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# Two New Long-Tailed Pomacanthine Fishes from Miyake-Jima and Okinawa-Jima, Japan

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**Abstract** *Holacanthus fucosus*, a new long-tailed pomacanthine from Miyake-jima and *H. watanabei*, also a new long-tailed pomacanthine from Ryukyu Is. are described here. The latter was formerly ascribed to *H. caudovittatus*, but discovery of additional specimens and examination of photographs of the holotype of *H. caudibicolor* convinced us that it is a distinct new species. Its variations especially color pattern are noted.

*Holacanthus fucosus*, n. sp. is based on a long-tailed pomacanthine specimen from Miyake-jima. *Holacanthus watanabei*, n. sp. is described from two specimens from Okinawa-jima, Ryukyu Is., which seem to be conspecific with a specimen reported from Zamami-shima, Ryukyu Is. by Watanabe (1949) as *Holacanthus caudovitatus* (sic).

Because long-tailed pomacanthines are highly variable in color pattern within a species, and because specimens hitherto reported are scarce, our knowledge about these fishes is quite limited. This paper aims to expand the knowledge of the group.

The genus *Genicanthus* has been applied to the long-tailed pomacanthines by most current authors, because they are easily distinguished from all others by the elongate upper and lower lobes of the caudal fin. Except in this character *Holacanthus tricolor*, type species of the genus *Holacanthus*, does not differ from some or all members of the long-tailed pomacanthines. In contrast to Fraser-Brunner's (1933) finding, we found that the preorbital is not always notched mesially, and its hinder margin is not always free; teeth in both jaws are not always short in the long-tailed pomacanthines. According to him, scale rows on the opercle number six to eight in *Genicanthus* and about nine in *Holacanthus*. The count of vertical scale rows on the opercle in this group of fishes may differ by one or two depending on the investigators' counting method. In the absence of the osteological study of the world representatives of the pomacanthines, it may be reasonable now to retain the long-tailed pomacanthines in the genus *Holacanthus*.

*Holacanthus* ***fucosus***, sp. nov.
(New Japanese name: kumadori-yakko)
(Figs. 1, 2, and 13)

Holotype—ZUMT (Section: Zoology, University Museum, University of Tokyo) 52422, a female specimen, 128.5 mm in standard length, collected by Mr. Takahiro Isogai, using a hand line with a piece of squid as bait, from rocky shore, water depth about 15 m, at Sanbon-ne, Miyake-jima (about 34°05′N, 139°30′E), on 20 August, 1969.

Life colors are based on a color transparency taken at a depth of about 15 m by Mr. Hajime Masuda in May 1968 at Hachijo-ko-jima (about 33°05′N, 139°45′E).

## Diagnosis

A slender species of *Holacanthus* with elongate upper and lower lobes of the caudal fin. This species is different from other long-tailed pomacanthines in having the black caudal peduncle and two vertical black streaks; one behind the eye and another on the opercle.

