

A New Indo-Pacific Fish of the Genus *Cirripectes* (Blenniidae, Salariini)¹

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ABSTRACT: *Cirripectes auritus* is described from the Line Islands in the central Pacific, southeast Asia, and the western Indian Ocean. It is distinguished from other *Cirripectes* in having a small black flap with a fringe of tiny yellow cirri on either side of the nape, a low number of premaxillary and dentary incisor teeth, 15–17 dorsal and 16–18 anal rays, and a reduced number of cephalic sensory pores.

THE SPECIES OF *Cirripectes* are small, agile, herbivorous fishes of the Indo-Pacific region. They are most commonly observed in shallow surge-zone habitats, although one undescribed species has been taken as deep as 33 m. Most species are secretive, drably colored, and often overlooked, but they are frequently among the most numerous fishes taken in shallow-water rotenone stations. They are most closely related to a group of genera including *Scartichthys* from the eastern Pacific; *Ophioblennius* from the eastern Pacific and eastern and western Atlantic; *Pereulixia* from the western Indian Ocean; and *Exallias*, which occurs throughout the Indo-Pacific region. *Cirripectes* differs from these genera chiefly by a combination of characters, including a continuous or nearly continuous row of cirri across the nape, a single continuous lateral line, 14–17 dorsal and 15–18 anal fin rays, and a pair of posterior canines on the dentaries. Most of the species are similar in morphology and coloration, and, in the absence of a thorough revision of the genus, they are often difficult to identify.

Several authors have reported on *Cirripectes* from the Pacific and Indian oceans. Schultz (1943) listed four species from the

Phoenix and Samoan islands; Strasburg and Schultz (1953) discussed seven species from Oceania; Strasburg (1956) reported three species from Hawaii; Smith (1959) listed four species from the western Indian Ocean; and Schultz and Chapman (1960) briefly characterized five species found in the Marshall and Mariana islands. Smith-Vaniz and Springer (1971) provided the most complete diagnosis of *Cirripectes* and listed 24 nominal species.

Chave and Eckert (1973) briefly mention collecting a new species of *Cirripectes* at Fanning Island in the Line Islands. In 1975 I visited Fanning and obtained additional specimens of the species. At about the same time J. E. McCosker, of the Steinhart Aquarium, collected two specimens at Grand Comoro Island in the Indian Ocean that proved to be conspecific with the Fanning Island specimens. Additional specimens collected at Apo Island, Philippines, have since been obtained from L. Knapp, of the Smithsonian Institution; and specimens collected in Kenya have been obtained from J. E. Randall, of the Bernice P. Bishop Museum. Randall has also provided an underwater photograph of this species taken in Thailand. This new species, *Cirripectes auritus*, is described herein.

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METHODS

All measurements were made to the nearest 0.1 mm using dial calipers. Mor-



FIGURE 1. *Cirripectes auritus*; 50.7 mm SL; paratype BPBM 14062, Fanning Island (35-mm Kodachrome of freshly killed specimen).

phometric dimensions are presented as proportions in the text and as percent standard length in Table 2. Procedures for making counts and measurements generally follow Springer (1967) and Smith-Vaniz and Springer (1971), with some changes and additions described below.

When the last two anal fin rays were supported by a single pterygiophore, they were counted as a single ray [method A of Springer (1967)]. Only segmented pelvic fin rays were counted [= "apparent counts" of Smith-Vaniz and Springer (1971)]. The snout length was taken as the shortest diagonal distance between the anteriormost point on the midtip of the upper lip and fleshy rim of the left orbit. The snout to dorsal fin origin was measured from the anteriormost point of the upper lip to the base of the first dorsal fin spine. The snout to anal fin origin was measured from the anteriormost point of the upper lip to the base of the first anal fin spine, except on females where the first anal spine is embedded. This distance on females was estimated by measuring to a point immediately posterior to the anus. The depth was taken at the anus, since the abdomen is soft and often distorted. The width of the body was measured above the anus. The length of the caudal peduncle is the diagonal distance from the posterior axil of the last

anal fin ray to the midbase of the caudal fin. Nasal, supra-orbital, and nuchal cirri counts are totals for left and right sides with all free tips counted. Terminology used in identifying cephalic sensory pores is adapted from Springer (1967), Smith-Vaniz and Springer (1971), and Smith-Vaniz (1976).

