

New Record of the Annular Sole, *Synaptura annularis* (Soleidae, Pleuronectiformes) from Japan

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During a monthly survey of the ichthyofauna in Tosa Bay by the Toyohata Maru, a research vessel of the Usa Marine Biological Institute (Kochi University), a soleid flatfish with ring-like patches on the body was caught by the trawl net, on March 5, 1993. The specimen was later identified as *Synaptura annularis* (Fowler, 1933). This is the first record of the species from Japan.

Vertebral count and examination of teeth were based on radiographs. The holotype and a paratype of this species, deposited in the United States National Museum (Washington, D.C.), were re-examined to verify the presence of pectoral fins and to recount the number of pectoral and pelvic fin rays, and scales on the lateral line. Measurements are after Norman (1934) and Ochiai (1963). Institutional abbreviations follow Leviton et al. (1985).

***Synaptura annularis* (Fowler, 1933)
(New Japanese name: Wamon-ushinoshita)
(Fig. 1)**

Brachirus annularis Fowler, 1933: 346, fig. 99, China Sea, Vicinity of Formosa, (original-description).

Synaptura nebulosa Chen and Weng, 1965: 76-77, fig. 52, Tungkong.

Synaptura annularis: Shen and Lee, 1981: 35; fig. 11, Taiwan; Keith et al., 1985: 292-293, North-western Australia.

Material examined. BSKU (Department of Biology, Faculty of Science, Kochi University) 81384, 122 mm SL, 33°17.12'N, 133°40.20'E-33°16.00'N, 133°38.15'E, Tosa Bay, southern Japan, beam trawl, 151-154 m, March 5, 1993.

Diagnosis. An elongated sole with distinct, dark brown, annular patches on ocular side of body, including five large patches on margin of body. Body depth more than 2.5 in SL. Pectoral fins relatively small, with unbranched rays. Divergent grooves on scales immediately below lateral line 4-7. All fins brownish, black on tips.

Description. D 70; A 57; P₁ 9 on ocular side, 10 on blind side; P₂ 5 on both sides; C 18; SLL 100; SAL 32; SBL 35; V 43. Body depth 2.8 in SL; head length 6.1. Snout 4.3 in HL; snout to lower orbit 3.8; upper eye diameter 6.7; lower eye diameter 6.7; interorbital width 2.0; upper jaw 2.7 on ocular side, 4.0 on blind side; lower jaw 3.5 on ocular side, 4.9 on blind side; pectoral fin 5.6 on ocular side, 8.0 on blind side; pelvic fin 3.1 on ocular side, 3.6 on blind side; longest dorsal fin ray 2.0; longest anal fin ray 1.7; caudal fin 1.0.

Eyes on right side, widely separated by ctenoid

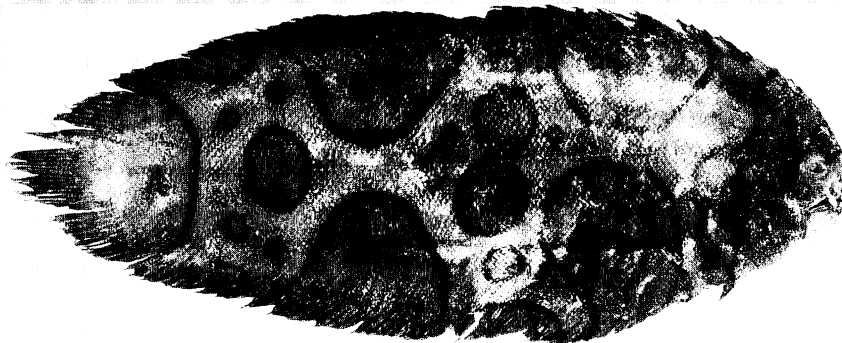


Fig. 1. *Synaptura annularis* from Tosa Bay, Japan, BSKU 81384, 122 mm SL.

