

DESCRIPTIONS OF NEW GENERA AND SPECIES OF FISHES FROM JAPAN AND THE RIU KIU ISLANDS.

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During the recent cruise of the U. S. Bureau of Fisheries steamer *Albatross* in the North Pacific Ocean and in the seas about Japan, many fishes were collected along the shores of Japan and to the southward as far as Okinawa. In the preparation of a report on these fishes a number of new forms have been discovered. Descriptions of 2 genera and 14 species heretofore unknown appear in the present paper.^a

Family SYNGNATHIDÆ.

SIPHOSTOMA YOSHI, new species.

Head 9 in length to base of caudal; depth 3.5 in head; eye 5.5; snout 2.5; dorsal 48; rings 18+31.

Body slender, the tail long; dorsal outline of snout concave; interorbital space flat; occiput convex. The snout bears ridges as follows: a median one from the tip to interorbital space; a dorso-lateral one extending from tip to supraorbital rim where it branches on interorbital space; a pronounced median ventral one, and above this a less prominent pair, the upper of which passes below nostrils and eye. Occiput with 3 ridges, the outer ones having their origins above the eye, and continued backward as the dorsal body keels. Ventral surface of body rounded, without a median keel; no spines or very strong keels on body or tail.

Dorsal on 10.5 rings, 4 of which belong with the body; the height of rays about equal to depth of body. Anal minute. Caudal equal in length to snout. Pectoral somewhat over half as long as caudal.

Color in spirits yellowish white; a dusky stripe, indefinite in outline, passing from tip of snout backward across head; body with dusky reticulations which form a row of diamond-shaped figures on

^a Other species from the same region are described in a previous paper, Proc. U. S. Nat. Mus., XXXV, pp. 93-111.

the tail, connected by a narrow, median stripe; caudal dusky, with light edges.

Type.—One specimen, Cat. No. 62944, U.S.N.M., measuring 105 mm. Locality, Tanegashima, Japan.

(*yoshi*, a Japanese word meaning a reed.)

ICHTHYOCAMPUS NOX, new species.

Head 8.2 in length to base of caudal; depth 18; depth caudal peduncle 7.5 in head; snout 2.5; eye 5; D. 20; A. 3; rings 16+31.

Snout with a strong median keel which abruptly ends on interorbital area; a lateral one of about one-half the height of median keel extending obliquely from tip of snout to eye; a third extending alongside of snout to opercle; another on lower edge of snout; opercle with a keel on anterior third, from which faint lines radiate; supraorbital keels converging toward a short median ridge behind. Body with a median ventral ridge and 3 lateral ones. Tail square in cross section, except on 3 anterior rings over which the median of the lateral ridges extends. Plates of body without spinous angles; those of tail with incipient spines on upper angles

Dorsal extending over 5.5 rings, 5 of which belong with the tail. Caudal equal in length to diameter of eye. Pectoral slightly longer.

Color of preserved specimen almost black; a narrow stripe, scarcely visible, extending along each flat surface; caudal narrowly edged with white.

Described from the type, a female 51 mm. long, from Naha, Okinawa.

Type.—Cat. No. 62945. U.S.N.M.

MICROPHIS OCELLATUS, new species.

Head 5.7 in length to base of caudal; depth 1.7 in head; depth caudal peduncle 7; diameter eye 6; length snout 2.5; D. 30. A. 5; rings 19+18.

Body of about equal depth from occiput to tail where it abruptly grows smaller, the outlines of the tail gradually sloping to the caudal peduncle. Snout perceptibly curved upward; narrow, the width slightly less than diameter of orbit; rounded anteriorly. Nostrils with low rims. Head with ridges as follows: one above eye, having its origin on tip of snout, curves outward as it passes back, abruptly bends inward and increases in height on reaching nostrils, then bends outward and curves downward behind the eye and extends to upper edge of opercle; one on occiput; a central, oblique one on opercle with lesser ridges radiating from it; 3 on each side of snout. Each body ring with a median dorsal and ventral keel, except where displaced by egg-pouch or fin; 5 lateral keels, the fourth row of which, counting from above, disappears near vent; the third and fifth rows unite just posterior to vent; caudal rings each with a dorsal, ventral, and

3 lateral keels, each of those of the upper lateral row on both body and tail with a weak posterior spine; facets of rings weakly sculptured between the keels. Egg-pouch extending over 13.5 body rings, the keels on either side of pouch markedly elevated.

