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Himantura chaophraya, a New Giant Freshwater Stingray from Thailand

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Abstract A new whiptailed stingray, *Himantura chaophraya*, is described from three specimens caught in the Mae Nam Chao Phraya of Thailand. The new species, reportedly attaining 500 kg or more, belongs to a species group found mainly in fresh water and characterized by large body size, strongly projecting snout, broad but thin oval disc, small eyes, black marginal coloration on ventral surface of disc, very narrow tail base, 158–164 pectoral radials, and 21 spiral valve turns. The species group is known from India, Borneo and New Guinea and probably also occurs in the Mekong River, but the only specimens available in museum collections are from the Chao Phraya and the Mahakam River basin in eastern Borneo (Kalimantan, Indonesia).

Four species of the family Dasyatidae or whiptailed stingrays have been recognized in the fresh waters of Thailand: *Hypolophus sephen* (Forsskål, 1775), *Himantura krempfi* (Chabanaud, 1923), *Himantura signifer* Compagno et Roberts, 1982, and *Dasyatis laosensis* Roberts et Karnasuta, 1987 (Compagno and Roberts, 1982; Roberts and Karnasuta, 1987).

In his monograph on the freshwater fishes of Thailand, Smith (1945: 41–42) reported only two species of the Dasyatidae or whiptailed stingrays, *Dasyatis* (=*Hypolophus*) *sephen* (Forsskål, 1775) and *Dasyatis* (=*Himantura*) *bleekeri* (Blyth, 1860). *Hypolophus sephen* is a marine species which frequently occurs in estuaries and occasionally ascends rivers in Thailand and other Indo-Pacific countries. It has been found in the Chao Phraya only so far upriver as Ayutthaya. It is unknown from the Thai portion of the Mekong River but may be found in its lower reaches. *Himantura bleekeri* is a marine species known mainly from the Bay of Bengal. It was reported from the Tale Sap ("outer lake at Singgora") in Peninsular Thailand by Hora (1924: 464) and from the Mae Nam Nan (Chao Phraya basin) by Smith (1945: 42). The identity of the Tale Sap specimen needs verification, and the locality is estuarine rather than fresh water; the species figured by Smith (pl. 1, opposite p. 52) and identified as *H. bleekeri*, possibly from the Nan but without indication of locality, is *H. krempfi* Chabanaud, 1923 (Compagno and Roberts, 1982). There is no verified freshwater locality record of *H. bleekeri* from Thailand or any other country.

The first notices of giant freshwater stingrays in the Chao Phraya and Mekong to come to our attention appeared in newspapers in Thailand in 1983. These and additional newspaper accounts indicate that they attain 300 kg. Fishermen along the Chao Phraya and Mekong report that the largest individuals are 500 or even 600 kg. Since 1987 we have succeeded in obtaining three whole preserved specimens, all from the Chao Phraya. These are now in the fish collection of the Kasetsart University Museum of Fisheries, Bangkok (KUMF).

Key to the Dasyatidae found in the fresh waters of Thailand

1a. Tail fold(s) present 2
1b. Tail folds absent (*Himantura*) 3
2a. Tail with huge ventral membranous fold; teeth greatly enlarged, thick crowned, and hexagonal; tail base very thick, sting positioned far posteriorly; ventral surface of disc uniformly white (Indo-Pacific marine and estuarine; ascends Chao Phraya and other rivers at least for short distances) .... *Hypolophus sephen* (Forsskål)
2b. Tail with low lying dorsal and ventral folds; teeth relatively small, thin crowned, and rhomboidal; tail base moderately thick, sting positioned relatively anteriorly; ventral surface of disc with orange marginal coloration (Mekong; Chao Phraya; ?West River, Guanxi prov.,

China)
..... *Dasyatis laosensis* Roberts et Karnasuta

3a. Dorsal surface of disc uniformly brownish or grayish brown; ventral surface with broad black marginal band; pectoral radials 158–164; spiral valve turns 21 (Mekong, Bangpakong, Chao Phraya, Tapi)..... *Himantura chaophraya* sp. nov.

