

## New Species of Scorpionfish, *Scorpaena cocosensis* (Scorpaeniformes: Scorpaenidae) from the Cocos Islands, Costa Rica, Eastern Pacific Ocean

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A new species of small-sized scorpionfish, *Scorpaena cocosensis*, is described on the basis of a single specimen collected from off Nuez Island, Cocos Islands, Costa Rica, eastern Pacific Ocean. The new species is similar to two eastern Pacific species of *Scorpaena*, *Scorpaena russula* and *Scorpaena sonorae*, in overall body appearance and in lacking a supplemental preopercular spine. However, it is distinguished from these two species by the following characters: eight dorsal-fin soft rays; well-exposed scales covering anteroventral body surface; interorbital ridges well developed, beginning just behind nasal spines, diverging anteriorly and posteriorly in dorsal view; lateral margins of frontal diverging posteriorly in dorsal view; upper posttemporal spine directed upward; posterior margin of maxilla just reaching level with posterior margin of pupil; posterior tip of pectoral fin reaching level with origin of third dorsal-fin soft ray; large head length (48.8% SL); large orbit diameter (16.9% SL); wide interorbital space between supraocular spine bases (9.2% SL).

**D**URING revisionary studies of the scorpionfish genus *Scorpaena* (Scorpaeniformes: Scorpaenidae), a single unidentified scorpionfish specimen, collected from off the Cocos Islands, Costa Rican territory (approximately 800 km northeast of the Galápagos Islands), eastern Pacific Ocean, at a depth of approximately 57–92 m, was found in the collection of the California Academy of Sciences, San Francisco. The specimen was subsequently identified as belonging to the genus *Scorpaena* Linnaeus. Eastern Pacific species of the genus are characterized by 12 dorsal-fin spines, eight or nine dorsal-fin soft rays and some pectoral-fin rays branched, although no definition of the genus on a worldwide basis is available (Eschmeyer, 1965, 1969; Eschmeyer and Randall, 1975).

The specimen is similar to two eastern Pacific species, *Scorpaena russula* Jordan and Bollman, 1890, and *Scorpaena sonorae* Jenkins and Evermann, 1889, in overall body appearance and in lacking a supplemental preopercular spine, which is present in all other eastern Pacific species of *Scorpaena*. However, this specimen differed in several aspects, including squamation on the anteroventral body surface, interorbital space structure, and several proportional measurements. The specimen is described herein as a new species.

### MATERIALS AND METHODS

Lengths given for specimens are standard length (SL), being the direct distance from the front of the upper lip to the middle of the posterior margin of the hypural plate. Body depth

was measured from the origin of the fourth dorsal-fin spine to the origin of the pelvic spine, body width being the greatest width at the pectoral-fin base. Head length (HL) was measured from the front of the upper lip to the posteriormost part of the opercular membrane, and snout length from the front of the upper lip to the anteriormost bony edge of the orbit. Orbit diameter is the greatest bony diameter, and postorbital length the direct distance from the posteriormost bony edge of the orbit to the posteriormost part of the opercular membrane. Interorbital width is the least bony width, and the other interorbital width was taken between the supraocular spine bases. Upper-jaw length was measured from the front of the upper lip to the middle of the posterior margin of the maxilla. Predorsal, preanal, and prepelvic lengths were measured from the front of the upper lip to the origins of the first dorsal spine, first anal spine and pelvic spine, respectively. Pectoral-fin length was measured from the origin of the uppermost ray to the posterior tip of the longest ray and caudal-fin length from the middle of the posterior margin of the hypural plate to the fin posterior margin of middle rays. Caudal-peduncle length is the straight-line distance from the posterior end of the anal-fin base to the middle of the posterior margin of the hypural plate, and caudal-peduncle depth is the least depth.

