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A New Goby and Other Fishes from Formosa

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The American Museum of Natural History has recently received from Mr. Myles Walsh, III, a few "fresh-water" fishes which he collected from the Tam-sui River, Formosa, September 27, 1956. He says the Tam-sui River is affected by tide. These specimens are unexpectedly worth while, perhaps because recent published work on Formosan fishes has had to do with those of more strictly fresh-water or marine, rather than estuarine, habitats. There are taxonomic problems involved, and one interesting small goby (a single specimen) seems to be undescribed. Mrs. Nina Williams has kindly drawn the diagrammatic figure of this type specimen, based on my examination thereof.

Konosirus thrissa (Linnaeus)

Clupea thrissa LINNAEUS, 1758, after Osbeck.

Clupanodon thrissa, REGAN, 1917. FOWLER, 1928, in part.

There are three specimens of this fish in the Formosa collection. Its interest lies in the fact that, owing to the vagaries of taxonomy, it has been and still is often either disregarded or confused with *Dorosoma nasus* (*Clupea nasus* Bloch, 1795; *Chatoessus nasus*, Bleeker, 1852, equals *Nematalosa come*, Regan, 1917; *Chatoessus come* Richardson, 1846). Regan replaces oriental *Dorosoma* with his genus *Nematalosa*, and confines *nasus* Bloch to India.

Including two *thrissa* from "Canton fish ponds," there are five of 65 to 77 mm. in standard length to hand for comparison with five *nasus* of 70 to 78 mm. from North Queensland and New Guinea. The former have a "herring" mouth, which, though not large, is lateral and terminal, with the jaws subequal. In the latter the mouth is small, inferior,

more transverse, and placed well back under the projecting snout. It is one way in *thrissa*, the other in *nasus*, nothing intermediate. Otherwise, in tangible specific characters, the two are so much alike as to suggest close relationship.

With slight increase of length, the depth of body increases regularly and considerably in *nasus*, depth in length 2.8 in the smallest, 2.3 in the largest. In *thrissa* it varies less, without any such marked tendency, 3.0 in three of the five specimens, including the largest, 3.1 in the smallest, 2.7 in the next to the largest (of 74 mm.) Their body outline seems to taper more posteriorly, and they have a different color pattern—five or six rounded blackish marks in a grayish stripe running backward from the shoulder along the side. There is no indication of anything but the shoulder mark in *nasus*.

The taxonomy of *thrissa* Linnaeus (1758) was first complicated by Broussonet (1782) who assigned it to an Atlantic species (*Opisthonema oglinum*, *Megalops oglina* Le Seuer, 1817), which it resembles, at least superficially. He was followed in so doing by Günther (1868), perhaps partly because the latter had no oriental fish to identify with it. Other authors following Günther have also done so, including Weber and de Beaufort (1913).

Konosirus Jordan and Snyder (1900) is used advisedly, though by the latest ruling with which I am familiar, it would be a synonym of *Clupanodon*. *Clupanodon*, by previous established usage, was a genus of different herrings, and in present taxonomic procedure, stability being unlikely, it is uncertain what it will be presently. The type of *Konosirus* is *Chatoessus punctatus* Temminck and Schlegel (1850), a Japanese fish close to *K. thrissa*, not *C. nasus* Bloch as stated (we must suppose inadvertently) by Jordan (1920). Regan has presumably followed this error in synonymizing *Konosirus* with his *Nematalosa*.

Misgurnus mizolepis hainan Nichols and Pope

The Formosan collection contains four specimens of *Misgurnus*, identified as the form Nichols and Pope (1927) called *hainan*, though somewhat less elongate and compressed, in these respects intermediate towards *fukien* Nichols (1925). The types of the two species have been compared. It is not unreasonable that they should be so, as the fresh-water fishes of Formosa show definite relationships to those of Fukien, and Formosa and Hainan are both islands.