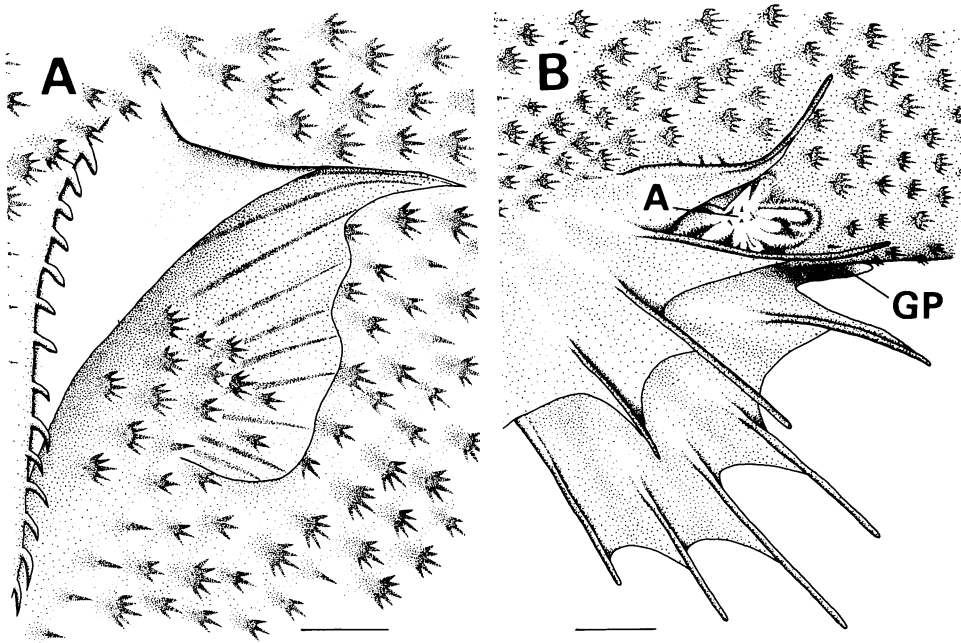


Fig. 2. Blind side view of pectoral and pelvic fins of *Synaptura annularis*, BSKU 81384. A) Pectoral fin base joining branchiostegal membrane and opercular margin with dermal papillae; B) lateral view of pelvic fins and ano-urogenital area. (A, anus; GP, genital papilla). Scale bars indicate 1 mm.

scales. Teeth small, conical, in bands on both jaws on blind side, absent on ocular side. Anterior nostril long, tubular, immediately above upper jaw, posterior nostril slit-like, covered by a flap in front of lower eye. A series of dermal papillae along opercular margin, brown on ocular side, white on blind side

(Fig. 2A). Lateral line straight, developed on both sides of body. Dorsal, anal and caudal fin rays branched; pectoral fin rays unbranched, upper base of pectoral fin joined with branchiostegal membrane, forming a pocket (Fig. 2A), the upper most ray longest. Pectoral fin on blind side vestigial. Caudal

Table 1. Features of *Synaptura annularis* as described by several authors from different localities

| Author | Fowler (1933) | | Chen and Weng (1965) | Shen and Lee (1981) | | Keith et al. (1985) | Present study |
|---------------------------|---------------------|---------------------|----------------------|---------------------|------------|---------------------|---------------|
| Locality | Philippines | | Tungkong | Tungkong | | Australia | Tosa Bay |
| | USNM 93095 holotype | USNM 93206 paratype | THUP 02768 | NTUM 05173 | THUP 02768 | AMS 462014 | BSKU 81384 |
| Body length (mm) | 151 | — | 137 SL | 139 SL | 137 SL | 130 TL | 122 SL |
| Dorsal fin rays | 70 | — | 71 | 70 | 71 | — | 70 |
| Anal fin rays | 57 | — | 59 | 57 | 59 | — | 57 |
| Pectoral fin rays | 9–8 | 9–9 | 6–6 | 6–7 | 6–7 | short | 9–10 |
| Pelvic fin rays | 5–5 | 5–5 | 5–5 | 5–5 | 5–5 | — | 5–5 |
| Caudal fin rays | — | — | 18 | 18 | 18 | — | 18 |
| Lateral line scales | 104 | 105 | 85 | 85 | 89 | — | 100 |
| Scales above lateral line | 29 | — | — | — | — | — | 32 |
| Scales below lateral line | 37 | — | — | — | — | — | 35 |
| Vertebrae | — | — | — | 42 | — | — | 43 |
| Large annular patches | 7 | — | 5 | 5 | — | 6–7 | 6 |

fin rounded, confluent with dorsal and anal fins. Pelvic fins symmetrical, anterior limit at the same level on both sides, posterior limit ending near anus, posterior limit on blind side with a finger-like process (genital papilla) (Fig. 2B). All fin bases scaled.

