

## Seahorses of the genus *Hippocampus* (Syngnathidae) from Kagoshima Prefecture, southern Japan, with a new record of *H. mohnikei* Bleeker, 1853

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### ■ Introduction

The seahorse genus *Hippocampus* Rafinesque, 1810, belonging to the family Syngnathidae which also includes pipefishes and seadragons (Mobley, 2011), comprises 42 valid species (Lourie et al., 2016; Zhang et al., 2016). In Japanese waters, the genus is currently represented by eight species viz., *Hippocampus bargibanti* Whitley, 1970; *H. coronatus* Temminck and Schlegel, 1850 (Japanese name: Tatsuno-otoshigo), *H. histrix* Kaup, 1856 (Ibara-tatsu), *H. kelloggi* Jordan and Snyder, 1901 (O-umiuma), *H. kuda* Bleeker, 1852 (Kuro-umiuma), *H. mohnikei* Bleeker, 1853 (Sango-tatsu), *H. sindonis* Jordan and Snyder, 1901 (Hana-tatsu) and *H. trimaculatus* Leach, 1814 (Takakura-tatsu) (Lourie et al., 2004; Motomura et al., 2010; Senou, 2013; Lourie et al., 2016; Motomura and Harazaki, 2017).

Apart from *H. mohnikei*, the above species have all been recorded from Kagoshima Prefecture (Kagoshima City Aquarium Foundation, 2008; Motomura et al., 2010; Senou, 2013; Matsunuma, 2014; Iwatsubo et al., 2016; Motomura and Harazaki, 2017), Japanese records of the former having been limited to waters from Hokkaido to Ehime and off Kumamoto prefectures (Yagi et al., 2011; Senou, 2013). A single specimen, collected from off Chiringa-shima island, Ibusuki, Kagoshima Bay and described herein, represents the first confirmed record of the species from Kagoshima Prefecture. In addition, the fish diversity surveys conducted off Kagoshima Prefecture since 2006 by the Kagoshima University Museum (KAUM) has resulted in more than 100,000 specimens

collected and deposited in the museum. These include examples of six of the eight species of *Hippocampus* recorded in Japan.

### ■ Methods

Counts and proportional measurements [made with digital calipers to the nearest 0.1 mm] followed Lourie (2004), with Japanese and scientific names following Senou (2013) and Lourie et al. (2016). Each voucher specimen included the registration number and collection locality. Total length [defined as the sum of the head, trunk and tail length following the curve of the body], head length and snout length are abbreviated as TL, HL and SnL, respectively. Descriptive characters are based solely on Kagoshima specimens examined in this study.

*Hippocampus coronatus* Temminck and Schlegel, 1850 Tatsuno-otoshigo (Fig. 1)

**Materials examined.** 4 specimens (19.5–100.0 mm TL). KAUM–I. 12745, 100.0 mm TL, KAUM–I. 12746, 92.1 mm TL, off Nagashima Station, Kagoshima University Fisheries, Naga-shima island, Naga-shima islands, 12 Oct. 2007, 5 m, M. Yamada; KAUM–I. 19885, 51.5 mm TL, off Nagashima Station, Kagoshima University Fisheries, Naga-shima island, Naga-shima islands (32°13'22"N, 130°10'31"E), 13 Feb. 2008, hand net, Kagoshima City Aquarium, KAUM–I. 27774, 19.5 mm TL, off Kasasa, Minami-satsuma (31°25'44"N, 130°11'49"E), 2 June 2010, set net, 27 m, M. Itou.

**Description.** Trunk rings 10; tail rings 38–40; snout long (HL/SnL: 2.3–2.5); dorsal-fin base with 2 trunk rings and no tail rings; dorsal-fin rays 14; pectoral-fin rays 12; coronet distinctly high and turned back; most trunk and tail angles without spines.



Fig. 1. *Hippocampus coronatus*, KAUM-I. 12746, 92.1 mm TL, off Nagashima Station, Izumi.

**Distribution.** Japan (Pacific and Japan Sea coasts from Aomori to Wakayama prefectures, and Aomori to northern Kagoshima prefectures, respectively, and southern Korea (Senou, 2013; Lourie et al., 2016). In Kagoshima Prefecture, this species has been reported from Naga-shima island, Izumi, northwest coast of Satsuma Peninsula (Senou, 2013; this study) and Kasasa, west coast of Satsuma Peninsula (this study).

*Hippocampus histrix* Kaup, 1856  
Ibara-tatsu (Fig. 2)

**Materials examined.** 3 specimens (66.0–230.6 mm TL). KAUM-I. 62299, 66.0 mm TL, Uchinoura Bay, Kimotsuki (31°17'N, 131°05'E), 19 June 2014, set net, K. Koeda; KAUM-I. 80296, 230.6 mm TL, KAUM-I.



