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Review of Japanese Fishes of the Genus *Cirripectes* (Blenniidae) with Description of a New Species

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Abstract A new species, *Cirripectes kuwamurai* is described based on a single specimen from Shirahama, Japan. Other three species of the genus, *C. variolosus* (Valenciennes), *C. castaneus* (Valenciennes) and *C. polyzona* (Bleeker) from Japan are redescribed. *Cirripectes kuwamurai* differs from *C. auritus* Carlson in its color pattern and by the presence of a notch between spinous and soft portions of dorsal fin. Other characters shared by these two species suggest that they are each others' relatives and form a species group within *Cirripectes*.

Fishes of the genus *Cirripectes* are widely distributed in the Indo-Pacific region, occurring from the Red Sea to Easter Island. Smith-Vaniz and Springer (1971) estimated that the genus *Cirripectes* comprised 10 to 15 species and stated that additional study on the genus was needed. Recently, Williams (pers. comm.) estimated that 20 to 30 valid species may eventually be recognized in the genus. Matsubara (1955) listed three species of the genus, *C. variolosus* (Valenciennes), *C. sebae* (Valenciennes) and *C. reticulatus* Fowler from Japanese waters. Another species, *C. polyzona* (Bleeker) was reported from the Ryukyu (Okinawa) Islands by Aoyagi (1955). In this study, Matsubara's *C. variolosus* is synonymized with *C. castaneus* (Valenciennes), and his *C. sebae* and *C. reticulatus* are synonymized with *C. polyzona*.

On May 4, 1974, a specimen of undescribed species which appears to belong to *Cirripectes* was collected by Dr. Kuwamura from Shirahama, Wakayama Prefecture. This fish was briefly described as *Cirripectes* sp. by Masuda et al. (1975, 1980) and listed in "Dictionary of Japanese fish names and their foreign equivalents (Ichthyological Society of Japan, 1981)." Dr. Kuwamura also subsequently collected *C. castaneus* from Shirahama and *C. polyzona* from the Satsunan Islands. During 1973 to 1980, the author also collected *C. polyzona* from Shirahama, the Okinawa Islands, and from the Ogasawara (Bonin) Islands; *C. variolosus* was also collected at the latter locality.

As pointed out by Carlson (1980), most of the species of the genus are similar in morphology and coloration, and, in the absence of a thorough revision, species of *Cirripectes* are often difficult to identify. In this paper, the above noted new species of *Cirripectes* is described in detail and *C. variolosus*, *C. castaneus* and *C. polyzona* are redescribed. Only these four species are known from Japanese waters.

Materials and methods

All specimens used in this study were caught with anesthetic quinaldine and dip net. Except as noted below, methods of counts and measurements used in this study follow those of Hubbs and Lagler (1958). Body depth at anal origin is the least distance between anal origin and the closest point on dorsal contour of body. Opercular membrane is excluded from head length and postorbital head length measurements. When the last anal ray is branched at the base, it is counted as one ray. Only segmented pelvic fin rays were counted. When a nuchal cirrus is subdivided, it is counted as one. Nasal and orbital cirri counts are totals for left and right sides with all free tips counted. Terminology used in identifying cephalic sensory pores is adapted from Smith-Vaniz and Springer (1971) and Smith-Vaniz (1976).

Proportion of each measurement is expressed in thousandths of standard length. When allometric growth changes were observed, regression line formulae of proportion to standard length are given. In the sections of specimens examined, the number and the range of standard

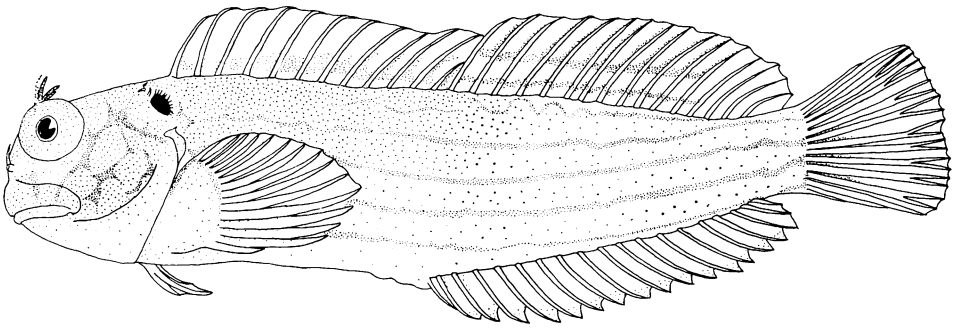

Fig. 1. Holotype of *Cirripectes kuwamurai*. sp. nov., FAKU 48479.

length (expressed in mm) of the specimens are shown in parentheses following sex indication.

Key to the Japanese species of *Cirripectes*

1a. Dorsal fin rays, XII, 16; anal fin rays II, 17; vertebrae 10+22. Dorsalmost 4 or 5 nuchal cirri (unilateral) separated at their base. Five red longitudinal stripes on dusky brown body....***C. kuwamurai*** sp. nov.

1b. Dorsal fin rays, XII, 13 to 14 (mostly 14); anal fin rays, II, 14 to 15 (mostly 15); vertebrae 10+19 or 20 (mostly 20). Dorsalmost several nuchal cirri (unilateral) continuous at their base. Markings on body not as la.

2a. Crimson (whitish brown in formalin) spots on upper lip, suborbital area and cheek .....*C. variolosus* (Valenciennes)

2b. No crimson (whitish brown in formalin) spots on upper lip, suborbital area and cheek.

3a. Head and body uniformly blackish brown .....*C. castaneus* (Valenciennes)

3b. Body blackish brown or chocolate brown with spots or blotches of bright yellow or white tinged with purple, which sometimes coalesce with each other to produce an incomplete barred or scrollwork appearance .....*C. polyzona* (Bleeker) Type A

3c. Body with numerous spots of pale brown or white tinged with purple, which are enclosed in reticulated chocolate or purplish brown lines...*C. polyzona* (Bleeker) Type B

3d. Body dusky gray or purplish white with 4 to 13 obsolete, parallel, equidistant, dark vertical bands..... .....*C. polyzona* (Bleeker) Type C

Cirripectes kuwamurai sp. nov.
(Figs. 1, 3 A)

(Japanese name: Suji-tategami-kaeruuo)

Cirripectes sp. Masuda, Araga and Yoshino, 1975, 1980: 267, pl. 87E.

Holotype: FAKU 48479, female, 55.9 mm in standard length, collected by Tetsuo Kuwamura; May 4, 1974; rocky reef, about 3 m in depth, off the northern beach of the Seto Marine Biological Laboratory, Shirahama, Wakayama Prefecture, Japan.

Diagnosis. Five longitudinal red stripes on dusky brown body. Dorsalmost 9 nuchal cirri which arise directly from body surface, wider spaced and longer than ventrolateral several cirri borne on well developed nuchal flap. Body relatively slender among species of *Cirripectes*. Dorsal fin deeply notched between spinous and soft portions.

Description. Dorsal fin rays XII, 16; anal fin rays II, 17; principal caudal fin rays 13, middle 9 branched; pectoral fin rays 15; pelvic fin rays 4; branchiostegal rays 6; vertebrae 10+22. Measurements and proportions of holotype are shown in Table 1.

Nasal cirri 4 (left) or 3 (right) on posterior rim of anterior nostril. Orbital cirri 8 (left) or 5 (right). A row of 30 cirri across nape reaching down a little ahead of and to top of opercular bone; basal line of the row oblique (upper edge anterior to lower edge); ventrolateral 11 (left) and 10 (right) short simple cirri borne on a well developed nuchal flap (Fig. 2 A); dorsalmost 9 cirri wider spaced and longer, arising directly from skin (Fig. 2 A). No crest on head.

Upper jaw reaching a point below the hind margin of eye. Upper lip broad and fleshy with 41 short blunt papillae for full length; lateral

Table 1. Measurements and proportions of holotype of *Cirripectes kuwamurai* and proportions of other three Japanese species of *Cirripectes*.