The last two soft rays of the dorsal and anal fins were counted as single rays, each pair being associated with a single pterygiophore. Pectoral-fin ray counts begin with the uppermost ele-

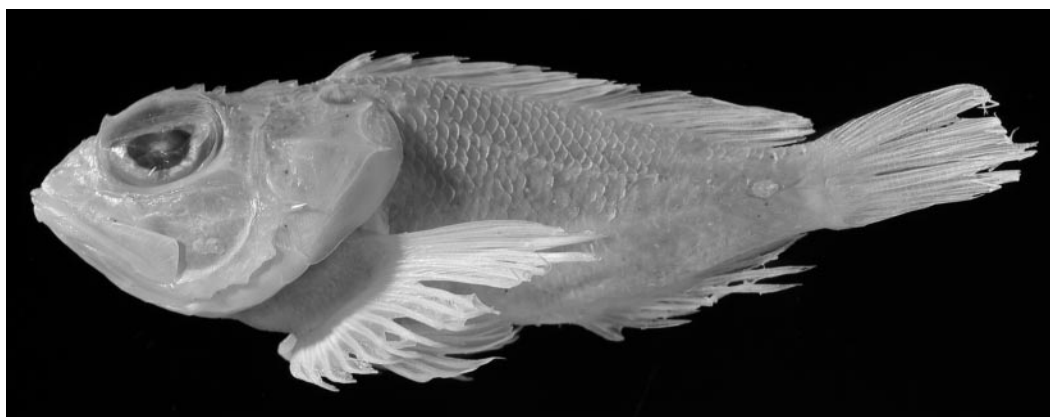


Fig. 1. *Scorpaena cocosensis*, CAS 219506, holotype, 62.0 mm SL, off Nuez Island, Cocos Islands, Costa Rica. Opercle, pectoral and caudal fins slightly flared.

ment. Longitudinal scale rows are the number of the near-vertical to oblique scale rows above the lateral line, taken from above the first pored lateral scale to the caudal-fin base. Pored lateral-line scales that had an external median tube were counted from the first pored scale near the upper end of the gill opening to the pored scale on the posterior margin of the hypural plate. Gill-raker counts were made on the first arch, the upper count given first (lower counts included raker at angle). Counts and measurements were made on the left side whenever possible. Data for SL of comparative material are rounded to whole numbers.

Terminology of head spines follow Randall and Eschmeyer (2002) except the spine occurring at the base of the uppermost preopercular spine is equivalent to “a supplemental preopercular spine” (Eschmeyer, 1965). Sex for the holotype was established by dissection of the abdomen on the right side. Vertebra count was confirmed by a radiograph. Institutional codes follow Leviton et al. (1985).

***Scorpaena cocosensis* n. sp.**

Figures 1–4

*Holotype*.—CAS 219506, male, 62.0 mm SL, off Nuez Island (05°34′00″N, 86°59′20″W), Cocos Islands, Costa Rica, 31–50 fathoms (approximately 57–92 m), coralline, Allan Hancock Pacific Expeditions, 13 January 1938. Type locality was mapped in Fraser (1943:408, chart 78, station no. 773).

*Diagnosis*.—A species of *Scorpaena* with the following combination of characters: dorsal-fin soft rays 8; pectoral-fin rays 22; well-exposed scales covering anteroventral body surface; interorbit-

al ridges well developed, beginning just behind nasal spines, diverging anteriorly and posteriorly in dorsal view; lateral margins of frontals diverging posteriorly in dorsal view; occipital pit shallow with distinct transverse ridge in front of pit; posterior lacrimal spine directed ventroanteriorly; suborbital ridge with a small spine; supplemental preopercular spine absent; second preopercular spine reduced; upper posttemporal spine directed upward; posterior margin of maxilla just reaching level with posterior margin of pupil; posterior tip of pectoral fin reaching level with origin of third dorsal-fin soft ray; head length large (48.8% SL); orbit diameter large (16.9% SL); interorbital space wide between supraocular spine bases (9.2% SL).

*Description*.—Dorsal fin with 12 spines and eight soft rays. Anal fin with three spines and five soft rays. Pectoral fin with 22 rays, an uppermost ray and lower 16 rays unbranched, remaining rays branched. Pelvic fin with one spine and five soft rays. Longitudinal scale rows 46. Pored lateral-line scales approximately 25 (scales lost on caudal peduncle). Scale rows between origin of last dorsal spine and lateral line 5. Gill rakers on upper limb 4, lower limb (including a raker at angle) 7, no rakers on hypobranchial. Branchiostegal rays 7. Vertebrae 24. Swimbladder absent.

