Original Article

Rhinogobius mizunoi, A New Species of Freshwater Goby (Teleostei: Gobiidae) from Japan

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Abstract. A new freshwater goby, *Rhinogobius mizunoi*, is described based on six specimens from a freshwater stream in Shizuoka Prefecture, Japan. The species is distinguished from all congeneric species by the following combination of characters: I, 8 second dorsal-fin rays; 18–20 pectoral-fin rays; 13–18 predorsal scales; 33–35 longitudinal scales; 8 or 9 transverse scales; 10+16=26 vertebrae 26; first dorsal fin elongate in male, its distal tip reaching to base of fourth branched ray of second dorsal fin in males when adpressed; when alive or freshly-collected, cheek with several pale sky spots; caudal fin without distinct rows of dark dots; a pair of vertically-arranged dark brown blotches at caudal-fin base in young and females.

Key words: amphidoromous, fish taxonomy, *Rhinogobius* sp. CO, valid species

Introduction

The freshwater gobies of the genus *Rhinogobius* Gill, 1859 are widely distributed in the East and Southeast Asian regions, including the Russia Far East, Japan, Korea, China, Taiwan, the Philippines, Vietnam, Laos, Cambodia, and Thailand (Chen & Miller, 2014). Their life history indicates that many members of the genus are amphidromous; the remaining are known as lake-river maigrating, fluvial or lentic species (Mizuno, 1960a; Takahashi & Okazaki, 2002; Huang & Chen, 2007)

Rhinogobius belongs the gobiid subfamily Gobionellinae (Pezold, 1993, 2011), and is distinguished from the other gobionelline genera by having the following combination of characters (Chen & Shao, 1996; Suzuki *et al.*, 2015; Yang *et al.*, 2008; present study): first dorsal fin with 5–7 spines; second dorsal fin with a single spine and 6–11 segmented rays; anal fin with a single spine and 5–11 segmented rays; pectoral fin with 14–23 segmented rays; pelvic fin with a single spine and five segmented rays; 25–44 longitudinal scales; 7–16 transverse scales; P-V 3/II II I I 0/9; 10–11+15–18= 25–29 vertebrae; body mostly covered with ctenoid scales; snout, cheek and operculum naked; cheek with a longitudinal pattern of sensory papillae (Hoese, 1983), except for a single species (*Rhinogobius similis* Gill, 1859) with several short transverse rows of sensory papillae below the eye; gill opening extending to a vertical through the middle of the operculum; pelvic fins fused medially into a circular/ovoid disc via the frenum (between spines) and connecting the membrane (between innermost ray).

Rhinogobius, originally described as a monotypic genus based on *R. similis* by Gill (1859), is currently known as the most species-rich freshwater goby genus, comprising 72 described, valid species (Table 1), although several unnamed species are left unresolved.

In Japanese waters, 17 species are currently known (Akihito *et al.*, 2013; Suzuki *et al.*, 2015). Of these, seven species [viz., *Rhinogobius brunneus* Temminck & Schlegel, 1845, *R. flumineus* (Mizuno, 1960), *R. fluviatilis* Tanaka, 1925, *R. kurodai* (Tanaka, 1908), *R. nagoyae* Jordan & Seale, 1906, *R. ogasawaraensis* Suzuki, Chen & Senou, 2012, *R. smillis*] have been described; the other 10 remain undescribed. Akihito *et al.* (2013) recognized these undescribed species with

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Table 1. Nominal species of *Rhinogobius* and their present status. Valid species, assigned to *Rhinogobius*, are shaded.

No. of nominal species	No. of valid species	Nominal species	Present status	Main reference
1	1	*Gobius brunneus* Temminck & Schlegel, 1845	*Rhinogobius brunneus* Temminck & Schlegel, 1845	van Oijen *et al.*, 2011
2	2	*Rhinogobius similis* Gill, 1859	*Rhinogobius similis* Gill, 1859	Suzuki *et al.*, 2015
3	3	*Gobius davidi* Sauvage & Dabry de Thiersant, 1874	*Rhinogobius davidi* (Sauvage & Dabry de Thiersant, 1874)	Chen & Miller, 1998
4		*Gobius giurinus* Rutter, 1897	*Rhinogobius similis* Gill, 1859	Suzuki *et al.*, 2015
5		*Ctenogobius hadropterus* Jordan & Snyder, 1901	*Rhinogobius similis* Gill, 1859	Suzuki *et al.*, 2015
6	4	*Rhinogobius nagoyae* Jordan & Seale, 1906	*Rhinogobius nagoyae* Jordan & Seale, 1906	Akihito *et al.*, 2013
7		*Rhinogobius mowbrayi* Bean, 1906	*Lythrypnus mowbrayi* (Bean, 1906)	Greenfield, 1988
8		*Rhinogobius corallinus* Jordan & Seale, 1906	*Bathygobius cocosensis* (Bleeker, 1854)	Akihito & Meguro, 1980
9		*Rhinogobius muscarum* Jordan & Seale, 1906	*Pleurosicya muscarum* (Jordan & Seale, 1906)	Larson, 1990
10		*Rhinogobius lungi* Jordan & Seale, 1907	*Yongeichthys nebulosus* (Forsskal, 1775)	Kottelat, 2013
11		*Rhinogobius ocyurus* Jordan & Seale, 1907	*Drombus ocyurus* (Jordan & Seale, 1907)	Hoese & Larson, 2006
12	5	*Ctenogobius candidianus* Regan, 1908	*Rhinogobius candidianus* (Regan, 1908)	Chen & Shao, 1996
13	6	*Ctenogobius bedfordi* Regan, 1908	a species of *Rhinogobius**1	Regan, 1908b
14	7	*Ctenogobius kurodai* Tanaka, 1908	*Rhinogobius kurodai* (Tanaka, 1908)	Suzuki & Chen, 2011
15		*Ctenogobius katonis* Tanaka, 1908	*Rhinogobius nagoyae* Jordan & Seale, 1906	Suzuki & Chen, 2011
16		*Rhinogobius perpusillus* Seale, 1910	possibly a valid species of *Amblygobius**2	Seale, 1910
17	8	*Rhinogobius carpenteri* Seale, 1910	*Rhinogobius carpenteri* Seale, 1910	Kottelat, 2013
18		*Rhinogobius leftwichi* Ogilby, 1910	*Arenigobius leftwichi* (Ogilby, 1910)	Hoese & Larson, 2006
19		*Gobius* (*Rhinogobius*) *scapulopunctatus* de Beaufort, 1912	*Palutrus scapulopunctatus* (de Beaufort, 1912)	Larson, 2000
20		*Gobius* (*Rhinogobius*) *labiatus* Weber, 1913	*Pleurosicya labiata* (Weber, 1913)	Larson, 1990
21		*Rhinogobius hongkongensis* Seale, 1914	*Istigobius campbelli* (Jordan & Snyder, 1901)	Murdy & Hoese, 1985
22		*Rhinogobius hoshinonis*Tanaka, 1917	*Istigobius hoshinonis* (Tanaka, 1917)	Murdy & Hoese, 1985
23	9	*Rhinogobius sowerbyi* Ginsburg, 1917	*Rhinogobius sowerbyi* Ginsburg, 1917	Bogutskaya *et al.*, 2008
24		*Rhinogobius taiwanus* Oshima, 1919	*Rhinogobius candidianus* (Regan, 1908)	Chen & Shao, 1996
25	10	*Rhinogobius formosanus* Oshima, 1919	*Rhinogobius formosanus* Oshima, 1919	Chen & Shao, 1996
26	11	*Rhinogobius fluviatilis* Tanaka, 1925	*Rhinogobius fluviatilis* Tanaka, 1925	Suzuki & Chen, 2011
27	12	*Gobius cliffordpopei* Nichols, 1925	*Rhinogobius cliffordpopei* (Nichols, 1925)	Wu & Chen, 2008
28		*Rhinogobius hainanensis* Oshima, 1926	*Stenogobius ophthalmoporus* (Bleeker, 1853)	Kottelat, 2013
29		*Rhinogobius punctatus* Oshima, 1926	possibly *Acentrogobius caninus* (Valenciennes, 1837)*3	Oshima, 1926
30	13	*Tukugobius bucculentus* Herre, 1927	*Rhinogobius bucculentus* (Herre, 1927)	Kottelat, 2013
31	14	*Tukugobius philippinus* Here, 1927	*Rhinogobius philippinus* (Herre, 1927)	Koumans, 1940
32		*Rhinogobius decoratus* Herre, 1927	*Istigobius decoratus* (Herre, 1927)	Murdy & Hoese, 1985

Table 1. Continued.

