

Redescription of a Rare Callionymid Fish, *Paradiplogrammus corallinus*, from Hawaii and Japan

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Abstract *Paradiplogrammus corallinus* (Gilbert) has been represented by only two female specimens collected from the Hawaiian Islands. The species is redescribed on the basis of male and female specimens from the Hawaiian Islands and Hachijo-jima, Izu Islands, Japan. This species is unique among *Paradiplogrammus* in having a pair of supraorbital cirri.

Paradiplogrammus corallinus has been recorded only from the Hawaiian Islands. Gilbert (1905) described the species on the basis of a single female specimen from Avau Channel between Maui and Lanai Islands. Fricke (1983) described a second female specimen from Oahu.

While examining the paratypes of *Minysynchiropus kiyoe* (Fricke et Zaiser) at the Department of Zoology, University Museum, University of Tokyo (ZUMT), I found four specimens which do not agree with the holotype and paratypes of that species (Fricke and Zaiser, 1983, fig. 1A, C). The four specimens (ZUMT 42861–42863, 42881) included 3 males and a female from Hachijo-jima, Izu Islands, Japan. The female agreed well with the holotype of *P. corallinus* (Gilbert) (female). The three male specimens agreed with the female in many characters except for those which are secondary sexual ones. In addition to these specimens, a male specimen recently collected from the Hawaiian Islands was sent to me from Bernice P. Bishop Museum (BPBM). It agreed with the three male ZUMT specimens. I therefore identified the four ZUMT paratypes of *M. kiyoe* and the male BPBM specimen from the Hawaii as *P. collarinus*. Because *P. corallinus* has been poorly described by previous authors on the basis of female specimens only, a detailed redescription is given below, including male and female characters and the unique paired supraorbital cirri. This species is here recorded for the first time from Japan.

Counting and measuring methods follow Nakabo (1982), and counts and proportional measurements are shown in Table 1. Vertebrae were counted by soft X-ray negatives.

Paradiplogrammus corallinus (Gilbert) (New Japanese name: Sango-hanabi-numeri) (Figs. 1–3)

Callionymus corallinus Gilbert, 1905: 649, fig. 251 (type locality, Avau Channel between Maui and Lanai Islands, Hawaiian Islands, 58.5–68.4 fms). Jordan and Seale, 1906: 415 (after Gilbert). Jordan and Jordan, 1922: 80 (after Gilbert). Fowler, 1928: 423 (after Gilbert). Fowler, 1938: 299 (after Gilbert).

Callionymus (*Callionymus*) *corallinus*: Fricke, 1983: 742–745, fig. A1 (Oahu, Hawaiian Islands).

Paradiplogrammus corallinus: Nakabo, 1982: 80 (listed).

Synchiropus (*Synchiropus*) *kiyoe* Fricke and Zaiser, 1983 (in part): 122–127 (Hachijo-jima, Japan).

Material examined. **Hawaii:** USNM (National Museum of Natural History, Washington, D.C.) 51581 (holotype of *P. corallinus*), a female, 23.0 mm SL, Avau Channel between Maui and Lanai Islands, depth 58.5–68.4 m, Albatross St. 3876, 14th Apr. 1902. BPBM 22584 (described by Fricke, 1983), a female, 28.4 mm SL, sand and rubble, depth 27.4 m, Makua, Oahu, 30 Jan. 1979, maintained in aquarium until death, coll. by E. H. Chave. BPBM 28624, a female, 13.0 mm SL, depth 121.9 m, off Molokai, Penguin Bank, Hawaiian Islands, 17 Sep. 1982, coll. by C. Agegian. BPBM 34538, a male, 27.6 mm SL, algal bottom, depth 30.5 m, off Kanaio, Maui, 8 Feb. 1989, coll. by M. Severns. **Japan:** ZUMT 42861–42863, 42881 (paratypes of *Synchiropus kiyoe*), 3 males and a female, 15.3–24.7 mm SL, Hachijo-jima, Izu Islands, Japan, 33°04'N, 139°50'E, Sekiyama, Sep. 1922.

