

***Petroscirtes pylei*, a new saber-toothed blenny from the Fiji Islands (Teleostei: Blenniidae)**

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Abstract

Petroscirtes pylei is described from three specimens, 20.3–40.9 mm SL, obtained from a deep-water reef off Suva, Viti Levu, Fiji Islands. It is distinguished from all other congeners by its color pattern, including the presence of two dark body stripes, the lower one broadly extending onto the anal fin, and the dorsal fin with a broad, dark basal stripe, superimposed by a conspicuous white spot centered on the 4th spine. Among *Petroscirtes*, only the new species and *P. springeri* typically have 12 dorsal-fin spines but they are not closely related. The holotype was collected in 104–110 m, the second deepest depth record for a species of *Petroscirtes*. Discovery of this new species, and an apparently second new deep-water *Petroscirtes* (uncollected), at a different Fijian reef indicates that our knowledge of the biodiversity of this habitat and of the saber-toothed blennies is very incomplete.

Key words: Blenniidae, taxonomy, new species, deep-reef, Indo-west Pacific, Fiji Islands

Introduction

Coral reefs are among the most complex and species-rich habitats on earth. The advent of scuba technology opened up wide new avenues for study of fishes associated with this ecosystem (Ehrlich, 1975; Sale, 1991). Despite this interest, the deep reef has received relatively little attention because conventional scuba severely limits the depth and duration of reef exploration, and submersibles and remotely operated vehicles (ROVs) are very expensive to operate, require extensive logistical support, and have comparatively limited ability to collect specimens. Thus, the aptly named “twilight zone” spanning depths from 60–150 m, and at the lower limits of photosynthetically useful sunlight penetration, is very poorly known scientifically (Pyle, 1996a, 1996b). Fortunately, reliable mixed-gas, closed-circuit rebreathers (CCR) are now available that allow long duration dives at these depths with the added advantage of no release of expelled bubbles (Pyle, 1999, 2000).

Limited collections of deep-reef fishes using CCR during the past decade have resulted in the discovery of many new species (Pyle, 2000). One of these is a saber-toothed blenny of the genus *Petroscirtes* Rüppell, described herein, which was collected from a maximum depth of 104–110 m. This is the second deepest confirmed depth record for a saber-tooth blenny. Most of the 10 currently recognized species of *Petroscirtes* (Smith-Vaniz, 1976) typically occur in relatively shallow depths, usually less than 5 m. The only specimen of *P. marginatus* Smith-Vaniz with reliable collection data, however, was trawled in 180–300 m off Sumbawa, Indonesia (Smith-Vaniz, 1987), and Bath and Miroz (1997) reported the collection of one unusually large specimen of *P. ancylodon* Rüppell from the Gulf of Eilat in 67 m that buried vertically into the sand when approached by a diver. The semi-pelagic nemophinine blenny *Xiphasia setifer* (Swainson) has been trawled in 50–54 m and the holotype of its only congener, *X. matsubarai* Okada and Suzuki, was said to have come from 178 m but the method of capture was not specified and, if trawled, the specimen may have been captured nearer the surface. At least three species of the subfamily Blenniinae also occur in depths exceeding 100 m (Bath and Miroz, 1997), including *Blennius normani* Poll which has been trawled in 366–439 m (Helden and Wirtz, 1995).

In early December 2004, while on the Fiji based dive boat *Nai'a*, Richard Pyle used a CCR and a digital video camera to document what appears to be a second undescribed species of *Petroscirtes*. He videotaped, but was unable to collect, a single adult along a deep drop-off on an isolated reef NE of Viti Levu Island, in 82–83 m. It was distinguished by its almost uniformly bright orange body coloration and pale dorsal fin. Unfortunately, problems associated with obtaining a scientific collecting permit prevented the collection of this or other fishes. Based on extrapolations of the ratio of new species of Indo-Pacific fishes recently collected or videotaped at several deep-reef sites compared to the shallow reef ichthyofauna in the same general areas, Pyle (2000) suggested that a complete inventory of all deep-reef habitats for the whole Indo-Pacific region might increase the total number of known reef and shore fishes by as much as 45%. This may be an overestimation because the reduced light penetration of deep reefs makes them poor habitat for a large group of herbivorous fishes and the invertebrate prey of others, but there is little doubt that we have only just begun to explore the twilight zone and many new species still await discovery. Only two species of *Petroscirtes* were previously known from Fiji, *P. mitratus* Rüppell and *P. xestus* Jordan and Seale, both are broadly distributed throughout most of Oceania.

