

## Fishes Washed Up on Beaches in Chichi-jima, Ogasawara Islands

By

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**Abstract** Fifty-two species of fishes were found washed up on beaches in Chichi-jima, Ogasawara Islands, in the winter months of 1991 and 1992. An annotated list of collected specimens is given. The serranid fish *Grammatonotus macrophthalmus*, hitherto known only from the type specimens, is reported and another serranid, *Liopropoma pallidum*, is recorded for the first time from Japan. Full descriptions are given for these species and a few other interesting species. Mass stranding of the filefish *Thamnaconus tessellatus* was observed in November and December in 1991.

The Ogasawara Islands are located 1,000 km south of Tokyo and composed of many small rocky islands. The coasts of the islands consist mainly of rocky reefs with sandy beaches. Although there are corals in the coastal waters of the islands, the coral reefs are poorly developed when compared to those of the Ryukyu Islands and other tropical Pacific islands. The fish fauna of the Ogasawaras has been studied and compiled by ZAMA and FUJITA (1977) and ZAMA and YASUDA (1979), with 681 species belonging to 132 families being recorded. RANDALL and his colleagues have prepared a checklist of shallow water fishes (RANDALL *et al.*, MS) of the Ogasawaras, including several new species (RANDALL & EARLE, 1993; IDA & RANDALL, 1993; RANDALL & IDA, 1993).

In winter months of 1991 and 1992, the junior author and his colleagues collected fishes washed up on beaches in Chichi-jima (Fig. 1), one of the Ogasawara Islands. The collection includes several interesting species, such as *Liopropoma pallidum* (FOWLER) and *Grammatonotus macrophthalmus* KATAYAMA, YAMAMOTO et YAMAKAWA; the former is recorded for the first time from Japan, and the latter has been represented only by the type specimens. In the following pages a list of the stranded fishes is given with annotations.

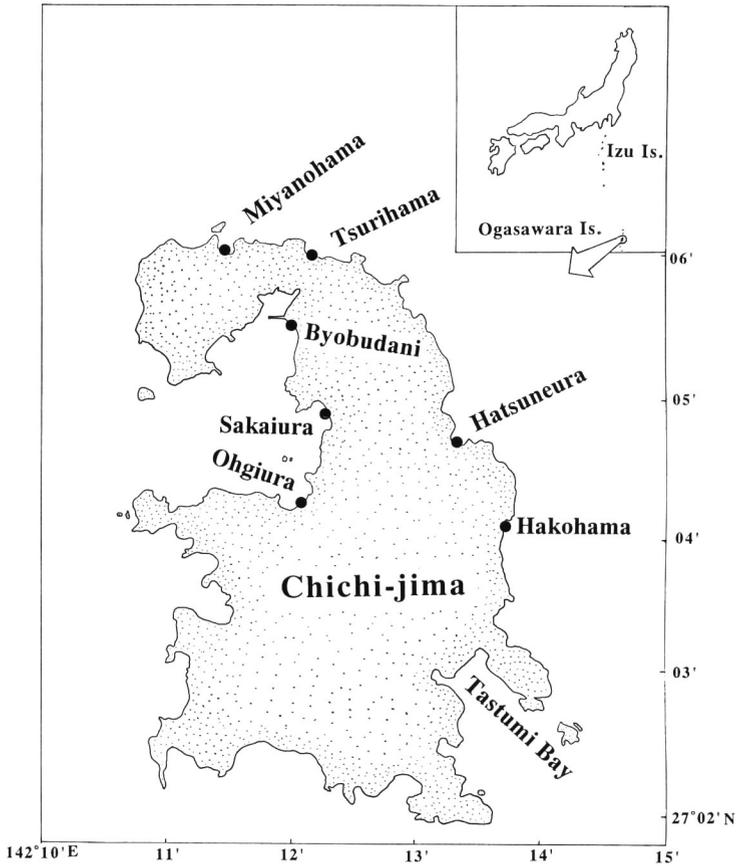


Fig. 1. Map showing localities in Chichi-jima where the specimens were collected.

### Methods

Methods of counting and measuring follow those of HUBBS and LAGLER (1947) unless otherwise stated. Caudal-fin length is measured from the mid-caudal base to the tip of middle caudal-fin ray. Length of caudal peduncle is measured from the end of anal-fin base to the mid-caudal-fin base. Lengths of specimens are standard length (SL) unless otherwise specified. Length is recorded to tenths of mm only for sizes under 100 mm. The specimens are deposited at the Department of Zoology, National Science Museum (NSMT). Species are shown in alphabetical order by family, genus and species. Although records of weather and water temperature were examined to see if stranding of fishes was related with particular conditions of weather or water temperature, no significant relationships were found.

## Acanthuridae

*Acanthurus triostegus* (LINNAEUS, 1758)

*Specimens examined.* NSMT-P 35288, 129 mm SL, Miyanohama beach, 20 Dec. 1992; NSMT-P 45389, 91.8 mm SL, Ohgiura beach, 9 Feb. 1992.

*Naso unicornis* (FORSSKÅL, 1775)

*Specimen examined.* NSMT-P 35269, 346 mm SL, Ohgiura beach, 2 Mar. 1992.