Fig. 2. *Hippocampus histrix*, KAUM-I. 80297, 193.9 mm TL, off Mihama, Tanega-shima island.

80297, 193.9 mm TL, off Mihama, Tanega-shima island (30°44'N, 131°59'E), 3 Oct. 2015, gill net, 20 m, FV An'ei-maru.

**Description.** Trunk rings 11; tail rings 35–36; snout long (HL/SnL: 1.9–2.0); dorsal-fin base with 2 trunk rings and 1 tail ring; dorsal-fin rays 18; pectoral-fin rays 16–17; coronet with four sharp spines; long sharp spines on trunk and tail.

**Distribution.** Indo-Pacific, from southern Africa to Japan, Australia, Samoa, French Polynesia and the

Hawaiian Islands (Lourie et al., 2016). In Kagoshima Prefecture, *H. histrix* has been reported previously only from Yaku-shima island [Osumi Islands] (Ichikawa et al., 1992; Motomura et al., 2010; Motomura and Harazaki, 2017). It is newly recorded from Uchinoura Bay, east coast of Osumi Peninsula and Tanega-shima island [Osumi Islands].

***Hippocampus kelloggi*** Jordan and Snyder, 1901  
O-umiuma (Fig. 3)

**Materials examined.** 5 specimens (83.2–350.0 mm TL). KAUM-I. 21226, 157.9 mm TL, off Chiringa-shima island, Ibusuki (31°16'38"N, 130°40'18"E), 8 July 2009, set net, 25 m, Orita Fisheries; KAUM-I. 30369, 83.2 mm TL, Kawajiri Fishing Port, Ibusuki (31°10'N, 130°32'E), 5 Mar. 2010, set net, 40 m, T. Ose; KAUM-I. 411, 87.7 mm TL, east of Sakinoyama, Minami-satsuma (31°25'44"N, 130°11'49"E), 8 Aug. 2006, set net, 27 m, M. Itou; KAUM-I. 11013, 350.0 mm TL, Sashiki-shima island, Minami-satsuma (31°24'55"N, 130°12'12"E), 30 July 2008, set net, 10 m, I. Kamimura; KAUM-I. 44953, 155.9 mm TL, Matsu-shima island, Minami-satsuma (31°25'06"N, 130°12'32"E), 11 Oct. 2011, set net, 20 m, M. Itou.

**Description.** Trunk rings 11; tail rings 38–41; snout long (HL/SnL: 2.0–2.3); dorsal-fin base with 2 trunk rings and 1 tail ring (1 specimen with 2 tail rings); dorsal-fin rays 17–20; pectoral-fin rays 17–18; coronet distinctly high with five short spines; low, bluntly tipped spines on trunk and tail.

**Distribution.** Indo-West Pacific, from eastern Africa to Japan and Australia (Lourie et al., 2016). In Kagoshima Prefecture, this species has been recorded from the East China Sea coast of Satsuma Peninsula and Amami-oshima island [Amami Islands] (Senou, 2013; this study).

***Hippocampus kuda*** Bleeker, 1852  
Kuro-umiuma (Fig. 4)

**Materials examined.** 14 specimens (44.8–208.7 mm TL). KAUM-I. 19889, 135.0 mm TL, Uchinoura Bay, Kimotsuki (31°17'N, 131°05'E), 5 Oct. 2007, set net, M. Yamada; KAUM-I. 35632, 48.6 mm TL, Kurose Port, Minami-satsuma (31°22'29"N, 130°10'06"E), 18 Sept. 2010, hand net, 4 m, M. Itou; KAUM-I. 58710, 172.0 mm TL, KAUM-I. 58711, 136.9 mm TL, KAUM-I. 58712, 130.5 mm TL, KAUM-I. 58713, 78.5 mm TL, off Bandokorobana National Park, Minamikyushu (31°14'N, 130°26'E),



Fig. 3. *Hippocampus kelloggi*, KAUM-I. 11013, 350.0 mm TL, Sashiki Island, Minami-satsuma.