Dorsal located on 7.5 rings, 2 of which belong with the tail. Caudal fin obtusely pointed, about half as long as snout. Anal minute. Pectoral about 1.5 times as long as diameter of orbit.

Color in spirits, light brown; 2 distinct dark stripes on occiput, which converge and join on back above pectoral fin and pass in a broken line to caudal; side of head with a broad, dark stripe passing through eye; a row of large spots along lower edge of jaw and on opercle; sides of body with a line of small spots on upper row of plates and a line of sharply defined ocelli on each of the three rows of plates below; tail with small, elongate, dark spots, one on each ring facet; caudal dusky, with a light border.

This description is of a male specimen, 63 mm. long, collected at Naha, Okinawa.

Type.—Cat. No. 62946, U.S.N.M.

A female, also from Naha, has 21 rings in the caudal. The keels of the rings are stronger and the surfaces between are more prominently sculptured. There are 29 dorsal rays. The color is less brilliant than that of the male, the ocelli being replaced by small spots.

A female, 39 mm. long, from Tanegashima has 22 caudal rings.

The color is very dark, except for 7 or 8 large, light spots passing over the back like saddles.

Cotype.—Cat. No. 21133, Stanford University collection.

Family APOGONICHTHYIDÆ.

APOGONICHTHYS NAFÆ, new species.

Head, 2.7 in length to base of caudal; depth, 2.9; depth caudal peduncle, 5.7; eye, 3.2 in head; snout, 5.5; width interorbital space, .4; D. VII-I-10; A. II-9; scales in lateral series, 23; between origin of anal and spinous dorsal, 8.

Head very large; snout pointed; jaws equal; eye large, the diameter greater than length of snout; maxillary extending beyond eye, its length almost equal to half that of head. Teeth of jaws in narrow bands; no canines; large teeth on vomer, none on palatines. Edge of preopercle, smooth. Border of preopercle with a row of 6 large scales; scales of opercle, large. Lateral line ending beneath origin of soft dorsal; a few scattered pores along middle of caudal peduncle.

First dorsal spine, minute; the second not quite half the length of third; third and fourth longest, about 2.2 in head. Anterior rays of soft dorsal longest, 1.9 in head. First spine of anal minute, the following one very small; longest rays somewhat shorter than those of

dorsal. Caudal rounded, 1.3 in head. Pectoral rather pointed, 1.5 in head. Ventral, 2.2.

Three blackish stripes extending backward from eye toward border of opercle; the median one broadened and rounded posteriorly; body with small, dark spots, those on caudal peduncle largest.

Described from the type, a specimen 30 mm. long, from Naha, Okinawa.

Type.—Cat. No. 62947, U.S.N.M.

The species closely resembles *A. isostigma* Jordan and Seale,^a from which it may possibly prove to be indistinguishable. *A. nafa* has a larger eye and a smaller second anal spine, while in *A. isostigma* the median stripe of head is broader, closely approaching a circular spot in shape, and bordered by a prominent ring of dead white; also each lateral scale of body has a large, black spot.

Family POMACENTRIDÆ.

ABUDEFDUF RICHARDSONI, new species.

Head, 3.8 in the length to base of caudal; depth, 2.5; depth caudal peduncle, 7.2; diameter eye, 2.8 in head; snout, 4.2; width interorbital space, 3; D. XIV-13; A. II-13; scales in lateral series, 26; in transverse series, counting upward and forward from origin of anal, 11.

