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**First Records of Five Teleostean Fishes and Three Second
Records of Gobiid Fishes from Japan, Collected
in Rivers on the Ryukyu Islands**

Harumi SAKAI* and Mitsuaki SATO**

Abstract

In our fish collection of about 160 species from rivers on the Ryukyu Islands, five species falling into five families are described as the first records from Japan; *Uropterygius concolor* (Muraenidae), *Hyporhamphus balinensis* (Hemiramphidae), *Gerres acinaces* (Gerreidae), *Mesopristes kneri* (Teraponidae), and *Stenogobius lacrymosus* (Gobiidae). Additionally, three rare gobiid fishes are also described as the second records; *Acentrogobius moloanus*, *Illana bicirrhosa*, and *Mugilogobius cavifrons*.

Introduction

Much of the freshwater and marine ichthyofauna of the Ryukyu Islands has been described in recent publications¹⁾⁻¹²⁾. We had opportunities to sample on the Ryukyu Islands several times from 1973 to 1978, and collected about 160 species from rivers on six islands. Of them, two gobiid species were described as new species previously¹³⁾. In this paper, five species falling into five families are added to the ichthyofauna of the Ryukyu Islands as the first records from Japan. Three rare gobiid fishes are also described which are the second records from Japan, first recorded by Hayashi et al. in their list¹¹⁾.

Counts and measurements were made in accordance with the method of Hubbs and Lagler¹⁴⁾. Counts for vertebrae and vertical fin rays were taken from radiographs. The alphabetical markings of sensory pores in gobiid species followed Prince Akihito¹⁵⁾ and Prince Akihito and Meguro¹⁶⁾.

Most specimens used in this study are deposited in the Department of Zoology, National Science Museum, Tokyo (NSMT-P), and others in the Laboratory of Marine Zoology, Hokkaido University (HUMZ).

Family Muraenidae

Uropterygius concolor Rüppel, 1835¹⁷⁾
(New Japanese name: Koge-utsubo)

Pl. I-A, Fig. 1

Material. NSMT-P 20771, 95.7 mm in standard length (SL), brackish water

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of the Atetsu River, Amami-Oshima Island, Kagoshima Pref., Apr. 3, 1975; NSMT-P 19632, 205.6 mm SL, Teima River, Okinawa Island, Okinawa Pref., Apr., 1975.

Description. Measurements: Preanus 49.5, 50.3, head 11.7, 12.6, body depth 4.7, 5.2, snout 1.4, 1.7, eye 0.7, interorbital width 1.0, 1.4, mouth cleft 3.6, 4.2% of SL.

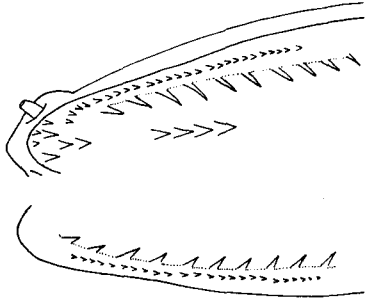


Fig. 1. Dentition of *Uropterigius concolor*, NSMT-P 20771, 95.7 mm SL. Top, upper jaw; bottom, lower jaw.

Body elongate, earthworm-like, slightly compressed. Snout blunt, rounded. Anterior nostrils in a conspicuous tube, posterior nostrils with a dermal rim. Mouth horizontal, shut completely. All teeth sharp and fang-like, not granular or molariform (Fig. 1). Maxillary and mandibular teeth in two series, outer one smaller, compressed and fixed, inner one depressible. Long depressible fangs on intermaxilla, a short single series of about six pointed ones on vomer. Eye situated above the middle of mouth cleft. Gill opening somewhat smaller than eye. Dorsal and anal fins reduced to rudiments near tail tip. Pectoral fin absent.

Color in alcohol: Uniformly brown, ventral paler.

Distribution. Borneo, New Guinea, Philippines, Australia, West Pacific Islands to Hawaii and Society Islands, Red Sea¹⁸⁾, and Amami-Oshima Island and Okinawa Island, Ryukyu Island (present study).

Family Hemiramphidae

Hyporhamphus balinensis (Bleeker, 1858~1859)¹⁹⁾

(New Japanese name: Minami-sayori)

Pl. I-B

Material. NSMT-P 29276, 91.6 mm SL, brackish water of the Urauchi River, Iriomote Island, Okinawa Pref., Apr. 4, 1974.

