

HIMANTURA KITTIPONGI, A NEW SPECIES OF FRESHWATER WHIPTAILED STINGRAY FROM THE MAEKHLONG RIVER OF THAILAND (ELASMOBRANCHII, DASYATIDIDAE)

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ABSTRACT

Himantura kittipongi new species is described from five specimens recently collected in the Maekhlong River near Kanchanaburi, Thailand. It appears to be related most closely to the distinctively colored *H. signifer*, which also occurs in the Maekhlong. The two species differ in coloration of the dorsal and ventral disc surfaces and of the tail and in the substantial development of denticulation in *H. kittipongi* and relative lack of it in *H. signifer*. There are also some slight differences in meristic characters. *Himantura signifer* has 13–14 spiral valve turns whereas *H. kittipongi* has only 11–12; *H. kittipongi* also has a much higher number of tooth rows in the tooth band of the lower jaw.

INTRODUCTION

Hugh M. Smith recorded only two species of Dasyatididae or whiptailed stingrays from the freshwaters of Thailand (SMITH, 1945). One was the widely distributed marine and estuarine flag-tailed stingray *Dasyatis* or *Hypolophus sephen* (now placed in *Pastinachus*). The other was the poorly known *Dasyatis bleekeri* (BLYTH 1860), probably a marine species. It is now placed in *Himantura*. Smith's Thai freshwater locality records for both species are doubtful.

Recent workers on flag-tailed stingrays recognize that the genus *Pastinachus*, previously regarded as monospecific, probably involves several poorly known species. Those entering freshwater may not be the same as the widely distributed species *P. sephen*. In Thai waters the species *P. sephen* apparently is common (or was until recently) in the Gulf of Thailand and in the Andaman Sea. The same or a related species occurs (or formerly occurred) in the Chao Phraya as far upstream as Ayuthaya. Smith's statement that it reproduces in Bung Borapet is almost certainly due to confusion with another species. It probably refers to *H. signifer*, a species unknown to Smith (Fig. 1).

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From the excellent figure drawn by Luang Masya published by SMITH (1946: pl. 1) it is clear that the species he identified as *H. bleekeri* is the same as *H. oxyrhyncha* (Sauvage 1878). Unfortunately there is no indication of locality for the fish in this drawing. Almost certainly it did not come from the Nan River at Paknampo, the locality mentioned for three specimens of this species by SMITH (1945: 42). These specimens, which we have not located, probably again were *H. signifer*. *Himantura oxyrhyncha* (Sauvage 1878) (senior synonym of *H. krempfi* Chabanaud 1923: see DEYNAT FERMON, 2001) inhabits mainly estuarine and tidal habitats in large lowland rivers. In Thailand it occurs in the Chaophraya from Samut Prakan (near the mouth) to Ayuthaya (about the limit of tidal influence) and in the Bangpakong from its mouth to Chachaerngsao. Reports from the Maekhlong have not been verified.

Knowledge of the freshwater stingrays of Thailand and of Indo-China including the Mekong was essentially limited to the information provided by Smith until 1982. In that year COMPAGNO & ROBERTS (1982) described *H. signifer* based on several specimens from the Sungai Kapuas of western Borneo and one juvenile specimen from Bung Borapet in the Chao Phraya basin of central Thailand. Then in 1987 *Dasyatis laosensis* was described from the Mekong River of Thailand and Laos (ROBERTS & KARNASUTA, 1987). This species, also reported from the West River basin in southern China, still is not known from any other rivers in Thailand. Three years later the giant freshwater whiptailed stingray *Himantura chaophraya* was described from specimens caught in the Chao Phraya (MONKOLPRASIT & ROBERTS, 1990). This species was reported also from the Mekong, Maekhlong and Tapi river systems of Thailand. Reports of *H. chaophraya* from rivers in northern Australia refer to a closely related but much smaller species (Mabel Manjaji Matsumoto and Peter Last, pers. comm., May 2005).