Methods

Methods, terminology and abbreviations are those of Smith-Vaniz (1976) unless otherwise noted.

Petroscirtes (Dasson) pylei, new species Twilight Fangblenny (Figures 1–3)

Holotype: BPBM 40080, male 40.9 mm SL, Fiji Islands, Viti Levu Island, Suva; outside of Suva Harbor, S end of "Fish Patch" below cave; sand and rubble slope with scattered outcroppings, below base of vertical reef drop-off; 104–110 m; rotenone and hand-nets; Richard L. Pyle, John L. Earle, and Joseph Dituri; 4 Feb 2002.

Paratypes: USNM 382411, juvenile (28.8), outside of Suva Harbor "Fish Patch"; vertical reef drop-off with vertical grooves and small holes and caves; 67–75 m; rotenone; Richard L. Pyle and Joseph Dituri; 29 Jan 2002. BPBM 39846, juvenile (20.3), outside of Suva Harbor beyond "Fish Patch"; directly off bow of old shipwreck on top of reef; vertical reef drop-off with a large diagonal crack and over-hang, with some sea fans; 67–70 m; rotenone; John L. Earle and David F. Pence; 31 Jan 2002.

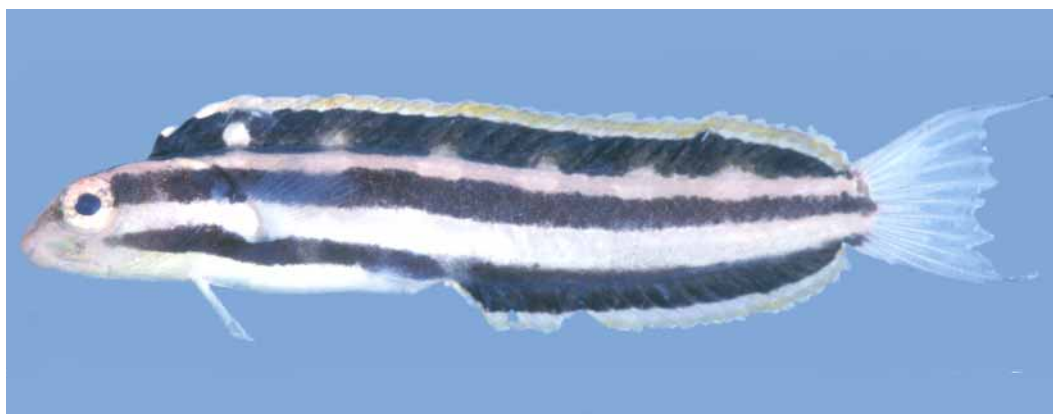


FIGURE 1. *Petroscirtes pylei*, holotype, BPBM 40080, male 40.9 mm SL, Fiji Islands, Viti Levu Island, Suva. Photograph by R. L. Pyle.



FIGURE 2. *Petroscirtes pylei*, paratype, USNM 382411, juvenile 28.8 mm SL, Fiji Islands, Viti Levu Island, Suva. Photograph by R. L. Pyle.

