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Description of a New Damselfish, *Chromis miyakeensis*, from Miyake Island, Japan

Jack T. Moyer and Hitoshi Ida

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Abstract *Chromis miyakeensis* is described as a new species in the family Pomacentridae. Although this fish is rather common in the waters of Miyake Island and locally along the Izu Peninsula, it has previously been mistaken for *Chromis notata*, from which it differs in having pointed soft dorsal and anal fins instead of rounded fins as in *C. notata*, a deeper body (50% of standard length), and by blue margins to the fins and a blue tinge to the anterior ventral surface, all lacking in *C. notata*.

Introduction

The distinction between *Chromis miyakeensis* and *C. notata* Temminck et Schlegel* first became apparent in August, 1974, when Moyer collected two distinct forms of *C.* "*notata*" from a large aggregate of juvenile *Chromis* spp. in Igaya Bay, Miyake Island (34°05′N, 124°10′E). Careful comparison of these and other Miyake specimens with *Chromis notata*, including a paratype of the species, and with other members of the genus from the western Pacific, showed that the common Miyake species is hitherto undescribed.

Materials and methods

All the materials used in this study were collected by us using screen and hand nets at depths of 14～17 m in the vicinity of underwater lava cliffs in Igaya Bay and Sabigahama on the island of Miyake.

Vertebral counts are based on radiographs. Caudal vertebrae are defined as those having closed haemal arches and thus forming haemal spines.

Chromis miyakeensis, sp. nov.
(Figs. 1～4)

New Japanese name: Miyake-suzumedai

Holotype: Zoological Department, University Museum, The University of Tokyo (ZUMT) 53957 130.0 mm in standard length, collected at a depth of 14 m, Nov. 17, 1973, Igaya Bay.

Paratypes: Bernice P. Bishop Museum (BPBM) 19703 123.6 mm S.L., Dec. 31, 1974, Igaya; BPBM 19704, 97.5 mm S.L., Dec. 20, 1973, Igaya; School of Fishery Sciences, Kitasato University, (FSKU) 751005, 74.1 mm S.L., Oct. 5, 1975, Igaya; FSKU 751013, 70.0 mm S.L., Oct. 13, 1975, Izu Peninsula; BPBM 19705, 60.8 mm S.L., Sabigahama; ZUMT 53958, 46.2 mm, S.L., Dec. 12, 1974, Igaya; ZUMT 53959, 46.0 mm S.L., Dec. 12, 1974, Igaya.

Diagnosis

A species of the genus *Chromis*, distinguishable from *Chromis notata*, the most similar form in the genus, by the following characteristics: pointed soft dorsal and anal fins instead of rounded fins as in *C. notata* (an important distinguishing character in this genus), a deeper body (50% of standard length), and by blue margins to the fins and a blue tinge to the anterior ventral surface, all lacking in *C. notata*.

Description

Holotype. Dorsal rays XIII, 14; anal rays II, 11; branched caudal rays 7+6; pectoral rays ii, 16, i; lateral line scales 17; scales above lateral line and those below lateral line 4/11; gill rakers 7+1+19; vertebrae 11+15=26. Body depth, 50.0% of S.L.; head length, 30.0%; eye diameter, 8.1%; caudal peduncle depth, 16.2%; length of 2nd anal spine, 17.7%; length of longest dorsal spine, 15.8%.

Paratypes. Dorsal rays XII～XIII, 12～13; anal rays, II, 10～12; branched caudal rays invariably 7+6=13; pectoral rays ii, 15, i～ii; lateral line scales 16～19; scales above lateral

* *Chromis* Cuvier, 1814 is feminine in gender (Emery, 1975).