	C. kuwamurai		*C. castaneus*	*C. variolosus* Proportions (N=4)				*C. polyzona* Proportions (N=55)			
	Measurements (mm)	Proportions	Proportions	Max.	Min.	Av.	±SD	Max.	Min.	Av.	±SD
Standard length	55.9	1,000									
Body depth at anal origin	13.1	234	291	258	244	249	± 6.4	319	192	270	±27.4
Caudal peduncle depth	6.1	109	117	117	110	114	± 2.9	129	100	114	± 6.0
Caudal peduncle length	5.8	104	100	122	96	112	±11.7	129	94	108	± 8.5
Predorsal length	14.9	267	289	318	307	311	± 5.3	365	272	306	±20.3
Preanal length	27.8	497	602	577	527	553	±20.6	599	497	548	±23.8
Anal origin to pelvic insertion	17.0	304	386	350	338	346	± 5.4	411	297	341	±25.7
Dorsal fin base length	41.2	737	682	712	674	688	±16.9	773	566	697	±38.4
Anal fin base length	25.9	463	420	410	366	387	±18.9	439	365	402	±17.1
Head length	13.2	236	268	287	276	284	± 5.1	322	250	275	±16.0
Head depth	12.4	222	284	274	254	266	± 8.4	295	238	264	±11.7
Head width	8.9	159	232	222	199	212	± 9.8	256	180	221	±15.4
Postorbital length of head	8.1	145	174	183	169	175	± 6.0	182	148	166	± 7.5
Orbit to angle of preopercle	5.9	106	125	139	124	131	± 6.2	139	96	120	± 9.3
Upper jaw length	6.8	122	138	152	141	147	± 5.3	164	125	143	± 9.0
Snout length	4.8	86	96	120	89	104	±13.3	114	85	100	± 7.4
Interorbital width	1.9	34	23	31	29	30	± 1.0	46	20	30	± 5.3
Orbit length	4.2	75	79	104	80	90	±10.4	111	55	81	±13.1
Suborbital width	1.9	34	48	54	41	49	± 5.7	69	38	53	± 7.0
Orbital cirrus length	3.1	55	34	38	33	35	± 2.4	58	25	40	± 7.1
Longest dorsal spine length	7.0	125	157	172	144	159	±15.4	242	126	170	±22.9
Longest dorsal ray length	8.0	143	182	196	172	180	±10.8	212	164	185	±11.5
Longest anal ray length	5.9	106	117	142	127	135	± 7.9	161	119	138	± 8.6
Second anal spine length	2.7	48	57	60	53	58	± 3.3	77	30	53	±11.0
Longest pectoral ray length	10.0	179	215	263	219	241	±18.2	271	210	239	±13.8
Longest pelvic ray length	6.8	122	174	189	164	174	±10.8	224	151	177	±16.1

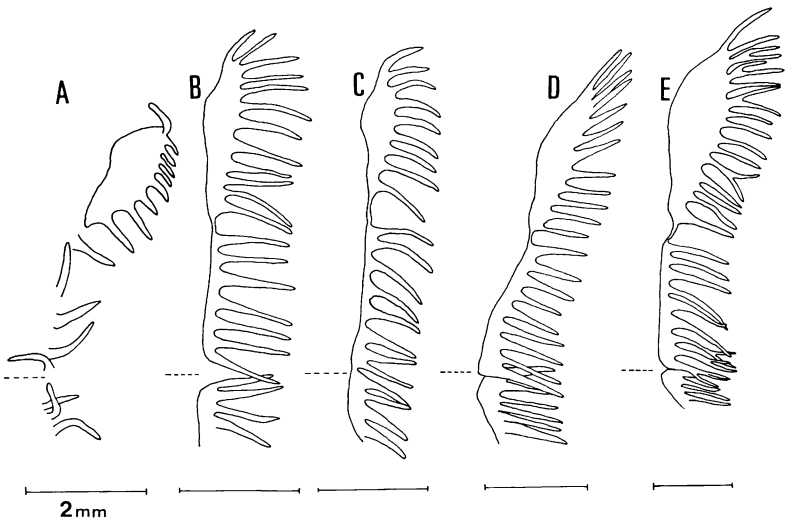

Fig. 2. Diagrammatic illustration of nuchal cirri (right side). A, *Cirripectes kuwamurai*, FAKU 48479; B, *C. variolosus*, FAKU 48144; C, *C. castaneus*, FAKU 48926; D, *C. polyzona*, FAKU 48380-a; E, *C. polyzona*, FAKU 48203-a. Broken lines show mid-dorsal line.

papillae best developed. Lower lip thin, shallowly plicate on lateral half but smooth mesially. Corners of mouth with broad, double holds. Incisiform teeth in a single row in both jaws very close set, movable; premaxillary teeth 145; dentary teeth 78; outline of each row slightly serrated. A small blunt canine tooth on each side of rear part of lower jaw. No cirrus on chin. Right and left opercular membranes broadly united to each other and free from isthmus. No cirrus on chin.

Cephalic sensory pores minute, relatively few in number; nasal series 3; infraorbital series 15; supraorbital series 3; interorbital series 3; mandibular series 6; preopercular series 8; lateral temporal series 6; supratemporal series 8; total 56. Lateral line on body arched over outline of appressed pectoral fin, and continueing posteriorly in straight line midlaterally; an anterior single lateral line tube with pores opening irregularly above and below the tube, ending at the point below 3rd dorsal soft ray; followed 4 short disconnected tubes with pores at each end, the last pore located at the point below 7th dorsal soft ray; then continued as a line of 11 single pores.

Dorsal fin deeply notched between spinous and soft portions; last spine buried in bottom of notch; last soft ray attached to caudal peduncle by a membrane for full length. Anal fin slightly lower than spinous dorsal fin; last ray divided at base and not attached to caudal peduncle by a membrane. Caudal fin rather truncate. Pectoral fin nearly rounded and not reaching anal origin. Pelvic fin inserted before pectoral origin, consisting of a short thin splintlike spine and 4 apparent soft rays.

Color in life: Ground color of body dusky brown; antero-dorsal part somewhat darker. Five narrow red longitudinal stripes on body. Two narrow red bars on both sides of upper lip. Irregular red stripes on cheek. Iris and pupil black. Nasal cirri sooty brown. Orbital cirri reddish brown. Nuchal flap and cirri black. Dorsalmost 9 cirri pale brown. Spinous dorsal fin reddish basally and dusky yellowish distally with reddish margins; spines pale whitish. Soft dorsal fin yellowish basally, and yellow tinged with red distally, especially reddish along rear margins of distal parts of rays; an irregular red stripe running at the median part of yellow basal half of the fin. Anal fin semitransparent, slightly tinged with red and with dusky margins; rays pale whitish with dusky brown tips. Caudal fin semitransparent; rays reddish basally and pale whitish distally. Pectoral and pelvic fins semitransparent.

