

Symphurus ocellaris, a new shallow-water symphurine tonguefish collected off Pacific Panama (Pleuronectiformes: Cynoglossidae)

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Abstract.—*Symphurus ocellaris* is described on the basis of a holotype (73.2 mm SL) and paratype (42.3 mm SL) collected in the environs of Coiba Island, Gulf of Chiriqui, Pacific Panama, at 24 m and 7.4 m, respectively. This species is distinguished from congeners by the combination of: a 1–3–4 pattern of interdigitation of dorsal-fin pterygiophores and neural spines (ID pattern), 12 caudal-fin rays, presence of an ocellated spot on the caudal fin in both sexes, 51 total vertebrae, 96–97 dorsal-fin rays, 80–81 anal-fin rays, 85–86 longitudinal scale rows, a pupillary operculum, unpigmented peritoneum, uniformly pigmented blind side, and ocular-side background coloration lacking prominent dark spots or conspicuous crossbands. *Symphurus ocellaris* is only the second known species in the genus characterized by a 1–3–4 ID pattern. Among eastern Pacific *Symphurus*, *S. callopterus* also has a 1–3–4 ID pattern and 12 caudal-fin rays, but lacks the ocellated caudal spot, has a different ocular-side pigmentation, and has higher, non-overlapping meristic features. The only other eastern Pacific tonguefish with an ocellated caudal-fin spot, *S. fasciolaris*, differs in having 10 caudal-fin rays, a 1–4–3 ID pattern, and ocular-side pigmentation featuring prominent spots and crossbands.

Recent collecting of fishes and invertebrates in the environs of Coiba Island, Panama, during April–June 2003 expeditions of the Smithsonian Tropical Research Institute's Research Vessel *Urraca* yielded two interesting specimens of *Symphurus* bearing a distinctive ocellated spot on the caudal fin. Ocular-side pigmentation patterns of these individuals were unlike those observed for any of the 17 species of *Symphurus* previously described from the eastern Pacific (Munroe et al. 1995) or for the 24 known western Atlantic species (Munroe 1998). Among previously described New World species of *Symphurus*, only *S. fasciolaris* Gilbert, 1892 (eastern Pacific) and *S. urospilus* Ginsburg, 1951 (western Atlantic) bear an ocellated spot on the caudal

fin. Beyond similarities in the spotted caudal fin, other features of coloration, counts and morphology of *S. fasciolaris* and *S. urospilus* are quite different from those of the two specimens collected near Coiba Island. Further study of morphological characters indicates that these two specimens belong to an undescribed species. Here we provide a formal description of the species and diagnose it from congeners.

Materials and Methods

Methods for counts and measurements and general terminology follow those of Munroe (1998). Formulae for interdigitation patterns of dorsal-fin pterygiophores and neural spines (ID pattern) indicate the

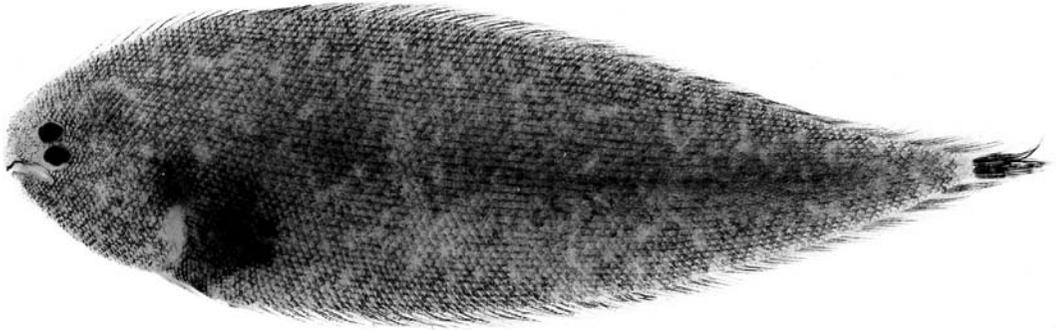


Fig. 1. *Symphurus ocellaris*, holotype, female, 73.2 mm SL, USNM 378272, Pacific Panama.

arrangement of dorsal-fin pterygiophores inserting into successive interneural spaces beginning with the first interneural space (e.g., a 1–3–4 ID pattern indicates one pterygiophore inserted into interneural space one, three pterygiophores in interneural space two, and four pterygiophores inserted into interneural space three; see Munroe (1992) for additional information on this important diagnostic character). Vertebral counts were made from radiographs and include the terminal centrum counted as one vertebra. All measurements refer to standard length unless noted otherwise. Measurements were taken to nearest 0.1 mm with dial calipers or ocular micrometer. Morphometric features are expressed either as measurements in thousandths of standard length (SL), or thousandths of head length (HL). Comparative material for other species of *Symphurus* was included in Munroe (1992, 1998). Specimens of the new species were deposited at the USNM, National Museum of Natural History, Smithsonian Institution, Washington, DC.

