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トカラ列島初記録のハタ科魚類シモフリハタ *Epinephelus rivulatus*

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First record of the grouper *Epinephelus rivulatus* (Teleostei: Serranidae) from the Tokara Islands, northern Ryukyu Archipelago, Japan

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Abstract. A specimen of the serranid fish *Epinephelus rivulatus*, collected south of Suwanosejima Island, Tokara Islands, represents the first record of *E. rivulatus* from the Tokara Islands. The previous records of the species in Kagoshima Prefecture exist only from Tanega-shima (Osumi Islands) and Amami-oshima islands. In addition, a photographic record of *Epinephelus retouti* previously reported from Tanega-shima Island is shown to be a misidentification of *E. rivulatus*, and thus there are no confirmed records of *E. retouti* from Tanega-shima Island to date.

Introduction

A recent review of the taxonomy of the serranid subfamily Epinephelinae, on the basis of molecular analysis, suggested that the genus *Epinephelus* in fact comprises several generic level groupings. However, *Epinephelus rivulatus* (Valenciennes, 1830), a widely distributed Indo-West Pacific species (Randall & Heemstra 1991; Heemstra & Randall 1993, 1999; Fennessy et al. 2011; Senou 2013), has been retained in *Epinephelus* sensu stricto (Craig & Hastings 2007; Ma & Craig 2018; Parenti & Randall 2020). *Epinephelus rivulatus* has been sporadically reported from southern Japan. During an ichthyofaunal survey of the Tokara Islands, a single specimen of *E. rivulatus* caught south of Suwanosejima Island (in the middle of the Tokara Islands, northern part of Ryukyu Archipelago), and was landed at Kagoshima Central Fish Market. The specimen represents the first record of the species from the Tokara Islands, and is described herein in detail.

Counts and proportional measurements shown in Table 1 followed Randall & Heemstra (1991). All measurements were made with digital calipers to the nearest 0.1 mm. Abbreviations: SL (standard length), KAUM (the Kagoshima University Museum).

Results and Discussion

Epinephelus rivulatus (Valenciennes, 1830)

Standard Japanese name: Shimofuri-hata (Fig. 1; Table 1)

Material examined. KAUM-I. 64775, 269.0 mm SL, 332.0 mm total length, south of Suwanosejima Island, Tokara Islands, northern Ryukyu Archipelago, Japan, >100 m depth, 4 July 2014, line-fishing (purchased at Kagoshima City Central Fish Market), H. Hata, K. Koeda, and N. Oshiro.

Description. Body oblong, rather compressed, deepest at origin of seventh dorsal-fin spine; dorsal profile of body elevating from snout tip to dorsal-fin origin, thereafter gently lowering to end of dorsal-fin base; ventral profile lowering from lower-jaw tip to pelvic-fin insertion, thereafter elevating gradually to end of anal-fin base. Dorsal and ventral profiles of caudal peduncle nearly straight. Snout tip pointed. Lower jaw somewhat projecting, its anterior tip slightly anterior to anterior tip of maxilla. Maxilla posteriorly beyond vertical through posterior margin of eye. Single row of conical teeth on lateral part of maxilla. Conical teeth patches on vomer, and palatines and anterior parts of maxilla and lower jaw. Two serial rows of conical teeth on lateral part of lower jaw. Eye oval. Pupil round, narrow anteriorly. Interorbital space flat. Nostrils paired, rounded, close together anterior to orbit. Small fleshy lobe on posterior margin of anterior nostril. Posterior and ventral margins of preopercle serrated and smooth, respectively. Five spines on angle of preopercle. Posterior margins of subopercle and interopercle smooth. Two spines on upper part of opercle, lower spine smaller and partly embedded by skin. Ctenoid scales entirely covering lateral surface of body; cycloid scales covering nape, anterior surface of body above lateral line and abdomen. Maxilla scaleless. Dorsal-fin origin anterior to uppermost

Table 1. Counts and measurements of a specimen of *Epinephelus rivulatus* (KAUM-I. 64775) from Suwanose-jima Island, Tokara Islands, northern Ryukyu Archipelago, Japan.