No. of nominal species	No. of valid species	Nominal species	Present status	Main reference
33		*Rhinogobius schultzei* Herre, 1927	a species of *Mugilogobius* or *Pseudogobius*	Larson, 2001
34		*Rhinogobius caninus magnisquamatus* form Herre, 1927	*Acentrogobius caninus* (Valenciennes, 1837)	Koumans, 1940
35		*Rhinogobius multifasciatus* Herre, 1927	*Acentrogobius multifasciatus* (Herre, 1927)	Akihito *et al.*, 1984
36		*Rhinogobius suluensis* Herre, 1927	*Acentrogobius suluensis* (Herre, 1927)	Akihito *et al.*, 1984
37		*Rhinogobius flavoventris* Herre, 1927	*Silhouettea flavoventris* (Herre, 1927)*4	Herre, 1927b
38		*Aboma tsinanensis* Fowler, 1930	*Rhinogobius similis* Gill, 1859	Suzuki *et al.*, 2015
39		*Rhinogobius similis* Smith, 1931	*Acentrogobius caninus* (Valenciennes, 1837)	Koumans, 1940
40		*Rhinogobius atripinnatus* Smith, 1931	*Aulopareia atripinnatus* (Smith, 1931)	Larson, 2000
41		*Rhinogobius simulans* Smith, 1931	*Acentrogobius caninus* (Valenciennes 1837)	Koumans, 1940
42	15	*Gobius cheni* Nichols, 1931	*Rhinogobius cheni* (Nichols, 1931)	Chen *et al.*, 2008
43		*Rhinogobius laddi* Fowler, 1931	*Bathygobius laddi* (Fowler, 1931)	Hoese, 1986
44	16	*Rhinogobius smilis lindbergi* Berg, 1933	*Rhinogobius lindbergi* Berg, 1933	Sakai *et al.*, 2000
45		*Ctenogobius lini* Herre, 1934	*Rhinogobius similis* Gill, 1859	Suzuki *et al.*, 2015
46		*Rhinogobius melanobranchus* Fowler, 1934	*Favonigobius melanobranchus* (Fowler, 1934)	Hoese, 1986
47	17	*Rhinogobius chiengmaiensis* Fowler, 1934	*Rhinogobius chiengmaiensis* Fowler, 1934	Chen & Kottelat, 2000
48		*Rhinogobius robinsoni* Fowler, 1934	*Favonigobius reichei* (Bleeker, 1854)	Hoese, 1986
49	18	*Rhinogobius fukushimai* Mori, 1934	*Rhinogobius fukushimai* Mori, 1934	Wu & Chen, 2008
50		*Rhinogobius aestivaregia* Mori, 1934	*Rhinogobius fukushimai* Mori, 1934	Wu & Chen, 2008
51		*Rhinogobius barbatus* Tomiyama, 1934	*Heteroplopomus barbatus* (Tomiyama, 1934)	Tomiyama, 1936
52	19	*Ctenogobius leavelli* Herre, 1935	*Rhinogobius leavelli* (Herre, 1935)	Wu & Chen, 2008
53	20	*Ctenogobius duospilus* Herre, 1935	*Rhinogobius duospilus* (Herre, 1935)	Wu & Chen, 2008
54		*Ctenogobius whitleyi* Herre, 1936	*Rhinogobius duospilus* (Herre, 1935)	Wu & Chen, 2008
55		*Rhinogobius bergi* Lindberg, 1936	*Rhinogobius sowerbyi* Ginsburg, 1917	Vasil'eva, 2007
56		*Tukagobius ocellatus* Fowler, 1937	*Papuligobius ocellatus* (Fowler, 1937)	Chen & Kottelat, 2003b
57		*Ctenogobius vexillifer* Fowler, 1937	a species of *Drombus**5	Fowler, 1937
58	21	*Ctenogobius henryi* Herre, 1938	*Rhinogobius henryi* (Herre, 1938)	Chen *et al.*, 2008
59	22	*Glossogobius* (*Sinogobius*) *szechuanensis* Tchang, 1939	*Rhinogobius szechuanensis* (Tchang, 1939)	Wu & Chen, 2008
60	23	*Ctenogobius filamentosus* Wu, 1939	*Rhinogobius filamentosus* (Wu, 1939)	Wu & Chen, 2008
61		*Gobius* (*Sinogobius*) *szechuanensis* Liu, 1940	*Rhinogobius liui* Chen & Wu, 2008	Wu & Chen, 2008
62		*Ctenogobius wui* Liu, 1940	*Rhinogobius duospilus* (Herre, 1935)	Wu & Chen, 2008
63	24	*Gobius mekongianus* Pellegrin & Fang, 1940	*Rhinogobius mekongianus* (Pellegrin & Fang, 1940)	Chen *et al.*, 1999a
64		*Gobius chengtuensis* Chang, 1944	*Rhinogobius szechuanensis* (Tchang, 1939)	Wu & Chen, 2008

Table 1. Continued.

