

Taenioides limicola, A New Goby from Guam, Marianas Islands

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The gobioid fishes allied to *Taenioides* were recognized by Koumans (1953) as constituting a distinct family, the Taenioididae, distinguished from the Gobiidae by the presence of a single long dorsal fin and small to indistinct eyes. Although its rank may be questioned, it appears that this is a natural group of closely related genera. Kouman recognized two subgroups, the Trypaucheninae, which have a small cavity above the gill chamber, and the Taenioinae, which do not. Taenioidid gobys are elongate, nearly blind fishes that live in the lower reaches of streams. The form described here appears to be the first known from the Marianas Islands since *Taenioides gertrudae* Fowler from Guam is not a goby according to Koumans (1940, p. 157).

Taenioides limicola new species

Figure 1

Holotype: American Museum of Natural History No. 20445, a male 44 mm. in standard length. Collected near the mouth of a stream flowing into Acfayan Bay about 1 mile south of Inarajan, Guam, April 23, 1961 by C. L. Smith and students.

Paratypes: A.M.N.H. No. 20446, 13 specimens, 16–53 mm., collected with the holotype. A.M.N.H. No. 20447, 17 specimens, 26–47 mm. same locality, July 2, 1961, C. L. Smith and students.

Diagnosis: A small species of *Taenioides* (*sensu* Koumans, 1953; p. 269; Norman, 1957, p. 437) with barbel-like flaps on the top and sides of the head as well as on the lower jaw. Dorsal soft rays 27–30, anal rays 26–29. Head shorter than the distance from the pelvic origin to the anus. Outer row of teeth enlarged, caniniform. In the largest specimens there are 4–8 canine teeth on each side of the symphysis of both upper and lower jaws.

Description: Meristic characters of the holotype: Dorsal VI, 29; Anal 27; Pectoral 18–18; pelvic I, 5; Branchiostegal rays 5–5; Caudal 2+13+2 (thirteen branched rays); Gill rakers 3+6. There are 25 myomeres between the pectoral base and the caudal base.

Body elongate and slightly compressed, head terete. Proportional measurements of the type and nine other large specimens are given in Table 1. Lips thick and fleshy, without tentacles. Gill membranes broadly joined to each other and to the isthmus, restricting the gill openings to the width of the pectoral fin base. Dorsal margin of the operculum connected to the body by membrane. No free preopercular margin. Anterior nostril at the end of a short tube; posterior

TABLE 1. PROPORTIONAL MEASUREMENTS OF TEN SPECIMENS OF *TAENIOIDES LIMICOLA*
 Standard lengths are in millimeters; proportions are in thousandths of the standard length

MEASUREMENT	SPECIMEN NUMBER										Ave.
	20446-2 male	20446-3 male	20447-1 male	20447-3 male	20445 male	20447-2 female	20446-1 male	20446-4 male	20447-4 male	20447-5 female	
Standard length	53.2	48.9	47.2	45.3	44.0	42.5	38.6	38.0	37.9	37.5	
Head length	158	166	172	146	164	179	171	174	161	155	164.6
Longest caudal ray	353	368	309	369	373	306	376	337	311	304	340.6
Snout to dorsal origin	235	235	256	234	250	254	262	263	227	227	244.3
Snout to anal origin	425	405	455	419	432	468	427	447	449	493	442.2
Snout to pelvic origin	132	121	169	139	148	148	158	147	156	184	150.2
Snout length	42	47	44	44	36	47	39	42	53	42	43.7
Maxillary length	53	59	57	59	66	71	64	68	69	69	63.5
Longest pectoral ray	75	82	93	77	84	99	91	87	84	93	86.5
Length pelvic disk	122	153	146	148	132	140	130	174	158	173	147.6
Depth of body at anal origin	66	65	85	62	68	80	77	74	74	83	73.4

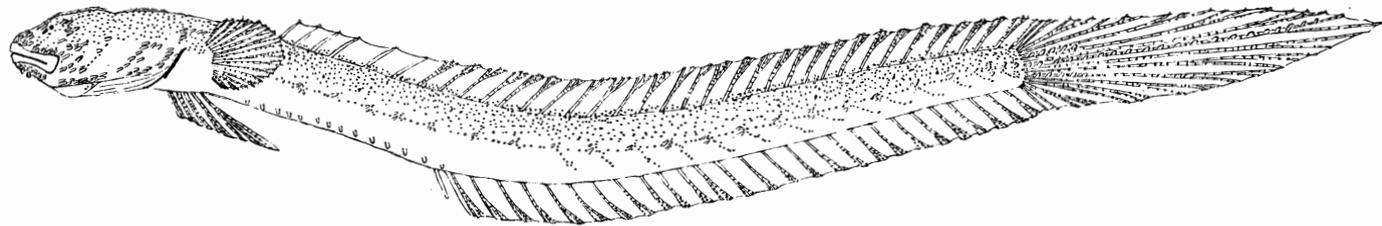


Figure 1. Holotype of *Taenioides limicola*. Standard length 44.0 mm.

nostril an elongate slit in front of the eye. End of maxilla falling below the rudimentary eye.

