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LANDED AND RECORDED OF SHARKS AND RAYS IN THE BAY OF BENGAL OF BANGLADESH REGION

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ABSTRACT

The study was conducted during April, 2006 to March, 2014 on the status of shark fishery (shark and ray) resources in the Bay of Bengal of Bangladesh region; data were collected from Fishery ghat fish landing center, Chittagong and BFDC fish harbor, Cox's Bazar. A total 11 species of sharks belonging to 3 families (under Carcharhinidae-8 species, Sphyrnidae-2 species and Hemiscyllidae-1 species) and 24 species of rays belonging to 7 families (under Dasyatidae-14 species, Rhinobatidae-2 species, Rhynchobatidae-1 species, Gymnuridae-1 species, Myliobatidae-2 species, Rhinopteridae-2 species and Mobulidae-2 species) were recorded.

The elasmobranch species, such as sharks were Grey sharp nose shark (*Rhizoprionodon oligolinx*-Springer, 1964), Graceful shark *(Carcharhinus amblyrhynchoides* -Whitley, 1934), Bull shark *(Carcharhinus leucas* -Valenciennes in Muller and Henle, 1839), Black tip reef shark *(Carcharhinus melanopterus* -Quoy and Gaimard, 1824), Soft tail shark *(Carcharhinus sorrah*- Valenciennes, in Muller and Henle,1839), Milk shark *(Rhizoprionodon acutus* -Rupell,1837), Spade nose shark *(Scoliodon laticaudus* -Cuvier 1829), Tiger shark *(Galeocerdo cuvier* -Peron and LeSueur, in LeSueur, 1822), Scalloped hammerhead shark *(Sphyrna lewini* -Griffith and Smith, 1834), Great hammerhead shark *(Sphyrna mokarran*-Ruppell, 1837) and Slender bamboo shark *(Chiloscyllum indicum* -Gmelin, 1789).

And the ray's species were- Pink whip ray *(Himantura fai* -Jordan and Seale, 1906), Tube mouth whip ray *(Himantura lobistoma* -Manjaji- Matsumoto & Last, 2006), Leopard whip ray *(Himantura undulata* -Bleeker,1852), White spotted whip ray *(Himantura gerrardi-*

Person and Lesucur,1822), Reticulate whip ray *(Himantura uarnak* -Forsskal,1775), Brown whip ray *(Himantura uarnacoides* -Bleeker, 1852),Scaly whip ray *(Himantura imbricata* -Bloch and Schneider, 1801), Dwarf whip ray *(Himantura walga* -Muller and Henle, 1841*),*Chinese sting ray (*Dasyatis sinensis* -Steindachner, 1892), Sharp nose sting ray *(Dasyatis zugei* -Miiller and Henle, 1841), Blue spotted sting ray *(Dasyatis kuhlii* -Muller and Henle,1841*),* Banana leaf -tail ray *(Pastinachus sephen* -Forsskal, 1775), Blotched fantail ray *(Taeniura meyeni* -Miiller and Henle, 1841), Porcupine ray (*Urogymnus asperrimus* -Bloch and Schneider,1801*),* Giant shovelnose ray *(Rhinobatos typus* -Bennett, 1830),Club nose guitar fish *(Rhinobatos thouin* -Anonymous, in Lacepede,1798), Bowmouth guitar fish *(Rhina ancylostoma* -Bloch and Schneider,1801*),* Japanese butterfly ray *(Gymnura japonica* -Schlegal, 1850), Banded eagle ray *(Aetomylaeus nichofii* -Blyth, 1860),White spotted eagle ray *(Aetobatus narinari* -Euphrasen, 1790), Rough cow nose ray (*Rhinoptera adspersa* -Valenciennes in Muller and Henle, 1841), Javanese cow nose ray *(Rhinoptera javanica* -Muller and Henle, 1841), Lesser devil ray *(Mobula kuhlii*- Valenciennes, in Muller and Henle,1841) and Japanese devil ray *(Mobula japonica* -Miiller and Henle, 1841).

Among the shark species, Spade nose shark *(Scoliodon laticaudus*), Milk shark *(Rhizoprionodon acutus*), Black tip reef shark *(Carcharhinus melanopterus)* & Scalloped hammerhead shark *(Sphyrna lewini)* were dominantly exploited and Grey sharp nose shark (*Rhizoprionodon oligolinx*), Graceful shark *(Carcharhinus amblyrhynchoides)* & Soft tail shark (*Carcharhinus sorrah)* are rarely exploited. And belong to ray species Reticulate whip ray *(Himantura uarnak),* Brown whip ray*(Himantura uarnacoides*), Dwarf whip ray*(Himantura walga*), Giant shovelnose ray *(Rhinobatos typus*) & White spotted whip ray *(Himantura gerrardi)* were prominently landed and Banana leaf -tail ray *(Pastinachus sephen),* Blotched fantail ray *(Taeniura meyeni),* Rough cow nose ray(*Rhinoptera adspersa),* Pink whip ray *(Himantura fai*), Tube mouth whip ray *(Himantura lobistoma*), White spotted eagle ray *(Aetobatus narinari*) and Sharp nose sting ray *(Dasyatis zugei)* were rarely found.

KEYWORDS: Sharks, rays, species, landing volumes, artisanal and industrial fishing.

INTRODUCTION

The marine fisheries sector of Bangladesh plays a significant role in supporting the county's economic growth through provision of employment and providing source of protein for the population. Fisheries sector are divided into inland and marine fisheries. The marine fisheries categorized into coastal (artisanal) fisheries and deep sea (industrial) fisheries.

Among the fish group, class chondrichthyes, the cartilaginous fishes, includes about 60 families, 189 genera and some 1200 living species (Compagno, 2005). They are comprised of the sharks (34 families and about 500 species), Batoids (23 families and about 650 species including skates, stingrays, guitar fishes and sawfishes) and Chimaeroid fishes (Three families and some 40-50 species). The Chimaeras fall in subclass-Holocephali and the sharks and rays in subclass Elasmobranches (the latter are also commonly referred to as elasmobranches) Early classifications divided the elasmobranches into sharks (Squali, Pleurotremata) and rays (Batoidea, Hypotremata). The cartilaginous fishes occupy niches in every marine environment except the deepest oceans below 4000 m. Adult size ranges from less than 10 cm to 20 m. In the Bay of Bengal of our marine territory 435 fish species, 36 shrimp, 5 lobster, 12 cephalopods, 301 mollusk, 15 crabs, 53 species of shark & ray and others resources are present. The sharks and rays landing, that constitute of less than 1% of the total marine landing volumes, which a part of the demersal fishery occur throughout the marine waters from the coast to the deep sea.

Sharks comprised an insignificant by-catch by artisanal or small-scale fisheries and ranked low among all commercial species landed (Dr. Siriraksophon, 2011).

Sharks and rays are exploiting mainly in artisanal fisheries sector (4805MT) by different gears, mainly by shark nets (one kind of modified large mesh drift gill nets), set bag net & long lines. In small scale fishing a small number (100-120 no.) mechanized boats are engaged by shark nets as target species to exploiting shark and ray are caught by hooks and lines in traditional method; but maximum are caught together with other commercially important species. From the year 2010 record keeping of group wise shark's and ray's data as shark fishery in industrial (trawl fishing) fishing (843 MT) have been continued separately which were unreported during the last decay. In commercial fishing most rays are harvesting by different fish trawlers and shrimp trawlers; but sharks are caught incidentally by mid water trawlers.

In 2013-14 total marine fish production amounts were 5, 95,385 MT; in artisanal and industrial fisheries contributed 5, 18,500 MT (91%) and 76,885 MT (9%) respectively (DoF, 2013-14). In this period, total landing of sharks and rays were 5648 MT, on which artisanal fishing volumes was 4805 MT (85.07 %) and trawl fishing was 843 MT (14.93 %). In small scale fishing, gill net fishing contributed 37.36 %(2110 MT), set bag net 6.91 %(390 MT) and long line 40.81 %(2305 MT). Total landing of sharks and rays was only 0.95% of the

total marine fish production of Bangladesh (DoF, 2013-14).

Maximum shark and ray species are exploiting from the three major areas (grounds), whose are near the Dublar char in Khulna, Sonar char in Patuakhali and south - west parts of the elephant point at near Cox's Bazaar district in the Bay of Bengal of Bangladesh region. All sharks and rays are brought back as a whole to the fish landing centers and sold at a reasonable price with the fins fetching of shark's and dorsal part of ray's skin a better prices. During April, 2006 to March, 2014 were recorded 11 species of shark (04 families) and 24 species of ray (09 families) in the Bay of Bengal of Bangladesh region. Among them, under the family charcharhinidae of shark species and belong the family Dasytidae of ray species were found dominantly.

MATERIALS AND METHODS

Sampling stations

The study was undertaken for about 8 years starting from April 2006 up to March 2014 at two fish landing centers i.e. BFDC fish harbor of Cox's Bazaar district and Fishery ghat of Chittagong district situated at the south-eastern part of the Bay of Bengal. These two landing centers were selected, because the major landing of sharks and rays are done here, the wholesale and retail market also located in these two places.