Description. Counts: Dorsal fin 18; anal fin 16; pectoral fin 13; scales in a longitudinal series 58; in a transverse series 4+7; predorsal scales 40; gill rakers 9+21; vertebrae 55.

Measurements: Predorsal 76.1, preanal 78.1, head 23.1, body depth 10.9, caudal peduncle depth 5.3, snout 7.8, upper jaw 6.6, lower jaw beyond extremity of upper jaw 19.7, eye 7.2, interorbital width 6.1, dorsal fin base 16.7, anal fin base 13.4, pectoral 14.5, pelvic 7.5% of SL. Body width 80.0% of depth. Width of triangular part of upper jaw 60.0% of its length.

Body somewhat compressed, slender. Head entire, flat above. Triangular part of upper jaw broader than long, covered with scales. Teeth small, in narrow bands on both jaws. The preorbital canals with posterior branch, three openings. Origin of dorsal fin slightly before that of anal fin. Dorsal and anal fins concave, the anterior the higher. Origin of pelvic fins about midway between gill opening and base of caudal fin. Caudal fin forked, lower lobe longer.

Color in alcohol: Ground color yellowish white, darker above, each scale on back with dark brown punctures. Head darker above, triangular part of upper jaw black, beak of lower jaw blackish above. Three narrow longitudinal rows of dark spots along middle of the back from occiput to base of dorsal fin, the middle one broadest. A dark brown lateral band from base of pectoral fin to base of caudal fin, broadest below anterior half of dorsal fin. A series of blackish spots from isthmus to anus. Dorsal and caudal fins dusky, others hyaline. Base of anal fin with a series of blackish spots.

Distribution. Widely distributed in the Indo-Pacific region, in coastal waters²⁰⁾.

Family Gerreidae

Gerres acinaces Bleeker, 1854²¹⁾
(New Japanese name: Tsuppari-sagi)
Pl. I-C

Material. NSMT-P 28323, 192.0 mm SL, mouth of the Nakama River, Iriomote Island, Okinawa Pref., Apr. 2, 1974.

Description. Counts: Dorsal fin IX, 10; anal fin III, 7; pectoral fin 16; pelvic fin I, 5; lateral line scales 44; scales in a transverse series 7+12; predorsal scales 24; gill rakers 5+1+7; vertebrae 10+14=24.

Measurements: Predorsal 42.8, preanal 68.8, head 31.3, body depth 37.2, caudal peduncle depth 10.8, snout 10.4, upper jaw 12.2, eye 9.2, interorbital width 9.2, dorsal fin base 49.4, anal fin base 16.7, longest (2nd) dorsal spine 23.0, longest (2nd) anal spine 13.8, pectoral fin 35.2, pelvic fin 18.0% of SL.

Body compressed, oblong. Head pointed, rostronuchal profile straight. Maxilla reaching below anterior margin of eye. Teeth small, none on vomer, palatines and tongue. Preopercle entire, its angle rounded. Dorsal fin originating just above the origin of pelvic fin. Pectoral fin reaching about the origin of anal fin. Caudal fin deeply forked, both lobes pointed. No scales before eyes, two rows on cheek. Each base of dorsal and anal fins covered with a row of sheath scales, separated by a groove from the other scales. Pelvic fin with a long axillary process.

Color in alcohol: Uniformly white yellow, with several irregular series of oblong dark spots along the lateral scale rows in upper half of body. Fins hyaline, tips of dorsal and caudal fins blackish.

Distribution. Java, Cocos Island, Celebes, Tonga, Red Sea, Madagascar²²⁾, and Iriomote Island, Ryukyu Islands (present study).

Family Teraponidae

Mesopristes kneri (Bleeker, 1873~1876)²³⁾
(New Japanese name: Misuji-shimaisaki)
Pl. I-D

Material. NSMT-P 19046, 101.4 mm SL, brackish water of the Nagura River, Ishigaki Island, Okinawa Pref., May 2, 1977.

Description. Counts: Dorsal fin XII, 10; anal fin III, 8; pectoral fin 14; pelvic fin I, 5; lateral line scales 50; scales in a transverse series 10+19; predorsal scales 14; gill rakers 10+1+16; vertebrae 10+15=25.

