

## *Aseraggodes crypticus*, a new Sole (Pleuronectiformes: Soleidae) from Christmas Island, Indian Ocean

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**Abstract** – A new soleid fish, *Aseraggodes crypticus*, is described from two specimens, 35.7–48.6 mm in standard length, collected from 15–25 m at Christmas Island, Indian Ocean. Previously confused with *A. melanostictus* (Peters), it is distinct in having 76–79 dorsal-fin rays, 56–59 anal-fin rays, 66–70 lateral-line scales, no branches of the lateral line on the head, 37 vertebrae, 12–13 dorsal pterygiophores anterior to the fourth neural spine, no caudal peduncle, pelvic fins free from anal fin and genital papilla, and a strongly variegated ocular-side colour pattern.

### INTRODUCTION AND METHODS

Allen and Steene (1979: 65) reported *Aseraggodes melanostictus* (Peters) from one specimen taken in 16–18 m at Christmas Island in the eastern Indian Ocean, adding that it was a new record for the Indian Ocean. Allen and Steene (1988: 156, upper right figure) illustrated the species in colour from a second specimen from Christmas Island. The two specimens are deposited in the Western Australian Museum, Perth (WAM).

On learning that *Aseraggodes melanostictus* (Peters) is known only from the holotype taken in 78 m off the island of Bougainville (Randall, 2005; Randall and Gon, 2005), Allen re-examined his Christmas Island specimens and decided they were incorrectly identified. The specimens were sent on loan to Randall who recognised them as an undescribed species. We describe this new sole here.

Methods of counting and measuring specimens follow Randall (2005).

### SYSTEMATICS

#### Family Soleidae

#### Genus *Aseraggodes* Kaup

*Aseraggodes* Kaup, 1858: 103 (type species *Aseraggodes guttulatus* Kaup)

#### Diagnosis

Dorsal-fin rays 58–79; anal-fin rays 39–61; caudal-fin rays typically 18 (usually 14–16 branched in adults); no pectoral fins; pelvic-fin rays normally 56; lateral-line scales 39–96 (including those extending onto head); no gill rakers; vertebrae 33–

40; 7–16 dorsal pterygiophores anterior to fourth neural spine; body depth 2.0–2.8 in SL; head length 2.9–5.1 in SL; eyes on right side, elevated, separated by a narrow scaled space; upper eye in advance of lower eye (rarely directly above); eyes small, 3.8–8.3 in head length; caudal peduncle, if present, very short; two nostrils on each side, the anterior nostril of both sides tubular, not more than one eye diameter in length; posterior nostril of ocular side a narrow opening in labial groove before lower eye, covered dorsally by skin or membrane; scales small, ctenoid; a straight lateral line midlaterally on both sides of body; branches of cephalic lateralis system on blind side often obscure, the cephalodorsal branch (supratemporal branch of some authors) from front of snout along base of dorsal fin generally the most evident; a very small sensory pore, usually at end of a small papilla, on snout above base of tubular anterior nostril at about level of ventral edge of upper eye; gill membranes united, free from isthmus, the lower part of head scaled over from ocular to blind side; mouth ventral and small, the jaws strongly curved; a band of villiform teeth on blind side of jaws, but not on ocular side (except one to two rows of tiny teeth on ocular side of upper jaw of *A. dubius*); dorsal fin originating anteriorly on snout, the first ray not prolonged; no pore at base of dorsal and anal rays; caudal fin not connected by membrane to dorsal and anal fins, the fin rounded (may seem rhomboid if rays not spread), the fin length 2.7–5.8 in SL; pelvic fins on ventral edge of body, close together anteriorly, the origins adjacent or with ocular-side fin slightly anterior; anus anterior or ventroanterior to first anal ray; sciatic part of urohyal forming an angle of about 60 to 90° to horizontal main part of bone.

*Aseraggodes crypticus* sp. nov.

Figure 1; Table I

**Holotype**

WAM P.28990-020, 35.7 mm, Indian Ocean, Christmas Island, 10°26'S, 105°40'E, 15–25 m, rotenone, G.R. Allen and R.C. Steene, 20 May 1986.

**Paratype**

WAM P.26108-016, 48.6 mm, Christmas Island, Flying Fish Cove, 10°29'S, 105°40'E, 16–18 m, rotenone, G.R. Allen and R.C. Steene, 30 May 1978.