3b. Dorsal surface of disc with distinctive coloration; ventral surface entirely white; pectoral radials 109–116; spiral valve turns 11–14 4

4a. Dorsal surface of disc brown or tan, with narrow marginal white band, white spot immediately anterior to eye and posterior to spiracle; spiral valve turns 13–14 (Chao Phraya, Meklong, Tapi basins in Thailand; Perak R., Malaya; Indragiri R., Sumatra; Kapuas R., Borneo) .... *Himantura signifer* Compagno et Roberts

4b. Dorsal surface of disc with reticulate color pattern; spiral valve turns 11 (Mekong, Bangpakong, Chao Phraya) .....*Himantura krempfi* (Chabanaud)

Himantura chaophraya sp. nov.
(Fig. 1)

?*Raia fluviatilis* Hamilton-Buchanan, 1882: 1–2 (Ganges: nomen nudum or nomen dubium).

?*Trygon fluviatilis* Annandale, 1910: 2–3, pl. 1, fig. 1 (Ganges, Bay of Bengal; name preoccupied by *Trygon fluviatilis* Day, 1871=*Hypolophus sephen* (Forsskål, 1775)).

?*Himantura* sp. undet. Compagno and Roberts, 1982: 337–338, fig. 12 (Fly River, New Guinea).

Holotype. KUMF 2998, 78 cm female, Chao Phraya at Ayutthaya (about 100 km upriver from mouth of Chao Phraya into Gulf of Thailand), Kittipong Jarutanin, 31 May 1989.

Paratypes. KUMF 2999, 107 cm male, Mae Nam Nan at Pichit (460 km upriver from Gulf of Thailand), Boonyeon Chokekiri, 9 November 1987; KUMF 3000, 192 cm female, Mae Nam Nan at Chumsang (60 km upriver from Nakorn Sawan and 360 km from Gulf of Thailand), Sophorn Virasettakul, 14 June 1988.

Diagnosis. A *Himantura* with broad but relatively thin oval disc; medial lobe or snout very broad-based and elongate; eye very small; dorsal surface of disc uniformly brown or gray and covered with denticles; ventral surface of disc and pelvic fins white with a broad black marginal band, more or less interrupted at snout, but otherwise complete; spiral valve turns 21; total pectoral radials 158–164.

Description. Proportional measurements (as percent of disc width) and counts are presented in Table 1. Preorbital length 2.1–2.8 times interorbital width. Preoral length 2.8–3.1 times internarial width and 1.1–1.4 times width between first gill slits. Snout broad basally but narrowing anteriorly to an acute angle. Eye very small, length of eyeball 6.5 in interorbital width and 13.9 in preorbital length in 78 cm specimen (holotype). Spiracle large, length 2.1–2.3 in interorbital width.

Floor of mouth with transverse row of 4–7 short papillae, including one or two small lateral papillae on each side and two to four somewhat larger papillae near middle of mouth (78 cm female with 5, 107 cm male with 7, and 192 cm female with 4 buccal papillae). Palate with five ridges, an anteromedian longitudinal ridge and two lateral pairs of anteroposteriorly oblique ridges, the posterior pair distinctly flaplike. Nasal curtain with fimbriate posterior margin and posterolateral triangular projection on each side.

Entire dorsal surface of disc, pelvic fins, and tail covered with fine rough tubercles. Tubercles on elevated central portion of disc, from just in front of eyes anteriorly and continuing onto base of tail posteriorly, distinctly larger than those on lateral portion of disc. A few slightly enlarged midscapular tubercles in a longitudinal row (78 cm female with four midscapular tubercles, 5, 3, 2, and 3 mm in diameter; 107 mm male with about a half dozen midscapular tubercles, largest 6 mm, these almost indistinguishable in size and morphology from surrounding tubercles, which encroach upon them. A few slightly enlarged prickle-like tubercles on middorsal line of tail just anterior to sting. Tail anterior to sting with fine prickle-like tubercles dorsolaterally, ventral surface smooth. Tail posterior to sting uniformly covered with fine sharp tubercles. All three specimens have a single sting. In the 78 and 107 cm specimens half or more than half of the sting has been broken off, but the 192 cm female has an intact sting 20 cm long and 1.5 cm wide near base, with 68 serrations on one side of the serrate distal two-thirds of its length.