Measurements: Predorsal 42.8, preanal 73.2, head 35.5, body depth 39.5, caudal peduncle depth 12.9, snout 12.8, upper jaw 11.0, eye 9.6, interorbital width 8.7, dorsal fin base 54.7, anal fin base 19.7, longest (5th) dorsal spine 20.7, longest (2nd) anal spine 20.3, pectoral fin 20.4, pelvic fin 28.4% of SL.

Body compressed, deep. Back profiled a gentle curve from snout to nape, then convex to origin of dorsal fin: Ventral profile nearly horizontal. Anterior and posterior nostrils separated by a distance equal to one and one-half times diameter of posterior nostrils. Mouth small, maxilla reaching below posterior nostril. Teeth villiform on both jaws, outer row enlarged. No teeth on vomer and palatines. Interorbital region with distinct ridges. Lacrimal serrated. Preopercle serrated, serrations largest on vertical edge. Lower opercular spine larger and stronger, not extending beyond end of opercular edge. Post-temporal exposed, serrated along posterior edge. Cleithrum exposed, serrated posteriorly. Supracleithrum exposed. First dorsal spine short, 5th longest, those following decreasing in length. The longest dorsal spine longer than the longest dorsal soft ray. Soft dorsal slightly convex in profile. Second anal spine longest, as long as the longest anal soft ray. Soft anal rounded in profile. Pectoral fin asymmetrically pointed, 4th ray longest. Pelvic fin pointed, first soft ray longest, slightly filamentous, reaching to anus. Caudal fin emarginate. Cheek scaled in 7 rows. Two rows of sheath scales at spinous dorsal base, 3~5 rows at soft dorsal base.

Color in alcohol: Body dusky above, paler ventrally. Three series of small dark spots arranged into longitudinal stripes on side: first convex, running from nape to upper part of caudal peduncle; second from posttemporal region to middle of caudal peduncle; third straight, from supracleithrum to above soft anal. Dorsal fin dusky, margin of soft dorsal becoming hyaline. Anal fin dark. Caudal fin dusky. Pelvic fin darker in basal half, becoming clear in distal half.

Distribution. Known only from the Fiji Island previously²⁴, but the range is extended to Ishigaki Island, Ryukyu Islands (present study).

Family Gobiidae

Stenogobius lacrymosus (Peters, 1868)²⁵

(New Japanese name: Douke-haze)

Pl. II-A, Fig. 2

Material. NSMT-P 16008, 92.8 mm SL, fresh water of the Nagura River, Ishigaki Island, Okinawa Pref., Oct. 23, 1973; HUMZ 87841, 17.2 mm SL, same locality, May 26, 1978.

Description. Counts: Dorsal fin VI-I, 10; anal fin I, 10; pectoral fin 16; pelvic fin I, 5; scales in a longitudinal series 51, 53; predorsal scales 18; vertebrae 11+15=26; first dorsal fin with 6 pterygiophores articulating after 3rd neural arch and spaced with respect to interneural spaces 1-2-2-1

Measurements: Preanal 55.4, 56.4, head 27.3, 27.4, body depth at anal origin

18.6, 22.3, caudal peduncle depth 9.9, 11.7, snout 6.7, 7.0, eye 4.6, 6.4, interorbital width 2.3, 5.5, pectoral fin 20.9, 22.7, pelvic fin 20.3, 22.8% of SL.

Body elongate, compressed. Head compressed. Snout slightly exceeding upper lip. Mouth slightly oblique, upper jaw a little prominent. Posterior margin of maxilla extending below half of eye. Teeth of both jaws conical, in some rows. Outer row of upper jaw teeth somewhat enlarged. Gill opening wide, extending from above upper margin of pectoral fin base to before origin of pelvic fin base. Inner edge of shoulder girdle with some fleshy flaps. Body covered with ctenoid scales, extending forward to occipital region where they become cycloid. Upper part of opercle also covered with several cycloid scales.

Cephalic lateral line system (Fig. 2): Anterior oculoscapular canal with pores A', B, C, D, F and H'; posterior oculoscapular canal with K' and L'; preopercular canal with M', N and O'. Pit organs are shown in Fig. 7 as small dots.

