

***Ammodytoides leptus*, a new species of sand lance
(Teleostei: Ammodytidae) from Pitcairn Island**

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Abstract.—*Ammodytoides leptus* is described from 23 specimens from Pitcairn Island. It has more lateral-line scales than any other known species of *Ammodytoides* or *Bleekeria* (119–123 vs. 88–118). It is thinner than *A. pylei*, *A. kimurai*, and *A. gilli* (body depth 8.6–9.5% SL vs. 9.5–11.7%).

During his expedition to the eastern South Pacific on board the schooner *Westward* (Randall 1978, 1999), the second author collected the first sand lance recorded from the South Seas at Pitcairn Island in January 1971. The purpose of this paper is to describe this sand lance and assess its relationships to other members of the genus *Ammodytoides* as defined by Ida et al. (1994), including two additional species described by Ida & Randall (1993) and Randall et al. (1994) and *A. gilli* redescribed by Collette & Robertson (2000).

Materials and Methods

Type specimens of the new species have been deposited in the Bernice P. Bishop Museum, Honolulu (BPBM), the National Museum of Natural History, Washington, D.C. (USNM), the Australian Museum, Sydney (AMS), the Museum of Comparative Zoology, Cambridge (MCZ), and the National Science Museum, Tokyo (NSMT). Institutional abbreviations for sources of comparative material follow Leviton et al. (1985). Measurements follow Ida and Randall (1993) and Randall et al. (1994). Generic nomenclature follows Ida et al. (1994). All proportions are presented as percent of standard length (SL).

Ammodytoides leptus, new species
Fig. 1

Ammodytes sp. Randall 1999:24 (an undescribed species from Pitcairn).

Diagnosis.—A species of *Ammodytoides* with dorsal-fin rays 50–53; anal-fin rays 24–25; pectoral-fin rays 16–17; pelvic fins absent; lateral line incomplete, pored lateral-line scales 114–118 + 4–6 unpored scales = 119–123; gill rakers on first arch (6–7) + (22–25) = 29–32; vertebrae (34–36) + (26–27) = 61–63, including hypural plate.

Description.—Body elongate, depth 8.6–9.5%, width 5.6–6.3%; head length 23.3–25.1%; snout length 6.7–7.3%; orbit diameter 4.1–4.5%; fleshy interorbital distance 3.5–3.7%; upper jaw length 7.8–8.6%; least caudal peduncle depth 4.7–5.1%; caudal peduncle length 6.6–8.3% SL; predorsal distance 24.0–28.5%; preanal distance 63.3–66.2%; caudal-fin length 13.6–14.5%; caudal fin concavity 6.3–7.1%; pectoral-fin length 9.0–10.1% (Table 1).

Scales small, thin, and cycloid, arranged in straight diagonal rows; head naked, no row of small scales on upper part of opercle, scales extending anteriorly to supratemporal lateral-line canal; about 10–12 rows of predorsal scales; fins naked except caudal fin, which has scales extending about

Table 1.—Proportional measurements of type specimens of *Ammodytoides leptus* expressed in percent of standard length.

	Holotype				Paratypes				
Standard length (mm)	96.2	89.1	86.9	86.4	85.3	82.9	81.3	79.8	75.8
Body depth	8.6	9.2	9.5	9.3	9.0	8.8	8.7	8.9	9.0
Body width	6.2	5.8	6.3	6.1	5.6	5.6	6.0	5.6	5.9
Head length	23.3	24.8	24.4	24.1	24.2	24.6	24.6	24.4	25.1
Snout length	6.8	6.7	7.0	7.1	6.9	7.0	7.0	7.0	7.3
Orbit diameter	4.2	4.2	4.1	4.1	4.1	4.1	4.2	4.4	4.5
Interorbital space	3.7	3.7	3.7	3.7	3.6	3.7	3.7	3.5	3.7
Upper jaw length	7.8	8.0	7.9	8.1	7.9	8.2	8.2	8.0	8.6
Caudal peduncle depth	4.7	4.7	4.7	4.9	4.9	4.8	4.8	5.0	5.1
Caudal peduncle length	8.3	7.4	—	6.9	6.8	6.6	6.8	6.8	6.9
Predorsal length	26.2	24.0	24.7	24.3	28.5	25.2	24.7	24.4	24.1
Preanal length	65.7	65.7	66.2	66.2	63.3	65.1	65.7	65.8	65.0
Caudal fin length	14.4	13.6	13.7	13.9	14.2	14.5	13.7	13.5	14.1
Caudal concavity	7.1	6.7	6.7	6.8	6.6	6.6	6.3	6.8	—
Pectoral fin length	10.1	9.5	9.5	9.6	9.0	9.4	9.6	9.3	9.8