The total number of 164 pectoral radials or pterygiophores was readily counted on the 78 cm holotype before preservation. The count of 158, obtained with difficulty from radiographs of the 107 cm specimen, may be too low by several radials.

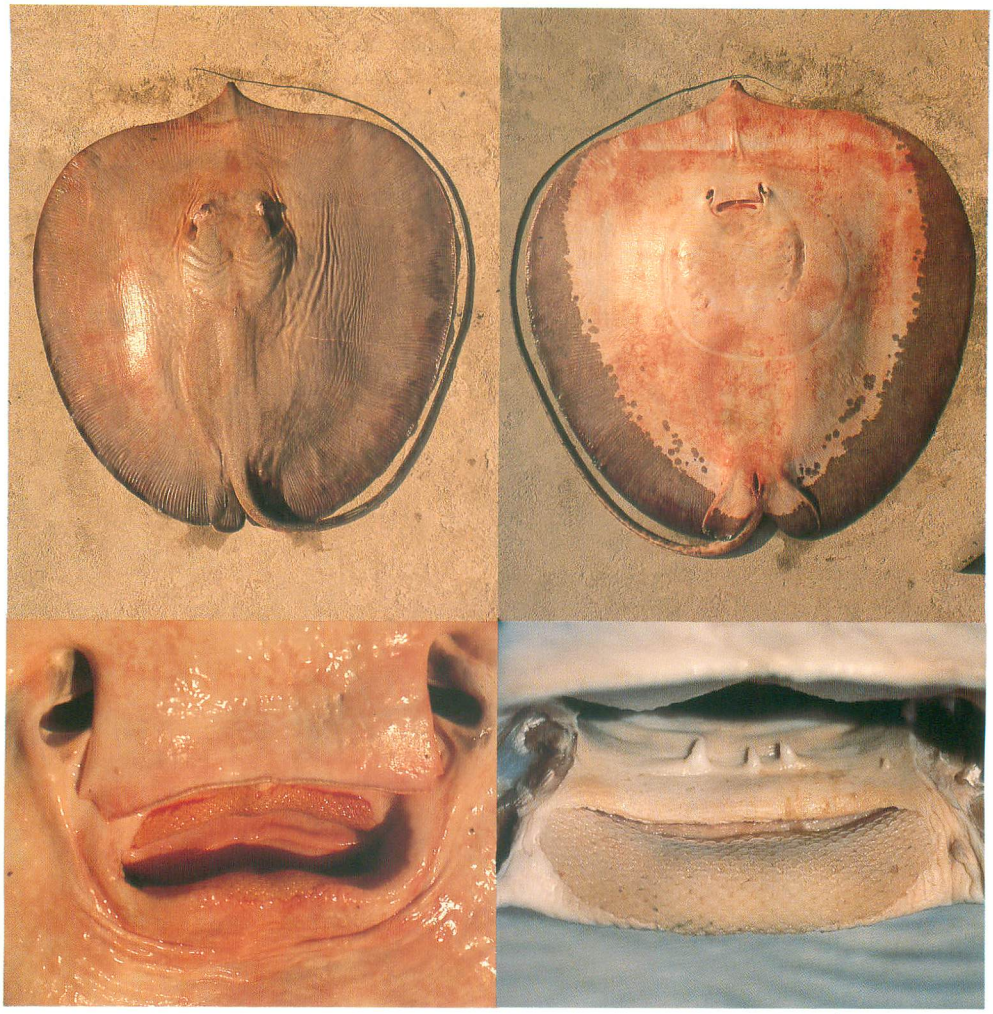

Fig. 1. *Himantura chaophraya* sp. nov., holotype, 78 cm immature female. Above, dorsal and ventral views; below, mouth and lower jaw with oral papillae.

The 107 cm male is sexually mature, with relatively massive claspers 20.9 cm long and 4.6 cm wide near base. Clasper groove 13.2 cm long, pseudosiphon aperture 2.1 cm long. Jaw teeth with heavy ridges, as in males of other dasyatid species.

Dorsal surface of disc uniformly brown or grayish brown. Ventral surface of disc white, with broad marginal black band; scattered round black spots inside marginal band.