Color in alcohol: Body with five transverse crescent bands on side, scattered dark dots on back. On infraorbital region from eye to behind posterior margin of maxilla tapered a conspicuous dark stripe. A black spot on upper part of pectoral fin base.

Distribution. The Philippines, New Guinea²⁶⁾, and Ishigaki Island, Ryukyu islands (present study).

Remarks. Koumans²⁷⁾ identified *Stenogobius lacrymosus* as a synonym of *S. genivittatus* (Valenciennes). But the latter species is different from the former as follows; mouth larger, posterior margin of maxilla extending below posterior margin of eye or more backward, with straight transverse bands on side, and 11 soft rays in second dorsal and anal fins. Taking these differences into account, they are regarded as two species.

Acentrogobius moloanus (Herre, 1927)²⁸⁾

(Japanese name: Futasuji-nobori-haze)

Pl. II-B, Fig. 3

Material. NSMT-P 28494, 44.3 mm SL, brackish water of the Midara River, Iriomote Island, Okinawa Pref., Apr. 5, 1974; NSMT-P 29320, 43.8 mm SL, brackish water of the Urauchi River, Iriomote Island, Okinawa Pref., Apr. 4, 1974.

Description. Counts: Dorsal fin VI-I, 9; anal fin I, 9; pectoral fin 17; pelvic fin I, 5; scales in a longitudinal series 37, 38; predorsal scale 0; vertebrae 10+16=26; first dorsal fin with 6 pterygiophores articulating after 3rd neural arch and spaced with respect to interneural spaces 2-2-1-1.

Measurements: Preanal 58.4, 58.9, head 26.5, 27.5, body depth at anal origin 18.9, 19.4 caudal peduncle depth 12.3, 12.6, snout 7.1, 7.7, eye 6.1, 6.4, interorbital width 1.8, 2.5, pectoral 26.2, 27.2, pelvic 22.3, 23.3% of SL.

Body elongate, compressed. Head compressed. Snout slightly exceeding upper lip. Mouth slightly oblique, jaws subequal. posterior margin of maxilla extending below half of eye. Teeth of both jaws conical, in some rows, outer row somewhat enlarged. Gill opening wide, extending from before upper margin to before the portion below lower margin of pectoral fin base. Body covered with ctenoid scales, extending forward to above opercle where they become cycloid.

Head and predorsal space naked. Second spine of first dorsal fin prolonged and threadlike.

Cephalic lateral line system (Fig. 3): Anterior oculoscapular canal with pores B', C, D, E, F, G and H'; posterior oculoscapular canal with K' and L'; preopercular canal with M', N and O'. Pit organs are shown in Fig. 9 as small dots.

Color in alcohol: Two longitudinal stripes on side; one from behind eye extending back to upper origin of caudal fin, the other from axil of pectoral fin ending at middle of caudal fin base. On the latter stripe six black spots, the last two very close together. From eye a dark stripe extending downward behind angle of maxilla. The basal portion of caudal fin with several black spots.

Distribution. The Philippines, Thailand, Taiwan^{26),29)}, and Iriomote Island, Ryukyu Islands (Hayashi et al.¹¹⁾ and present study).

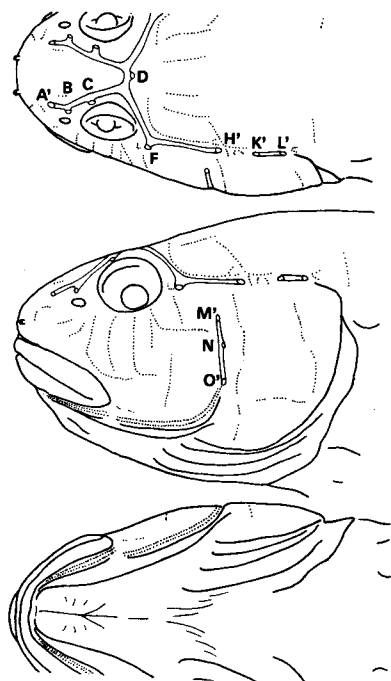


Fig. 2. Cephalic lateral line system of *Stenogobius lacrymosus*, NSMT-P 16008, 92.8 mm SL. Top, dorsal; middle, lateral; bottom, ventral views. A'~H', pores of the anterior oculoscapular canal; K' and L', pores of the posterior oculoscapular canal; M'~O', pores of the preopercular canal.