Mouth oblique; maxillary extending to a vertical through anterior edge of orbit. Teeth incisor-like in front of jaws, the edges rounded; growing more conical and smaller posteriorly; not crowded, the spaces between them quite evident. Gill-rakers on anterior arch, 7+16, long and slender. Suborbital narrow, the edge smooth; edge of preopercle naked and very finely denticulated.

Snout naked between nostrils and lip; head and body otherwise completely scaled; bases of dorsal and anal scaled, the spinous dorsal with three rows of attenuated scales extending upward between the spines. Lateral line ending below origin of soft dorsal; a few pores along median part of caudal peduncle.

Median spines of dorsal somewhat longer than the others, 1.8 in the head; longest (ninth) ray, 1.2 in head. Second anal spine, 2 in head, the first not quite half as long; rays of about equal length throughout, 1.6 in the head. Soft dorsal reaching base of caudal when depressed; neither dorsal nor anal filamentous. Caudal deeply cleft, the lobes somewhat filamentous in a few examples. Pectorals, 3.6 in the length; ventrals, 4; occasionally filamentous.

Color of preserved specimens; base of pectoral with a prominent black spot on its upper third; dorsal half of body dusky, the color gaining in intensity posteriorly and forming a black stripe along upper part of caudal peduncle and caudal fin; lower lobe of caudal

^a Fishes Samoa, Bull. Bureau Fisheries, XXV, p. 251.

fin with a similar dark border which extends forward and ends near the middle of lower edge of caudal peduncle; scales of body each with a dusky spot, the spots growing less distinct and finally disappearing ventrally; posterior basal part of soft dorsal with a light, yellowish spot, round and well defined in some examples; other parts of fin, together with spinous dorsal, dusky; anal with a well marked blackish border.

Described from the type, a specimen 70 mm. long, and other examples from Naha, Okinawa, among which are the cotypes, Cat. No. 21134, Stanford University Collection.

Type.—Cat. No. 62948, U.S.N.M.

The species resembles *P. cyanomus* Bleeker.^a It is distinguished by the black spot on the base of the pectoral, the absence of a blue spot at upper edge of gill-opening, the less sinuate dorsal, and other less conspicuous characters.

Named for Mr. Robert Earl Richardson.

ABUDEFDUF REX, new species.

Head, 3.6 in length to base of caudal; depth, 2.4; depth caudal peduncle, 6.4; diameter eye, 3 in head; width interorbital space, 3.3; D. XIII—14; A. II—13; scales in lateral series, 25; between lateral line and spinous dorsal, 2; between origin of anal and lateral line, counting upward and forward, 9.

Body moderately elongate, the eye large, snout short and blunt, the maxillary extending to a vertical passing midway between pupil and anterior edge of orbit. Teeth in a single row; conical and close set. Gill-rakers on first arch 5+11; slender and rather short; suborbital smooth; edge of preopercle exposed and smooth.

Lateral line ending below origin of soft dorsal; a number of pores scattered along middle of caudal peduncle. Snout and chin naked; head and body elsewhere scaled; bases of dorsal and anal with a strong sheath of scales, above which several rows of narrow, thin scales extend outward on the membranes; basal half of caudal with scales.

Membrane of spinous dorsal with a scalloped edge, a small filament extending beyond each spine; the posterior spines longest, about 1.6 in head; last rays extending somewhat beyond base of caudal when depressed. Second spine of anal almost equal in length to the following ray, 1.6 in head; longest rays somewhat shorter than those of dorsal, not quite reaching caudal when depressed. First ray of ventral filamentous, reaching slightly beyond origin of anal when depressed, the spine about half as long as the ray. Upper rays of the pectoral longest, 3.8 in the length; the others successively shorter. Caudal with a rather shallow notch, the lobes rounded.

^aAtl. Ichth. Pomac., pl. ix, fig. 3.