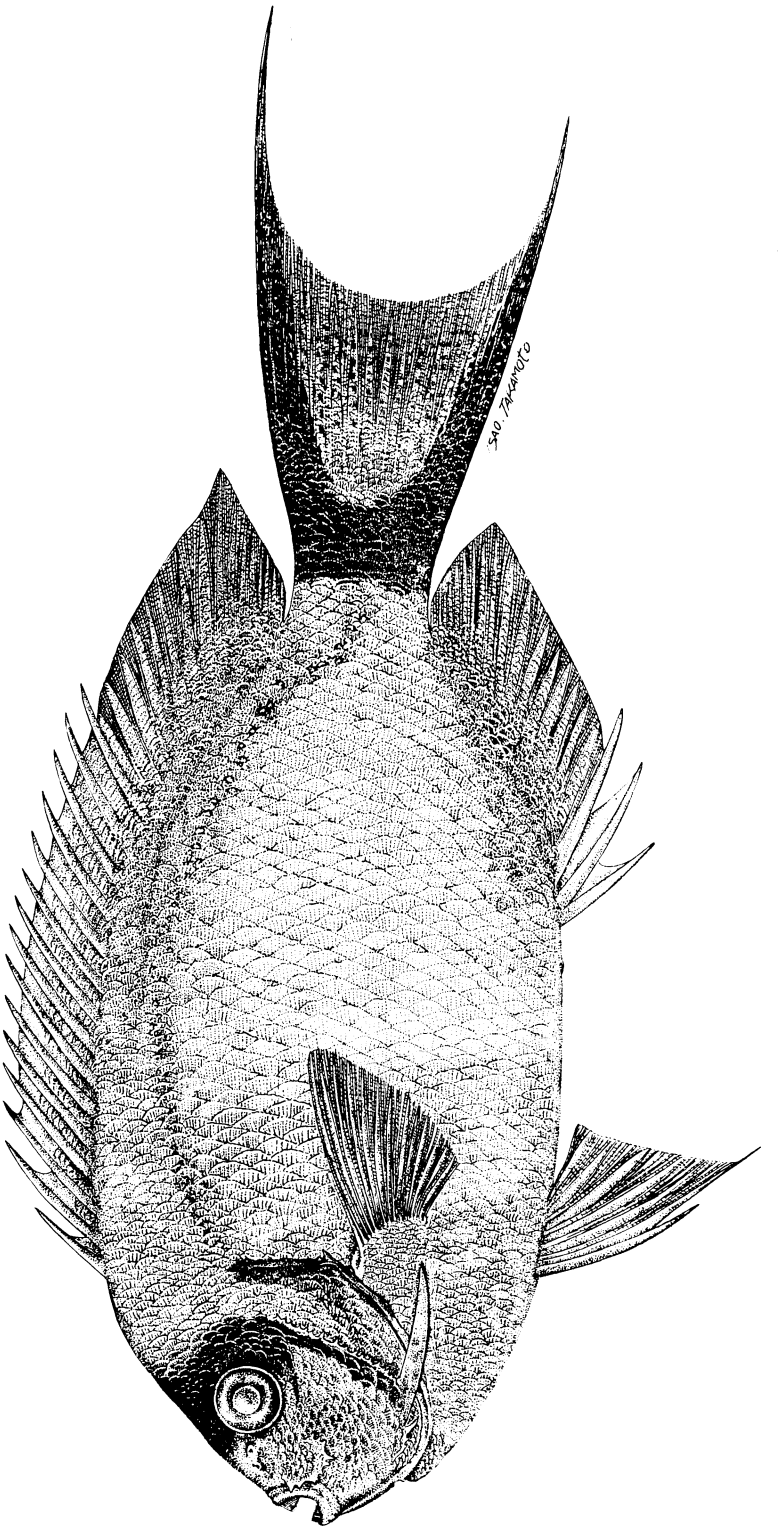


Fig. 1. Holotype of *Holacanthus fucosus*, ZUMT 52422, 128.5 mm in standard length, collected from Miyake-jima.

Teeth are longer for the group and exposed beyond the fleshy lips.

### Description

D. XV, 16; A. III, 17; $P_1$. 16: (1st non-segmented, 2nd and last unbranched); $P_2$. I, 5; caudal branched rays 8 + 7. Pored scales in lateral line more than 39 (left) and more than 41 (right), scales between lateral line and 6th dorsal spine 5, scales below lateral line 23 (not shown exactly in Fig. 1), number of diagonal scale rows tilting posteriorad ventrally, from upper end of opercle to caudal base ca. 30, number of those tilting forward ventrally ca. 45. Branchiostegals 6; gill rakers of outer rows of 1st branchial arch, 11 (lower) + 1 (middle) + 3 (upper); number of vertebrae 10 + 14 (urostylar vertebra counted as 1). Predorsal bone 1.

Measurements expressed in hundredths of standard length (128.5 mm): depth of body through base of 6th dorsal spine 46.2, head length to fleshy rim of opercle 28.0, snout length 10.1, horizontal diameter of orbit 8.2, interorbital width 9.4, least depth of caudal peduncle 13.2, snout to dorsal origin 32.7, snout to anal origin 66.9, snout to pectoral insertion 28.0, snout to pelvic insertion 36.6, dorsal base 67.7, length of 4th dorsal spine 17.5, anal base 33.1, length of 3rd (longest) anal spine 16.4, length of pectoral fin 21.0, length of pelvic fin 28.0, length of pelvic spine 19.1

Teeth on both jaws are needle-like, well exposed beyond the lips, and arranged in several rows; the internal ones are smaller. The prevomer and palatine are devoid of teeth. The anterior opening of the nostril has a raised fleshy rim. Eye diameter is shorter than interorbital width. Anterior and ventral margins of the first infraorbital (preorbital) are free; the posterior margin is covered with skin and scales. On the left first infraorbital, there are two spines at the anterior end, and eight spines ventrally. The gap between anterior and posterior groups of spines is spaced and notched. On the right side, spines at the anterior end are torn off; a small bony process is at the middle of the gap, and probably seven spines (some damaged) are on the ventral margin. The preopercle has a stout spine at the angle and three spines along the ventral horizontal margin: there are about 20 bony serrations on the posterior vertical margin. The interopercle has two spines anteriorly, and several low processes posteriorly which are observable only after removal of scales. The ventral margin of the interopercle is not covered by the preopercle. The posteroventral rim of the subopercle is studded with several low bony processes which are observable after removal of scales. The exposed rim of the cleithrum is smooth (Fig. 2). Hinder margins of the supracleithrum and posttemporal are finely serrated.

