

Three New Species of *Oxyurichthys* (Teleostei: Gobiidae) from the Indian and Pacific Oceans

FRANK PEZOLD

Three new species of *Oxyurichthys* are described: *O. heisei* from Hawaii, *O. paulae* from southwestern India, and *O. takagi* from Belau (Palau). *Oxyurichthys heisei* is a deepwater species that differs from the only other *Oxyurichthys* species in Hawaii, *O. lonchotus*, a shallow water species, in pigmentation pattern, number of pectoral-fin rays, eye size, and body width. *Oxyurichthys paulae* is a member of the *Oxyurichthys* group possessing ocular cirri. It is most similar to *O. tentacularis* but has a higher number of pectoral-fin rays and differs in pigmentation. *Oxyurichthys takagi* has cycloid scales over the entire trunk. The only other species that exhibits this condition (variably) is *O. microlepis*. *Oxyurichthys takagi* lacks the dark spot on the upper cornea and dark spots on dorsal scales characteristic of *O. microlepis*.

G OBIROID fishes in the genus *Oxyurichthys* are common inhabitants of tropical and subtropical waters of the Pacific and Indian Oceans. Of the estimated 20 or so species of *Oxyurichthys*, only one species, *O. stigmalocephus* (*Gobionellus*) occurs in the western Atlantic (Pezold, 1984). There are no records of this genus from the continental eastern Pacific or the eastern Atlantic. Previous accounts of *Oxyurichthys* from the Gulf of Guinea region of west Africa refer to *Gobionellus occidentalis* (Pezold, 1984). Most *Oxyurichthys* species are limited to shallow coastal waters (under 10 m) with bottom substrates of silt or other fine sediments, but *O. stigmalocephus* is usually taken in greater depths (exceeding 10 m).

The purpose of this paper is to describe three new species of *Oxyurichthys* from the Indian and Pacific Oceans. Two of these species, one from Hawaii and the other southwestern India, are only known from depths greater than 30 m.

MATERIALS AND METHODS

Standard length, caudal-peduncle length, pectoral-fin length (length of longest pectoral ray), head width, and interorbital width (least fleshy width) were measured as described by Hubbs and Lagler (1958). Upper-jaw length, head length, orbit length, snout length, pelvic-fin length, and caudal-fin length were measured as described by Pezold (1991). Body width was measured as the midlateral transverse distance from left to right flank above the anal-fin origin. Spines are represented in counts by Roman numbers, rays are designated by Arabic numbers. Abbreviations for counts used are as follows: D₁, spinous, first dorsal fin; D₂, soft, second dorsal fin; A, anal fin; P₁, pectoral-fin rays; LS, lateral-scale rows; PRED, predorsal-scale

rows; TRF, transverse-scale rows counted from the anal-fin origin forward up to the spinous dorsal fin; and TRC, transverse-scale rows counted rearward from the anal-fin origin up to the soft dorsal fin. Counts, described more fully in Pezold (1991), are presented as modes followed by the range in parentheses in the descriptions. Oculoscaphular canal pore labeling is according to Akihito et al. (1984). Comparative materials examined are listed at the end of this paper. Museum abbreviations follow Leviton et al. (1985).

Oxyurichthys heisei new species ribbon goby Figure 1

Holotype.—BPBM 15473, 63.7 mm SL, male, Hawaiian Islands, northwest of Molokai, 21°14'N, 157°08'W, 124 m depth. Collected by 12.5 m shrimp trawl TOWNSEND CROMWELL cruise 40, station 40, 0125 h. P. Struhsaker. 13 November 1968. Bottom temperature 23.3 C.

Paratypes.—Paratypes taken with holotype: BPBM 34513, 4: 3 males, 57.4–59.7 mm SL, 1 female (damaged); CAS 74809, 2: male, 57.8 mm SL, female, 54.5 mm SL; LIAIP 1968466, female, 54.1 mm SL; LIAIP 1968467, male, 61.7 mm SL; NLU 64915, 2: male, 56.5 mm SL, female, 43.7 mm SL. Other paratypes collected by the TOWNSEND CROMWELL, cruise 40, off northwest side of Molokai, Hawaiian Islands: BPBM 24145, 3 females, 53.8–61.2 mm SL, 21°15'N, 157°09'W, 124 m depth, station 39, 12 November 1968; BPBM 24151, 2 females, 51.5–59.4 mm SL, 21°15'N, 157°09'W, 119 m, station 41, 13 November 1968, NMFS-Honolulu Lab; BPBM 24140, female, 49.4 mm SL, 21°15'N, 157°09'W, 124 m depth, station 37, 12 Novem-