## Antigonidae

*Antigonia rubicunda* OGILBY, 1910

*Specimen examined.* NSMT-P 35097, 63.9 mm SL, Miyanohama beach, 25 Nov. 1991.

*Description.* Dorsal-fin rays IX, 27; anal-fin rays III, 25; pectoral-fin rays 14.

Proportional measurements: body depth 70.7% SL; head length 36.8% SL; snout length 11.3% SL; snout to dorsal-fin origin 57.1% SL; snout to anal-fin origin 68.1% SL; orbit diameter 17.2% SL; interorbital width 11.6% SL; postorbial length 11.4% SL; upper jaw length 9.7% SL; longest dorsal-fin spine 24.7% SL; longest anal-fin spine 11.7% SL; longest pectoral-fin ray 25.7% SL; pelvic-fin spine 22.5% SL; longest pelvic-fin ray 15.6% SL; length of dorsal-fin base 49.1% SL; length of anal-fin base 44.4% SL; caudal peduncle depth 12.1% SL; caudal peduncle length 10.0% SL.

Body rhomboidal, strongly compressed, very deep, the depth 1.4 in SL. Dorsal profile of head almost straight, very slightly concave above anterior edge of orbit; interorbital space convex. Mouth terminal, small, upper jaw length 3.8 in head length; maxilla ending at a vertical through anterior edge of orbit. Jaws with a band of villiform teeth. Preopercle and opercle margins finely serrated. Scales on body ctenoid. Dorsal fin originating above pectoral-fin base; the first dorsal spine minute, the third longest. Anal-fin origin located below middle of soft portion of dorsal fin. Soft rays of dorsal and anal fins missing except for proximal parts. Pectoral fin relatively long, extending posteriorly beyond a vertical through end of pelvic-fin base. Pelvic-fin spine long and stout, reaching the second spine of anal fin. Posterior part of caudal fin missing. Caudal peduncle short, slightly tapering, deeper than long.

Color in alcohol: Body pale; silver peritoneum visible externally.

*Remarks.* *Antigonia rubicunda* was recorded for the first time from Japan by MACHIDA (1985) on the basis of 20 specimens collected at depths of 182–250 m from the Okinawa Trough. It has been recorded from Kai Island in the Banda Sea, the Arafura Sea, New Zealand and Queensland (FRASER-BRUNNER, 1950). The washed-up specimen remains in relatively good condition. Although most of the distal part of the soft dorsal and anal-fin rays are missing, the proximal part provided the counts

of 27 dorsal-fin rays and 25 anal-fin rays which separate *A. rubicunda* from the closest congener *A. capros* which has higher fin ray counts (32–35 dorsal and 32–35 anal).

Apogonidae

*Apogon bandanensis* BLEEKER, 1854

*Specimens examined.* NSMT-P 35300, 65.0 mm SL, Byobudani beach, 31 Jan. 1992; NSMT-P 35301, 64.2 mm SL, same as preceding, 2 Feb. 1992.

*Apogon taeniophorus* REGAN, 1908

[New Japanese name: Misuji-tenjikudai]

(Fig. 2)

*Specimen examined.* NSMT-P 35302, 60.8 mm SL, Ohgiura beach, 30 Dec. 1991.

*Description.* Dorsal-fin rays VII–I, 10; anal-fin rays II, 10; pectoral-fin rays 14; lateral-line scales 23; gill rakers 5+13.

Proportional measurements: body depth 35.0% SL; body width 17.8% SL; head length 38.3% SL; snout length 11.0% SL; snout to spinous dorsal-fin origin 44.2% SL; snout to anal-fin origin 66.4% SL; orbit diameter 15.0% SL; interorbital width 8.4% SL; postorbital length 16.8% SL; upper jaw length 20.9% SL; longest dorsal-fin spine 21.9% SL; longest dorsal-fin ray 27.8% SL; longest anal-fin spine 14.8% SL; longest anal-fin ray 23.5% SL; longest pectoral-fin ray 21.9% SL; pelvic-fin spine 13.5% SL; longest pelvic-fin ray 21.9% SL; caudal fin 32.6% SL; length of soft dorsal-fin base 15.6% SL; length of anal-fin base 13.2% SL; caudal peduncle depth 13.2% SL; caudal peduncle length 27.6% SL.

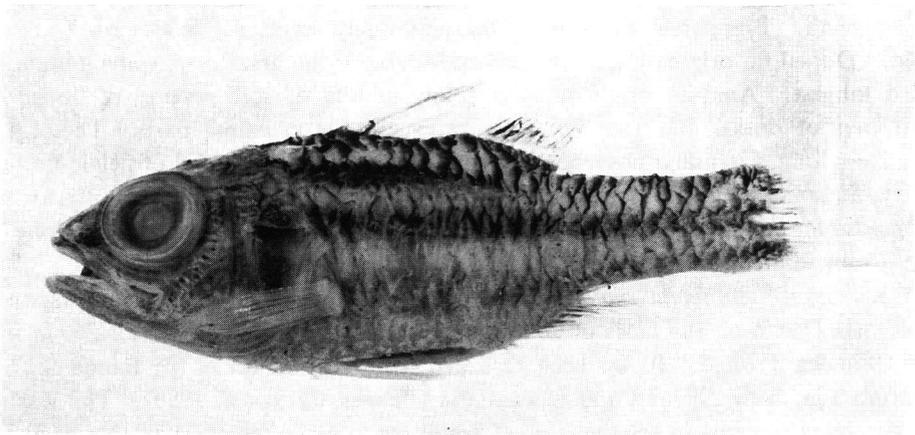


Fig. 2. *Apogon taeniophorus*, NSMT-P 35302, 60.8 mm SL, Ohgiura beach, Chichi-jima.