Scales are strongly ctenoid; auxiliary scales (Fraser-Brunner, 1933: 545) are present on the areas above the lateral line and below the pectoral fin. Scales on the occiput, around the eye, and on the fins are smaller and more irregularly arranged than those on the belly. The exposed parts of the interopercle and branchiostegals below the preopercle are scaled. Scaleless areas inolude the distal part of the spinous dorsal, the fin membrane between the anal spines, the pectoral and ventral fins except the outer bases, lips, the fleshy posterior rim of the opercle, and around the nostril and anus. The gular area is also scaleless except for the mid-ventral ridge, which is low but conspicuous and made up of minute scales. Scales are in regular series below the lateral line on the abdomen; above the lateral line, arrangement of scales is disturbed by scales of irregular size. Scales on the opercle are in about seven vertical rows, arranged somewhat irregularly. Each lateral line scale is accompanied by several auxiliary scales, as in all pomacanthines, it is thus difficult to count pored scales exactly. The total number of pored scales in the lateral line is more than 39 on the left side, and more than 40 plus one beyond the caudal base on the right side. Posteriorly, the lateral line is

interrupted by one or several non-pored regular (non-auxiliary) scales into three to four parts; number of pored scales is as follows with the gap being represented by a plus sign: 26+ 5 + 2 + 2 + 4 (left) and 36 + 1 + 2 + 1 + 1 beyond caudal base (right).

The first spine of the spinous dorsal fin is about three-fourths the length of the second; the first to third dorsal spines are progressively longer. The fourth to 15th spines are of nearly the same length, but apparent length decreases posteriorly because posterior spines are more deeply embedded in skin and flesh. Anterior to the first dorsal spine there is a groove along the mid-dorsal line through which the antrorse projection of the first pterygiophore is exposed. The soft portions of the dorsal and anal fins are pointed; the former extends slightly more posteriad. The eighth dorsal and ninth anal soft-rays form the posterior tips of the fins. The tip of the pelvic fin reaches the anus but not the origin of the anal fin. The caudal fin is strongly forked, with elongate upper and lower lobes. The second upper and second lower branched rays form the tips of each lobes. There are unbranched rays on both dorsal and ventral sides.

**Life colors** based on a color transparency (Kodachrome) taken at Hachijo-ko-jima at a depth of about 15 m (Fig. 13). The ground color is dorsally olivaceous and ventrally silvery. A black vertical band runs from the occiput through the posterior margin of the eye to the base of the preopercular spine. This black band broadens dorsally and extends over the eye, but a blue area is retained along the mid-dorsal line. There is another vertical band between the origin of the dorsal fin and the insertion of the pectoral fin. The area between the two black bands is silvery. The eye is surrounded by a blue ring. A horizontal orange band traverses the nostril, and another wavy orange streak lies between the snout and the first black vertical band, passing below the eye. The rest of the head, including the main preopercular spine, is blue. An oval area below the dorsal origin is pale blue. The spinous dorsal fin and anterior half of the soft-dorsal fin are orange yellow. The anal fin is mostly olivaceous. Posteroventral areas of the dorsal and anal fins are blue. The caudal peduncle and upper and lower lobes of the caudal fin are black to their filamentous tips. The pectoral fin is transparent with a blue tint. The pelvic fin and remaining portion of the caudal fin are blue.

**Color of the holotype in formalin.** The ground color is warm brown, which is paler ventrally. Black bands or streaks described in living condition remain black. Unlike in the photographed specimen, the second vertical black band scarcely extends dorsally beyond the origin of the lateral line. Yellow or orange areas in living condition are paler, and blue areas are darker than the olivaceous region. The posteromedian blue area of the caudal fin is finely mottled with dark markings.

**Ecological note.** Mr. Hajime Masuda informed us that this species inhabits on the rocky bottom at about 15 m in depth, and is rather common in Hachijo-ko-jima.

**Distribution.** The holotype is known from Miyake-jima, off the Sagami Gulf (about 34°05′N, 139°30′E). An underwater photo indicates that this species occurs also near Hachijo-ko-jima (about 33°05′N, 139°45′E).