Color in spirits brownish anteriorly, becoming much lighter on posterior half; each scale with a round, white spot, behind which is a small dusky area, the former fading and the latter becoming more distinct on exposure to light: upper edge of gill-opening with a distinct black spot partly covering one scale; 2 or 3 faint light stripes on snout. In life brilliant purple anteriorly, blending with bright orange on posterior half of body, each scale with a round purple spot, the posterior spots standing out in bold contrast against the orange; spinous dorsal narrowly edged with purple, the soft dorsal, anal, and caudal orange; base of pectoral orange, the fin washed with purple; ventrals suffused with purple.

Small examples have the dorsal and anal more elongate than the larger ones.

Type.—Cat. No. 62949, U.S.N.M., a specimen 61 mm. long from Naha, Okinawa. *Cotype*, Cat. No. 21135, Stanford University Collection.

Twenty-five specimens were secured from the tide pools, where the species is well represented. Their bright colors make them very conspicuous. When disturbed they quickly conceal themselves in the crevices of the coral rocks.

Family SCARICHTHYIDÆ.

CALLYODON BOWERSI, new species.

Head, 2.9 in length to base of caudal; depth, 2.6; depth caudal peduncle, 7; snout, 2.2 in head; eye, 7; interorbital space, 2.7; D. IX-10; A. II-11; scales in lateral series, 21; between anal and dorsal, 8.5.

Body rather deep and heavy, anterior profile elevated, the head blunt; interorbital space acutely arched. Lips thin and narrow, not covering half of jaws, the upper lip double for a slight space only, the inner part reduced to a small, rounded pad. Teeth whitish, the tips of only one row evident; one short, conical tooth at posterior edge of upper jaw.

Two rows of scales on the cheek; 7 or 8 in the upper, 6 or 7 in the lower; one row along the lower edge of the operculum. Highest dorsal spines, 3.3 in head; rays, 2.8; median anal rays, 2.9. Edge of caudal concave, the length 1.4 in the head. Pectoral rather pointed, 1.3 in head; ventral, 1.7.

Color in spirits deep green, lighter beneath, approaching a yellowish tint on chin and throat: each scale of body with a narrow, light, vertical bar at base; lower lip deep green, narrowly edged with yellowish; upper lip similar; snout with a broad, transverse purplish band which is edged with dark green; interorbital area with two narrow, yellowish bands; lower margin of orbit edged with yellow;

a conspicuous yellow area extending from near eye backward to a vertical through base of sixth dorsal spine, narrow anteriorly, where it is connected with the orbit by two slender stripes, rapidly broadening as it extends backward and downward behind and beneath the pectoral fin; dorsal fins with 2 broad, yellow, median stripes which are united anteriorly; anal with a broad, yellowish green stripe narrowly separated from base of fin; caudal with light stripes between the rays; larger part of pectoral yellowish, the upper edge and the base green; ventrals yellow, edged with green.

Type.—Cat. No. 62950, U.S.N.M.

Two specimens from the market at Naha. One, the type, measures 300 mm. in length. The second, cotype, No. 21136, Stanford University collection, is somewhat smaller and a little more brightly colored, the pattern remaining the same. The pectoral of this specimen is somewhat more rounded than that of the type.

Named for Hon. George M. Bowers, United States Commissioner of Fisheries.

CALLYODON GEDEMA, new species.

Head, 2.8 in the length to base of caudal; depth, 2.5; depth caudal peduncle, 2.4, in head; eye, 7; snout, 2.1; interorbital space, 3.1; D. IX—10; A. IV—9; scales in lateral series, 22; between bases of dorsal and anal, 7.5.

Body deep and heavy; occiput and nape with a great hump which is angular in front and more rounded above, rising abruptly from a point over anterior margin of orbit. Lips thin, covering only basal portion of teeth; the upper double for about half its width; points of teeth distinct along cutting edge of jaws only; 2 conical teeth on proximal part of upper jaw.