Morphometrics expressed as percentage of SL, followed in parentheses by times in SL: body depth 33.7 (3.0); body width 23.2 (4.3); head length 48.4 (2.1); snout length 11.1 (9.0); orbit diameter 16.9 (5.9); interorbital width 6.1 (16.3); interorbital width between supraocular spine bases 9.8 (10.2); upper-jaw length 23.9 (4.2); posterior margin of maxilla depth 6.5

(15.5); postorbital length 22.3 (4.5); predorsal length 40.6 (2.5); preanal length 70.5 (1.4); pre-pelvic length 42.7 (2.3); first dorsal-fin spine length 6.5 (15.5); second dorsal-fin spine length 11.0 (9.1); longest dorsal-fin spine (fifth) length 14.7 (6.8); 11th dorsal-fin spine length 9.4 (10.7); 12th dorsal-fin spine length 12.9 (7.8); longest dorsal-fin soft ray (second) length 19.8 (5.0); first anal-fin spine length 6.0 (16.8); second anal-fin spine length 13.5 (7.4); third anal-fin spine length 12.7 (7.8); longest anal-fin soft ray (second) length 18.9 (5.3); longest pectoral-fin ray (fifth) length 34.2 (2.9); pelvic-fin spine length 14.8 (6.7); longest pelvic-fin soft ray (second) length 23.2 (4.3); caudal-fin length 30.0 (3.3); caudal-peduncle length 16.9 (5.9); caudal-peduncle depth 11.0 (9.1). Morphometrics expressed in HL: snout length 23.0 (4.3); orbit diameter 35.0 (2.9); interorbital width 12.7 (7.9); interorbital width between supraocular spine bases 20.3 (4.9); upper-jaw length 49.3 (2.0); posterior margin of maxilla depth 13.3 (7.5); postorbital length 46.0 (2.2).

Body moderately compressed anteriorly, progressively more compressed posteriorly. Nape and anterior body not highly arched, body depth relatively shallow. Head large, length much greater than body depth. Head surface, except anterior nostril, without distinct tentacles. Eyes large, oriented somewhat dorsolaterally; dorsal third of eye covered by a translucent membrane with 9 cirri along its ventral margin. Thin cycloid scales covering lower cheek (posterior to maxilla), centrally on area surrounded by pterotic spine, sphenotic spines, postorbital spines and preopercular margin, and on area surrounded by pterotic spine, upper end of preopercular margin, origin of opercular spines and lower posttemporal spine; thin cycloid scales behind preopercular margin above uppermost preopercular spine in a row. Well-exposed cycloid scales covering opercular membrane between tips of opercular spines (not on opercular bone or membrane margin); other parts of head, including snout, interorbital space, occipital pit, maxilla, and underside of mandible and isthmus, not covered with scales. Cycloid scales covering entire body but not extending onto rays or membranes of median fins, except caudal fin. Well-exposed cycloid scales covering pectoral-fin base, those on upper part extending onto basal pectoral-fin rays and membranes. Well-exposed cycloid scales covering ventral body surface, including between pelvic fins.

Mouth large, slightly oblique, forming an angle of about 20 degrees to horizontal axis of head and body. Posterior margin of maxilla just

reaching level of posterior margin of pupil. Lateral surface of maxilla smooth, without ridges. Lower jaw with a small symphyseal knob. Width of symphyseal gap separating premaxillary teeth bands slightly greater than width of each band. Upper jaw with a band of short, incurved, conical teeth. About eight tooth rows at front of upper jaw, tooth band narrowing posteriorly. Tooth band of upper jaw wider than that of lower jaw. About three tooth rows at front of lower jaw, most teeth approximately same length as teeth of upper jaw. Small teeth in about two rows forming a V-shaped patch on vomer. About two tooth rows on palatine. Width of vomer plate approximately equal to length of palatine plate. Underside of dentary with three sensory pores on each side, last pore located on posterior margin of dentary. A small pore behind symphyseal knob of lower jaw on each side. Underside of lower jaw without tentacles.