**Etymology.** Latin adjective "fucosus", meaning painted or colored, in allusion to the markings of face.

*Holacanthus* ***watanabei***, sp. nov.
(Japanese name: hirenaga-yakko)
(Figs. 3 to 7, 11 and 12)

*Holacanthus caudovitatus*, Watanabe, 1949: 40, fig. 4 (Not of *H. caudovittatus* Gunther) (Zamami-shima, Ryukyu Is.; Japanese name "hirenaga-yakko").

*Genicanthus caudovittatus*, Matsubara, 1955: 937, (part, in key).

Holotype—ZUMT 52421, a female specimen 89 mm in standard length, brought by a fisher-

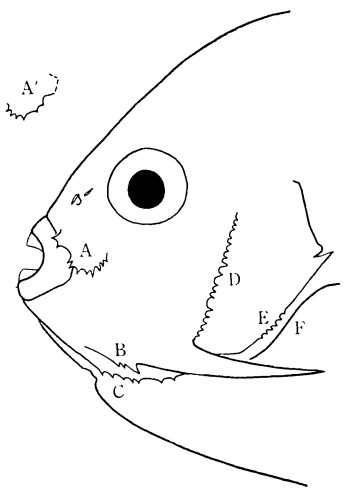


Fig. 2.

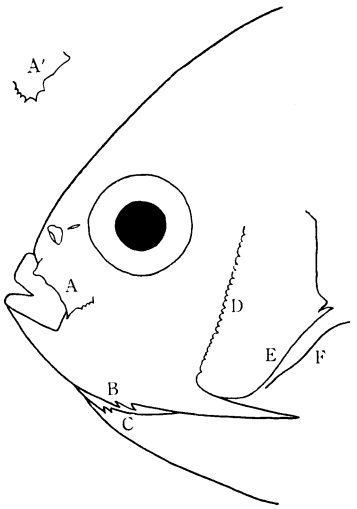


Fig. 3.

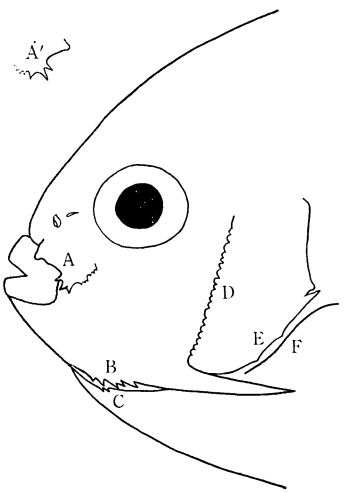


Fig. 4.

Figs. 2 to 4. Head regions of two new species of *Holacanthus* showing bony projections. Fig. 2. Holotype of *Holacanthus fucosus*, ZUMT 52422. Fig. 3. Holotype of *H. watanabei* ZUMT 52421. Fig. 4. Paratype of *H. watanabei* ZUMT 52420. A. first infraorbital; A'. that of right side; B. horizontal margin of preopercle; C. ventral margin of interopercle; D. vertical posterior margin of preopercle; E. margin of subopercle; F. exposed rim of cleithrum.

man to Mr. Hajime Masuda from Onna Beach, Okinawa-jima, Ryukyu Is. (about 26°30'N, 127°50'E), in December, 1969.
Paratype—ZUMT 52420, a male specimen 109 mm in standard length, collection data same as ZUMT 52421.

Above two specimens, collected simulaneously from the same locality, are different in color pattern, but scarcely different in other characters.

(Specimen no. W. 66). A specimen which belongs to this new species was first found and identified as *Holacanthus caudovitatus* (sic.) by Watanabe (1949). The specimen was unfortunately lost in the confusion at the end of the World War II (personal communication from Dr. Watanabe). This specimen was 151.2 mm in total length (about 100 mm in standard length) and was collected from Zamami-shima, Ryukyu Is., 60 km from the type locality.

## Diagnosis

A slender species of *Holacanthus* with elongate upper and lower lobes of the caudal fin. This species is closely allied to *H. caudovittatus* and *H. macclesfieldiensis* from which it can be distinguished by the shape of the body. The body depth is less than 50% of the standard length in the present species, whereas it is more than 50% in *H. caudovittatus* and *H. macclesfieldiensis*. Markings of known three specimens of this species differ from each other, but agree in the presence of dark streaks on the upper and lower lobes of the caudal fin, and on the distal halves of the dorsal and anal fins.

## Description

In the following counts and measurements, those of the holotype appear first; those of the paratype follow when the values are different.

D. XV, 15; A. III, 17; $P_1$. 16 (1st non-segmented, 2nd and last unbranched); $P_2$. I, 5; caudal branched rays 8 + 7. Pored scales in lateral line ca. 42, ca. 41; scales above lateral line 5, 6; scales between anal origin and lateral line 23; number of diagonal scale rows tilting posteriorad ventrally, from upper

end of opercle to caudal base ca. 31; number of those tilting forward ventrally ca. 45, ca. 46. Branchiostegals 6; gill rakers, 12 (lower) + 1 (middle) + 2 (upper), 12 + 1 + 1; number of vertebrae 10 + 14 (urostylar vertebra counted as 1). Predorsal bone 1.