Cheeks with 2 rows of scales, the preopercular margin naked; 7 scales in the lower row, 10 in the upper; posterior part of upper row extending dorsally behind the eye; anterior and upper edge of occipital elevation naked; 3 rows of scales anterior to the dorsal fin. Membrane along edge of spinous dorsal thickened; length of longest spines, 3.5 in head; soft dorsal equal in height to spinous portion, the posterior rays somewhat lengthened. Anal equal in height to soft dorsal, the posterior rays considerably elongated and somewhat falcate, about 2 in head; tips of both dorsal and anal reaching caudal when depressed. Caudal slightly convex, 1.4 in head. Pectoral pointed, the tip, when depressed, reaching a vertical through anal opening. Ventrals pointed, the outer edges greatly thickened, 1.5 in head.

Color in spirits deep brown, the dorsal, anal, and pectoral narrowly edged with green; teeth, deep green.

One specimen, measuring 450 mm. long, from the market at Naha.

Type.—Cat. No. 62951, U.S.N. M.

Family CEPHALACANTHIDÆ.

DACTYLOPTENA GILBERTI, new species.

Head measured from tip of snout to upper edge of gill-opening. 3.8 in length; depth, 5.3; depth caudal peduncle, 4.3 in head; eye, 3; snout, 3.1; interorbital space, 1.4; D. I-I-V-8; A. 6.

Snout extremely blunt; interorbital space broad and deeply concave; occipital region convex; posttemporal processes short and rather blunt, the space between their apices rounded anteriorly instead of angular; each with a strong dorsal keel which is divided anteriorly and broken up into two rows of sharp elevations much like those on the scales. Opercular spine acute, the outer edge serrated; distance from its tip to end of snout contained 2.6 times in the length.

Scales with strong keels, the posterior edges of which are serrated; sides posteriorly, with a row of 6 large, movable, knife-like scales, the first of which is located some distance anterior to the anal opening; base of caudal with a pair of enlarged, movable scales, each of which has a high, sharp keel. An indication of a lateral line in the shape of a slight ridge without pores may be followed some distance backward and downward from the posttemporal spine.

First and second dorsal spines separate from each other, and from the remaining part of the fin; the first spine very high, extending to tips of other spines when the dorsal is depressed; contained 3 times in the length, inserted immediately behind the occiput, its posterior edge with a broad membrane; second spine short, its length contained about 3.8 times in the length of first; its posterior edge with a membrane which scarcely connects it with the following ray; succeeding spines all connected by membrane, their tips when depressed reaching origin of soft dorsal. Longest (first and second) dorsal rays somewhat shorter than head. Highest anal ray 1.3 in head; edge of membrane between rays deeply scalloped. Longest pectoral rays reaching just beyond base of caudal. Caudal truncate; the uppermost rays slightly longer than the others. Ventrals reaching anal opening.

In spirits the color is a very deep brown, almost concealing a few black spots on the upper and lateral surfaces; first dorsal spine with 6 distinct, blackish cross-bands, the color continuing backward and darkening the membrane; other spines and rays of both dorsals and caudal similarly barred; anal immaculate; pectoral with many round, dusky spots of various sizes, and a large, dusky area near base of fin.

Type.—Cat. No. 62952, U.S.N.M., a specimen 208 mm. long from Kagoshima.

The species is represented by but one specimen. It is not to be confused with *D. orientalis*, being readily distinguished by the ex-

tremely short snout, the broad interorbital space, and the curved outline of the area between the posttemporal processes. *D. gilberti* also has the scales more strongly keeled, the tips of the pectoral rays less filamentous, the membranes extending farther out on them, the knife-like scales along the sides better developed and more numerous, and the mouth somewhat wider.

Named for Dr. Charles H. Gilbert.

Family GOBIIDÆ.

ZONOGOBIUS BOREUS, new species.

Head 3.1 in length to base of caudal; depth, 3.7; depth caudal peduncle, 7; eye, 3.2 in head; snout, 4; interorbital space, 4; D. VI—10; A. 8; scales in lateral series about 26; between anal and dorsal, counting upward and forward, about 10.