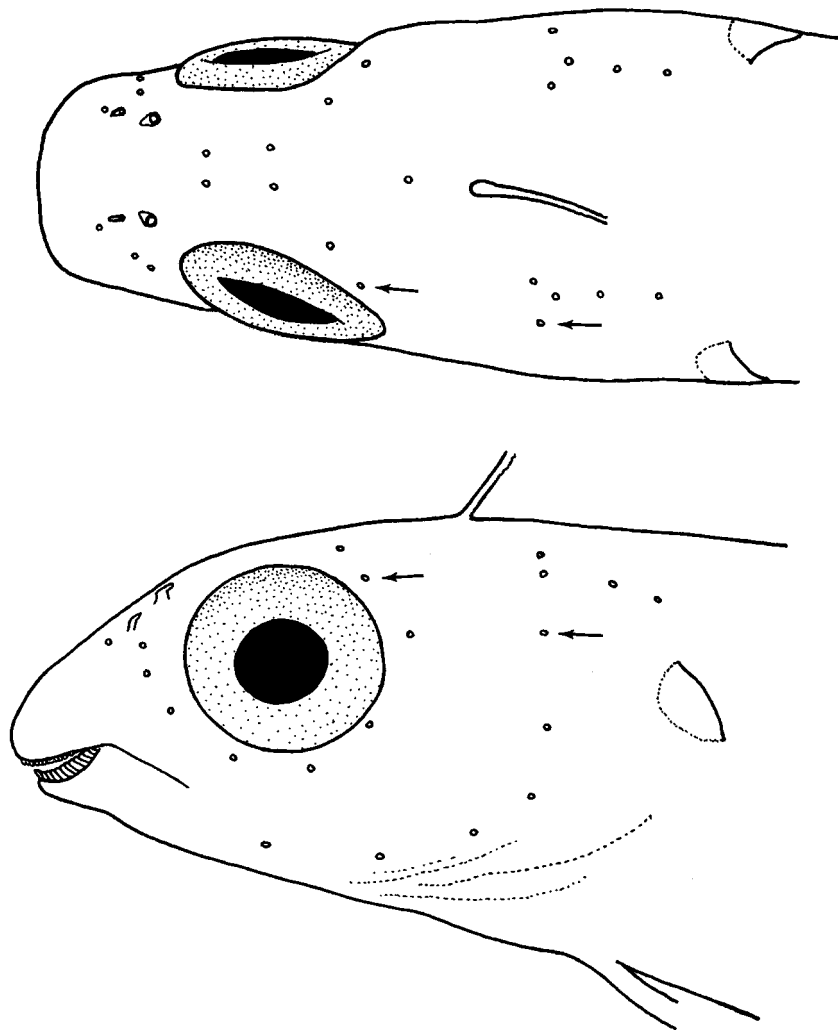


FIGURE 3. Cephalic sensory pores of holotype of *Petrosirtes pylei* (reversed right side view). Small arrows identify ventramost supraorbital and dorsalmost preopercular pores in both lateral and dorsal views.

Diagnosis. A species of *Petrosirtes*, subgenus *Dasson*, with the following combination of characters: Head and body with two dark lateral stripes, the lower stripe broadly extending onto the anal fin; dorsal fin with basal 4/5 to 2/3 of fin very dark and superimposed by 5 or 6 approximately equally spaced pale spots, first spot conspicuous, discrete, and round, the others diffuse and partially extending onto the dorsum; dorsal fin XII, 20.

Description. (Characters of the larger followed by the smaller paratype are given in parentheses if different from those of the holotype). Dorsal-fin rays XII, 20; anal-fin rays II, 20; pectoral-fin rays 14/14; caudal-fin rays: procurrent rays 3+2 (3+3, 3+3); segmented

rays 6+5. Vertebrae (precaudal + caudal):12+24 (13+24, 12+24). Pleural ribs on vertebrae 3 through 12 (3-13, 3-12). Dentition: lower jaw with one pair of large posterior canines and 28 (26, 22) incisors; upper jaw without canines (except one on right side of smaller paratype) and 26 (24, 22) incisors.