Data collection and statistical analysis

Species wise landing data were recorded both at landing stations and on board commercial fishing vessels. Data were collected from four days field visits per month i.e. new-moon, full-moon, first quarter and last quarter. The species were preserved in 5% formalin just after collection from the landing centers and then sorted in the laboratory of Marine Fisheries Survey Management Unit (MFSMU), Chittagong, Bangladesh. Species were identified to the lowest possible taxonomic position by consulting the following resources.

Ramon Bonfil and Mohamed Abdullah, 2003; Compagno, L., Dando, M. and Fowler, S. 2005; CMS Technical Series No-15, December 2007; Ahmad Ali, Albert Chuan Gambang, Mable Manjaji- Matsumoto and Anne Lim Pek Khiok, 2007; Albert Chuan Gambang, Ahmad Ali and Anne Lim Pek Khiok, 2007; Quddus. (1988); FAO (1984); Munro (1982); Day (1978); Raje (2007) and Hussain(1970).

Sampling was performed through interviews with the Arartdar (assemblers), boat owners and fishermen of the boat. Information was collected on trip duration per month, number of

fishing days and fishing effort. The length (total length for shark and disc width length for ray) and weight of the fishes were measured directly by using weighting balance and measuring tape. The percentage contributions of shark and ray species were calculated by weight. The species wise weight was measured in kilogram and then it was converted into metric tons (MT). Data processing and analysis was done by MS Excel.

Description of boats and gears

Sharks and rays usually come as the commercial catch of artisanal mechanized fishing boats. In Cox's Bazaar and Chittagong, about 100-120 boats are engaged for fishing which are typical open hulled wooden boats of 5-7 meters long with engines of 45-65/75 Hp. Each boat carries 17-18 fishermen and their active fishing days were for 15-18 days depending on the volume of the catch. The main gears include shark net (gill net), set bag net (ESBN and MSBN) and long lines. Shark nets are large mesh gill net made of thread no.4 and having length, depth and mesh size of 1500-3000 m, 10-15 m and 450 mm respectively. Long lines are mainly used for rays consist of a nylon monofilament mainline of 2 to 3 mm in diameter hung in a sagging curve between surface float. The branch lines with a length of 5-12 m descend from the main line, each terminating in a single baited 'J' hook. The number of hooks ranges from 800-6000 and hook size varies from No.6-11. Frozen squids (*Loligo spp.)* and cuttle fish (*Sepia spp.)* and sardines (*Sardinella spp*.) are commonly used as bait. Both long lines and gill nets are shot in the evening and their retrieval begins after midnight.

Characteristics of Sharks & Rays

Sharks: Sharks are a group (Super order **Selachimorpha**) of fish, with a full cartilaginous skeleton, a streamlined body plan with between 5 and 7 gill slits along the sides (Most often) or side of the head, Sharks have pointed snouts; their crescent-shaped mouths are set on the underside of the body. Usually there are two additional respiratory openings on the head, called spiracles. Shark skin is covered by tiny, sharp tooth-like structures called dermal denticles. Sharks have mobile jaws containing many rows of replacement teeth. In the mouth their teeth are not attached to the jaw, but embedded in their flesh. The lower teeth are primarily used for holding prey, while the top are used for cutting into it. . A shark's intestine has a unique spiral valve, which increases the area of absorption. Fertilization is internal in sharks; the male has paired organs called claspers for introducing sperm into the cloaca of the female. Sharks tend to mature later and reproduce slowly.

Rays: Rays are flattened into disc or diamond shapes. They have reduced caudal fins and swim by undulating their pectoral fins up and down in a wave-like manner, a rounded pectoral disc; soft, flabby body; dorsal fins nearer the pelvic fins than the tail tip; and kidney-shaped electrogenic organs at the base of the pectoral fins, rays have pectoral fins attached to the sides of their heads in front of their gill slits, forming flat wings, with the gill slits located underneath the head.

Family Characteristics of shark's

Family: Carcharhinidae- Head depressed, 2nd dorsal fin much less than 2/3 times height of 1st dorsal fin, precaudal pit present. Snout long, narrowly rounded, eye moderately large, First dorsal fin moderately large.

Family: Sphyrnidae: Head laterally expanded in hammer form, eyes at extremities of expansions. the head width less than 40% of total length, a very tall and falcate first dorsal fin, serrated teeth, concave posterior margins to the pelvic fins.

Family: Hemiscyllidae: Mouth well in front of eyes, spineless dorsal fins far posterior on tail; greatly elongated slender precaudal tail; long and low anal fin just anterior to caudal fin; lateral ridges on trunk; dorsal fins without elongated free rear tips; Tail longer than trunk, three rough ridges on back at front of first dorsal fin.

Family Characteristics of Ray's

Family: Dasyatidae: Body flattened with pectoral fins greatly expanded, whip-like tail with no dorsal or caudal fins and 1 or more poisonous spines. Tail slightly longer than disc length not depressed at base; prominent ventral skin fold extending to tail tip.

Family: Rhinobatidae: Depressed body with a tapering snout and elongate caudal portion, 1st dorsal fin well posterior to pelvic-fin bases, pectoral fin reaches origin of pelvic fin. Very broad oblique, nostrils with small nasal lobes; no intranasal flap and a rectangular anterior nasal aperture.

Family: Rhynchobatidae: 1st dorsal fin over pelvic- bases, pectoral fin ends anterior to pelvic fins, distinct lower caudal lobe, a broadly rounded snout, large thorns on the back located on horny ridges and no spiracular folds.

Family: Gymnuridae: Disc kite- shaped, disc at least 1.5 times broader than long, spine usually present, tail slender, shorter than disc, tail from cloaca to tip about half as long as length from snout tip to cloaca.

Family: Myliobatidae: Subrostral lobe present, rays with wide angular wings. A V-shaped internasal flap, a stinging spine, and a long fleshy lobe around the snout that is not connected to the pectoral fins.

Family: Rhinopteridae: Head prominent, pair of rostral fins, head marked off from trunk, 2 subrostral lobes. A whip-like tail, tail length over 3 times disc length, and a distinctive bi-lobed forehead with a pair of lobe-like flaps located underneath.

Family: Mobulidae: Disc wider than long, pectoral tips falcate, two cephalic fins, spiracles slit-line and dorsal to plane of pectoral disc, a depressed tail base, a white tip on the dorsal fin, and having a stinging spine.

Result and Discussion:

Based on different landing data collected from April 2006 up to March 2014 at two fish landing centers. In this period no skates were found. A total 11 species of shark under 3 families (under Carcharhinidae-8 species, Sphyrnidae-2 species and Hemiscyllidae-1 species**)** and 24 species of ray under to 7 families (under Dasyatidae-14 species, Rhinobatidae-2 species, Rhynchobatidae-1 species, Gymnuridae-1 species, Myliobatidae-2 species, Rhinopteridae-2 species and Mobulidae-2 species) were recorded.

Species composition

Among the recorded elasmobranches species; 11 shark species were- Grey sharp nose shark (*Rhizoprionodon oligolinx*), Graceful shark *(Carcharhinus amblyrhynchoides*), Bull shark *(Carcharhinus leucas*), Black tip reef shark *(Carcharhinus melanopterus*), Soft tail shark *(Carcharhinus sorrah*), Milk shark *(Rhizoprionodon acutus*), Spade nose shark *(Scoliodon laticaudus*), Tiger shark *(Galeocerdo cuvier*), Scalloped hammerhead shark *(Sphyrna lewini),* Great hammerhead shark *(Sphyrna mokarran*), Slender bamboo shark *(Chiloscyllum indicum*)(Table,1).

And landed 24 ray species were- Pink whip ray *(Himantura fai*), Tube mouth whip ray *(Himantura lobistoma*), Leopard whip ray *(Himantura undulata*), White spotted whip ray*(Himantura gerrardi*), Reticulate whip ray *(Himantura uarnak*), Brown whip ray

(Himantura uarnacoides), Scaly whip ray *(Himantura imbricata*), Dwarf whip ray *(Himantura walga*), Chinese sting ray *(Dasyatis sinensis*), Sharp nose sting ray *(Dasyatis zugei*), Blue spotted sting ray *(Dasyatis kuhlii*), Banana leaf -tail ray *(Pastinachus sephen*), Blotched fantail ray *(Taeniura meyeni*), Porcupine ray *(Urogymnus asperrimus*), Giant shovelnose ray *(Rhinobatos typus*), Club nose guitar fish *(Rhinobatos thouin*), Bow mouth guitar fish *(Rhina ancylostoma*), Japanese butterfly ray *(Gymnura japonica*), Banded eagle ray *(Aetomylaeus nichofii*),White spotted eagle ray *(Aetobatus narinari*), Rough cow nose ray (*Rhinoptera adspersa*), Javanese cow nose ray *(Rhinoptera javanica*), Lesser devil ray *(Mobula kuhlii) &* Japanese devil ray *(Mobula japonica*) found in Bangladesh marine territory(Table,1).

Table: 1 Percentage contribution (%) of Sharks and Rays during April, 2006 to March, 2014 (By weight).