Head very large; snout blunt, mouth oblique, maxillary extending to a verticle through posterior edge of pupil; interorbital space narrow and flat, the dorsal rims of eyes projecting slightly above it. Teeth simple, in narrow bands on the jaws, the outer and inner row of lower jaw distinctly enlarged; vomer and palatines naked. Tongue truncate. Gill-rakers on first arch 3+10, long and very slender. Gill-openings large, extending far forward below, but not confluent. Shoulder girdle without any apparent armature. Nostrials tubular. Head naked, and without barbels; rows of papilliferous mucous pores on sides of head, snout, and chin. Body with large, loosely attached ctenoid scales, except on breast, abdomen, and a considerable space on back below the spinous dorsal, the scales extending forward toward base of pectoral in one or two rows.

Origin of spinous dorsal slightly posterior to base of pectoral, separate from the soft dorsal; the latter slightly higher, the longest ray contained 1.7 times in the head. Origin of anal on a vertical passing between second and third dorsal rays; the height about equal to spinous dorsal, the longest rays contained 2 times in head; neither dorsal nor anal united by membrane to the caudal peduncle, nor reaching base of caudal when depressed. Ventrals separate, pointed; extending to the anal opening when depressed; inserted directly below the gill-opening. Pectorals rounded, their length contained 1.5 times in the head.

Color in spirits, pale brown, darker on head and neck, where there are a series of light, dark bordered bands, the first of which passes over the snout, curving in front of the eye; the second through eye, the third and fourth across occiput, the fifth over the nape and downward on base of pectoral; between the third and fifth bands are two very light and indistinct ones, which are separated by the fourth. On cheeks, opercles, and base of pectorals the bands are oblique.

Type.—Cat. No. 62953, U.S.N.M., a specimen 33 mm. long, from the tide pools at Misaki. Cotype, Cat. No. 21137, Stanford University collection. Only 2 specimens seen.

This species exhibits much the same type of coloration as *Z. semidoliatus* (Cuvier and Valenciennes), and might be mistaken for that form. It differs in being more slender, in having a naked area below the spinous dorsal, and in color.

It may be remarked, in passing, that *Gobius semidoliatus* Day^a represents a species that has apparently been wrongly identified.

Genus EXPEDIO, new genus.

Body elongate and slender, head broad, the muscles of the jaws greatly developed. Tongue notched. Teeth simple; a band on upper jaw, outside of which is a row of enlarged ones; a single row on the lower jaw. Gill-opening restricted to side of head. A small anal papilla. Body scaleless. Spinous dorsal and ventral fins absent. Soft dorsal inserted above the anal. Middle of back with two parallel rows of minute plicæ.

The genus resembles *Luciogobius*, and is perhaps closely related to it. It differs in having no ventrals.

Type.—*Expedio parvulus*, new species.

EXPEDIO PARVULUS, new species.

Head, 5.9 in length to base of caudal; depth, 11; depth caudal peduncle, 11; eye, 8 in head; snout, 3.5; D. 10; A. 11.

Body of about the same depth throughout, the width less than the depth: head broader and deeper than the body; muscles of sides and top of head greatly developed, the interorbital and occipital regions with a marked concavity; rim of eye extending above contour of head. Mouth large, the cleft extending to a point below posterior border of eye; lower jaw projecting beyond the upper; lips large and pendent; tongue broad, very deeply notched at tip; teeth simple, a narrow band on upper jaw, a single series on the lower, outer row on upper jaw enlarged. Gill-opening about equal in width to base of pectoral. Nostrils with well-developed rims. A row of mucous pores extending along snout and backward below eye; a short row behind and above eye. A small anal papilla present.

Head and body scaleless.

Spinous dorsal and ventral fins absent. Soft dorsal inserted on posterior third of body, measured from gill-opening to base of caudal; the rays about equal in height to length of snout. Anal inserted slightly in advance of dorsal, the rays somewhat longer than those of dorsal; caudal rounded; about three-fifths as long as head. Pectorals with 13 rays; the length contained about 2 times in head.

^a Fishes, India, p. 295, pl. LIX, fig. 6.

Anal opening located in advance of anal fin a distance about equal to depth of caudal peduncle.

Yellowish white in spirits, closely covered with minute, dark-brown specks.