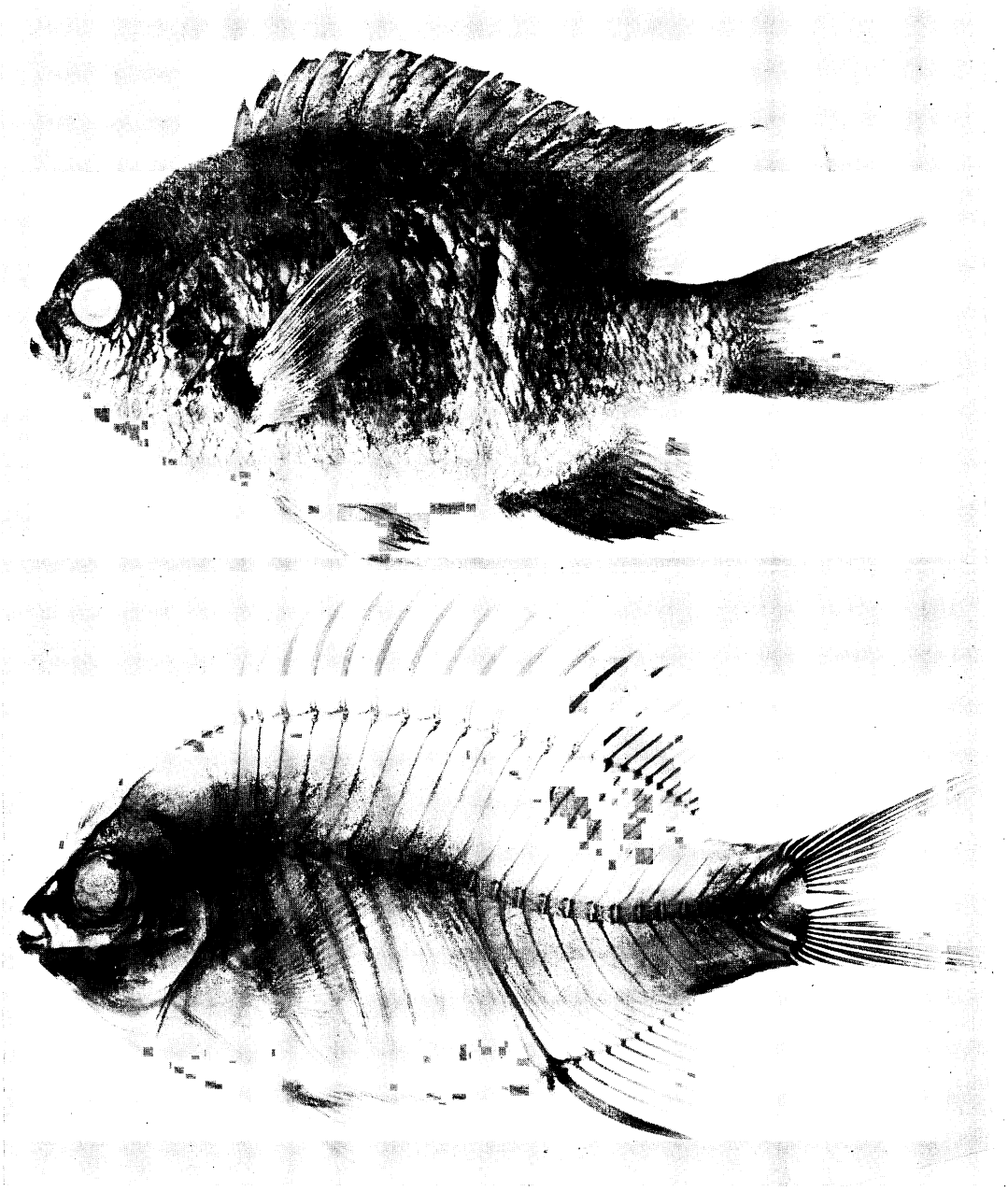

Fig. 1. Holotype of *Chromis miyakeensis*, sp. nov., 130mm in st. l., ZUMT 53957. Collected at Miyake Island, Japan.

line and those below lateral line invariably 4/11; gill rakers 7～9+1+18～21; vertebrae invariably 11+15=26. Most counts and proportional dimensions are listed in Table 1.

The body is rather deep and slightly increases with growth, reaching just half of the standard length in adults. The body is compressed. Head length is about one third of the standard length, slightly shortening proportionally with growth (Fig. 2). Snout length is less than 10%

Table 1. Measurements and counts of type specimens of *Chromis miyakeensis*. Measurements are expressed in percentages of standard length.