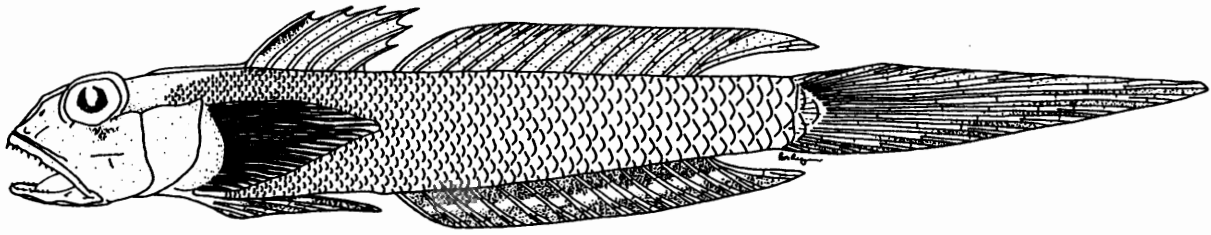


Fig. 1. *Oxyurichthys heisei*, new species, paratype, female, 59.1 mm SL, BPBM 24084, 21°15'N, 157°08'W, Hawaiian Islands.

ber 1968, NMFS-Honolulu Lab; BPBM 24084, female, 59.1 mm SL, 21°15'N, 157°08'W, 124–125 m depth, station 31, 11 November 1968; USNM 342315, 4: 3 males, 52.5–59.7 mm SL, female, 50.4 mm SL, 21°14–15'N, 157°08–14'W, 124 m depth, 11 November 1968.

Diagnosis.—No spot, tentacle, or thick callus on dorsoposterior surface of eye; upper lip of about equal thickness along entire length, not constricted at premaxillary symphysis; anterior nares not darkly pigmented; no spots on throat beneath preopercle or anterior process of quadrate; low membranous crest present on nape reaching from D_1 origin to above preopercle; body slender, width at anal-fin origin less than one-third of head width; scales mostly ctenoid; lateral scales 50–64; first dorsal spines not greatly produced, appressed fin not reaching beyond second, or third dorsal-fin element; 21–23 pectoral-fin rays; pelvic fin not reaching beyond anus; pelvic fin pigmented most prominently between distal branches of rays.

Description.—Head large (26% SL); anterior nares without pronounced tube, posterior nares large, open pits; no cirrus or callus on eye; mouth oblique; jaws extending posteriorly to below middle or posterior third of orbit diameter in females, to below posterior margin of orbit in males; about 14–16 teeth in single row on premaxilla; symphyseal gap in upper-jaw tooth row about equal to bony interorbital width; upper-jaw teeth two times the size of lower-jaw teeth, with slightly recurved tips; lower-jaw teeth in two or three rows; innermost teeth recurved canines, not noticeably larger than conical teeth in outermost row; upper-lip width at premaxillary symphysis not constricted, at least two-thirds greatest lip width; first gill arch with three broad, bladelike gillrakers parallel to axis on ceratobranchial, two thin elongate rakers at angle, single large, fleshy, fingerlike lobe on epibranchial (examined by dissection in three specimens); free neuromasts of cheek and opercle illustrated in Figure 2. Oculoscapular

lateralis canal with pores A'BCD(S)FH'. No preopercular lateralis canal.

LS 58 (50–64); TRF 20 (18–23); TRC 17 (15–20); PRED 15 (11–19); cheek and opercle naked; nape scaled to above midopercle, but with naked median; prepectoral and prepelvic regions naked; abdomen with cycloid scales, naked near base of pelvic fins (region superficial to infracarinalis medius muscle); ctenoid scales midlaterally on trunk from caudal-fin base to beneath fourth D_1 spine (from holotype, midlateral trunk scales lost in paratypes); cycloid scales on anterior trunk, in row along part of second dorsal fin, in row along most of anal fin, and on caudal fin. Proportional characters are given in Table 1.

D_1 VI; D_2 I, 12; A I, 13; P_1 22 (21–23); appressed first dorsal-fin spines reaching beyond second dorsal-fin origin to third element; pectoral fins to or just beyond second dorsal-fin origin; pelvic fins reaching or nearly reaching anus; penultimate and posteriormost rays of appressed second dorsal and anal fins extending beyond caudal-fin base. D_1 spine proportions Table 2.

Color in alcohol.—No spot on eye; no spots on gular fold beneath preopercle or anterior process of quadrate; anterior nares not darkly pigmented; body uniformly yellowish brown with faint pigment on cheek beneath posterior portion of orbit (in one specimen, five faint midlateral patches of melanophores are discernible with a microscope); D_1 lightly pigmented, but with dark streak between first and second spines, variably indicated (weakly represented in holotype); D_2 lightly pigmented; caudal fin with scattered melanophores, dusky distally and between lowermost rays; anal fin lightly pigmented basally and marginally, with clear zone between bands; pelvic fins with few melanophores on connecting membrane, dusky in patches but primarily concentrated between distal branches of rays and proximally between rays 2/3 and 4/5 in some specimens; pectoral fins unpigmented.

