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Research note

The ringtail tonguefish, *Symphurus ocellaris*, a new addition to the marine fish fauna of Mexico (Cynoglossidae, Pleuronectiformes).

La lengua cola ocelada, *Symphurus ocellaris*, una nueva adición a la ictiofauna de México (Cynoglossidae, Pleuronectiformes).

Albert M. van der Heiden*, Marcela Ruiz-Guerrero and Héctor G. Plascencia-González

Centro de Investigación en Alimentación y Desarrollo, A. C. – Unidad Mazatlán en Acuicultura y Manejo Ambiental, Av. Sábalo-Cerritos s/n "Estero del Yugo" Apartado postal 711, 82010 Mazatlán, Sinaloa, México.

**Correspondencia: albert@ciad.mx*

Abstract. Eleven specimens of the ringtail tonguefish, *Symphurus ocellaris* Munroe and Robertson, 2005, were obtained from off the coasts of Chiapas and Colima, Mexico. Previously, this species was known only from the 2 type specimens collected off the Pacific coast of Panama. Our finding constitutes the first record of the species in Mexico and the second known occurrence of the species. The northern distribution limit of *S. ocellaris* is now extended by 11.5 degrees latitude or about 3 400 km of the eastern Pacific coastline, from Panama to Colima, Mexico.

Key words: range extension, geographical distribution, eastern Pacific, Panama, Mexico.

Resumen. Se recolectaron 11 individuos de la especie lengua cola ocelada, *Symphurus ocellaris* Munroe y Robertson, 2005, frente a las costas de Chiapas y Colima, México. Hasta el momento, la especie sólo era conocida a partir de 2 ejemplares tipo recolectados frente a la costa pacífica de Panamá. El presente descubrimiento constituye el primer registro para México y un segundo reporte conocido de la especie. Se extiende el ámbito de distribución norteña de la especie en 11.5 grados de latitud (aproximadamente 3 400 km de línea de costa del Pacífico oriental), desde Panamá hasta Colima, México.

Palabras clave: ampliación, ámbito geográfico, Pacífico oriental, Panamá, México.

The symphurine tonguefishes of the eastern Pacific were poorly known and difficult to identify until around 1990, when T. H. Munroe and collaborators published a series of descriptions of new species belonging to the genus *Symphurus*, mostly based on the dissertation of Mahadeva (1956): Munroe and Mahadeva (1989), Mahadeva and Munroe (1990), Munroe (1990), Munroe and Nizinski (1990), and Munroe et al. (1991). Recently, a new species of tonguefish, *Symphurus ocellaris* Munroe and Robertson, 2005, was described from the Pacific coast of Panama, based on 2 specimens, increasing the number of eastern Pacific species of *Symphurus* to 18 (Munroe et al., 1995; Munroe and Robertson, 2005).

Several specimens of *S. ocellaris* were obtained during an extensive collecting effort for demersal fishes on the continental shelf of the Gulf of Tehuantepec in 1991-1992 and 2 additional specimens were caught in the coastal waters off the state of Colima in 1996. Only recently, however, could the specimens be classified as *S. ocellaris* (Fig. 1A-D), after having examined all the *Symphurus* specimens in our institutional fish collection (CIAD) obtained from many cruises carried out along the eastern Pacific coast of Mexico, including the Gulf of California.

Methods for counts and measurements and general terminology are according to Munroe (1998). Institutional abbreviations are as listed in Leviton et al. (1985); Centro de Investigación en Alimentación y Desarrollo, A. C. is abbreviated as CIAD. The common English and Spanish name used here, ringtail tonguefish and lengua cola ocelada, are taken from Robertson and Allen (2006).

The external morphology of our symphurine tonguefishes collected from off the coasts of Colima and Chiapas corresponds to that of the type material of *S. ocellaris* from Panama provided by Munroe and Robertson (2005); only the pupillary operculum is somewhat less conspicuous in our specimens. Our specimens and the types of *S. ocellaris* also coincide in measurements and counts, except, however, for the interdigitation (ID)

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pattern of proximal dorsal-fin pterygiophores and neural spines (Tables 1 and 2). The predominant ID arrangement in our specimens is 1-4-3-2-2 (present in 9 out of 11; Fig. 2) whereas both type specimens of *S. ocellaris* have a 1-3-4-2-2 ID pattern.

