

Solea stanalandi, a New Sole from the Persian Gulf

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Abstract A new soleid flatfish, *Solea stanalandi*, is described from two specimens collected in 1–7 m in the Persian Gulf near Dhahran, Saudi Arabia. It is distinctive among species of the genus in having 57–59 dorsal rays, 46 anal rays, 104–106 pored scales in the straight portion of the lateral line to the caudal-fin base, a body depth of 2.45–2.5 in standard length, a large black spot on the outer half of the pectoral fin of the ocular side, and a similar narrower dark spot on the pectoral fin of the blind side.

The soleid fish genus *Solea* Quensel is represented by 11 species: seven in the eastern Atlantic and Mediterranean (Fowler, 1936; Torchio in Hureau and Monod, 1973); two from southern Africa (Heemstra and Gon in Smith and Heemstra, 1986); and two from India (Norman, 1928), one of which, *S. elongata* Day, ranges to Sri Lanka and the Persian Gulf. We follow Torchio in regarding *Buglossidium* Chabanaud and *Dicologlossa* Chabanaud as valid genera. We agree with the statement of Heemstra and Gon that the Soleidae is in need of revision.

During a night dive from shore at Half Moon Bay near Dhahran, Saudi Arabia in September, 1985, the authors and Brock E. Stanaland observed a sole on a silty sand, sparse seagrass bottom with a large black area on the pectoral fin of the ocular side as seen on the common sole *Solea elongata*, but darker and more strongly marked with blackish; also it seemed deeper-bodied. It was caught by hand by the junior author. In June, 1986 a second specimen was captured in the same area by Stanaland. Examination of these specimens readily demonstrated that they represent an underscribed species of *Solea*. Notable among the difference from other species is the unusual low count of the dorsal and anal rays.

The holotype of the new species is deposited at the Bernice P. Bishop Museum, Honolulu (BPBM), and the paratype at the National Museum of Natural History, Washington, D. C. (USNM). Data in parentheses in the description refer to the paratype.

Table 1 presents proportional measurements of the type specimens in percentage of the standard length. Proportions in the text of the description

Table 1. Proportional measurements of type specimens of *Solea stanalandi* expressed as a percentage of the standard length.

	Holotype BPBM 32806	Paratype USNM 300936
Standard length (mm)	104.0	92.5
Body depth	40.0	40.8
Body thickness	8.0	8.1
Head length	24.2	23.8
Snout length	4.6	4.4
Eye diameter	4.5	4.7
Interorbital width	3.1	3.2
Upper jaw length	6.9	6.7
Caudal peduncle depth	9.6	9.6
Predorsal length	4.8	5.6
Preanal length	27.9	27.4
Prepelvic length	24.2	24.4
Length of first dorsal ray	3.8	2.2
Length of second dorsal ray	5.7	4.9
Length of longest dorsal ray	9.4	9.4
Length of penultimate dorsal ray	5.0	6.0
Length of last dorsal ray	4.0	4.6
Length of first anal ray	5.0	4.3
Length of second anal ray	7.2	5.4
Length of longest anal ray	9.4	9.2
Length of penultimate anal ray	5.2	4.5
Length of last anal ray	3.8	2.9
Caudal fin length	17.8	18.2
Ocular-side pectoral fin length	11.4	12.5
Blind-side pectoral fin length	9.6	10.0
Pelvic fin length	6.0	5.9