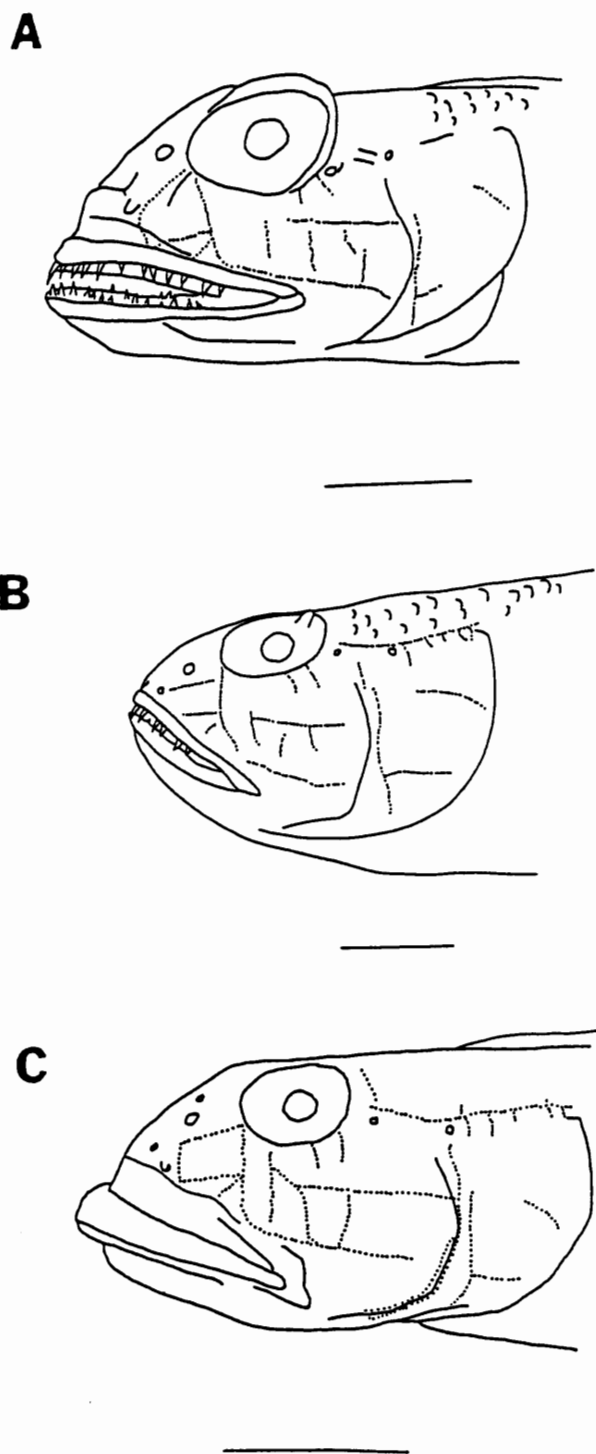


Fig. 2. Free neuromast patterns of the cheek and opercle (dotted lines) in (A) *Oxyurichthys heisei*, (B) *O. paulae*, and (C) *O. takagi*. Bars = 5 mm.

Distribution.—All specimens taken are from deep water off the coast of Molokai, Hawaiian Islands. Struhsaker (1973) reports collecting another individual 11 November 1967 from Kealaikahiki Channel near Lanai at 108 m depth. I have not seen this specimen, but there has been much confusion of Struhsaker's collections. A total of eight specimens was originally taken

with the holotype, BPBM 15473 (Struhsaker 1973), but 11 specimens were present when it was subdivided (J. Randall, pers. comm.) Five specimens were originally collected with BPBM 24145 (off Molokai, 12 November 1968). Two from this collection are lost. Eight other specimens were also obtained off Molokai on 12 November 1968. The disposition of all eight of these specimens is also unknown. USNM 342315 contains four specimens collected 11 November 1968 near Molokai, though Struhsaker (1973) reported only three taken at that time. In short, the additional specimens discovered with the holotype may include the missing Lanai specimen and/or other specimens missing from other collections or represent a miscount by Struhsaker.

Etymology.—The name *heisei* is Japanese for "peace succeeds" or "realized peace." This is the name of the era of Emperor Akihito. It was chosen to recognize the many contributions to gobioid systematics made by Emperor Akihito and members of the Laboratory of Ichthyology, Akasaka Imperial Palace, working under his direction. The epithet *heisei* is treated as a noun in apposition.

Oxyurichthys paulae new species
jester goby
Figure 3

Holotype.—BPBM 27556, male, 66.1 mm SL, India, off Cochin. Trawling from research vessel of Central Marine Fisheries Research Institute, 34–38 m depth; mud bottom, some shell. J. E. Randall and B. B. Collette. 2 February 1980. Color and black/white photos of 71 mm SL specimen (106 mm TL).

Paratypes.—BPBM 34516, 3: 2 males, 67.0–68.4 mm SL, 1 female, 68.9 mm SL, collected with the holotype. USNM 346922, 2: 1 male, 66.2 mm SL, 1 female, 63.8 mm SL, exchanged out of BPBM 34516. CAS 74810, 2: male, 67 mm SL, female, 68.9 mm SL, exchanged out of BPBM 27556.

Diagnosis.—Short, flat flaplike membranous tentacle on dorsoposterior cornea; upper lip constricted at premaxillary symphysis; anterior nares not darkly pigmented; no gular spots; nape lacking well-developed membranous crest, tiny piece of membrane at base of first D_1 spine; body width at anal-fin origin 57–72% head width; scales mostly ctenoid; 43–50 lateral-scale rows; first dorsal spines not greatly produced, appressed fin not reaching beyond second, or

TABLE 1. MORPHOMETRIC DATA FOR *Oxyurichthys heisei* AND *O. paulae*. Measurements presented as percentages of standard length, except for standard length, which is given in millimeters.