Watanabe (1949) noted on his specimen "D. XV–16, A. III–17, scales in lateral line 45 + 11". His specimen had one more dorsal soft-rays than the types. Since it is hardly possible that there are more than ten pored scales beyond the caudal base in any of the pomacanthines, we must assume his count of lateral line scales to be erroneous.

Measurements expressed in hundredths of standard length (89, 109 mm): depth of body at base of 6th dorsal spine 48.3, 47.2; head length 28.1, 27.5; snout length 9.0, 9.6; horizontal diameter of orbit 9.6, 8.7; interorbital width 9.6, 9.6; depth of caudal peduncle 12.9, 12.8; snout to dorsal origin 35.4, 33.9; snout to anal origin 65.1, 63.3; snout to pectoral insertion 29.2, 27.1; snout to pelvic insertion 37.6, 35.8; dorsal base 69.1, 67.0; length of 4th dorsal spine 11.8, 10.1; anal base 33.7, 34.9; length of 3rd (longest) anal spine 15.7, 13.8; length of pectoral fin 24.2, 22.5; length of pelvic fin 26.4, 26.1; length of pelvic spine 19.1, 14.7.

The teeth on both jaws are almost hidden by fleshy lips. There is a distinct notch above the upper lip. The eye diameter is smaller than interorbital width. The first infraorbital (preorbital) has a blunt spine at the anterior end, three pointed spines anteroventrally, and four or more minute ones posterior to these. The preopercle has a stout spine at the angle; its posterior tip does not reach the insertion of the pectoral fin, there are five (left) or four (right) spines on the ventral horizontal margin and more than 20 minute spines on the posterior vertical margin. The interopercle has two or three spines anteriorly. Scales on the opercles are arranged somewhat irregularly in about six vertical rows. The subopercle is sparsely supplied with low bony processes (Figs. 3 and 4). The posterior margins of the posttemporal and supracleithrum are serrated.

Scales are strongly ctenoid; auxiliary scales are present on the areas above the lateral line and below the pectoral fin. Scales on the occiput, around the eye, and on the fins are small. The lateral line terminates at the caudal fin base.

The dorsal and anal fins are pointed posteriorly. The tips of the ninth dorsal and tenth anal soft-rays form the posterior points of the fins. The tip of the pelvic fin extends beyond the anus, but not to the anal origin. The caudal fin is strongly forked with extended upper and lower lobes.

**Life colors of the holotype** (Fig. 12). The dorsal side of the body is olivaceous, and the ventral side is silvery with a blue tint. Four black markings are present from the snout to occiput, each edged with light blue; the third extends to the eye. The fleshy flap of the opercle is black. A black blotch is at the insertion of the pectoral fin. The anterior three dorsal spines are olivaceous; behind the third spine, about distal one-third of the dorsal fin is black. The distal margin of the anal, and elongate upper and lower lobes of the caudal fin are black. Paired fins and median part of the caudal fin are transparent.

**Life colors of the paratype** (Fig. 11). The dorsal part of the body is violet blue, becoming silvery ventrally. The spinous dorsal and the distal half of the soft dorsal are black; the black part extends anteriorly in mid-dorsal line to the occiput reaching the vertical of the hinder margin of the eye. This black horizontal streak is ventrally margined by light blue. A black blotch exists at the insertion of the pectoral fin. The color of the fleshy flap of the opercle is light brown. Nine black horizontal bands are present on the side of the body behind the head and the insertion of the pectoral fin. The third, fourth, and fifth bands posteriorly anastomose with each other. The sixth is the longest and reaches the caudal base. The seventh and eighth enter the anal fin. The ninth is in-

distinct and continuous with a broad black band which margins the distal edge of the anal fin. A black marking on the anal fin below the eighth band is anteriorly continuous with the distal streak of the anal fin. A black bar is on the posterior part of the anal fin between those which are continuous with the seventh and eighth bars of the side of body. The extension of the second black bar is represented by a brilliant yellow streak. Upper and lower lobes of the caudal fin are dark blue.

**Variations in markings of *Holacanthus watanabei*** (Figs. 5 to 7)

**Pattern A:** Represented by a specimen reported by Watanabe (1949) from Zamami-shima, Ryukyu Is. (Fig. 5).

The caudal fin is marked by a black band along the upper and lower margins. The dorsal and anal fins are black on the distal one-third. The head becomes darker anteriorly. The posterior margin of the opercle is black (after Watanabe, 1949).