Color in formalin: Head and body dusky

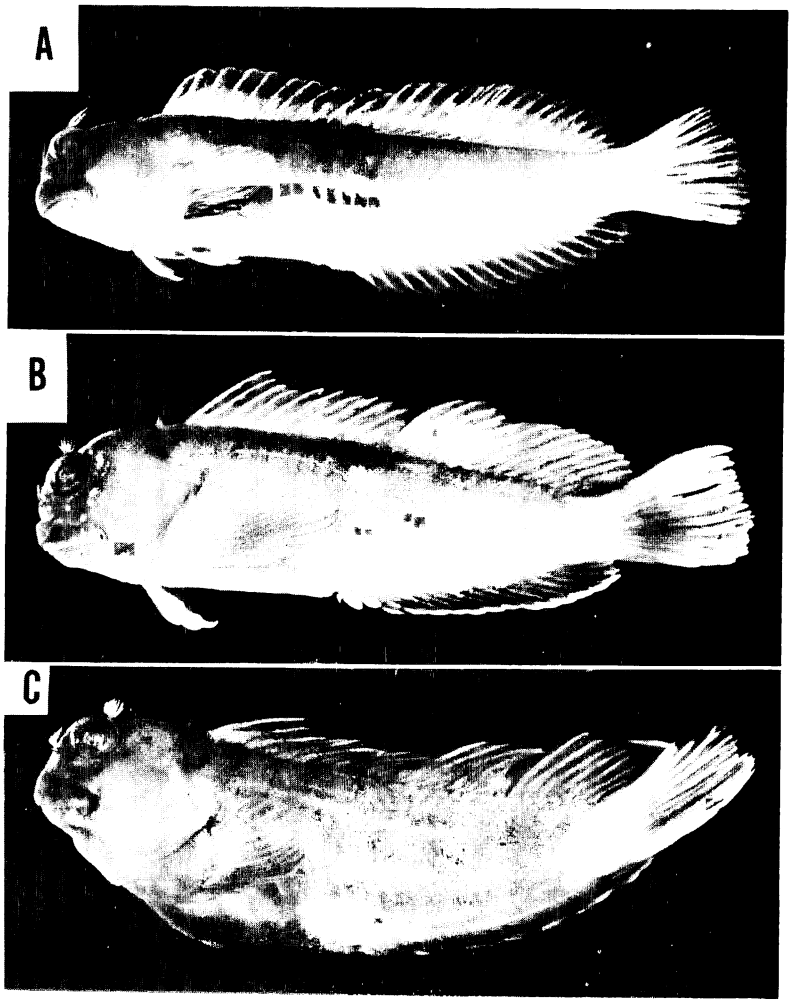

Fig. 3. Specimens of the three Japanese species of *Cirripectes*. A, *C. kuwamurai* sp. nov., holotype, FAKU 48479. B, *C. variolosus* (Valenciennes), FAKU 48183-a. C, *C. castaneus* (Valenciennes), FAKU 48926.

brown. Red stripes and bars on head faded. Median 3 red stripes on body became sooty black; other 2 faded.

Habitat. This fish hid under a shrub coral, *Acropora* sp. on moderately exposed rocky reef in about 3 m depth.

Etymology. Named *kuwamurai* in honor of the fish ecologist, Dr. Tetsuo Kuwamura, who collected the fish.

Remarks. Although the holotype was briefly described as *Cirripectes* sp. by Masuda et al. (1975, 1980), some discrepancies are noticed as follows: standard length 55.9 mm instead of 57.0 mm; nasal cirrus not simple but divided with 3 or 4 filaments; pectoral fin ray count 15 instead of 17.

C. kuwamurai and *C. auritus* (Carlson, 1980) differ from the diagnosis of the genus *Cirripectes* as given by Smith-Vaniz and Springer (1971) by having fewer premaxillary and dentary incisiform teeth, increased anal fin ray counts (17 in *C. kuwamurai*), the separate dorsalmost several nuchal cirri and the presence of a distinct nuchal flap. In addition to these characters, the number of cephalic sensory pores of *C. kuwamurai* is close to that of *C. auritus*. As tentatively suggested by Carlson (1980), *C. kuwamurai* seems to be most closely related to *C. auritus*. *C.*

kuwamurai was collected from moderately exposed (somewhat protected) rocky reef. While Carlson (1980) reported that *C. auritus* was collected in a protected area. As pointed out by Carlson (1980), most species of *Cirripectes* are found mainly in surge-zone habitats with clean rocky substrates. These two species appear to occupy a rather isolated position in the genus *Cirripectes* and form a species group.

C. kuwamurai differs from *C. auritus* by the color pattern and by the presence of a notch between spinous and soft portions of dorsal fin.

Cirripectes variolosus (Valenciennes)
(Fig. 3 B)

(New Japanese name: Benitsuke-tategami-kaeruuo)

Salarias variolosus Valenciennes in Cuvier and Valenciennes, 1836: 325, Günther, 1861: 247.

Salarias nigripes Seale, 1901: 127.

Cirripectes variolosus: Schultz, 1941: 19 (in part); Schultz and Chapman, 1960: 311 (in part); Masuda, Araga and Yoshino, 1980: 267, pl. 87B; Kuwamura, Fukao, Nakabo, Nishida, Yanagisawa and Yanagisawa, 1983: 88.

Cirripectus variolosus: Chapman, 1951: 249 (in part); Strasburg and Schultz, 1953: 130 (in part).

Specimens examined: FAKU 48143, female (1, 36.1); Apr. 7, 1974; Kominato, Chichijima I., Ogasawara Is. FAKU 48144, male (1, 51.5); Apr. 21, 1974; Kominato. FAKU 48183, male (2, 41.8–48.2); Apr. 8, 1974; Sakaiura, Chichijima I.

Description. Dorsal fin rays XII, 14; anal fin rays II, 14 or 15 (14 in one specimen and 15 in three specimens); principal caudal fin rays 13, middle 8 or 9 branched; pectoral fin rays 15; pelvic fin rays 4; branchiostegal rays 6; vertebrae 10+20. Ranges and average values of proportional measurements are shown in Table 1.

Nasal cirri 4 to 11 on posterior rim of anterior nostrils. Orbital cirri 4 to 12. A row of 25 to 37 cirri across nape, extending down a little ahead to top of opercular bone; in 3 specimens, the series interrupted at middorsal line (one or two cirri lacking) (Fig. 2 B); in 1 specimen, the series very narrowly interrupted at middorsal line; basal line of row nearly vertical, slightly curving posteriorly; ventrolateral 5 to 12 slender cirri borne on a weakly developed nuchal flap (Fig. 2 B); others slender, continuous only at their slightly swollen base (Fig. 2 B); usually these two portions of row slightly interrupted.

Upper jaw extending to or slightly beyond a point below the hind margin of eye. Upper lip broad and fleshy with 35 to 45 short blunt papillae for full length. Lower lip thin, shallowly plicate on lateral half but smooth mesially. Incisiform teeth in both jaws very close set and movable; premaxillary teeth 174 to 190; dentary teeth 90 to 93; outline of each row nearly smooth or slightly serrated. One canine tooth on each side of rear part of lower jaw.

Cephalic sensory pores minute, moderate in number; nasal series 3; infraorbital series 18 to 23; supraorbital series 8 to 10; infraorbital series 3 to 4; mandibular series 6 to 7; preopercular series 13 to 16; lateral temporal series 13 to 20; supratemporal series 10 to 12; total 77 to 92. An anterior single lateral line tube ending at the point below 5th to 7th dorsal soft ray; followed 4 to 6 short tubes, the last pore located at the point below 8th to 12th dorsal soft ray; then continuing as a line of 3 to 7 single pores.

Dorsal fin deeply notched between spinous and soft portions; first dorsal spine longest, especially in male; other spines subequal in length except for last one which is noticeably shorter. Pectoral fin nearly rounded or triangular and reaching just to or little past anal origin.

Color in life: Body uniformly blackish brown or chocolate brown. Head blackish brown or chocolate brown; crimson spots on upper lip, suborbital area and cheek. Iris and pupil black. Nasal cirri blackish brown or chocolate brown. Orbital cirri brown. Nuchal cirri and nuchal flap brown. Spinous dorsal fin dusky brown or blackish brown; antero-dorsal triangular part of fin semitransparent; spines red or reddish brown. Soft dorsal fin blackish brown basally and semitransparent distally. Anal fin blackish with semitransparent tips. Upper half of caudal fin semitransparent and lower half blackish brown with somewhat lighter distal part; rays reddish brown or blackish brown. Pectoral fin semitransparent; rays reddish brown or dusky brown. Pelvic fin dusky brown.

Color in formalin: Head and body dusky brown. Crimson spots on head became pale brown. Dorsal spine pale whitish or pale brown.