2013, set net, S. Kato; KAUM-I. 54118, 156.3 mm TL, Shimama Port, Tanega-shima island (30°28'02"N, 130°51'38"E), 15 Apr. 2013, hand net, 2–5 m, M. Takayama; KAUM-I. 21741, 208.7 mm TL, Ambo River, Yaku-shima island (33°18'55"N, 130°39'07"E), 27 July 2009, hand net, 1.5 m, G. Ogihara et al.; KAUM-I. 29110, 103.7 mm TL, Koseda Port, Yaku-shima island (30°24'03"N, 130°38'06"E), 4 May 2010, hand net, 1 m, M. Matsunuma; KAUM-I. 2587, 110.2 mm TL, Uchiumi Bay, Amami-oshima island (28°17'40"N, 129°26'55"E), 5 May 1991, hand net, 1 m; KAUM-I. 32597, 130.0 mm TL, Uchiumi Bay, Amami-oshima island (28°17'20"N, 129°26'43"E), 15 May 2010, hand net, 1 m, KAUM Fish Team; KAUM-I. 91100, 173.0 mm TL, Uken, Amami-oshima island (28°18'N, 129°12'E), June 2016, hand net, T. Fujii; KAUM-I. 39726, 176.7 mm TL, fishing port adjacent to Terasaki coast, Yoron-jima island (27°03'58"N, 128°26'16"E), 8 Aug. 2011, hand net, 1–2 m, KAUM Fish Team; KAUM-I. 55186, 44.8 mm TL, off Maehama, Yoron-jima island (27°01'13"N, 128°26'26"E), 1 July 2013, hand net, 12–15 m, T.





Fig. 4. *Hippocampus kuda*, KAUM-I. 54118, 156.3 mm TL, Shimama Port, Tanega-shima island.

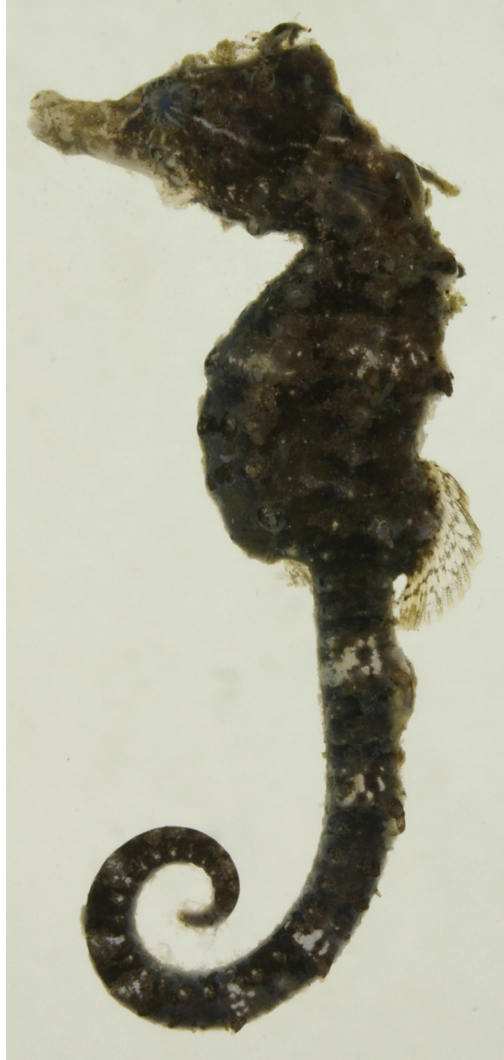


Fig. 5. *Hippocampus mohnikei*, KAUM-I. 17724, 29.2 mm TL, off Chiringa-shima island, Ibusuki.

Trnski.

**Description.** Trunk rings 11; tail rings 34–37; snout long (HL/SnL: 2.1–2.5); dorsal-fin base with 2 trunk rings and 1 tail ring; dorsal-fin rays 17–18; pectoral-fin rays 15–17; coronet high and distinct; low, bluntly tipped spines on trunk and tail.

**Distribution.** Indo-Pacific, from southern Africa to southern Japan, Australia, New Caledonia, Fiji and the Hawaiian Islands (Allen and Erdmann, 2012; Lourie et al., 2016). In Kagoshima Prefecture, this species has been reported from Yaku-shima island [Osumi Islands], East China Sea coast of Satsuma Peninsula and Yoron-jima island [Amami Islands] (Motomura et al., 2010; Matsunuma, 2014; Iwatsubo et al. 2016; Motomura and Harazaki, 2017; this study), and is

newly recorded from Uchinoura Bay, east coast of Osumi Peninsula, Kagoshima Bay, Tanega-shima island [Osumi Islands] and Amami-oshima island [Amami Islands] (this study).

**Remarks.** Although Motomura et al. (2010) and Motomura and Harazaki (2017) listed a single specimen (KAUM-I. 21741, 208.7 mm TL) collected from Yaku-shima island [Osumi Islands] as *Hippocampus kelloggi*, re-examination of the specimen showed it to be *H. kuda*, having 36 tail rings, 17 dorsal-fin rays and 16 pectoral-fin rays.