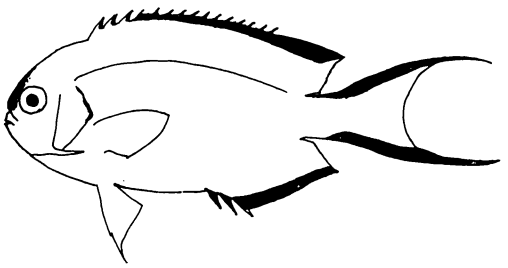

Fig. 5.

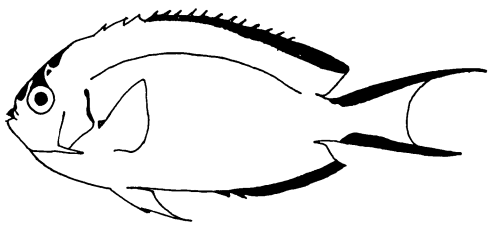

Fig. 6.

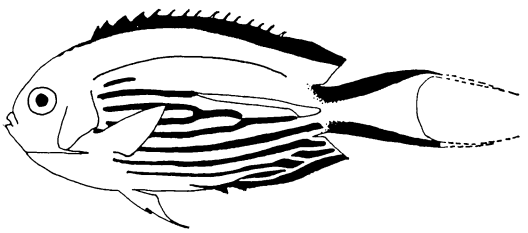

Fig. 7.

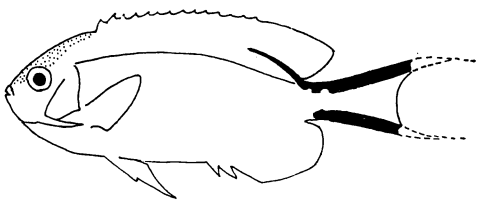

Fig. 8.

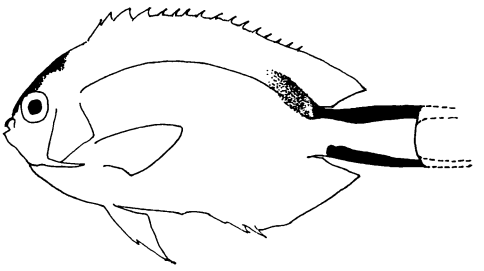

Fig. 9.

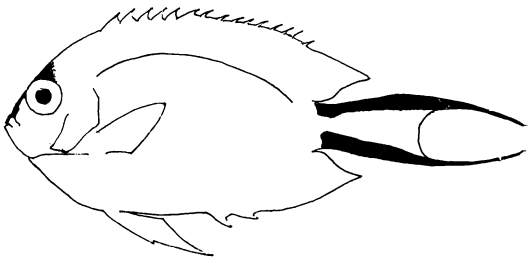

Fig. 10.

Figs. 5 to 10. Long-tailed pomacanthines showing general body shape and markings. Fig. 5. A specimen collected from Zamami-shima, Ryukyu Is. (after Watanabe, 1949). Fig. 6. Holotype of *Holacanthus watanabei*, n. sp. Fig. 7. Paratype of *H. watanabei*. Fig. 8. Holotype of *H. caudovittatus* (after Fraser-Brunner, 1933). Fig. 9. Holotype of *H. caudibicolor* (based on a photograph sent by Dr. Bauchot of MNHN, Paris). Fig. 10. *H. macclesfieldiensis* (after Chan, 1956 and a photograph of the paratype sent by Mr. Burgess of Univ. Hawaii).

**Pattern B:** Represented by the holotype, from Okinawa-jima, Ryukyu Is. (Fig. 6).

This pattern is similar to the pattern A, differing in the prescence of maculations on the head, which are margined blue when alive, and a black spot at the axil of the pectoral fin. The distal black band of the dorsal fin does not extend to the anterior three spines.

**Pattern C:** Represented by the paratype, from Okinawa-jima, Ryukyu Is. (Fig. 7).

The markings of the caudal fin are similar to the patterns B and C, but these two bands are blue when alive. A black band along the distal margin of the dorsal fin is wider, and the spinous dorsal is almost entirely black. This band extends anteriorly along the mid-dorsal line to the occiput. A black band along the distal margin of the anal fin is present. The head is without markings. The posterior margin of the opercle is scarcely darker. A black spot is at the axil of the pectoral fin. Nine black horizontal streaks are present on the side of the body below the lateral line, and four bands are on the proximal part of the anal fin. A white (yellow when alive) horizontal band is at the posterior part of the side of the body.

