, inclined at angle of 70–80º to longitudinal axis of body; maxilla reaching posteriorly to a point below anterior edge of eye; snout short, blunt, less than eye diameter; teeth: outer rows of caniniform teeth and 1–2 inner rows of small, slender caniniform teeth; anterior and posterior nostrils a simple pore; 5 head pores present including: posterior nasal pore, anterior interorbital pore, posterior interorbital pore, supraocular pore, infraorbital pore; preopercular pores absent; gill rakers on first arch 3 or 4 + 12 or 13 = 15 or 17, rakers compressed, elongate; all rakers ossified; rakers on second, third and fourth arches tuberculate with dorsal spiny projections; gill opening moderate, lower attachment of branchiostegal membrane below middle of opercle; in female specimen, left ovary reduced in size, right ovary well developed with very tiny developing ova; genital papilla bulbous and rounded in both sexes but smaller in size for males; dorsal fins of males and female with membrane of first dorsal fin attached to spine of second dorsal fin about one-fifth of spine length above its base, mature males with dorsal spines 2–6 elongate with spines 3, 4 and 5 approximately equal in length, spines 3–6 reaching posteriorly to beyond second dorsal origin when pressed parallel to dorsal contour of body; female without elongate dorsal-fin spines, spine 1 shorter than spine 2, spines 2–5 about equal, spine 6 shorter than spine 5, no spine tips reaching posteriorly to beyond second dorsal origin when pressed parallel to dorsal contour of body; posterior rays of second dorsal fin decreasing in length in female; males with all second dorsal rays approximately equal in length, last ray of second dorsal and anal fins slightly elongate, reaching to base of caudal fin or beyond; pectoral-fin margin oblong, fin length less than head length; innermost segmented pelvic ray unbranched, others branched, pelvic rays 3 and 4 filamentous in males but not reaching to anus, no rays prolonged in female, no dark ring around anus in either sex; female with caudal fin truncate, males with caudal fin truncate along rays 3–11, with rays 12–15 about one-third longer than rays 3–11, forming a ventral lobe; black sub-triangular to roughly rectangular spot on base of caudal rays 5–13; nuchal crest a low fold on males, barely evident on female, extending in both sexes forward to above operculum.

Colour of fresh material. Males (Fig. 2): body brown becoming tan on ventral third of body, belly white; nuchal ridge red; head yellowish to beneath middle of nuchal ridge where the yellow coloration tapers into narrow yellow stripe that extends along side of body just ventral to bases of dorsal fins and merges with yellow stripe on caudal fin above black spot; small white spot on caudal peduncle just below midline of body; head with small iridescent blue spot behind posterodorsal edge of eye, iridescent blue stripe from behind angle of mouth to beneath eye and onto opercle with narrow break over preopercle, opercle reddish, subopercle with pupil-sized iridescent blue spot; dorsal half of iris rimmed by black semicircle, remainder of iris mottled with yellow and white around pupil;

pectoral and pelvic fins translucent; tiny iridescent blue spot on centre of pectoral-fin base, slightly larger iridescent blue spot on chest immediately ventral to pectoral base; anal fin with red basal stripe, broad yellow stripe on middle part bordered on each side by narrow translucent stripe, distal margin with narrow yellow stripe; spinous and segmented dorsal fins with narrow red stripe distally, first dorsal with basal red stripe bordered above by broad dusky stripe forming black splotch over area from about spine five to just posterior to spine six, dusky stripe bordered dorsally by narrow translucent stripe from spines one to five, filamentous part of spines one to five with reddish tint; second dorsal basally with thin yellow stripe bordered above by red stripe, red stripe bordered dorsally by reddish-brown stripe, distal half of fin with three stripes, translucent stripe, yellow stripe, then red marginal stripe; black sub-triangular (varying to roughly rectangular) spot adjacent to base of segmented caudal rays 5–13, almost encircled by white ring with several red melanophores breaking the ring dorsally and ventrally, anterior portion of ring iridescent blue; caudal fin with sequential stripes as follows: broad reddish stripe covering dorsal lobe, translucent stripe, yellow stripe continuing from soft dorsal to near tip of central caudal rays, broad irregular reddish stripe extending posteriorly from black spot, narrow translucent stripe, broad yellow stripe covering remaining ventral third of caudal fin.

Female (Fig. 3): body translucent with brownish tint, white area extending from underside of head to anus, including silvery white lining of abdominal cavity, belly ventral to white area faintly pinkish posterior to pelvic base becoming yellowish near anus; narrow black stripe along dorsal profile from snout to base of first procurrent rays; vertebral column outlined with black pigment evident through translucent musculature; top of head yellowish from lips to behind eye, black melanophores as described for color in alcohol, broad dark band on nape reaching ventrally to middle of opercle; opercle reddish; iris of eye with black outer ring with remainder of iris mottled with gold, white and brown; pectoral and pelvic fins translucent; anal fin translucent with broad yellow stripe along distal margin; first dorsal fin dusky basally with scattered basal yellow and red splotches, distal half yellow with narrow red margin; second dorsal similar to males except basal stripe is yellow at base followed by translucent stripe replacing dusky stripe of male; dorsal procurrent rays yellow with red tips, ventral procurrent rays yellow; roughly rectangular black spot over bases of segmented caudal rays 6–12, almost encircled by translucent ring with several yellow and red melanophores breaking the ring dorsally and ventrally; basal half of caudal fin with yellow crescent extending from dorsal procurrent rays around caudal-fin base and through ventral procurrent rays; most ventral segmented rays with red tips.