Distribution and biological notes. Much of the information about distribution and size of *H. chaophraya* has come to us through accounts printed in Thai newspapers. We suspect that, as in other dasyatids, the largest individuals are females, but the newspaper accounts do not indicate the sex of the individuals reported and usually this cannot be determined by the accompanying photographs. Otherwise, they represent an important source of information which may be summarized briefly, together with some information obtained by us from fishermen and other sources.

In January 1983 a 300 kg female was caught in the Chao Phraya at Singburi 200 km upriver from the Gulf of Thailand. After capture the female gave birth to four young about 30 cm disc width. The first author obtained photographs of the female and its young from a local photo shop on 1 February 1983.

On 25 April 1983 the Bangkok newspaper "Thai Rat" published a photograph of a 185 kg fish caught at Angthong on the Chao Phraya. So far as we are aware, this is the earliest published report of the fish in Thailand.

On 1 June 1983 the Bangkok Post published a photograph of a 242 kg fish caught in the Mekong in Nakorn Phanom province, "about a kilometre from where the Hua Phun River enters the Mekong from Laos." While we have yet to examine a specimen from the Mekong basin, the photograph of the ventral disc surface clearly shows the dark marginal coloration with scattered round spots inside it which is characteristic of the species or group of species to which *H. chaophraya* belongs. In March 1985 the second author visited Tha Uten on the Mekong in Nakorn Phanom province and was informed that a 500 kg stingray had been caught a few km upriver during the previous year. In December 1988–January 1989 and March–April 1989 the second author interviewed several groups of fishermen along the Mekong River at Nongkai, Nakorn Phanom, and

Table 1. Proportions (parallel measurements as percent of disc width) and counts of *Himantura chaophraya* sp. nov.

	Chao Phraya			Mahakam
	Holotype 78 cm ♀	Paratype 107 cm ♂	Paratype 192 cm ♀	57 cm ♂
Total length	275	306	241	—
Disc length	103	127	108	112
Disc depth	10.2	15.0	11.4	9.8
Eye ball	2.2	2.6	—	3.0
Eye diameter	1.5	1.9	1.0	1.8
Interorbital width	14.0	15.0	12.0	15.8
Spiracle length	6.7	6.4	5.5	6.7
Interspiracular width	14.5	—	—	15.8
Nasal curtain length	10.9	12.4	—	11.8
Nostril	2.8	3.6	3.6	5.2
Internarial width	10.0	12.0	10.0	10.3
Mouth width	11.2	10.7	—	8.9
Mouth opening	8.8	9.0	8.3	7.5
First gill slit	3.3	3.6	3.2	2.8
Fifth gill slit	2.2	2.1	2.0	1.8
Width betw. first gill slits	20.9	30.8	—	22.0
Width betw. fifth gill slits	15.1	—	—	16.4
Snout tip to eye	30.4	35.5	33.9	35.1
Snout tip to nostril	25.0	29.9	—	29.1
Snout tip to mouth	29.7	33.6	31.8	34.4
Snout tip to first gill slit	39.2	45.8	—	46.1
Snout tip to fifth gill slit	48.7	57.9	—	57.9
Snout tip to pelvic fin base	85.9	96.3	—	98.6
Snout tip to vent (anterior border)	85.9	107	88.5	95.6
Pectoral fin inner margin	12.2	13.1	—	14.6
Pelvic fin anterior margin	14.0	15.9	10.0	13.5
Pelvic fin posterior margin	15.4	11.2	—	6.7
Pelvic fin base	9.6	14.9	12.5	6.7
Pelvic fin span	30.4	—	—	23.6
Tail base width	6.3	4.8	4.6	5.8
Tail base depth	4.1	4.0	4.3	4.2
Tail total length	183	220	135	—
Oral papillae	5	7	4	5
Spiral valve turns	21	21	—	21
Tooth rows upper jaw	6–7/40	—	—	6/36
Tooth rows lower jaw	11/37	—	—	12/37
Pectoral radials	164	158+	—	169
Pelvic radials	23	20	—	20

Mukdahan and was informed of rays 500 kg or even (at Mukdahan) 600 kg.

In 1986 Mr. Sompong Duljindachabaporn, a student in the Faculty of Fisheries at Kasetsart University, obtained photographs of a mature male well over 1 m disc width from the Mae Nam Bangpakong. His photos show very clearly the dark marginal coloration on the ventral disc surface, narrow tail base, and other characteristics of *H. chaophraya*. This is our only record of the species from the Bangpakong.

