

## Occurrence of the Stromateoid Fish

### *Ariomma brevimanus* in

#### Southern Japan

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On October 5, 1973, a considerable number of a stromateoid fish (1.8 tons in weight) was fecture, Kyushu. This fish was taken by a single-wing purse seine from the surface in an area of 80 m in depth around Aji-sone Bank (32°20'N, 129°30'E) in the early morning of October 5, 1973. Aji-sone Bank is located near the west Kyushu sea valley between Goto and Amakusa Islands, into which a branch of the warm Tsushima Current pours directly. An immature specimen was sent to the senior author. A detailed examination revealed that this fish could be ascribed to *Ariomma brevimanus* Klunzinger which was previously recorded only from Red Sea by a single specimen (Klunzinger, 1884). As this specimen is the second specimen to be recorded, the authors describe it here in detail.

In the examination of the specimen, the vertebrae were counted by means of X-ray photograph and the caudal skeleton was observed after alizarin treatment. The gonad was histologically examined.

#### *Ariomma brevimanus* Klunzinger

Minami-medai (New Japanese name)

*Ariomma brevimanus* Klunzinger, 1884; 164, Tafel XII-3.

SUF (Shimonoseki University of Fisheries) No. 7401011. An immature (Fig. 1), 488 mm in total length 393 mm in standard length, caught from the surface water around Aji-sone Bank (32°20'N, 129°30'E, 80 m in depth), off Amakusa Islands, by a single-wing purse seiner No. 3 Shotoku-maru\* (68.5 tons) at about 02:00 on October 5, 1973.

**Description** D. X-I, 15; A. II, 15; P<sub>1</sub>. 23; P<sub>2</sub>. I, 5; C. 9+8; L. 1. 53, Tr. 3/12; Branchiostegals 6; gill-rakers on first arch (right) 10+18=28; vertebrae 15+16=31.

Of standard length: head 25.5%, width at

upper pectoral base 16.2, greatest width (at middle of dorsal base) 17.8, depth at middle of dorsal base 28.3, distance from pelvic fin insertion to anal origin 34.7, distance from tip of snout to first dorsal origin 31.3, to second dorsal origin 60.2, to upper pectoral base 25.7, to vent 61.0, to anal origin 64.2, base of first dorsal 19.8, base of second dorsal 31.1, base of anal 27.1. Of head: snout 26.4%, eye diameter 22.9, maxillary 18.9, interorbital space 36.8, postorbital 49.3, depth of caudal peduncle 23.1, length of the same 27.7, longest spine of first dorsal 50.2, longest ray of second dorsal 26.6, longest anal ray 21.1, longest pectoral ray 58.8, longest pelvic ray 38.2, longest caudal ray 95.5, longest gill-lamella 17.1, longest gill-raker 7.1.

Body oblong, slightly compressed, rather resembles torpedo form, snout blunt anteriorly, a little longer than eye diameter. Eye large, a little less than 1/4 of head. Adipose tissues around eye well developed, with rather undeveloped eyelid. In formalin no adipose tissue on pupil. Nostrils located near tip of snout and close together. Mouth small, lower jaw projecting a little beyond the upper; premaxillary not protractile, its margin roundish; maxillary hidden under thick adipose tissue. Both jaws with several rows of slender, minute and comb-like teeth. Tongue thin anteriorly, thick posteriorly, with numerous minute and slender processes on the middle part.

Gill opening large, the gill membranes connected below, free from the isthmus. Gill-rakers slender with minute spines. Pseudobranchiae well developed. Opercles thin, without spines or processes.

Scales cycloid, very large, highly deciduous, covering the body, cheek, and occiput behind the vertical through posterior margin of eye. Forehead and snout naked. Lateral line high, concurrent with dorsal contour, curving upwards at caudal region.

First dorsal rather high, its origin vertical through origin of ventral; base of first dorsal a little shorter than head; the spines feeble, flexible; the third and fourth spines highest. Second dorsal low, a little more than one eye diameter apart from first dorsal; base of second dorsal longer than head; the first ray highest, and gently decreasing in height posteriorly (10.9% of head

\* Owner: Mr. Norio Fukagawa, Ushibuka City, Kumamoto Prefecture.



Fig. 1. *Ariomma brevimanus* Klunzinger from Kyushu, southern Japan, Cat. SUF No. 7401011, 488 mm in total length.

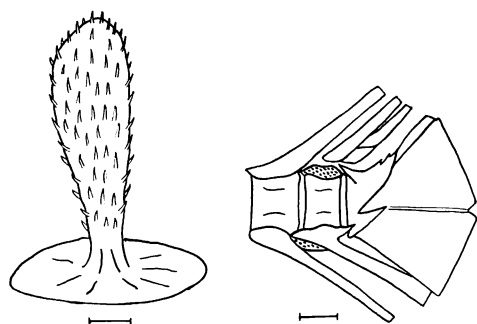


Fig. 2. Left: papilla in the esophagus (scale 1.0 mm). Right: caudal skeleton (scale 10.0 mm).

at middle of the base), but the last ray broad and long (20.8%). Anal fin low, its origin a little behind vertical through second dorsal; base of anal fin long, but shorter than that of second dorsal; the first ray highest (20.8% of head) and evenly decreasing in height posteriorly (12.8% of head at middle of the base); the last ray broad and long (20.8%), equal to the first. Fin membranes in the posterior half of second dorsal and anal connect the rays only basally, giving the appearance of finlets in mackerels. Caudal fin stiff, deeply forked; uppermost and lowermost 3 or 4 rays elongate. Pectoral fin low, its insertion below the posterior end of opercle, extending to anterior 2/3 of first dorsal base. Pelvic fin small, its insertion a little behind the posterior end of pectoral base, the fin rays also short, received in shallow groove on the belly.