Habitat. In the Ogasawara Islands, this species was mostly observed at the base of or in interstices of cauliflower coral, *Pocillopora verrucosa* in depths of 0.5 to 5 m and was rarely

observed in depressions in rocks. Other blenniid species observed in interstices of that coral were *Cirripectes polyzona* and *Exallias brevis* (Kner). When frightened, individuals of *C. variolosus* and *C. polyzona* move from place to place in interstices of coral and often transfer from one coral to another whereas individuals of *E. brevis* never leave the original coral. *E. brevis* seems to be more closely associated with corals than are the two species of *Cirripectes*. In the Ogasawara Islands, *C. variolosus* is common but less abundant than *C. polyzona* or *E. brevis*.

Remarks. My specimens of this species agree well with those described by Schultz and Chapman (1960) from the Marshall and Marianas, except for life coloration of the upper edge of the caudal fin (semitransparent instead of orange to yellow). Whether this color discrepancy is due to geographical variation or specific difference can not determined until more information about the life color of this species from various localities is available. Fishes from Honolulu described by Jenkins (1903) as *Salarias variolosus* have the upper half of the anterior margin of the dorsal fin and the upper margin of the caudal fin bright red in life. The fishes from Hawaii described as *Cirripectus variolosus* by Strasburg (1956) also have the red upper portion of the dorsal and caudal fin. A fresh specimen from Hawaii identified as *Alticus variolosus* by Jordan and Evermann (1905) was reported to have the edge of dorsal fin and upper half of caudal fin white. According to Williams (pers. comm.), *C. variolosus* does not occur in the Hawaiian Islands. The above noted Hawaiian fishes may be different species.

The fish figured and described by Günther (1876, pl. 116 A) as *Salarias variolosus* has small pale specks on the head and body. Günther listed *S. variolosus* described by Cuvier and Valenciennes (1836: 317) in his synonymy and simultaneously listed pl. 330 of Cuvier and Valenciennes, although that is the figure of *S. variolatus* which Smith-Vaniz and Springer (1971) assigned to the genus *Scartichthys*. No reference to small pale specks on body occurs in the original description of *S. variolosus* but is given in the description of *S. variolatus*. As noted by Jordan and Evermann (1905), the fish of Günther (1876) is a different species. This confusion may have occurred because the French name for both *S. variolosus* and *S. variolatus* in Cuvier and Valenciennes (1836) are the same, Salarias variolé. Ogilby (1899) noted that Günther's fish was the same as his *Salarias alboapicalis*. The fishes described by Fowler (1928, 1941) as *Cirripectus variolosus* also appear to be a different species, since its flanks are marked with obscure scattered small round gray spots or dots.

Matsubara (1955) designated the Japanese name "tategami-kaeruuo" for his *C. variolosus*. Judging from the brief account in his key, however, his *C. variolosus* seems to be a synonym of *C. castaneus*. Therefore, a new Japanese name "benitsuke-tategami-kaeruuo" is designated for *C. variolosus* in this study.

As there was confusion in the specific identification of this species (see also remarks of *C. castaneus* and of *C. polyzona*), references without sufficient description or figure are omitted from the synonymy of this species, except for Kuwamura et al. (1983).

Cirripectes castaneus (Valenciennes)
(Fig. 3 C)

(Japanese name: Tategami-kaeruuo)

Salarias castaneus Valenciennes in Cuvier and Valenciennes, 1836: 239; Günther, 1861: 247; Sauvage, 1891: 390, pl. 11-7.

Salarias Sebae Valenciennes in Cuvier and Valenciennes, 1836: 239; Weber, 1913: 537.

Ciripectes variolosus: Fowler, 1938: 243; Herre, 1939: 343; Schultz, 1941: 19 (in part); Schultz and Chapman, 1960: 311 (in part).

Cirripectus variolosus: Chapman, 1951: 249–251 (in part); Strasburg and Schultz, 1953: 130 (in part); Matsubara, 1955: 746; Strasburg, 1956: 250 (in part); Fowler, 1958: 172 (in part).

Specimen examined: FAKU 48926, female (1, 52.2) Oct. 18, 1975; Shirahama.

Description. Dorsal fin rays XII, 14; anal fin rays II, 15; principal caudal fin rays 13, middle 9 branched; pectoral fin rays 15; pelvic fin rays 4; branchiostegal rays 6; vertebrae 10+20. Proportional measurements are shown in Table 1.

Nasal cirri 8 (left) or 7 (right) on posterior rim of anterior nostrils. Orbital cirri 9 (left) or 6 (right). A row of 33 slender cirri across nape reaching down a little above to top of opercular bone; the series continuous at middorsal line (Fig. 2 C); basal line of row nearly vertical; ventrolateral 9 cirri borne on a nuchal flap (Fig. 2 C); dorsalmost 15 cirri continuous only at

their slightly swollen base (Fig. 2 C); these two portions of row interrupted (two cirri lacking).

Upper jaw reaching a point below hind margin of pupil. Upper lip broad and fleshy with 43 papillae for full length. Lower lip thin, shallowly plicate on lateral half but smooth mesially. Incisiform teeth in a single row in both jaws very close set, movable; premaxillary teeth 189; dentary teeth 95; outline of each row conspicuously serrated. One canine tooth in each side of rear part of lower jaw.

Cephalic sensory pores minute, relatively few in number; nasal series 3; infraorbital series 16; surpraorbital series 2; interorbital series 3; mandibular series 6; preopercular series 8; lateral temporal series 7; supratemporal series 5; total 50. An anterior single lateral line tube ending at the point below 5th dorsal soft ray; followed 12 short tubes; the last pore located at the caudal fin base.

Dorsal fin deeply notched between spinous and soft portions; first dorsal spine longest but not much longer than others except for last one which is noticeably shorter. Pectoral fin nearly rounded and not reaching anal origin.

Color in formalin: Head and body uniformly blackish brown. Nasal cirri and orbital cirri blackish brown. Nuchal cirri and nuchal flap blackish. Spinous dorsal fin dusky brown; antero-dorsal triangular part of the fin semitransparent. Soft dorsal fin dusky brown. Anal fin blackish. Upper and lower part of caudal fin semitransparent and middle part somewhat dusky. Pectoral fin and pelvic fin dusky.

Habitat. This fish hid under a shrub coral, *Acropora* sp. on a moderately exposed rocky reef about 2 m in depth.

Remarks. Following the original description by Valenciennes in Cuvier and Valenciennes (1836), this species was redescribed by a few authors (see synonymy). However, it has been misidentified, especially as *C. variolosus*, by many other authors (see synonymy).

Chapman (1951) noted "An examination of the types shows *C. castaneus* to differ from *C. variolosus* only in the lack of pock-like pale dots on the front of the head and an increased number of nuchal filaments. The Sula Island and Ambon specimens agree with *castaneus* in both characters. It is probably [sic] that the two forms are subspecifically separable and that other forms can be separated on the basis of number of nuchal filaments when adequate series become available for comparison."

In addition to differences in color pattern, minor differences in the condition of nuchal cirri appear to distinguish those two species. In *C. castaneus*, the base of nuchal cirri is continuous at the mid-dorsal line whereas it is interrupted at the mid-dorsal line in *C. variolosus*. In the case of *C. polyzona* (55 specimens examined), however, both conditions were observed even in the same color pattern groups. This character, therefore, can not be used as a distinguishing character of these two forms until sufficient materials are examined. Differences in the proportions of the following 3 characters were noted in specimens of these two forms. Proportions of body depth at anal origin, preanal length and distance from pelvic insertion to anal origin of *C. castaneus* are larger than those of *C. variolosus* (Table 1). The pectoral fin reaches the anal origin in *C. variolosus* and not in *C. castaneus*. Lastly, outlines of the row of incisiform teeth in both jaws are conspicuously serrated in *C. castaneus* whereas these teeth are nearly smooth or only slightly serrated in *C. variolosus*. Differences in the above noted characters suggest that the two forms are different species. *Cirripectes castaneus* was not collected in the Ogasawara Islands and conversely *C. variolosus* is unknown from Shirahama. I know of no sympatric collections of these two forms. As noted above, I have no conclusive reason to blieve that these two forms are specifically separable rather than subspecifically. However, I treat these two forms as different species, because the crimson spots (pale brown spots in formalin) on head of *C. variolosus* are very conspicuous in life and may be important for their discrimination.