In view of the fact that Munroe (1992) and Munroe and Robertson (2005) stated that the ID pattern serves as an important diagnostic character for the identification of symphurine tonguefishes it is essential to address the discrepancy mentioned above. The 1-4-3-2-2 ID arrangement, typically present in our specimens, only occurs in but 2 eastern Pacific *Symphurus* species, *S. fasciolaris* and *S. leei* (predominant 1-4-3-2-2 ID pattern 69% and 62% and variant ID pattern 1-3-4-2-2, 6% and 7%, respectively; number of specimens 39 and 198, respectively; Munroe, 1992). However, compared to our specimens, *Symphurus leei* differs in general body shape, in lacking the ocellated caudal spot, and in presenting a higher number of dorsal- and anal-fin rays (93-104 and 78-88 vs. 93-97 and 76-81) whereas *S. fasciolaris*, although possessing a prominent, ocellated caudal spot, differs noticeably in general body shape and size (at least 162 mm SL vs. 135 mm maximum SL), in number of caudal-fin rays (10 vs. 12, an extremely conservative character within the species of the genus) and in overall body coloration (see coloration below). Thus none of our specimens pertain to *S. leei* or *S. fasciolaris*.

Notwithstanding the difference in predominant ID pattern, we considered our specimens to be conspecific with *S. ocellaris* because of their similarity in measurements, meristics, external morphology, and presence of a prominent ocellated caudal spot (see below). Identifying our specimens as *S. ocellaris* was also supported by the results obtained by Castillo Velázquez (2001) who perceived an opposite situation in ID pattern between specimens of *S. chabanaudi* captured along a short geographic range (n = 22; 26°49' and 16°11' northern latitude; from Baja California Sur to Guerrero, Mexico) and Munroe´s 1992 specimens captured over a very wide range (n = 132; from the northern Gulf of California to Colombia): predominant 1-4-3-2-2 ID pattern (59.1%) and 1-5-3-2-2 variant ID pattern (40.9%) vs. the predominant 1-5-3-2-2 (53%) and variant pattern 1-4-3-2-2 (14%), respectively. Apart from weakening the importance of ID patterns as a diagnostic character in species identification, *S. chabanaudi*, at least within part of its geographic range, represents a third eastern Pacific *Symphurus* species that shares the predominant 1-4-3-2-2 pattern with our specimens, and thus a comparison is necessary. *Symphurus chabanaudi* may be larger in size than our specimens (maximum SL at least 233 mm, common to 210 mm SL vs. 135 mm maximum SL) and it lacks the ocellated caudal

Figure 1. *Symphurus ocellaris*: (A), CIAD 1991-23, 125.9 mm SL, ocular side medium brown with 5 irregular crossbands; (B), CIAD 1991-115, 134.5 mm SL, ocular side medium brown with 3 faint crossbands; (C), CIAD 1992-32, 118.4 mm SL, ocular side dark brown without crossbands, and (D), close-up of black, ocellated spot on distal 3/4ths of caudal fin; (E), *S. fasciolaris*, CIAD 1985-16, 121 mm SL, typical coloration of prominent crossbands, spots and ocellated spot on caudal fin.