	<i>O. heisei</i>						<i>O. paulae</i>					
	Males			Females			Males			Females		
	Mean	Range	n	Mean	Range	n	Mean	Range	n	Mean	Range	n
Standard length	59.5	56.5–63.7	7	54.3	43.7–61.2	9	66.8	66.1–68.4	5	64.9	62.1–68.9	3
Caudal fin	56	52–62	7	50	46–56	8	61	58–68	3	57	53–61	2
Pectoral fin	25	24–25	7	24	22–27	9	26	24–28	5	24	24	3
Pelvic fin	25	23–27	7	24	22–26	9	24	22–25	4	20	19–20	3
Head length	26	25–27	7	26	25–29	9	21	21–22	5	21	21–22	3
Nape length	18	16–19	7	19	17–21	9	15	15–16	5	15	14–15	3
Snout length	8	8–9	7	8	7–9	8	6	6–7	5	6	5–7	3
Orbit	8	8–9	7	8	8–9	9	6	6	5	6	5–6	3
Premaxilla	16	14–18	7	15	14–16	9	11	11–12	5	11	10–11	3
Body depth	14	12–15	7	13	12–15	9	16	15–17	5	16	15–16	2
Interorbital	2	1–2	7	2	1–2	9	1	1	5	1	1–2	3
Caudal peduncle	10	10–11	7	10	9–12	9	11	10–13	5	11	10–12	3

third dorsal-fin element; 24–26 pectoral rays; longest rays of pelvic fins reaching anus in females, anal-fin origin in males; pelvic fins most darkly pigmented between distal branches of rays.

Description.—Head moderate (22% SL); anterior nares short tubes, posterior nares open pits; mouth oblique; jaws reaching to beneath mid-orbit; single row of teeth in upper jaw, 2–3 rows in lower jaw; 20–27 large conical teeth either side of premaxillary symphysis; upper lip at premaxillary symphysis very narrow, less than one-third to one-half the maximum lip width; first gill arch usually with three broad, bladelike rakers on the lower arm (lowermost raker rudimentary in three of four specimens examined, absent in fourth), and fleshy, fingerlike lobe on upper arch (in three of four examined, fourth specimen has two fused rakers forming lobe); tentacle on posterodorsal cornea short and flat (sometimes triangular); crest on nape reduced, present only as small membrane at D_1 origin,

extending onto nape for length of two scale rows; free neuromasts of cheek and opercle illustrated in Figure 2. Oculoscapular lateralis canal with pores A'BCD(S)FH'. No preopercular lateralis canal.

LS 47 (43–50); TRF 17 (17–18); TRC 14 (13–15); CPD 7; PRED 13 (12–15). Cheek and opercle naked; nape scaled to above preopercle; pectoral-fin base naked; prepelvic region with about 6 rows of cycloid scales; abdomen with cycloid scales up to, but not covering, infracranialis medius muscle; trunk anteriorly with cycloid scales to below D_2 origin, there becoming ctenoid; some cycloid scales along D_2 and anal-fin bases. Proportional measurements given in Table 1.

P_1 25 (24–26); appressed D_1 spines reaching to second or third D_2 ray in males, to first or second in females; first five spines of D_2 roughly equal height; pectoral fins extending to point between verticals from D_2 origin or second/third D_2 element; longest rays of pelvic fins reaching anus in females, anal-fin origin in

TABLE 2. FIRST DORSAL-FIN SPINE LENGTHS. Spine measurements presented as percentages of standard length (given in Table 1).

	<i>O. heisei</i>						<i>O. paulae</i>					
	Males			Females			Males			Females		
	Mean	Range	n	Mean	Range	n	Mean	Range	n	Mean	Range	n
First spine	16	15–17	7	20	17–25	9	15	15–16	5	14	14–15	3
Second spine	17	15–20	7	16	12–20	8	17	16–18	5	18	17–19	3
Third spine	18	17–20	7	16	14–18	8	18	16–20	5	18	17–20	3
Fourth spine	19	16–22	7	16	15–18	8	18	17–19	5	17	16–18	3
Fifth spine	19	18–21	7	17	15–19	8	17	16–18	5	16	14–17	3
Sixth spine	12	9–15	7	11	10–12	8	10	8–11	5	10	9–11	3

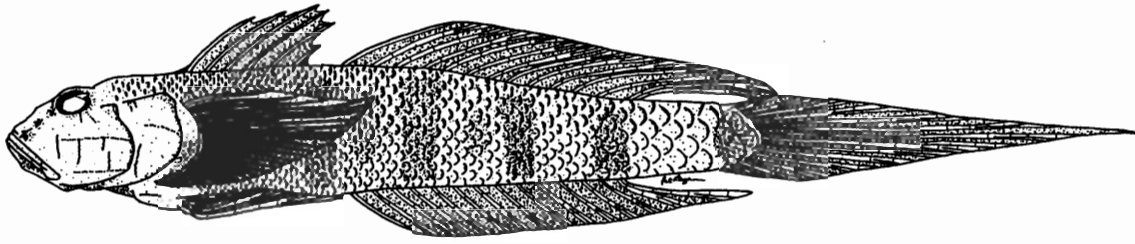


Fig. 3. *Oxyurichthys paulae*, new species, holotype, male, 66.1 mm SL, BPBM 27556, Cochin, India.

males; appressed D_2 and anal fins reaching beyond caudal-fin base. D_1 spine proportions given in Table 2.