No. of nominal species	No. of valid species	Nominal species	Present status	Main reference
65		*Ctenogobius cephalopardus* Smith, 1945	*Rhinogobius mekongianus* (Pellegrin & Fang, 1940)	Chen *et al.*, 1999a
66	25	*Tukugobius flumineus* Mizuno, 1960	*Rhinogobius flumineus* (Mizuno, 1960)	Akihito *et al.*, 1984
67	26	*Ctenogobius shennongensis* Yang & Xie, 1983	*Rhinogobius shennongensis* (Yang & Xie, 1983)	Wu & Chen, 2008
68	27	*Ctenogobius multimaculatus* Wu & Zheng, 1985	*Rhinogobius multimaculatus* (Wu & Zheng, 1985)	Wu & Chen, 2008
69	28	*Ctenogobius lentiginis* Wu & Zheng, 1985	*Rhinogobius lentiginis* (Wu & Zheng, 1985)	Wu & Chen, 2008
70		Ctenogobius cervicosquamus Wu, Lu & Ni, 1986	Rhinogobius leavelli (Herre, 1935)	Wu & Chen, 2008
71	29	*Ctenogobius yaoshanensis* Luo, 1989	*Rhinogobius yaoshanensis* (Luo, 1989)	Wu & Chen, 2008
72	30	*Ctenogobius parvus* Luo, 1989	*Rhinogobius parvus* (Luo, 1989)	Wu & Chen, 2008
73	31	*Rhinogobius rubromaculatus* Lee & Chang, 1996	*Rhinogobius rubromaculatus* Lee & Chang, 1996	Chen & Shao, 1996
74	32	*Rhinogobius gigas* Aonuma & Chen, 1996	*Rhinogobius gigas* Aonuma & Chen, 1996	Aonuma & Chen, 1996
75	33	*Rhinogobius nantaiensis* Aonuma & Chen, 1996	*Rhinogobius nantaiensis* Aonuma & Chen, 1996	Aonuma & Chen, 1996
76	34	*Rhinogobius delicatus* Chen & Shao, 1996	*Rhinogobius delicatus* Chen & Shao, 1996	Chen & Shao, 1996
77	35	*Rhinogobius henchuenensis* Chen & Shao, 1996	*Rhinogobius henchuenensis* Chen & Shao, 1996	Chen & Shao, 1996
78	36	*Rhinogobius maculafasciatus* Chen & Shao, 1996	*Rhinogobius maculafasciatus* Chen & Shao, 1996	Chen & Shao, 1996
79	37	*Pseudorhinogobius aporus* Zhong & Wu, 1998	*Rhinogobius aporus* (Zhong & Wu, 1998)	Wu & Chen, 2008
80	38	*Rhinogobius genanematus* Zhong & Tzeng, 1998	*Rhinogobius genanematus* Zhong & Tzeng, 1998	Wu & Chen, 2008
81	39	*Rhinogobius lanyuensis* Chen, Miller & Fang, 1998	*Rhinogobius lanyuensis* Chen, Miller & Fang, 1998	Chen *et al.*, 1998
82	40	*Rhinogobius albimaculatus* Chen, Kottelat & Miller, 1999	*Rhinogobius albimaculatus* Chen, Kottelat & Miller, 1999	Chen *et al.*, 1999a
83	41	*Rhinogobius lineatus* Chen, Kottelat & Miller, 1999	*Rhinogobius lineatus* Chen, Kottelat & Miller, 1999	Chen *et al.*, 1999a
84	42	*Rhinogobius taenigena* Chen, Kottelat & Miller, 1999	*Rhinogobius taenigena* Chen, Kottelat & Miller, 1999	Chen *et al.*, 1999a
85	43	*Rhinogobius xianshuiensis* Chen, Wu & Shao, 1999	*Rhinogobius xianshuiensis* Chen, Wu & Shao, 1999	Chen *et al.*, 1999b
86	44	*Rhinogobius honghensis* Chen, Yang & Chen, 1999	*Rhinogobius honghensis* Chen, Yang & Chen, 1999	Chen *et al.*, 1999c
87	45	*Rhinogobius maculicervix* Chen & Kottelat, 2000	*Rhinogobius maculicervix* Chen & Kottelat, 2000	Chen & Kottelat, 2000
88	46	*Rhinogobius changjiangensis* Chen, Miller, Wu & Fang, 2002	*Rhinogobius changjiangensis* Chen, Miller, Wu & Fang, 2002	Chen *et al.*, 2002
89	47	*Rhinogobius linshuiensis* Chen, Miller, Wu & Fang, 2002	*Rhinogobius linshuiensis* Chen, Miller, Wu & Fang, 2002	Chen *et al.*, 2002
90	48	*Rhinogobius nandujiangensis* Chen, Miller, Wu & Fang, 2002	*Rhinogobius nandujiangensis* Chen, Miller, Wu & Fang, 2002	Chen *et al.*, 2002
91	49	*Rhinogobius wangchuangensis* Chen, Miller, Wu & Fang, 2002	*Rhinogobius wangchuangensis* Chen, Miller, Wu & Fang, 2002	Chen *et al.*, 2002
92	50	*Rhinogobius milleri* Chen & Kottelat, 2003	*Rhinogobius milleri* Chen & Kottelat, 2003	Chen & Kottelat, 2003a
93	51	*Rhinogobius nammaensis* Chen & Kottelat, 2003	*Rhinogobius nammaensis* Chen & Kottelat, 2003	Chen & Kottelat, 2003a
94	52	*Rhinogobius vermiculatus* Chen & Kottelat, 2003	*Rhinogobius vermiculatus* Chen & Kottelat, 2003	Chen & Kottelat, 2003a
95	53	*Rhinogobius boa* Chen & Kottelat, 2005	*Rhinogobius boa* Chen & Kottelat, 2005	Chen *et al.*, 2008
96	54	*Rhinogobius sulcatus* Chen & Kottelat, 2005	*Rhinogobius sulcatus* Chen & Kottelat, 2005	Chen & Kottelat 2005

Table 1. Continued.

No. of nominal species	No. of valid species	Nominal species	Present status	Main reference
97	55	*Rhinogobius variolatus* Chen & Kottelat, 2005	*Rhinogobius variolatus* Chen & Kottelat, 2005	Chen & Kottelat 2005
98	56	*Rhinogobius virgigena* Chen & Kottelat, 2005	*Rhinogobius virgigena* Chen & Kottelat, 2005	Chen & Kottelat 2005
99		*Rhinogobius longipinnis* Nguyen & Vo, 2005	*Rhinogobius similis* Gill, 1859	Suzuki *et al.*, 2015
100	57	*Rhinogobius imfasciocaudatus* Nguyen & Vo, 2005	*Rhinogobius imfasciocaudatus* Nguyen & Vo, 2005	Kottelat, 2013
101	58	*Rhinogobius wangi* Chen & Fang, 2006	*Rhinogobius wangi* Chen & Fang, 2006	Chen & Fang, 2006
102	59	*Rhinogobius changtinensis* Huang & Chen, 2007	*Rhinogobius changtinensis* Huang & Chen, 2007	Chen *et al.*, 2008
103	60	*Rhinogobius lungwoensis* Huang & Chen, 2007	*Rhinogobius lungwoensis* Huang & Chen, 2007	Chen *et al.*, 2008
104	61	*Rhinogobius ponkouensis* Huang & Chen, 2007	*Rhinogobius ponkouensis* Huang & Chen, 2007	Huang & Chen, 2007
105	62	*Rhinogobius reticulatus* Li, Zhong & Wu, 2007	*Rhinogobius reticulatus* Li, Zhong & Wu, 2007	Li *et al.*, 2007
106	63	*Rhinogobius wuyiensis* Li & Zhong, 2007	*Rhinogobius wuyiensis* Li & Zhong, 2007	Huang *et al.*, 2016
107	64	*Rhinogobius liui* Chen & Wu, 2008	*Rhinogobius liui* Chen & Wu, 2008	Wu & Chen, 2008
108	65	*Rhinogobius longyanensis* Chen, Cheng & Shao, 2008	*Rhinogobius longyanensis* Chen, Cheng & Shao, 2008	Chen & Miller, 2008
109	66	*Rhinogobius wuyanlingensis* Yang, Wu & Chen, 2008	*Rhinogobius wuyanlingensis* Yang, Wu & Chen, 2008	Huang *et al.*, 2016
110	67	*Rhinogobius rubrolineatus* Chen & Miller, 2008	*Rhinogobius rubrolineatus* Chen & Miller, 2008	Li & Zhong, 2009
111	68	*Rhinogobius sagittus* Chen & Miller, 2008	*Rhinogobius sagittus* Chen & Miller, 2008	Li & Zhong, 2009
112	69	*Rhinogobius zhoui* Li & Zhong, 2009	*Rhinogobius zhoui* Li & Zhong, 2009	Li & Zhong, 2009
113	70	*Rhinogobius ogasawaraensis* Suzuki, Chen & Senou, 2012	*Rhinogobius ogasawaraensis* Suzuki, Chen & Senou, 2012	Suzuki *et al.*, 2012
114	71	*Rhinogobius sangenloensis* Chen & Miller, 2014	*Rhinogobius sangenloensis* Chen & Miller, 2014	Chen & Miller, 2014
115	72	*Rhinogobius niger* Huang, Chen & Shao, 2016	*Rhinogobius niger* Huang, Chen & Shao, 2016	Huang *et al.*, 2016

*1: Some researchers regarded this nominal species as a junior synonym of *R. brunneus* (e.g., Kottelat 2013); nevertheless, *R. bedfordi* is provisionally treated here as a valid species, since it appears to differ from *R. brunneus* (re-described by van Oijen *et al.* 2011) in having 36–38 longitudinal scales (vs 32–35 in *R. brunneus*) and filamentous second spine of first dorsal fin (vs non-filamentous) (Regan 1908); taxonoic status of *R. bedfordi* needs to be resolved based on examination of the syntypes.

*2: Kottelat (2013) provisionally identified this as *Amblygobius decussatus* (Bleeker, 1855) with doubt; judging from the original description (particularly those of coloration), it presumed to be identical with *Amblygobius linki* Herre, 1927 (rather than *A. decussatus*); *R. perpusillus* has a priority over *A. linki*, and thus may should be a valid name.