**Diagnosis**

Dorsal-fin rays 76–79; anal-fin rays 56–59, all dorsal and anal rays branched except for first few dorsal rays; lateral-line scales 70–76; vertebrae 37; dorsal pterygiophores anterior to fourth neural spine 12–13; body depth 2.2–2.45 in SL; head length 4.05–4.15 in SL; caudal peduncle absent; snout length 2.85–2.9 in head length; eye diameter 5.35–5.9 in head length; interorbital space narrow, 12.4–17.2 in head length; longest dorsal ray 1.6–1.7 in head length; caudal fin 4.15 in SL; pelvic fins not connected to anal fin or genital papilla, reaching base of third anal ray, 1.9–2.0 in head length; most scales of body with 10–12 cteni that project well beyond scale margin; ocular-side of snout fully scaled, the scales progressively smaller anteriorly, the cteni replaced anteriorly by small cirri; ocular side when fresh mottled pale yellowish and light brown with many irregular dark brown blotches.

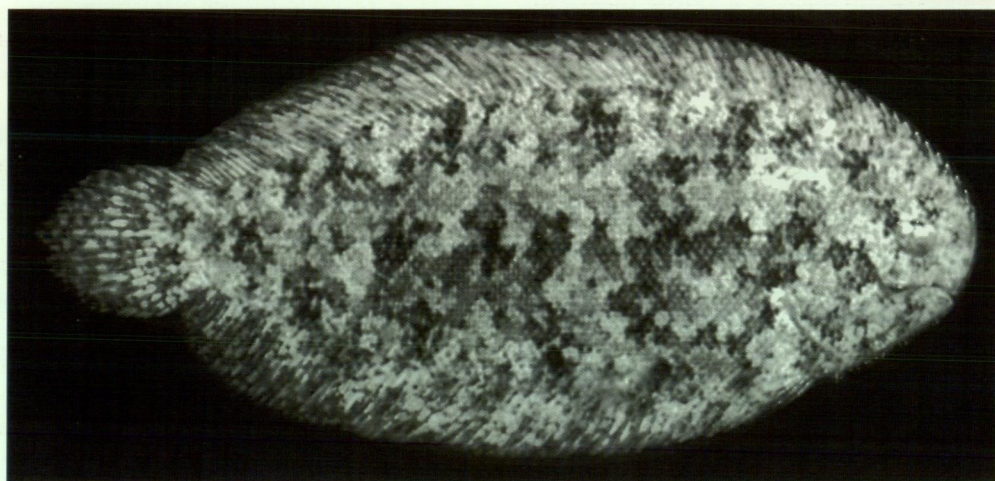
**Description**

Dorsal rays 79 (76), branched except first few dorsal rays; anal rays 59 (56), all branched; caudal rays 18; all but uppermost and lowermost branched, 14 (16) double-branched; pelvic rays 5, all branched;

lateral-line scales 70 (76), including 8 anterior to a vertical at upper end of gill opening; no branches of lateral line on ocular side of head; scales above lateral line about 25; scales below lateral line about 27; vertebrae 37; dorsal pterygiophores before fourth neural spine 13 (12), with 3 pterygiophores, including the erisme, before tip of second neural spine, 6 (7) in space between second and third neural spines; and 3 in space between third and fourth neural spines; ventroanterior margin of the urohyal forming an angle of about 80°, the inner angle broadly rounded.

Proportional measurements as percentages of SL provided in Table 1. Body depth 2.45 (2.2) in SL; body greatly compressed, the width 4.9 (5.6) in body depth; head length 4.15 (4.05) in SL; no caudal peduncle (base of last anal ray below or posterior to base of lowermost caudal ray); depth of caudal-fin base 1.75 (1.85) in head length; snout length 2.85 (2.9) in head length; preorbital length 3.2 (4.0) in head length; eye diameter 5.35 (5.9) in head length; eyes separated by a narrow concave space, the least vertical interorbital width 17.2 (12.4) in head length; upper eye overlapping one-half (seven-eighths) of lower eye; upper end of gill opening at level of a line passing about one-half eye diameter below lower eye.

Mouth inferior, the jaws strongly curved; maxilla extending a little posterior to a vertical at anterior edge of pupil of lower eye, the upper-jaw length 3.0 (2.95) in head length; jaws on blind side with a band of very small villiform teeth in about 6 rows at widest place, the teeth in about posterior three-fourths of lower jaw and about posterior half of upper jaw; tubular anterior nostril slender, in front of upper edge of lower eye, reaching dark edge of eye when depressed posteriorly, its length about equal to eye diameter; posterior nostril of ocular side a small aperture in groove below front of lower



**Figure 1** Holotype of *Aseraggodes crypticus* sp. nov., WAM P.28990-020, 35.7 mm, Christmas Island. Photograph by G.R. Allen.

eye; anterior nostril of blind side a very slender tubule just above upper lip nearly to middle of upper jaw, its length equal to about one-half eye diameter; posterior nostril of blind side a short strongly tapering tubule nearly an eye diameter dorsoposterior to anterior nostril; an indistinct small sensory pore with a fleshy rim above front of base of anterior nostril at level of ventral edge of upper eye.