Recent collections from the Maekhlong in western Thailand, well above the tidal influence and in water that is entirely fresh, include yet another undescribed species of freshwater stingray. It is closely related to *H. signifer*, a freshwater species also known from the Maekhlong, but differs strikingly from it in coloration, and in having a pearl organ throughout life and extensive denticulation of the central part of the dorsal disc surface. There also are differences between the two species in disc shape, number of tooth rows in the lower tooth band, and number of spiral valve turns.

Besides *H. kittipongi* the following species of Dasyatidae or whiptailed stingrays are known from the fresh waters of Thailand: *H. signifer*, *H. oxyrhyncha*, *H. chaophraya*, *Dasyatis laosensis*, and *Pastinachus* cf. *sephen*.

The type specimens of the new species are deposited in the fish collections of the Zoological Reference Collection, Raffles Museum of Biodiversity, National University of Singapore (ZRC) and the National Inland Fisheries Institute, (recently Bureau of Inland Fisheries Research and Development) Department of Fisheries, Bangkok, Thailand (NIFI).

Himantura kittipongi new species

Figures 2–6

Holotype (Fig. 2).—ZRC 50381, female, 264 mm disc width, Thailand, Menam Maekhlong near Kanchanaburi, Kittipongs Jarutanin, 30 Jan 2004.

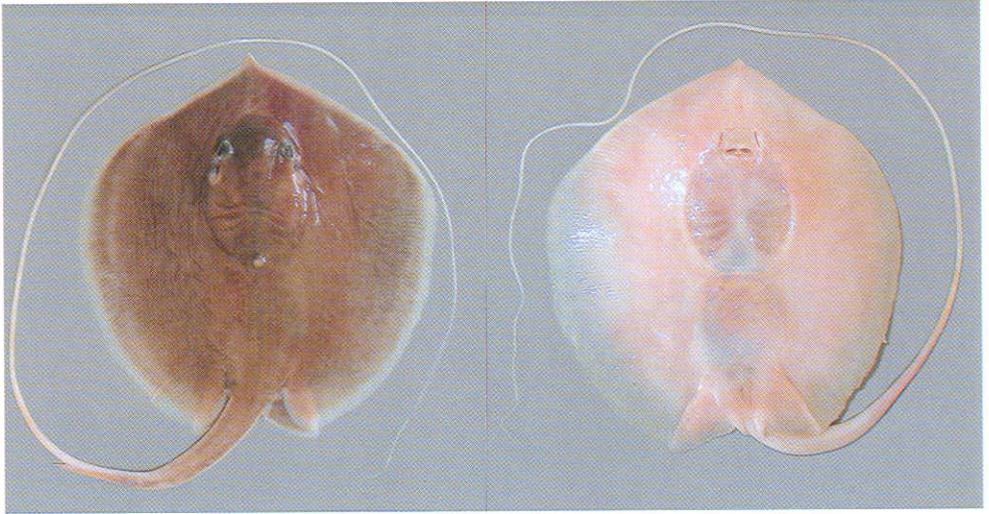


Figure 1. *Himantura signifer*. NIFI 3198, immature male, 119 mm disc width, Maekhlong River near Kanchanaburi, 20 June 2005. Note vestigial pearl spine (absent in larger fish) and the long white tail (retained throughout life).