*3: Wu & Chen (2008) and Kottelat (2013) identified this as *Yongeichthys nebulosus* and a valid species of *Rhinogobius*, respectively, with no statements about their decision; judging from the original description (particularly those of shape of head details), it is undoubtedly not a species of *Rhinogobius*; and, its coloration suggests that it is most probably identifiable as *Acentrogobius caninus* (rather than *Y. nebulosus*).

*4: Judging from the original description, it most probably belongs *Silhouettea*, revised by Miller (1988); it is regarded here as a valid species of *Silhouettea*, since it does not agree with all eight species recognized by Miller (1988).

*5: Judging from the original description, it undobtedly belongs *Drombus*, re-defied by Hoese (1986) and Larson & Murdy (2001); the genus is in need of revision (Shibukawa, Suzuki & Senou, unpubl.).

specific abbreviations, as follows (each vernacular name in Japan is in parenthesis): *Rhinogobius* sp. BB (Aobara-yoshinobori), *Rhinogobius* sp. BF (Shimahire-yoshinobori), *Rhinogobius* sp. BW (Biwa-yoshinobori), *Rhinogobius* sp. CO (Ruri-yoshinobori), *Rhinogobius* sp. DL (Hira-yoshinobori), *Rhinogobius* sp. KZ (Kazusa-yoshinobori), *Rhinogobius* sp. MO (Aya-yoshinobori), *Rhinogobius* sp. OM (Oumi-yoshinobori), *Rhinogobius* sp. TO (Tokai-yoshinobori), and *Rhinogobius* sp. YB (Kibara-yoshinobori).

In this paper, we describe *Rhinogobius* sp. CO of Akihito *et al.* (2013), originally recognized as a distinct species by Mizuno (1989). The species, fairly common in swift freshwater streams in temperate areas of Japan, is a species bearing bright blue spots on cheek, so that the Japanese vernacular name is "Ruri-yoshinobori"; the Japanese words "Ruri" and "yoshinobori" mean cobalt blue and a goby of *Rhinogobius*, respectively.

Materials and Methods

The type specimens of the new species are deposited in the Kanagawa Prefectural Museum of Natural History (KPM), the Osaka Natural History Museum, Osaka (OMNH), and the Museum of Natural and Environmental History, Shizuoka, Japan (SPMN). The comparative materials examined here were as shown in Suzuki *et al.* (2012). Information about the other described species is from the literatures shown in Table 1.

All specimen lengths given are standard lengths (SL). Measurements were made point-to-point with calipers to the nearest 0.1 mm. The methods for measurements followed those of Hubbs & Lagler (1958), with exceptions given below (the snout tip refers to the mid-anteriormost point of the upper lip): head length was measured from the snout tip to the posteriormost edge of the gill membrane; cheek depth was measured as the least distance from the orbit downward to the ventral edge of the cheek; caudal-fin length was measured from the base to the tip of the middle ray. The methods for counting followed Akihito *et al.* (1984), except for counts of gill rakers (including all rudiments on the outer side of the first arch) and scales between the origin of the first dorsal fin and pectoral fin (counted from the dorsal origin of the pectoral fin to the origin of the first dorsal fin). Osteological features were observed from radiographs. The cephalic sensory system and scales were examined based on specimens stained with cyanine blue. Data and the other information about teeth, head squamation, gill rakers, teeth, and fifth pelvic-fin ray were made based on a paratype (OMNH-P 40617) stained with alizarin red. The method of Akihito *et al.* (1984) is used in describing the pattern of the interdigitation of the dorsal-fin pterygiophores and neural spines ("P-V").

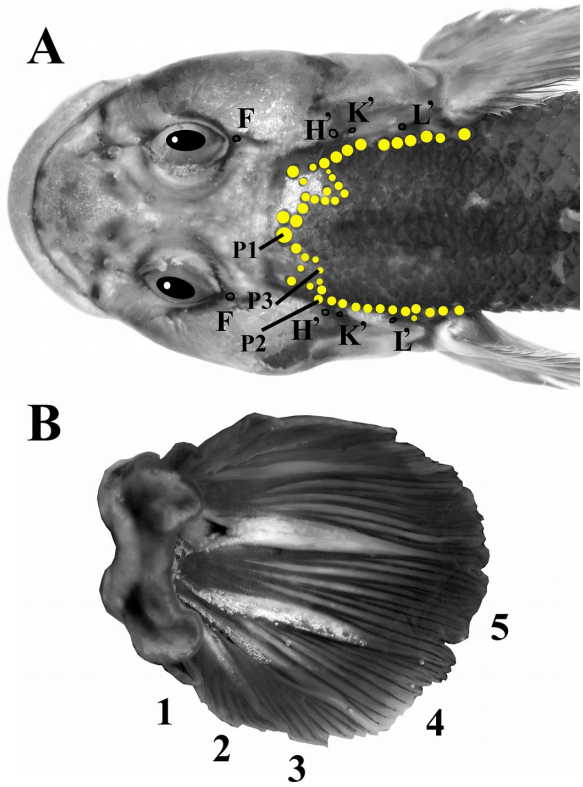

Fig. 1. Dorsal view of head (A) and ventral view of pelvic fin (B) of paratype of *Rhinogobius mizunoi* (OMNH-P 40617, a male, 73.6 mm SL), stained with alizarin red. Black circle with black letters F, H, K, and L indicate sensory-canal pores; letter with prime mark indicates the terminal opening if sensory canal. Yellow dots indicate scales along edge of scaled area on nape and occipital region; letters P1, P2, and P3 indicate boundary of anterior extension of scaled area along predorsal midline, boundary of anterior extension of scaled area on side of occipital region, and boundary of most concave point of scaled area between P1 and P2, respectively. Black letters 1–5 indicate number of segmented rays of pelvic fin. Photographed and annotated by T. Suzuki.

Notations of cephalic sensory-canal pores and sensory-papillae rows followed Akihito *et al.* (1984) and Suzuki *et al.* (2012), respectively. Description of the coloration when alive and freshly-collected was based on digital images. The names of colors follow those of Japan Color Research Institute (1995). Notations of points for describing the extension pattern of the predorsal squamation follow those of Oijen *et al.* (2011: fig. 1); namely, the points 1, 2, and 3 indicate the anteriormost point of the scaled area along the predorsal midline, the anteriormost point of the scaled area on the side of the nape-occipital region, and the posteriormost edge of the concavity of the scaled area (between the points 1 and 2), respectively.

Rhinogobius mizunoi **sp. nov.**
(Japanese name: Ruri-yoshinobori)
(Figs 1–6, Table 2)

Rhinogobius brunneus (not of Temminck & Schlegel, 1845): Hayashi in Masuda *et al.*, 1984: 270 (in part: Cobalt type).

Rhinogobius sp. CO; Mizuno in Kawanabe & Mizuno, 1989: 592 (Japan exclusive of east Hokkaido and the Ryukyu Islands); Akihito *et al.*, 2002: 1252 (Japan from Hokkaido southward to Kyushu and Cheju Island, Korea); Suzuki *et al.*, 2004: 454 (Japan from Hokkaido southward to Kyushu and Cheju Island, Korea); Akihito *et al.*, 2013: 1456 (Japan from southwestern Hokkaido southward to Kyushu and Cheju Island, Korea).

Holotype. SPMN-PI 3196, male, 67.2 mm SL, Sato-gawa River, Ochiai-gawa tributaries, Inouzawa-gawa water system, Ochiai, Shimoda, Izu Peninsula, Shizuoka Prefecture, Japan, 34°43'10.9"N 138°56'57.2"E, collected by Y. Kitahara and K. Kano, 22 August 2013.