Dorsal profile of snout steep, forming an angle of about 50 degrees to horizontal axis of head and body. Nasal spine simple, conical, directed upward, its length approximately equal to anterior nostril diameter. Anterior nostril with a long tentacle with eight small branches distally, its length greater than anterior nostril diameter. Ascending process of premaxilla slightly intruding into interorbital space, its posterior margin extending well beyond level of posterior margin of posterior nostril. Median interorbital ridge absent. Interorbital ridges well developed, beginning just behind nasal spines and ending near posterior end of postocular spine base, separated by a deep channel anteriorly and shallow channel posteriorly. Interorbital ridges diverging anteriorly and posteriorly in dorsal view, distance between interorbital ridges narrowest at vertical midline of eye. Interorbital space shallow, about one-tenth of orbit extending above dorsal profile of head. Preocular spine simple, canted posteriorly. Supraocular spine simple, located slightly posterior to vertical midline of eye, spine length smaller than preocular, postocular and tympanic spines. Postocular spine simple, its length approximately equal to tympanic spine, base of former wider than that of tympanic spine. Tympanic spine simple, strongly pointed. Coronal and extra spines absent. A distinct transverse ridge (formed from bases of postocular and tympanic spines) anterior to occipital pit curved posteromedially in dorsal view. Occipital pit smooth with nine small cirri restricted to center of pit. Posterior part of occipital pit without distinct ridge. Occipital pit surrounded laterally by tympanic spines, low ridges between tympanic and parietal spines, and parietal spines. Parietal

and nuchal spines simple, both spines joined at base. Sphenotic with three small spines. Postorbital with a small spine, smaller than sphenotic spines. Pterotic spine simple. Upper posttemporal spine simple, pointed, small, directed upward, its length shorter than largest sphenotic spine. Lower posttemporal spine simple, its base length much shorter than that of pterotic spine. A small pointed spine occurring between pterotic and lower posttemporal spines. Supracleithral spines simple, flattened.

Lacrimal ridge smooth. Anterior lacrimal spine simple, directed forward, its tip just reaching dorsal margin of upper-jaw lip. Posterior lacrimal spine simple, directed ventroanteriorly, its tip reaching upper-jaw lip. Posterior lacrimal spine larger than anterior spine. Suborbital ridge with a small spine at vertical midline of eye. Narrow space between ventral margin of eye and suborbital ridge. Suborbital pit small, shallow. Preopercle with five spines, uppermost spine simple, largest without a supplemental preopercular spine on its base, second spine smallest with narrow base and pointed tip, third to fifth spines with wide base and blunt tip. Preopercle with two serrae between uppermost preopercular spine and upper end of preopercle. Upper opercular spine simple with a low median ridge. Lower opercular spine simple with a distinct median ridge. Pored lateral-line scales not associated with tentacles.

Origin of first dorsal-fin spine above supraclithral spine. Posterior margin of opercular membrane extending slightly beyond level with origin of fourth dorsal-fin spine. Posterior tip of pectoral fin reaching level with origin of third dorsal-fin soft ray. Posterior tip of pelvic fin extending slightly beyond anus when fin depressed. Origin of first anal-fin spine slightly anterior to origin of last dorsal-fin spine.

*Color of preserved specimen.*—Head (except black eye), body and fins white with a small number of scattered melanophores on body and opercle. Life colors unknown.

*Distribution.*—Currently known only from type locality, off Nuez Island, Cocos Islands, Costa Rica, eastern central Pacific Ocean.

*Etymology.*—The specific name “*cocosensis*” is based on the Cocos Islands in reference to the holotype locality.