Color in alcohol.—Scales on dorsum lightly outlined in black; four broad, lightly contrasted bars on side of trunk, variably reaching dorsal or anal fins; large basicaudal spot; no saddle over caudal peduncle; snout dusky; trunk background color yellowish; median and paired fins dusky; dark spot on D_1 membrane behind sixth spine; pelvic fins darker than other fins, with darkest membrane distal to branching point of rays; pectoral-fin base dusky on upper half.

Color in trawled specimen before preservation.—Color slide of female specimen, 71 mm SL (69 mm SL preserved). Dark pigment as above, except anal fin appears white, faint dusky spots alternating with bars, almost smudgelike, lower half of caudal fin dusker than upper half; body background color white; gold highlights on cornea, ocular tentacles, along dorsum and on pectoral-fin base; snout with faint gold streak from eye to lateral midpoint of jaw; silvery opalescent mark on upper and lower pectoral-fin base, above and below gold pigment; faint opalescent stripe on cheek.

Distribution.—Known only from Cochin, India.

Etymology.—This species is named for Paula Arledge Pezold, my academic companion and spouse.

Oxyurichthys takagi new species
sea newt
Figure 4

Holotype.—CAS 74814, male, 46 mm SL, Belau, Koror Island, Madali District, $7^{\circ}20'13''N$, $134^{\circ}28'22''E$. GVF Reg. 1381. Collected by H. A. Fehlmann et al. 7 September 1957.

Paratypes.—CAS 51059, 4: 2 males, 45.1–46.1 mm SL, 2 females, 36.8–39.7 mm SL, collected with the holotype. CAS 51047, 53: 15 males, 19.3–48.3 mm SL, 36 females, 19.1–45.0 mm SL, 2 juveniles, 15.8–17.2 mm SL, Belau, Ngarbaged Village, Koror Island, mud flat, station 93, collected by R. Gaines, 2 September 1956. USNM 346921, 10: 5 males, 30.9–48.6 mm SL, 5 females, 33.5–43.5 mm SL, exchanged out of CAS 51047. CAS 51050, 7: 6 males, 42.0–45.2 mm SL, 1 female, 31.8 mm SL, Belau, mudflat off SE tip of Koror Island, station 28, collected by H. A. Fehlmann et al., 25 July 1956. Additional paratypes exchanged from CAS 51047: BPBM 34511, 4: 2 males 43.5–46.2 mm SL, 2 females, 39.2–42.2 mm SL; LIAIP 1957007, male, 49.1 mm SL; LIAIP 1957008, male, 39.3 mm SL; LIAIP 1957009, female, 42.1 mm SL; LIAIP 1957010, female, 37.0 mm SL; NLU 64913, 4: 2 males, 46.0–46.8 mm SL, 2 females, 34.2–42.1 mm SL.

Diagnosis.—No spot, cirrus, or callus on eye; upper lip not constricted at premaxillary symphysis; anterior nares dark; no gular spots; low crest on nape from D_1 origin to above preopercle; body width at anal-fin origin 37–53% head

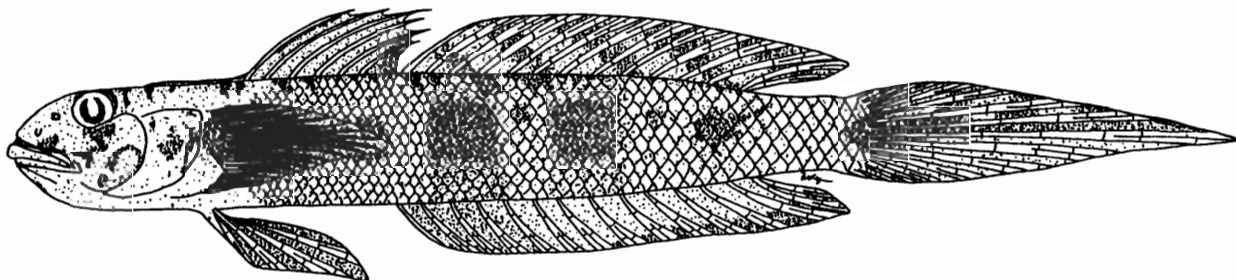


Fig. 4. *Oxyurichthys takagi*, new species, paratype, male, 43.5 mm SL, CAS 51059, Koror Island, Belau.

TABLE 3. MORPHOMETRIC DATA FOR *Oxyurichthys takagi*. Measurements presented as percentages of standard length, except for standard length, which is given in millimeters.