Paratypes. Five specimens (male and four females, 51.6–77.5 mm SL), collected with holotype: KPM-NI 41338, female, 77.5 mm SL; OMNH-P 40617, male, 73.6 mm SL, a cleared and stained; OMNH-P 40618, female, 61.9 mm SL; OMNH-P 40619, female, 55.2 mm SL; OMNH-P 40620, male, 51.6 mm SL.

Digital images examined. KPM-NR 78800 & 91331, lower reaches of Okitsu-gawa River, Shizuoka Prefecture, Japan, 26 August 2006, 1 m depth, photographed by K. Uchino.

Diagnosis. *Rhinogobius mizunoi* is distinguished from all congeners by having the following unique combination of characters: 13–18 predorsal scales; 33–35 longitudinal scale series; 8 or 9 transverse scale series; 10+16=26 vertebrae; first dorsal fin elongate in male, its distal tip reaching to base of fourth branched ray of second dorsal fin when adpressed; when alive or freshly-collected, cheek with several pale sky spots; caudal fin lacking distinct rows of dark dots; a pair of dark brown blotches at caudal-fin base in young and females.

Description. In the following description of meristics, data from the holotype have an asterisk, and the frequency of each count is given in parentheses following the relevant count. Dorsal-fin rays V-I, 8 (1) or VI-I, 8* (5); anal-fin rays I, 8* (5) or I, 9 (1); pectoral-fin rays 18 (1), 19* (4), or 20 (7); pelvic-fin rays I, 5* (12); segmented cauda-fin rays 9+8* (6); branched caudal-fin rays 7+7* (5) or 8+7 (1); longitudinal scales 33 (1), 34* (2), or 35 (3); transverse scales 9* (5) or 10 (1); scales between origin of dorsal and pectoral fin 9 (1), 10* (3), 11 (1), or 12 (1); predorsal scales 13 (1), 14 (2), 15 (1), 16* (1), 18 (1); P-V 3/II II I I 0/9* (6); vertebrae 10+16=26* (6); gill rakers 3+7 (1).

Proportional measurements are given in Table 2. Body slender, almost cylindrical anteriorly, compressed posteriorly. Head moderately large, slightly depressed. Eye large, located dorsolaterally on head on a vertical line a little before midway between snout tip and posterior margin of preopercle. Interorbital relatively wide, slightly wider than pupil diameter. Cheek somewhat fleshy. Lips thick and fleshy; upper lip slightly protruding beyond lower lip; gape oblique, forming an angle of about 20 degrees with body axis; rear margin of lower jaw extending to and slightly beyond a vertical through anterior margin of eye in female and male, respectively. Anterior naris a short tube without skin flap at its tip; posterior naris a round pore with low rim, closer to anterior naris than to eye. Gill-opening extending anteriorly to a vertical through posterior margin of preopercle. Gill membranes broadly attached to isthmus. No fleshy papilla- or finger-like projections on lateral margin of shoulder girdle. Tongue free from floor of mouth, with rounded anterior margin. Mental flap on chin weakly developed, nearly rectangular. Genital papillae is cone-shaped and oval-shaped in male and female, respectively.

In the following description of the fins, data for the holotype (male) are given first, followed by data for the paratypes in parentheses where different. First dorsal fin originated 1.5 times the width of the orbit-diameter behind from uppermost of pectoral-fin base, falcate (nearly semicircular in females); second spine longest but not filamentous; when adpressed, rear tip of first dorsal fin extending to base of fourth branched rays of second dorsal fin (not to origin of second dorsal fin in females). Second dorsal fin originated an orbit-diameter width behind from end of first dorsal-fin base (1.3 orbit-diameter behind in a female); second dorsal fin lower than first dorsal fin (equal to first dorsal fin in a female); all segmented rays of second dorsal fin branched; seventh branched ray longest (second, third, fourth, fifth or sixth in females); when adpressed, rear tip of second dorsal fin reaching to procurrent rays of caudal fin (not reaching to caudal fin in females); posteriormost base of second dorsal fin at a vertical through posteriormost of anal-fin base. Anal fin originated below base of first branched ray of second dorsal fin (below base of second branched ray in one, between first and second branched ray bases in four); anal fin lower than second dorsal fin; all segmented rays branched; seventh branched ray longest (sixth in a male, fourth in a female, fourth to sixth in two females); rear tip not reaching to caudal fin when adpressed. Pectoral fin elliptical; rear tip reaching to a vertical through interspace between base of sixth spine and posterior end of base of first dorsal fin (to a vertical through base of sixth spine of first dorsal fin in two females). Pelvic fins fused medially via a frenum (between spines) and connecting membrane (between innermost

Table 2. Measurements for *Rhinogobius mizunoi*.

Cat. No.	SPMN-PI 3196	OMNH-P 40617	OMNH-P 40620	KPM-NI 41338	OMNH-P 40618	OMNH-P 40619
Type	Holotype	Paratypes				
Sex	Male	Male			Female	
Standard length (mm)	67.2	73.6	51.6	77.5	61.9	55.2
% in SL						
Head length	32.7%	32.6%	29.5%	27.1%	29.2%	28.8%
Predorsal length	39.9%	39.5%	37.8%	38.2%	39.1%	38.0%
Snout to 2nd dorsal origin	61.0%	60.6%	57.4%	61.7%	61.4%	61.6%
Snout to anus	58.0%	57.7%	55.4%	58.3%	59.8%	57.2%
Snout to anal fin origin	62.5%	62.1%	60.1%	63.9%	63.5%	62.9%
Prepelvic length	30.2%	27.9%	28.9%	24.5%	25.0%	23.6%
Caudal peduncle length	26.6%	26.4%	26.9%	25.7%	26.0%	26.3%
Caudal peduncle depth	14.7%	14.8%	14.7%	14.2%	14.1%	14.5%
1st dorsal fin base	17.6%	17.7%	17.4%	19.2%	18.6%	19.2%
Length of longest D1 spine	28.3%	25.5%	22.1%	17.0%	14.7%	18.1%
2nd dorsal fin base	16.5%	15.6%	17.8%	16.1%	16.8%	15.8%
Length of last D2 ray	22.2%	25.5%	15.9%	13.5%	12.1%	12.7%
Anal fin base	14.3%	13.0%	15.5%	12.5%	12.9%	13.0%
Caudal fin length	24.7%	25.0%	23.8%	23.5%	23.6%	24.6%
Pectoral fin length	25.1%	23.8%	23.6%	22.3%	22.8%	25.0%
Pelvic fin length	16.4%	15.5%	17.4%	15.9%	17.0%	16.7%
Body depth of pelvic fin origin	17.1%	16.0%	17.8%	17.3%	17.3%	15.9%
Body depth of anal fin origin	17.1%	15.4%	17.4%	17.2%	17.0%	17.6%
Body width of anal fin origin	13.4%	12.6%	15.3%	14.5%	13.9%	13.8%
Pelvic fin origin to anus	29.0%	29.9%	29.1%	34.1%	34.2%	35.3%
% in HL						
Snout length	35.0%	35.4%	36.2%	40.0%	33.7%	34.0%
Eye diameter	17.7%	16.7%	18.4%	19.0%	18.8%	20.1%
Postorbital length	50.0%	52.9%	52.0%	51.4%	49.2%	47.8%
Cheek depth	28.6%	26.7%	29.6%	29.5%	27.6%	25.2%
Head width in upper gill opening	43.6%	39.6%	45.4%	56.2%	49.7%	50.3%
Head width in maximum	63.6%	64.6%	63.8%	78.6%	68.5%	68.6%
Head depth in maximum	52.7%	50.0%	58.6%	61.9%	58.0%	54.7%
Bony interorbital width	13.6%	13.3%	14.5%	14.3%	14.4%	13.8%
Lower jaw length	43.2%	42.9%	37.5%	42.4%	35.9%	35.8%
% in Caudal peduncle length						
Caudal peduncle depth	55.3%	56.2%	54.7%	55.3%	54.0%	55.2%

Abbreviations: SL: Standard Length; D1: First dorsal fin; D2: Second Dorsal fin; HL: Head length

rays), forming a rounded disc (longitudinally-elongate oval in two, transversely-elongate oval in one); rear tip reaching to a vertical through base of fifth spine of first dorsal fin (to a vertical through interspace between bases of third and fourth spines in a male, between bases of fourth and fifth spines in a male, between bases of second and third spines in three females); round membranous lobe developed around distal tip of pelvic-fin spine; first branched ray of pelvic fin longer than pelvic-fin spine; fifth pelvic-fin ray divided into four primary branches just above its base (Fig 1B). Caudal fin elliptical (round fan-shaped in four).