*Remarks.*—Unlike most species of *Scorpaena*, *S. cocosensis* lacks a supplemental preopercular spine at the base of the uppermost preopercular spine (Fig. 2). Two other species lacking a

supplement preopercular spine, *S. russula* and *S. sonorae*, are also known from the eastern Pacific Ocean (Allen and Robertson, 1994; Poss, 1995). *Scorpaena russula*, originally described from Panama, is widely distributed in the tropical eastern Pacific, where it ranges from the Gulf of California to northern Peru (Allen and Robertson, 1994), whereas *S. sonorae*, originally described from Guaymas, Mexico, is currently known only from the Gulf and southwest coast of the California Peninsula (Poss, 1995). Both species have long been regarded as valid (e.g., Thomson et al., 2000), no synonyms being known. These two species and *S. cocosensis* are very similar to each other in overall body appearance, sharing many characters, including lack of the supplemental spine, reduction of the second preopercular spine, and presence of a shallow or flat occipital pit, all of which are unusual in *Scorpaena*. In addition, most of the meristics of the three species overlap, suggesting a close relationship.

*Scorpaena cocosensis*, however, can be easily distinguished from *S. russula* and *S. sonorae* by the well-exposed scales on the anteroventral body surface (vs scales embedded in the latter two species). In addition, structural differences in the interorbital areas of the three species are also reliable to discriminate species. The interorbital ridges of *S. cocosensis* are well-developed, beginning just behind the nasal spines and ending near the posterior end of the postocular spine base, being separated by a deep channel anteriorly that is more shallow posteriorly (Fig. 3), whereas in *S. russula* and *S. sonorae* the ridges are absent or poorly developed, beginning behind the preocular spines (if indistinct ridges are present). In addition, the area between the ridges (when present) is flat, not forming a channel. Furthermore, the interorbital ridges of *S. cocosensis* diverge from the midline anteriorly and posteriorly in dorsal view, the distance between the ridges at the vertical midline of the eye being narrowest (Fig. 3). In contrast, those of *S. russula* and *S. sonorae* diverge only posteriorly, the distance between the ridges at their origins (anterior to the vertical midline of the eye) being narrowest. In dorsal view, the lateral margins of the frontal between the preocular and supraocular spines in *S. cocosensis* diverge posteriorly (narrowest interorbital width just behind preocular spine bases; Fig. 3), whereas in *S. russula* the frontal margins are usually slightly divergent anteriorly and posteriorly (narrowest interorbital width around vertical midline of eye). In *S. sonorae* and (rarely) *S. russula*, the frontal margins run nearly parallel with each other. Both *S. russula* and *S. sonorae* have the

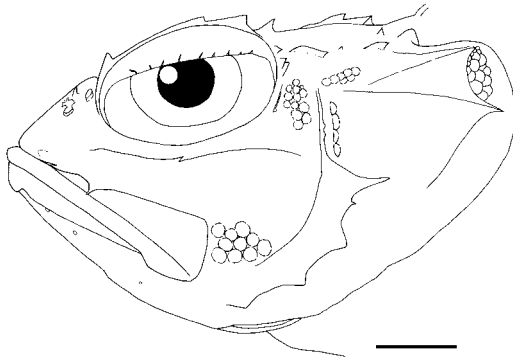


Fig. 2. Lateral view of head of *Scorpaena cocosensis*, CAS 219506, 62.0 mm SL. Scale bar = 5 mm.

interorbital area covered with a large number of small cirri, large tentacles usually being present posteriorly on the supraocular spine base. Such are absent in *S. cocosensis*.

The occipital pit of *S. cocosensis* is shallow with a distinct anterior edge formed between the posterior ends of the supraocular spine bases and a very small number of cirri centrally, whereas that of *S. sonorae* is flat with an indistinct anterior ridge and a large number of broadly distributed cirri. The occipital pit of *S. russula* is similar to that of *S. cocosensis* but with a large number of cirri.

*Scorpaena cocosensis* has a single small spine on the suborbital ridge at the vertical midline of the eye (Fig. 2), whereas *S. russula* has two or three spines (usually 2). Although the number of suborbital ridge spines in *S. sonorae* (0–2 reported by Poss, 1995; one or two in this study based on 26 specimens examined) overlapped that in *S. cocosensis* (1), *S. sonorae* usually had two such spines, rarely one. *Scorpaena cocosensis* further differed in having the upper posttemporal spine directed upward (Fig. 2; vs dorsoposteriorly or posteriorly in *S. russula* and *S. sonorae*), the posterior margin of the maxilla just level with the posterior margin of the pupil (vs level with about midline between posterior margins of pupil and orbit, rarely level with posterior margin of orbit), the posterior margin of the pectoral fin level with the third dorsal-fin soft ray base (vs usually level with last dorsal-fin spine base; somewhat variable but never extending beyond level with second dorsal-fin soft ray base) and eight dorsal-fin soft rays (vs usually nine rays).