Scales ctenoid on both sides. Scales on middle of body with 7–9 ctenii on apical margin, 4–7 divergent grooves on basal area.

Five large, deep colored patches on ocular side of body, each outlined by a dark brown ring. Two large patches on dorsal margin and ventral margin of body. One large patch on tail and posterior region of body. Several smaller blotches scattered among larger patches. Small annular patches between larger ones on dorsal and anal fins. Distinct band-like patch on head, covering opercular area just posterior to eyes.

Remarks. This species was earlier described as *Brachirus annularis* by Fowler (1933) and subsequently as *Synaptura nebulosa* by Chen and Weng (1965). In his original description, Fowler noted that this species has no pectoral fin on the blind side, 3 pelvic fin rays on the blind side and 77 scales on the lateral line (SLL). In our specimen, however, the pectoral fins are visible, with 9 rays on the ocular and 10 on the blind sides. Moreover, the present specimen has 5 pelvic fin rays on both sides and 100 SLL. Dr. Kunio Sasaki, while visiting the United States National Museum, re-examined the holotype of *S. annularis*, USNM 93095 and one paratype, USNM 93206. He noted 9 pectoral fin rays on the ocular side and 8 rays on the blind side of the holotype. The paratype had 9 pectoral fin rays on both sides of the body. Dr. Sasaki also noted that the holotype and paratype have 5 pelvic rays on both sides and that the number of SLL on the holotype is 104 while it is 105 on the paratype. Therefore, it is concluded that the absence of a pectoral fin on the blind side, the number of fin rays on the pectoral and pelvic fins, and the number of SLL in the original description of Fowler (1933) are erroneous. Moreover, the present specimen agrees with the descriptions of Chen and Weng (1965), Shen and Lee (1981) and Keith et al. (1985) in having the blind side pectoral fin, 5 pelvic fin rays on both sides and the large annular patches but disagrees for the number of pectoral fin rays and

the number of scales on the lateral line. Judging from the results of the re-examination of the holotype and paratype (Table 1), it becomes possible that Chen and Weng (1965), and Shen and Lee (1981), might have miscounted the numbers of SLL and pectoral fin rays on their specimens.

S. annularis is distinguished from other congeneric species by the large annular patches on the body, unbranched pectoral fin, more elongated body and 4–7 divergent grooves on scales. This specimen represents the first record of an annular sole, *Synaptura annularis* from Japan. The species is distributed in north-western Australia, the Philippines and adjacent seas, the surrounding waters of Taiwan, and the China Sea.

Acknowledgment

We wish to thank all the crew and captain of R/V Toyohata Maru, for their kind assistance in collecting the specimen. We are also grateful to Dr. Kunio Sasaki for the re-examination of the holotype and paratype of *Synaptura annularis*.

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日本初記録のササウシノシタ科魚類, ワモンウシノシタ
(新称)

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ササウシノシタ科魚類, ワモンウシノシタ *Synaptura annularis* が1993年3月に, 高知大学調査船「豊旗丸」のビームトロールによって土佐湾の水深150mの砂泥底から採集された。本種は左右の胸鰭があり, 尾鰭が背鰭及び臀鰭と鰭膜で連なること, 有眼側に横帯がないことで明らかに *Synaptura* ミナシマウシノシタ属に属する。また, 体が細長く, 有眼側に大きな6個の輪状

斑があること, 胸鰭が小さく, その上部が鰓条膜とつながること, 胸鰭条が分枝しないこと及び鱗基部の放射状溝条が4-7本であることによって特徴づけられる。なお, 本種はオーストラリアからフィリピン諸島を経て台湾までの分布が知られており, 日本からの報告はこれが初めてである。

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