In the following description, data in parentheses apply to paratypes if different from the holotype.

The holotype has been deposited at the Bernice P. Bishop Museum, Honolulu (BPBM); paratypes are deposited at the U.S. National Museum of Natural History, Washington, D.C. (USNM); the Academy of Natural Sciences, Philadelphia (ANSP); and the California Academy of Sciences, San Francisco (CAS).

Cirripectes auritus sp. nov.

Figures 1, 2, 3C; Tables 1, 2

HOLOTYPE: BPBM 20478, 70.8 mm SL, Fanning Island, Line Islands, in English Harbor near village, on large coral rock above sand bottom, 5 m, quinaldine, B. A. Carlson, 5 October 1975.

PARATYPES: BPBM 24454, 56.9 mm SL, Kenya, 5 mi north of Lamu, 4 mi offshore, 10 m, Tavolek anesthetic, J. E. Randall,



FIGURE 2. *Cirripectes auritus*; photographed underwater at Similan Island, Thailand, by J. E. Randall.

11 March 1980; USNM 222489, 55.0 and 50.7 mm SL, same data as preceding; ANSP 138366, 48.2 and 43.8 mm SL, same data as preceding; BPBM 14062, 50.1 mm SL, Fanning Island, Line Islands, in English Harbor, patch reef, 7 m, rotenone, E. H. Chave and D. B. Eckert, July 1972; CAS 34383, 43.5 and 41.8 mm SL, Grand Comoro Island, north of Hahaia, large isolated coral head over coral sand, 20 m, J. E. McCosker, S. McCosker, and M. D. Lagios, 23 February 1975; USNM 222490, 31.8 mm SL, Apo Island, Philippines, 9°4.5' N, 123°16.4' E, coral heads, sand patches, and rocks at base of cliff just west of Chanos pond, 0–2.4 m, L. Knapp et al., 18 May 1979.

DESCRIPTION: Dorsal fin XII(XII–XIII), 17(15–17), last spine noticeably reduced; anal fin II,18(16–18), first spine embedded in females; pectoral fin rays 15 (one paratype with 14 rays unilaterally), all unbranched, lower 5 rays thickened; pelvic fin I,4; caudal

fin 13 segmented rays, 5(5–6) dorsal and 5(5–6) ventral procurrent rays, inner 5 + 4 segmented rays unbranched; vertebrae 10 + 22(21–23), epipleural ribs terminate on vertebra 18(15–19), pleural ribs terminate on vertebra number 11(9–12).

Body moderately elongate, depth 4.1 (3.8–4.6) in SL and slightly compressed, width 2.0 (1.7–2.6) in depth; head 3.6 (3.5–3.9) in SL; dorsal profile of head nearly vertical anterior to eyes; snout 2.5 (2.2–3.1) in head; eye 4.6 (3.2–4.2) in head, relative size inversely proportional to SL; interorbital narrow, 11.4 (9.5–13.0) in head; caudal peduncle longer than deep, least depth 2.5 (2.3–2.9) in head.

Mouth wide, subterminal, maxilla extending beyond vertical from posterior border of orbit in holotype, just reaching or anterior to vertical in smaller paratypes. Upper lip crenulae about 33 (26–38), lateral crenulae best developed; lower lip smooth centrally, weakly plicate laterally. Incisiform teeth in single row

