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A New Seahorse Species (Syngnathidae: *Hippocampus*) From the Great Barrier Reef

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ABSTRACT. A new seahorse, *Hippocampus queenslandicus* (family Syngnathidae) is described from northern Queensland, Australia. Diagnostic characters include meristics: 15–18 dorsal-fin rays, 16–17 pectoral-fin rays, 10–11 trunk rings, 34–36 tail rings, and the presence of body and tail spines, as well as a moderately low coronet with five distinct spines.

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Seahorses, pipefishes and seadragons collectively belong to the family Syngnathidae. Syngnathids occur in coastal waters of temperate and tropical regions of the world in habitats ranging from sand, seagrass beds to sponge, algae, rubble and coral reefs (Vincent, 1997; Kuiter, 2000). A recent revision of the seahorses, genus *Hippocampus*, recognizes 32 species world-wide (Lourie *et al*., 1999). The number of valid Australian seahorse species has been estimated at seven (Gomon, 1997) and 13 (Lourie *et al*., 1999).

Materials and methods

A total of 226 specimens (height range: 56–143 mm, 111 males, 115 females) of a new *Hippocampus* species, together with five specimens of *H. zebra* Whitley, 1964, and four of *H. dahli* Ogilby, 1908, were collected between October 1997 and December 1998. Seahorses found dead in trawl nets were immediately frozen. Upon return to shore, frozen seahorses were placed in FAACC (formaldehyde–acetic acid–calcium chloride fixative) for 48 hours then removed to 100% ethanol.

Macroscopic description of seahorses included sex, number of body segments and colour morphs. Standard seahorse measurement protocol was followed (Lourie *et al*., 1999). Meristic values were recorded to within 0.1 mm using dial callipers and include; height (measured from top of crown to tip of tail, HT), wet weight, head length (HL), snout length and snout depth, eye diameter (horizontal measurement of the left eye), tail length, dorsal-fin length (length of fin base) and abdominal width. In males, the pouch length (measurement from top of opening slit to ventral point where pouch meets tail) was also recorded. Using a stereo dissector the number of rays in the dorsal, anal and pectoral fins of each individual were counted. All specimens examined, including types, were collected by the author. Types are deposited in the Museum of Tropical Queensland in Townsville (QM), Museum Victoria (NMV) and the Australian Museum, Sydney (AMS).

Hippocampus queenslandicus n.sp.

Hippocampus species 4 (Kuiter, 2000)

HOLOTYPE, QM I24445, ♂, HT 103.9 mm, collected by trawl, 50 m depth off John Brewer Reef, 18°37'S 147°03'E, October 1999. PARATYPES: QM I24446 ♀, HT 102.8 mm, collected with holotype; NMV A 21578 ♂, collected by trawl, 50 m depth off Britomart Reef, 18°14'S 146°35'E, February 1999; NMV A 21579 4♀♀, collected by trawl, 50 m depth off Britomart Reef, February 1999; AMS I.40832–001 ♀, HT 100 mm, collected by trawl, 40 m depth off Bait Reef, 19°47'S 149°06'E, December 1998; AMS I.40833–001 ♂, HT 111.2 mm, collected by trawl, 50 m depth, off John Brewer Reef, 18°37'S 147°03'E, November 1998.

Non-type material: 217 specimens, 115♀♀, 111♂♂, (HT range 56–143 mm), collected by trawl, 30–50 m depth, north Queensland, Great Barrier Reef, October 1997–December 1998.

Diagnosis. Number of dorsal fin-rays 15–18, (17 in 67% of specimens). Pectoral fin-rays 16–17, (17 in 77% of specimens). Snout length 35.9–54.2%, snout depth HL 8.2–11.2%; coronet moderately low HT 2.3 mm (2.2–2.4 mm) with 5 spines; inferior tail ridge with moderate spines along pouch section of males, filaments absent; nasal spine absent; 1–2 cheek spines, length 1.4 mm (1.2–1.8 mm); eye spine present, 1.1 mm (0.9–1.5 mm) in length; first trunk ring spine large, 2.8 mm (2.4–2.9 mm) in length; lateral head spine 1.8 mm (1.17–2.1 mm) in length; trunk rings 10 or 11; tail rings 34–36.