Scales on body moderately large and ctenoid posteriorly, small and cycloid anteriorly. Base of pectoral fin with some small cycloid scales. Belly with small cycloid scales. A small cycloid scale between genital papillae and origin of anal fin in alizarin-red stained paratype (OMNH-P 40617). Anterior part of predorsal area naked. Predorsal squamation with trifurcate anterior edge and anterior extension of middle series extending to beyond above through canal pore H' (Fig. 1A). The other part of head and prepelvic area naked.

Teeth in both jaws conical, inwardly curved; upper jaw

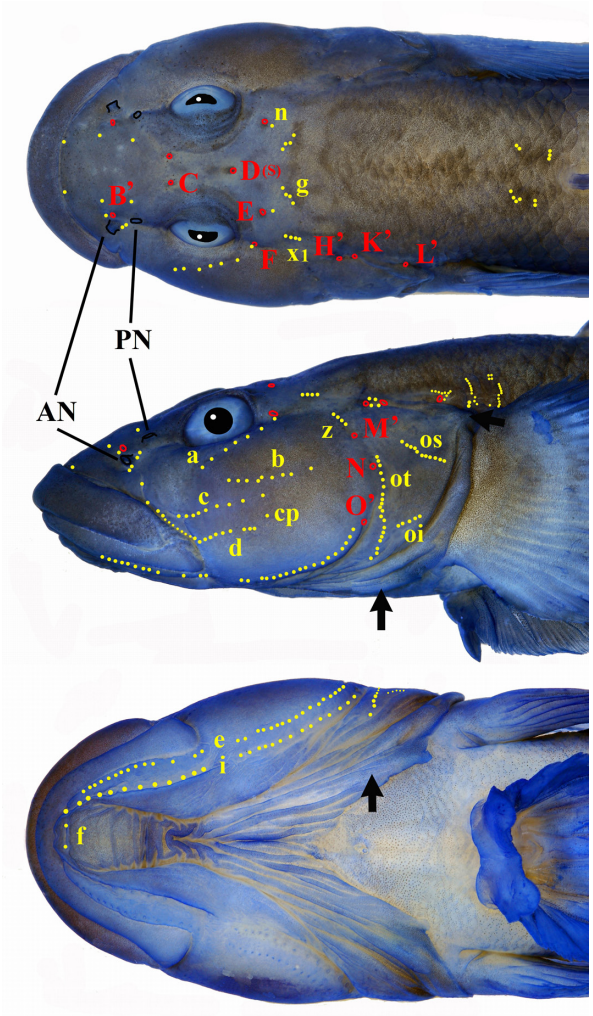

Fig. 2. Dorsal (top), lateral (middle), and ventral (bottom) views of head of holotype of *Rhinogobius mizunoi* (SPMN-PI 3196, male, 67.2 mm SL), showing cephalic sensory pores and papillae. Red circle with red letters indicate sensory canal pores (letters with prime marks indicate terminal opening of sensory canal); yellow dots indicated by yellow letters represent sensory papillae; black arrows show positions of dorsal and ventral most of gill opening. Abbreviations: AN, anterior narial pore; PN, posterior narial pore. Photographed and annotated by T. Suzuki.

Fig. 3. Dorsal (top), lateral (middle), and ventral (bottom) views of head of holotype of *Rhinogobius mizunoi* (SPMN-PI 3196, male, 67.2 mm SL), showing freshly-collected coloration. Photographed by T. Suzuki.

with 3–4 rows of medium-sized teeth anteriorly; middle and posterior parts of upper jaw with an outer row of eight large teeth, and anterior half of central part with an inner row of medium-sized teeth; anterior half of lower jaw with an outer row of nine large teeth, and two to three inner rows of medium-sized teeth, central part with an inner medium-sized tooth, posterior part with an outer large tooth.

Cephalic sensory systems are illustrated in Fig. 2. Nasal extension of anterior oculoscapular canal with terminal pore B' located above anterior naris. Anterior interorbital sections of anterior oculoscapular canal separated, with paired pore C and a single pore D. Pore E present just behind posterior edge of eye. Lateral section of anterior oculoscapular canal with anterior pore F and terminal pore H'. Posterior oculoscapular canal with two terminal pores K' and L'. Gap between anterior and posterior oculoscapular canals slightly smaller than length of posterior oculoscapular canal. Preopercular canal present, with three pores M', N, and O'. Sensory-papillae row a oblique and uniserial, composed of loosely-arranged papillae, extending anteriorly to a vertical through anterior margin of eye. Row b longitudinal, extending anteriorly to a vertical through middle of eye; its length slightly longer than eye diameter. Rows c and d composed of densely-arranged papillae, extending posteriorly to, or slightly behind, a vertical through posterior margin of eye. Row cp comprising a single papilla. Row f comprising a paired papillae. Anterior end of row oi well separated from a vertical row ot.

Coloration of male (Figs. 3 & 4). Freshly-collected coloration of male holotype is as follows. Ground color

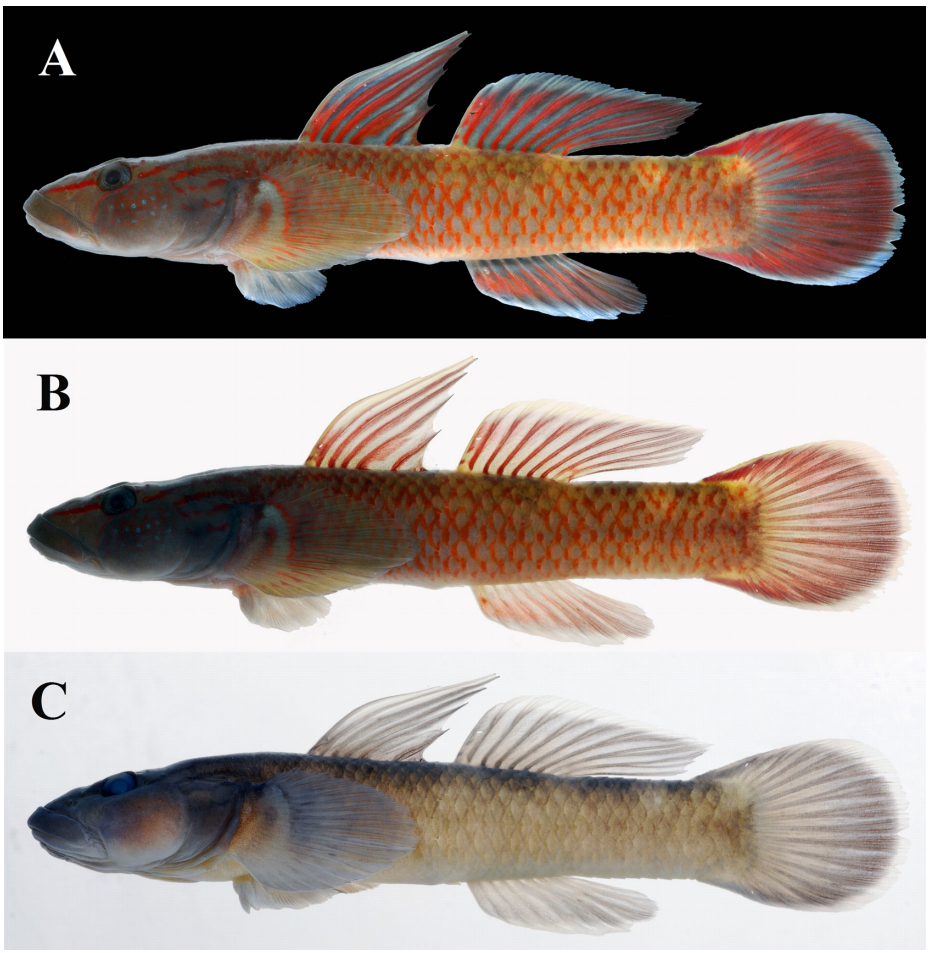

Fig. 4. Freshly-collected (A and B) and alcohol-preserved (C) holotype of *Rhinogobius mizunoi* (SPMN-PI 3196, male, 67.2 mm SL). Photographed by T. Suzuki..