Williams (pers. comm.) found that the types of *C. sebae* and *C. castaneus* belong to the same species. In the original description of Valenciennes, the description of *sebae* is prior to that of *castaneus*. Williams (pers. comm.) also noted that the holotype of *sebae* is in bad condition (also pointed out by Chapman, 1951) and has no locality data. Therefore, the name *castaneus* is used in this study.

C. castaneus was originally described from Isle-de-France (=Mauritus). No discrepancy

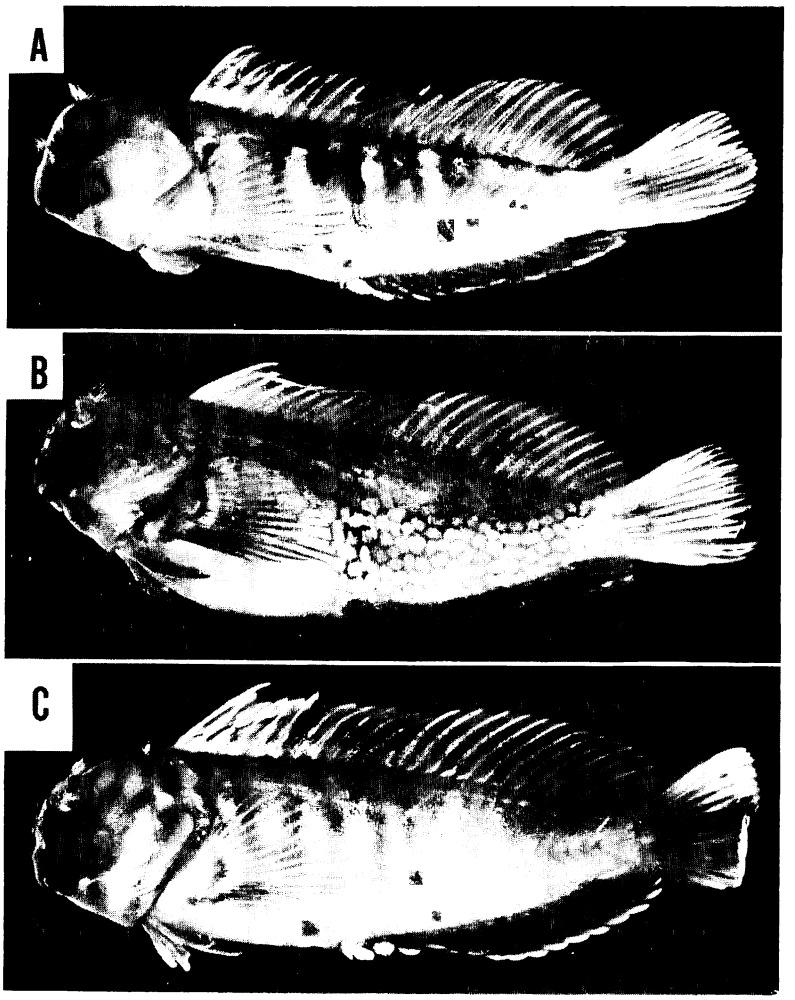

Fig. 4. Typical color pattern of *Cirripectes polyzona* (Bleeker). A, Type A, FAKU 48184. B, Type B, FAKU 48187. C, Type C, FAKU 49173.

was noticed between my specimens and Valenciennes' description.

Cirripectes polyzona (Bleeker)
(Fig. 4 A, B, C)

(Japanese name: Mino-kaeruuo)

Salarias Sebae Bleeker, 1856: 373 (not Valenciennes).

Salarias sebae: Günther, 1861: 146, Günther, 1876: 202 (not Valenciennes).

Salarias (Cirripectes) polyzona Bleeker, 1868: 278.

Salarias polyzona: Weber, 1913: 536.

Cirripectes sebae: Fowler, 1928: 433; Aoyagi, 1955: 77, figs. 3, 4; Fowler, 1958: 174; Schultz and Chapman, 1960: 313; Kamohara and Yamakawa, 1965: 25; Masuda, Araga and Yoshino, 1975, 1980: 267, pl. 87 C, D; Kuwamura, Fukao, Nakabo, Nishida, Yanagisawa and Yanagisawa, 1983: 88.

Cirripectes variolosus: Schultz, 1941: 19 (in part); Masuda, Araga and Yoshino, 1975: 266, pl. 87 B.

Cirripectes reticulatus Fowler, 1946: 173, fig. 39.

Cirripectus gibbifrons Smith, 1947: 815; Smith, 1949: 347, fig. 966.

Cirripectus sebae: Chapman, 1951: 251; Strasburg and Schultz, 1953: 130 (in part); Matsubara, 1955: 747; Fowler, 1958: 174.

Cirripectes polyzona: Aoyagi, 1955: 76, figs. 1,2.

Cirripectus reticulatus: Matsubara, 1955: 747; Fowler, 1958: 173, fig. 9.

Cirripectus variolosus: Smith, 1959: 238; Smith and Smith, 1963: 50, pl. 37 A.

Specimens examined: FAKU 47989, male (1, 57.0); Oct. 25, 1974; Sesokojima I., Okinawa I.,

Okinawa Is. FAKU 48108, male (1, 68.5) and female (1, 74.0); Oct. 24, 1974; Sesokojima I. FAKU 49109, male (1, 52.3) and female (1, 66.5); Oct. 30, 1974; Hedomisaki, Okinawa I. FAKU 48184, male (1, 53.5); Apr. 12, 1974; Tsurihama, Chichijima I., Ogasawara Is. FAKU 48185, female (1, 59.6); Apr. 13, 1974; Kanameiwa, Chichijima I. FAKU 48186, female (1, 55.8); Apr. 18, 1974; Futamiiwa, Chichijima I. FAKU 48187, female (1, 64.1); Apr. 19, 1974; Nishijima I., Ogasawara Is. FAKU 48203, male (3, 54.5–66.3) and female (4, 52.0–64.1); Apr. 8, 1974; Sakaiura, Chichijima I. FAKU 48268, young (1, 19.8) and male (1, 46.7); Nov. 14, 1973; Shirahama, Wakayama Prefecture. FAKU 48269, male (1, 52.3); Nov. 30, 1973; Shirahama. FAKU 48270, young (1, 20.2); Nov. 5, 1973; Shirahama. FAKU 48271, young (1, 35.1); Dec. 2, 1973; Shirahama. FAKU 48272, female (1, 46.8); Oct. 21, 1973; Shirahama. FAKU 48273, young (1, 24.1); Oct. 23, 1973; Shirahama. FAKU 48380, young (1, 23.2) and female (1, 57.1); Sept. 13, 1973; Shirahama. FAKU 48398, male (1, 41.9); July 27, 1973; Shirahama. FAKU 48399, female (1, 39.8); Aug. 21, 1973; Shirahama. FAKU 48400, male (3, 40.2–54.2); Aug. 21, 1973; Shirahama. FAKU 48478, young (1, 33.0); July 1, 1973; Shirahama. FAKU 48947, young (1, 24.6); June 18, 1975; Shirahama. FAKU 48963, young (1, 29.2); July 31, 1975; Shirahama. FAKU 48965, young (1, 26.1); Aug. 1, 1975; Shirahama. FAKU 48968, young (1, 35.5); Aug. 10, 1975; Shirahama. FAKU 48973, young (1, 31.7); Aug. 24, 1975; Shirahama. FAKU 49173, male (2, 48.0–61.1); Apr. 8, 1976; Kanebo, Yoron I., Satsunan Is. FAKU 49174, female (2, 35.9–60.8); Apr. 26, 1976; Oogomori, Takarajima I., Satsunan Is. FAKU 49175, female (1, 66.1); Apr. 22, 1976; Maegomori, Takarajima I. FAKU 49176, male (1, 72.3); Apr. 12, 1976; Wanjyo, Okinoerabujima I., Satsunan Is. FAKU 49177, female (2, 71.4–71.8); Apr. 19, 1976; South-west coast of Takarajima I. FAKU 49178, female (2, 71.5–75.9); Apr. 8, 1976; Kanebo. FAKU 49179, female (3, 58.1–76.9); Apr. 8, 1976; Kanebo. FAKU 49182, female (3, 90.9–103.1); Apr. 12, 1976; Wanjyo. FAKU 50400, female (1, 72.3); Oct. 8, 1980; Okinawahonto I., Okinawa Is. FAKU 50401, male (1, 52.2); Oct. 8, 1980; Okinawahonto I. FAKU 50402, female (1, 34.8); Oct. 8, 1980; Okinawahonto I.