表 1. 諏訪之瀬島産シモフリハタ *Epinephelus rivulatus* (KAUM-I. 64775) の計数・計測形質。

Standard length (SL; mm) 標準体長	269.0		
Counts 計数形質		1st dorsal-fin spine length 背鰭第1棘長	6.3
Dorsal-fin rays 背鰭鰭条数	XI, 16	2nd dorsal-fin spine length 背鰭第2棘長	12.0
Anal-fin rays 臀鰭鰭条数	III, 8	3rd dorsal-fin spine length 背鰭第3棘長	14.8
Pectoral-fin rays 胸鰭軟条数	17	4th dorsal-fin spine length 背鰭第4棘長	broken
Pelvic-fin rays 腹鰭鰭条数	I, 5	5th dorsal-fin spine length 背鰭第5棘長	15.0
Gill rakers on upper limb 上枝鰓耙数	6	6th dorsal-fin spine length 背鰭第6棘長	14.1
Gill rakers on lower limb 下枝鰓耙数	14	7th dorsal-fin spine length 背鰭第7棘長	broken
Total gill rakers 総鰓耙数	20	8th dorsal-fin spine length 背鰭第8棘長	13.1
Measurement (% SL) 計測形質		9th dorsal-fin spine length 背鰭第9棘長	12.3
Body depth 体高	36.4	10th dorsal-fin spine length 背鰭第10棘長	11.7
Body width 体幅	18.3	11th dorsal-fin spine length 背鰭第11棘長	10.8
Head length 頭長	41.3	Longest dorsal-fin ray length 背鰭最長軟条長	14.5 (6th)
Snout length 吻長	8.6	Anal-fin base length 臀鰭基底長	17.8
Orbit diameter 眼窩径	8.4	1st anal-fin spine length 臀鰭第1棘長	4.8
Interorbital width 眼隔域幅	5.6	2nd anal-fin spine length 臀鰭第2棘長	10.8
Suborbital depth 眼下骨高	4.1	3rd anal-fin spine length 臀鰭第3棘長	10.8
Upper-jaw length 上顎長	19.2	Longest anal-fin ray length 最長臀鰭軟条長	16.1 (4th)
Caudal-peduncle length 尾柄長	17.7	Caudal-fin length 尾鰭長	23.9
Caudal-peduncle depth 尾柄高	11.1	Pectoral-fin length 胸鰭長	24.9
Predorsal-fin length 背鰭前長	35.2	Pelvic-fin spine length 腹鰭棘長	11.9
Preanal-fin length 臀鰭前長	69.1	Pelvic-fin length 腹鰭長	11.6
Prepelvic-fin length 腹鰭前長	38.2		
Dorsal-fin base length 背鰭基底長	60.5		

point of pectoral-fin insertion and anteriormost point of pelvic-fin insertion. Membranes of spinous portion of dorsal fin deeply incised. Dorsal contour of dorsal fin slightly concave between spinous and soft portions. Uppermost point of pectoral-fin insertion just below origin of second dorsal-fin spine. Posterior margin of pectoral fin round. Posterior tip of pectoral fin reaching to vertical through eighth dorsal-fin spine origin, not reaching anus. Anteriormost point of pelvic-fin insertion slightly posterior to uppermost point of pectoral-fin insertion. Posterior tip of depressed pelvic fin not exceeding posterior tip of pectoral fin. Last ray of pelvic fin connected to body by fleshy membrane. Anal-fin origin slightly posterior to origin of first dorsal-fin soft ray. Second anal-fin spine longest. Caudal fin rounded. Anus anterior to anal-fin origin.

Color when fresh (Fig. 1). Dorsum to lateral surface of body reddish-orange, ventral surface white. White spot centrally on each scale on opercle and body. Dorsal fin light green, orange basally. Base of spinous portion of dorsal fin dark. Outer margin of soft portion of dorsal fin whitish. Pectoral, pelvic, and anal fins brownish-green. Red blotch smaller than eye on pectoral-fin insertion. Caudal fin

yellowish-green with white posterior margin. Two oblique bars running from maxilla tip to lowermost point of pectoral-fin insertion and lower-jaw tip to pelvic-fin insertion. Red blotch on isthmus. Eye margined yellow. Iris red. Pupil bluish-black.