	Holotype	Paratypes						
	ZUMT 53957	BPBM 19703	BPBM 19704	FSKU 751005	FSKU 751013	BPBM 19705	ZUMT 53958	ZUMT 53959
Standard length	130.0 mm	123.6 mm	97.5 mm	74.1 mm	70.0 mm	60.8 mm	46.2 mm	46.0 mm
Body depth	50.0%	50.2%	51.3%	47.8%	49.3%	47.6%	46.5%	46.5%
Head length	30.0	29.1	32.3	32.4	32.1	32.2	34.8	34.8
Snout length	8.5	8.1	9.7	8.1	8.1	8.4	9.1	9.1
Eye diameter	8.1	9.0	9.2	11.4	10.9	11.2	12.6	12.8
Interorbital width	10.1	10.9	12.1	11.3	11.1	11.0	11.9	11.5
Caudal peduncle depth	16.2	14.9	15.1	15.5	16.3	15.5	14.7	14.8
2nd anal spine length	17.7	16.6	19.0	21.1	21.3	16.9	21.6	19.6
Longest dorsal spine length	15.8	16.6	16.9	19.8	20.7	16.8	19.5	18.5
Pectoral fin length	30.2	31.7	34.7	34.4	34.3	32.6	33.8	33.9
Pelvic fin length	30.8	28.3	33.3	33.7	34.2	32.6	34.6	37.0
Basal length of dorsal fin	62.3	60.0	61.2	61.2	61.4	59.1	59.5	57.6
Basal length of anal fin	22.7	21.8	21.1	22.3	22.9	22.3	21.2	22.2
Snout to dorsal origin	38.1	39.0	39.8	38.3	39.3	39.8	40.0	40.9
Dorsal fin	XIII, 14	XII, 12	XII, 13	XIII, 13	XIII, 12	XIII, 13	XIII, 13	XIII, 13
Anal fin	II, 11	II, 11	II, 11	II, 11	II, 10	II, 12	II, 11	II 11
Pectoral fin	ii, 16, i	ii, 15, i	ii, 15, ii	ii, 15, i	ii, 15, ii	ii, 15, i	ii, 15, ii	ii, 15, ii
Branched caudal rays	7+6	7+6	7+6	7+6	7+6	7+6	7+6	7+6
Lateral line scales	17	17	18	17	17	19	16	18
L. transverse scale rows	4/11	4/11	4/11	4/11	4/11	4/11	4/11	4/11
Gillrakers	7+1+19	7+1+18	7+1+19	9+1+19	9+1+21	8+1+18	8+1+20	8+1+19
Vertebrae	11+15	11+15	11+15	11+15	11+15	11+15	11+15	11+15

of S.L., showing no marked changes with growth. Eye diameter markedly changes with growth from about 13% of S.L. in young to 8% in adults. Interorbital space is evenly convex, about 10% of S.L. The least caudal penduncle depth is about 15% of S.L. with no marked changes with growth. The longest dorsal spine (3rd to 7th) shortens proportionally with growth from about 20% of S.L. in young to about 16% in adults. The 2nd anal spine is slightly longer than the longest dorsal spine in all stages of life, shortening proportionally with growth from more than 20% of S.L. in young to about 17% in adults. Pectoral and pelvic fins are almost the same in length, varying from about 1/3 of S.L. in young to about 30% in adults. The tip of the pelvic fin is extended into a filament which reaches the base of the second anal spine in young but shortens to scarcely reach the anal fin in adults.

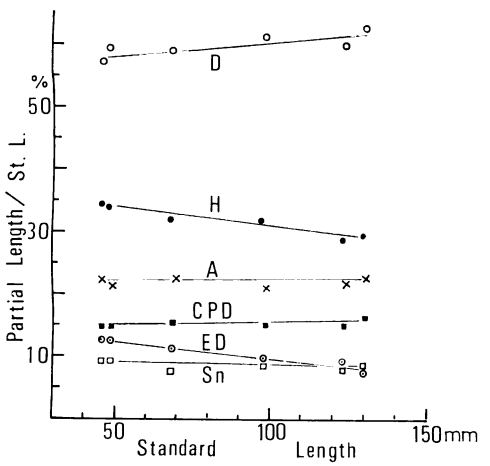

Fig. 2. Change with growth of some proportional dimensions of *Chromis miyakeensis*. A: basal length of anal fin; CPD: least caudal peduncle depth; D: basal length of dorsal fin; ED: eye diameter; H: head length; Sn: snout length.