Description. Dorsal fin rays XII, 13 or 14 (13 in only 1 specimen); anal fin rays II, 14 or 15 (14 in only 1 specimen); principal caudal fin rays 13, middle 9 branched in adults; pectoral fin rays 14 or 15 (14 in only 2 specimens); apparent pelvic fin rays 3 or 4 (3 in only 2 specimens); branchiostegal rays 6; vertebrae 10+19 or 20 (19 in only 1 specimen). Ranges and average values of proportional measurements are shown in Table 1. The proportional changes with growth are observed in following 8 parts. The proportions of predorsal length, caudal peduncle length, head length, upper jaw length, orbit length and longest pelvic ray length decrease as they grow (Table 2). The proportion of body depth at anal origin and dorsal base length increase as they grow (Table 2).

Nasal cirri 4 to 34 (Table 3) on posterior rim of anterior nostril. Orbital cirri 4 to 38 (Table 3). A row of 32 to 59 slender cirri (Table 4) across nape reaching down a little ahead to top of opercular bone; in 23 specimens, the series very narrowly interrupted at middorsal line (Fig. 2 E); in 15 specimens, the series continuous at middorsal line; in 10 specimens, one or two cirri of left and right series overlapping at middorsal line (Fig. 2 D); in 4 specimens, the series clearly interrupted at middorsal line (1 cirrus lacking); basal line of row more or less oblique (upper edge anterior to lower edge); ventrolateral 8 to 19 cirri (mostly simple and rarely subdivided) borne on a weakly to well developed nuchal flap (Fig. 2 D, E); dorsalmost 7 to 12 cirri (mostly simple and rarely subdivided) continuous only at their slightly swollen base (Fig. 2 D, E);

Table 2. Regression lines of propotions of 8 parts to standard length in *Cirripectes polyzona*.

	Regression line	r	*P*
Body depth at anal origin	Y= 0.09X+21.73	0.676	0.000
Caudal peduncle length	Y=−0.03X+12.59	−0.747	0.000
Predorsal length	Y=−0.08X+35.15	−0.777	0.000
Dorsal fin base length	Y= 0.12X+62.97	0.613	0.000
Head length	Y=−0.07X+31.41	−0.850	0.000
Upper jaw length	Y=−0.03X+16.00	−0.678	0.000
Orbit length	Y=−0.06X+11.44	−0.897	0.000
Longest pelvic ray length	Y=−0.06X+21.41	−0.792	0.000

mostly these two portions of row interrupted (1 to 3 cirri lacking) and rarely continuous.

Upper jaw slightly beyond the hind margin of eye. Upper lip broad and fleshy with 33 to 50 (Table 3) short blunt papillae for full length (in small specimen smooth mesially). Lower lip thin, shallowly plicate on lateral half but smooth mesially. Incisiform teeth in both jaws very close set and movable; premaxillary teeth 132 to 229 (Fig. 5); dentary teeth 79 to 114 (Fig. 6); outline of each row nearly smooth in larger specimens, slightly serrated in smaller specimens. Canine tooth on each side of rear part of lower jaw.

Cephalic sensory pores minute, quite variable in number; nasal series 3 to 7 (mostly 3); infraorbital series 15 to 79; supraorbital series 3 to 17; interorbital series 3 to 8; mandibular series 6 to 9 (mostly 6); preopercular series 8 to 39; lateral temporal series 6 to 32; supratemporal series 4 to 21; total 50 to 187 (Fig. 7). In adults (SL>60 mm), an anterior single lateral line tube ending at the point below 5th to 8th dorsal soft ray; followed 7 to 13 short tubes, the last pore located at the point below 13th dorsal spine to caudal fin base; when the last short tube not reaching the caudal fin base, continued as a line of a few single pores.

Dorsal fin deeply notched between spinous and soft portions. Pectoral fin neary rounded or triangular.

Color in life: Three types of color pattern exist, although these three types combined with each other to some extent.

Type A: Body blackish brown or chocolate brown; posteriorly, body with roundish spots of white tinged with purple, that are smaller than eye; anteriorly, body with blotches of white tinged with purple, that are larger than eye and sometimes coalesced with each other to produce an incomplete barred or scrollwork appearance. Head and pectoral base also blackish brown or chocolate brown with spots or blotches of white tinged with purple, that sometimes coalesced with each other to produce an incomplete barred or scrollwork appearance: sometimes one or two

Table 3. Number of nasal cirri, orbital cirri and papilla on upper lip of *Cirripectes polyzona*. Types A, B and C see the paragraph of color pattern. Groups A and B: see the paragraph of remarks and Table 4.

		N	Nasal cirri		Orbital cirri		Papillae on upper lip	
			Mean±SD	Range	Mean±SD	Range	Mean±SD	Range
Ogasawara								
Type A ♂	Group B	4	21.3± 1.3	20–23	32.3±4.6	28–38	42.5±4.4	36–45
Type B ♀	Group B	7	25.6± 6.1	16–34	27.3±5.3	22–38	45.4±2.4	42–49
Okinawa								
Type A ♂	Group B	2	12	12	22.0±4.2	19–25	42.0±1.4	41–43
Type B ♀	Group B	2	22.0±15.5	11–33	23.0±8.5	17–29	38.0±1.4	37–39
Type A ♂	Group A	1	16	16	13	13	41	41
Type B ♀	Group A	1	16	16	10	10	41	41
Un I ♂	Group A	1	14	14	12	12	44	44
Un I ♀	Group A	1	15	15	17	17	42	42
Satsunan								
Type B ♀	Group B	3	24.3± 3.2	22–28	21.7±2.3	19–23	43.0±3.0	40–46
Type B ♀	Group A	7	12.1± 0.9	11–13	13.1±2.5	9–16	41.1±4.3	34–46
Type C ♂	Group A	3	12.0± 3.0	9–15	11.7±1.5	10–13	43.7±5.7	42–50
Type C ♀	Group A	2	13.0± 1.4	12–14	7.0±4.2	4–10	35.0±2.8	33–37
Un I ♀	Group A	1	13	13	18	18	42	42
Shirahama								
Type A ♂	Group B	7	10.7± 1.5	9–13	17.2±3.4	12–20	42.2±4.1	36–47
Type B ♀	Group B	4	12.3± 2.2	10–15	20.3±5.4	14–27	44.0±5.5	37–50
Type C ♂	Group B	1	9	9	18	18	43	43
Type C ♀	Group A	3	8.0± 1.7	6– 9	8.0±2.0	6–10	35.7±4.7	32–41
Type C ♀	Group A	4	7.3± 2.2	4– 9	8.5±1.9	6–10	39.5±1.9	37–41
Un I ♀	Group A	1	6	6	8	8	41	41