Symphurus ocellaris, new species

Ringtail tonguefish

Figs. 1–3

Holotype.—USNM 378272; 73.2 mm SL; female; Pacific Panama, several km off the mainland coast between the coast and Islas Secas, approx. 8°5′N, 81°50′W, June, 2003; collected with otter trawl on a sand bottom at 20 m; Panama-Isla de Coiba Ex-

pedition, Smithsonian Tropical Research Station Cruise, R/V *Urraca*; D. R. Robertson, J. van Tassell and J. Earle, collectors.

Paratype.—USNM 378273; 42.3 mm SL; male; Pacific Panama, Isla Coiba, West Ensenada Hermosa, 7°31.076′N, 81°52.175′W; 7.4 m; 14 May 2003; rotenone station on sand immediately abutting a rock face, Panama-Isla de Coiba Expedition, Smithsonian Tropical Research Station Cruise, R/V *Urraca*; D. R. Robertson, J. van Tassell and J. Earle, collectors.

Diagnosis.—*Symphurus ocellaris* is distinguished from congeners by the combination of: a 1–3–4 ID pattern; 12 caudal-fin rays; ocellated spot on the caudal fin; 96–97 dorsal-fin rays; 80–81 anal-fin rays; 51 total vertebrae; 4 hypurals; 85–86 longitudinal scale rows; no scales on either side of dorsal- and anal-fin rays; a pupillary operculum; an unpigmented peritoneum; and ocular-side pigmentation without prominent spots or crossbands.

Description.—[Features for holotype (Fig. 1) presented first, followed by those of paratype (Fig. 2) in parentheses]. A species attaining standard lengths at least to 73.2 mm. ID pattern 1–3–4 (1–3–4) (Fig. 3). Caudal-fin rays 12 (12). Dorsal-fin rays 96 (97). Anal-fin rays 80 (81). Pelvic-fin rays 4 (4). Total vertebrae 51 (51); abdominal vertebrae 9 in both specimens. Hypurals 4 (4). Longitudinal scale rows 85 (86). Scale rows on head posterior to lower orbit 18 (both specimens). Transverse scale rows 44 (43).

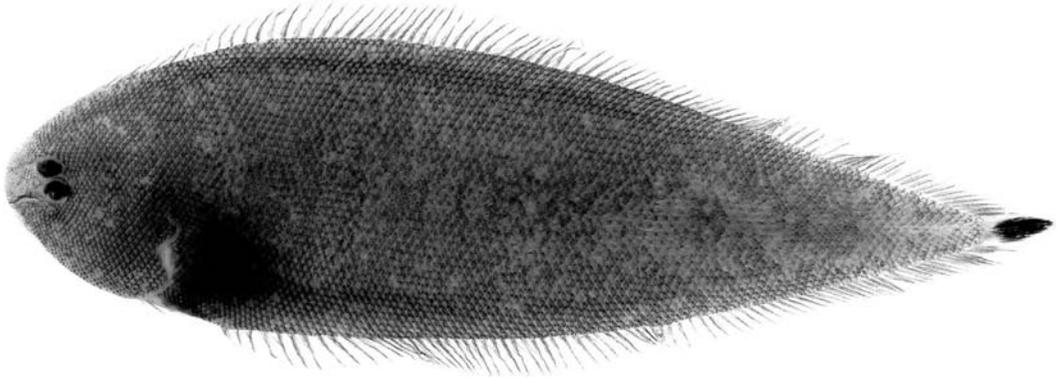


Fig. 2. *Symphurus ocellaris*, paratype, male, 42.3 mm SL, USNM 378273, Pacific Panama.

Morphometrics (expressed as thousandths of SL or HL) for holotype and paratype appear in Table 1. Body depth greatest in anterior one-third of body; body tapering gradually anteriorly and posteriorly. Preanal length slightly smaller than body depth. Head wide; head width (HW) greater than head length (HW/HL = 1.2 in holotype, 1.1 in paratype). Lower head lobe narrower than upper head lobe; width of lower head lobe less than postorbital length. Snout short and rounded, its length longer than eye diameter. Dermal papillae conspicuously present on blind-side snout of holotype; not nearly as well developed in paratype. Ocular-side anterior naris tubular, elongate; reaching anterior margin of lower eye when depressed posteriorly. Blind-side anterior naris slender, tubular, barely perceptible among dermal papillae. Ocular-side lower jaw with fleshy ridge on posterior third. Posterior margin of maxilla at vertical through midpoint of lower eye. Lower eye large; eyes subequal in position, anterior margin of lower eye at point between verticals through anterior margin of upper eye and anterior margin of pupil of upper eye. Eyes contiguous, or nearly so, for most of their lengths; without scales in narrow interorbital space, and with several rows of small ctenoid scales in interorbital space anteriorly. Pupillary operculum present, conspicuous. Dorsal-fin origin at vertical through anterior margin of upper eye. Both