Body compressed, relatively long, the depth 2.9 in SL. Dorsal profile of head gently arched. Mouth terminal, oblique; maxilla reaching a vertical through posterior half of pupil. Jaws with a band of villiform teeth; a V-shaped band of villiform teeth on vomer; a long, narrow band on palatine. Nostrils of each side distinctly separated. Preopercular margin finely serrated. All scales missing. Two dorsal fins, clearly separated; origin of spinous dorsal fin just above pectoral-fin base; soft dorsal-fin origin slightly anterior to anal-fin origin. Pectoral fin relatively long, reaching a vertical through middle portion of soft dorsal fin. Pelvic fin insertion slightly anterior to pectoral-fin base; pelvic fin reaching slightly beyond anus. Caudal fin slightly damaged, posterior part missing. Caudal peduncle relatively long, its length 1.4 in head length.

Color in alcohol: Ground color of body pale brown with 4 dark stripes; first narrow, running from middorsal part of nape along dorsal-fin base to end of soft dorsal-fin base; second starting from dorsal rim of orbit, passing on dorsal side of body, meeting with the first at end of soft dorsal-fin base, ending upper caudal-fin base; third wide, running from snout along mid-body to mid-caudal-fin base; fourth beginning from cheek, running posteriorly to lower caudal-fin base; basal parts of soft dorsal and anal fins dark, other fins pale.

*Remarks.* *Apogon taeniophorus* is similar to *A. angustus*, *A. cookii*, and *A. nigrofasciatus* in color. RANDALL and LACHNER (1986) separated *A. taeniophorus* from these closely related species: *Apogon angustus* differs from *A. taeniophorus* by having higher counts of gill rakers (19–22 vs. 17–19) and the elongate last anal-fin ray making the distal margin of the fin concave (vs. no elongate last ray, the distal fin margin straight); *A. cookii* differs from *A. taeniophorus* by having usually 15 pectoral-fin rays (vs. usually 14 rays) and a distinct dark spot at the caudal-fin base; and *A. nigrofasciatus* differs from *A. taeniophorus* by having higher counts of gill rakers (20–24 vs. 17–19), and a distinct dark spot at the caudal-fin base. Because the color of the specimen was slightly worn off before it was found on the beach, it is difficult to tell if it had a distinct dark spot at the caudal-fin base. However, the combination of 14 pectoral-fin rays, 18 gill rakers, and the usual anal-fin shape shows that it is *A. taeniophorus*.

*Apogon taeniophorus* is widely distributed in the tropical regions of the Indo-west Pacific from the Red Sea eastward to the Line Islands (RANDALL & LACHNER, 1986). Although MYERS (1989) included southern Japan in the distribution of *A. taeniophorus*, he did not give details about records in Japan.

*Cheilodipterus quinquelineatus* CUVIER, 1828

*Specimen examined.* NSMT-P 35273, 61.3 mm SL, Byobudani beach, 11 Mar. 1992.

***Fowleria variegata*** (VALENCIENNES, 1832)

*Specimens examined.* NSMT-P 35303, 61.3 mm SL, Byobudani beach, 7 Feb. 1992; NSMT-P 35304, 39.6 mm SL, same as preceding.

## Balistidae

***Canthidermis maculata*** (BLOCH, 1786)

*Specimen examined.* NSMT-P 35271, 85.8 mm SL, Miyanohama beach, 27 Feb. 1992.

## Blenniidae

***Istiblennius edentulus*** (FORSTER, 1801)

*Specimen examined.* NSMT-P 45388, 140 mm SL, Byobudani beach, 2 Feb. 1992.

## Chaetodontidae

***Chaetodon guentheri*** AHL, 1913

*Specimen examined.* NSMT-P 35293, 128 mm SL, Tsurihama beach, 19 Jan. 1992.

## Dactylopteridae

***Dactyloptena orientalis*** (CUVIER, 1829)

*Specimen examined.* NSMT-P 35287, 241 mm SL, Byobudani beach, 24 Jan. 1992.

## Diodontidae

***Diodon holocanthus*** LINNAEUS, 1758

*Specimen examined.* NSMT-P 35496, 149 mm SL, Hakohama beach, 29 Jan. 1991.

## Fistulariidae

***Fistularia commersonii*** RÜPPELL, 1838

*Specimen examined.* NSMT-P 35267, 594 mm SL, Ohgiura beach, 28 Feb. 1992.

## Holocentridae

*Myripristis berndti* (JORDAN et EVERMANN, 1903)

*Specimen examined.* NSMT-P 45383, 120 mm SL, Byobudani beach, 8 Feb. 1992.