Table 1. Morphometrics and meristics for the holotype, paratype*, and 11 specimens from the Mexican eastern Pacific (Colima and Chiapas) of *Symphurus ocellaris*. (SL in mm; characters 2-11 in % of SL, 12-21 in % of HL)

	Characters	*Holotype* 378272 USNM	*Paratype* 378273 USNM	*CIAD* n = 2 1996-17	*CIAD* n = 2 1991-115	*CIAD* n = 2 1991-23	*CIAD* n = 1 1992-32	*CIAD* n = 1 1991-35	*CIAD* n = 1 1991-36	*CIAD* n = 1 1991-37	*SIO* n = 1 91-76	*Range* n = 11	*Mean*	*SD*
1	Standard length	73.2	42.3	115.5-116.9	114.8-134.5	121.2-125.9	118.4	114.0	107.3	119.7	114.0	107.3-134.5	118.4	7.1
2	Trunk length			82.4-83.5	83.4-83.9	81.3-83.1	84.2	83.5	83.0	83.2	82.0	81.3-84.2	83.0	0.8
3	Body depth	30.5	30.5	28.9-31.4	28.0-28.5	28.6-30.1	27.1	27.5	27.1	27.2	29.0	27.1-31.4	28.5	1.3
4	Head length	19.3	22.7	19.4-20.0	18.1-19.2	18.8-20.0	23.3	24.5	18.4	18.2	25.7	18.1-25.7	20.5	2.7
5	Head width	23.5	25.3	23.1-25.6	24.2-24.9	26.2-27.6	19.1	18.9	24.1	24.6	19.2	18.9-27.6	23.4	3.0
6	Pre-anal length	22.3	25.1	25.8-27.4	24.5-25.5	24.2-25.3	24.2	24.4	24.8	26.2	24.2	24.2-27.4	25.1	1.0
7	Dorsal-fin length			97.7-97.8	97.0-98.2	97.4-98.2	97.0	97.2	97.4	98.1	97.2	97.0-98.2	97.6	0.5
8	Anal-fin length			77.0-80.3	79.3-80.9	78.1-79.2	84.0	79.0	78.8	76.8	77.7	76.8-84.0	79.2	2.0
9	Caudal-fin length	9.2	10.2	8.5-10.2	8.8-9.4	8.9-9.3	9.7	9.4	8.6	9.0	9.1	8.5-10.2	9.2	0.5
10	Pelvic-fin length			9.5-9.8	8.4-8.5	8.8-10.9	7.6	8.1	8.3	8.3	8.4	7.6-10.9	8.8	0.9
11	Pelvic to anal length			4.9-5.9	6.1-6.9	4.6-6.6	4.0	5.6	6.0	8.0	6.1	4.0-8.0	5.9	1.1
12	Snout length	21.3	21.9	19.6-21.0	21.1-25.1	22.6-24.4	17.8	16.5	22.8	17.4	16.7	16.5-25.1	20.5	3.1
13	Upper jaw length	26.2	25	24.3-25.3	22.4-24.0	27.9-28.4	20.9	21.4	26.0	25.5	21.1	20.9-28.4	24.3	2.6
14	Eye diameter	14.9	14.6	11.0-12.8	11.2-11.5	14.7-14.9	12.8	11.3	14.8	12.4	9.6	9.6-14.9	12.4	1.8
15	Upper head lobe width	73.8	74	83.0-86.4	87.1-91.3	86.4-89.0	70.6	67.2	83.7	86.2	65.8	65.8-91.3	81.5	9.1
16	Lower head lobe width	57.4	47.9	47.1-57.1	51.4-53.3	58.3-60.5	44.8	47.3	59.0	67.4	43.8	43.8-67.4	53.6	7.5
17	Pre-dorsal length	22	21.9	26.0-28.5	27.6-28.1	28.9-36.7	20.1	23.9	19.8	28.7	19.7	19.7-36.7	26.2	5.1
18	Postorbital length	62.4	61.5	65.6-67.4	62.4-65.3	67.1-68.8	54.1	53.0	67.6	68.7	51.8	51.8-68.8	62.9	6.6
19	Chin depth			26.5-33.5	32.7-37.9	35.7-37.2	24.8	28.1	34.4	41.2	22.6	22.6-41.2	32.2	5.9
20	Upper opercular lobe			21.4-21.6	21.8-22.0	24.6-25.1	17.1	19.6	22.3	27.1	16.7	16.7-27.1	21.8	3.2
21	Lower opercular lobe			25.6-33.3	27.2-28.7	30.6-30.8	25.6	24.7	28.0	32.4	24.9	24.7-33.3	28.3	3.1
22	Caudal-fin rays	12	12	12	12	12	12	12	12	12	12	12	12.0	0.0
23	Dorsal-fin rays	96	97	93-94	94-97	94-96	93	95	93	94	95	93-97	94.4	1.3
24	Anal-fin rays	80	81	76-80	77-81	78-80	79	79	77	79	80	76-81	78.7	1.6
25	Longitudinal scale count	85	86	89	84-93	90	90	85	89	85	90	84-93	88.6	2.7
26	Head scale count	18	18	18-19	17-18	19	18	18	18	19	19	17-19	18.4	0.7
27	Transverse scale count	44	43	41-43	40-41	41-42	39	42	41	41	43	39-43	41.3	1.2
28	ID pattern	1-3-4	1-3-4	1-4-3	1-4-3	1-5-2/1-4-3	1-4-2	1-4-3	1-4-3	1-4-3	1-4-3			
29	Vertebrae	51	51	49			51	50		51	50	49-51**	50.2	0.8