sides of dorsal- and anal-fin rays without scales. Distal tips of dorsal- and anal-fin rays free from interradiation membranes. Caudal fin short, pointed, with middle fin rays longer than others; with several scales on both sides of basal region of fin.

Ocular-side dentary without teeth; ocular-side premaxilla with complete row of teeth in holotype, lacking teeth in paratype. Blind-side dentary in both specimens with 2–3 rows of well-developed teeth anteriorly expanding to several rows posteriorly; blind-side premaxilla with 2 rows of well-developed teeth curving slightly inwards.

Scales ctenoid on both sides of body.

Coloration in preservative.—Ocular side light to medium brown with numerous, small, irregular white markings (Figs. 1–2). Head and body scales with their distal halves darker than proximal halves, and with their posterior margins distinctly outlined with dark pigment. Outermost scales along dorsal and ventral contours of body more lightly pigmented than interior scales giving appearance of white band along proximal borders of dorsal and anal fins. Scales over body cavity on ocular side darker than those on other regions of head and body. Posterior surface of eyes of holotype spotted (spots not evident in smaller paratype); pupillary operculum brown; ocular-side anterior naris spotted; upper jaw of holotype with dark moustache anteriorly and with lighter spots posteriorly (paratype



Fig. 3. Digital radiograph of anterior region of holotype (USNM 378272) of *Symphurus ocellaris* depicting the 1–3–4 pattern of interdigitation of anterior, dorsal-fin proximal pterygiophores and neural spines characteristic of this species. (See Munroe, 1992 for detailed information on ID patterns among symphurine tonguefishes)

with dark spots on ocular-side upper jaw); lower jaw of holotype and paratype spotted (spots not as dark as those on upper jaw). Ocular-side outer opercle with same general pigmentation as that on body, except distinctly white posterior margin that strongly contrasts against more darkly pigmented head and body. Inner opercular linings on both sides unpigmented in holotype (paratype with small scattering of light pigment

spots on ocular-side inner opercular lining). Isthmus lightly pigmented on ocular side in holotype and paratype; paratype also with less dense concentration of melanophores on blind-side isthmus compared with that on ocular side. Blind side uniformly whitish-yellow in both specimens. Paratype also with interrupted, medial series of dark spots located deep within dermis of blind-side in posterior third of body.

Table 1.—Morphometrics for holotype (USNM 378272) and paratype (USNM 378273) of *Symphurus ocellaris* (SL in mm, characters 2–9 in thousandths of SL; 10–16 in thousandths of HL).

Character	Holotype	Paratype
1. Standard length	73.2	42.3
2. Body depth	305	305
3. Pre-anal length	223	251
4. Caudal-fin length	92	102
5. Head length	193	227
6. Head width	235	253
7. Upper head lobe	142	168
8. Lower head lobe	111	109
9. Postorbital length	120	140
10. Snout length	213	219
11. Upper jaw length	262	250
12. Eye diameter	149	146
13. Lower head lobe	574	479
14. Upper head lobe	738	740
15. Pre-dorsal length	220	219
16. Postorbital length	624	615

First two dorsal-fin rays of holotype white, otherwise dorsal- and anal-fin rays and inter-radial membranes streaked with dark pigment. Paratype with four anterior-most dorsal-fin rays white; remainder of fin with series of darkly-streaked fin rays (3–7 consecutive pigmented rays) alternating with lighter fin rays (3–4 in consecutive series); pigmented fin rays becoming progressively darker posteriorly. Streaked fin rays pigmented nearly to distal tips, which are white. Ocular side of pelvic fin of both specimens with first fin ray unpigmented and with remaining 3 fin rays streaked with an interrupted series of dark melanophores. Distal-most tips of pelvic-fin rays whitish. Blind side of pelvic fin uniformly whitish.

Caudal fin with distinct, black, ocellated spot on distal 3/4ths of fin. Caudal spot irregularly rounded (holotype) to rectangular (paratype); surrounded by white areas along base of fin, by single white fin ray in dorsal-most and ventral-most portions of caudal fin; and with distal-most tips of caudal-fin rays white.