TABLE 1

COUNTS RECORDED FROM TYPE SPECIMENS OF *Cirripectes auritus*

	PARATYPE									
	HOLOTYPE, BPBM 20478 (Fanning)	BPBM 24454 (Kenya)	USNM 222489 (Fanning)	USNM 222489 (Fanning)	BPBM 14062 (Fanning)	ANSP 138366 (Fanning)	ANSP 138366 (Fanning)	CAS 34383 (Comoro)	CAS 34383 (Comoro)	USNM 222490 (Apo)
Standard length (SL)	70.8	56.9	55.0	50.7	50.1	48.2	43.8	43.5	41.8	31.8
Sex	♂	♀	♂	♀	♀	♂	♀	♂	♂	♀
Dorsal fin	XII,17	XII,16	XII,16	XIII,15	XII,15	XII,16	XII,17	XII,15	XII,16	XII,15
Anal fin	II,18	II,17	II,17	II,16	II,17	II,17	II,18	II,17	II,18	II,17
Pectoral fins*	15,15	15,15	15,15	15,15	15,15	15,15	15,14	15,15	15,15	15,15
Pelvic fins*	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3
Caudal fin										
segmented rays	7 + 6	7 + 6	7 + 6	7 + 6	7 + 6	7 + 6	7 + 6	7 + 6	7 + 6	7 + 6
branched rays	9	9	9	9	9	9	9	9	9	9
Vertebrae (precaudal + caudal)	10 + 22	10 + 22	9 + 23	10 + 22	10 + 22	10 + 22	10 + 22	10 + 21	10 + 22	10 + 22
epipleural ribs	18	15	19	18	16	18	18	17	17	?
terminal pleural ribs on										
vertebra number	11	12	9	11	11	11	11	10	11	11
Dentary incisor teeth	80	74	75	64	76	70	75	71	69	67
Premaxillary incisor teeth	161	155	157	147	150	158	155	143	138	143
Nuchal cirri*	3 + 3	6 + 5	3 + 2	4 + 4	3 + 3	4 + 5	4 + 4	6 + 7	5 + 5	6 + 6
Supra-orbital cirri*	3 + 3	3 + 3	3 + 1	2 + 2	4 + 1	2 + 2	0 + 2	4 + 3	3 + 3	3 + 2
Nasal cirri*	3 + 3	3 + 3	3 + 3	2 + 3	3 + 3	2 + 2	2 + 2	3 + 3	3 + 3	3 + 3
Cephalic sensory pores										
supratemporal commissural†	7	7	7	7	6	7	7	7	7	7
lateral temporal	9	8	8	9	9	10	8	8	9	9
preopercular	8	8	8	8	8	8	8	9	8	8
mandibular	6	6	6	6	6	6	6	6	6	6
supra-orbital	3	3	4	3	3	3	3	3	3	3
infraorbital	25	15	17	15	18	16	14	16	16	16
interorbital	4	4	4	4	4	4	4	4	4	4
nasal	2	2	2	2	2	2	2	2	2	2
total pores	64	53	56	54	56	56	52	55	55	55
Posterioriormost bipored lateral- line tube below level of segmented ray number	8	9	8	9	8	7	12	7	8	5

* Left, then right.

† Left + right.

TABLE 2
 PROPORTIONAL MEASUREMENTS OF TYPE SPECIMENS OF *Cirripectes auritus*
 (EXPRESSED AS A PERCENTAGE OF STANDARD LENGTH)