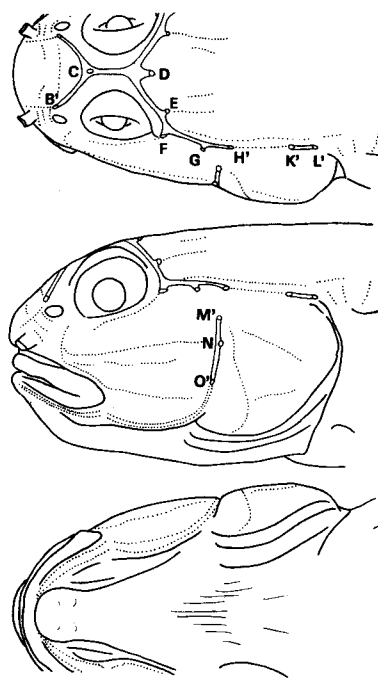


Fig. 3. Cephalic lateral line system of *Acentrogobius moloanus*, NSMT-P 29326, 43.8 mm SL. Top, dorsal; middle, lateral; bottom, ventral views. B'~H', pores of the anterior oculoscapular canal; K' and L', pores of the posterior oculoscapular canal; M'~O', pores of the preopercular canal.

Illana bicirrhosa (Weber)
(Japanese name: Agohige-haze)
Pl. II-C, Fig. 4

Material. HUMZ 88064, 26.6 mm SL, brackish water of the Nagura River, Ishigaki Island, Okinawa Pref., Aug. 25, 1977; HUMZ 88065~88067, 30.5~46.2 mm SL, Same locality, Oct. 27, 1977, HUMZ 88068~88069, 25.2 and 34.9 mm SL, same locality, Nov. 19, 1977; HUMZ 88070, 22.0 mm SL, same locality, Feb. 4, 1978.

Description. Counts: Dorsal fin VI-I, 9; anal fin I, 8; pectoral fin 18 or 19; pelvic fin I, 5; scales in a longitudinal series 32~34; predorsal scales 13 or 14; vertebrae 10+17=27; first dorsal fin with 6 pterygiophores articulating after 3rd neural arch and spaced with respect to interneural spaces 2-2-1-1.

Measurements: Preanal 53.6~56.8, head 27.9~30.5, body depth at anal origin 15.1~17.7, caudal peduncle depth 9.9~10.0, snout 8.5~10.2, eye 7.1~8.6, interorbital width 0.9~2.6, pectoral fin 23.6~30.8, pelvic fin 20.9~24.9% of SL.

Body elongate, cylindrical. Head depressed. Snout not exceeding upper lip. Mouth oblique, lower jaw prominent. Posterior margin of maxilla extending below anterior margin of eye. Lip thick. A pair of large fleshy barbels on chin. Gill opening wide, extending from before upper margin of pectoral fin base to far forward to pelvic fin base. Body covered with ctenoid scales extending forward to behind eyes.

Cephalic lateral line system (Fig. 4): Anterior oculoscapular canal with pores B', C, D, E, F, G and H'; posterior oculoscapular canal with K' and L'; preopercular canal with M' and O'. Pit organs are shown in Fig. 11 as small dots, a patch of relatively large pit organs on basal ground of the pair of barbels.

Color in alcohol: Four indistinct bands over back, first before first dorsal fin, second on the place of insertion of first dorsal fin, third on the place of insertion of second dorsal fin, and fourth just behind second dorsal fin. Along the side, five dark blotches alternating with the indistinct bands on back. Dorsal fins with some oblique lines of dark dots. Caudal fin with irregular vertical brown bands. A small black dots on the base of pectoral fin.

Distribution. The Philippines, East Indies²⁶⁾ and Ishigaki Island, Ryukyu Islands (Hayashi et al.¹¹⁾ and present study).