Several morphometric characters of *S. cocosensis* differed significantly from *S. russula* and *S. sonorae*, including greater head length (48.4% of SL vs mean 44.7% [range 42.2–46.1%] of SL in *S. russula* and 42.2% [40.3–44.2%] of SL in

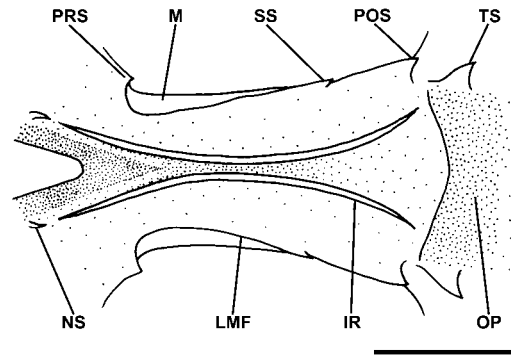


Fig. 3. Dorsal view of interorbital space in *Scorpaena cocosensis*, CAS 219506, 62.0 mm SL. IR: interorbital ridge; LMF: lateral margin of frontal; M: membrane; NS: nasal spine; OP: occipital pit; POS: postocular spine; PRS: preocular spine; SS: supraocular spine; TS: tympanic spine. Anterior to left. Scale bar = 5 mm.

*S. sonorae*, Fig. 4A), orbit diameter (16.9% of SL vs 13.5% [12.1–14.4%] of SL and 13.0% [11.5–14.4%] of SL, respectively; Fig. 4B) and interorbital width between the supraocular spine bases (9.3% of SL vs 5.4% [4.4–6.0%] of SL and 6.7% [6.0–7.2%] of SL, respectively; Fig. 4C). The interorbital width also differed significantly between *S. russula* and *S. sonorae* (Fig. 4C). In addition, *S. cocosensis* differed from the latter two species in having a greater least interorbital width (6.1% of SL vs mean 4.6% [range 3.7–5.5%] of SL in *S. russula*) and postorbital length (22.3% of SL vs 19.7% [17.8–20.6%] of SL in *S. sonorae*).

In addition to interorbital width, *S. russula* and *S. sonorae* are distinguished from each other by the color pattern of the soft rayed portion of the dorsal fin (Allen and Robertson, 1994; Poss, 1995): irregular rows of small spots on the fin in *S. russula* and a large blotch, approximately equal to the pupil diameter, in *S. sonorae*. The soft rayed portion of the dorsal fin in *S. cocosensis* is white, lacking melanophores. However, I could not determine whether spots or blotches had initially been present on the fin of *S. cocosensis* and had subsequently faded because of long-term preservation (specimen collected in 1938).

With the exception of *S. cocosensis*, *S. russula*, and *S. sonorae* (all eastern Pacific species), only three species of *Scorpaena*, *S. calcarata* Goode and Bean, 1882, *S. inermis* Cuvier in Cuvier and Valenciennes, 1829, and *S. melasma* Eschmeyer, 1965 (all western Atlantic species; Eschmeyer, 1965, 1969; Poss and Eschmeyer, 2003), are known to lack a supplemental preopercular spine. *Scorpaena cocosensis* is readily distinguish-