	PARATYPE									
	HOLOTYPE, BPBM 20478 (Fanning)	BPBM 24454 (Kenya)	USNM 222489 (Fanning)	USNM 222489 (Fanning)	BPBM 14062 (Fanning)	ANSP 138366 (Fanning)	ANSP 138366 (Fanning)	CAS 34383 (Comoro)	CAS 34383 (Comoro)	USNM 222490 (Apo)
Standard length (mm)	70.8	56.9	55.0	50.7	50.1	48.2	43.8	43.5	41.8	31.8
Depth at anus	24.4	26.2	22.9	23.1	26.1	21.8	21.7	25.1	24.4	21.7
Head length	27.4	27.4	26.9	26.6	26.7	26.1	27.4	26.7	25.8	28.3
Snout length	11.0	10.2	10.5	9.5	9.8	11.6	9.8	9.7	8.6	9.1
Diameter of eye	5.9	7.4	7.1	6.3	6.6	7.9	7.3	7.8	7.6	8.8
Interorbital width	2.4	2.1	2.2	2.2	2.4	2.5	2.7	2.8	2.4	2.2
Longest nuchal cirrus	0.7	2.1	0.9	0.7	1.0	0.8	1.1	0.9	1.9	1.2
Longest supra-orbital cirrus	2.7	4.7	3.1	3.4	4.6	3.7	4.8*	5.1	6.7	4.7
Longest nasal cirrus	3.0	4.2	2.5	2.2	3.8	2.3	3.2	3.7	2.9	3.4
Snout to origin of dorsal fin	27.4	27.1	27.3	24.4	27.9	27.6	27.6	26.7	26.3	27.0
Length of dorsal fin base	82.9	85.9	79.4	72.5	80.4	77.6	74.9	80.0	74.2	73.9
Length of first dorsal spine	7.9	11.1	9.6	9.0	12.6	9.1	8.9	12.9	13.4	11.0
Length of second dorsal spine	9.3	11.8	10.7	9.7	13.0	10.4	10.5	12.9	13.9	12.3
Length of last dorsal spine	6.2	7.6	8.4	6.3	7.8	7.5	6.8	7.1	8.1	8.2
Length of first dorsal ray	13.7	14.4	16.2	12.4	15.0	14.7	13.0	16.3	16.5	14.8
Length of longest dorsal ray	15.5	15.5	16.4	13.6	17.4	16.0	13.0	18.2	17.5	16.0
Snout to origin of anal fin	46.2	46.7	44.7	49.0	47.1	46.9	50.0	51.7	52.9	49.7
Length of anal fin base	44.5	44.3	45.6	38.6	47.5	45.2	42.2	46.2	44.5	48.1
Length of longest anal ray	11.2	11.2	12.5	10.4	12.6	10.8	11.4	12.4	12.4	13.2
Length of pectoral fin	18.5	19.5	20.9	18.8	21.6	18.7	19.2	23.2	21.3	23.6
Length of pelvic fin	10.4	12.6	13.5	11.8	14.2	12.0	13.2	14.2	15.1	12.6
Length of caudal fin	25.0	22.7	23.4	19.0	24.6	24.1	20.1	22.3	23.9	21.7
Least depth of caudal peduncle	10.9	11.6	9.4	10.1	11.6	10.8	10.7	10.8	10.3	9.4

*right side.

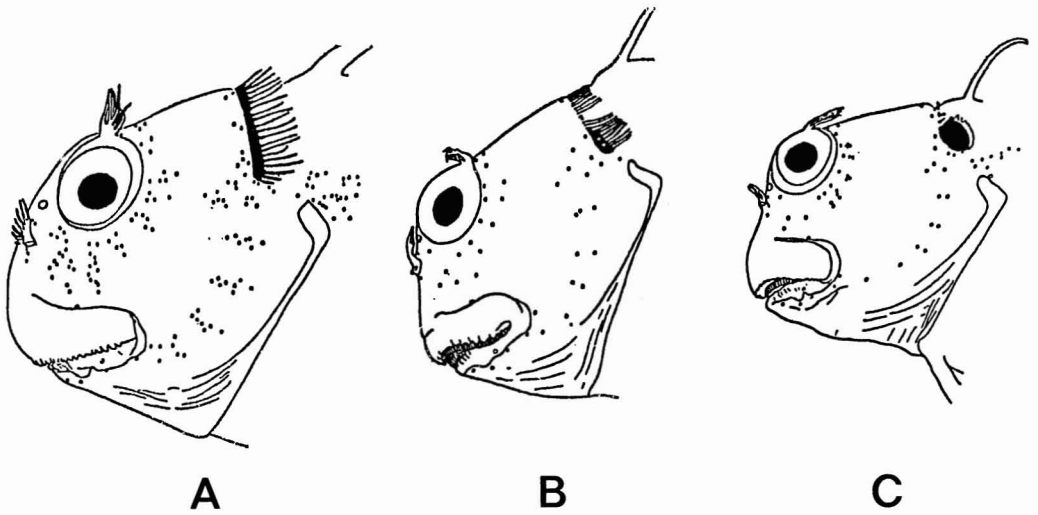


FIGURE 3. Arrangement of nuchal cirri and cephalic sensory pores on three species of *Cirripectes*. A, *C. obscurus*; B, *C. stigmaticus*; C, *C. auritus*.