Short, flattened tentacles (barbels), each about 0.5 mm. long, are present on the head and body, arranged on the left side of the holotype as follows: a group of five along the midline of the snout; a cluster of four between the anterior and posterior nostrils; a cluster of three immediately behind the anterior nostril followed by an irregular row of seven along the lower edge of the suborbital region; a single tentacle in front of the eye, two above and behind the eye, and three directly behind the eye; a group of five below and behind the eye with single isolated barbels above and below this; two above and behind and five directly behind the end of the maxilla; two well-separated tentacles along the vertical limb of the preopercle. There are two pairs of tentacles on the midline of the lower jaw and an irregular double row of 14 along each side of the lower jaw followed by a similar row of 14 along the edge of the corresponding interoperculum and 10 along the edge of the operculum. There is a cluster of nine scattered over the surface of the operculum, a group of six above the gill opening, and two above the base of the pectoral fin.

A row of similar tentacles extends along the ventrolateral region on each side of the body beginning below the pectoral base and ending above the second anal ray. Most of the myomeres have a pair of tentacles near the horizontal skeletogenous septum. There are three rows of tentacles on the tail. The upper and lower of these are short, but the central row extends to the tip of the longest caudal rays.

The first four dorsal spines are evenly spaced, the fourth and fifth and the fifth and sixth being more widely separated. All dorsal and anal soft rays are branched and similar in shape. The dorsal and anal fins are continuous with the elongated, pointed caudal. The first three caudal rays (two unbranched and one branched above and below) are much smaller than the rest of the branched rays.

The pectoral fin is rounded with its interradial membrances slightly indented between the rays, all of which are branched. The pelvic fins are completely united with a well-developed basal membrane. They are attached to the body for about one-third of their length. The pelvic disc forms an elongate oval.

The palate is toothless, the upper and lower jaws have an outer row of well-spaced canines and an inner band of closely set villiform teeth. The gill rakers are very short, almost rudimentary.

The dorsal surface of the body is peppered with superficial melanophores. These stop abruptly at the midline, and ventrally a series of deeper melanophores are visible along the myosepta through the nearly transparent skin. The body pattern extends onto the base of the dorsal fin and there are melanophores on the caudal membranes; otherwise the fins are unpigmented. The top of the head, the lips and the anterior part of the lower jaw have melanophores like

those of the body. In life the fish was reddish-brown, presumably because blood could be seen through the flesh.

The paratypes show slight variation in pigmentation and in the number and arrangement of the fleshy tentacles. Meristic data on 31 specimens are as follows: Dorsal spines 6 in 31; dorsal soft rays 27 in 1, 28 in 9, 29 in 16, 30 in 5; anal soft rays 26 in 6, 27 in 15, 28 in 9, 29 in 1; pectoral rays 34 in 1, 35 in 3, 36 in 23, 37 in 2, 38 in 2; pelvic rays I, 5 in 31; Caudal rays 2+13+2 in 29, 1+14+1 in 2; Branchiostegals 5-5 in 31.

The genital papilla is long and slender in the male, a low, rounded hill in the female. No other sexual dimorphism was apparent.

Ecology: All of the specimens described here came from the mouth of a stream flowing into a narrow bay. The water at the collecting site was extremely turbid and from one to three feet deep at low tide. The bottom was an extremely fine, creamy mud. All specimens were taken in a twelve-foot minnow seine which could be pulled only with great difficulty owing to the depth of the soft mud bottom. Apparently these gobies live in the mud and depend chiefly upon their tentacles for navigation in an environment where there is little light. The rudimentary eyes can probably do little more than distinguish light from darkness.

Both collections contained females with mature eggs which could be seen through the body wall in the living fish. The eggs are relatively large; the left ovary of a female 37.5 mm. long contained only about 245 eggs.

Discussion

Taenioides limicola differs from most other members of the genus in its small size, its low dorsal and anal counts and in having flap-like barbels rather than granular ridges on the dorsal surface of the head. *Taenioides jacksoni* Smith (1943) from South Africa agrees with *limicola* in the presence of tentacles on the dorsal surface of the head and approaches it in counts, but *jacksoni* is reported to lack dorsal spines. Moreover, it seems unlikely that the nearest relative of a Micronesian form would occur only in South Africa. Pending a complete revision of the taenioidid gobies it is not possible to assess the relationships of the several nominal species.

Estuarine situations are neglected habitats in areas where there are coral reef environments to lure the collector. It is to be hoped that future collections in such places will yield additional forms and that these will offer further clues to the zoogeography of the Pacific.

The name *limicola* is a Latin substantive meaning mud dweller. In shape and coloration these gobies resemble earth-worms, hence, an appropriate English common name might be "worm goby".

I am indebted to Dr. Leonard Tuthill of the University of Hawaii for advice concerning the formation of the name and to many eager students who willingly

aided in collecting in one of Guam's less attractive habitats.

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