*Neoniphon sammara* (FORSSKÅL, 1775)

*Specimen examined.* NSMT-P 35289, 186 mm SL, Miyanohama beach, 9 Mar. 1992.

*Plectrypops lima* (VALENCIENNES, 1831)

*Specimens examined.* NSMT-P 35298, 80.4 mm SL, Byobudani beach, 3 Feb. 1992; NSMT-P 45390, 52.3 mm SL, Ohgiura beach, 6 Feb. 1992.

*Sargocentron ittodai* (JORDAN et FOWLER, 1903)

*Specimen examined.* NSMT-P 35299, 100 mm SL, Ohgiura beach, 2 Feb. 1992.

*Sargocentron melanospilos* (BLEEKER, 1858)

*Specimen examined.* NSMT-P 35296, 118 mm SL, Ohgiura beach, 2 Mar. 1992.

*Remarks.* This species has frequently been confused with *S. cornutum* (BLEEKER, 1853) by many authors (e.g., SHIMIZU & YAMAKAWA, 1979). RANDALL and HEEMSTRA (1985) showed that *S. melanospilos* differs from *S. cornutum* by the color of the dorsal fin and the shape of the mouth. *Sargocentron melanospilos* is distributed in the Indo-west Pacific from Zanzibar eastward through the Red Sea and the Seychelles to northern Queensland, and northward to southern Japan (RANDALL & HEEMSTRA, 1985).

## Labridae

*Pseudolabrus japonicus* (HOULTUYN, 1782)

*Specimen examined.* NSMT-P 35292, 193 mm SL, Ohgiura beach, 2 Feb. 1992.

## Lutjanidae

*Lutjanus kasmira* (FORSSKÅL, 1775)

*Specimen examined.* NSMT-P 35279, 115 mm SL, Ohgiura beach, 28 Feb. 1992.

## Monacanthidae

*Aluterus monoceros* (LINNAEUS, 1758)

*Specimen examined.* NSMT-P 35265, 533 mm SL, Ohgiura beach, 3 Mar. 1992.

*Aluterus scriptus* (OSBECK, 1765)

*Specimen examined.* NSMT-P 35309, 400 mm SL, Hatsuneura beach, 15 Dec. 1991.

*Paramonacanthus japonicus* (TILESIIUS, 1809)

(Fig. 3)

*Specimens examined.* NSMT-P 35094, 67.3 mm SL, Miyanoama beach, 5 Dec. 1991; NSMT-P 35148, 63.3 mm SL, west coast of Tatsumi Bay, 4 Jan. 1992; NSMT-P 35285, 107 mm SL, Miyanoama beach, 5 Feb. 1992.

*Description.* Dorsal-fin rays II-29; anal fin rays 28-29; pectoral-fin rays 12 (excluding the uppermost rudimentary ray).

Proportional measurements (measuring methods follow MATSUURA, 1980): body

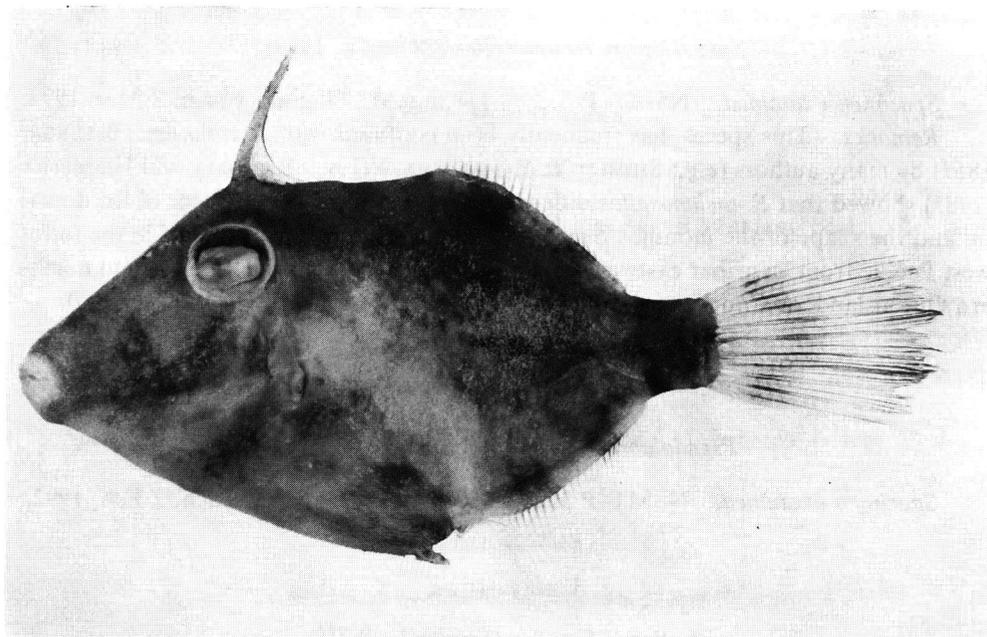


Fig. 3. *Paramonacanthus japonicus*, NSMT-P 35094, 67.3 mm SL, Miyanoama beach, Chichijima.