Scientific Name	Year wise (Apr,06-Mar,07) %	Year wise (Apr,07-Mar,08) %	Year wise (Apr,08-Mar,09) %	Year wise (Apr,09-Mar,10) %	Year wise (Apr,10-Mar,11) %	Year wise (Apr,11-Mar,12) %	Year wise (Apr,12-Mar,13) %	Year wise (Apr,13-Mar,14) %	Average Percentage (%)
Rhizoprionodon oligolinx	-	-	-	-	-	0.002	3.73	-	0.47
Carcharhinus amblyrhynchoides	0.06	-		0.30	-	-	-	0.02	0.11
Carcharhinus leucas	-	-	-	-	0.75	0.30	-	-	0.17
Carcharhinus melanopterus	4.74	7.51	6.99	18.88	3.87	1.25	1.56	0.84	5.71
Carcharhinus sorrah	-	-	-	-	-	0.001	0.78	-	0.10
Rhizoprionodon acutus	9.07	22.52	7.37	7.32	4.96	1.45	2.25	3.56	7.31
Scoliodon laticaudus	6.45	9.77	18.39	25.49	6.06	22.09	23.03	10.18	15.18
Galeocerdo cuvier	2.05	2.71	2.26	-	-	1.34	2.20	-	1.45
Sphyrna lewini	1.36	4.37	3.38	1.66	5.06	7.08	10.51	6.50	4.99
Sphyrna mokarran-	1.34	6.97	6.55	10.01	-	-	-	6.22	3.96
Chiloscyllum indicum	3.48	3.81	5.47	2.58	7.12	1.26	0.54	-	3.03
Himantura fai	-	-	-	-	-	-	-	0.02	-
Himantura lobistoma	-	-	-	-	-	-	-	0.01	-
Himantura undulata	-	3.67	-	-	0.28	0.23	2.11	2.20	1.10
Himantura gerrardi	-	-	0.74	7.17	11.32	0.20	0.49	1.14	2.63

Himantura uarnak	31.28	7.74	10.30	14.49	33.96	42.41	2.43	22.16	20.60
Himantura uarnacoides	4.43	4.61	19.60	4.88	11.33	8.70	33.98	30.35	14.74
Himantura imbricata	-	-	-	-	-	-	-	1.11	0.14
Himantura walga	28.98	18.98	11.64	5.45	0.41	0.31	-	-	8.87
Dasyatis sinensis	-	-	-	-	-	-	1.00	0.01	0.13
Dasyatis zugei	-	-	-	-	-	-	-	0.02	-
Dasyatis kuhlii	-	-	-	-	0.03	-	-	1.10	0.27
Pastinachus sephen	-	-	-	-	0.04	-	-	0.02	-
Taeniura meyeni	-	-	-	-	-	-	0.02	0.01	-
Urogymnus asperrimus	-	-	-	-	0.02	0.18	-	-	0.03
Rhinobatos typus	2.40	2.09	-	-	11.48	7.10	7.12	4.53	4.36
Rhinobatos thouin	-	-	-	-	0.01	2.30	-	-	0.29
Rhina ancylostoma	0.05	-	-	0.14	-	-	0.001	0.01	0.03
Gymnura japonica	0.05	0.44	2.49	0.22	-	-	3.53	3.19	1.57
Aetomylaeus nichofii	0.39	1.29	0.49	0.04	0.63	0.88	1.37	2.24	0.92
Aetobatus narinari	-	-	-	-	-	0.02	-	-	-
Rhinoptera adspersa	-	-	-	-	-	-	-	0.03	-
Rhinoptera javanica	0.27	3.52	1.58	-	-	0.08	0.58	1.12	0.99
Mobula kuhlii	-	-	-	-	-	0.19	-	-	0.03
Mobula japonica	-	-	2.75	0.58	0.82	-	-	0.02	0.78
									99.96

Status of sharks and rays

Belong the shark species, dominant 4 species were- Spade nose shark *(Scoliodon laticaudus*), Milk shark *(Rhizoprionodon acutus*), Black tip reef shark *(Carcharhinus melanopterus)* & Scalloped hammerhead shark *(Sphyrna lewini)*; commonly exploited 4 species were Bull shark *(Carcharhinus leucas*),Tiger shark *(Galeocerdo cuvier)*, Great hammerhead shark *(Sphyrna mokarran*) & Slender bamboo shark *(Chiloscyllum indicum*) and rarely 3 species - Grey sharp nose shark (*Rhizoprionodon oligolinx*), Graceful shark *(Carcharhinus amblyrhynchoides)* & Soft tail shark (*Carcharhinus sorrah)* were landed (Table,1).

And among ray species, the most prominent 5 species were Reticulate whip ray *(Himantura uarnak)*, Brown whip ray*(Himantura uarnacoides*), Dwarf whip ray*(Himantura walga*), Giant shovelnose ray *(Rhinobatos typus*) & White spotted whip ray *(Himantura gerrardi)* were available; commonly 12 species were Leopard whip ray *(Himantura undulata)*, Scaly whip ray *(Himantura imbricata*),Chinese sting ray*(Dasyatis sinensis*), Blue spotted sting ray *(Dasyatis kuhlii*), Porcupine ray*(Urogymnus asperrimus*), Club nose guitar fish *(Rhinobatos thouin*), Bow mouth guitar fish*(Rhina ancylostoma*), Japanese butterfly ray *(Gymnura japonica*), Banded eagle ray *(Aetomylaeus nichofii*), Javanese cow nose ray*(Rhinoptera javanica*), Lesser devil ray*(Mobula kuhlii) &* Japanese devil ray *(Mobula japonica*) and rarely landed 7 species were Banana leaf -tail ray *(Pastinachus sephen)*, Blotched fantail ray *(Taeniura meyeni)*, Rough cow nose ray(*Rhinoptera adspersa)*, Pink whip ray *(Himantura fai*), Tube mouth whip ray *(Himantura lobistoma*), White spotted eagle ray *(Aetobatus narinari*) & Sharp nose sting ray *(Dasyatis zugei)* (Table,1).

Percentage contribution

During the study period 11 shark species was contributed 42% and 24 ray species was 58% of the total landing by weight. Belong the shark species Grey sharp nose shark was contribute 0.47% followed by Graceful shark, Bull shark, Black tip reef shark, Soft tail shark, Milk shark, Spade nose shark, Tiger shark, Scalloped hammerhead shark, Great hammerhead shark and Slender bamboo shark were 0.11, 0.17, 5.71, 0.10, 7.31, 15.18, 1.45, 4.99, 3.96 and 3.03% respectively(Table,1).

And among to ray species Pink whip ray contribute 1.10% followed by 2.63, 20.60, 14.74, 0.14, 8.87, 0.13, 0.0, 0.27, 0.0, 0.0, 0.03, 4.36, 0.29, 0.03, 1.57, 0.92, 0.0, 0.0, 0.99, 0.03 and 0.78% were found in Tube mouth whip ray, Leopard whip ray, White spotted whip ray, Reticulate whip ray, Brown whip ray, Scaly whip ray, Dwarf whip ray, Chinese sting ray,

Sharp nose sting ray, Blue spotted sting ray, Banana leaf -tail ray Blotched fantail ray, Porcupine ray, Giant shovelnose ray, Club nose guitar fish, Bow mouth guitar fish, Japanese butterfly ray, Banded eagle ray, White spotted eagle ray, Rough cow nose ray, Javanese cow nose ray, Lesser devil ray and Japanese devil ray respectively (Table,1).

Sharks: Among the recorded elasmobranches species; 11 shark species were- Grey sharp nose shark, Graceful shark, Bull shark, Black tip reef shark, Soft tail shark, Milk shark, Spade nose shark, Tiger shark, Scalloped hammerhead shark, Great hammerhead shark and Slender bamboo shark

1. Grey sharp nose shark

Family: Carcharhinidae

Scientific name: *Rhizoprionodon oligolinx(*Springer,1964)

English name: Grey sharpnose shark

Local name: gvBj¨v nvsMi (Mailla Hangar)

Field characters

A small shark with the second dorsal fin originating well behind the anal fin origin, second dorsal fin smaller than anal fin, its origin far posterior to midlength of anal fin base, anal fin with slightly concave posterior margin and a pair of long preanal ridge, short labial furrows, usually less than 16 enlarged hyomandibular pores (Total for both sides of the head), relatively large eyes, and oblique, narrowly triangular, smooth-edged teeth.

Diagnostic characters

Body fusiform, moderately slender, interdorsal ridge occasionally present.

Labial furrows short, uppers 0.2-1.3% of the total length.

First dorsal fin origin over or just behind pectoral fin free rear tips.

Teeth similar in bath jaws, oblique, narrowly triangular and smooth-edged.

Colour : Dorsal surface bronze to grayish; Ventral surface pale, pectoral fin margins pale; upper caudal fin margins dark-edged.

Size : Maximum total length 70 cm, both sexes mature at 35-40 cm total length, size at birth about 20-30 total length.

2. Graceful shark

Family: Carcharhinidae

Scientific name: *Carcharhinus amblyrhynchoides* (Whitley, 1934)

English name: Graceful shark

Local name: gyBU¨v nvsMi (Muitta Hangar)

Field characters

A medium-sized, fairly short-shouted shark with black tips to most fins, bronze to greyish dorsal coloration. Lacking in inter dorsal ridge, and with slender, erect, serrated upper teeth.