Symphyseal and adjacent mandibular pore positions each with minute, simple cirrus (holotype only); other cephalic pores and eye without cirri. Posterior and anterior nostrils each open at the end of a short tube with a small, tapered flap on anterior rim. Cephalic pores (Fig. 3): infraorbital 7; posttemporal (lateral temporal) 3; lateral supratemporal 1 (each side); median supratemporal 1. Lateral line of holotype (only) terminates slightly behind a vertical between dorsal-fin spines 11 and 12. First dorsal-fin spine not elongate, shorter than second and fourth spine, and without a slight fleshy flap distally. Outer lobes of caudal fin elongate in adult males.

Proportional measurements (as percent SL) are given only for the male holotype because measurements of the two small juveniles would have no practical identification value. Depth at anal-fin origin 14.6; preanal length 51.8; head length 25.0; orbit diameter 7.4; first dorsal spine length 6.4; second 8.6; third 10.3; fourth 10.5; first dorsal ray length 10.6; pelvic fin length 25.0+ (ray tips broken off); longest (upper) caudal ray length 27.6; shortest middle caudal ray 18.1.

Preserved color pattern (in alcohol). Holotype with two dark lateral stripes on head and body. Pale interspace between stripes approximately same depth as that of upper stripe on about anterior third of body, but becoming noticeably deeper posteriorly. Background color on sides of head and body very pale compared to dark lateral stripes, but darker above upper stripe compared to mostly white sides and belly. For most of its length, upper dark stripe slightly deeper than half eye diameter; stripe completely envelops gill opening and extends onto bases of three dorsalmost pectoral rays, gradually tapering as it nears its termination on central base of caudal fin. Stripe well developed in postorbital region, with its ventral margin slightly below middle of pupil, but is distinctly narrower and much paler on snout. Another dark stripe (scarcely visible in lateral view) also present along dorsum. Its width equals that of the interorbital, where it begins, and for most of the length of spinous dorsal fin, but it narrows considerably as it continues along dorsal-fin base and onto caudal peduncle, terminating on bases of several upper caudal rays. Anteriorly, stripe is broken into several blotches; lengths of blotches determined by pale dorsal-fin spots that extend slightly onto dorsum. Lighter dark band on upper part of caudal-fin base connects dark dorsum of caudal peduncle with upper dark lateral stripe. Lower dark stripe noticeably tapered at its origin slightly below bony orbit and just behind vertical from posterior margin of pupil. It curves downward in front of pectoral-fin base (on left side it slightly brushes margin of fin; on right side it extends onto bases of lower three rays). Stripe is slightly deeper than pupil diameter for most of its length anterior to anal-fin origin, at which point it tapers noticeably as it runs along base of fin, becoming very narrow posteriorly and extending onto bases of several ventralmost caudal rays.

Dorsal fin mostly dark, with distal 1/5 to 1/3 of fin pale, including dusky submarginal stripe that is slightly wider than its anal fin counterpart. Most striking feature of dorsal fin is round, brilliant white spot, slightly larger than pupil and centered on 4th spine, with its ventral margin somewhat diffuse and slightly above base of fin. Dorsal fin also has row of five pale spots that are much more diffuse and irregular; only first of these spots is completely on fin, with others at least half extending onto dorsum. Spots are approximately equally spaced and centered on dorsal-fin spines or rays as follows: 2nd spot (8th spine), 3rd spot (1st ray), 4th spot (6th ray), 5th spot (11th ray), and 6th spot (16th ray). Basal 2/3 of anal fin has broad dark stripe that is continuous with lower body stripe; remainder of fin is white except for narrow dusky submarginal stripe. Pelvic fin uniformly white; pectoral fin mostly transparent, with rays narrowly outlined with dark melanophores. Except for extensions of dark body stripes onto base of fin, caudal fin is mostly white with outer margins of elongated upper and lower rays slightly dusky.

Color pattern of the paratypes generally agrees with that of the holotype except as follows. Only anterior pale spot in spinous dorsal fin apparent on smaller paratype. Dark body and fin stripes of larger paratype in the same positions as those of other two specimens, but they are much fainter and not as well defined, and there are seven rather than six pale dorsal-fin spots, all of which are faint and poorly defined.