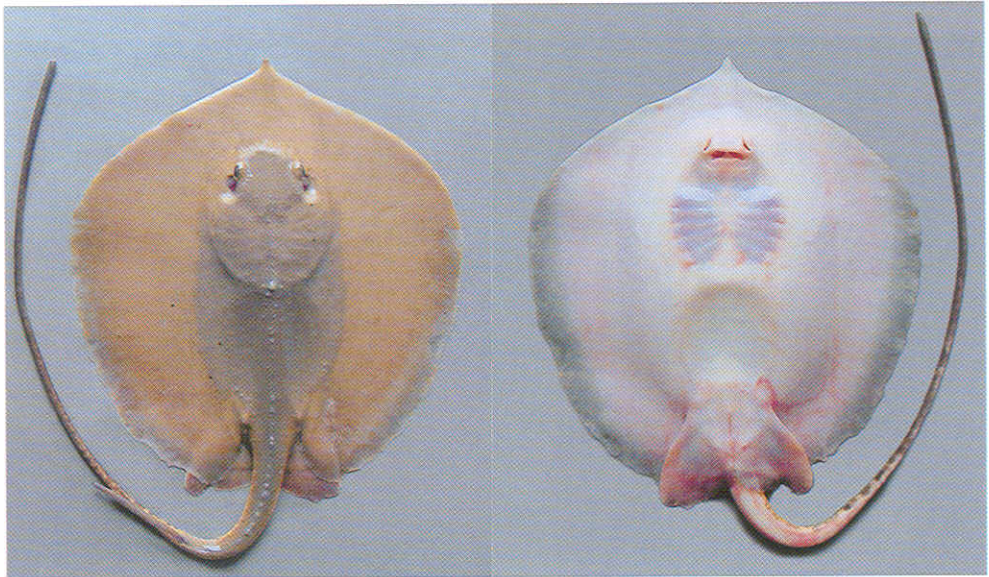


Figure 2. *Himantura kittipongi*. ZRC 50381, holotype, female, disc width 264 mm.

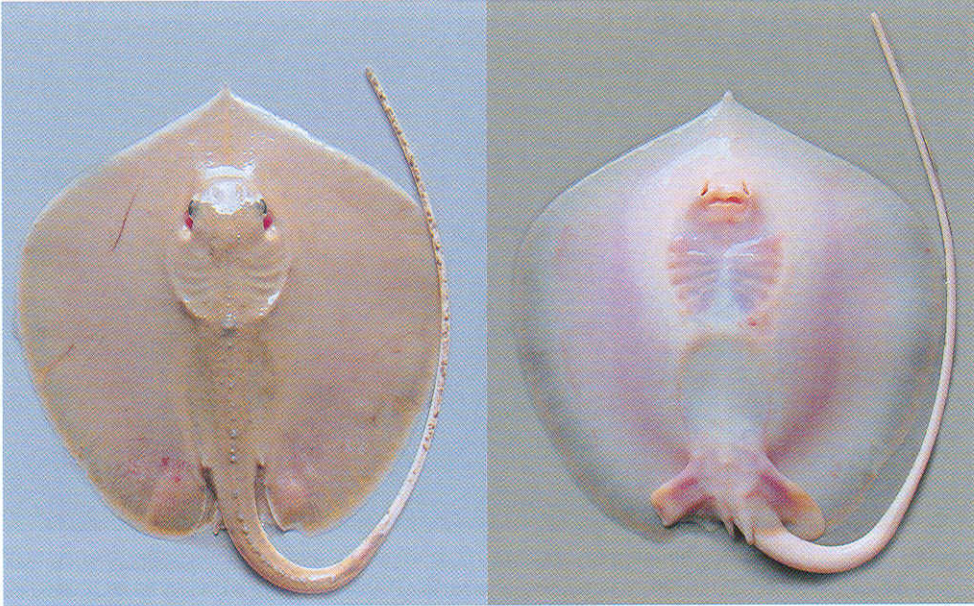


Figure 3. *Himantura kittipongi*. NIFI 3188, immature male, disc width 200 mm.