Colour in alcohol. Males (Fig. 4): head and body tan with melanophores concentrated along dorsal profile from snout to caudal fin; posterior margin of scales outlined with black, especially on upper body; head dusky with fine melanophores forming broad streak from mouth to beneath eye and onto upper half of operculum, lips and chin darkly pigmented; pectoral fins translucent with melanophores outlining ray shafts; fine melanophores cover pectoral-fin base except absent from narrow oblong area at postero-ventral margin; several tiny black spots on or just beneath skin adjacent to bases of anal-fin rays; basal quarter of membrane of anal fin dark, distal three-fourths translucent; spinous dorsal

fin dusky basally and distally with translucent stripe from middle of first spine to tip of fifth spine; membrane darker basally between dorsal spines 4 to end; basal half of membrane of second dorsal dark, distal half translucent with melanophores scattered along ray tips; black sub-triangular (varying to roughly rectangular) spot adjacent to base of segmented caudal rays 5–13, posterior most point on ray 12, followed posteriorly by pale oblong spot over caudal rays 6–11; caudal fin with melanophore pattern extending posteriorly from body in narrow stripes dorsally and ventrally around combined dark and pale caudal spots, merging at posterior border of pale spot and continuing as dusky stripe to tips of rays 5–13, below dusky stripe ventral lobe of caudal fin translucent, dusky stripe bordered dorsally by narrow translucent stripe, followed by dusky area covering remainder of dorsal lobe of fin.

FIGURE 4. *Parioglossus galzini* sp. nov., holotype, USNM 375190, male, 23.5 mm SL. Colour in preservative. Photo by S.J. Raredon.

FIGURE 5. *Parioglossus galzini* sp. nov., paratype, USNM 375191, female, 22.1 mm SL. Colour in preservative. Photo by S.J. Raredon.

Female (Fig. 5) with similar pigmentation except for the following: concentrated melanophores forming broad dark stripe along dorsal profile from snout to procurrent caudal-fin rays; body paler; pectoral-fin base with individual melanophores more prominent and pale oblong area broader; pectoral fins translucent with few melanophores outlining ray shafts; roughly rectangular black spot over bases of segmented caudal rays 6–12, almost encircled by translucent ring with several melanophores breaking the ring dorsally and ventrally; one small subdermal black spot on caudal peduncle just anterior to pale ring; caudal fin posterior to pale ring with membranes translucent and melanophores outlining ray shafts 1–15, distal one-fourth of dorsal and ventral lobes with sprinkling of tiny melanophores.

Distribution. The only known specimens were collected from mud and rubble substrates with some scattered sargassum in shallow water (< 1.5 m) near the head of Haurei Bay (Fig. 6), Rapa Island (French Polynesia).

FIGURE 6. Haurei Bay, Rapa Island, Austral Archipelago; the type locality of *Parioglossus galzini*. Photo by A. Nyeurt.

Comments. *Parioglossus galzini* differs from *P. aporos, P. dotui, P. formosus, P. lineatus, P. marginalis, P. raoi, P. taeniatus, P. verticalis, P. interruptus, P. sinensis* and *P. neocaledonicus* in lacking a dark lateral stripe in males. The *P.* sp. of Suzuki *et al*. (1994) from Iriomote Island, Japan, also has a dark lateral stripe along each side of the body of males. Five *Parioglossus* species lack a dark lateral stripe in males (*P. nudus, P. palustris, P. philippinus, P. rainfordi*, and *P. triquetrus*). *Parioglossus triquetrus* and *P. galzini* may be distinguished from these by having a moderate gill opening (open to isthmus), versus narrow (open to side of head near pectoral-fin base).

The Rapan *Parioglossus galzini* and the Fijian *P. triquetrus* appear to be sibling species. They are similar in appearance in preservative, but differ in several meristic and morphological characters. Both species key out to *P. triquetrus* in the identification keys published by Rennis & Hoese (1985) and Suzuki & Senou (1994). *Parioglossus galzini* is easily distinguished from *P. triquetrus* by having nonimbricate scales (vs. imbricate), longitudinal scale count of 100–112 (vs. 83–95), the two dorsal fins connected by fin membrane (vs. not connected by membrane), mature males with dorsal spines 3–5 elongate and about equal in length (vs. spine 4 longer than spines 3 and 5), and pelvic rays reaching about halfway to anus in both sexes (vs. often reaching to anus in males). Although there is overlap in some meristic characters, *P. galzini* and *P. triquetrus* show modal differences in the counts of pectoral-fin rays (mode of 20 vs. 18) and of anal-fin rays (18 vs. 17). In addition, two of the five specimens of *P. galzini* have 18 segmented dorsal-fin rays, but no *P. triquetrus* have been reported with more than 17. Although *P. galzini* and *P. triquetrus* are superficially similar, they clearly represent two distinct species.

Etymology. This species is named in honour of Professor René Galzin, Director of Laboratory of Ichtyoécologie Tropicale et Méditerrannéenne of Perpignan (France) and Centre de Recherches Insulaires et Observatoire de l'Environnement, Moorea, who assisted JTW in the collection of all of the known specimens of this species.

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