Remarks. We could not check the original description of *Gobius bicirrhosa* by M. Weber. But the present specimens well agree with Koumans' description.²⁷⁾

Overlooking the barbeles on chin, *Illana bicirrhosa* may be apt to be misidentified with *Glossogobius* species. The pattern of cephalic lateral line system (Fig. 4) is also similar to those of *Glossogobius*.³⁰⁾

Mugilogobius cavifrons (Weber, 1909)³¹⁾
(New Japanese name: Kuma-haze)
Pl. II-D, Fig. 5

Material. NSMT-P 28401-1~2, 28.9 and 31.4 mm SL, brackish water of a small stream on Iriomote Island, Okinawa Pref., Apr. 5, 1974; NSMT-P 28426-1~2, 10.7 and 22.9 mm SL, same locality, Aug. 26, 1974; NSMT-P 29365, 37.9 mm SL, same locality, Apr. 5, 1974.

Description. Counts: Dorsal fin VI-I, 8 or 9; anal fin 8 or 9; pectoral fin 15~17; pelvic fin I, 5, scales in a longitudinal series 37~41; predorsal scales 14~21; vertebrae 10+16=26; first dorsal fin with 6 pterygiophores articulating after 3rd neural arch and spaced with respect to interneural spaces 1-2-2-1.

Measurements: Preanal 58.1~62.3, head 27.4~33.6, body depth at anal origin 17.0~21.8, caudal peduncle depth 11.5~15.0, eye 7.2~8.3, interorbital width 5.6~8.2, pectoral fin 21.0~26.1, pelvic fin 17.2~18.0% of SL.

Body cylindrical, head somewhat depressed. Snout slightly exceeding upper lip. Anterior nostrils in a short tube. Mouth somewhat oblique, upper jaw a little prominent. Posterior margin of maxilla extending below half of eye. Teeth of both jaws in a narrow band. In upper jaw, outermost teeth enlarged and coarse-set. Gill opening wide, extending from before upper margin of pectoral fin base to before origin of pelvic fin. Body covered with ctenoid scales, extending forward to a little behind eyes, where they become cycloid and smaller. Upper part of opercle scaled with small cycloid scales.

Cephalic lateral line system (Fig. 5): Only pit organs exist which are shown as small dots.

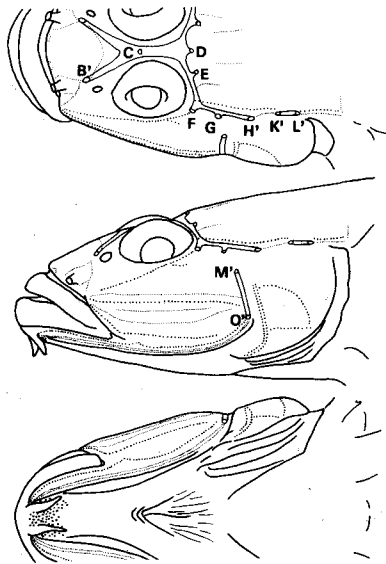


Fig. 4. Cephalic lateral line system of *Illana bicirrhosa*, HUMZ 88067, 30.5 mm SL. Top, dorsal; middle, lateral; bottom, ventral views. B'~H', pores of the anterior oculoscapular canal; K' and L', pores of the posterior oculoscapular canal; M' and O', pores of the preopercular canal.

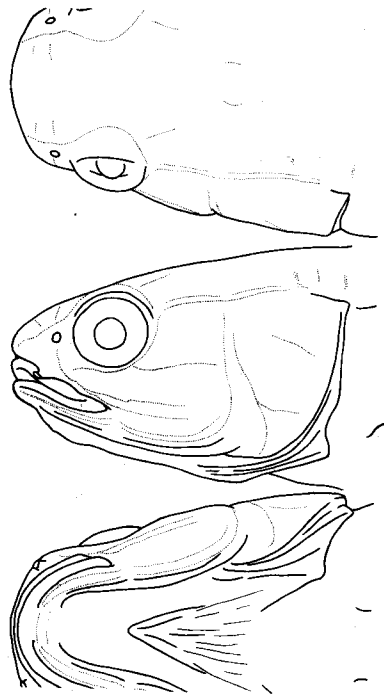


Fig. 5. Cephalic lateral line system of *Mugilogobius caviforms*, NSMT-P 29365, 37.9 mm SL, only pit organs exist. Top, dorsal; middle, lateral; bottom, ventral views.

Color in alcohol: Brown with irregular dark cross bands on body and caudal fin.

Distribution. Ternate, Lombok Island, Aru Islands²⁷⁾ and Iriomote Island, Ryukyu Islands (Hayashi et al.¹¹⁾ and present study).