depth 42.4–47.5% SL; body width 14.4–16.4% SL; head length 36.5–36.8% SL; snout length 26.7–27.1% SL; snout to spinous dorsal-fin origin 38.3–41.5% SL; snout to anal-fin origin 68.0–70.4% SL; orbit diameter 9.9–13.5% SL; interorbital width 8.7–10.3% SL; postorbital length 4.9–6.9% SL; gill opening length 7.0–8.1% SL; interdorsal space 26.1–28.4% SL; longest dorsal-fin spine 21.6–26.9% SL; longest dorsal-fin ray 16.6–32.4% SL; longest anal-fin ray 13.7–19.1% SL; longest pectoral-fin ray 13.9–14.1% SL; caudal fin 34.3–37.3% SL; length of dorsal-fin base 32.7–34.2% SL; length of anal-fin base 30.2–31.6% SL; caudal peduncle depth 13.0–13.5% SL; caudal peduncle length 11.1–12.2% SL.

Body strongly compressed, relatively long, the depth 2.1–2.4 in SL. Dorsal profile of head almost straight, very slightly concave. Mouth small, terminal; lips thin. Upper jaw with 3 outer teeth and 2 inner teeth on each side, extremity of the anterior inner tooth projecting between outer teeth; lower jaw with 3 teeth in a single row. Eye small, located high at posterior part of head. Nostrils closely set, just in front of eye. Gill opening slightly oblique, below posterior edge of eye. Scales small, feeble, each scale with several spinules arising directly from basal plate. Spinous dorsal fin with 2 spines; first spine originating over posterior part of eye, armed with small barbs anteriorly and with small ventrally-directed spines postero-laterally; second spine very small, hidden beneath skin. A short shallow groove on back between spinous and soft dorsal fins. Soft dorsal and anal fins similar in shape, elevated anteriorly. Encasing scales at pelvic end elongated, dorso-ventrally movable. Pectoral fin short, rounded. Caudal peduncle short, its length 2.1–3.3 in head length. Caudal fin almost rounded; middle rays slightly produced in the largest specimen.

Color in alcohol: Body brown, mottled with dark brown blotches; spinous dorsal fin brown, soft dorsal, anal, and pectoral fins pale; caudal fin pale with 2 transverse dark brown bands.

*Remarks.* *Paramonacanthus japonicus* is usually found in sandy-muddy areas in shallow waters in the Indo-west Pacific. However, MYERS (1989) reported it from Rongelap lagoon in the Marshall Islands.

#### *Thamnaconus modestoides* (BARNARD, 1927)

*Specimens examined.* NSMT-P 35083, 246 mm SL, Miyanohama beach, 27 Nov. 1991; NSMT-P 35310, 306 mm SL, Ohgiura beach, 30 Dec. 1991.

#### *Thamnaconus tessellatus* (GÜNTHER, 1850)

*Specimens examined.* NSMT-P 35080, 266 mm SL, Miyanohama beach, 27 Nov. 1991; NSMT-P 35092, 8, 62.0–132 mm SL, same as preceding, 2 Dec. 1991; NSMT-P 35315, 218 mm SL, same as preceding.

*Remarks.* *Thamnaconus tessellatus* has rarely been found in Japanese waters (TANAKA, 1912; KAMOHARA, 1940). It is widely distributed in the west Pacific from

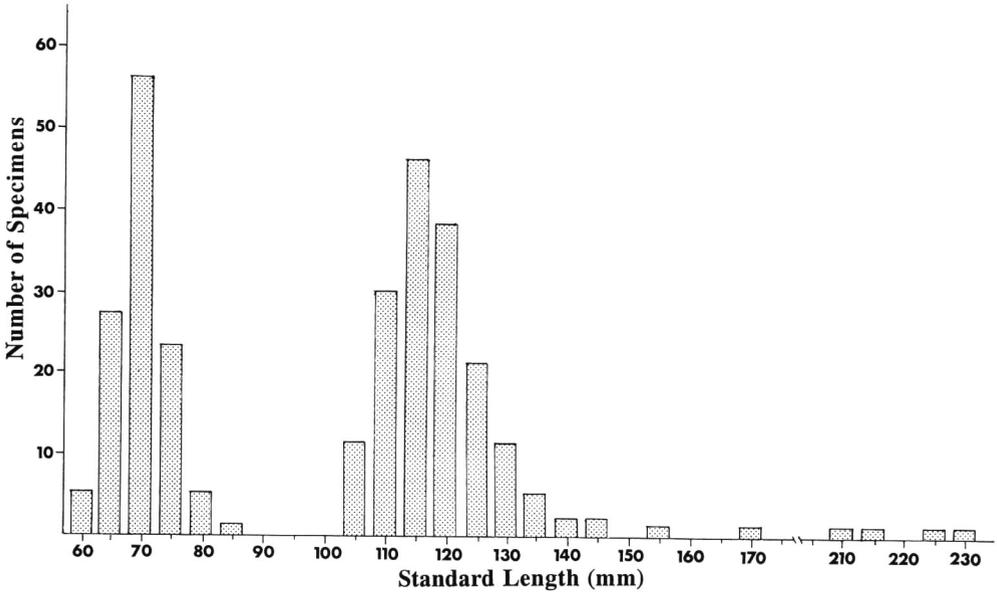


Fig. 4. Size frequency distributions in 296 specimens of *Thamnaconus tessellatus* collected from Miyano-hama and Ohgiura beaches, Chichi-jima.

