Japanese Journal of Ichthyology
Vol. 33, No. 4 1987

魚類学雑誌
33巻4号 1987年

The Occurrence of the Japanese Wrasse, *Stethojulis maculata* (Labridae), in Fiji

Richard Winterbottom
and Mary Burridge-Smith

(Received May 13, 1986)

Stethojulis maculata Schmidt is regarded as a species endemic to the Ryukyu and Izu Islands and Tanabe Bay on Honshu (Masuda *et al.*, 1984). The members of this genus are strongly dichromatic, with the terminal phase, as is typical in labrids, being male (Shepard and Randall, 1976).

During an ichthyological expedition to Fiji in 1983, the senior author collected 19 specimens of *S. maculata* in Suva harbour. Time constraints precluded photographing the fish in colour immediately after collection, and Fig. 1 is based on the preserved material. The description below follows the format used by Shepard and Randall (1976) in their redescription of the species.

Description. ROM 50580, 19 (23.0–74.7 mm SL). Fiji, Viti Levu, Suva Bay, reef-flat on SE corner of Nukulau Island, drainage channels and small bay with seagrass, sand, mud, shell and coral fragments, occasional pieces of *Acropora*, 0–1 m, rotenone, 1500–1700 hrs., 15 April 1983. Coll: R. Winterbottom, J. Payne and R. McKinnon. Dorsal IX, 11; anal III, 11 (three specimens with 10); pectoral rays 13 (one specimen with 14 both left and right fins); lateral-line scales 26 plus one beyond end of hypural plate (one specimen with 25); gill rakers, including all rudiments, 22–27 ($\bar{x}$=23.9), with 23 at 23 mm SL, 25–27 at 29–36 mm SL, and 22–24 at sizes larger than this. One specimen, 71 mm SL, had 24 gill rakers of which 17 were ossified (Fig. 2). Body depth at pelvic-fin origin 3.1–4.0 in SL, with body deeper in smaller specimens (3.1–3.4 at 23–40 mm SL, all primary phase, and 3.6–4.0 at 59–75 mm SL, all terminal phase); body width at pectoral-fin base 1.9–2.0 in body depth in primary phase and 1.5–1.7 in terminal phase; head length 2.6–2.8 in SL for primary phase, 2.8–3.0 for terminal phase; snout length 2.6–3.3 in head length; eye diameter 3.9–6.2 in head length; peduncle depth in head length 2.2–2.6 in primary phase and 2.8–3.5 in terminal phase; ninth dorsal-fin spine 2.8–4.4 in head length; longest dorsal-fin ray 2.3–3.3 in head length; base of dorsal fin 1.7–2.1 in SL; third anal spine 2.8–5.5 in head length; longest anal ray 2.2–3.9 in head length; base of anal fin 3.2–3.9 in SL; caudal fin 1.0–1.8 in head length; pectoral fin in head length 1.7–1.9 in primary phase, 1.3–1.6 in terminal phase; pelvic fin 1.8–2.7 in head

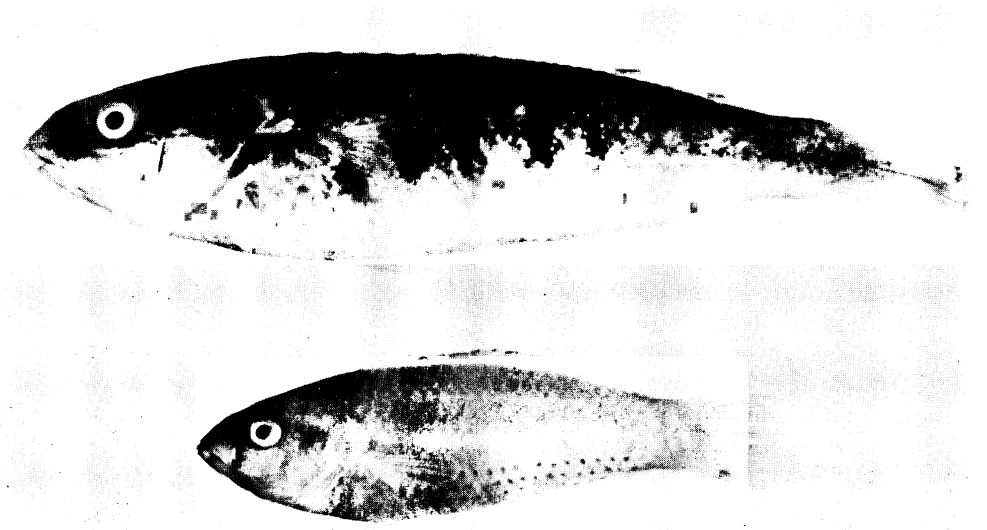

Fig. 1. Left lateral view of Fiji *Stethojulis maculata*, terminal phase (above, 69.4 mm SL) and primary phase (below, 40.4 mm SL). ROM 50580, preserved.