Diagnosis. This species differs from other species of *Paradiplogrammus* in the following characters. A pair of supraorbital cirri present on dorsoposterior edge of eye. Snout long and somewhat pointed. In male, first dorsal fin high and elongate, an inverse Y-shaped, blackish-brown blotch on throat. In

female, pelvic fin with a large dark mark at base.

Description. Body elongate and moderately depressed. Head moderately depressed. Snout long and somewhat pointed. Eye large. A pair of supraorbital cirri on dorsoposterior edge of eye. Interorbital space narrow and slightly concave. Gill-opening oval, located midway between dorsoposterior edge of eye and upper origin of pectoral fin. Preopercular spine with 4–7 upward processes on inner side; at base an antrorse process present; posterior tip curved upward. Upper jaw protractile, its posterior end not reaching anterior edge of eye. A pair of nostrils with short tube. Teeth on jaws villiform in broad bands. Palatine and prevomer

toothless. Anal papilla conical, more elongate in male than in female.

Cephalic lateral line system developed (Fig. 3); infraorbital canal simple, reaching only posteroventral edge of eye; postocular commissure not connected with preoperculomandibular canal. Lateral line extending a little beyond caudal peduncle, not interconnected on dorsal surface of caudal peduncle.

First dorsal fin very high and elongate in male, and low and small in female; beginning slightly behind gill-opening in male, somewhat behind gill-opening in female. Second dorsal fin elevated posteriorly in male, becoming lower posteriorly in female; dorsal rays unbranched except for last. Anal rays increasing

Table 1. Counts and proportional measurements of *Paradiplogrammus corallinus* from Hawaii and Japan.

* Whether the rays were branched or unbranched could not be determined.

Localities	Hawaiian Islands				Hachijo-jima, Japan			
Cat. No.	BPBM 34538	USNM 51581 holotype	BPBM 22584	BPBM 28624	ZUMT 42861	ZUMT 42862	ZUMT 42863	ZUMT 42881
Sex	male	female	female	female	male	male	male	female
Standard length (mm)	27.6	30.0	28.4	13.0	24.4	18.0	24.7	15.3
Counts								
Dorsal fin	IV-9	IV-9	IV-9	IV-9	IV-9	IV-9	IV-9	IV-9
Anal fin	8	8	8	8	8	8	8	8
Pectoral fin	ii + 15	ii + 16	iii + 14	18*	ii + 17	iv + 15	ii + 16	i + 18
Pelvic fin	I, 5	I, 5	I, 5	I, 5	I, 5	I, 5	I, 5	I, 5
Caudal fin	i + 7 + ii	i + 7 + ii	i + 7 + ii	i + 7 + ii	i + 7 + ii	i + 7 + ii	i + 7 + ii	i + 7 + ii
Vertebral number (AV + CV)	7 + 14	7 + 14	7 + 14	7 + 14	7 + 14	7 + 14	7 + 14	7 + 14
In % of SL								
Body width	21.7	23.0	18.7	17.0	20.9	20.0	19.8	21.6
Body depth	19.6	15.7	19.7	14.6	16.0	17.2	20.2	17.0
Caudal peduncle depth	7.2	7.0	6.0	7.7	7.0	6.7	10.6	7.2
Predorsal length	31.2	36.3	36.6	39.2	34.8	38.9	34.8	40.5
Caudal fin length	26.4	24.7	27.8	28.5	29.5	30.0	31.2	26.1
Head length	30.8	29.3	31.7	35.4	32.8	35.0	33.6	36.6
Eye diameter	10.9	12.0	11.3	11.5	10.2	11.7	10.5	13.1
Snout length	10.9	12.0	13.0	11.5	12.3	12.2	12.1	11.8
Upper jaw length	10.5	10.0	10.6	11.5	10.7	11.7	11.7	12.4
Interorbital width	2.2	2.0	2.1	0.8	1.2	1.1	3.2	1.3
1st dorsal spine length	44.6	19.7	19.7	11.5	42.2	30.0	52.2	13.7
2nd dorsal spine length	38.0	20.3	—	12.3	40.6	27.8	47.0	13.1
3rd dorsal spine length	38.8	18.7	19.7	11.5	38.7	26.7	44.9	10.5
4th dorsal spine length	32.6	13.0	12.8	7.7	16.8	21.1	24.3	5.2
1st dorsal ray length	20.7	19.7	14.7	16.2	20.9	18.9	18.6	19.0
Last dorsal ray length	20.7	16.3	17.3	12.3	20.5	16.1	24.3	—
1st anal ray length	9.1	8.3	7.0	10.0	9.8	8.9	10.1	9.8
Last anal ray length	18.8	15.0	14.3	12.3	20.1	13.9	22.7	13.1
Pectoral fin length	22.1	20.3	20.8	22.3	25.0	22.8	27.9	20.9
Pelvic fin length	32.6	30.0	28.2	30.8	32.8	28.3	32.8	30.1
Preopercular spine length	8.7	10.3	9.5	9.2	7.8	8.3	8.1	9.8
Anal papilla length	3.3	0.3	0.7	0.4	2.0	1.7	2.0	0.3