Japan through Indonesia to northwestern Australia (TANAKA, 1912; ANONYMOUS, 1962; GLOERFELT-TARP & KAILOLA, 1984; SAINSBURY *et al.*, 1985) and has recently been found from New Caledonia (MATSUURA & TYLER, MS).

Many thousands of specimens of *Thamnaconus tessellatus* were washed up on beaches in Chichi-jima during November and December of 1991. At Miyano-hama and Ohgiura beaches 296 specimens were randomly collected to examine frequency distributions of size; two modes in size are found at 70 mm and 115–120 mm SL (Fig. 4). Monthly records of the Ogasawara Fisheries Center, which takes oceanographic data in middle of each month at 18 stations around the islands, did not show significant differences between November–December and other fall and winter months, although there were no detailed records of water temperature around the days when the filefishes were found washed up.

#### Monocentridae

##### *Monocentris japonicus* (HOULTUYN, 1782)

*Specimen examined.* NSMT-P 35247, 111 mm SL, Miyano-hama beach, 25 Nov. 1991.

## Myctophidae

*Ceratoscopelus warmingii* (LÜTKEN, 1892)

*Specimen examined.* NSMT-P 35275, 77.5 mm SL, Sakaiura beach, 7 Mar. 1992.

*Diaphus chrysorhynchus* GILBERT et CRAMER, 1897

*Specimen examined.* NSMT-P 35274, 65.0 mm SL, Byobudani beach, 2 Mar. 1992.

## Ophidiidae

*Brotula multibarbata* TEMMINCK et SCHLEGEL, 1847

*Specimen examined.* NSMT-P 35290, 70 mm in head length (body missing, only head remained), Hatsuneura beach, 15 Dec. 1991.

## Ostraciidae

*Lactoria diaphana* (BLOCH et SCHNEIDER, 1801)

*Specimen examined.* NSMT-P 35268, 315 mm SL, Ohgiura beach, 2 Mar. 1992.

*Lactoria fornasini* (BIANCONI, 1846)

*Specimen examined.* NSMT-P 35286, 101 mm SL, Byobudani beach, 22 Jan. 1992.

*Ostracion cubicus* LINNAEUS, 1758

*Specimen examined.* NSMT-P 35284, 220 mm SL, Ohgiura beach, 24 Jan. 1992.

## Plotosidae

*Plotosus lineatus* (THUNBERG, 1787)

*Specimen examined.* NSMT-P 35096, 127 mm in total length, Miyanojima beach, 2 Dec. 1991.

## Pomacentridae

*Chromis flavomaculata* KAMOHARA, 1960

*Specimens examined.* NSMT-P 35098, 106 mm SL, Miyanojima beach, 3 Dec.

1991; NSMT-P 45380, 102 mm SL, Byobudani beach, 14 Feb. 1992.

#### Scaridae

##### *Scarus forsteni* (BLEEKER, 1861)

*Specimen examined.* NSMT-P 35308, 391 mm SL, Miyanohama beach, 3 Feb. 1992.

#### Scorpaenidae

##### *Apistus carinatus* (BLOCH et SCHNEIDER, 1801)

*Specimen examined.* NSMT-P 35146, 82.7 mm SL, Ohgiura beach, 31 Dec. 1991.

##### *Dendrochirus zebra* (CUVIER, 1829)

*Specimen examined.* NSMT-P 35283, 198 mm SL, Ohgiura beach, 24 Jan. 1992.

##### *Ebosia bleekeri* (DÖDERLEIN, 1884)

*Specimens examined.* NSMT-P 35147, 136 mm SL, Ohgiura beach, 31 Dec. 1991; NSMT-P 35149, 136 mm SL, Byobudani beach, 26 Dec. 1991; NSMT-P 35276, 148 mm SL, Ohgiura beach, 22 Feb. 1992; NSMT-P 35278, 132 mm SL, Byobudani beach, 1 Mar. 1992; NSMT-P 45382, 127 mm SL, Miyanohama beach, 14 Feb. 1992; NSMT-P 45387, 145 mm SL, Ohgiura beach, 2 Feb. 1992.

##### *Pterois lunulata* TEMMINCK et SCHLEGEL, 1844

*Specimen examined.* NSMT-P 45386, 147 mm SL, Byobudani beach, 28 Dec. 1992.

#### Serranidae

##### *Cephalopholis miniata* (FORSSKÅL, 1775)

*Specimen examined.* NSMT-P 35281, 83.4 mm SL, Ohgiura beach, 28 Feb. 1992.

##### *Epinephelus fasciatus* (FORSSKÅL, 1775)

*Specimens examined.* NSMT-P 45391, 2, 67.8–69.0 mm SL, Ohgiura beach, 2 Feb. 1992.