Large esophagus internally provided with papillae bearing minute, slender teeth (Fig. 2); the papillae with broad, rounded base, its diameter subequal to its height. Peritoneum pale. Gonad undeveloped, threadlike; the histological preparation of the gonad indicated

to be inter-sex. Other organs were not fully observed due to improper preservation. Pores and canals of the cephalic lateral line in the snout region and on the lower jaw are not clear externally, because those are covered by the thick adipose tissues. Caudal skeleton represents 2 hypurals (upper and lower plates), 1 uroneural, 1 urostyle, and 3 epurals (Fig. 2). In 10% formalin, parts of thin, translucent opercles and cleithrum exposed.

When alive, dark blue on back, greyish white on belly, anal fin pale, other fins dark. In formalin general ground color deep brown; back of body and head, opercle and pharynx black; dorsal aspect of pectoral, and dorsal, pelvic and caudal dusky; anal pale.

The schooling behavior of the fish was stated to be similar to that of horse and jack mackerels. They were taken after being attracted from the 10 m layer to the surface by a lure lamp. According to the fishermen the schools of the present fish descended very quickly when the net was cast. The catch consisted only of the present species, and amounted to about 1.8 tons. The present specimen weighs 1.3 kg. If it was average in body weight, 1.8 tons therefore correspond to about 1400 specimens. The meat of the fish was said to be very delicious, similar to that of mullet.

Only a single catch of the fish in this area was informed to the authors. In this area during the first half of October, 1973, higher water temperatures compared with those of the last decade were observed; 25.7°C at the surface (average in 1964–1973 24.6°C), 24.4°C at 50 m layer (23.8°C) and 19.8°C at 100 m layer (19.4°C). The temperatures at the surface, 10, 20, and 30 m layers were recorded to be the highest in the decade (Unpublished data of the Kumamoto Prefectural Fisheries Experimental Station).

### Discussion

The present specimen is characterized by the esophagus with toothed papillae, two dorsal fins, fifteen soft rays both in dorsal and anal fins, slender caudal peduncle, large eye, well-developed adipose tissue around the eye, pale peritoneum, 31 vertebrae, large and deciduous scales, and 53 lateral line scale. These characters fit *Ariomma*, Ariommidae (Haedrich, 1967; Haedrich and Horn, 1972). Haedrich and Horn (1972) described six species referable to the genus *Ariomma* from the subtropical and tropical seas of both hemispheres, and presented the diagnostic key. On the combination of the characters mentioned above and geographical distribution the present specimen does not fall into any of these species. However, the present specimen agrees with the original description of *A. brevimanus* Klunzinger 1884, which was excluded from the list of the genus because no specimens have been known except for the single type specimen recorded from Red Sea (Haedrich and Horn, 1972). This is the second specimen of *A. brevimanus* ever recorded. *A. brevimanus* resembles *A. evermanni* Jordan and Snyder in having comparatively smaller eye (less than 28% of head) and poorly developed adipose eyelid, and in attaining a larger sized, more than 60 cm in body length, etc., but is clearly distinguishable from the latter in having many lateral line scales (more than 50 in *A. brevimanus*; less than 45 in *A. evermanni*; Klunzinger, 1884; Haedrich and Horn, 1972). A specimen, 387 mm in total length, which was identified as *A. lurida* by Abe (1954), is considered to be referable to *A. brevimanus*, because it has the smaller eye (24% in left and 22% in right of head), pelvic fins nearly as long as pectorals, 24 rays in pectorals, poorly developed adipose eyelid, and about 50 lateral line scales. The present specimen differs from the holotype (80 cm in body length, Klunzinger, 1884: Tafel XII-3) in body shape, which is rather slender. The difference in body shape may be attributed to the developmental stage. The toothed papillae in the esophagus of *A. brevimanus* resemble to those in *A. lurida* (Katayama, 1952: Fig. 2, C), and differ little from those in *A. nigriargentea* (Haedrich, 1967: Fig. 50, C) in having larger teeth. The caudal skeleton observed in the present speci-

men is remarkably simple as compared with that of 28-mm specimen of *Ariomma* sp. (Haedrich, 1967: Fig. 33).

Adults of all the species of *Ariomma* are bottom or near-bottom dwellers in deep water in tropical and subtropical waters. All large specimens reported have been taken by bottom trawlers, usually at depths deeper than 100 m (Haedrich, 1967; Horn, 1972). During juvenile stages, however, they seem to be pelagic for they occur in surface collections. The present species was observed, like other species of *Ariomma*, to form school. The unusual occurrence of the fish may be explained by the prominent prevalence of warm waters into this area.

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#### 天草で発見されたミナミメダイ (新称)

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1973 年 10 月 5 日の早朝に、九州天草沖合の通称鰻曾根において、片手巾着網によって、約 1.8 トンのミナミメダイが漁獲された。調査個体は全長 488 mm の未成魚で、食道が大きく、内壁には微細な歯を持つ突起がある。眼は大きく、その周囲には脂肪組織が発達する。背鰭は 2 つで、背、尻鰭の軟条は共に 15、側線鱗は 53。この個体は、1884 年に紅海でとれた標本にもとづいて本種の記載がなされて以来、記録された 2 番目の個体である。この属の魚類は熱帯、亜熱帯の深海で群を形成していることが知られている。今回、この海域に大量に出現したことは、この時期の水温が平年に比して著しく高かったことに関連があると思われる。

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