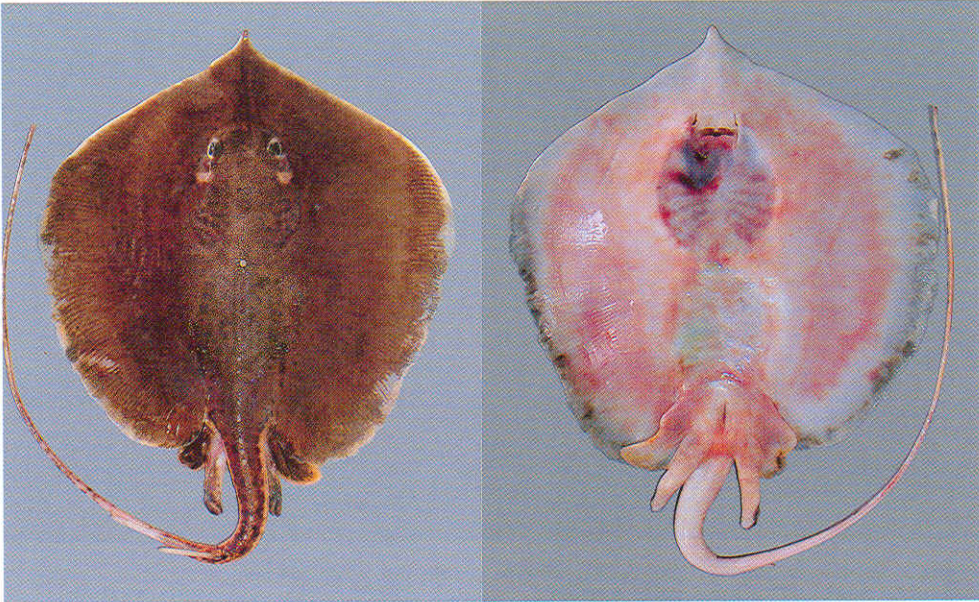


Figure 4. *Himantura kittipongi* NIFI 3198, mature male, disc width 234 mm. Note extensive damage to disc and pelvic fins probably inflicted by pufferfishes.



Figure 5. *Himantura kittipongi*. Close-up of snout, 285-mm female (NIFI 3200).

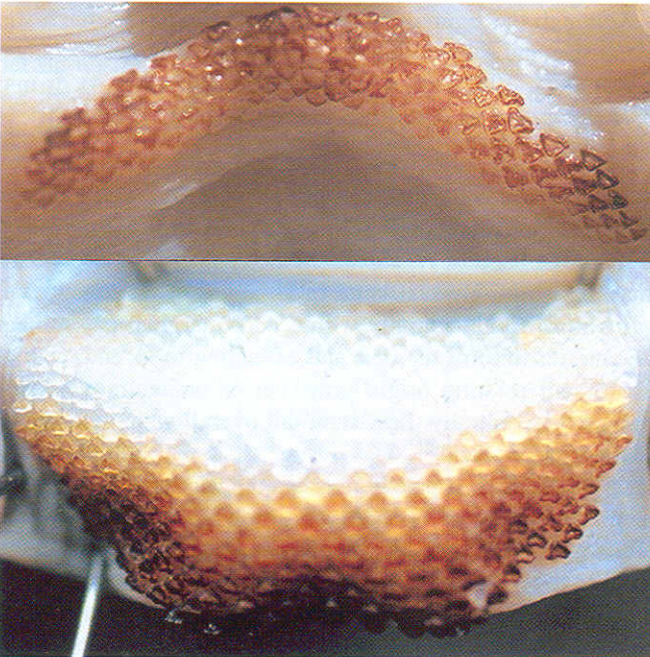


Figure 6. *Himantura kittipongi*. Upper and lower tooth bands, 234-mm male (NIFI 3198).

Paratypes (Figs. 3–6).—NIFI 3188, immature male, 200 mm disc width, same locality data as holotype; NIFI 3198, mature male, 234 mm disc width, Menam Maekhlong near Kanchanaburi, 20 June 2005, Kittipongs Jarutanin; NIFI 3200, female, disc width 285 mm, and NIFI 3201, mature male, disc width 268 mm, same collection data as NIFI 3198.