three-fourths distance to posterior margin; lateral line high on body, ascending from gill opening to three scales below origin of dorsal fin, passing posteriorly parallel to upper edge of body, pored scales ending high on body, about 4–6 scales from caudal-fin base. Suborbital lateral-line canal interrupted, with four preorbital and four postorbital pores (as in *A. pylei*; Randall et al., 1994: fig. 2A).

In life, dorsum grayish green, sides silvery and ventrum iridescent; fins hyaline, caudal yellowish. Specimens brown in preservative.

Comparisons.—*Ammodytoides leptus* has more lateral-line scales than any other known species of *Ammodytoides* or *Bleekeria* (119–123 vs. 88–118). It is thinner

than *A. pylei*, *A. kimurai*, and *A. gilli* (body depth 8.6–9.5% vs. 9.5–11.7%, Table 2). It resembles *A. gilli* and differs from *A. pylei* and *A. kimurai* in several morphometric characters, larger eye (4.1–5.1% vs. 2.8–3.7%), longer upper jaw (7.8–9.5% vs. 6.6–7.9%), longer predorsal distance (24.0–28.5% vs. 21.8–24.7%), and longer caudal fin (12.8–16.0% vs. 10.5–12.9%). There is no row of small scales on upper part of opercle as in *A. pylei* (Randall et al., 1994).

Ecology.—The series of ten types was collected from a school of about 25 individuals seen over sand with high ripple marks. Schools were fast swimming and exhibited rapid changes in direction, all fish in perfect unison. When frightened, as by a spear shot into the school, a few dove into



Fig. 1. *Ammodytoides leptus*. Paratype, USNM 360077, 86.9 mm SL, Pitcairn Island, off Gudgeon Point; 20 Jan 1971. Photo by J. E. Randall.

Table 2.—Morphometric comparison of four species of *Ammodytoides* expressed in percent of standard length. (Data for *A. kimurai* from Ida & Randall 1993; for *A. pylei* from Randall et al. 1993; and for *A. gilli* from Collette & Robertson 2000).

	<i>A. leptus</i>		<i>A. kimurai</i>		<i>A. pylei</i>		<i>A. gilli</i>	
	Min	Max	Min	Max	Min	Max	Min	Max
Standard length (mm)	75.8	96.2	99.4	121	93.2	168	51.6	84.5
Body depth	8.6	9.5	10.0	10.3	10.0	11.7	9.5	11.2
Body width	5.6	6.3	8.1	8.4	7.2	9.5	5.9	7.8
Head length	23.3	25.1	22.2	23.6	22.0	24.6	25.4	27.8
Snout length	6.7	7.3	6.7	7.5	6.4	7.0	6.9	7.9
Orbit diameter	4.1	4.5	2.8	3.3	2.9	3.7	4.1	5.1
Interorbital space	3.5	3.7	4.1	4.6	3.5	4.1	3.8	4.9
Upper jaw length	7.8	8.6	7.6	7.9	6.6	7.9	7.8	9.5
Caudal peduncle depth	4.7	5.1	4.0	5.0	4.5	5.2	4.8	5.4
Caudal peduncle length	6.6	8.3	8.4	9.8	10.6	12.0	3.6	6.0
Predorsal length	24.0	28.5	23.1	24.2	21.8	24.7	25.1	26.9
Preanal length	63.3	66.2	61.3	65.3	63.8	66.8	62.5	65.3
Caudal fin length	13.6	14.5	11.5	12.9	10.5	12.0	12.8	16.0
Caudal concavity	6.3	7.1	6.1	7.3	5.3	5.8	6.3	7.8
Pectoral fin length	9.0	10.1	9.1	9.5	8.4	9.2	9.9	11.1
N	9		6		10		10	

the sand. A larger school (about 100 individuals) was observed in 30 m around an offshore rock in the same general area. *Ammodytoides leptus* is eaten by larger pelagic fishes such as the jack, *Carangoides ferdau*, as are other species of *Ammodytoides*.