in each jaw; teeth slender, close-set, flexible, their distal tips forming straight comblike edge; total premaxillary teeth 161 (138–158); total dentary incisiform teeth 80 (64–76); ratio of premaxillary to dentary incisiform teeth 2.0 (2.0–2.3); dentaries with pair of small canine teeth posteriorly; no teeth on palatines or vomer.

Anterior nostril circular, with low membranous rim bearing palmate tentacle of 3 (2–3) cirri; diameter of anterior and posterior nostrils about equal. Left orbital tentacle of holotype deeply bifurcated, giving rise to two main cirri, one of which is secondarily branched near tip; right tentacle with three cirri about equal in length; total left supra-orbital cirri 3 (0–4), the longest 10.2 (3.8–8.7) in head; dorsolateral nuchal cirri patch with 3 (2–7) separate cirri (except in one paratype where dorsal two cirri are fused basally on both sides of nape), short 2.2 (1.1–3.5) in eye; ventrolateral nuchal cirri patch of a semicircular flap margined with 11–13 (5–15) minute cirri; length of base of flap greater than height, the greatest height 11.4 (7.4–10.4) in head.

Cephalic sensory canal pores relatively few in number, the unilateral total 64 (52–56); infraorbital canal pores increasing in number somewhat with increase in standard length; a single pore in skinfold above maxil-

la; one median supratemporal commissural canal pore anterior to line joining bases of dorsolateral nuchal cirri patches; one or two pores at each position in preopercular series. Gill membranes broadly united, free from isthmus.

Lateral line commencing above dorsal edge of gill opening, arching over outline of appressed pectoral fin, and continuing posteriorly in straight line midlaterally below segmented ray portion of dorsal fin; anterior lateral-line pores opening irregularly above and below lateral-line canal; a single large pore opening behind upper edge of gill opening; lateral line of short disconnected tubes with pore at each end, the last pore located below insertion of eighth (seventh–twelfth) segmented dorsal fin ray.

Dorsal fin origin a short distance behind nuchal cirri and approximately above insertion of pelvic fins. First dorsal spine shorter than second in both sexes; first spine length 12.6 (7.5–11.2), second 10.7 (7.2–9.6), last 16.1 (12.3–14.6) in SL. No notch between spinous and segmented rayed portions of dorsal fin but rayed portion higher; length of first segmented ray 7.3 (6.1–7.7), eighth (sixth–eighth) ray longest 6.4 (5.5–7.7) in SL, terminal ray bound by membrane to a point slightly anterior to caudal fin base (occasionally just above, or slightly posterior

in some paratypes). Anal fin spines covered by fleshy rugose tissue in males, the first spine embedded in females but the second spine well developed, without rugose tissue; longest segmented ray 9.0 (7.6–9.3) in SL, terminal ray not bound by membrane to caudal peduncle; last pterygiophore supports one or two external rays.

Caudal fin rounded, its length 4 (4.1–5.0) in SL. Pectoral fins somewhat rounded, the tenth ray from dorsalmost longest, extending approximately to vertical passing through anus (anterior to vertical in some paratypes). Pelvic fins splintlike, inserted just under gill membranes (slightly posterior to gill membranes in some paratypes) 9.6 (6.6–8.3) in SL.