Coloration of freshly collected fish.—Essentially the same as for preserved fish.

Remarks.—It is hypothesized that the 1–

3–4 ID pattern is the predominant ID pattern for *S. ocellaris* based on the fact that both specimens have this arrangement of dorsal-fin pterygiophores. Whether this pattern is the predominant one for this species will only be determined when additional specimens become available for study. The 1–3–4 ID pattern as a predominant pattern for dorsal-fin pterygiophores is unusual among the 73 species currently recognized in the genus (Munroe, 1992; Munroe, unpubl. data). Of these species, only *S. callopterus* Munroe & Mahadeva features this pterygiophore arrangement as its predominant ID pattern. Although specimens of other species characterized by different predominant ID patterns sometimes have this pterygiophore arrangement, this pattern occurs only infrequently in these species (Munroe, 1992). Because of the rarity of the 1–3–4 ID pattern among species of *Symphurus*, capture of two specimens within the same species featuring this pattern strongly suggests this as the predominant ID pattern for the species.

Both sexes have the prominent ocellated caudal spot. The holotype is an immature female with ovaries undergoing posterior elongation. No ova were evident in macroscopic examination of the ovary. The paratype is a male of undetermined sexual maturity.

Habitat and distribution.—The two specimens of *S. ocellaris* were taken in the environs of Coiba Island, Pacific Panama. Both were collected on sand bottoms, the paratype in a rotenone station at 7 m near-shore; the holotype at 20 m at a station located about 2 km offshore.

Etymology.—*ocellaris*, from the Latin meaning with eyes; in reference to the distinct ocellated spot on the caudal fin.

Comparisons.—No other species in the genus features the combination of meristic, morphometric and pigmentation characters observed in *S. ocellaris*. *Symphurus callopterus*, which also occurs in the eastern Pacific, is the only member of the genus characterized by a 1–3–4 ID pattern (Munroe

1992). ID pattern is the only similarity between these otherwise distinctive species. *Symphurus ocellaris* differs noticeably from *S. callopterus* in its general body shape, in possessing an ocellated spot on the caudal fin (lacking in *S. callopterus*), lacking crossbands on the body (vs. 9–11 crossbands present), and in its non-overlapping meristic features (96–97 vs. 105–114 dorsal-fin rays; 80–81 vs. 91–98 anal-fin rays; 51 vertebrae vs. 57–61 vertebrae; 85–86 vs. 104–113 longitudinal scale rows).

Both *S. fasciolaris*, from the eastern Pacific, and *S. urospilus* from the western North Atlantic also feature a prominent, ocellated caudal spot. However, *S. ocellaris* differs from both in having 12 caudal-fin rays (vs. 10 in *S. fasciolaris* and 11 in *S. urospilus*), the 1–3–4 ID pattern (vs. 1–4–3), and its ocular-side pigmentation (no prominent crossbands or spots in *S. ocellaris* vs. both spots and crossbands present in *S. fasciolaris* and crossbands usually present in *S. urospilus*). *Symphurus ocellaris* further differs from *S. urospilus* in its greater number of vertebrae, dorsal- and anal-fin rays (compare with 44–48 vertebrae, 82–90 dorsal-fin rays, and 64–74 anal-fin rays in *S. urospilus*; see Munroe, 1998).

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Literature Cited

- Gilbert, C. H. 1892. No. XXII. Descriptions of thirty-four species of fishes collected in 1888 and 1889, principally among the Santa Barbara islands and in the Gulf of California. Scientific results of explorations by the U.S. Fish Commission Steamer "Albatross."—Proceedings of the United States National Museum 14:539–566.
- Ginsburg, I. 1951. Western Atlantic tonguefishes with descriptions of six new species.—Zoologica, New York 36:185–201.
- Munroe, T. A. 1992. Interdigitation pattern of dorsal-fin pterygiophores and neural spines, an important diagnostic character for symphurine tonguefishes (*Symphurus*: Cynoglossidae: Pleuronectiformes).—Bulletin of Marine Science 50:357–403.
- . 1998. Systematics and ecology of tonguefishes of the genus *Symphurus* (Cynoglossidae: Pleuronectiformes) from the western Atlantic Ocean.—Fishery Bulletin 96:1–182.
- , F. Krupp, & M. Schneider. 1995. Cynoglossidae. Pp. 1039–1059 in W. Fischer, F. Krupp, W. Schneider, C. Sommer, K. E. Carpenter, & V. H. Niem, eds., Guía FAO para la identificación de especies para los fines de la pesca. Pacífico centro-oriental, vol. 2. Vertebrados—parte 1.—Rome, FAO. 2:647–1200.

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