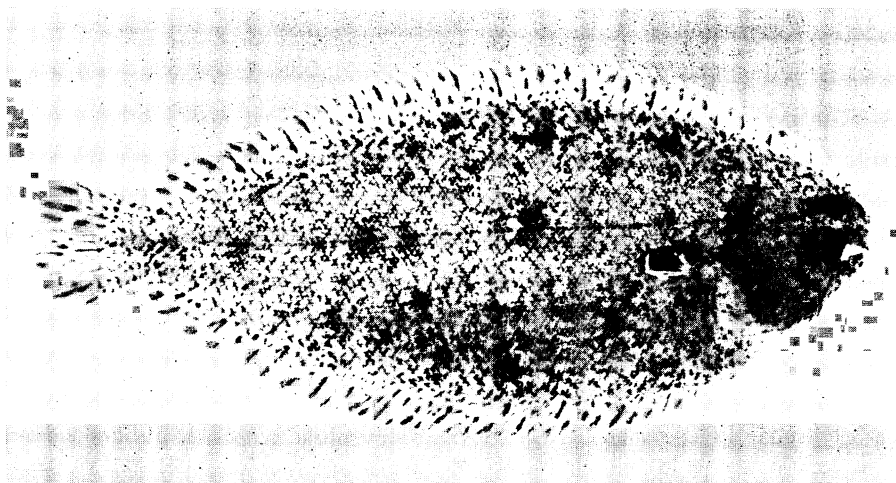


Fig. 1. Holotype of *Solea stanalandi*, BPBM 32806, 104 mm SL, Persian Gulf (photo by John E. Randall).

are step-in measurements rounded to the nearest .05.

Standard length (SL) is measured from the most anterior point of the head to the base of the caudal fin (end of hypural plate); head length is taken from the same anterior point horizontally to a vertical at the posterior end of the opercular membrane; body depth is the greatest depth from the base of the dorsal rays to the base of the anal rays; body thickness is the maximum thickness posterior to the head; caudal peduncle depth is the least depth; snout length is measured horizontally from the most anterior point of the head to a vertical at the anterior edge of the upper eye; eye diameter is the horizontal length of the upper eye; interorbital width is the vertical distance between horizontals at the lower scaled edge of the upper eye and the upper scaled edge of the lower eye; predorsal, preanal, and prepelvic lengths are taken from the base of the first ray of these fins to the most anterior point of the head; fin-ray lengths are measured from their extreme bases. Lateral-line scales are counted on the ocular side along the straight portion of the lateral line to the base of the caudal fin (counts include several scales anterior to posterior margin of head); gill-raker counts include rudiments.

Solea stanalandi sp. nov.
(Fig. 1)

Holotype. BPBM 32806, 104.0 mm SL, Persian Gulf, Saudi Arabia, Half Moon Bay (near Dhahran), off UPM Beach, silty sand and sparse seagrass, 1 m,

caught by hand, Linda J. McCarthy, 7 September 1985.

Paratype. USNM 300936, 92.5 mm SL, same locality as holotype, 4 m, salinity 52‰, caught by hand, Brock E. Stanaland, 6 June 1986.

Diagnosis. A species of *Solea* with 57–59 dorsal rays, 46 anal rays, 104–106 pored scales in straight portion of lateral line, body depth 2.45–2.5 in SL, brown, finely mottled and blotched with blackish, a large black spot on outer half of ocular-side pectoral fin, and a similar narrower dark spot on blind-side pectoral fin.

Description. Dorsal rays 57 (59); anal rays 46; pectoral rays (both sides) 8 (7); pelvic rays 5 (except 4 on ocular side of holotype); principal caudal rays 15, the upper and lower unbranched; upper and lower procurent caudal rays 2; lateral-line scales on straight portion of lateral line to caudal-fin base 106 (104); scales above middle of lateral line to base of dorsal fin (counted in a diagonal anterodorsal row) 30 (26); scales below middle of lateral line to base of anal fin (counted in a diagonal posteroventral row) 47 (41); gill rakers 5 + 9 (2 + 8), all small; vertebrae 9 + 26.

Body depth 2.5 (2.45) in SL; body thickness 5.0 (5.05) in depth; head length 4.15 (4.2) in SL; snout length 5.25 (5.4) in head; orbit diameter 5.4 (5.05) in head, the upper eye distinctly anterior to lower; interorbital width 7.8 (7.45) in head; caudal-peduncle depth (at caudal-fin base) 2.5 in head (last dorsal and anal rays linked by membrane almost to base of caudal fin, thus caudal peduncle has no measurable length).