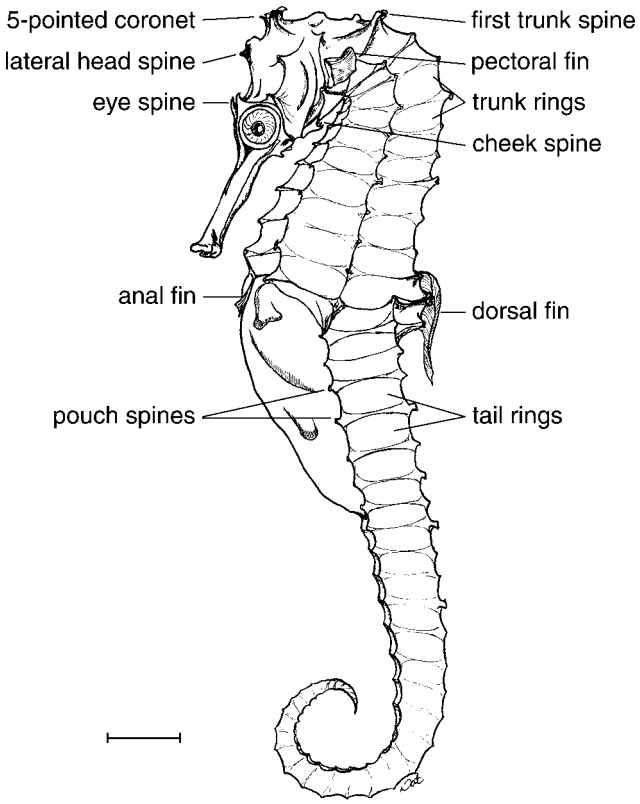

Figure 1. Composite diagram of male *Hippocampus queenslandicus*. Scale 1 cm.

Description. Values are for the holotype, with ranges given between parentheses based on other material examined (Table 1). Holotype height (HT) 103.9 mm (56–143.4 mm). Wet weight of holotype 6.89 g (1.8–14 g). The head prominent and relatively mobile, maintained at an angle of approximately 90° to the axis of the trunk. Head length (HL) 27.9% HT (30.3–35.8). Snout length 47% HL (35.9–54.2). Snout depth 9.3% HL (8.2–11.2). Eye diameter 11.1% HL (5.2–16.4). Abdominal width 14.5% HT (12.8–23.0). Tail length 51% HT (37.8–64.4). Holotype pouch length 23% HT (11.2–27.7). Colour patterns vary among individuals (see colour photos in Kuiter, 2000: 38–39); holotype orange; colour range among paratypes: red, purple, white, brown, silvery grey and orange.

Table 1. Morphometric values for *Hippocampus queenslandicus* holotype and opther specimens (paratypes and non-type material).

	holotype (mm)	holotype proportion	n	range (mm)	range proportion
height (HT)	103.9	—	226	56–143.4	—
head length (HL)	29.0	27.9% HT	226	17–39.7	30.3–35.8% HT
snout length	13.6	47.0% HL	226	6.1–18.6	35.9–54.2% HL
snout depth	2.7	9.3% HL	226	2.3–3.1	8.2–11.2% HL
eye diameter	3.2	11.1% HL	226	1.2–4.8	5.2–16.4% HL
abdominal width	15.1	14.5% HT	226	7.2–28.9	12.8–23% HT
tail length	53.2	51.0% HT	226	28–81.3	37.8–64.4% HT
pouch length	23.8	23.0% HT	111	11.2–33	11.2–27.7% HT
wet weight (g)	6.9	—	226	1.8–14.0	—

Table 2. Selected meristic values for three *Hippocampus* species; data from Lourie *et al*. (1999) marked by asterisk.

species	dorsal fin-rays (mode)	pectoral fin-rays (mode)	anal fin-rays	trunk rings (mode)	tail rings (mode)
H. queenslandicus	15–18 (17)	16–17 (17)	4	10–11 (10)	34–36
H. taeniopterus *	17–18	15–18 (16)	4	11	34–38
H. spinosissimus *	16–20	16–19 (17)	4	11	33–39

The holotype coronet is moderately low and has five distinct, pointed spines, forming a pentamerous crown (Fig. 1). A single distinguishable spine occurs above each orbit, termed "eye spine" (length in holotype 1.1 mm). A single prominent lateral spine on the sides of the head preceding the coronet, termed "head spine" is apparent (length in holotype 1.8 mm). Holotype has one large cheek spine, some paratypes with 2, length 1.4 mm. The first spine on the dorsal first trunk ring is extremely prominent, (length 2.8 mm in holotype, Fig. 1). Inferior tail ridge with moderate spines along pouch section of males. Nasal spine is absent in this species. Filaments are absent in this species.

Holotype possesses 10 trunk rings (range 10–11) and 34 tail rings (range 34–36), with the trunk of moderate length. The male pouch occupies most of the abdominal cavity and is ventral to the last two trunk and first seven tail segments. The dorsal fin is relatively small with 17 rays (range 15–18) and a length of 8.0 mm (range 5–10.5 mm). The number of pectoral fin-rays in holotype is 17 (range 16–17) and there are 4 anal fin-rays.