The mouth is terminal, small, oblique, and reaching below the anterior margin of the eye in young, but scarcely reaching the eye in adults. Teeth are conical, arranged in several rows in the anterior half of the premaxillary and a single row posteriorly. There are about

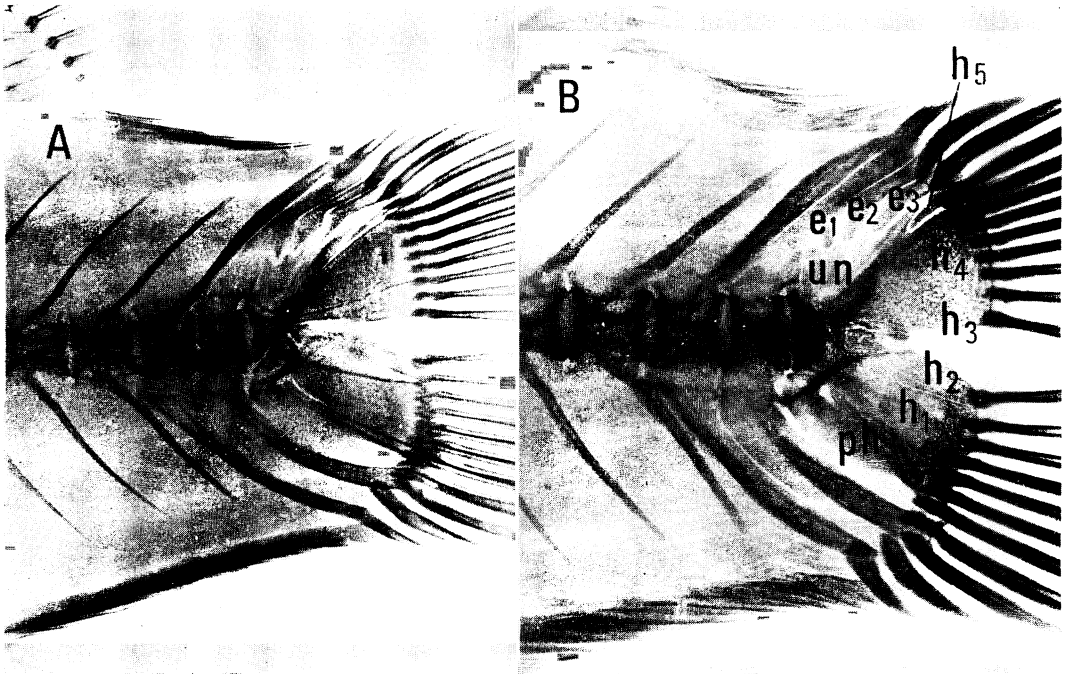

Fig. 3. Caudel skeleton of *Chromis miyakeensis*. A: smallest paratype, ZUMT 53959, 46.0 mm S.L; B: holotype ZUMT 53957, 130 mm. Note the fusion of parhypural with hypural$_1$, and of hypural$_{3,4}$, in the adult. $e_1 \sim e_3$: epural; $h_1 \sim h_5$: hypural; ph: parhypural; un: uroneural.

25 teeth in the outer row. Teeth on the dentary are smaller than in the upper jaw and number about 22.

The suborbital depth is narrow, amounting to less than one-third of the eye diameter. The edge of the preorbital is smooth. The edge of the first suborbital is slightly free and those of the following suborbitals are completely covered with scales.

Scales are ctenoid. The body is completely covered with scales except for the narrow zone around the nasal opening and lips, as shown in Fig. 4. Suborbital scales are in a single row. Those on the preopercle number three rows anteriorly and four posteriorly. There are four rows on the opercle, with much smaller scales in two rows at the anterior of the opercle. All fins are scaled basally, especially heavily on the dorsal and anal fins.

The lateral line tube ends below the last dorsal spine.

Osteological features: Figs. 1 and 3.