Type.—Cat. No. 62954, U.S.N.M., a specimen 37 mm. long from Misaki, Japan. Cotype, Cat. No. 21138, Stanford University collection. Five specimens in all were secured from the tide pools, the largest measuring 43 mm. In some specimens the pectoral fins were much more pointed and slightly longer than in others.

Genus INU, new genus.

This genus resembles *Luciogobius* and is no doubt related to it. It differs principally in having scales.

Body short, with a deep caudal penduncle; head large, broad, the muscles of the cheeks and sides of the head greatly developed, bulging upward beyond the occiput; eyes directed upward and forward; jaws about equal, the cleft of mouth extending backward far beyond eyes. Teeth simple; an outer row of enlarged ones, within which is a narrow band of minute ones. Tongue notched at tip. Gill-openings restricted to the sides. Shoulder girdle without processes. Pectorals without filamentous rays. Ventrals present, well developed and united in a round disk, the anterior edge of which is greatly thickened; spinous dorsal absent; soft dorsal and anal inserted opposite each other, their points of origin near middle of body. Small cycloid scales on posterior part of body; head naked. A small anal papilla. On the back, before the dorsal is a slight median depression, on either side of which is a row of minute, oblique plicae, these being preceded by a slight median ridge. These peculiar plicae are also present in *Luciogobius*, *Clariger*, and *Expedio*, and they are slightly developed in *Astrabe*.

The genus is known to include two species of voracious-looking little gobies found in the pools at Misaki.

Type of genus.—*Inu koma*, new species.

(*inu*, a Japanese word meaning dog.)

INU KOMA, new species.

Head 3.4 in length to base of caudal; depth 7.5; depth caudal peduncle 9; snout 4.5 in head; eye about 10; width interorbital space 9; dorsal 11; anal 12.

The body is short and deep, being almost cylindrical behind the head, growing more compressed posteriorly to the flat caudal peduncle which has a pronounced, thickened, fleshy keel on the upper and lower edges of its posterior half. Head very broad, somewhat over a third wider than the body, and considerably depressed, the great muscles of the cheeks and sides of head bulging outward and upward, thus forming a deep trough behind the eyes and on the

occiput. Interorbital space broad, slightly concave; with a narrow, transverse, fleshy ridge. Eyes directed upward and forward in a marked degree, the upper orbital rims projecting above dorsal contour of head. Nostrils with low rims. Mouth very large, the maxillary extending far beyond eye, its length contained about 2.5 times in the head. Tongue with a deep notch anteriorly. A single row of widely spaced, enlarged, simple teeth in each jaw, within which is a band of minute teeth. Gill-opening restricted to the sides, the opening somewhat greater in width than base of pectoral fin.

A low ridge with a line of large mucous pores extending across snout and backward along side of head below eye; a similar ridge with its crest of mucous pores extending along lower jaw; anterior part of body with a median lateral series of pores. Head and body naked except the caudal peduncle which is closely covered with minute, cycloid scales, the area thus protected extending anteriorly, and growing narrower is reduced to a point below the middle portion of the dorsal fin.

Dorsal and anal inserted almost halfway between edge of gill-opening and base of caudal, the dorsal slightly higher than anal, the longest ray contained about 2.3 times in length of head. Caudal rounded, 1.5 in head. Pectoral rounded, 2 in head. Anterior part of ventrals thickened, the posterior part with weak rays and thin membrane.

Color in spirits, pale brown, finely stippled with dark brown; darker on the snout and on base of caudal where there is a distinct vertical bar; fins with small and distinct dark spots.

Type.—Cat. No. 62955, U.S.N.M., described from the type, a specimen 39 mm. long, from Misaki, Japan. Another specimen, cotype, Cat. No. 21139, Stanford University collection, about half as large, does not appear to differ from the above.

(*koma*, a Japanese word; *Koma-inu* the name of one of the two ever-present, dog-like images found in the Shinto temple grounds.)

INU AMA, new species.