*data of type material taken from Munroe and Robertson (2005).
** n = 5

Table 2. Frecuency distribution of meristic characters of Symphurus ocellaris*. The holotype (H), paratype (P) and all specimens examined have 12 caudal-fin rays

Number of dorsal-fin rays												
93	94	95	96	97						n	Mean	SD
3	4	2	2H	2P						13	94.7	1.4
Number of anal-fin rays												
76	77	78	79	80	81					n	Mean	SD
1	2	1	3	4H	2P					13	79.0	1.6
Longitudinal scale count												
84	85	86	87	88	89	90	91	92	93	n	Mean	SD
1	2				3	4			1	11	88.6	2.7
Head scale count												
17	18	19								n	Mean	SD
1	7H,P	5								13	18.3	0.6
Transverse scale count												
39	40	41	42	43	44					n	Mean	SD
1	1	5	2	3H	1P					13	41.6	1.4
ID pattern												
1-3-4-2-2		1-4-3-2-2		1-4-2-2-2		1-5-2-2-2				n		
2H,P		9		1		1				13		
Total vertebrae												
49	50	51								n	Mean	SD
1	2	4H,P								7	2.3	1.5

*data of type material taken from Munroe and Robertson (2005)

spot, and possesses a higher number of dorsal- and anal-fin rays (98-109 and 82-92 vs. 93-97 and 76-81 in our specimens).

Additional arguments in considering our specimens to be conspecific with *S. ocellaris* are the following. The description of *S. ocellaris* was only based on 2 specimens, which, according to Munroe and Robertson (2005), makes it difficult to determine whether the 1-3-4 pattern is the predominant one for this species. Also, the 1-3-4-2-2 ID pattern found in both type specimens of *S. ocellaris* is a highly unusual one among the 77 species currently recognized in the genus *Symphurus*. Only one other species, *S. callopterus*, features this predominant ID pattern, although only in 64% of the 191 specimens examined and the variant pattern being 1-4-3-2-2 in 14% of them, which is the same variant pattern as in our specimens. *Symphurus callopterus*, however, lacks the ocellated caudal spot, and possesses a higher number of dorsal- and anal-fin rays, 105-114 and 91-88 vs. 93-97 and 76-81 in our specimens (Munroe, 1992; Munroe and Robertson, 2005; Eschmeyer and Fricke, 2009). In addition, fidelity for a predominant ID pattern may be low; according to Munroe (1992), although average fidelity for the predominant ID pattern in 69 species was approximately 78% per species, values ranged from 37 to 100% per species.