Mouth anterior to lower eye, the gape strongly

curved, the maxilla ending below front of pupil, the upper-jaw length 3.5 (3.55) in head. A band of villiform teeth in about six rows at its widest place on side of lower jaw on the blind side. Anterior nostril of the ocular side directly in front of upper edge of lower eye, tubular, about as long as pupil width, when laid back nearly covering posterior nostril; posterior nostril small, close to lower eye, covered by a dorsal flap; anterior nostril of blind side a short fleshy tube dorsal to center of gape with a fleshy tentacle projecting into aperture from the ventroanterior edge; posterior nostril also a short tube located posterior and slightly dorsal to anterior nostril, the internarial distance nearly equal to eye diameter. Fleshy cirri covering snout and chin on blind side to just behind mouth, extending ventrally to gill opening and dorsally to base of seventh dorsal ray; cirri basally on membranous edge of dorsal rays 1–13 on blind side (progressively fewer cirri posteriorly). Gill openings of both sides confluent ventrally. Preopercular margin covered by epidermis.

Scales small, ctenoid, the ctenii well-developed (a maximum of about 20 on each scale); body and head fully scaled except cirri-covered anterior part of head on the blind side; scales extending out on rays of median fins and adjacent section of membranes one-half to three-fourths distance to ray tips; base of pectoral fins scaled. Lateral line straight to above front end of isthmus, then arching strongly on dorsal part of head and curving anteriorly beneath dorsal rays to end at front of upper eye.

Origin of dorsal fin on a vertical between anterior nostril and front of mouth; all dorsal and anal fin rays branched except last ray of dorsal fin of paratype; longest dorsal and anal rays 2.55 (2.6) in head; last dorsal and anal rays distinctly shorter than penultimate rays, the dorsal 6.05 (5.2) in head, the anal 6.35 (8.2) in head. Caudal fin rounded, 5.6 (5.5) in SL. Pectoral fins fan-shaped, expanding distally from a narrow base; middle four or five pectoral rays branched; ocular-side pectoral-fin length 2.1 (1.9) in head; blind-side pectoral-fin length 2.5 (2.4) in head. Pelvic fins short, 4.05 in head, the blind-side fin slightly anterior; pelvic rays branched, the last ray joined by a membrane for three-fourths its length to a point near origin of anal fin (one membrane to each side of fin origin); a fleshy papilla behind pelvic-fin attach-

ment of ocular side.

Color of holotype on ocular side in life: light brown, finely mottled and blotched with blackish, the dark pigment concentrated incompletely on scale edges thus tending to form small dark crosses (large blotches are produced where the crosses are strongly pigmented and interconnected); lateral line on body readily apparent as a narrow, more darkly pigmented line; a large, white-edged black spot covering outer half of pectoral fin; dorsal and anal fins with large, elongate black spots on membranes and smaller spots basally on many of the rays; ray tips whitish; caudal fin similar in color to dorsal and anal fins, the black spots more elongate on membranes. Color of blind side whitish with a blackish spot on outer half of pectoral fin between fourth and sixth rays. Inside of mouth white; epidermis of gill chamber blackish.

Color of holotype in preservative similar to life color. The white rim of the black pectoral-fin spot is no longer apparent (now pale brown), and the fin-ray tips are not as whitish.

Etymology. This sole is named in honor of Brock E. Stanaland, the junior author's husband, who collected fishes with us in the Gulf and captured the paratype.

Remarks. With the description of *Solea stanalandi*, the genus, as currently defined, consists of 12 species, of which nine occur primarily in temperate seas. The present species seems closest to *S. elongata* Day with which it is sympatric in the Persian Gulf and to *S. heinii* Steindachner from southern Arabia and the Makran coast of Pakistan, both of which have a large black spot on the pectoral fin of the ocular side. In body depth it is closest to *S. heinii*, but in the pattern of the fleshy cirri anteriorly on the blind side of the head it is similar to *S. elongata* (Norman, 1928; text-fig. 1). It is easily distinguished from both of these species in having 57–59 dorsal rays and 46 anal rays. *S. elongata* has 72–77 dorsal rays and 59–63 anal rays, and *S. heinii* 68–71 dorsal rays and 54–58 anal rays.

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ペルシャ湾から採集されたササウシノシタ科の新種
Solea stanalandi

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ペルシャ湾のサウジアラビア沿岸で採集された2個体の標本に基づいて、新種 *Solea stanalandi* を記載した。本種は同属の他種から背鰭条数 57–59, 臀鰭条数 46, 側線直走部の有孔鱗数 104–106, 体長が体高の 2.45–2.5 倍であること, および有眼側の胸鰭に1黒色斑があり, 無眼側の胸鰭にも1黒斑があることにより識別される。