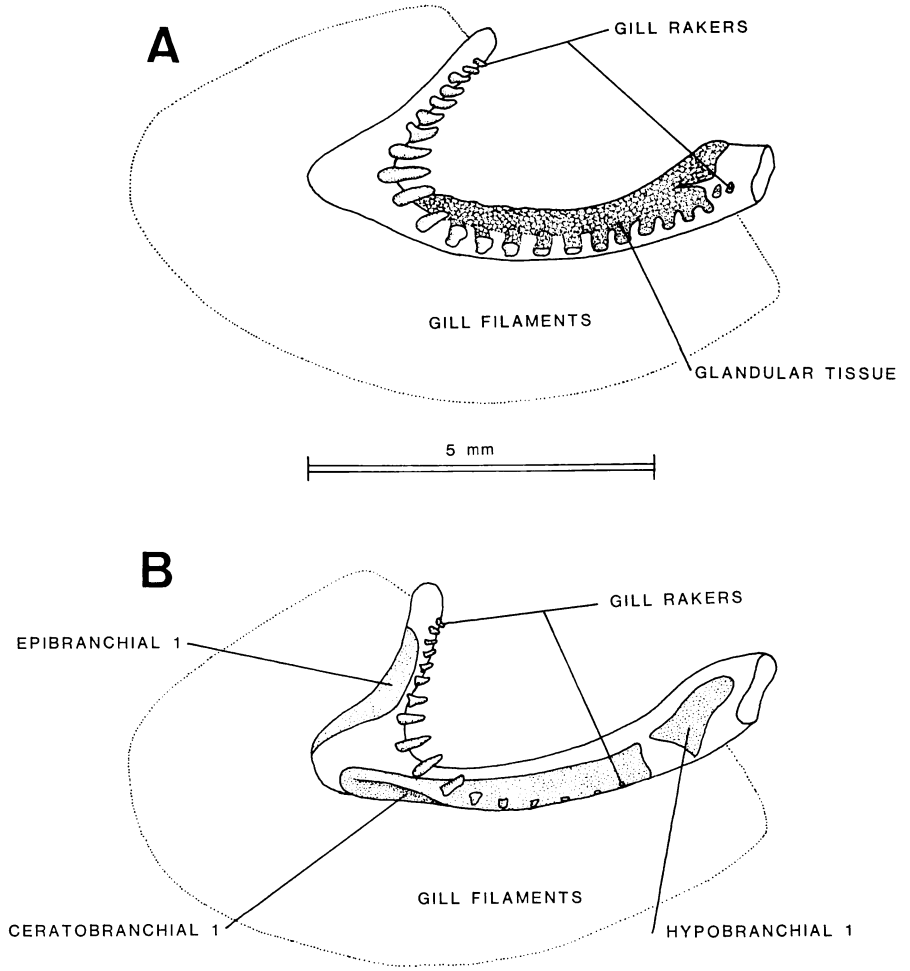

Fig. 2. *Stethojulis maculata*, ROM 50580, 70.9 mm SL (terminal phase). A, right first gill arch in anterolateral view showing gill rakers and glandular tissue. B, as for A, but cleared and stained to show ossified gill rakers.

length.

Colour of terminal phase in alcohol dark brown dorsally, fading to light brown or white ventrally, with five or six distinct, vertical, black bars laterally, first bar over pectoral-fin base and last bar beneath posterior region of soft dorsal fin. A white, eye-sized spot between upper edge of opercle and pectoral-fin base (partially hidden beneath opercular flap anteriorly). Three thin (one-third pupil width) brown lines on head, the first a horizontal line from upper lip below eye to opercle; the second passing horizontally from snout through nostrils to orbit, continuing behind eye along upper edge of opercle; the third from the dorsal margin of eye across nape to origin of dorsal fin and along its base. Some or all of these lines may be obscured by pigment. Fins pale, caudal fin slightly brown.

Colour of primary phase in alcohol light brown with several rows of dark, brown, half pupil-diameter sized spots just posterior to the focus of each scale ventrolaterally on body, beginning below pectoral fin, spots best developed on abdomen and above anal-fin base; a faint brown spot on the posteriormost lateral-line scale; a small brown spot mid-dorsally at the anterior margin of the snout; fins pale.

Discussion. We compared our specimens with two examples of *S. maculata* from Miyakejima, Japan (BPBM 19912, 19928), and could find no

significant differences other than the larger size of the latter specimens. The apparent difference between the Fiji and Japanese populations in gill raker counts (22–27 vs 19–23 respectively) undoubtedly arises from different methods of counting. We include all rudiments (see Fig. 2) in our counts. In many cases there are slight differences in the ranges for morphometric data—we do not believe these to be taxonomically significant.