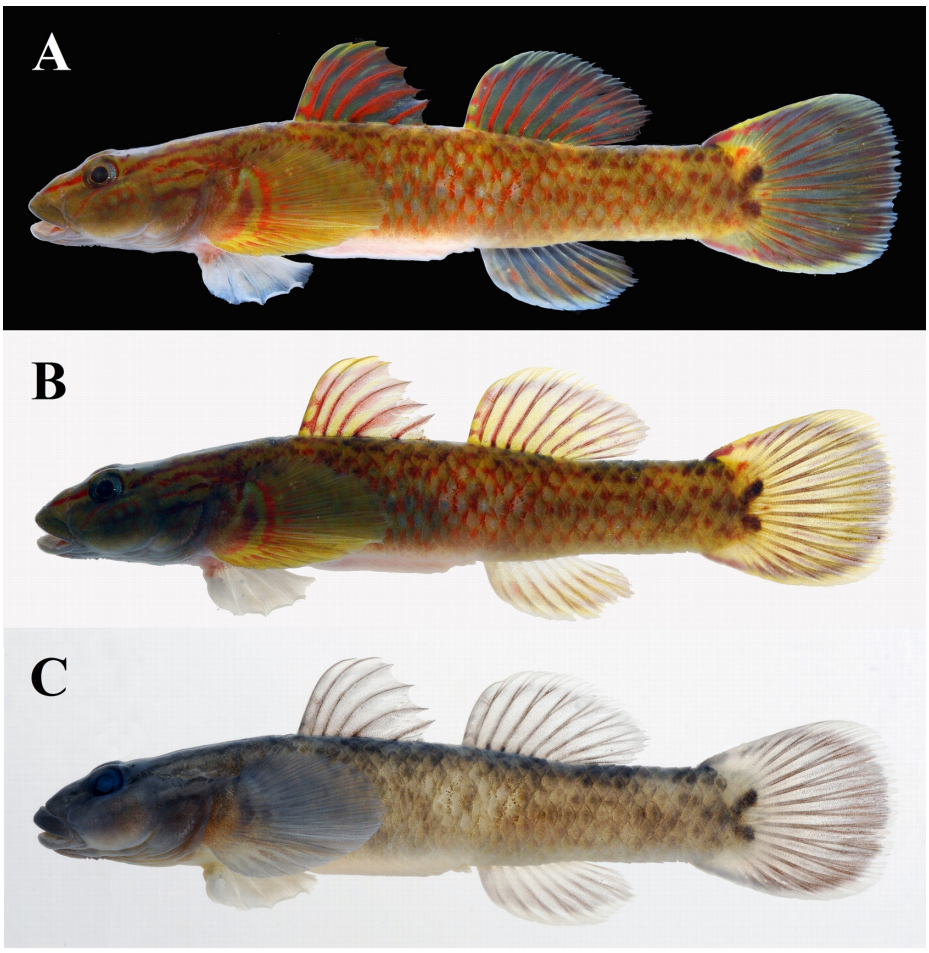

Fig. 5. Freshly-collected (A and B) and alcohol-preserved (C) paratype of *Rhinogobius mizunoi* (OMNH-P 40618, female, 61.9 mm SL). Photographed by T. Suzuki.

Fig. 6. Underwater photographs of male (A, KPM-NR 91331B) and female (B, KPM-NR 78800A) of *Rhinogobius mizunoi*, taking at lower reach of Okitsu-gawa River, Shizuoka Prefecture, Japan. Photographed by K. Uchino.

Fig. 7. Freshly-collected specimens of *Rhinogobius fluviatilis*. A: OMNH-P 18393, male, 53.8 mm SL, Komenotsu-gawa River, Kagoshima Prefecture, Japan; B: OMNH-P 18429, female, 69.8 mm SL, Nabeno-gawa River, Kagoshima Prefecture, Japan. Photographed by T. Suzuki.

of head and body light bluish gray and light bluish gray to yellowish gray, respectively. Ventral side of belly white. Cheek with 10 or more small pale-sky spots and a deep pink network pattern. Snout with a vivid red oblique stripe between eye and anterior one fourth of upper lip; several irregular-shaped, short vivid-red lines/spots on dorsal surface of snout and interorbital space; dorsoanterior margin of cheek edged by a narrow deep-pink line; upper part of operculum with two oblique vivid red broken stripes. Nape and occipital region with several irregular-shaped, essentially longitudinal or oblique vivid-red stripes. Branchiostegal membrane tinged with orange ventrally, without any distinct markings. Many of scale pockets on body edged by deep yellowish pink. Dorsum of body with four saddle-like, large light-gray blotches; anteriormost one below base of first dorsal fin, middle one below base of second dorsal fin, and the other two on caudal peduncle. Fin membranes grayish white. Vertical fins with deep pink rays; distal margins of dorsal, anal, and caudal fins white; anal fin whitish basally. Base of pectoral fin white with two deep yellowish pink crescent-shaped marks. All reddish, yellowish, and bluish colorations faded after preservation in alcohol (Fig. 4C).

Coloration of female (Fig. 5). Freshly-collected coloration of female resembles that of male, except as follows. Ground color of head, body and fins more yellowish. Cheek spots pale, less in number. Caudal-fin base with a pair of diagonal dark-brown blotches, forming an incomplete, bold C-shape. All reddish, yellowish, and bluish colorations faded after preservation (Fig. 5C).

Coloration when alive (Fig. 6). Coloration when alive in underwater photographs resembles freshly-collected coloration, except as follows. Cheek with more pale-sky spots in number. Many of body scales with pale sky spots, and deep yellowish pink of scale pockets much more indistinct. Lower lip dull pale sky in male. Dorsal side of body with about six (5–7) dark gray saddle-like blotches anteriormost one on nape, middle 3–4 below dorsal fins, and posterior 2–3 on caudal peduncle. Mid-lateral side of body with a longitudinal series of eight large dark-gray blotches.

Distribution. Known from middle reaches or mountain torrents of freshwater streams in Japan (western Hokkaido southward to southern Kyushu) and Cheju Island, Korea (Akihito *et al.*, 2013); sometimes landlocked in freshwater reservoirs (e.g., Mizuno, 1989).

Etymology. The new species is named after Dr. Nobuhiko Mizuno, the former professor of Ehime University, Japan, in honor of his great contribution to our knowledge of the ecology of freshwater fishes in Japan, particularly gobies of *Rhinogobius*.

Comparison. *Rhinogobius* is currently known as the most species-rich freshwater goby genus, comprising 72 described, valid species (Table 1). As indicated by Chen & Shao (1996) and Suzuki *et al.* (2015), the genus *Rhinogobius* is divided into two distinct groups; one comprises only a single species *R. similis* [referred as *Rhinogobius giurinus* (Rutter, 1897), a junior synonym, by many authors including Chen & Shao, 1996; see Suzuki *et al.*, 2015], whereas the other includes all the remaining species. *Rhinogobius similis* differs from the other congeners by having large ctenoid scales on the nape (vs nape naked or with cycloid scales in the others) and several short transverse rows of sensory papillae on the cheek (vs no distinct transverse rows of sensory papillae on cheek) (Suzuki *et al.*, 2015). The new species *R. mizunoi* clearly belongs the latter group, here is treated as within the *Rhinogobius brunneus* complex, following Chen & Shao (1996).