Misgurnus is generally distributed, abundant, and very variable in the Orient. It was present in an American Museum collection from various parts of China. I found the differences in and relationships

of its forms there an interesting subject for speculation and recognized 13 of them, at least tentatively (1943). They are more or less regional or local, poorly differentiated, and confusing. In extensive collections from Tungting Lake, Hunan, there were three clearly marked ones occurring together, of which *mizolepis*, probably an ecological form, may well be the most aberrant of the 13. On the basis of characters assumed to be of greatest importance (but which may not have been), I assigned our material to three species, *anguillicaudata* Cantor (1842), *mizolepis* Günther (1888), and *mohoity* Dybowski (1869), three strains, respectively, more or less of the north, the south, and the west.

These and other species have been recognized by authors. But, on the other hand, some recent authors place all the oriental forms in *anguillicaudatus*, too confusingly variable a species even to subdivide. It would be not illogical to consider all but the central forms (as in Tungting Lake) *anguillicaudatus*, recognizing their differences only as those of local populations; the lake as being in a differentiation and distribution center whence they had spread (versus come together); and its three forms as subspecies of *anguillicaudatus*, of which the others are widely distributed foreign intermediates.

Hyporhamphus occipitalis (Gill)

There are three small *Hyporhamphus* of 90 to 120 mm. in standard length, which at first glance passed for the young of *H. georgii*, owing to the long slender extension of the lower jaw, conspicuous black on its basal prongs, and the character of the silvery lateral band. On closer inspection, they are not this, as they have dorsal and anal origins in approximately the same vertical line, but match the description of *Hemirhamphus occipitalis* Gill (1859) from Japan, sufficiently well for them to be identified therewith.

Gill speaks of the length of the lower jaw in the type of *occipitalis* and only specimen mentioned (it was of comparable size with ours) as a character that differentiated it from Japanese *sajori* Temminck and Schlegel (1846), which has a notably short lower jaw for a hemiramphid. He named it from the triangle of spots on the occiput, which may or may not be a good specific character in such small halfbeaks. In our specimens there is a blackish area of the same shape in the same position, which on close scrutiny is seen to consist of black spots on a somewhat paler ground. In these, aside from considerable conspicuous black on the basal prongs of the lower mandible, blackish submarginal bands, meeting in front, extend along the sides of the upper. As preserved, their bodies are pale, except for a blackish and silvery lateral

band, very narrow in front and becoming broader between dorsal and anal fins, like that in some related species. They have also three narrow, dotted, darkish streaks along the midline of the back to the origin of the dorsal fin, from just behind the head where they are spread into a more complicated pattern.

Jordan and Starks (1903) synonymize *occipitalis* with *sajori* (as its young), which reaches a large size, and, at least when adult is an unusually short beaked species. They must have overlooked this character, or assume it changes with age, though they do not say so or give any data from which such might be deduced. They say: "The young of this species (*sajori*) agree very well with Dr. Gill's description of *H. occipitalis* (which was taken from a specimen 4 inches in length) except that his specimen is alleged to have fewer anal rays and 2 or 3 fewer dorsal rays. Owing to the small size of his type, a mistake of this sort might easily be made. No species other than *H. sajori* has been recognized along the coast of Hondo. . . . It is one of the commonest fishes of Japan, much used for food."

Francesca R. LaMonte and I confirm what they say of the difficulty and uncertainty of fin counts in such small specimens, and if our count of the largest under a binocular microscope is correct, they are closer to those of *sajori* than those given for *occipitalis*. However, *sajori* is also an unusually fine-scaled species, and our largest *occipitalis* (120 mm.) has about 56 scales from nape to dorsal origin, versus about 75 in two *sajori* of 255 and 280 mm., with which it has been compared.

Gill described *H. occipitalis* in a collection of otherwise all or mostly marine species, and one might assume it was also from salt water, although this is not necessarily the case. He says, "Notes on a collection of Japanese fishes, made by Dr. J. Morrow . . . during the expedition to Japan, under the command of Commodore Perry," but gives no specific localities. Jordan and Starks say "from Shimoda" for *H. occipitalis*, possibly just the expedition base.