	Males			Females		
	Mean	Range	n	Mean	Range	n
Standard length	44.9	42–48.3	11	39.6	31.8–42.6	9
Caudal fin	48	38–58	10	46	37–63	8
Pectoral fin	24	23–26	11	24	19–26	9
Pelvic fin	23	22–25	11	21	19–22	9
Head length	24	23–25	11	26	25–27	9
Nape length	17	16–18	11	19	17–20	9
Snout length	6	6–7	11	7	6–8	9
Orbit	6	6–7	11	7	6–8	9
Premaxilla	12	12–13	11	13	12–14	9
Body depth	16	15–16	11	16	16–17	9
Interorbital	2	1–2	11	2	1–2	9
Caudal peduncle	12	10–13	11	11	11–12	9

width; all scales cycloid; lateral scales 51–67; first dorsal-fin spines only reaching to third D_2 element; 19–21 pectoral-fin rays; pelvic fins reaching urogenital papilla or anal-fin origin in males, not reaching anus in females; pelvic fins dusky.

Description.—Head large (25% SL); anterior nares short tubes, posterior nares large open pits; jaws extending posteriorly two-thirds to three-quarters of the orbit diameter; single row of teeth in upper jaw with about 15–18 on either side of premaxillary symphysis, six largest teeth near symphysis on each side with recurved tips; all upper-jaw teeth larger than lower-jaw teeth; lower-jaw teeth in 2–3 rows, teeth of innermost row largest and strongly recurved, especially near mandibular symphysis; teeth in lower jaw not as large in females, but innermost teeth recurved, prominent canines at symphysis; lip at premaxillary symphysis not constricted; three triangulate gillrakers on lower arm of first gill arch, two thin elongate rakers at angle, fleshy

TABLE 4. FIRST DORSAL-FIN SPINE LENGTHS. Measurements expressed as percentages of standard length (given in Table 3).

	<i>O. takagi</i>					
	Males			Females		
	Mean	Range	n	Mean	Range	n
First spine	26	21–34	11	17	16–20	9
Second spine	24	19–36	8	15	14–18	8
Third spine	24	18–38	8	15	14–17	8
Fourth spine	24	18–38	9	16	15–17	8
Fifth spine	20	18–22	11	17	15–21	9
Sixth spine	13	11–15	11	12	10–16	9

lobe formed from two modified rakers on upper arch; low membranous crest on nape extending from D_1 origin to above preopercle; free neuromasts of cheek and opercle illustrated in Figure 2. Oculoscapular lateralis canal with pores A'BCD(S)FH'. No preopercular lateralis canal.

LS 57 (51–67) TRF 22 (19–25) TRC 18 (15–22) CPD 10 (9–10). Cheek, opercle, nape, prepectoral base and prepelvic region naked; all scales cycloid (reduced ctenoid). Measurements given in Table 3.

P_1 (20:19–21); appressed D_1 spines reaching third D_2 element; appressed D_2 and anal fins extending beyond procurrent caudal rays to end of fleshy caudal-fin base; pectoral fins extending posteriorly to point beneath second D_2 element; pelvic fins reaching anal-fin origin or urogenital papilla in males, not reaching anus in females. D_1 spine proportions given in Table 4.

Color in alcohol.—Anterior nares darkly pigmented, posterior nares with dark trim; eye dark dorso posteriorly, but with no discernible spot; dark patch beneath ventroposterior orbit on cheek; dark spot on cheek above rear terminus of maxilla; 4–5 dark bands on nape including one crossing behind the eyes; crest with dark margin; large dark spot on upper pectoral base; four oblong spots midlaterally on trunk with smaller spots between them, large basicaudal spot; dorsum with short, narrow bars not reaching midlateral spots; some specimens with faint, wide bands extending from midlateral spots to ventral profile; paired fins, anal fin dusky; caudal fin in males dusky ventrally, with 4–5 well-defined diagonal bars distally and dark margin; caudal fin in females dusky, especially lower pos-

terior margin; D_2 with about five diagonal rows of large spots; D_1 dusky with dark streak between first and second spines (best developed in males), dark along and behind sixth spine.

Distribution.—Known only from Belau.

Etymology.—This species is named for K. Takagi whose early studies of gobioid oculoscapular canals revealed their significance for gobioid systematics.

DISCUSSION

Oxyurichthys has been traditionally diagnosed by a single character, the presence of one row of teeth in the upper jaw. That condition is also present in the genera *Evorthodus*, *Oligolepis*, and *Gobionellus*. I recently offered additional diagnostic characters for *Oxyurichthys* (Pezold, 1991), including a rounded fleshy tongue, a membranous crest on the nape of most species, no preopercular lateralis canal, a fleshy lobelike process on the anterior surface of the upper arm of the first gill arch, 13 second dorsal and 14 anal-fin elements, a simple fourth neural spine and an abbreviate oculoscapular canal with an A'BCD(S)FH' pore pattern (Akihito et al, 1984). All of the species described herein share this unique combination of traits (with the exception of the membranous crest that is lacking in *O. paulae* as in a few other *Oxyurichthys*), but they represent three distinct phenotypic groups within the genus.