*Epinephelus rivulatus* (VALENCIENNES, 1830)

*Specimens examined.* NSMT-P 35280, 158 mm SL, Ohgiura beach, 25 Feb. 1992; NSMT-P 35297, 78.4 mm SL, same as preceding, 2 Feb. 1992.

*Grammatonotus macrophthalmus* KATAYAMA, YAMAMOTO et YAMAKAWA, 1982

*Specimen examined.* NSMT-P 35093, 96.8 mm SL, Miyanohama beach, 25 Nov. 1991.

*Description.* Dorsal-fin rays XI, 9; anal-fin rays III, 9; pectoral-fin rays 20; lateral-line scales 15; gill rakers 8+18.

Proportional measurements: body depth 33.3% SL; body width 14.5% SL; head length 34.6% SL; snout length 7.2% SL; snout to dorsal-fin origin 35.9% SL; snout to anal-fin origin 62.3% SL; orbit diameter 15.7% SL; interorbital width 9.7% SL; postorbital length 13.3% SL; upper jaw length 14.1% SL; longest dorsal-fin spine 14.0% SL; longest dorsal-fin ray 15.5% SL; longest anal-fin spine 11.9% SL; longest anal-fin ray 19.6% SL; longest pectoral-fin ray 22.8% SL; pelvic-fin spine 17.3% SL; longest pelvic-fin ray 26.2% SL; caudal fin 23.4% SL; length of dorsal-fin base 50.6% SL; length of anal-fin base 21.8% SL; caudal peduncle depth 16.5% SL; caudal peduncle length 21.3% SL.

Body compressed, relatively long, the depth 3.0 in SL. Dorsal profile of head convex; snout short and blunt at tip. Mouth oblique, large; maxilla reaching a vertical through anterior edge of pupil. Jaws with a band of villiform teeth; outer teeth of upper jaw conical, enlarged, 3–4 times larger than the inner teeth; 2 canines at front of each upper jaw; outer teeth of lower jaw also conical, enlarged, distinctly larger than the inner teeth; a large canine at antero-lateral corner of lower jaw, and 2–3 anteriorly-directed canines, half the length of the large one, at tip of jaw; a V-shaped band of villiform teeth on vomer; a long, narrow band of villiform teeth on palatine. Nostrils of each side distinctly separated, the anterior situated close to the anterior edge of snout, the posterior just above anterior end of orbit; a series of sensory pores surrounding eye. A sharp spine on posterior edge of opercle; margins of all four opercular bones smooth. Scales large, ctenoid; head scaled except for lips; lateral line running along base of dorsal fin, ending just below penultimate soft ray. Dorsal fin unnotched, originating above pectoral-fin base; dorsal-fin spines slender, increasing in length posteriorly, the fifth the longest; sixth to last spines slightly shorter than the fifth. Origin of anal fin below last dorsal-fin spine, the third spine the longest. Pectoral fin relatively long, reaching a vertical through anus. Pelvic-fin insertion slightly anterior to pectoral-fin base; pelvic fin long, reaching anal fin. Caudal fin damaged, posterior part missing.

Color in alcohol: Body and fins pale.

*Remarks.* *Grammatonotus macrophthalmus* was described by KATAYAMA *et al.* (1982) on the basis of 9 specimens collected at depths of 330–360 m in the Kyushu-

Palau Ridge. This species is distinguished from the other two species of the genus, *G. laysanus* and *G. surugaensis*, by having a large eye (eye diameter 2.2–2.4 in head length vs. 2.5–2.7).

***Liopropoma pallidum*** (FOWLER, 1938)

[New Japanese name: Momo-hanasuzuki]

(Fig. 5)

*Specimen examined.* NSMT-P 35314, 79.5 mm SL, Ohgiura beach, 5 Feb. 1992.

*Description.* Dorsal-fin rays VI–I–I, 12; anal-fin rays III, 8; pectoral-fin rays 16; lateral-line scales 47+3.

Proportional measurements: body depth 29.9% SL; body width 17.6% SL; head length 29.9% SL; snout length 9.7% SL; snout to spinous dorsal-fin origin 43.1% SL; snout to anal-fin origin 67.2% SL; orbit diameter 8.7% SL; interorbital width 7.9% SL; postorbital length 22.6% SL; upper jaw length 17.4% SL; longest dorsal-fin spine 12.6% SL; longest dorsal-fin ray 17.0% SL; longest anal-fin spine 12.6% SL; longest anal-fin ray 15.3% SL; longest pectoral-fin ray 24.5% SL; pelvic-fin spine 9.3% SL; longest pelvic-fin ray 19.7% SL; caudal fin 20.8% SL; length of soft dorsal-fin base 14.5% SL; length of anal-fin base 13.8% SL; caudal peduncle depth 11.9% SL; caudal peduncle length 21.8% SL.