Fresh coloration (based on photographs of freshly dead specimens). Holotype and smaller paratype have lateral head and body stripes and stripe on dorsum dark brown. Broad basal stripe on dorsal and anal fins dark brown, above which both fins are white except for a narrow light orange-brown submarginal stripe. Pale spots on dorsal fin of holotype white, anterior one more solid and conspicuous. Other fins mostly white or transparent. Below upper dark stripe, pale areas of head and body are various shades of white, pale areas above stripe have rosy hue. Iris of holotype and larger paratype light pink except where upper head stripe crosses eye as faint light brown stripe. Pale areas of head and body of larger paratype range from dull white on belly to light orange above, dark stripes on body and fins light brown.

Comparisons. *Petroscirtes springeri* Smith-Vaniz is the only other species of *Petroscirtes* that typically has 12 dorsal-fin spines (Yatsu et al., 1983). Unlike the new species, *P. springeri* has symphyseal mandibular cirri typically bifurcate or multifid (versus simple), cirri 3-6 (each side) associated with preopercular pores (vs. absent), and a single body stripe (vs. two stripes). Within the subgenus *Dasson*, this combination of characters is shared only with *P. xestus* Jordan and Seal. Only three previously described species of *Petroscirtes* have two or more dark stripes on the body but the color pattern of the dorsal and anal fins of *Petroscirtes pylei* is very different from all of them. The lowermost dark stripe does not extend onto the anal fin in the other species, nor do they have a conspicuous white spot centered on the fourth dorsal-fin spine in adults. In *Petroscirtes fallax* Smith-Vaniz the dorsal fin is immaculate except for a black spot, which is usually restricted to the distal margin of the interradial membranes of the first 3 or 4

spines. The dorsal fin of *P. marginatus* has a narrow dusky area proximally, a wider pale stripe above, and the distal half to two-thirds of the fin is very dark; in both species the ventral body stripe does not extend onto the base of the uniformly pale anal fin. In *P. breviceps* (Valenciennes) a dark stripe follows the dorsal contour of the body and extends well onto the base of the dorsal fin for its entire length; distally the dorsal fin is spotted or heavily reticulated and the anal fin may be spotted, reticulated or almost uniformly dark.

Petroscirtes breviceps usually has a minute orbital cirrus (absent in the other double-striped species) and only in *P. marginatus* and *pylei* is the last posttemporal pore without a cirrus. Unlike the latter two species, the lower dark body stripe typically extends well onto the base of the pectoral fin in *P. fallax*. *Petroscirtes pylei* agrees with most species of *Petroscirtes* in (typically) having a single median supratemporal pore, but the two available specimens of *P. marginatus* are exceptional in having a pair of such pores.

Remarks. The 40.9 mm adult male holotype of *Petroscirtes pylei* qualifies as the smallest species of *Petroscirtes*. The second smallest species, *Petroscirtes marginatus* (known from on a single 49.1 mm male and the 39.2 mm female holotype) is also an inhabitant of the deep-reef twilight zone, possibly indicating that the small sizes of both species might be more than coincidental.

Distribution. Known only from the Fiji Islands, but may be discovered at other localities with more deep-reef exploration.

Etymology. Named in honor of Richard L. Pyle in appreciation of his pioneering efforts to shed more light on the ichthyofauna of the deep reef “Twilight Zone.”

Acknowledgements

I extend my appreciation to Richard Pyle who collected the holotype and larger paratype of the new species, generously allowed me to describe it, and encouraged that effort. I thank Arnold Y. Suzumoto (BPBM) for loan of the type specimens. Richard Pyle (BPBM) and Sandra Raredon (NMNH) provided color images and digital radiographs, respectively, of the new species. Jeffrey T. Williams (NMNH) critically reviewed the manuscript.

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