### Variations other than color pattern

The holotype and Watanabe's specimen have the larger eye and longer anal spine than the paratype. The mid-dorsal line just in front of the dorsal origin is cracked and the antrorse spine of the first pterygiophore can be seen through the crack in the holotype, but it is not the case in the paratype. The presence or absence of the crack can be regarded as the trivial character, because in the specimens of *H. lamarck* this crack is present in some and absent in others. Watanabe's specimen differs from the types in having one more dorsal soft ray. Judging from his figure, the snout is blunter than the types.

**Distribution.** The holotype and paratype are known from Okinawa-jima, Ryukyu Is. (about 26°30′N, 127°50′E). Watanabe (1949) reported another specimen from Zamami-shima, Ryukyu Is. (about 26°15′N, 127°20′E).

**Etymology.** Species name is dedicated to Dr. Masao Watanabe who first reported this species under the name *Holacanthus caudovitatus*.

### Relationships

Fraser-Brunner (1933) synonymized *H. caudovittatus* Günther (1860), *H. caudibicolor* Sauvage (1891), and *H. semicinctus* Waite (1900) with *H. melanospilos* Bleeker (1857).*

Weber and Beaufort (1936) followed Fraser-Brunner (1933), but Watanabe (1949) stressed that *H. melanospilos* and *H. caudovittatus* are different from each other. Smith (1955) also stated that *H. caudovittatus* and *H. semicinctus* should be kept separate from *H. melanospilos*. Although overestimation of the difference of markings of the body may be dangerous for the long-tailed pomacanthines (Fraser-Brunner, 1933), we concur with the opinion of Watanabe and Smith, because *H. melanospilos* has longer teeth on both jaws, and stouter spines on the face and shoulder bones. Fraser-Brunner (1933, fig. 17) showed a pointed antrorse spine at the anterior rim of the first infraorbital in *Genicanthus melanospilus* var. *caudovittatus*, actually the holotype of *H. caudovittatus* (BMNH 1960. 6. 22. 2) has a blunt antrorse spine (personal communication from Dr. G. Palmer). The spine of the holotype of *H. caudibicolor* is also blunt.

The holotype of *H. caudovittatus* is, according to the original description and Fraser-Brunner's figure of the type (1933: 575), very slender (Fig. 8). Upon examining photos and a radiograph of the holotype of *H. caudibicolor* (A. 66, MNHN, Paris), we found this specimen belongs to a rather deep-bodied form (Fig. 9). Smith (1955) illustrated *H. caudovittatus* from Pinda, East Africa, which is also deep-bodied.

* *Holacanthus melanospilos* is original and correct spelling (International Code, London, Art. 32–a–ii). Almost all authors except Günther (1860) used the spelling *melanospilus*.

Since the holotype of *H. caudovittatus* is a stuffed specimen, its proportional data are unreliable. The original localities of *H. caudibicolor* and *H. caudovittatus* are both Mauritius, andcolor pattern of two nominal species are similar in details. *H. caudovittatus* and *H. caudibicolor* are possibly conspecific.*

*H. macclesfieldiensis* Chan (1956) is similar to *H. caudovittatus* in general body shape and color pattern (Fig. 10).

As pointed out by Watanabe (1949), the present species differs from *H. caudovittatus*, *H. caudibicolor*, and *H. macclesfieldiensis* in the dorsal profile of the head. The present species tends to have fewer number of the dorsal and anal soft-rays than three nominal species in question (15 or 16 dorsal and 17 anal soft-rays in *H. watanabei*, 16 to 18 dorsal and 18 to 20 anal in three species) (Günther, 1860; Sauvage, 1891; Smith, 1955; Chan, 1956). The general body shapes and markings are compared in Figs. 5 to 10, which will justify the erection of the present new species.

## Acknowledgments

We thank to Mr. Takahiro Isogai who collected and offered us a specimen of *H. fucosus*, and to Mr. Hajime Masuda who presented specimens, informations, and color photographs of *H. fucosus* and *H. watanabei*. Figure 1 is prepared by Mr. Isao Takamoto. Dr. M. L. Bauchot of Museum National d'Histoire Naturelle, Paris, kindly sent us photographs and radiograph of the holotype of *H. caudibicolor*. Dr. G. Palmer of the British Museum (Natural History), London, kindly examined the holotype of *H. caudovittatus* upon our request. Dr. Teruya Uyeno of Nippon Luther Shingaku Daigaku, Tokyo, assisted us in obtaining the copies of the literature and critically read the manuscript. Dr. Masao Watanabe of the Waseda University offered us valuable suggestion. Mr. Warren E. Burgess of University of Hawaii sent us a photograph of a paratype of *H. macclesfieldiensis*.