Body compressed, relatively long, the depth 3.3 in SL. Dorsal profile of head straight; interorbital space flattened. Mouth moderately large; posterior end of maxilla below posterior one-fifth of eye; lower jaw slightly projecting beyond tip of upper jaw. Jaws with a band of villiform teeth; inner teeth at front of jaws and side of lower jaw 3–4 times longer than outer teeth; a V-shaped band of villiform teeth on vomer; a long, narrow band of villiform teeth on palatine. Nostrils of each side distinctly separated, the anterior tubular, situated close to the anterior edge of snout, the posterior just above anterior end of orbit; no enlarged pores around posterior nostril. Three flat spines on posterior edge of opercle, the middle spine much closer

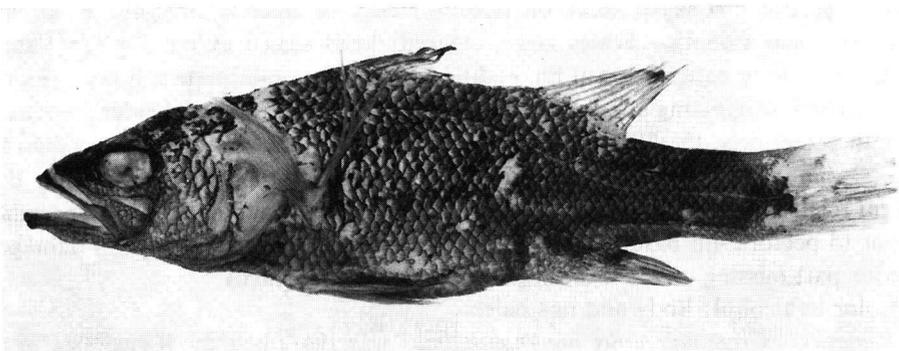


Fig. 5. *Liopropoma pallidum*, NSMT-P 35314, 79.5 mm SL, Ohgiura beach, Chichi-jima.

to lower than upper spine; preopercle margin finely serrated. Scales small, ctenoid; scaled area on dorsal surface of head extending to the level of posterior nostril; cheek, maxilla, and ventral surface of head scaled. Spinous and soft dorsal-fins clearly separated; spinous dorsal-fin situated posterior to pectoral fin, the third spine longest; origin of soft dorsal fin just above anal-fin origin. Pectoral fin relatively long, extending beyond a vertical through posterior end of spinous dorsal fin. Caudal fin slightly rounded.

Color in alcohol: Body dark uniformly brown; vertical fins dark; pectoral and pelvic fins pale.

*Remarks.* This species has been collected from coral reefs at islands in Oceania: Christmas Island in the Line Islands, Bikini in the Marshall Islands, Tinian in the Mariana Islands, the Society Islands and Austral Islands, Oneo Atoll in the Pitcairn Group, and Ant Atoll in the Caroline Islands (Randall & Taylor, 1988, and references contained there).

*Variola louti* (FORSSKÅL, 1775)

*Specimen examined.* NSMT-P 35294, 160 mm SL, Byobudani beach, 6 Feb. 1992.

Siganidae

*Siganus argenteus* (QUOY et GAIMARD, 1825)

*Specimens examined.* NSMT-P 35291, 171 mm SL, Byobudani beach, 6 Feb. 1992; NSMT-P 45384, 150 mm SL, same as preceding, 24 Jan. 1992.

Tetraodontidae

*Arothron firmamentum* (TEMMINCK et SCHLEGEL, 1850)

*Specimens examined.* NSMT-P 35277, 149 mm SL, Ohgiura beach, 28 Feb, 1992; NSMT-P 35282, 2, 139–166 mm SL, Miyanoama beach, 26 Feb. 1992; NSMT-P 45381, 135 mm SL, Byobudani beach, 31 Jan. 1992; NSMT-P 45385, 128 mm SL, Sakaiura beach, 28 Jan. 1992.

*Meristics.* Dorsal-fin rays 13–14; anal-fin rays 14; pectoral-fin rays 16.

*Remarks.* *Arothron firmamentum* is antitropical in distribution; it has been reported from the waters around Japan and Korea, the northern South China Sea (KAMOHARA, 1964; MATSUURA, 1988), and New Zealand and southeastern Australia (HARDY, 1980). This species has recently been recorded from New Caledonia (MATSUURA & TYLER, MS).

*Arothron hispidus* (LINNAEUS, 1758)

*Specimen examined.* NSMT-P 35270, 231 mm SL, Ohgiura beach, 22 Feb. 1992.

*Canthigaster coronata* (VAILLANT et SAUVAGE, 1875)

*Specimens examined.* NSMT-P 35272, 80.3 mm SL, Byobudani beach, 15 Mar. 1992; NSMT-P 45379, 114 mm SL, same as preceding, 31 Jan. 1992.

*Canthigaster janthinoptera* (BLEEKER, 1855)

*Specimen examined.* NSMT-P 45393, 49.7 mm SL, Ohgiura beach, 2 Feb. 1992.

*Canthigaster rivulata* (TEMMINCK et SCHLEGEL, 1850)

*Specimens examined.* NSMT-P 35095, 124 mm SL, Miyanohama beach, 5 Dec. 1991; NSMT-P 45378, 95.0 mm SL, same as preceding, 10 Dec. 1991.

*Sphoeroides pachygaster* (MÜLLER et TROSCHER, 1848)

*Specimen examined.* NSMT-P 35307, 297 mm SL, Ohgiura beach, 11 Jan. 1992.

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