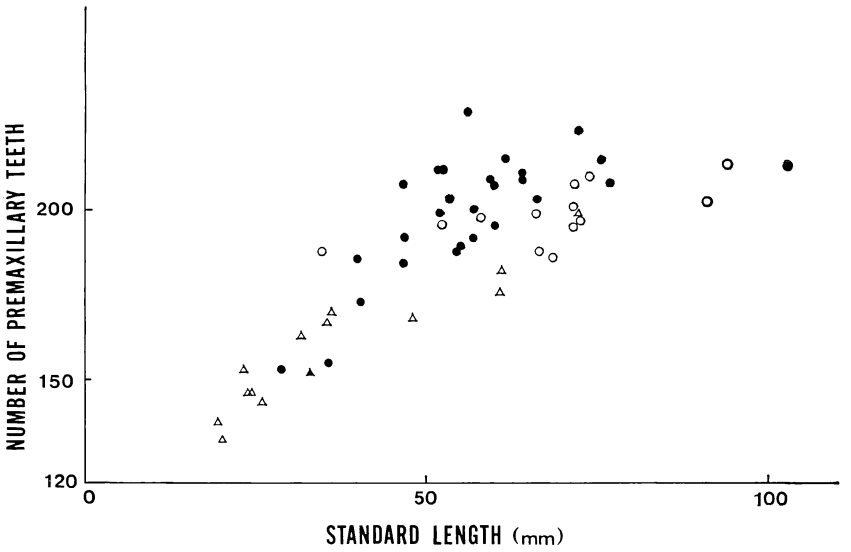

Fig. 5. The relationship between number of premaxillary teeth and standard length in *Cirripectes polyzona*. ○, Group A in the number of nuchal cirri, Types A and B in the color pattern; ●, Group B, Types A and B; △, Group A, Type C; ▲, Group B, Type C.

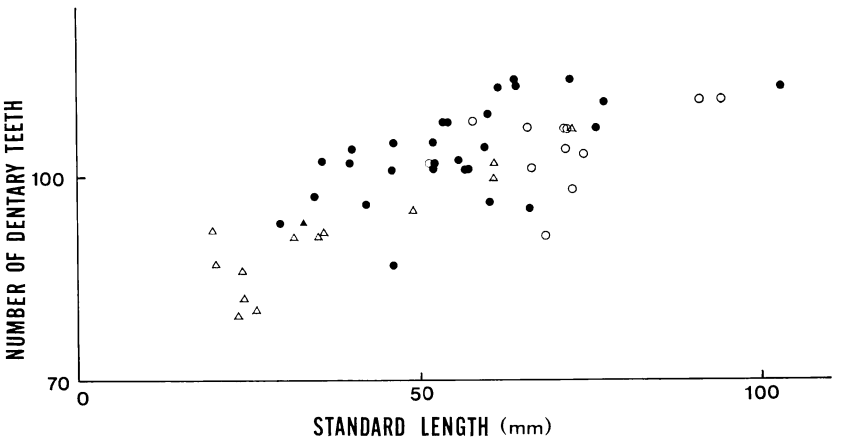

Fig. 6. The relationship between number of dentary teeth and standard length in *Cirripectes polyzona*. Symbols as in Fig. 5.

V-shaped blackish brown or chocolate brown bars on throat. Iris golden and pupil black. Nasal and orbital cirri chocolate brown or purplish brown. Nuchal cirri and nuchal flap blackish brown. Dorsal fin dusky tan; anterodorsal triangular part of the fin semitransparent; spines and rays reddish brown, chocolate brown or purplish brown. Anal fin somewhat dusky with a darker subterminal band. Caudal fin semitransparent with slightly dusky middle part; rays reddish brown, chocolate brown or purplish brown. Pelvic fin sooty.

Specimens from Ogasawara differ from those from other localities in the color of the following parts. Roundish spots and blotches on body, head and pectoral base bright yellow. Spinous dorsal fin blackish brown with a pale olivaceus basal part and with pale olivaceus oblong blotches in the middle. Soft dorsal fin dusky pale olivaceus on basal three fourths and

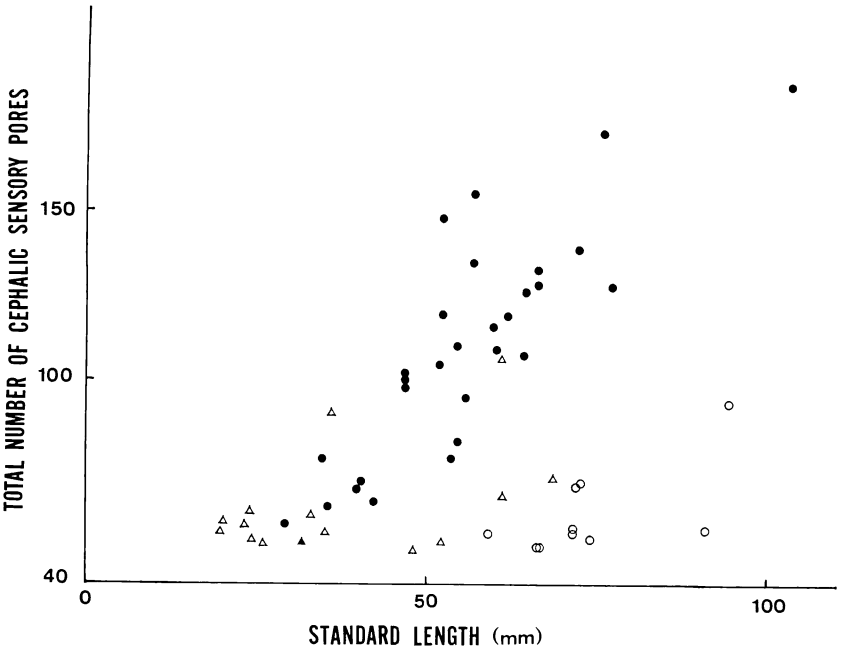

Fig. 7. The relationship between total number of cephalic sensory pores and standard length in *Cirripectes polyzona*. Symbols as in Fig. 5.

blackish brown distally.

Type B: Head, body and pectoral base with numerous spots of pale brown or white tinged with purple, that are equal to or smaller than eye, and enclosed in reticulated chocolate or purplish brown lines that resemble a honeycomb.

Type C: Body dusky gray with 4 to 13 obsolete, parallel, equidistant, vertical darker bands (in specimens with lesser number of bands, these bands limited to anterior part of body). Head dusky gray; sometimes with one or two oblique darker bands; one or two V-shaped darker bands on throat.

Color in formalin. Markings on head and

Table 4. Frequency distributions for number of nuchal cirri in *Cirripectes polyzona*.

	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
Ogasawara																												
Type A																		2		1		1						
Type B											1				1			1	1	2								1
Okinawa																												
Type A							1							1	1													
Type B			1									1		1														
Unidentified			1	1																								
Satsunan																												
Type B		2	1	1	1	1		1						1		1	i											
Type C	1					1		2	1																			
Unidentified							1																					
Shirahama																												
Type A																1		2	2	1			1					
Type B														1	1							2						
Type C			1		2	2	2																1					
Unidentified									1																			
Total	1	2	4	2	3	4	4	3	2		1	1		4	3	2	1	5	3	4		3	2					1

body became slightly obscure.

Type A: Spots or blotches of bright yellow (Ogasawara specimens) or white tinged with purple become dusky pale brown. Pale olivaceus coloration on dorsal fin turns to dusky pale brown so as to make the fin uniformly pale brown or dusky brown except for semitransparent anterodorsal triangular part of the fin (Ogasawara specimens). Golden iris becomes black.

Type B: Darker tone on head, body and fins become slightly lighter than that in life and purplish tinge fades.

Type C: Dusky gray head and body become light brown or pale brown; body bands dusky brown.