***Oxyurichthys formosanus*, new species**

A single small goby in the collection is apparently an undescribed species of *Oxyurichthys*, probably related to *O. jaarmani* Weber from New Guinea. It has the characteristic form of this genus, with long, exerted, filamentous rays in the first dorsal fin; a long, pointed, caudal fin; and, as in *jaarmani*, unusually large scales and gill openings not continued forward, the gill membranes being attached to sides of breast under middle of opercle. It has a broad truncate tongue suggesting that of *Gobius genivittatus* Cuvier and Valenciennes (which is

placed in *Awaous* by Jordan and Evermann, 1905; in *Stenogobius*, by Koumans, 1953). It furthermore suggests *genivittatus* (with which it has been compared, and which has smaller scales and different teeth) in that its most striking color mark is a black band extending downward from the eye, less broad and slanting less backward than in that species.

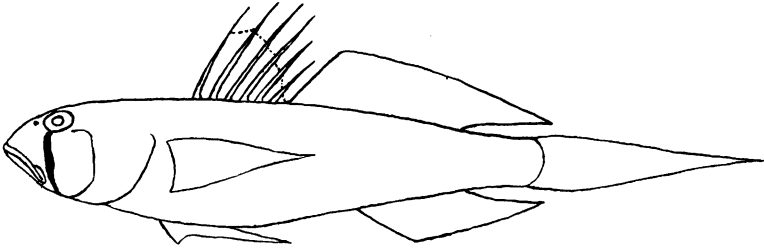


FIG. 1. *Oxyurichthys formosanus*, new species, type. Standard length, 39 mm.

DESCRIPTION OF TYPE: A.M.N.H. No. 20323, from the Tam-sui River, Formosa, September 27, 1956; collected by Myles Walsh, III.

Length, including caudal, 55 mm., to base of caudal, 39. Depth in this last (standard length), 4.3; head, 3.5; caudal, 2.4. Eye in head, 4.4; snout, 3.1; maxillary, 2.5; greatest width (at back of head), 2.2; depth of peduncle, 2.8; pectoral, 1.0; ventral, 1.2; most of the rays of first dorsal, 1.2 to 1.4; longest rays of second dorsal, about 1.5; of anal, about 2. Interorbital in eye, 2.5.

Dorsal VI-12; anal, 11. Scales about 30.

Head moderately, and body well, compressed, tapering back from the greatest depth under the first dorsal. Mouth moderately oblique, the maxillary curving down to not quite under the middle of eye, the jaws subequal. Snout broad, blunt, longer than eye, its profile curving down to its tip which is below the level of the lower margin of eye. Eyes close together, superolateral, their upper margins touching the profile of the head.

Gill membranes attached to sides of breast under middle of opercles, the distance across breast between their attachments about equal to length of snout. The obvious teeth are a single row in the upper jaw and a group of larger teeth at the front of the lower jaw.

First and second dorsal fins close together. Ventrals pointed, reaching four-fifths of the distance to anal origin, their basal cross membrane broad. Pectorals narrowed to a filamentous tip, reaching to over the first anal rays; caudal long, cuneate, also narrowed to a filamentous tip.

Moderately large scales cover the back and sides, becoming somewhat smaller near the origin of the first dorsal and near the bases of pectoral and ventral fins. No obvious scales on the head, on the back before the dorsal, before the pectorals, or on the breast before the ventrals.

Color in preservative pale, a sharp, narrow, blackish band from just before the middle of eye down and slightly back to behind the tip of the maxillary, whence its end becomes narrower and slants more backward to under the middle of the preopercle. Otherwise there are inconspicuous narrow dark markings on the back and upper side, and four or five irregular dusky blotches along the middle of the side, the last at the base of the caudal; there are smaller spots in the interspaces between them, and one or two of the blotches have a faint cross mark which extends farther down.

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