Diagnostic characters

Body fusiform, moderately stout; inter dorsal ridge absent.

Upper teeth with erect to slightly oblique, slender, finely serrated cusps; lower teeth erect, more slender,

either with fine serrations or smooth, edge.

Snout moderately short, labial furrows small and inconspicuous.

First dorsal fin origin over or just behind pectoral fin insertions.

Colour: Dorsal surfaces bronze, fading to grey after death or in preservative. Pale ventrally with a pale stripe extending along the mid-flank from the pelvic fin to below the first dorsal fin. All fin tips usually black or dusky (Anal fin sometimes uniformly pale).

Size: Maximum total length at 167 cm and both sexes mature at 110-115 cm total length; size at birth about 52-55 cm total length.

3. Bull shark

Family : Carcharhinidae

Scientific name : *Carcharhinus leucas* (Valenciennes in Muller and Henle,1839)

English name: Bull shark

Local name: ewj nvsMi/ ej` nvsMi (Bali/Balad Hangar).

Field characters

A large, stout-bodied whaler shark with a short, blunt snout, a rather large second dorsal fin (Mostly more than a third of first dorsal fin height) no interdorsal ridge or distinctive fin markings and with broadly triangular, serrated upper teeth.

Diagnostic characters

Body fusiform, snout short and blunt, inter-dorsal ridge absent, eye small.

#Upper teeth erect to slightly oblique, broadly triangular, serrated, lower teeth similar but more slender.

First dorsal fin origin over or just behind pectoral fin insertion;

The first dorsal fin is broad and triangular and less than 3.2 times height of second dorsal fin.

Colour : Dorsal surface grey, ventral surface pale, an indistinct pale stripe on each flank, juveniles with dusky to black fin tips (Particularly the caudal, pectoral, second dorsal and anal fins); upper caudal fin with a thin dusky posterior margin.

Size : Maximum total length about 340 cm, size at birth about 55-80 cm total length.

4. Black tip reef shark

Family: Carcharhinidae

Scientific name: *Carcharhinus melanopterus* (Quoy and Gaimard, 1824)

English name: Black tip reef shark

Local name: Bwjkv nvsMi/ Kvjv nvsMi (Ilisha/ Kala Hangar)

Field characters

A small shark with a short and bluntly rounded snout, a yellowish brown to grayish upper surface, no inter dorsal ridge, and with very distinct black tips to the first dorsal and lower caudal fins, a prominent black tip of first dorsal fin set off abruptly by a light band below it, medium-sized, fairly short-shouted shark with black tips to most fins, bronze to grayish dorsal coloration.

Diagnostic characters

Body fusiform; inter dorsal ridge absent.

Snout short and bluntly rounded; nasal lobes relatively long; labial furrows short and inconspicuous.

First dorsal fin origin over free rear tips of pectoral fins.

Colour : Dorsal surfaces varying from yellowish brown to grey; ventral surfaces white. A distinct pale stripe on each flank extends from above the pelvic area to level with the first dorsal fin origin, upper caudal fin with black margins.

Size : Maximum total length about 200 cm; both sexes mature between 95 and 110 cm total length; size at birth about 35-50 cm total length.

5. Soft-tail shark

Family: Carcharhinidae

Scientific name: *Carcharhinus sorrah(*Valenciennes, in Muller and Henle,1839)

English name: Soft-tail shark

Local name: gvBj¨v nvsMi (Mailla Hangar).

Field characters

A medium-sized shark with a bronze to brownish grey upper surface, an interdorsal ridge, the first dorsal fin origin more or less over the pectoral fin free rear tips, conspicuous black tips to the pectoral, second dorsal and lower caudal fins and with oblique, triangular, serrated upper teeth.

Diagnostic characters

Body fusiform, interdorsal ridge present.

First dorsal fin origin varying from just anterior to just behind pectoral fin free rear tips.

Second dorsal fin with a long inner margin (2.0-2.6 times second dorsal fin height)

Colour : Dorsal surface bronze in life, fading to brownish grey or grey after death and in preservative. Ventral surfaces white. A pale stripe on the flanks extends interiorly from above the pelvic fins. Pectoral, second dorsal and lower caudal fins with distinct black tips, first dorsal and upper caudal fins with dusky margins.

Size: Maximum total length 100 cm, both sexes mature at about 90-95 cm total length; size at birth about 50 cm total length.

6. Milk shark

Family : Carcharhinidae

Scientific name : *Rhizoprionodon acutus* (Rupell,1837)

English name: Milk shark

Local name: gyBU¨v nvsMi/ Kv‡gvU nvsMi (Kamot Hangar)

Field characters

A small shark with second dorsal fin originating well behind the anal fin origin, long labial furrows, usually more than 16 hyomandibular pores (Total for both sides of the head), relatively large eyes, second dorsal fin smaller than anal fin, its origin for posterior to mid length of anal fin base, anal fin with slightly concave posterior margin and a pair of long preanal ridges and oblique, narrowly triangular, smooth-edged teeth.

Diagnostic characters

Body fusiform, moderately slender.

Snout relatively long and narrow. Tooth similar in both jaws.

First dorsal fin origin varying from just anterior to just behind pectoral fin free rear tips.

Anal fin with slightly concave posterior margin and a pair of long preanal ridges.

Colour : Dorsal surfaces bronze to grey fish ventral surface pale; pectoral, pelvic, anal and lower caudal fin tips pale; pectoral fin posterior margins pale.

Dorsal and upper caudal fin tips dark in juveniles, some times dark-edged in adults.

Size : Maximum total length of 178 cm was record from waters off Africa; both sexes mature at about 75 cm total length, size at birth about 35-40 cm total length.

7. Spade nose Shark

Family : Carcharhinidae

Scientific name: *Scoliodon laticaudus* (Cuvier 1829)

English name: Spade nose Shark

Local name: UvBK¨v nvsMi/ _yBU¨v nvsMi (Taikka/Thuitta Hangar)

Field characters

Head and snout strongly depressed; snout long, narrowly rounded, eye moderately large (Labial furrows very short).

First dorsal fin moderately large, second dorsal fin very small, its height less than 1/3 of that of first dorsal.

Diagnostic characters

A small shark, with a very long, flat, laterally expanded and a stocky compressed body.

Spade like snout.

Anal fin much larger than the second dorsal fin.

A caudal fin with its post ventral margin only moderately concave not deeply notched.

Colour : Branzy grey above, white below.

Size **:** Maximum Total length about 74 cm but most individuals smaller; male mature at 24 to 36 cm total length and reaching 58 cm total length; females nature at 33 to 35 cm total length and reaching at least 69 cm total length; size at birth 12 to 15 cm total length, averaging about 14 cm total length.

8. Tiger shark

Family: Carcharhinidae

Scientific name: *Galeocerdo cuvier* (Peron and LeSueur, in LeSueur, 1822)

English name : Tiger shark

Local name: evNv nvsMi (Bagha Hangar)

Field characters

A very large shark with heavily serrated, cockscomb-shaped teeth, a broad and blunt head, long upper labial furrows, and a colour pattern of dark, vertical, flank bars.

Diagnostic characters

Body fusiform, stout forward of the first dorsal fin; interdorsal ridge present.

Caudal peduncle relatively narrow; low lateral keels present.

Head large and broad; snout short and blunt.

Mouth large; spiracles present

Upper caudal fin lobe tapering; tip thin and pointed.

Colour : Dorsal surface grey with bold, dark reticulations in newly born young; reticulations becoming vertical bars in specimens up to 300 cm; bars faint or missing in larger adults. Ventral surfaces white.

Size : Maximum total length 650 cm, commonly till 400 cm total length ; males mature at about 300 cm total length and females at about 330 cm total length ; size at birth about 50-75 cm total length.

9. Scalloped hammerhead

Family - Sphyrnidae

Scientific name: Sphyrna lewini (Griffith and Smith, 1834)

English name**:** Scalloped hammerhead

Local name: Kvbbyqv nvsMi/ nvZzox nvsMi (Hatori Hangar)

Field characters

A hammarhead shark with the front margin of the head curved forward anteriorly with a median indentation, the head width less than 40% of total length, smooth-edged (or at most weakly serrated) teeth, straight posterior margins to the pelvic fins and a rather low dorsal fin, height less than or equal to length of third gill slit.

Diagnostic characters

Body fusiform, moderately slender, upper precaudal pit 'V' shaped.

Head laterally expanded into prominent keels (A hammer); maximum width 24-30% of total length.

Anterior profile of hammer curved anteriorly, with median and lateral indentations.

First dorsal fin origin about over or slightly behind pectoral fin insertion.

Second dorsal fin origin about over midpoint of anal fin base.

Colour : Olive, bronze or brownish grey dorsally, pale ventrally, ventral surface of pectoral fin tips dusky in adults; no other fin markings, pectoral, lower caudal and second dorsal fin tips dark in juveniles.

Size : Maximum total length 420 cm, males mature at 140-160 cm total length, females at about 200 cm total length, size at birth about 45-50 cm total length.