Twelve of the 19 Fiji specimens are terminal phase males (59–75 mm SL). The seven primary phase fish are 23–40 mm SL. We have no explanation for this extraordinary ratio of terminal to primary phase fish. Unfortunately, the amount of time it took from collection to initial preservation in formalin resulted in the degradation of the internal organs to the point where we were unable to sex the primary phase fish. Clearly, however, the population in Suva harbour consists of considerably smaller-sized fish than the Japanese examples, where terminal males are 91–140 mm SL (Shepard and Randall, 1976). The large size of the Japanese fish may well be correlated with the lower sea temperatures, as discussed by the above authors. Shepard and Randall (1976) also report and figure a black spot at the rear base of the dorsal fin in a 32.5 mm SL juvenile, which was absent in their specimens greater than 36 mm SL. This spot was not seen in any of our specimens, six of which were shorter than 36 mm SL. In view of the significant difference in size of the terminal males, we suspect that smaller specimens than we collected of the Fiji population will be found to possess the spot.

The occurrence of *S. maculata* in Fiji could either reflect its natural distribution or be due to dispersal. Few, if any, other fish species are shared exclusively between Japan and Fiji, and thus evidence to support a faunal link hypothesis is lacking. In numerous reports of similar disjunct fish distribution patterns, the authors have tended to suggest transportation via ship's ballast tanks (e.g. Dawson, 1973 for the eleotridid *Prionobutis koilmatodon*; Hoese, 1973, for two speices of gobiids; Springer and Gomon, 1975, for the blenniid *Omobranchus punctatus*; Paxton and Hoese, 1985 for *Lateolabrax japonicus*). Additional circumstantial evidence favouring the latter view in the present case is that we only collected *S. maculata* in Suva harbour. It was not seen or collected at the other localities visited (Nairi, Gau, Great Astrolabe Reef, Yasawa Islands), nor did Dr. Springer collect specimens of this species during his 1982 expedition to Fiji (pers. comm.). These circumstances also tend to argue against an anti-equatorial distribution hypothesis. However, if our interpretation is correct, then this represents the first record of which we are aware of transportation by ballast tank for any coral reef fish that is not strongly associated with the substrate.

Acknowledgments

We are most grateful to Dr. Alan R. Emery, Frances and Tim Emery, Master Warrant Officer Ralph ('Reb') McKinnon, Master Corporal John Payne, Dr. Udey Raj and the Institute of Marine Resources, University of the South Pacific, and the Fisheries Division, Ministry of Primary Industries, especially Dr. Tony Lewis, for their support and assistance during the 1983 Fiji expedition. The hospitality and help of Dr. Paddy Ryan and Felicity Ryan was much appreciated. Dr. J. E. Randall (Bernice P. Bishop Museum, Honolulu; BPBM) kindly loaned us comparative material from Japan, and commented on the manuscript. This study was supported in part by NSERC Grant A7619 to the senior author.

Literature cited

Dawson, C. E. 1973. Occurrence of an exotic eleotrid fish in Panama with discussions of probable origin and mode of introduction. Copeia, 1973(1): 141–144.

Hoese, D. F. 1973. The introduction of the gobiid fishes *Acanthogobius flavimanus* and *Tridentiger trigonocephalus* into Australia. Koolewong, 2(3): 3–5.

Masuda. H., K. Amaoka, C. Araga, T. Uyeno and T. Yoshino, eds. 1984. The fishes of the Japanese Archipelago. Tokai Univeristy Press, Tokyo. 437 pp., 370 pls.

Paxton, J. R. and D. F. Hoese. 1985. The Japanese sea bass, *Lateolabrax japonicus* (Pisces, Percichthyidae), an apparent marine introduction into eastern Australia. Japan. J. Ichthyol., 31(4): 369–372.

Shepard, J. W. and J. E. Randall. 1976. Notes on the labrid fish *Stethojulis maculata* from Japan. Japan. J. Ichthyol., 23(3): 165–170.

Springer, V. G. and M. F. Gomon. 1975. Revision of the blenniid fish genus *Omobranchus* with descriptions

of three new species and notes on other species of the tribe Omobranchini. Smithson. Contr. Zool., (177): 1–135.

(Department of Ichthyology and Herpetology, Royal Ontario Museum, 100 Queen's Park, Toronto, Canada, M5S 2C6)

スミツキカミナリベラのフィジーからの記録

Richard Winterbottom·Mary Burridge-Smith

スミツキカミナリベラは日本固有種で，伊豆諸島から琉球列島にかけて分布している。フィジーのスヴァで魚類を調査中，本種を 19 個体採集した．これらの標本と日本産の標本を比べたところ，日本産の標本の方が体が大きかったが，他の多くの形質で両者に差はなかった．本種はフィジーの他の海域では発見できなかったので，船舶のバラストタンクに入って日本から運ばれた可能性もある．