* The priority of *H. caudovittatus* Günther (1860) over *H. caudibicolor* is problematical. The original author of *H. caudibicolor* has generally been ascribed to Sauvage (1891), but he cited "Liénard. 1832. Mem. Soc. Hist. de Maurice". We have not access to this paper. If Liénard's description of *H. caudibicolor* is actually present and fulfill the requirements of International Code, it is prior to that of Günther (1860).

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**三宅島および沖縄本島から得られたキンチャクダイ類の二新種**　　**安田富士郎・富永義昭**

伊豆三宅島産の標本にもとづいて，キンチャクダイ類の新種クマドリヤッコ (*Holacanthus fucosus*) を記載した．この種類は八丈小島にも分布するという．

渡部がヒレナガヤッコの和名で，琉球列島座間味島から報告した個体と同一種類と思われる2個体が，沖縄本島で得られた．この種類は *H. caudovittatus* と異なるので，新種 *H. watanabei* として記載した．ヒレナガヤッコの斑紋の変異についても併せて言及し，近縁種との関係を論じた．

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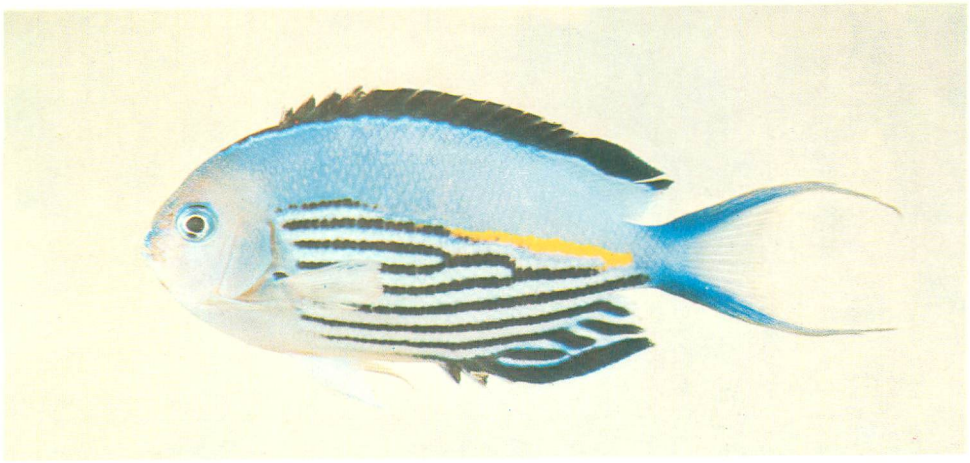

Fig. 11.

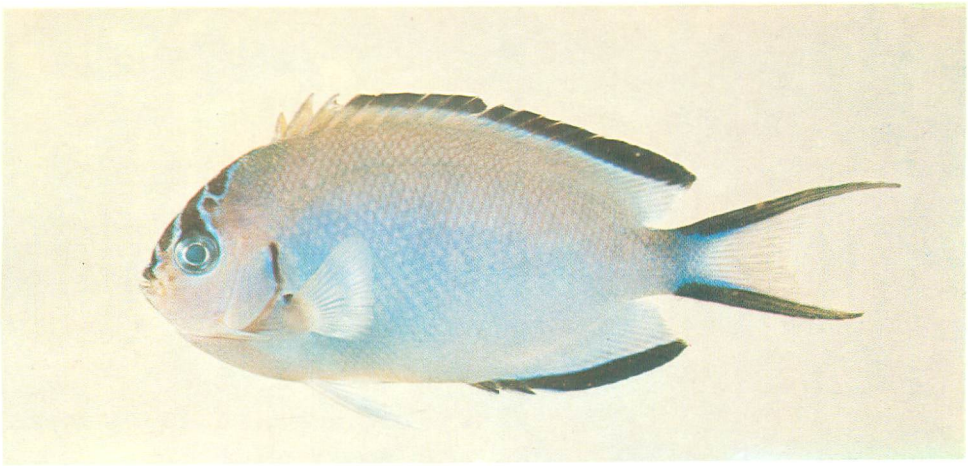

Fig. 12.

Fig. 13.

Fig. 11. Paratype of *Holacanthus watanabei*, ZUMT 52420, collected from Okinawa-jima, Ryukyu Is.

Fig. 12. Holotype of *H. watanabei*, ZUMT 52421, collected from Okinawa-jima, Ryukyu Is.

Fig. 13. Underwater photograph of *H. fucosus* taken by Mr. Hajime Masuda at Hachijo-ko-jima.