10. Great hammerhead

Family: Sphyrnidae

Scientific name **:** *Sphyrna mokarran*(Ruppell, 1837)

English name : Great hammerhead

Local name: Kvbbyqv nvsMi/ nvZzox nvsMi (Hatori Hangar)

Field characters

A hammerhead shark with the front margin of the head nearly straight (Except in small juveniles) but with a median indentation, the head width less than 40% of total length, a very tall and falcate first dorsal fin, serrated teeth, concave posterior margins to the pelvic fins, and a relatively tall second dorsal fin (Height greater than length of third gill slit).

Diagnostic characters

Body fusiform, moderately slender; upper precaudal pit 'V' shaped.

Head laterally expanded into prominent keels. Resembling a hammer; maximum width 23-27% of total length; anterior profile of 'hammer' nearly straight, but with both median and oblique.

First dorsal fin very tall, slender and falcate.

Pelvic fin posterior margins markedly concave.

Colour : Bronzy to greyish brown dorsally, pale ventrally. No fin markings in adults; second dorsal fin tip dark in juveniles.

Size : Maximum total length 600 cm (Although rarely reaching 450 cm total length); size at birth about 60-70 cm total length.

11. Slender bambooshark

Family : Hemiscyllidae

Scientific name *: Chiloscyllum indicum* (Gmelin, 1789)

English name: Slender bambooshark

Local name: e¨vO nvsMi (Beng Hangar)

Field characters

Mouth well in front of eyes, spineless dorsal fins far posterior on tail; greatly elongated slender precaudal tail; long and low anal fin just anterior to caudal fin; lateral ridges on trunk; dorsal fins without elongated free rear tips; first dorsal origin opposite or just behind pelvic insertions; anal fin length from origin to free rear tip subequal to length of hypural caudal lobe from lower caudal origin to subterminal notch; colour pattern of numerous small dark spots and dashes.

Diagnostic characters

Body and tail very slender.

Snout narrowly rounded anteriorly; a lateral ridge present on each side of trunk.

Dorsal fins small and rounded, smaller than pelvic fins.

Aanal fin length from origin to free rear tip subequal to length of hypural caudal lobe from lower caudal origin to subterminal notch.

Colour : Colour pattern of numerous dark brown or blackish spots and dashes on light brown back ground.

Size : Maximum total length about 0.5 m; male mature between 39 to 42 cm total length and reaching at least 54 cm total length. Female mature at about 43 cm total length.

Rays: Recorded 24 ray species were- Pink whip ray, Tube mouth whip ray, Leopard whip ray, White spotted whip ray, Reticulate whip ray, Brown whip ray, Scaly whip ray, Dwarf whip ray, Chinese sting ray, Sharp nose sting ray, Blue spotted sting ray, Banana leaf -tail ray, Blotched fantail ray, Porcupine ray, Giant shovelnose ray, Club nose guitar fish, Bow

mouth guitar fish, Japanese butterfly ray, Banded eagle ray, White spotted eagle ray, Rough cow nose ray, Javanese cow nose ray, Lesser devil ray and Japanese devil ray.

1. Pink whipray

Family: Dasyatidae

Scientific name: *Himantura fai* **(**Jordan and Seale, 1906)

English name : Pink whipray

Local name: mwb nvDm (kvcjv cvZv) (Suni houshi/ shapla pata)

Field characters

A large, uniformly brownish pink stingray with a very long, whip-like tail that lacks skin folds. The head and trunk are covered with short, widely spaced denticles but there are no enlarged thorns on the upper surface.

Diagnostic characters

Disc rhomboidal, very robust centrally, quadrangular; pectoral fin apex broadly rounded.

Eye small, inter orbital space broad.

Snout very broad, tip feebly pointed; anterior margin straight to slightly convex.

Tail very long, about twice disc width, rather narrow, almost cylindrical in cross-section; whip- like behind sting, mostly with single sting: no cutaneous folds.

Colour: Upper surface greyish pink. Ventral surface uniformly pale. Tail dark greyish or black beyond sting.

Size: Disc width exceeding 150 cm; size at birth about 55 cm disc width, 154 cm total length.

2. Tubemouth whipray

Family: Dasyatidae

Scientific name: Himantura lobistoma (Manjaji-Matsumoto & Last,2006)

English name**:** Tubemouth whipray

Local name: **ivwg nvDm (kvcjv cvZv),** (Rami houshi/ shapla pata)

Field characters

Highly protrusible jaws. This species has a diamond-shaped pectoral fin disc with an elongated, pointed snout and broadly rounded outer corners covered by small, flattened dermal denticles.The tubemouth whipray has a diamond-shaped pectoral fin disc longer than wide, with broadly rounded outer corners. The pelvic fins are short and can be rotated forwards; the males have short, stout claspers.

Diagnostic characters

The anterior margins of the disc are strongly concave, and converge on a narrow, flattened, pointed snout.

The mouth is straight and transverse, and contains no papillae (Dipple-like structures).

The jaws are highly protrusible, capable of forming a tube longer than the mouth width.

The slender tail measure over twice the length of the disc and lacks fin folds.

Colour: Measuring up to 1 m (3.3 ft) across. The upper surface of the disc is a plain greyish or brownish in colour.

Size: The type specimen is an adult male 49 cm (19 in) across. One known specimen contained a single near-term pup measuring 18 cm (7.1 in) across. Males attain sexual maturity at under 49 cm (19 in) across, and females at under 70 cm (28 in).

3. Leopard whipray

Family: Dasyatidae

Scientific name: *Himantura undulata* (Bleeker,1852)

English name: Leopard whipray

Local name: evNv nvDm/ wPZv nvDm (kvcjv cvZv) (Bagha/ chita houshi,shapla pata).

Field characters

A large stingray with a whip like long tail that lacks skin folds. Disc shape suboval, preorbital snout moderately long, with a distinct apical lobe, lateral apices moderately rounded; dorsal surface entirely covered with large dark brown polygonal spots in young, and with broad yellowish-brownish undulations and elongated loops, or large and separated by slightly narrower or equally wide paler (White) lines.

Diagnostic characters

Disc quadrangular trunk deep, slightly longer than width.

Pectoral fin apexices narrowly rounded, tip pointed, anterior margin almost straight.

Pelvic fin small, subtriangular.

With an attractive pattern of Leopard like spots on the dorsal surface.

Colour : Adults sandy brown with dark rings (Resembling a leopards spot) covering most of disc and tail; rings mostly becoming obscure near disc margin. Juveniles greyish to brownish with rather large black spots. Ventral surface white. Tail before sting usually with a single row of spots on each side, with black and white bands beyond sting.

Size: Maximum total length reaching 410 cm; maximum disc width 140 cm. Size at birth about 20 cm DW(92 cm TL).

4. White spotted whipray

Family: Dasyatidae

Scientific name: *(Himantura gerrardi*) (Person and Lesucur,1822)

English name: White spotted whip ray

Local name: mv`v †KvUv nvDm (kvcjv cvZv), Sada kota housh (shapla pata).

Field characters

A medium to large size ray, upper surface brownish grey, usually with diffused white spots confined to posterior half of disc, spots sometimes very sparse, absent or also extending over anterior disc. Tail base brownish with row of white spots along dorsolateral margin to sting beyond sting alternating black and white bands on upper half of tail, uniformly dusky on lower half.

Diagnostic characters

Disc rhomboidal, pectoral fin apex narrowly rounded (More broadly rounded in juveniles).

Tail very slender; elongated about 2.5 to 3 times of disc width.

Pelvic fins small, almost triangular.

No enlarged thorns on midline of tail; tail covered posteriorly with small, sharp thorns.

Mostly wit one sting, no cutaneous fold on tail.

Colour: Upper surface brownish grey, usually with diffuse white spots confined to posterior half of disc spot sometimes very sparse, absent or also extending over anterior disc; ventral surface of disc, usually uniformly white. Tail base brownish with row of white spots along dorsolateral margin to sting, beyond sting alternating black and white bands on upper half of tail, uniformly dusky on lower half.

Size: Maximum total length reaching 200 cm, maximum disc width reaching 90 cm.

5. Reticulate whipray

Family :Dasyatidae

Scientific name: *Himantura uarnak* (Forsskal, 1775)

English name: Reticulate whip ray

Local name: wU°v †cvov nvDm (kvcjv cvZv), Tikka pora housh (shapla pata).

Field character

A large sting ray with a whip-like tail that lacks skin folds with a dense pattern of fine reticulations on the dorsal surface. Juveniles have a rhomboidal disc densely covered by black spots, more than 5 spot (Usually about 7) in a direct line across interspiracular space.

Diagnostic character

Disc rhomboidal.

Trunk thick; width pectoral fin apex narrowly rounded, tip distinctly pointed.

2 prominent part thorns in centre of disc but enlarged thorns absent from midline of tail.

Tail very slender, elongated about 3-3.5 times disc width in juveniles, whip-like beyond sting, mostly with one sting, no cutaneous fold.