Oxyurichthys heisei, from Hawaii, is most similar to *Oxyurichthys stigmalophius*, an Atlantic species. It is easily distinguished from that species by a lower number of lateral scales. *Oxyurichthys heisei* has 50–64 scales in a lateral series compared with 70–92 in *O. stigmalophius*. Mead and Böhlke (1958) reported 89–102 for three type specimens of *O. stigmalophius*. I counted 92 lateral scales or pockets on the holotype and 86 for one paratype (USNM 159590); the other paratype, ANSP 81855, was in too poor condition to determine a number. *Oxyurichthys heisei* and *O. stigmalophius* also differ in nape squamation (11–19 predorsal scale rows in *O. heisei* vs no nape scales present in *O. stigmalophius*) and first dorsal-fin pigmentation. *Oxyurichthys stigmalophius* has a large black spot on the posterior edge of the first dorsal that is lacking in the new species. The only other *Oxyurichthys* species known from Hawaiian waters, *O. lonchotus*, occurs along the shallow coast and differs from *O. heisei* in pigmentation. Besides a lateral series of large elongate blotches on the trunk, *O. lonchotus* has a dark spot on the superior margin of

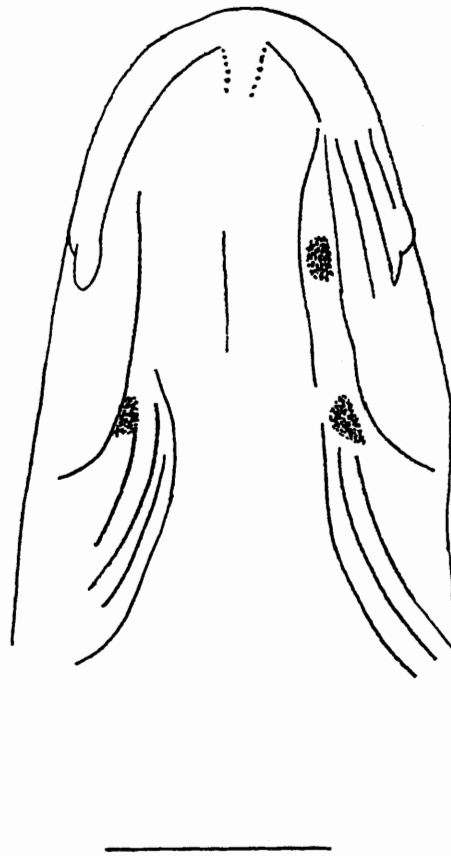


Fig. 5. Gular pigmentation in *Oxyurichthys lonchotus*. Left suspensorium pulled away slightly to reveal pigmentation in groove between lower jaw and gular region. Only posterior spot visible on right side without abducting suspensorium. Bar = 5 mm.

the eye, a large, prominent spot on the upper pectoral-fin base and dark spots in the gular folds behind the dentaries (Fig. 5) and a dark spot on the membrane at the base of each anal-fin element. None of these features is observed in the new species. *Oxyurichthys lonchotus* also has 18–21, usually 20, pectoral rays, compared with 21–23, usually 22 or 23, in *O. heisei*. *Oxyurichthys lonchotus* is a more robust, round-bodied species than *O. heisei*, which is thin and ribbonlike. The body width at the anal-fin origin is about two-thirds the head width in *O. lonchotus* (unpubl. data) versus less than one-third in *O. heisei*. The orbit in *O. heisei* is also larger, averaging 8% SL (8–9%) versus 5% (5–6%) in *O. lonchotus* (unpubl. data).

Oxyurichthys paulae belongs to a group of species possessing ocular cirri, including *Oxyurichthys ophthalmonema*, *O. tentacularis*, and *O. uronema*. It shares a constricted upper lip with *O. tentacularis* and *O. uronema* but can be distinguished from *O. tentacularis* by its higher number of pectoral-fin rays (24–26 vs 20–22), pigmentation of the trunk, the dark spot on the rear dorsal fin, and its reduced membranous

crest on the nape. The new species differs from *O. uronema* in having shorter first dorsal-fin spines, the longest of which does not extend beyond about the third element of the second dorsal fin, shorter caudal-fin rays, and trunk pigmentation patterns. Preserved specimens show barring in *O. paulae*, whereas a row of faint lateral spots is present in *O. uronema*. *Oxyurichthys ophthalmonema* does not have the constricted lip observed in *O. paulae*, *O. tentacularis*, and *O. uronema*. Although scales on the dorsum of *O. paulae* may have fine, dark margins, the species lacks the prominent spots present on the dorsal scales of *O. ophthalmonema*. *Oxyurichthys paulae* also lacks the well-developed crest seen on the nape of *O. ophthalmonema* and has a greater number of pectoral-fin rays. In addition, some specimens currently assigned to *O. ophthalmonema* differ from *O. paulae* in having greatly elongate first dorsal-fin spines.

Only two *Oxyurichthys* species lack ctenoid scales midlaterally on the posterior portion of the trunk—*O. microlepis* and *O. takagi*. *Oxyurichthys takagi* does not have a dark spot on the upper portion of the cornea nor spots on the rear margins of scales on the dorsum as observed in *O. microlepis*. *Oxyurichthys takagi* also has fewer pectoral-fin rays (19–21, usually 20 vs 21–23, usually 22) and a greater number of lateral scale rows (51–67, mean 57, vs 46–52, mean 49) than *O. microlepis*.