*Hippocampus mohnikei* Bleeker, 1853

Sango-tatsu (Fig. 5)

**Material examined.** KAUM-I. 17724, 29.2 mm TL, off Chiringa-shima island, Ibusuki (31°16'38"N, 130°40'08"E), 1 Apr. 2009, set net, 25 m, Orita Fisheries.

**Description.** Trunk rings 11; tail rings 38; snout short (HL/SnL: 3.1); dorsal-fin base with 2 trunk rings and 1 tail ring; dorsal-fin rays 15; pectoral-fin rays 12; 2 rounded cheek spines; coronet low, indistinct; low, bluntly tipped spines on trunk and tail.

**Distribution.** Indo-West Pacific, from eastern India to Japan (Lourie et al., 2016; Aylesworth et al., 2016). In Japanese waters, this species has been reported previously from Hokkaido to Ehime and Kumamoto prefectures (Yagi et al., 2011; Senou, 2013), but is here reported from off Chiringa-shima island, Kagoshima Bay.

**Remarks.** *Hippocampus mohnikei* is distinguished from all other members of the genus by having a small body, a maximum adult height of 8 cm, short snout (HL/SnL: 2.8–3.9), pectoral-fin rays usually 13 (range 12–14) and 2 rounded cheek spines (Lourie et al., 2004).

This report is the first record of *H. mohnikei* from Kagoshima Prefecture and the southernmost distributional record of the species in Japanese waters.

*Hippocampus trimaculatus* Leach, 1814

Takakura-tatsu (Fig. 6)

**Materials examined.** 12 specimens (38.9–183.0 mm TL). KAUM-I. 77492, 151.7 mm TL, Uchinoura Bay, Kimotsuki (31°17'31"N, 131°04'49"E), 5 Aug. 2015, set net, 30–35 m, K. Koeda et al.; KAUM-I. 80379, 183.0 mm TL, Uchinoura Bay, Kimotsuki (31°16'55"N, 131°04'49"E), Aug. 2015, set net, 30–35 m, T. Yanagigawa; KAUM-I. 1800, 179.2 mm TL, off Kasasa, Minami-satsuma (31°25'44"N, 130°11'49"E), 28 May 2006, set net, 27 m, M. Itou; KAUM-I. 9300, 61.3 mm TL, KAUM-I. 9301, 38.9 mm TL, KAUM-I. 25542, 72.7 mm TL, off Kasasa, Minami-satsuma (31°25'44"N, 130°11'49"E), 20 Sep. 2007, 13 Oct. 2007, and 22 Dec. 2009, set net, 27 m, M. Itou; KAUM-I. 97158, 174.6 mm TL, off Kasasa, Minami-satsuma (31°25'44"N, 130°11'49"E), 26 Dec. 2016, set net, 27 m, M. Itou; KAUM-I. 58709, 131.5 mm TL, off Bandokorobana National Park, Minamikyushu (31°14'N, 130°26'E), 2013, gill net, S. Katou; KAUM-I. 6852, 130.0 mm TL, off Chiringa-shima island,



Fig. 6. *Hippocampus trimaculatus*, KAUM-I. 25542, 72.7 mm TL, Kasasa, Minami-satsuma.

Ibusuki (31°16'38"N, 130°40'18"E), 24 Oct. 2007, set net, 25 m, Orita Fisheries; KAUM-I. 62312, 135.0 mm TL, off Kumano, Tanega-shima island (30°28'13"N, 130°58'32"E), 14 June 2014, set net, M. Takayama; KAUM-I. 66668, 175.0 mm TL, off Makigou Fishing Port, Tanega-shima island (30°37'40"N, 130°56'53"E), 29 Oct. 2014, hand net, 8 m, M. Yamada; KAUM-I. 66992, 159.4 mm TL, off Osaki, Tanega-shima island (30°39'N, 130°54'E), 19 Nov. 2014, drift net, 20–30 m, M. Takayama.

**Description.** Trunk rings 11; tail rings 38–41; snout long (HL/SnL: 2.0–2.4); dorsal-fin base with 2 trunk rings and 1 tail ring; dorsal-fin rays 17–21; pectoral-fin rays 16–18; coronet low, indistinct; low, bluntly tipped spines on trunk and tail; eye and cheek spines sharp; sometimes 3 dark spots on dorsolateral surface of first, fourth and seventh trunk rings.

**Distribution.** Indo-West Pacific, from western India to Japan and Indonesia (Lourie et al., 2016). In

Kagoshima Prefecture, this species has been reported from Uchinoura Bay, east coast of Satsuma Peninsula, and Nomaike and Ei, East China Sea coast of Osumi Peninsula (Kagoshima City Aquarium Foundation, 2008; Iwatsubo et al., 2016; this study), and is newly recorded herein from Tanega-shima island [Osumi Islands].

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