Colour: Upper surface of adults highly ornamented; pale on yellowish brown with a dense pattern of dark brown wavy lines or reticulations over disc and tail. Juveniles pale yellowish brown with extremely dense pattern of small. Ventral surface uniformly pale; dorsal and ventral surfaces of tail black behind sting, banded laterally.

Size: Maximum total length reaching 450 cm, maximum disc width about 150 cm, size as birth about 28 cm disc width, 110 cm total length.

6. Brown whipray

Family: Dasyatidae

Scientific name **:** *Himantura uarnacoides* (Bleeker, 1852)

English name : Brown whipray

Local name: nvDm (kvcjv cvZv) Housh (shapla pata)

Field characters

A large, uniformly dark brown or yellowish stingray with a very long, whip-line tail that lacks skin folds. Disc sub rhomboidal; snout narrows and acutely pointed.

Diagnostic characters

Pectoral fin apex broadly rounded; snout narrow and acutely pointed, apex strongly produced; anterior margin distinctly concave.

Tail very elongated and, usually more than 3 times disc width, whip-like beyond sting, almost rounded near base, tapering gently to sting; mostly with 1 sting; no cautaneous folds.

Pelvic fins small, almost triangular.

No enlarged thorns on midline of tail.

Colour : Uniform dark brown or yellowish (greyish green in juveniles) above; greyish brown, (white in juveniles) ventrally, with darker margin on disc and tail; dorsal tip of snout, lower jaw, base of pelvic fins, and some areas of belly usually white; tail lacking distinct black and white rings.

Size : Maximum total length reaching 300 cm; maximum disc width 105 cm.

7. Scaly whipray

Family: Dasyatidae

Scientific name: *Himantura imbricata* (Bloch and Schneider, 1801)

English name: Scaly whip ray

Local name: nvDm (kvcjv cvZv) Housh (Shapla pata).

Field characters

Disc sub-oval, pectoral fin apex broadly rounded; snout acute. Tail base depressed, tapering rapidly at sting, becoming filamentous beyond; tail of mature females not bulbous. Denticle band with well-defined margin in adults; denticles in band flat, abutted; enlarged thorns along tail base to base of sting. More than one (Usually 2-3) stinging spines.

Diagnostic characters

Trunk thin, width sub equal to length.

Pectoral fin apex broadly rounded; anterior margin slightly concave.

Pelvic fins small, almost triangular.

Tail with mostly 4 to 6 not enlarged thorns, much shorter than half eye diameter(Absent in small juveniles), tail beyond sting completely smooth.

Colour: Upper surface of adults plain greyish brown, becoming paler yellowish around disc margin; ventral surface uniformly white with some dusky patches; tail greyish brown dorsally to sting, white ventrally, white beyond sting in males, mostly dusky and white in females.

Size: Maximum total length about 65 cm; maximum disc width 22 cm.

8. Dwarf whipray

Family : Dasyatidae

Scientific name : *Himantura walga* (Muller and Henle, 1841)

English name: Dwarf whip ray

Local name: nvDm (kvcjv cvZv), Housh (Shapla pata).

Field characters

Disc almost oval, pectoral fin apex broadly rounded; snout acute, tail base rather broad, depressed, tapering rapidly at sting, filamentous beyond sting in mature males, initially bulbous then terminating in a fine filament immature females; thorns on tail very elongated, much longer than ½ eye diameter.

Diagnostic characters

Trunk thin, width subequal to length.

Pectoral fin apex broadly rounded; anterior margin slightly concave.

Tail base rather broad, depressed, tapering rapidly at sting, length slightly longer than disc in male and juveniles; sub-equal in mature females;

Pelvic fins small, almost triangular.

Tail with mostly 4 to 6 greatly enlarged, spear-like thorns, tail beyond sting completely smooth.

Colour: Upper surface of adults plain greyish brown, becoming paler yellowish around disc margins, ventral surface uniformly white with some dusky patches, tail greyish brown dorsally to sting, white ventrally, white beyond sting in males, mostly dusky and white in females.

Size: The maximum total length of the present specimens is more than 47 cm, maximum disc width more than 20 cm.

9. Chinese stingray

Family: Dasyatidae

Scientific name **:** *Dasyatis sinensis* (Steindachner, 1892)

English name : Chinese stingray

Local name: nvDm (kvcjv cvZv) Housh (Shapla pata).

Field characters

A small stingray; matured at 38 cm disc width. Dorsal and ventral cutaneous tail folds present. Eyeball diameter about half of inter orbital width. Disc greyish above, its margins yellowish; uniform pale below.

Diagnostic characters

Disc rhomboidal, anterior and posterior margins of disc slightly convex; snout triangular and protruding.

The pectoral fin disc of the Chinese stingray is diamond-shaped and almost as long as wide, with slightly convex leading and trailing margins .

The whip-like tail measures not quite twice the length of the disc and bears both dorsal and ventral fin folds behind a stinging tail spine; the ventral fold measures less than half as long as the disc.

The eyes are moderate size and closely followed by a pair of spiracles.

The snout is triangular and projecting, comprising a quarter of the disc length.

Colour : Dorsal surface of disc grey with yellowish margin; ventral surface whitish.

Size : The holotype specimen (380 mm DW) is already matured.

9. Sharp nose stingray

Family: Dasyatidae

Scientific name: *Dasyatis zugei* (Miiller and Henle, 1841)

English name : Sharpnose stingray

Local name: evwU nvDm (kvcjv cvZv) Bati Houshi (Shapla pata)

Field characters

Disc sub rhomboidal, snout narrow and acutely pointed, apex strongly protruded; anterior margin distinctly concave. Disc and tail yellowish brown above, pale below; ventral disc with broad yellowish brown marginal band. Tail with narrow ventral skin fold, not baded. Mouth without oral papillae.

Diagnostic characters

Eyes small, inter orbital space rather narrow, mouth with oral papillae.

Trunk rather thick, width slightly exceeding length; pectoral fin apexices broadly rounded.

Snout narrow and acutely pointed, apex strongly produced; anterior margin distinctly concave.

Tail elongated and slender; ventral skin fold narrow.

Pelvic fins small, almost triangular.

Colour : Uniform dark brown above; white ventrally, with darker margin of disc tail lacking distinct black and white bands.

Size : Maximum total length at least 75 cm; maximum disc width 29 cm.

10. Blue spotted stingray

Family - Dasyatidae

Scientific name: Dasyatis kuhlii (Muller and Henle,1841)

English name: Blue spotted sting ray

Local name: ‡ZBj¨v nvDm (kvcjv cvZv), Tailla Housh (Shapla pata).

Field characters

A small to medium size sting ray with a rhomboidal disc. Short thorns confined to the midline of the disc and with prominent dorsal and ventral skin folds on the tail. The dorsal surface has usually prominent bluish spots (But several individuals were with very few unclear spots or no spots at all) with dark transverse bars about the eyes, and the tail is banded.

Diagnostic characters

Pectoral fin apexices angular, narrowly rounded in juveniles, snout broadly rounded.

Tail broad based, slightly depressed, slender and rather compassed beyond sting, its length mostly longer than disc generally with 2 stings.

Ventral cutaneous fold low elongate, dorsal fold short, situated beyond sting.

Colour : Dorsal surface greyish to brownish with prominent bluish spot, spots variable in size and number. Ventral surface mostly pale, slightly darker around disc margin. Tail with alternating black and white bands, tip mostly pale, skin folds pale at base with dark outer margin.

Size : Reaches a disc width of 38 cm and a total length of at least 75 cm, male mature at about 25 cm disc width, size at birth about 16 cm disc width.

11. Banana leaf-tailray

Family: Dasyatidae

Scientific name: *Pastinachus sephen* (Forsskal, 1775)

English name: Banana leaf-tail ray

Local name: ‰eivMx nvDm/ Miæ †jBÄv nvDm (Boiragi/ Garow langa houshi).

Field characters

A large stingray; disc rhomboidal. Tail base depressed, sting posteriorly located, ventral skin fold very deep but not reaching tail apex; tail tip filamentous. Dense band of blunt denticles along trunk and tail. Disc uniform dark brown above white below.

Diagnostic characters

Disc rhomboidal, trunk very thick, width about 1.1-1.3 times length. Pectoral fin apexices broadly rounded; snout broadly rounded, tip blunt anterior margin almost straight to slightly convex.

Pelvic fins of moderate size, broadly rounded., tail very broad-based and depressed; tapering gradually to sting; slender and almost cylindrical behind sting;

Ventral cutaneous fold very well developed, terminating abruptly about 2 sting lengths behind sting tip.

No dorsal skin fold; tip of tail filamentous.

Colour : Upper surface uniform dark greyish brown to black; tail fold and tail tip black. Ventral surface mostly white.

Size : Adults reaching at least 180 cm disc width, exceeding 300 cm total length; size at birth about 18 cm disc width, 50 cm total length or larger.

12. Blotched fantail ray

Family: Dasyatidae

Scientific name: *Taeniura meyeni* **(**Miiller and Henle, 1841)

English name : Blotched fantail ray

Local name: ‡ZBj¨v nvDm/ ˆeivMx nvDm (kvcjv cvZv), Tailla/ Boiragi housh (Shapla pata).