Remarks. Tomiyama³²⁾ recorded *Gobius tagara* (Herre) from Taiwan and synonymized *Glossogobius parvus* of Oshima³³⁾ in spite of the difference between them in number of scales in a longitudinal series. Recently, Hayashi et al.¹¹⁾ recorded *Mugilogobius* species which well agree with the description of *Glossogobius parvus* and identified as *Mugilogobius tagara* following Tomiyama³²⁾. The specimens on hand agree very well with the original description of *Gobius cavifrons* (Weber, 1909)³¹⁾ and *Glossogobius parvus* (Oshima, 1919)³³⁾, but not with that of *Tamanka tagara* (Herre, 1927)²⁸⁾. The greatest difference between them is that of number of scales in a longitudinal series, about 40 in *Mugilogobius cavifrons* and 50 in *M. tagara*.

Acknowledgments

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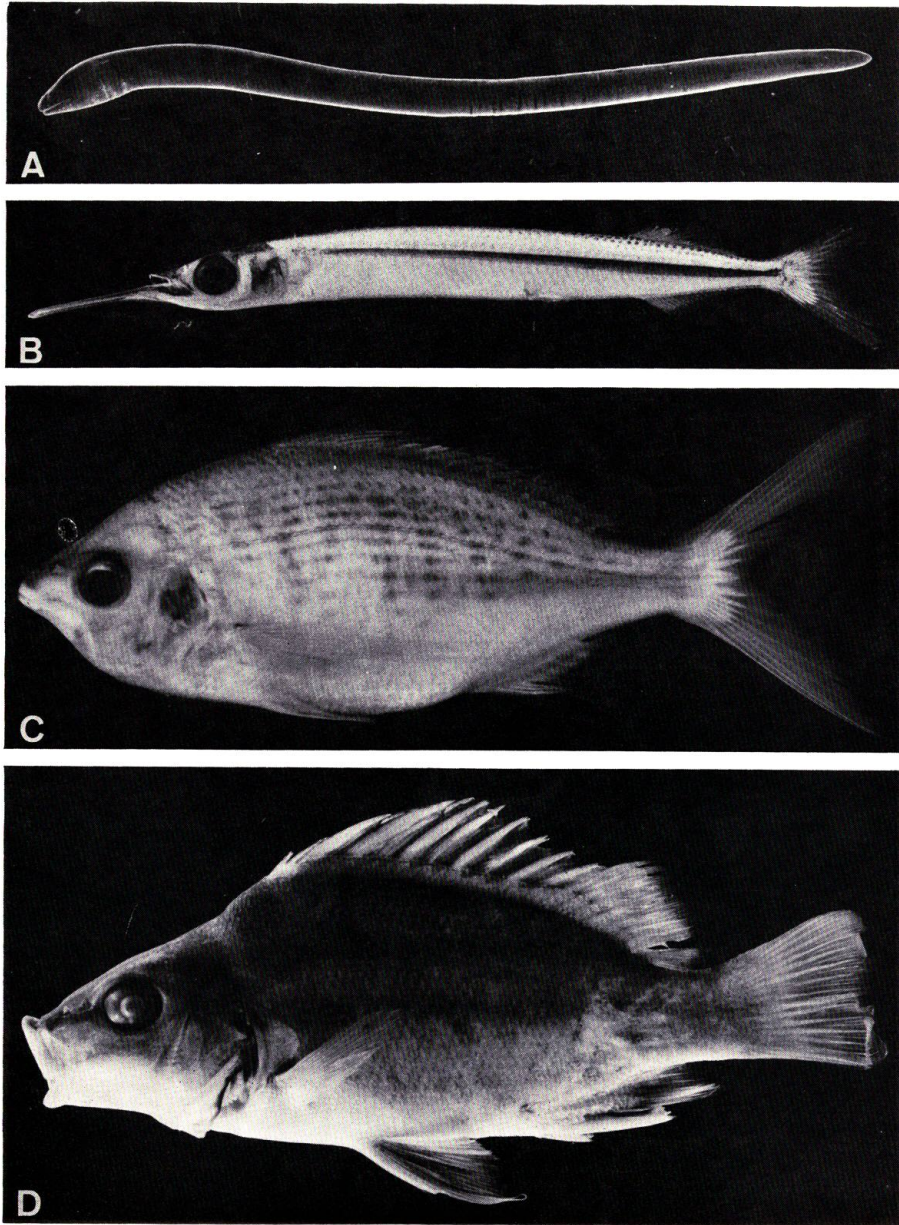
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Explanation of Plates