Diagnosis.—*Himantura kittipongi* is a small freshwater species of *Himantura* (greatest disc width observed 285 mm) differing from previously described species including its apparent close relative *H. signifer* in its distinctive coloration. It shares with *H. signifer* the dorsal disc color features of a pale margin and pale spots in front of the eye and on the posterior rim of the spiracle. It differs from *H. signifer* in having a narrow dusky, gray, or brownish-orange (not black) marginal band (except for the one-fourth of the disc nearest to the snout) on the ventral disc surface vs. ventral disc surface entirely white. The mid-dorsal pearl organ is present throughout life (present in new born and very young *H. signifer* but then disappears in that species). Denticulation on central area of dorsal disc surface and tail well developed (absent or weakly developed in *H. signifer*). A series of enlarged denticles, some with projecting posterior margins raised above the surface, on dorsal midline between pearl organ and base of sting. The largest of these are on the tail base.

Disc shape.—Overall disc shape is similar in *H. kittipongi* and *H. signifer*. There is, however, a consistent difference in the shape of the anteromedian projection or apex. In both species this terminates in a small knob or nipple, as in many other dasyatidids. In *H. kittipongi* the apex and its nipple is larger and more prominent than in *H. signifer*. This can be seen quite clearly in the ventral views of the discs in Fig. 1 of *H. signifer* and in Figs. 2–4 of *H. kittipongi*. Although the figured specimen of *H. signifer* is much smaller than those of *H. kittipongi*, the size and shape of its apex is typical of larger specimens of its species (COMPAGNO & ROBERTS, 1982 figs. 4–5; ROBERTS, 1989, fig. 4). It may be noted that the specimen of *H. kittipongi* in Fig. 4 has the nipple of its apex partly bitten off.

Coloration.—Dorsal surface of disc and pelvic fins uniformly light gray or tan to deep orange-brown. A narrow white marginal band present in some specimens but narrower and less evident than the white marginal band of *H. signifer*. Pale spot at front of eye and on posterior rim of spiracle may be white (always white in *H. signifer*) or yellow. Ventral surface of disc and pelvic fins milk white centrally with a dark marginal or submarginal band beginning at about the anterior third of the disc and extending to its end, continuing across the pelvic fins. Base of tail to sting origin gray, tan or orange-brown dorsally, sometimes with yellow marks; white ventrally. Post-sting tail overall white with brown or black spotting, or overall dark, nearly black.

In fish in which the dorsal disc surface is pale gray or tan the ventral submarginal band is gray. In fish in which the dorsal surface is a richer color, brown or orangish-brown, the marginal band may also be brownish or orange-brown or it may be gray. The marginal colored band of *H. kittipongi* is narrower than the marginal band of *H. chaophraya*, which always extends to the edge of the disc and is dark gray or dark brown (nearly black).

In the small 200-mm specimen and 264-mm holotype of all of the teeth are white. There is no indication of coloration. The other three specimens show varying degrees of orangish-brown coloration or stain. This is most pronounced in the 234-mm male. In this

Table 1. Disc width (mm), proportional measurements (% disc width), and counts in freshwater *Himantura* species of Thailand. Data on *H. signifer* and *H. oxyrhyncha* from Compagno and Roberts, 1982; on *H. chaophraya* from Monkolprasit and Roberts, 1990. Upper and lower tooth row counts of *H. kittipongi* from NIFI 3198.