Field characters

A large stingray; disc sub circular, apex indented. Tail slightly longer than disc length, not depressed at base; prominent ventral skin fold extending to tail tip. Disc smooth, without thorns. Black and white mottling on upper surface, and on disc margins below.

Diagnostic characters

Disc subcircular, trunk robust, slightly wider than long margin of disc uniformly convex, tip not pointed.

Disc surface covered uniformly with short widely spaced granulations; on thorns.

Pelvic fin small, elongate.

Tail relatively broad-based, depressed, tapering rapidly at sting, slender and compressed beyond sting; short, slightly longer than disc width.

Ventral cutaneous fold very well developed and extending to tail tip.

Colour : Dorsal surface mottled black and white, sometimes brownish; tail uniformly black behind sting. Ventral surface of disc uniformly pale; margins and undersurface of tail greyish brown to black.

Size : Maximum disc width at least 180 cm, maximum total length about 330 cm; free swimming by 35 cm disc width (67 cm total length).

13. Porcupine ray

Family : Dasyatidae

Scientific name **:** Urogymnus asperrimus (Bloch and Schneider,1801)

English name**:** Porcupine ray

Local name: dvBb¨v nvDm (kvcjv cvZv), Fainna housh (Shapla pata).

Field characters

Disc oval .Tail shorter than disc length; stinging spine and skin folds absent.Dorsal disc, including pelvic fins and entire surface of tail covered with enlarged, prickly thorns; smaller, flat, plate-like denticles confined in dense patch on raised central part of disc and tail.

Diagnostic characters

Disc oval, trunk very robusts, slightly longer than wide, snout tip blunt.

Tail about equal to disc length, almost cylindrical in cross-section, tapering rapidly from base, no stinging spine or cautaneous folds.

Pelvic fin small, slender, upper disc of adults extremely prickly with large.

Spiny thorns scattered widely over entire surface, smaller flat-like dentacles confined in dense patch on raised central part of disc and on tail.

Colour : Uniform dark brown to greyish above, white below, tail tip dark.

Size: Maximum total length at least 220 cm, maximum disc width about 100 cm.

15. Giant Shovel nose ray

Family Rhinobatidae

Scientific name: *Rhinobatos typus* (Bennett, 1830)

English name**:** Giant Shovelnose ray

Local name**:** ‡K‡iÄv nvsMi/ wcZv¤^ix , Karenga hangar (Pitambari).

Field characters

A medium sized; greyish brown shovelnose ray with a relatively short, broad triangular snout; very broad oblique nostril with small nasal lobes; on internal flap and a rectangular anterior nasal aperture. It lacks a pronounced lower caudal fin lobe and has small thorns and a band of enlarged denticles along the dorsal midline.

Diagnostic characters

Disc wedge shaped; snout long, broad; tip broadly rounded.

Dorsal fin widely spaced, sub-equal in size; first dorsal in behind pelvic fin tips.

Pectoral fin tips broadly rounded spiracle with 2 low, widely separated skin folds.

Thorns small only in medium row along disc and tail.

Caudal fin without prominent lower lobe.

Colour : Upper surface greyish brown to olive along central disc and tail; distinctly paler and yellowish around pectoral, pelvic, dorsal and caudal fin margins.. Ventral surface uniformly pale; snout tip sometimes greyish.

Size : Maximum total length reaching 270 cm.

16. Club nose guitar fish

Family : Rhinobatidae

Scientific name: *Rhinobatos thouin* (Anonymous, in Lacepede,1798)

English name**:** Clubnose guitarfish

Local name: ‡K‡iÄv nvsMi/ wcZv¤^ix, Karenga hangar (Pitambari).

Field characters

A medium size, grayish fish brown shovelnose ray with a relatively short, broad triangular

snout, snout tip expanded into a club-like knob. Very broad oblique nostrils with small nasal lobes; no intranasal flap and a rectangular anterior nasal aperture. It lacks a pronounced lower caudal fin lobe and has small thorns and a band of enlarged denticles along the dorsal midline.

Diagnostic characters

Disc wedge-shaped, snout long, broad, tip expended into a club-like knob.

Dorsal surface uniformly granular, tail longer than disc.

Sub equal in size, first dorsal fin behind pelvic fin tips.

Pectoral fin tips broadly rounded, spiracle with 2 low, widely separated skin folds.

Colour : Upper surface greyish brown to olive along central disc and tail; distinctly paler and yell- wish around pectoral, pelvic, dorsal and caudal fin margins, snout pale yellow with dark brown stripe over rostral cartilage, becoming abruptly greyish brown just before eyes, ventral surface uniformly pale, snout tip sometimes greyish.

Size : Maximum total length between 250 to300 cm. Maximum total lengths recorded 1.2 m.

17. Bow mouth guitar fish

Family: Rhynchobatidae

Scientific name: Rhina ancylostoma (Bloch and Schneider,1801)

English name**:** Bowmouth guitar fish

Local name: KU nvsMi/ †ev nvsMi (Cot/ Bow hangar).

Field characters

A very deep-bodied guitarfish with its head distinctly demarcated from its pectoral fins, a broadly rounded snout, large thorns on the back located on horny ridges and no spiracular folds.

Diagnostic characters

Broadly rounded anteriorly, head clearly distinct from pectoral fins.

Body greatly thickened centrally, snout relatively short.

Tail much longer then disc.

Dorsal fins very tall, distinctly falcate with slightly concave posterior margins; relatively close together, first dorsal fin distinctly larger than second dorsal.

First dorsal fin origin about over pelvic fin origin, pectoral fins triangular.

Thorns greatly enlarged, very broad-based, some what compressed, sub triangular, with sharp tips.

Colour : Bluish grey on raised portion of disc and tail, dotted with large white spots, prominent white edged black blotch above pectoral fin base and dark bands between eyes; paler greryish to white around margin of pectoral fin and snout.

Ventral surface mostly pale. Dorsal and caudle fins similar to body, occasionally with white spots.

Size : Reported to reach 270 cm in total length, male adolescents between 157 & 178 cm and reaching at least 220 cm total length.

18. Japanese butterfly ray

Family: Gymnuridae

Scientific name: *Gymnura japonica* (Schlegal, 1850).

English name : Japanese butterfly ray

Local name: cÙ gwb nvDm/ cÖRvcwZ nvDm Padma moni/ Projapati housh.

Field characters

A distinctive, medium size ray with a very broad and flattened butterfly-shaped disc, and long filamentous tail, tail from cloaca to tip about half as long as length from snout tip to cloaca; tail with about 6 black bands.

Diagnostic characters

Disc lozenge-shaped, extremely flattened, much broader then long. Anterior margin slightly concave beside spiracle.

Snout very broadly angular, with a short, broad fleshy lobe at top.

Pectoral fin apexices narrowly rounded. Body firm, without denticles or thorns.

Mouth of moderate width; intenasal flap broad but short.

Tail filamentus, very flexible and long, tail from cloaca to tip about half as long as length from snout tip to cloaca, pelvic fin very small.

Colour : Mostly dark grey above (sometimes greyish or yellowish). Tail with alternating black and white bands, about 6 black bands. Ventral surface yellowish white or white.

Size : Maximum total length reaching about 100 cm; maximum disc width reaching about 160 cm.

19. Banded eagle ray

Family: Myliobatidae

Scientific name: *Aetomylaeus nichofii* (Blyth, 1860)

English name: Banded Eagle Ray

Local name: RvwZ †PvqvBb/ k•L wPj, (Jati choain/ Shankha chil).

Field characters

An eagle ray with a plain or faintly banded upper disc, no stinging spine a skirt-shaped intranasal flap and a single fleshy lobe around the snout that is not connected to the pectoral fins.

Diagnostic characters

Rostral lobe moderately long, duck-bill shaped, very fleshy, distinct from upper snout, much lower posteriorly than origin of pectoral fin.

Dorsal fin relatively large, triangular origin over or just in front of pelvic fin insertion; stinging spine absent.

Tail extremely long and whip-like.

Colour : Adult greyish brown above, fin margins and area below spiracle white; tail grey with faint evidence of banding posteriorly, juveniles with about 8 broad, dark bands, posterior pectoral fin margin dark; prominent dark band across interorbital; tail greyish above; black beneath, with alternating dark and light band posteriorly, ventral surface white.

Size : Maximum total length at least 100 cm, maximum disc width at least 64 cm, size at birth about 17 cm disc length.

20. White-spotted eagle ray

Family: Myliobatidae

Scientific name: *Aetobatus narinari* (Euphrasen, 1790).

English name : White-spotted eagle ray

Local name: wgVv †PvqvBb (Mitha choain)

Field characters

A distinctive white-spotted ray with a very angular disc, a V-shaped internasal flap, a stinging spine, and a long fleshy lobe around the snout that is not connected to the pectoral fins.

Diagnostic characters

Disc very broad and short; anterior margin deeply notched beside eye.

Head and body very thick, former almost circular in cross-section; rostra lobe long, duck-bill shaped, fleshy, distinct from upper snout, much longer posteriorly then origin of pectoral fin.

Pelvic fins slender, narrowly rounded distally, dorsal fin small.

Tail extremely long, whip-like, 2.5-3 times disc width when undamaged; dorsal fin small.