PLATE I

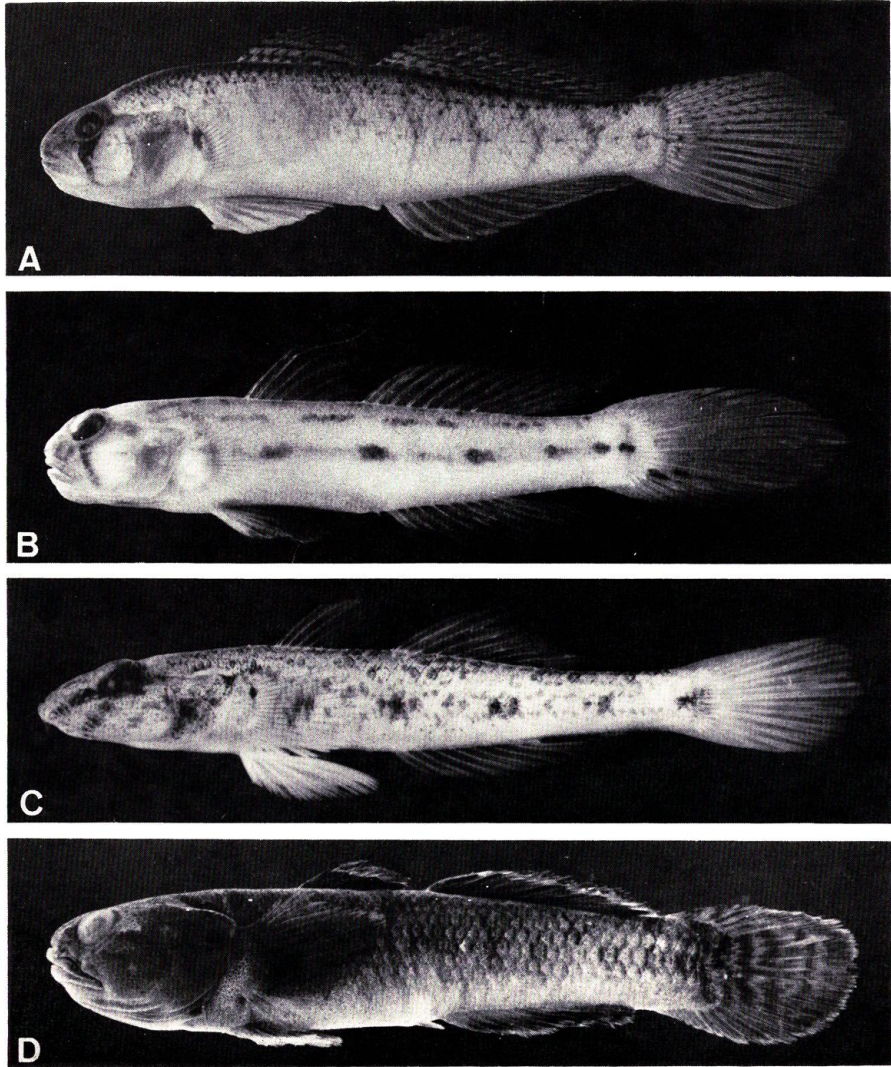
- Plate I-A *Uropterygius concolor*, NSMT-P 20771, 95.7 mm SL.
I-B *Hyporhamphus balinensis*, NSMT-P 29276, 91.6 mm SL.
I-C *Gerres acinaces*, NSMT-P 28323, 192.0 mm SL.
I-D *Mesopristes kneri*, NSMT-P 19046, 101.4 mm SL.



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PLATE II

- Plate II-A *Stenogobius lacrymosus*, NSMT-P 16008, 92.8 mm SL.
II-B *Acentrogobius moloanus*, NSMT-P 29326, 43.8 mm SL.
II-C *Illana bicirrhosa*, HUMZ 88067, 30.5 mm SL.
II-D *Mugilogobius cavifrons*, NSMT-P 29365, 37.9 mm SL.



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