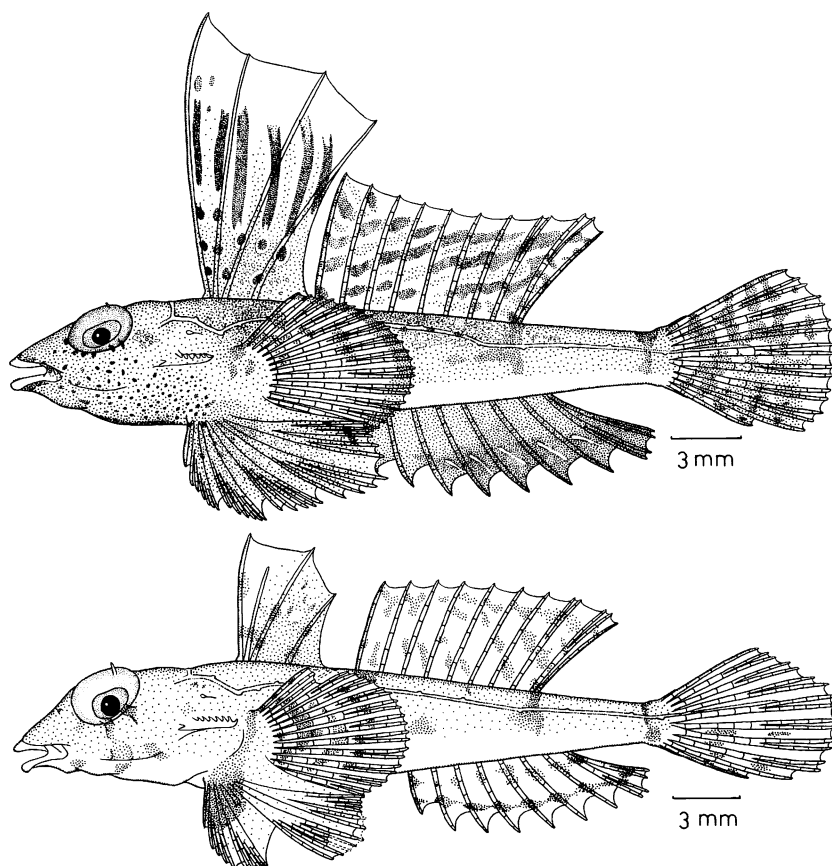


Fig. 1. *Paradiplogrammus corallinus* from the Hawaiian Islands. Upper, lateral view of male, 27.6 mm SL, BPBM 34538; lower, lateral view of female, 28.4 mm SL, BPBM 23584.

in length posteriorly and unbranched except for last. Pectoral fin rounded, reaching 4th anal ray in male, 3rd anal ray in female. Pelvic fin rounded, reaching 1st anal ray, and connected by membrane to middle part of pectoral fin base. Caudal fin rounded, somewhat longer in male than in female in the specimens from Japan; almost the same in those from Hawaii. The shapes of fins of BPBM 22584 (Fig. 1, lower) show some abnormalities, which are most likely due to its having been maintained in an aquarium.