	<i>kittipongi</i> holotype (paratype)	<i>signifer</i>	<i>oxyrhyncha</i>	<i>chaophraya</i>
Disc width	264 (200)	115–382	89–345	780–1920
Disc length	106 (102.5)	102–106	115–117	108–112
Disc depth	17.2 (10.0)	10.7–13.0	12.7–13.5	10.2–15.0
Eye diameter	3.6 (3.6)	2.1–3.3	2.6–4.5	1.0–1.9
Eyeball	5.0 (5.1)	3.7–5.2	4.9–6.7	2.2–2.6
Interorb. width	11.0 (10.5)	9.3–12.2	10.6–14.6	12.0–15.0
Spiracle length	7.6 (7.0)	7.0–8.6	6.3–7.9	5.5–6.7
Interspirac. width	16.1 (15.0)	12.9–18.3	15.5–21.3	14.5
Mouth width	9.9 (9.75)	6.1–8.7	9.0–11.2	10.7–11.2
Nasal curtain length	7.6 (7.15)	4.3–6.1	6.1–6.3	10.9–12.4
First gill slit	3.2 (2.5)	1.7–3.8	2.8–3.2	3.2–3.6
Fifth gill slit	2.7 (2.0)	1.7–2.9	2.0–2.6	2.0–2.2
Between first gill slits	25.9 (20.5)	20.4–23.5	21.7–24.6	20.9–30.8
Between fifth gill slits	– (13.8)	12.8–15.7	15.1–16.9	15.1
Snout tip-eye	26.1 (26.2)	23.8–25.9	30.3–35.2	30.4–35.5
Snout tip-nostril	20.8 (22.7)	18.6–21.7	25.8–31.7	25.0–29.9
Snout tip-first gill slit	38.6 (38.5)	36.0–40.9	45.5–50.0	39.2–45.8
Snout tip-fifth gill slit	53.4 (52.5)	49.4–55.1	58.3–64.1	48.7–57.9
Snout tip-pearl organ	56.1 (54.0)	58.5	58.6	–
Snout tip-pelvic fin	79.5 (81.0)	76.9–85.3	95.5–102.8	85.9–96.3
Snout tip-vent	82.2 (84.0)	80.3–88.7	98.9–104.9	85.9–107
Pelvic fin ant. margin	20.6 (21.25)	20.9–25.9	19.7–22.5	10.0–15.9
Pelvic fin post. margin	25.5 (25.5)	17.4–25.9	18.0–19.4	11.2–15.4
Pelvic fin base	19.7 (15.6)	11.5–18.9	11.2–14.8	9.6–14.9
Span of pelvic fins	50.1 (–)	46.8–55.4	47.8–52.8	30.4
Tail length	186 (167)	324–361	237–278	214
Tail base width	12.3 (11.0)	9.7–11.6	8.7–10.1	4.6–6.3
Tail base depth	7.6 (7.5)	6.6–8.2	5.6–9.0	4.0–4.3
Tail to sting	40.2 (37.2)	43–48		38.9
Oral papillae	5 (4)	4–5	4; 8	4–7
Upper tooth rows	4–5	3–5	4–5	6–7
Lower tooth rows	14–15	4–8	7–9	11
Spiral valve turns	11 (11)	13–14	11	21
Pectoral radials	111 (–)	109–116	112–116	158–164
Pelvic radials	25 (–)	20?–28	21–28	20–23
Free vertebral centra	102 (–)	109–116	108–114	–

specimen all of the teeth in the tooth band of the upper jaw are orangish-brown. In the lower jaw all of the teeth in the inner the inner two-thirds of the tooth band are white but the rest of the teeth or at least their crowns are orangish-brown or dark brown. The demarcation between white and colored teeth is quite sharp. The outermost colored teeth of the upper and lower tooth bands are exposed and hence visible when the mouth is shut. The orange-red coloration of the teeth is similar to the coloration of the submarginal or marginal band on the ventral disc surface of this specimen and one other paratype.

Measurements and counts.—Proportional measurements and meristic characters of *H. kittipongi* and the three other species of *Himantura* known from the fresh waters of Thailand are summarized in Table 1. The holotype of *H. kittipongi* has 11 spiral valve turns, 102 free vertebral centra, and $54+11+46 = 111$ pro-, meso-, and meta-ptyerygial = total pterygiophores or radials.

Stings.—Two of our five specimens of *H. kittipongi* have a single sting. This includes the small 200-mm individual, which has a very short but intact sting. The other three specimens have two stings. Except for the small 200-mm fish, which has an intact but very small sting, all of the stings are broken off. Only the 268-mm female holotype has a nearly complete sting. Broken off near the tip, it is missing perhaps only 5 mm of its total length. Its actual length is 73 mm or 28% of disc width (sting length in 200-mm immature specimen only 11.5% of disc width). It has about 35 serrations on each side. The total number of serrations on the intact spine probably would be less than 40. The edges of the basal 32 mm of the spine are smooth, without serrations.