The coloration in alcohol of our specimens conforms

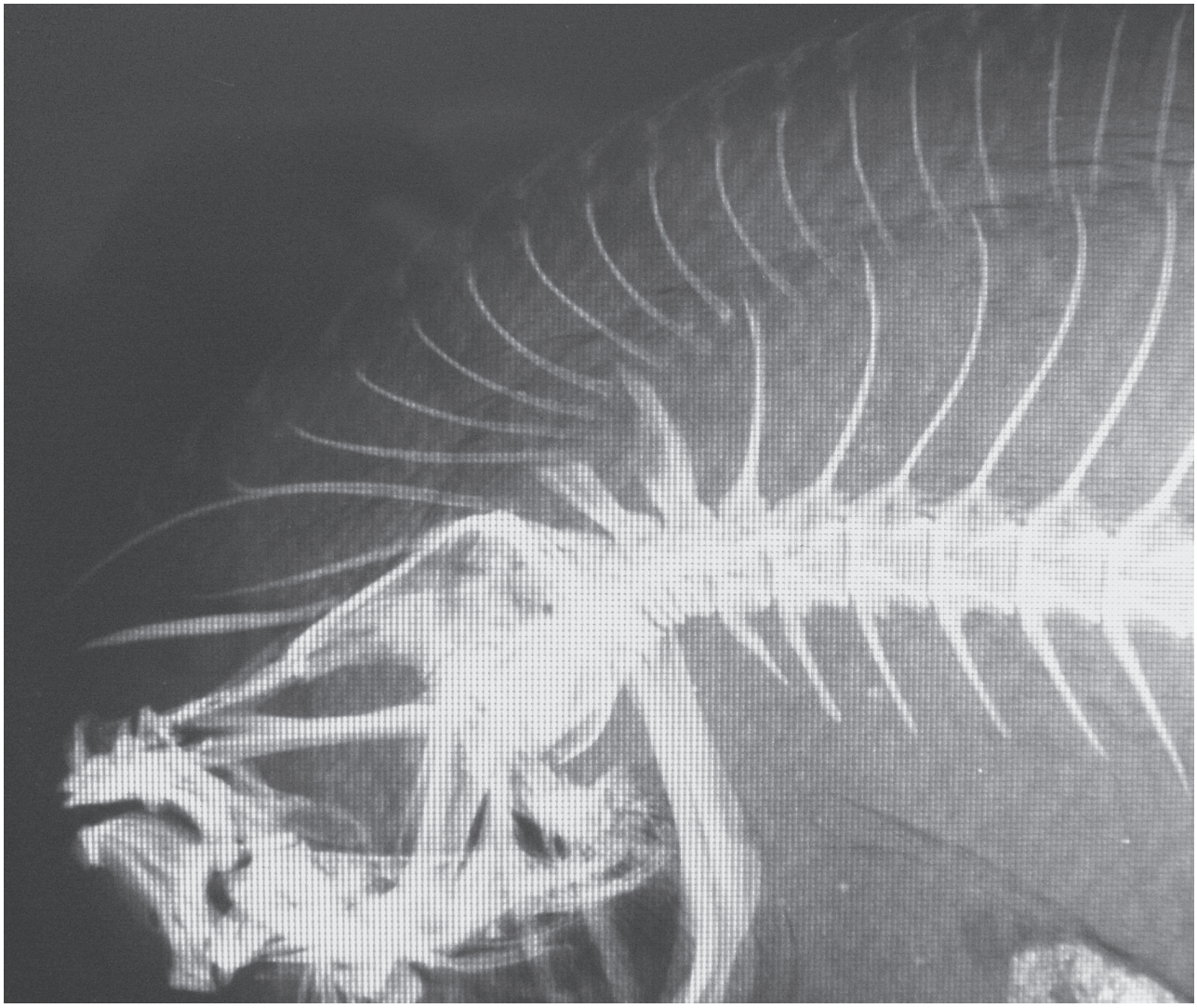

Figure 2. Radiograph of anterior region of *Symphurus ocellaris* (CIAD 1991-115, 134.5 mm SL) showing the 1-4-3-2-2 interdigitation pattern of anterior, dorsal-fin proximal pterygiophores and neural spines, predominant in specimens from Mexico.