Ground color of holotype in alcohol: light brown, darker dorsally; no markings on head except for nuchal flap, which is jet black with a narrow fringe of translucent cirri; body sides profusely covered with tiny black spots beginning below eighth dorsal fin spine and becoming darker posteriorly; dorsal, caudal, and anal fins pale brown, translucent; membranes of dorsal and caudal fins with tiny, obscure, brown spots, more pronounced basally; anal fin without brown spots; rugose tissue on anal fin spines of males dull white; pectoral and pelvic fins translucent, whitish, without spots. One Fanning Island paratype with nine distinct irregular bars on sides (body bars approximately equal in width to eye diameter); another paratype is similar, but banding pattern is less pronounced; both specimens with black nuchal flap accentuated by surrounding light-tan region resulting in a pattern reminiscent of an ocellus. Comoro paratypes similar to Fanning holotype, but black spots on sides, which begin below seventh dorsal fin spine, are most prominent dorsally and do not extend beyond vertical through eighth dorsal fin ray.

Color in life (from a 35-mm Kodachrome transparency of paratype, Figure 1): basically the same as above, but margin of nuchal flap bright yellow; dorsal fin membrane around last four spines and all rays pinkish, especially basally; other fins without pink coloration; pupil black, surrounded by yellow iris; perimeter of eye reddish-brown. Underwater photographs of *Cirripectes auritus* taken in Thailand by J. E. Randall

(Figure 2) show reddish-brown mottling on the head, and irregular bars on the body similar to the Fanning Island paratype previously described. Another underwater photograph from Randall taken in Kenya shows a specimen with a pattern almost indistinguishable from the paratype in Figure 1 except for fine red lines and white spots on the head.

COMPARISONS: *Cirripectes auritus* differs from the diagnosis of the genus *Cirripectes* as given by Smith-Vaniz and Springer (1971) by having fewer premaxillary and dentary incisiform teeth, up to 17 segmented dorsal and 18 segmented anal fin rays, a single median supratemporal commissural pore, a reduced number of nuchal cirri, and the presence of a distinct nuchal flap. It does not appear to have any close relations among the known species of *Cirripectes*; however, Masuda, Araga, and Yoshino (1975: plate 87, fig. E) illustrate an undescribed *Cirripectes* which also appears to have a black nuchal flap. From their description it differs from *C. auritus* in having orange stripes on the body, no black spots, a greater number of nuchal cirri, and 17 pectoral rays. Unfortunately, the single known specimen could not be obtained for examination.

There are three patterns of development and arrangement of nuchal cirri in the species of *Cirripectes*. In one group, exemplified by *C. obscurus* (Figure 3A), the nuchal cirri are long, all about equal in length, and often connected basally to form a continuous band across the nape. There is no flap formed by the fusion of the bases of the ventrolateral cirri. In another group, exemplified by *C. stigmaticus* (Figure 3B), the cirri are not continuous across the nape and are not all connected basally. However, the ventrolateral cirri are fused basally, forming a narrow flap. In *C. auritus* (Figure 3C), the dorsalmost cirri are reduced in size and number, and the ventrolateral cirri are completely fused, forming a large flap. The function of this flap is not known and could not be discerned from my limited field observations.

REMARKS: The specimen photographed in Figure 1 was originally chosen to be the

holotype of *Cirripectes auritus*. Later, this specimen was found to have an unusually high number of dorsal fin spines (XIII) which is not typical of any species of *Cirripectes*. For this reason, another specimen was chosen to be the holotype. However, since no photograph was taken of the holotype showing the life colors, the photograph of the paratype is used to illustrate *C. auritus*.

Cirripectes auritus occupies a somewhat different habitat on the reef than other species of *Cirripectes* I have observed. *Cirripectes* usually occur in surge-zone habitats on clean rocky substrates. The Fanning Island *C. auritus* were all collected in a small protected area inside English Harbor. They were not found anywhere else on the reef or lagoon despite intensive searching (the population size may thus be very small). The habitat consisted of large, isolated coral rocks, about 2 m in diameter, on a sandy bottom in water about 5 m deep. Only one individual was found on each coral rock. Collection data for the Comoro and Apo specimens indicate that they came from a similar habitat. In contrast, the specimen from Kenya was collected on an irregular rocky bottom with sparse live coral and no sand.

This fish has been named *auritus* (Latin, meaning "eared"), referring to the earlike nuchal flap on either side of the head.

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support while collecting at Fanning Island; and Arnold Suzumoto, for the radiographs used in making vertebral counts.

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