Scales ctenoid, most on body with 10–12 cteni that extend well beyond edge of scales; scales on ocular side of snout progressively smaller anteriorly, soon losing cteni, those anteriorly and in a broad ventral zone of blind side of snout and ventral edge of head with numerous slender cirri, none longer than pupil diameter; opercular edge of gill opening on blind side with a row of slender cirri that are progressively shorter dorsally; cirri on ocular side of edge of gill opening present only ventrally; eyes separated by two rows of scales, with one to four rows of small scales extending onto medial and anterior edges; a broad zone of fleshy papillae above and below mouth on blind side; lateral line straight on both sides along middle of body, on ocular side in alignment with upper eye when projected forward; cephalic lateralis system of blind side obscure except cephalodorsal branch that continues basal to dorsal fin about half way back on body.

Dorsal and anal fins with a basal sheath of two to three rows of scales, followed by progressively smaller scales that extend well out on rays anteriorly on blind side, progressively fewer

posteriorly; scales extending out on dorsal fin of ocular side only on about first 20 rays and only on first few rays of anal fin; five to six rows of progressively smaller scales extending out on base of caudal fin, before narrowing to small slender scales along rays; a fleshy membranous ridge on dorsal and anal rays not well developed; no cirri present along edge of dorsal- and anal-fin rays.

Origin of dorsal fin (base of first dorsal-fin ray) anterior to upper eye, the predorsal length 4.1 in head length; first dorsal ray 3.45 (3.5) in head length; longest dorsal-fin ray 1.6 (1.7) in head length; origin of anal fin below base of nineteenth dorsal-fin ray, the preanal length 3.55 in SL; anus anterior to first anal-fin ray; genital papilla on ocular side at base of first anal ray; length of first anal-fin ray 3.0 (3.05) in head length; longest anal-fin ray 1.6 (1.7) in head length; caudal fin 4.15 in SL; origin of pelvic fins close together on ventral edge of body, the prepelvic length 4.9 (4.65) in SL; third and fourth pelvic rays longest, reaching base of third anal ray, 1.9 (2.0) in head length.

Colour of ocular side of holotype in alcohol pale yellowish with numerous very irregular dark brown blotches, the largest mainly in three longitudinal rows, one below dorsal fin, one above anal fin, and one along lateral line; median fins with brown blotches along base; colour of blind side pale yellowish grey.

Colour of ocular side of holotype when fresh mottled pale yellowish and light brown with many irregular dark brown blotches.

**Table 1** Proportional measurements of the holotype and paratype of *Aseraggodes crypticus* sp. nov. as percentages of the standard length

	Holotype	Paratype
	WAM P28900	WAM P26108
Standard length (mm)	35.7	48.6
Body depth	40.7	45.3
Body width	8.3	8.1
Head length	24.1	24.7
Snout length	8.4	8.6
Preorbital length	7.6	6.2
Eye diameter	4.5	4.2
Interorbital width	1.4	2.0
Upper-jaw length	7.0	8.4
Base of caudal fin	13.7	13.3
Predorsal length	5.9	6.0
Preanal length	28.0	28.1
Prepelvic length	20.4	21.6
First dorsal-fin ray	7.0	7.1
Longest dorsal-fin ray	14.9	14.5
First anal-fin ray	8.1	8.1
Longest anal-fin ray	15.0	14.5
Caudal-fin length	24.0	broken
Pelvic-fin length	12.6	12.3

### Etymology

This species is named *crypticus* from the Greek *krypto* meaning hide or conceal, in reference to the concealment provided by the very mottled colour pattern.

### Remarks

*Aseraggodes crypticus* is presently known only from Christmas Island in the eastern Indian Ocean. The type series was first identified as *A. melanostictus* (Peters), a species described in 1877 from one specimen collected from 73 m off the island of Bougainville. Woods in Schultz et al. (1966) identified a specimen from the lagoon of Kwajalein Atoll in the Marshall Islands as *A. melanostictus*. However, Randall and Bartsch (2005) determined that it was a new species, which they named *A. heraldi*. They provided comparison with the holotype of *Solea melanosticta* (ZMB 9814, 72.5 mm SL) housed in the Museum für Naturkunde, Universität Humboldt in Berlin. Randall (2005) provisionally identified a sole in the Australian Museum, AMS I.24499-003, 86.5 mm SL, dredged in 115 m near North Reef, Great Barrier Reef (23°8'S, 152°12'E) as *A. melanostictus*.

*Aseraggodes crypticus* shares many features with the holotype of *A. melanostictus*. The meristic values are sufficiently similar to be expected within the range of *melanostictus* if a large series of the latter were available. Slight differences in proportional measurements could be related to the different size of the specimens, with those of *A. melanostictus* being much larger. Two characters that positively eliminate *A. crypticus* as specimens of *melanostictus* are the branched dorsal and anal rays (unbranched in *A. melanostictus*) and the absence of cirri along the edges of dorsal and anal rays (present in *A. melanostictus*).

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