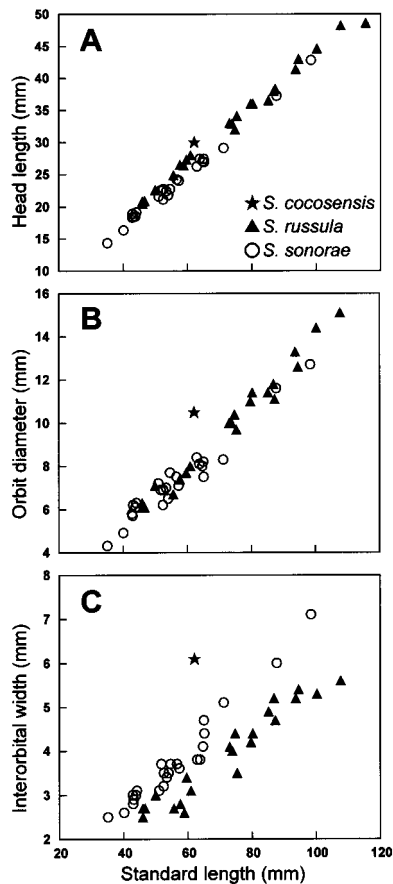


Fig. 4. Relationships of (A) head length, (B) orbit diameter and (C) interorbital width between the supraocular spine bases to standard length in *Scorpaena cocosensis* (star), *Scorpaena russula* (triangles), and *Scorpaena sonorae* (circles).

able from these species by the well-exposed anteroventral body scales (vs scales embedded in the latter).

*Comparative material examined.*—*Scorpaena calcarata* (eight specimens, 44–80 mm, all from western Atlantic Ocean): CAS 24385, 76 mm SL, Gulf of Mexico (16°01'N, 83°36'W), approximately 55–57 m, trawl, RV OREGON, 2 February 1967; CAS 28254, 80 mm SL, off Texas (28°18'N, 94°58'W), Gulf of Mexico, approximately 46 m, C. T. Fontaine, 3 March 1966; CAS 28255 (four specimens), 44–61 mm SL, off Texas (28°57'N, 94°47'W), Gulf of Mexico, approximately 18 m, C. T. Fontaine, 2 March 1966; CAS 31879, 60 mm SL, Caribbean Sea (08°49'N, 76°53'W), approximately 59 m, RV OREGON II, 2 November 1970; CAS 219507, 67 mm SL, off Florida (28°29'N, 80°18'W), 29–31 m, 19 January 1961. *Scorpaena inermis* (seven specimens, 34–88 mm

SL, all from western Atlantic Ocean): CAS 31897, 58 mm SL, Caribbean Sea (20°30'N, 79°33'W), RV SILVER BAY, 20 January 1961; CAS 31940, 52 mm SL, Key Biscayne, Florida, 25 January 1968; CAS 64828, 58 mm SL, east side of Ceycen Island (09°42'N, 75°51'W), Colombia, less than approximately 9 m, L. Knapp, 30 September 1969; CAS 219509 (two specimens), 72–88 mm SL, off Cuba (23°00'N, 78°40'W), approximately 24 m, trawl, RV OREGON II, 15 December 1969; CAS 219510 (two specimens), 34–40 mm SL, St. Andrews Island, Georgia, 10 October 1965. *Scorpaena russula* (38 specimens, 25–115 mm SL, all from eastern Pacific Ocean): BMNH 1900.9.29.189 (paratype), 50 mm SL, Panama, D. Jordan; CAS 13955 (five specimens), 85–115 mm SL, Peru (05°39'S, 81°00'W), 44 m, RV ANTON BRUUN, 7 September 1966; CAS 30645 (three specimens), 46–47 mm SL, Noas Island, Gulf of Panama, Panama, L. G. Abele and J. B. Graham, 20 April 1973; CAS 31932, 73 mm SL, El Salvador (13°27'N, 89°30'W), approximately 33 m, RV SAGITARIO, 9 December 1967; CAS 32221 (three specimens), 25–50 mm SL, Puerto Vallarta (20°37'N, 105°18'W), Mexico, approximately 18 m, E. E. Lewis, 13 April 1937; CAS 36623 (six specimens), 56–80 mm SL, off Los Frailes, Baja California, Mexico, approximately 28–37 m, trawl, J. E. McCosker, 27–28 April 1976; CAS 36668, 60 mm SL, Los Frailes, Baja California, Mexico, approximately 28–37 m, trawl, J. E. McCosker, 26–27 April 1976; CAS 64640, 94 mm SL, east of Chitré, Gulf of Panama (07°59'N, 79°50'W), Panama, approximately 3 m, trawl, RV PILLSBURY, 2 May 1967; CAS 90378, 59 mm SL, Tagus Cove, Isabela Island, Galápagos Islands, Ecuador, J. E. McCosker, 12 November 1995; CAS 100384 (four paratypes), 74–108 mm SL, Gulf of Panama (08°06'30"N, 78°51'00"W), Panama, approximately 60 m, trawl, RV ALBATROSS, 5 March 1888; CAS 204498, 100 mm SL, off San Carlos (08°25'N, 79°54'W), Gulf of Panama, Panama, approximately 12 m, trawl, U.S. Fish and Wildlife Service, 12 December 1963; USNM 41138 (paratype), 58 mm SL, same data as CAS 100384; USNM 41140 (paratype), 115 mm SL, same data as CAS 100384; USNM 41146 (paratype), 114 mm SL, same data as CAS 100384; USNM 41154 (paratype), 61 mm SL, same data as CAS 100384; USNM 41160 (holotype), 108 mm SL, same data as CAS 100384; USNM 41191 (paratype), 105 mm SL, same data as CAS 100384; USNM 41208 (paratype), 65 mm SL, Gulf of Panama (07°57'00"N, 78°55'00"W), Panama, approximately 60 m, trawl, RV ALBATROSS, 5 March 1888; USNM 41209 (paratype), 50 mm SL, same data as CAS 100384; USNM 41366