Head 3.3 in length to base of caudal; depth 5.6; depth caudal peduncle 7; snout 4 in head; diameter eye 7; width interorbital space 4; dorsal 9; anal 10.

Body notably short and thickset, the depth somewhat greater than the width; caudal peduncle almost as deep as body, and very flat. Head much broader than body, the huge muscles of cheeks and sides of head bulging outward and upward, forming a ridge across the occiput, and a deep pit, open in front, on the top of head. Eyes placed high in head, their dorsal rims projecting above contour of head; directed considerably upward and forward. Nostrils with rims. Mouth large, the cleft extending far behind eye; lower jaw

projecting a little beyond the upper; tongue with a deep notch. Teeth simple, in bands on both jaws; the outer row distinctly enlarged and widely spaced. Gill-openings restricted to the sides; considerably wider than base of the pectoral fin.

Skin of head very soft, lying in numerous small wrinkles and folds; mucous pores apparently absent; no papillæ or marked dermal ridges; back with a row of minute dermal plicæ on each side of median line for a short distance anterior to dorsal fin. Head, back, breast, and abdomen scaleless; posterior parts with minute, cycloid scales; the area thus covered diminishing in width anterior to origin of dorsal, and narrowing down to a point just behind insertion of pectoral fin.

Dorsal and anal inserted opposite each other, their points of origin about midway between bases of pectoral and caudal. Anal somewhat higher than the dorsal, and with a slightly longer base, the rays of either not reaching base of caudal when depressed. Caudal rounded posteriorly, its length contained about 2 times in head. Pectoral rounded, about equal in length to caudal. Ventrals with anterior part greatly thickened; rays slender and rather weak; edges of fin notched, the tips of rays projecting.

Color in alcohol, pale brown, the head with minute subdued spots of a darker color; fins with minute spots.

One specimen (type, Cat. No. 62956, U.S.N.M.), measuring 40 mm. in length, was found in a tidepool at Misaki.

This species is to be distinguished at a glance from the preceding by the more robust body which is more closely covered with scales. On close inspection, many lesser differences appear, as the fewer dorsal and anal rays, the absence of conspicuous mucous pores, etc.

(*ama*, Japanese from Ama-inu, a temple image resembling a dog.)

Family SOLEIDÆ.

TRULLA ITINA, new species.

Head, 5 in length; depth, 3.6; eye, 8 in head; snout, 3.2; dorsal rays about 95; anal, 89; scales in lateral series about 86.

Body sinistral; long and slender, much like the leaf of a willow or bamboo, the snout rather pointed. Eyes separated by a concave, fleshy isthmus, the width of which equals half the longitudinal diameter of the eye. Mouth nearly symmetrical in shape; rostral hook not extending to a vertical through anterior edge of upper eye; angle of mouth below posterior part of lower eye; upper lip of blind side double, the inner portion with a distinct fringe on the edge; no teeth on the left side; a narrow band of minute teeth on the right side. Gill opening of right side somewhat wider than that of the left. A single tubular nostril on left side directly in front of lower

eye; two nostrils on blind side; the anterior tubular, the posterior with a large flap.

Three lateral lines on the left side; the dorsal one beginning on the snout and following along the base of the dorsal fin for about two-thirds of the length of the body; the median one originating on the snout and extending to the tip of tail, sends a short branch upward on the back of head, and another downward across the gill cover toward the ventral fin from where it is continued along the body near base of anal and disappears at a point below end of dorsal line; no lateral line on the right side. Scales all ctenoid; growing smaller in size from the posterior parts toward the head; 12 or 13 scales between the median and dorsal lateral lines near middle of body; 17 between median and lower lines at a point about a head's length behind gill-opening, counting upward and forward in each case.

Pectorals absent. One ventral present, it being located on the median line, and separated from the anal.

Color of preserved specimen light brown, slightly variegated.

The species seems to be distinguished by the three lateral lines on left side, single nostril on left side, and the fringed lip.

Type.—Cat. No. 62957, U.S.N.M., a specimen 115 mm. long, from the market at Naha, Okinawa.