Habitat. In the Ogasawara Islands, this species was mostly observed at the base of or in interstices of the coral, *Pocillopora verrucosa* together with *C. variolosus* and *E. brevis* in depths of 0.5 to 5 m and was sometimes observed in the depression of the rock.

In the Okinawa Islands, *C. polyzona* was commonly observed in depths of 0.5 to 3 m in interstices of corals, *Acropora* spp. whose branches interlaced and made up complex spaces. This species and another blenniid, *Atrosalarias fuscus* (Rüppell), were more abundant in interstices of corals near or on the coral crest than in the lagoon. In interstices of corals in the lagoon, another blenniid, *Salarias fasciatus* (Bloch), was much more abundant than *C. polyzona* and *A. fuscus*. They were also observed in depths of 0.5 to 6 m in interstices of the coral, *P. verrucosa*, together with *E. brevis* and at base of that coral or other shrub corals, often in the depression of coral limestone, and in or near the empty shell of a large sized barnacle.

At Shirahama, they were sometimes observed in or near the empty shells of a large barnacle, *Balanus tintinnablum volcano* on very exposed rocky reefs at depths of 0.5 to 3 m and rarely observed in interstices of shrub corals, *Acropora* spp. on moderately exposed rocky reefs at depths of 1 to 4 m.

Specimens collected at Shirahama do not exceed 60 mm standard length (19.8 to 57.1 mm) and individuals observed there during 1973–1975 did not exceed ca. 60 mm S.L. In the inshore rocky reefs at Shirahama, the number of species increased in summer and autumn, but decreased in winter (Kuwamura, 1980). Araga and Tanase (1968) reported that the many tropical fishes were killed by the cold and stranded on the beach in winter at Shirahama. *C. polyzona* was observed from early July to December but not observed in spring. Pelagic larvae of this species are believed to drift in the Kuroshio Current from southern localities to Shirahama and to settle there during summer and autumn. Almost all settled young fishes are probably killed by the cold in winter. In Shirahama, breeding of this species was not observed, although some males develope dermal pads on anal spines. Individuals observed at Shirahama, therefore, are believed to be a pseudopopulation of the species.

Remarks. My specimens of the above species mostly agree with the fishes described as *C. sebae* by Chapman (1951). However, Williams (pers. comm.) has found that the types of *C. sebae* and *C. castaneus* are based on the same species (see remarks of *C. castaneus*). This finding makes *Cirripectes polyzona* the correct name to use for this species.

Chapman (1951) noted "*C. variolosus* and *C. sebae* [=*C. polyzona* in this study] occur together in collections made in Polynesia, Micronesia and Melanesia. In those areas the two species are easily defined by the higher nuchal filament count in the latter (35 to 42 in *sebae* [=*C. polyzona*]; 29 to 37 in *variolosus*), the more anterior slanting of the nuchal cirri in *variolosus* (the travel downward slanting line running well forward of the posterior edge of the operculum), and the colour pattern. In the Indo-Australian area, where *variolosus* has higher nuchal filament count, the differentiation can be safely made often only on colour pattern."

When only specimens from the Ogasawara Islands are compared, these two species are separable in the number of nuchal cirri (Table 4: 42 to 59 in *C. polyzona* versus 25 to 36 in *C. variolosus*). When all the spcimens are compared, however, the number of nuchal cirri in 3 of 4 specimens of *C. variolosus* are within the range of *C. polyzona*. In *C. polyzona*, the basal line of the row of nuchal cirri is more or less oblique. In contrast, it is nearly vertical in *C. variolosus*. However, this character is too subtle to be relied upon solely to distinguish these two species. At present, the differentiation of these two species can be safely made only on

color pattern. This is also true for the differentiation between *C. polyzona* and *C. castaneus*.

Generally speaking, there are three color pattern types of this species. Type A pattern is represented by 14 males and type B pattern by 24 females. Specimens of type C include 7 males and 6 females. Judging from the sex ratioes, type A pattern apparently is characteristic of males and type B pattern of females, and fish with type C pattern may possibly represent a different species. Absence of type C specimens from the Ogasawara Islands seems to support this idea. Specimens with type B pattern agree with fish described as *Salarias sebae* by Bleeker (1856) and specimens with type C pattern agree with the fish described as *Salarias* (*Cirripectes*) *polyzona* by Bleeker (1868). Chapman (1951) synonymized the former and the latter of Bleeker's fishes with his *C. sebae*, because he believed that the former and the latter represented the third and the second of three growth stages respectively. However, the standard length size ranges for the three color patterns (type A, 40.2–66.3 mm; type B, 29.2–103.1 mm; type C, 20.2–72.3 mm) broadly overlap and type C does not appear to be the one growth stage. Nevertheless, in this paper fishes with three different color pattern types are treated as conspecific and all referable to *C. polyzona* because these three types combine with each other to some extent.

In my specimens of this species the color of the anterodorsal triangular part of the spinous dorsal fin and of the distal upper triangular part of the caudal fin is semitransparent. Whereas in fishes described as *Salarias sebae* by Günther (1861; from Ternate, Ambon and Guam), as *Cirripectes sebae* by Fowler (1928; from East Indies and Polynesia) and as *Cirripectes sebae* by Kamohara and Yamakawa (1965; from Amami), these two parts are red in color. Whether this color discrepancy is due to geographical variation or is a specific difference, can not be determined until life color observations of the fish from other localities are available.

No change with growth was observed in the number of nuchal cirri. The number of nuchal cirri seems to divide this species into two groups (Table 4: group A, 32 to 40 and group B, 42 to 59). Twelve of 13 specimens with type C color pattern belong to group A. On the other hand, 13 of 14 specimens with type A color pattern belong to group B. Eight of 24 speciemns with type B specimens belong to group A and other 16 specimens belong to group B. Some correlation was observed in the total number of cephalic sensory pores between these two groups. In the group B, the total number of cephalic sensory pores steeply increase as they grow (Fig. 7). Whereas, in the group A, cephalic sensory pore numbers are nearly constant (Fig. 7). Some tendencies were also observed between these two groups in the number of premaxillary teeth which increase as they grow (Fig. 5). Fishes of group B have slightly more numerous teeth than do fishes of group A. These two groups, therefore, may possibly be regarded as different populations. Since a few exceptions exist in either above noted characters (Figs. 5, 7), however, these two groups were treated as a variation of the species *C. polyzona*.

The population of Shirahama, Satsunan Islands and Okinawa Islands may be continuous, since these localities are under the influence of the Kuroshio Current. On the other hand, the Ogasawara Islands are not under the influence of the Kuroshio Current. The population at these islands may be isolated from the other three localities, similar to the case of the anemonefish *Amphiprion clarkii* (see Bell et al., 1982). This assumption is supported by following facts: 1) Specimens with type C color pattern are absent in the Ogasawara Islands. 2) Specimens with type A color pattern are a little different in color between these two assumed local populations (see the paragraph of color pattern). 3) All 11 specimens belong to the group with more than 42 nuchal cirri (group B). 4) Nasal and orbital cirri of fishes from Ogasawara are numerous compared to the fishes from other localities (Table 3).

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日本産タテガミカエルウオ属魚類の再検討

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和歌山県白浜で採集されたイソギンポ科タテガミカエルウオ属の1新種，*Cirripectes kuwamurai* を記載した．

本種は *C. auritus* にもっとも近縁と考えられ，タテガミカエルウオ属魚類のうちでは比較的細長い体型をしており，両顎の歯が少ないこと，臀鰭条数が多いこと，および項部皮弁の形状が特異であることなどから，*C. auritus* とともにタテガミカエルウオ属の1 species group を形成すると考えられる．*C. kuwamurai* は体の斑紋および背鰭の棘条部と軟条部の間に欠刻があることにより *C. auritus* と区別される．

他の日本産タテガミカエルウオ属3種の再記載を行ない，上記の1新種を含めた日本産タテガミカエルウオ属魚類の検索表を作製した．

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