There are three predorsals. The second and third dorsal spine pterygiophores are situated between the neural spines of the third and fourth vertebrae. With the exception of these two, pterygiophores of the spinous dorsal and

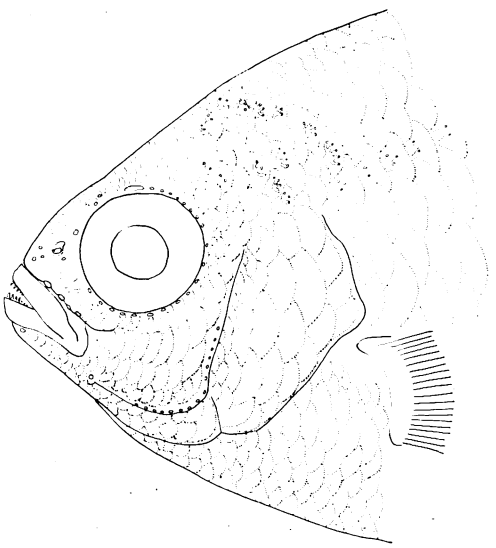

Fig. 4. Head of *Chromis miyakeensis*, smallest paratype, ZUMT 53959, 46.0 mm in S.L. Showing state of squamation, suborbital margin, preopercleedge, and lateralis systems.

neural spines correspond 1 to 1, while those of the soft dorsal and neural spines correspond 2 to 1. There are three epurals (Fig. 3A, B). Hypural plates number five. The second and third hypurals are about half of the first and fourth ones in size, and the fifth hypural is slit and much smaller than the smallest (third) epural. The parhypural and haemal spines of the penultimate and antepenultimate vertebrae are autogeneous, i.e., separate from the centra or urostyle, as usual in perciforms (Gosline, 1961). But in adults, the last two haemal spines of the caudal skeleton are fused with their centra, the parhypural is fused with the first (lowest) hypural plate distally, and the third hypural is completely fused with the fourth hypural. Thus, the urostyle, uroneural, and the third and fourth hypurals form a single plate (Fig. 3).

Color when alive:

The body color is dark brown to grey, and areas below the pectoral fin are silvery blue. Dorsal and anal fins are the same color as the body except for the crescent light to hyalin parts posterior to the longest (5th) dorsal and anal rays. Both the upper and lower margins of the caudal fin are dark and the center of the forked part is light, just like the posterior soft part of the dorsal and anal fins. Pectoral and pelvic fins are light colored. A large triangular black spot is present on the pectoral base, extending to the inner axil and forming a large round spot. The upper base of the pectoral is thus totally black and rimmed dorsally by a blue semicircular line. A white spot, about half of the eye diameter, is present on the upper anterior caudal peduncle, just below the rear base of the soft dorsal. In younger fish, the spot at the pectoral base and axil is proportionally smaller than that of adults, and is situated near the upper half of the pectoral base. The center of each scale on the lower body has a blue tinge, especially those of the preopercle and opercle, which appear larger than on scales posteriorly. There are about eight large blue spots on the opercular region.

In the sea, the margins of the dorsal, caudal, anal, and ventral fins are blue.

Color after preservation:

The bluish tinge of the lower body and blue margins of most fins disappear gradually after preservation. The white spot on the anterior caudal peduncle disappears immediately after preservation, but in rare occasions, especially in younger specimens, the spot remains as a faint light spot for more than six months. The dark membranes of the dorsal and anal fins remain after preservation.

Remarks

Although this species is not rare in the waters of Miyake Island and some localities along the Izu Peninsula, the difference between it and *Chromis notata* has not been recognized previously, probably because of their extreme similarities in color and the presence of a white spot on the caudal peduncle. For example, Masuda and Abe (1972) show *C. miyakeensis* under the name *C. notata*. The present species is distinguishable from *C. notata* by the pointed soft dorsal and anal fins together with the deeper body (50% of S.L.). Characters distinguishing *C. miyakeensis* from other members of the genus *Chromis* presently known from the western Pacific Ocean are shown with proposed groupings as follows:

I. *Chromis margaritifer* group: *C. margaritifer* Fowler, *C. atripes* Fowler et Bean, *C. agilis* Smith. In these species, the second of the upper and fifth of the lower caudal rays are extended into long filaments (Randall and Swerdloff, 1973). In the new species, tips of the caudal fin are pointed, but never extended into filaments.

II. *Chromis xanthochir* group: *Chromis xanthochir* (Bleeker), *C. xanthura* (Bleeker), *C. weberi* Fowler et Bean. In these species, the body depth is less than 45% of S.L. in adults, and two distinct vertical dark bands are present on the posterior margin of the preopercle and on the upper margin of the opercle. *C.miyakeensis* has no such dark bands in the opercular region and has adeeper body (50% of S.L.).