Color in 70% ethyl alcohol: Body marbled brown above, faint dark below in male and white below in female; dorsal part of body with many irregular, pinkish-silver or silver marks overlain by marbled brown in holotype (female) and BPBM 34538 (male), but not in other specimens. Cheek with many small dark spots and oblong dark marks in male, without conspicuous marks in female. Throat with an inverse Y-shaped blackish-brown mark in

male, mark absent in female. First dorsal fin with some long dark lines on upper half, and with several dark spots on lower half in male; almost dark with small transparent area anterodorsally in female. Second dorsal fin faint dark with several broad oblique darker bands and with transparent distal margin in male, transparent with some dark oblique series of dark spots in female. Anal fin dark brown with faint dark area near base, and with short, oblique white line on distal half of each membrane in a male from Hawaii, but not in males from Japan; with some irregular dark spots on medial half, a row of dark spots near distal margin, or almost transparent with a dark spot near posterior end in female. Pectoral fin with some faint dark bands in male. Pelvic fin dark with many small white spots in male, with a large dark mark at base and 2 small dark spots near posterior end in female. Caudal fin with 4 transverse dark brown bands on upper half and dark

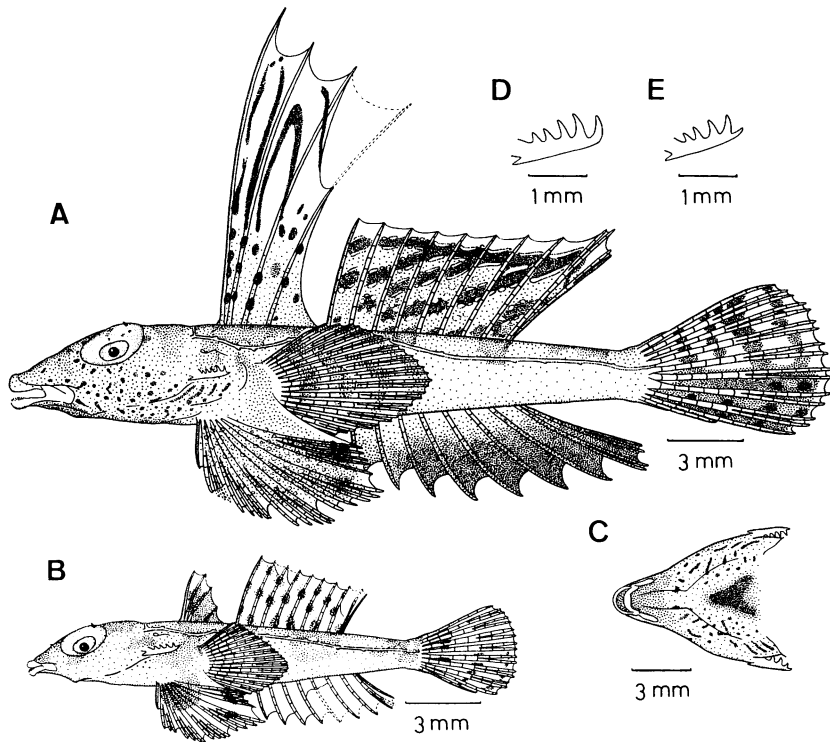


Fig. 2. *Paradiplagrammus corallinus* from Hachijo-jima, Japan. A, lateral view of male, 24.7 mm SL, ZUMT 42863. B, lateral view of female, 15.3 mm SL, ZUMT 42881. C, ventral view of head of male, ZUMT 42863. D, preopercular spine of male, 24.4 mm SL, ZUMT 42861. E, preopercular spine of male, 18.0 mm SL, ZUMT 42862.