in many aspects with the detailed description given by Munroe and Robertson (2005). Some differences in coloration on the ocular side, however, were observed: 1 specimen is dark brown instead of light to medium brown (Fig. 1C); all specimens are devoid of the numerous, small, irregular white markings present in the type material; all except 3 of our specimens show 1 to 5 irregular, faint to prominent crossbands (Fig. 1A, B); head and body scales are more uniformly brown, instead of having their distal halves darker than their proximal halves, but present the posterior margins distinctly outlined with dark pigment. In all specimens, the isthmus is devoid of pigment and the blind side does not present the interrupted, medial series of dark spots located deep within the dermis of the posterior third of the body of the paratype. The number of anterior dorsal-fin rays without pigmentation ranges from 0 to 5 (1 specimen with all rays pigmented, 1 specimen with 1, 3 with 2, 3 with 3, 2 with 4, and 1 with 5 rays unpigmented) instead of 2 to 4 for the type specimens (holotype 2, paratype 4). Among all 18 eastern Pacific species of the genus *Symphurus*, besides *S. ocellaris*, only *S. fasciolaris* presents an ocellated spot on the caudal fin (Fig. 1E; Munroe and Robertson, 2005).

The 2 type specimens of *S. ocellaris* were caught near Coiba Island, off the Pacific coast of Panama. Given that no additional specimens of this species are reported upon in the literature, our findings extend the distributional range of the species northwards by about 11.5 degrees latitude or

3 400 km of coastline and constitute the first record of *S. ocellaris* in Mexico. Since the type material was collected at 7-20 m depth, Munroe and Robertson (2005) believed the species to be a shallow-water occupant. Considering, however, that all our specimens were obtained from deeper waters, between 23 and 64 m, *S. ocellaris* is to be classified as a shallow- to medium-deep water form. As well as the holotype, our specimens were obtained over soft bottom by otter trawl.

Material examined (measurements are in SL): *Symphurus ocellaris*: Mexico, Colima: CIAD 1996-17, 2(115.5-116.9 mm), DEM-III, depth 20-40 m, off Playa El Coco. Golfo de Tehuantepec, Chiapas: CIAD 1991-23, 2(121.2-125.9 mm), CEEMEX-P4, station 19A, depth 34 m, off Barra de Tonalá (15°53.8' N - 93°54.4' W); CIAD 1991-115, 2(114.8-134.5 mm), CEEMEX-P5, station 19, depth 35 m, off Barra de Tonalá (15°54.0' N - 93°55.1' W); CIAD 1992-32, 1(118.4 mm), CEEMEX-P7, station 29, depth 42 m, off mouth of Río Nicolás (14°58.5' N - 92°59.9' W); CIAD 1991-35, 1(114.0 mm), CEEMEX-P4, station 37, depth 23 m, off Barra de San Simón (14°42.4' N - 92°32.3' W); CIAD 1991-36, 1(107.3 mm), CEEMEX-P4, station 38, depth 45, off Barra de San Simón (14°29.9' N - 92°31.0' W); CIAD 1991-37, 1(119.7 mm), CEEMEX-P4, station 39, depth 64 m, off Barra de San Simón (14°21.7' N - 92°32.9' W); SIO 91-76 (ex CIAD 1991-29), 1(114.0 mm), CEEMEX-P4, station 28, depth 28 m, off Río Nicolás (15°08.3' N - 92°58.7' W). *Symphurus fasciolaris*: Mexico, Golfo de California, CIAD 1985-16, 5(117-134 mm), CORTES 2, station 37, depth 36 m, Norte de Rocas Consag (31°15.2' N - 114°22.1' W).

Specimens from the Gulf of Tehuantepec were collected during the CEEMEX cruises with the R/V *El Puma* (Commission of the European Communities Contracts TS2.0213.E and CI1.0431.E). Specimens from Colima were obtained during the DEMERSAL cruises with the R/V *BIP V* and provided by Luz Estela Rodríguez Ibarra. Valerie Williams Holland kindly revised the manuscript for correct use of the English language. Valentín Zambrana Torres generously put his medical equipment at our disposal and provided the high quality radiographs. Levid Torres Guzmán´s interest and support of our research is also greatly appreciated.

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