Colour : Upper surface uniformly greynish to pinkish with numerous small white or pale blue spots with faint margins; disc and pelvic fin margins dark. Ventral surface uniformly white. Tail dark for young.

Size : Maximum total length reaching 880 cm; maximum disc width possibly till 330 cm, most found to be less then 200 cm disc width; females mature at 241 cm disc width. Size at birth between 17 and 36 cm disc width.

21. Rough cow noseray

Family: Rhinopteridae

Scientific name: *Rhinoptera adspersa* (Valenciennes in Muller and Henle, 1841)

English name: Rough cownose ray

Local name: wPj †PvqvBb/ Nywo nvDm (Chil choain/ Ghori houshi).

Field characters

A stocky ray with a lozenge-shaped disc, a whip-like tail, tail length over 3 times disc length, and a distinctive bi-lobed forehead with a pair of lobe-like flaps located underneath, upper teeth in 9 rows.

Diagnostic characters

Disc broad, short; anterior margin deeply notched behind eyes.

Head thick and broad; spiracles large, situated above pectoral fin origin.

Pectoral fin tips angular.

Tail elongate, tail length over 3 times of disc length; dorsal fin prominent, origin just in front of pelvic fin insertion.

Colour: Uniform dark greyish brown above, white below.

Size: Total length 99 cm.

22. Javanese cow nose ray

Family: Rhinopteridae

Scientific name: *Rhinoptera javanica* (Muller and Henle, 1841)

English name: Javanese cow nose Ray

Local name**:** wPj †PvqvBb/ Nywo nvDm (Chil choain/ Ghori housh).

Field characters

A stocky Ray with a lozenge-shaped disc, a whip-like tail, tail length almost twice that of disc length, a distinctive bi-lobed forehead with a pair of lobe-like flaps located underneath 7 row of upper teeth.

Diagnostic characters

Spiracles large, situated above pectoral fin origins, pectoral fin tips angular.

Disc broad, short, anterior margin deeply notched; lobe-like rostral flaps partly depressible into shallow grooves.

Tail elongated tail length less than twice that of disc.

Dorsal fin prominent, origin just in front of pelvic fin insertion, serrated spine about equal in length to dorsal fin base.

Colour : Uniform dark greyish brown above, white below.

Size : Maximum disc width at least 150 cm.

23. Lesser devil ray

Family: Mobulidae

Scientific name: Mobula kuhlii (Valenciennes, in Muller and Henle,1841)

English name**:** Lesser devilray

Local name: wms †PvqvBb/ ev`yo nvDm(Shing choain/ Badur houshi).

Field characters

A medium size devil ray with a short head and cephalic lobes, a ventral month, a depressed tail base, a white tip on the dorsal fin and lacking a stinging spine. Anterior margin of pectoral fins not undulated.

Diagnostic characters

Disc broad, short, anterior margin of pectoral fins not undulated.

Head relatively short, distance from mid-snout to fifth gill slight, about 4.5 times disc width.

Tip of cephalic lobe to corner of mouth about 12% of disc width, cephalic lobe short, spiracles small, almost circular, situated below level of pectoral fins.

Mouth on under surface of head, teeth small.

Tail shorter than disc width, lacking a caudal spine, base dorsally flattened.

Colour : Dorsal surface dark bluish, dorsal fin tip white, inside of month pale, ventral surface white.

Size: Maximum disc width about 110 cm.

24. Japanese devil ray

Family: Mobulidae

Scientific name: *Mobula japonica* (Miiller and Henle, 1841).

English name: Japanese devilray

Local name: wms †PvqvBb/ ev`yo nvDm (Shing choain/ Badur houshi).

Field characters

A medium to large size devil ray with a short head and cephalic lobes, a ventral mouth,

spiracles slit-line and dorsal to plane of pectoral disc, a depressed tail base, a white tip on the dorsal fin, and having a stinging spine, anterior margin of disc straight or slightly convex.

Diagnostic characters

Disc broad, short, anterior margin of disc straight or slightly convex.

Head short, distance from mid-snout to fifth gill slight, about 4.5-5.2 times disc width.

Tip of cephalic lobe to corner of mouth about 11-13% of disc width; cephalic lobes short.

Anterior margin of disc straight or slightly convex.

Tail long, when undamaged sub equal to or longer than disc width, mostly with stinging spine.

Colour : Dorsal surface dark bluish; two white crescentic patches on shoulders in juveniles, sometimes fading in adults; dorsal-fin tip white; inside of mouth dark. Ventral surface white, often with dark patches in adults; no broad dark margin anteriorly.

Size: Maximum disc width 310 cm; usually smaller than 250 cm in the eastern Pacific; born at about 85 cm disc width.

Catches in the exploratory surveys by the government of Indian tuna long liners showing that, the pelagic sharks constitute 42% in the Arabian Sea; 36% in the Bay of Bengal; 43% in the Andaman Sea and 31% in equatorial areas. However, there has been no organized industrial fishing for the pelagic sharks till now (Devadoss, 1997). Sivasubramaniam (1987) summarizes data from fisheries survey of Indian tuna research cruises off the south west coast of India during 1983-1986.

As many as, 70 species of sharks are found in Indian waters, through only 18 species are occasionally or frequently caught (Hausfather, 2004).

The status of shark information collection in Cambodia recorded in 9 families of sharks (19 species) and 6 families of rays (22 species). No records by species are made (SEAFDEC, 2012).

The present status of information on shark fishery, among the 60 known shark species reported to have occurred in Myanmar waters. Only 36 species have been reported recently by various research works. These sharks and rays have been found in a wide array of habitats. They are largely caught as by – catch by long line, gillnet, trap and bottom trawl (SEAFDEC, 2012).

Taxonomically, the Philippines sharks and rays resources comprise 163 species of 3 chimaeras, 94 sharks and 66 batoids(SEAFDEC, 2012).

There are 134 major shark and ray species are recognized in Indonesia and they are mainly caught by loglines, gillnet and trawl (SEAFDEC, 2012).

There are 7 orders of sharks comprising of 62 species (18 families), 6 orders of rays comprising of 79 species (15 families) and 1 species of chimaeras in habiting Malaysian waters from fresh water to deep sea (SEAFDEC, 2012).

The total sharks records of 25 species in 10 families that have been found in the Thai water (SEAFDEC, 2012).

According to the survey, some 38 species of sharks and rays under 23 genera and 16 families have been found in the Vietnamese water, largely in the southern region (SEAFDEC, 2012).

This volume presents a fully illustrated field guide for the identification of the sharks and rays most relevant to the fisheries of the Red Sea and Gulf of Aden. An extensive literature review and two field surveys in the region were carried out for the preparation of the document. A total of 49 sharks and 45 batoids reliably reported for the region are listed and those common in the fisheries or likely to be found through fishing operations are fully treated (44 sharks and 33 batoids)(Bonfil, 2003).

According to Bonfil, 2003 report, 49 sharks and 45 batoids were recorded from the Red Sea and Gulf of Aden, but in our marine territory 11 sharks and 24 rays species were recorded which were reported and related in this report.

The number of shark and ray species in Bangladesh reported by different authors varies. According to IUCN (2000), the total number is 56, while Rahman (2009), Roy (2007), Quddus (1988), Day (1978) and Hussain (1970) mentioned the number as 51, 22, 21, 63 and 56 respectively.

For proper identification of species, publication of detail species profile in vernacular language is very important (Halder, 2010). For identification of sharks and rays species need particular book and picture. Both are present in this paper to easy identification which helpful for field level worker in shark fishery. Besides, the scientific names and even family names

of many Chondrichthyes species has been changed which needs to be upgraded to avoid mistakes. Cantor (1849) published a catalogue, which outlines the taxonomy of 28 species of sharks and rays in Malaysian waters, while Scott (1959) described some 294 marine fishes, out of which 25 are sharks and rays. About 70 species of sharks occur in Indian seas within which about 22 species have only limited occurrence and value; around 12 are moderately abundant though not frequently caught and only 06 are major species in the fishery (Hanfee, 1998).

In the present study during the sampling period total 11 shark species belonging to 3 families Carcharhinidae (including 8 species), Sphyrnidae (2 species) and Hemiscyllidae (1species**)** and 24 ray species of belonging to 7 families Dasyatidae (14 species), Rhinobatidae (2 species), Rhynchobatidae (1 species), Gymnuridae (1 species), Myliobatidae (2 species), Rhinopteridae (2 species) and Mobulidae (2 species) were recorded. Maximum harvested sharks under the family Carcharhinidae and ray's were Dasyatidae family. Among the shark species 3 species were dominant, 6 common and 2 were rarely landed and comprise ray species 8 were prominent, 12 were common and 4 species were rarely exploited in Bangladesh marine territory.

CONCLUSION

"Shark Fishery" is a newly introduced single fishery and the exploitation and scientific analysis is increasing rapidly day by day. These Fisheries contain sharks, skates and rays of the class Condrichthyes. Many fishery traders, stake holders, exporters as well as scientific personnel have little knowledge to familiar with the identification of various sharks and rays occurring in the Marine water of Bangladesh or their landing center.

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