COMPARATIVE MATERIALS

Oxyurichthys lonchotus. Hawaii: AMNH 2351 (4); BPBM 26372 (3) Molokai; BPBM 4888 (1) Oahu; BPBM 5520 (1) Oahu; BPBM 5521 (1) Oahu; BPBM 15382 (13) Oahu; CAS-SU 23328 (14), paratypes, Oahu; FMNH 4160–4162 (3); FMNH 76347 (1); LACM 1035 (1) Oahu; UMMZ 56760 (1) Oahu; UMMZ 196868 (3) Maui; USNM 50698 (1), holotype, Oahu; MCZ 13314 (6); MNHN 8912 (2). *Oxyurichthys microlepis*. India: ANSP 80506 (14) Tuticorin; ANSP 122266 (2) Baudia; ANSP 122436 (3) Baudia; BPBM 27610 (1) Kerala; CAS-SU 40072 (1) lower Bengal; USNM 276542 (3) Ennore estuary. Indonesia: RMNH 1889 (2); ZMA 110.104 (1); ZMA 116.673 (2); ZMA 116.670 (1) Java; ZMK CN.1 (1) Malacca; BPBM 29795 (2) Lombok; MCZ 33218 (1) Djakarta; RMNH 6179 (2) syntypes, Straits of Madura; RMNH 13214–16 (13) Surabaya; CAS-SU 62728 (1) Surabaya. Iran: ZMK CN.1 (1) Jask. Malaysia: USNM 346923 (2) Sabah. Papua: USNM 260522 FMNH 51800 (2) Sabah. (22) Daru; USNM 260943 (2) Daru. Philippines: ANSP 48917–26 (9); ANSP 77409 (9) Bataan; ANSP 100175 (3) San Fernando; FMNH

47503 (5) Manila; FMNH 47561 (1) Manila; CAS-SU 9594 (1) Iloilo Island; CAS-SU 26332 (6) Manila; USNM 160931 (7) Manila; USNM 265078 (7) Bulacan; UMML 14353 (4) Bulacan; UMMZ 100268 (5) Manila; UMMZ 100539 (5) Manila. Taiwan: FMNH 52214 (1) Takao; FMNH 100602 (3). Thailand: CAS 51051 (29) Mae Nam Chantaburi River; CAS 51052 (1) Mae Nam Welu River. Viet Nam: ZMK P 781388 (1) Nhatrang. *Oxyurichthys ophthalmonema*. India: ANSP 167493 (2); USNM 276544 (2) Ennore estuary. Malaysia: CAS-SU 27785 (2) Sabah; FMNH 24741 (1) Sabah; FMNH 51739 (2) Sabah; USNM 99830 (1) Sabah. Viet Nam: ZMK P-781390, P-781431–33 (4). China: ANSP 52936 (1) Hong Kong. Taiwan: FMNH 91545 (10). Guam: AMNH 27029 (40); AMNH 27088 (19). Indonesia: BPBM 29796 (4) Lombok; BPBM 29969 (3) Lombok; USNM 297090 (15) Irian Jaya; USNM 297213 (5) Misool Is., Irian Jaya; RMNH 4542 (4 of 6), including holotype. Belau: CAS 51040 (1) Babelthaupt Island; CAS 47818 (5) Babelthaupt Island; CAS 51036 (9) Koror Island; CAS 74816 (1). Papua: USNM 260518 (1) Trobriand Is., Kiriwana Is. USNM 260497 (1) Bismarck Arch., Pitilieu Is. Philippines: CAS 51055 (19) Negros Oriental; FMNH 40437 (1) Dumaguete, Negros Oriental; NLU 71395 (1) Bolinao Market, Pangasinan; UMMZ 100533 (3) Dumaguete, Negros Oriental; CAS 66640 (29) Sumalring, Negros Oriental; CAS-SU 33137 (10) Nasugbu. Reunion: MNHN 993 (1). *Oxyurichthys stigmatophius*. Gulf of Mexico: ANSP 81855, paratype, Gulf of Campeche, 18°45'N 93°20'W; FMNH 86619 (1) Glover's Reef; USNM 159590, paratype, Bay of Campeche, 18°43'N 93°29'W. Bahamas: ANSP 81233, holotype, Green Cay; ANSP 144295 (2) Cat Island; GCRL 3852 (1) 27°11'N 75°08'W; USNM 264988 (1) 21°11'N 75°08'W. British West Indies: ANSP 144382 (1) Green Island, Antigua; UF 11306 (1) Green Island, Antigua. Puerto Rico: ANSP 144379 (2) El Negro; ANSP 144495 (1) Aquadilla. Martinique: ANSP 106060 (1). South America: UMML 3992 (2) 07°18'N 56°49'W. *Oxyurichthys tentacularis*. Indonesia: BPBM 29968 (1) Lombok; RMNH 4542 (1); MNHN A.1136 (2), syntypes, Java. Philippines: CAS 51054 (2) Manila Bay; NLU 71393 (9) Bolinao Market, Pangasinan. *Oxyurichthys uronema*. Indonesia: ZMA 111.336 (2), syntypes, Bay of Bima.

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NORTHEAST LOUISIANA UNIVERSITY, BIOLOGY DEPARTMENT, MONROE, LOUISIANA 71209. E-mail: bipezold@alpha.nlu.edu. Submitted: 22 Aug. 1997. Accepted: 7 Dec. 1997. Section editor: R. L. Mayden.