III. *Chromis caerulea* group: *Chromis caerurulea* (Cuvier), *C. ternatensis* (Bleeker), *C. vanderbilti* Fowler, *C. lineata* (Fowler et Bean). In these species, the first suborbital margin is not free, and the second anal spine is shorter than the least caudal peduncle depth (Randall and Swerdloff, 1973; Fowler and Bean, 1928). In the new species, the margin of the first suborbital is free, and the second anal spine is much longer than the least caudal peduncle depth.

IV. *Chromis cinerascens* group: *Chromis cinerascens* (Cuvier), *C. analis* (Cuvier), *C. chrysura* Bliss, *C. mirationis* Tanaka, *C. albomaculata* Kamohara. In these species, the margins of the soft dorsal and anal fins are rounded (Bleeker, 1877: pls. 401～405; Kamohara, 1960), while in the new species both of these fins are pointed.

V. *Chromis notata* group: *Chromis notata*, *C. azurelineata* Fowler et Bean, *C. elerae* Fowler et Bean, *C. flavomaculata* Kamohara, *C. scotochiliptera* Fowler. In these species, a light spot is present on the upper anterior caudal peduncle, similar to the new species. *C. miyakeensis* is distinguishable from *C. flavomaculata* by the presence of a pointed anal fin instead of a rounded one as in the latter species; from *C. azurelineata* by the absence of a blue line at the center of each scale; from *C. notata* by the presence of blue margins to the fins and a pectoral spot and by pointed soft dorsal and anal fins, in contrast to the less pointed fins of *C. notata*; from *C. elerae* by a much larger pectoral spot; and from *C. scotochiliptera* by a greater number of dorsal rays (12～14 in *C. miyakeensis* compared to 10～11 in *C. scotochiliptera*).

VI. Other species. *C. miyakeensis* differs from *C. retrofasciata* Weber by its comparatively large size and by the absence of a dark vertical band on the anterior caudal peduncle; from *C. lepidolepis* Bleeker by the red-brown iris compared to the golden iris of that species and by the absence of the contrasting black tips to the caudal fin present in *C. lepidolepis* (Fowler and Bean, 1928; Weber, 1913).

Distribution

Chromis miyakeensis is found in the waters of Miyake Island, where it is rather common, and along the Izu Peninsula. Moyer has observed it at Chichijima, Bonin Islands. With the exception of these records, the distribution of this species remains unknown at present.

Ecological comments will be included in our next paper.

Acknowledgments

We wish to thank Dr. M. Boeseman, Rijksmuseum van Natuurlijke Histoire, Leiden, for kindly lending us a paratype of *Chromis notata*. Mr. Hiroshi Watanabe, former head of the Fishery Division, Tokyo Prefectural Government, and Mr. Noboru Hamada, head of the Fishery Division, Miyake Branch, Tokyo Prefectural Government, are thanked for issuing collecting permits to us. Kathy Meyer and John Shepard of the Tanaka Memorial Biological Station helped us in many ways. To them we express our gratitude.

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(JTM: Tatsuo Tanaka Memorial Biological Station, Toga Farm, Ako, Miyake-jima, Tokyo 100–12, Japan; HI: School of Fishery Sciences, Kitasato University, Sanriku-cho, Kesen-gun, Iwate-ken, 022–01, Japan)

スズメダイ属の1新種ミヤケスズメダイの記載

Jack T. Moyer・井田 斉

三宅島周辺および伊豆半島の浅海より得られたスズメダイ属で西部太平洋産の本属のいずれの既知種にも該当しない標本を新種ミヤケスズメダイ *Chromis miyakeensis* として記載した．本種は軟条背鰭終部付近に白斑を有する事（但し死後容易に消失する），体型，体色などでスズメダイ *C. notata*，キホシスズメダイ *C. flavomaculata* などに類似するが，背鰭および臀鰭の軟条中部が延長し尖り時には糸状に延びる事および成魚では体高は体長の 1/2 以上と高い事などで本属の既知種と識別される．

(Moyer:100–12 東京都三宅島阿古　富賀農園　田中達男記念生物実験所；井田:022–01 岩手県気仙郡三陸町　北里大学水産学部)