The *Rhinogobius brunneus* complex is divided

Table 3. Comparisons of 35 species of *Rhinogobius* with low or unknown vertebral counts. Morphological data chiefly follow those in references shown in Table 1.

Species	Vertebrae	Predorsal scales	Distal tip of D1 of male (when the fin adpressed)	Vertical dark lines or rows of dark spots on caudal fin
R. aporus	26	0	to 2nd*	present
R. bedfordi	unkown	unkown	to 6th*	present
R. brunneus	26	11–13	to 1st or 2nd*	present
R. bucculentus	unkown	8–10	not to origin**	absent
R. candidianus	25–26	9–19	beyond 2nd*	absent
R. carpenteri	unkown	0–few	to 1st	absent
R. changjiangensis	26	2–3	not to origin**	present
R. cliffordpopei	unkown	0	to 1st*	present
R. delicatus	26	10–14	not to origin**	present
R. fluviatilis	26	13–18	to 3rd*	absent
R. formosanus	26	9–14	to 2nd*	present
R. fukushimai	unkown	2–6	to 1st or 2nd*	present
R. gigas	26	5–16	to 3rd*	present
R. henchuenensis	26	12–16	to 1st*	present
R. imfasciocaudatus	unkown	4	beyond origin**	absent
R. kurodai	26	6–15	mostly not to origin**	mostly absent
R. lanyuensis	26	13–17	to origin**	present
R. leavelli	26	6–16	to 1st*	present
R. maculafasciatus	26	8–12	to origin**	present
R. mizunoi n. sp.	26	13–18	to 4th*	absent
R. nagoyae	26	12–18	to 4th–8th*	present
R. nandujiangensis	25–26	8–11	to 4th or 5th*	present
R. nantaiensis	26	13–17	to 1st or 2nd*	absent
R. ogasawaraensis	26	7–16	to 2nd–6th*	present
R. philippinus	unkown	12–14	not to origin**	absent
R. reticulatus	26–27	3–6	not to origin**	present
R. rubrolineatus	26	3–5	to 1st	absent
R. sagittus	26	3–4	to origin**	present
R. sangenloensis	26	9–12	to origin**	present
R. shennongensis	unkown	5–6	to 3th or 4th*	present
R. sowerbyi	unkown	6–8	unknown	absent
R. variolatus	26–27	8–11	not to origin**	present
R. virgigena	26	10–12	not to origin**	present
R. wuyiensis	26	0–4	to 4th or 5th*	present
R. zhoui	26	10–12	to 2nd*	present

Abbreviations: D1, first dorsal fin; D2, second dorsal fin; *, segmented ray base of D2; **, of D2.

into two distinct groups. One, comprising 37 species (Huang *et al.*, 2016), has almost always 27 or more vertebrae, whereas the others, including 25 species, has lower count of vertebrae (25–27, almost always 26) (e.g., Chen & Kottelat, 2005; Wu & Chen, 2008; Li & Zhong, 2009; Akihito *et al.*, 2013); no information about the vertebral counts are known in the other nine congeners. *Rhinogobius mizunoi*, having 26 vertebrae, is readily distinguished from the first group.

These 35 congeners having low or unknown vertebral counts are listed in Table 3 with selective characters. *Rhinogobius mizunoi* can be distinguished from all others but three species (viz., *R. candidianus*, *R. fluviatilis*, and *R. nantaiensis*) by having the following combination of characters: 13–18 predorsal scales; first dorsal fin elongate in male, extending posteriorly well beyond origin of second dorsal fin (reaching to base of fourth segmented ray in the holotype) when adpressed; no distinct vertical dark lines or rows of dark spots on caudal fin (Regan, 1908a; Aonuma & Chen, 1996; Chen & Shao, 1996; Wu & Chen, 2008; Suzuki & Chen, 2011).

Rhinogobius candidianus and *R. nantaiensis* differ

from *R. mizunoi* in having 12–14 and 11–13 transverse scales, respectively (vs 8–9 in *R. mizunoi*) (Aonuma & Chen, 1996; Chen & Shao, 1996). *Rhinogobius fluviatilis* (Fig. 7), a sympatric species in temperate Japan, is also distinguished from *R. mizunoi* by having: when alive or freshly-collected, no sky spots on the cheek (vs present in *R. mizunoi*); a distinct dark spot at upper base of pectoral fin (vs two deep yellowish pink crescent-shaped marks on the pectoral-fin base; a distinct vertical dark band along the caudal-fin base (vs a pair of diagonal dark brown blotches at caudal-fin base) (Suzuki & Chen, 2011; Akihito *et al.*, 2013).

Several sky spots on the cheek appear to be unique for *R. mizunoi* amongst the described species of *Rhinogobius*, although the fleshly-collected coloration in detail of some non-Japanese species is hitherto unknown. An undescribed species, *Rhinogobius* sp. MO of Mizuno (1989) from the Ryukyu Islands, is known to have bright sky spots on the cheek, but has several vertical rows of dark spots on the caudal fin (e.g., Akihito *et al.*, 2013).

Remarks. *Rhinogobius mizunoi* was one of the best known unidentified species of the genus in Japan. Due to previous confusion in taxonomy of the Japanese species of *Rhinogobius* (see, e.g., Suzuki & Chen, 2011; Suzuki *et al.*, 2015), its identification was left unresolved. Mizuno (1972) first recognized this as a color morph of *R. brunneus* sensu Takagi (1962) from western Shikoku of Japan; he named it as "Nise-o-gata" (meaning "false large morph") in Japanese vernacular, because the size of the adult fish is similar to "Kokusyoku-o-gata" (meaning "blackened large morph"), the other color morph named by him, the "Kokushoku-o-gata" is currently identified as a distinct species *R. fluviatilis* (see Suzuki & Chen, 2011). The "Nise-o-gata", however, renamed as "Ruri-gata" (meaning "cobalt morph") by Mizuno (1976) in reference to many pale sky spots on cheek and body. Subsequently, Mizuno (1989) regarded the morph as a distinct species based on ecological, ethological, and/or molecular genetics evidences, and recognized it as an unidentified species with the provisional name *Rhinogobius* sp. CO (the "CO" is an abbreviation of "Cobalt") or "Ruri-yoshinobori", a Japanese vernacular meaning "a goby of *Rhinogobius* in cobalt". Since then, all of the Japanese ichthyologist used the Mizuno's (1989) provisional name for this species (e.g., Akihito *et al.*, 2013).

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摘　要

鈴木寿之・渋川浩一・藍澤正宏 , 2017. 日本産ハゼ科魚類の 1 新種 *Rhinogobius mizunoi*. 神奈川県立博物館研究報告（自然科学）, (46): 79-95.［Suzuki, T. , K. Shibukawa, & M. Aizawa, 2017. *Rhinogobius mizunoi*, A New Species of Freshwater Goby (Teleostei: Gobiidae) from Japan. *Bull. Kanagawa prefect. Mus.* (*Nat. Sci.*), (46): 79-95.］

静岡県の渓流域から得られたハゼ科ヨシノボリ属の 1 新種を記載した。本種は第 2 背鰭 1 棘 8 軟条、胸鰭 18-20 軟条、背鰭前方鱗数 13-18、縦列鱗数 33-35、横列鱗数 8 または 9、脊椎骨数 10（腹椎）+ 16（尾椎）=26（合計）、雄の第 1 背鰭は伸長し先端は倒すと第 2 背鰭第 4 軟条基部に達すること、生時および生鮮時、頬に青色点があること、尾鰭に縞模様がないこと、雌と幼魚の尾鰭基底の上下に 1 対の暗色横斑があることなどで、同属他種から区別できる。

なお、カラー写真は本報告の web 版（http://nh.kanagawa-museum.jp/research/bulletin/）を参照。

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