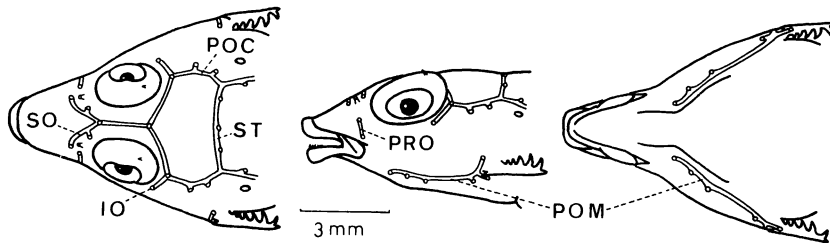


Fig. 3. Cephalic lateral line of *Paradiplagrammus corallinus*, ZUMT 42863, male, 24.7 mm SL. Left, dorsal view; middle, lateral view; right, ventral view. IO, infraorbital canal; POC, postocular commissure; POM, preoperculomandibular canal; PRO, preorbital canal; SO, supraorbital canal; ST, supratemporal canal.

brown with some darker spots on lower half in male; transparent with some dark spots in female.

Remarks. The supraorbital cirrus is so short that it has been overlooked by previous authors. However, all of the specimens I examined have a pair of supraorbital cirri. Within *Paradiplagrammus*, this character is unique to *P. corallinus*. Among the specimens examined in this paper, the holotype and BPBM 34358 have many irregular pinkish-silver or

silver marks under the marbled brown coloration on the dorsal part of the head and body, but the other specimens lack such marks. At present, it is difficult to say whether or not these silver marks are due to individual variation or preservation.

This species is closely related to an Atlantic species, *Paradiplagrammus boekei* (Metzelaar, 1919), as follows: 1) male 1st dorsal fin remarkably high and the 2nd membrane not notched deeply, 2) male

pelvic fin dark with many small white spots, 3) male caudal fin dark brown on lower half. But, *P. corallinus* differs from *P. boekei* in having a pair of supraorbital cirri, a somewhat pointed snout, a longer preopercular spine and different coloration of the 1st and 2nd dorsal fins, pelvic fin (female), and side and ventral surface of head (male).

Because of the aforementioned sexually dimorphic characters, *P. corallinus* seems to mature at about 24 mm SL.

Gosline and Brock (1960) synonymized this species with *Calliurichthys decoratus* Gilbert, but Fricke (1983) refuted this mainly because of a difference in the preopercular spine. I concur with Fricke's (1983) conclusion.

Tinker (1978) recognized this species as a female of *C. decoratus*. I do not agree with this, because the male specimens of *P. corallinus* shown above are quite different from *C. decoratus* mainly in the shapes of the preopercular spine, and 1st dorsal and caudal fins.

Fricke (1983) figured BPBM 23584 (female), but did not show the abnormalities of the 1st dorsal and pelvic fins.

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ネズボ科サンゴハナビヌメリ(新称)の再記載

中坊徹次

ネズボ科ハナビヌメリ属の1種 *Paradiplogrammus corallinus* はこれまで雌個体がハワイ諸島から記録されているのみである。ハワイ諸島、伊豆諸島の八丈島から得られた雌雄個体をもとに *P. corallinus* の再記載を行った。八丈島産の標本はヒメテグリ属のヒメテグリ *Minysynchiropus kiyooae* (Fricke et Zaiser, 1983) の副模式標本である。本種は日本初記録でありサンゴハナビヌメリという新称を提唱する。

本種は体長約 24 mm で成熟する矮小種であり、眼上に1対の小皮弁をもつ。雄は著しく伸びた第1背鰭、頬部に褐色小斑点と虫くい斑、喉部に逆Y字状の褐色斑をもつ。雌の第1背鰭は小さく、腹鰭は基部に大きな1褐色斑と後端近くに2つの小さな褐色斑をもつ。

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