Etymology.—Named *leptus* because it is thinner than other species of *Ammodytoides*.

Distribution.—*Ammodytoides leptus* is presently known only from Pitcairn Island.

Discussion.—*Ammodytoides leptus*, as well as two additional species recently described by Ida & Randall (1993) and Randall et al. (1994), fits the definition of the genus as given by Ida et al. (1994) and differs from species of *Bleekeria* in the following characters: no teeth in jaws; infraorbital canal interrupted; lateral line ending high on caudal peduncle instead of curving downward and continuing onto caudal fin base; two predorsal bones present; olfactory rosettes absent; neural and haemal spines on four posterior caudal vertebrae expanded and flattened; dorsal-fin rays 51–53 (three more than the previously recorded range for the genus), and anal-fin rays 21–25.

In addition to *Ammodytoides leptus*,

known species of the genus include the type-species, *A. vagus* (McCulloch & Waite, 1916) from Lord Howe Island and New South Wales; *A. renniei* (Smith, 1957) from South Africa, Seychelles Islands, and the Chagos Archipelago (Winterbottom et al. 1989, Winterbottom & Anderson 1999); *A. kimurai* Ida & Randall, 1993 from the Ogasawara Islands; *A. pylei* Randall et al., 1994 from the Hawaiian Islands; and *A. gilli* (Bean, 1895) from the eastern tropical Pacific (Collette & Robertson 2000).

Material examined.—23 specimens (71.4–127 mm SL) from 3 original lots from Pitcairn Island. Holotype USNM 360076 (1, 96.2), off Gudgeon Harbor, 10.5 m, rotenone; J. E. Randall and D. B. Cannon; 20 Jan 1971. Paratypes BPBM 16949 (2, 79.8–89.1), MCZ 157036 (1, 81.3), AMS I.39856-001 (1, 82.9), NSMT-P 59154 (1, 86.4), USNM 360077 (3, 75.8–86.9), and USNM 360078 (1, 89.8, cleared and stained), same data as holotype. BPBM 16441 (1, 83.3), dredge haul 2, 48–54 fms; 16 Oct 1967. Additional material examined but not designated as types due to their poor condition: BPBM 1660 (12, 71.4–127), off W. Harbour, stomach of *Carangoides fer-*

dau, 50 ft, J. E. Randall and S. Christian; 27 Dec. 1970.

Comparative material examined: *Ammodytoides kimurai* Ida & Randall, 1993. Paratype. USNM 324610 (1, 121), Japan, Ogasawara Islands, off Minami-shima, 15 m; H. Ida & R. L. Pyle; 1 Jun 1992.

Ammodytoides pylei Randall, Ida, and Earle, 1994. Paratype. USNM 316514 (1, 137), Hawaiian Islands, Oahu, Kahe Point; R. L. Pyle, A. Y. Suzumoto, J. B. Culp; 19 May 1989.

Ammodytoides renniei (Smith, 1957). RUSI 8440 (1, 56.4), Seychelles Islands, 3°57'S, 54°32'E; 25 Jul 1978. ROM 41487 (1, 60.7), Chagos Archipelago, Peros Banhos Atoll, Isle du Coin, 5°25'21"S, 71°46'52"E; 6 Feb 1979; R. Winterbottom.

Ammodytoides vagus (McCulloch & Waite, 1916). Holotype. AMS I-9272 (143 mm SL), Lord Howe Island.

Bleekeria mitsukurii Jordan & Evermann, 1903. USNM 59599 (2, 78.5–151), Japan, Kochi; H. M. Smith. UW 21253 (2, 91.6–107), Taiwan.

Bleekeria viridianguilla (Fowler, 1931). Paratypes. ANSP 53462-5 (4, 116–137), Hong Kong; 1930; G. A. C. Herklots.

Protammodytes sarisa (Robins & Böhlke, 1970). Holotype ANSP 113091 (115 mm SL) and paratype ANSP 113092 (99.2), Windward Islands, off east coast of St. Vincent; 13°11'12"N, 61°05'18"W; 187 m; Pillsbury sta. 874; 6 Jul 1969.

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