Claspers.—External clasper morphology of *H. kittipongi* is similar to that of *H. signifer* (COMPAGNO & ROBERTS, 1982: fig. 10a-c). Claspers, like pelvic fins, without denticles.

Habitat.—*Himantura kittipongi* and *H. signifer* both occur in the mainstream of the Maekhlong River near Kanchanaburi. The area is above the limit of tidal influence (or where tidal influence is minimal) and the water is fresh. *Himantura signifer* prefers places with mud bottom whereas *H. kittipongi* apparently prefers a sandy or sandy-muddy bottom.

Etymology.—Named for Bangkok aquarium fish dealer Khun Jarutanin Kittipong, collector of the type specimens.

DISCUSSION

The four larger specimens of *H. kittipongi* all exhibit extensive damage to the disc margin evidently inflicted by bites. All five fish have more or less extensive damage, also apparently due to bites, on one or both pelvic fins. All of the bites appear to be old and well-healed. Photographs of the fresh specimens do not reveal bleeding from them. All five fish have a (greatly) foreshortened tail ending in a healed-over stub with its cartilaginous supporting rod wholly or partially exposed at the tip. In having such a shortened tail they differ markedly from most specimens of *H. signifer*, *H. oxyrhyncha*, and *H. chaophraya*, in which the tail is much longer and ends in a more or less fine taper. The comparison is particularly striking with *H. signifer*, most specimens of which the milk-white tail is thread-like or filamentous and more than three times as long as the disc is wide (vs. only 1.3–1.8 times in *H. kittipongi*).

The four large *H. kittipongi* with more or less extensive injuries along the disc margins exhibit patches of fine denticles near the disc margin. Their distribution appears to be related to bites. They seem to be present only where bites have occurred, but are not present at the sites of all bites. The distribution of the denticles may indicate that their development is stimulated by wounding or wound-healing.

The foreshortening of the tail by roughly the same amount and its similar healing in all five specimens in *H. kittipongi* indicate that the cause of its removal is the same in all of them. Do individuals of this species bite off their own tails? The similar length of the part of the tail that remains might be evidence for this.

Khun Kittipong reports that large pufferfishes of two species (*Monotretes* cf. *leiurus* and *M. cf. nigroviridis*) are common where *H. kittipongi* lives. He thinks that they bite off its tail. Certainly these puffers, with their strong jaws and large strong teeth shaped like a parrot's beak, are physically capable of biting off the tail. The damage to the disc and pelvic fins of *H. kittipongi* mentioned above probably is due to pufferfish attacks.

Granted that the injuries inflicted on the disc, pelvic fins, and tail of *H. kittipongi* are due to pufferfish bites, why don't the puffers inflict similar injuries on *H. signifer*? Most specimens of *H. signifer* have intact tails with length 3–4 times the disc width (Fig. 1; COMPAGNO & ROBERTS, 1982, figs. 4–5; ROBERTS, 1989, fig. 4). Some individuals exhibit injuries on the discs that could well be due to pufferfish bites. These, however, are few compared to the numerous injuries observed on *H. kittipongi*. The pelvic fins of *H. signifer* as well as their tails usually are unscathed.

Until it was reported from fresh water in Thailand by SMITH (1945), *H. bleekeri* was known only from the original description by Edward Blyth, based on market specimens obtained in Calcutta (BLYTH, 1860). Since then the name has been repeated a number of times in the secondary literature on the fishes of Thailand and Southeast Asia without any scientific study. So far as we are aware the type specimens of *H. bleekeri* have not been redescribed or figured, nor have they been compared with any other specimens identified as *H. bleekeri*. There are two syntype specimens in The Natural History Museum, London: BMNH 1892.6.17.15 (ESCHMEYER, 2005).

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