Distribution. *Epinephelus rivulatus* is widely distributed in the Indo-West Pacific from the eastern coast of Africa to southern Japan and New Zealand (Lee 1990; Randall & Heemstra 1991; Heemstra & Randall 1993, 1999; Fennessy et al. 2011; Senou 2013; Chiang et al. 2014; Parenti & Randall 2020; Bogorodsky et al. 2020). In Japanese waters, the species has been reported from Nagasaki, Mie (Kuki and Wagu), Wakayama (Kushimoto, Minabe, and Tanabe), and Kochi prefectures, and the Osumi Islands (Tanega-shima Island), Amami Islands (Amami-oshima Island), Okinawa Islands, Yaeyama Islands, Izu Islands (Miyake-jima Island), Ogasawara Islands, and Volcano Islands (Io-jima and Minami-io-jima islands) [Fowler & Bean 1930; Masuda 1942; Katayama 1960; Ida 1971; Katayama 1974; Kataoka & Tomida 1981; Masuda & Kobayashi, 1994; Tokyo Metropolitan Fisheries Experiment Station 1994; Senou 1997; Fujiyama, 2004; Ohta, 2007, 2008; Miura 2012; Senou 2013; Sakai et al. 2015; Ikeda &



Fig. 1. Fresh specimen of *Epinephelus rivulatus*, KAUM-I. 64775, 269.0 mm SL, south of Suwanose-jima Island, Tokara Islands, Island, Kagoshima Prefecture, Japan.

図 1. シモフリハタ *Epinephelus rivulatus* (KAUM-I. 64775, 標準体長 269.0 mm, 鹿児島県トカラ列島諏訪之瀬島南方).

Nakabo 2015; Kaburagi 2016 (see Remarks); Nakae et al. 2018; Sakurai, 2018, 2019]. It is here newly recorded from Suwanose-jima Island, Tokara Islands.

Remarks. The Suwanose-jima specimen was identified on the basis of the following combination of characters, which closely matched the diagnostic features of *E. rivulatus* given by Randall & Heemstra (1991), Heemstra & Randall (1993, 1999), Fennessy et al. (2011), and Senou (2013): body scales with a whitish dot; a red blotch on pectoral-fin insertion; spinous portion of dorsal fin dark; cycloid scales on nape, anteriorly on body above lateral line, and abdomen.

As stated in “Distribution”, *E. rivulatus* has been widely recorded from southern Japan since Fowler & Bean (1930), who reported the species as *Serranus rhyncholepis* Bleeker, 1852 (currently regarded as a junior synonym of *E. rivulatus*: Randall & Heemstra 1991; Heemstra & Randall 1993, 1999) based on a specimen collected from Nafa (currently Naha), Okinawa-jima Island. However, distributional records of *E. rivulatus* from the Satsunan Islands are limited to Amami-oshima Island [Fujiyama (2004), photograph of line-caught individual; Nakae et al. (2018) and Sakurai (2018, 2019), voucher specimen, KAUM-I. 72440] and Tanega-shima Island, Osumi Islands. Kaburagi (2016) referred to a photograph of a serranid fish caught from Tanega-shima Island

as “Akahata-modoki (standard Japanese name for *Epinephelus retouti* Bleeker, 1868; see Motomura 2020 for consistency of scientific and Japanese names)”. However, the photographed individual was identified here as *E. rivulatus*, as the individual had the caudal fin with a round margin (vs. caudal fin truncate in *E. retouti*) and the dorsal fin was a uniformly light color (vs. outer margin of spinous portion dark) (Randall & Heemstra 1991; Heemstra & Randall 1993, 1999; Senou 2013). Coincidentally, the Tokara Islands specimen described here was also called “Akahata-modoki” in the Kagoshima City Central Fish Market. The present specimen from Suwanose-jima Island is the first record of *E. rivulatus* from the Tokara Islands. Thus, there appear to be no previous records from Tanega-shima Island, indicating that *E. retouti* in the Osumi Islands is now limited to only a record from Kuchinoerabu-jima Island (Hata & Motomura 2015; Kimura et al. 2017).

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トカラ列島初記録のハタ科魚類シモフリハタ *Epinephelus rivulatus*

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要旨・鹿児島市中央卸売市場魚類市場にトカラ列島諏訪之瀬島南方において漁獲された1個体のハタ科魚類シモフリハタ *Epinephelus rivulatus* が水揚げされた。本種は日本国内において長崎県、三重県から八重山諸島にかけてと、伊豆諸島、および小笠原諸島の広域から報告されていたが、鹿児島県における記録は種子島と奄美大島からのものに限られる。したがって、本研究の記載標本は本種のトカラ列島における初めての記録となる。また、シモフリハタの日本国内における記録を再検討したところ、種子島からシモフリハタがアカハタモドキに誤同定されて報告されていることが明らかとなると同時に、アカハタモドキの大隅諸島における記録は口永良部島からのものに限られることが明らかとなった。

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