Distribution and ecology. *Hippocampus queenslandicus* was recorded from Feather Reef (17°00'S 146°10'E), East of Innisfail in the northern section of the Great Barrier Reef, to Bait Reef (19°47'S 149°06'E). The highest recorded numbers over the 14–month sampling period were at John Brewer Reef (18°37'S 147°4'E), East of Ingham. The species was collected by trawl, at depths between 30 and 50 m and was usually caught in a sponge or seagrass habitat, often attached to hard and soft coral species.

Comparisons. Species in the genus *Hippocampus* are often distinguished by fin-ray counts together with number of body, dorsal and tail rings (Whitley & Allen, 1958; Lovett, 1969; Vari, 1982; Lourie *et al*., 1999).

Along with this new species there are a number of other seahorse species occurring in the north Queensland waters of the Great Barrier Reef, namely *Hippocampus zebra* Whitley, 1964, *H. bargibanti* Whitley, 1970, *H. dahli* Ogilby, 1908, *H. taeniopterus* Bleeker, 1852, and an undescribed species: the wing-spined seahorse (Lourie *et al*., 1999; Kuiter, 2000). *Hippocampus zebra* is a small species (HT range in this study 79.2–88.4 mm), with distinctive black (or dark brown) and white stripes over its external body and head, clearly differentiating it from *H. queenslandicus*. *Hippocampus bargibanti* differs from *H. queenslandicus* by its small size (adult height < 20 mm) and its "fleshy" appearance, mostly without recognizable body rings and its extremely short snout. The external surface of *H. dahli* is relatively smooth, with reduced, low spines that form ridges around each body segment, in contrast to the spiny external surface of *H. queenslandicus*. *Hippocampus dahli* is long, slender and thin, with a narrow head, flattened body shape and with the coronet laterally flattened. The wing-spined seahorse often displays filaments on the larger spines of the head and back, clearly differing from *H. queenslandicus* which completely lacks filaments.

Hippocampus queenslandicus superficially resembles two other species of the genus, *H. taeniopterus* and *H. spinosissimus* Weber, 1913. *Hippocampus queenslandicus* differs in its spinous ornamentation and fin-ray counts (Table 2). *Hippocampus taeniopterus* a species often confused with *Hippocampus kuda* Bleeker, 1852 (see Kuiter, 2000), is a commonly occurring inshore species in the northern section of the Great Barrier Reef. *Hippocampus taeniopterus* differs from *H. queenslandicus* in having 17–18 dorsal fin-rays, 15–18 (mode of 16) pectoral fin-rays, 11 trunk rings and 34–38 tail rings (Table 2). *Hippocampus taeniopterus* has a deep cheek area, a thick snout and a deep abdominal area giving it a more rounded and stout appearance than *H. queenslandicus*. *Hippocampus taeniopterus* lacks well-developed spines, appearing relatively smooth, with a number of irregularly spaced, rounded tubercles covering the external surface (Dawson, 1986; Lourie *et al*., 1999; Kuiter, 2000), in contrast to the spinous exterior of *H. queenslandicus*. The coronet of *H. taeniopterus* is more rounded than the five-spined coronet of *H. queenslandicus* and the coronet points backwards on the head of *H. taeniopterus*. Male *H. taeniopterus* are often drab coloured with striations over the head and small black spots over the trunk; females are often yellow with several large dark spots on the trunk. Male and female *H. queenslandicus* often are bright orange or red. Another notable difference between these two species is the differing sizes of the young: the average height of juvenile *H. queenslandicus* is 5.63 mm, whereas juvenile *H. taeniopterus* examined by Rick Brayley (pers. comm., 1999) are almost three times larger.

Hippocampus spinosissimus has similar meristic values to those of *H. queenslandicus* (Table 2). However, *H. spinosissimus* has a large eye spine, a medium to high coronet with four or five spines, a generally spinous exterior and strongly developed, blunt spines bordering the pouch in males (Lourie *et al*., 1999). By comparison, *H.*

queenslandicus, has a relatively reduced spinous exterior, lacks long pouch spines and has a shorter coronet with four or five spines. *Hippocampus spinosissimus* has not been recorded in the northern waters of the Great Barrier Reef to date.

In summary, *H. queenslandicus* differs in meristic values and physical appearance from other seahorse species found in the northern section of the Great Barrier Reef and from similar species found elsewhere (Lourie *et al.*, 1999; Kuiter, 2000). This species seems restricted to the northeast coast of Queensland, Australia, hence the name *H. queenslandicus*.

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