(paratype), 61 mm SL, same data as USNM 41208; USNM 41487 (paratype), 61 mm SL, same data as USNM 41208; USNM 41488 (paratype), 60 mm SL, same data as USNM 41208. *Scorpaena sonorae* (26 specimens, 35–98 mm SL, all from Mexico, eastern Pacific Ocean): AMS IA.913, 66 mm SL, Gulf of California (28°28'N, 112°04'W), 1922; CAS 13627, 55 mm SL, entrance to Guaymas Bay, B. W. Walker et al., 1 February 1950; CAS 13628, 88 mm SL, entrance to Bahia Concepcion and Bahia Coyote, B. W. Walker et al., 29 April 1953; CAS 13629, 65 mm SL, between San Felipe and mouth of Rio Colorado, C. Hubbs, 17 April 1947; CAS 16642, 57 mm SL, San Carlos Bay, Sonora, N. J. Wilimorsky et al., 4 June 1950; CAS 17690 (two specimens), 54–65 mm SL, Salinas Bay, Sonora, R. R. Harry and J. E. Böhlke, 30 March 1948; CAS 18891, 71 mm SL, Conception Bay (26°42'N, 111°52'W), J. E. Böhlke, 21 April 1952; CAS 19167, 40 mm SL, northwest of Angel de la Guarda Island (29°31'N, 113°37'W), J. E. Böhlke et al., 8 May 1952; CAS 30789 (14 specimens), 43–98 mm SL, Puerto Refugio, Angel de la Guarda Island, W. McFarland et al., 22 April 1953; CAS 48831, 52 mm SL, Santa Inez Bay, R. Bolin, 8 April 1953; CAS 219508, 35 mm SL, Puerta Retugio, Aukeldela Guardo Islands, A. Flechsiy et al., 20 April 1953; USNM 39644 (holotype), 48 mm SL, Guaymas, Sonora, O. P. Jenkins and B. W. Evermann.

#### ACKNOWLEDGMENTS

I am especially grateful to W. N. Eschmeyer, California Academy of Sciences (CAS), for sharing his extensive knowledge of scorpionfish systematics, in addition to his unpublished type data of *S. russula* and *S. sonorae*, and who, with T. Iwamoto, D. Catania, M. D. Hoang, and J. D. Fong, assisted my visits to CAS. I also thank G. S. Hardy (Ngunguru, New Zealand) for his valuable comments on the initial manuscript, Y. Motomura (Chatswood, Australia) for her assistance, and M. McGrouther, T. Trnski, J. M. Leis, and other staff of the Fish Section, Australian Museum (AMS), for their continued assistance. A photograph of Figure 1 was taken by C. Bento (AMS). This study was supported in part by a postdoctoral fellowship grant awarded to the au-

thor by the Japan Society for the Promotion of Science for Research Abroad (Tokyo, Japan).

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