On 25 September 1988 the Bangkok newspaper "Daily News" reported two rays, 288 and 295 kg, caught in the Mae Nam Tachin near Hanka. The Tachin is a tributary of the Chao Phraya.

Mr. Kittipong Jarutanin, an aquarium dealer in Bangkok, has supplied several larger individuals to sports fishing ponds in the Bangkok area. According to him the species attains 500 kg in the Chao Phraya. Our 78 cm specimen weighed 12.7 kg before preservation. Weights of the 107 and 192 cm specimen were not obtained.

A photograph of a large stingray from the Tapi river basin of peninsular Thailand was published in the Bangkok Post on 31 May 1990. The ray reportedly weighed 185 kg and was caught in Ratchaprapa Reservoir (Chiew Lan Dam), Surathani province, on 23 April 1990. Clearly visible in the newspaper photo is a dark marginal band on the ventral disc surface characteristic of *Himantura chaophraya*.

We do not have any reports of *H. chaophraya* from the Gulf of Thailand. But there are a number of large rays and other elasmobranchs in the Gulf, and thus the occurrence of a large batoid there is not newsworthy enough to appear in local newspapers.

Himantura chaophraya belongs to a species group of large rays, widely distributed in the tropical Indo-Pacific region, and found mainly in fresh water. A large ray similar in many respects to *H. chaophraya* was identified by Annandale (1910: 2–3, pl. 1, fig. 1) and Chaudhuri (1912) from several localities on the Ganges and from the Bay of Bengal as *Trygon fluviatilis* (Hamilton-Buchanan, 1822). Unfortunately Hamilton-Buchanan was unable to obtain a specimen of this ray, which he observed at Cawnpur, 1,000 km upriver from the Bay of Bengal and other localities on the Ganges, and the specimens reported upon by Annandale and Chaudburi apparently are no longer extant. *Raia fluviatilis* Hamilton-Buchanan, 1822, a nomen nudum or nomen dubium, was identified by Day, 1871, the first reviser, as *Trygon sephen* Forsskål, 1775, and is thus unavailable for the *H. chaophraya* species group. Until specimens become available, it cannot be determined whether the species in the Ganges and Bay of Bengal is conspecific with *H. chaophraya*. In July 1982 our colleague Leonard Compagno visited the Zoological Survey of India in Calcutta, where the material reported on by Annandale and Chaudhuri should be deposited. His search for the material, with the help of P. K. Talwar, Curator of Marine Fishes, was unsuccessful. In March 1985 the second author also visited the Zoological Survey of India and was unable to locate the material, which is presumed lost.

Apart from the three type specimens of *H. chaophraya*, the only specimen of this species group in museum collections known to us is a 57 cm immature male from the Mahakam basin, Borneo. This specimen, which we identify as *Himantura* cf. *chaophraya*, was caught at Pela, 116°33′E, 0°14′S [=Danau Semayang] on 28 October 1984. It is deposited in the fish collection of the California Academy of Sciences (CAS 66876). Proportional measurements and counts are presented in Table 1.

A large ray from the Fly River basin in Papua New Guinea reported as *Himantura* sp. undet. by Compagno and Roberts (1982: 337–338, fig. 12) clearly also belongs to this species group. Unfortunately, it is still known only from photographs.

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タイから得られた淡水産大型アカエイの新種，*Himantura chaophraya*

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アカエイ科の新種，*Himantura chaophraya*，をタイのチャオプラヤ川から採集した標本に基づいて記載した．本種は 500 kg 以上になるといわれ，主に淡水域に分布する種グループに属して，大型になること，吻端が著しく突出すること，幅広くて薄い円型の体盤をもつこと，眼が小さいこと，体盤の腹面が黒くふちどられること，尾部基底部が非常に狭いこと，胸鰭条数が 158–164 であること，腸のらせん弁の回転数が 21 であることにより特徴づけられる．この種グループはインド，ボルネオ，ニューギニアから知られ，またメコン川にも出現するようであるが，博物館収蔵標本としてはチャオプラヤ川と東ボルネオ（インドネシアのカリマンタン）にあるマハカム川流域からのものが現存するだけである．