STOMACH CONTENT OF THE LARGE PELAGIC FISHES IN THE BAY OF BENGAL

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ABSTRACT

Investigation of stomach contents of apex predator; frigate tuna (*Auxis thazard*), skipjack tuna (*Kasuwonus pelamis*), yellowfin tuna (*Thunnus albacares*), bigeye (*T. obesus*) and swordfish (*Xiphias gladius*) were studied in the Bay of Bengal during November to December 2007. The tunas were caught from drift gillnet and pelagic longliner of the operations cruise from MV.SEAFDEC.

Thirty five percent of 68 stomach samples found diet, the forage and parasite of tuna and tuna-like species were reported cephalopod (60.70% in weight and 44.83% in number), fish (38.85% in weight and 5.75% in number), and parasite (0.45% in weight and 49.42% in number). Fish prey composed of 3 families; Ostraciidae, Bramidae and Diretmidae, and 1 unidentified fish. Cephalopod was 1 order and 1 species, namely Teuthoidea and *Histioteuthis celetaria pacifica*, Octopoda. Parasite was reported Nematode (black and white) and Digenea. Diet data were comparison between surface and deep swimmers made, the result showed higher the number of prey and parasite from deep swimmers (4.79 prey and 5.07 parasite per stomach) than surface swimmers (1.62 prey and 1.15 parasite per stomach).

Community of tunas, prey and parasite was categorized into 3 assemblages upon species of predator, parasite and prey composition, and habitat (depth of water) of those species. It found significant differences between groups. Groups B and C has the highest total number of taxon and the highest average number of parasite found in group B, followed by groups C and A.

The preliminary of tunas trophic ecology in the Bay of Bengal was explanation from the result of the present study. Future develops on commercial deep-water fisheries and study on the taxonomy and field guide of deep-sea fishes and cephalopod beak have suggestion study in the Bay of Bengal.

INTRODUCTION

The predator-preys interactions play an important part in the structure and the dynamics of multispecies communities. Facing the dramatic increase of the catches of tuna and related species in the Indian Ocean, especially the eastern Indian Ocean. It becomes necessary to assess the impact of the fisheries on the pelagic ecosystems. The implement of research activities lading to a better knowledge of trophic ecology of apex predators will be provide such an ecosystem point of view that has to be considered nowadays in the high seas fisheries management.

Feeding studies have already been conducted on tunas and sharks only in the western Indian Ocean during the THETIS program (Potier *et al*., 2004), however the tunas feeding habits were constrained and considered in the eastern Indian Ocean, only the report on stomach content of tropical tunas in the Andaman Sea (Nootmorn, *et al*., 2007 and Panjarat, 2006).

The present study is a part of a project on The Ecosystem-Based Fishery Management in the Bay of Bengal. MV.SEAFDEC had conducted the cruise survey off Bay of Bengal during 25th October – 21st December 2007. The aims of the survey were the joint research survey would yield scientific data on characteristic of the ecosystem in the Bay of Bengal and contribute to the accomplishment of ecosystem-based management of fishery resources for sustainable utilization. The project would also provide opportunity to transfer technology, make understanding and good relationship among fishery scientists, and to exchange information among the BIMSTEC Members.

The purpose of this study considers on the stomach content of large pelagic fish, apex predator, in the Bay of Bengal.

MATERIALS AND METHODS

ON BOARD

On M.V.SEAFDEC cruise were conducted the three fishing gears, namely tuna long-line, drift gillnet and squid jigging in 3 areas of the Bay of Bengal (Figure 1); AreaA (Bangladesh, Latitude 16^o -19^{o}N, Longitude 88^o -91^{o}E), AreaB (Indian, Latitude9^o-14^{o}N, Longitude 82^o-85^o E) and AreaC (Myanmar, Latitude 9^o -13^o N, Longitude 95^o -97^o E). We collected the large pelagic fish sample from tuna long-line and drift gillnet, where the sampling sites showed in Table 1. Sixty eight fish samples were caught from two fishing gears; mainly 28 skipjack tuna (*Kasuwonus pelamis*), followed by 15 sword fishes (*Xiphias gladius*), 10 frigate tuna (*Auxis thazard*), 7 kawakawa (*Euthynnus affinis*), 5 yellowfin tuna (*Thunnus albacares*)and 3 bigeye tuna (*Thunnus obesus*). The entire stomach was removed from the freshly caught fish when hauled on board. Sizes of the predator in fork length (FL) and weight (kg) were recorded for each fish. This was put in a sealed plastic bag and stored in M.V.SEAFDEC's freezer at -20°C. A label with the main characteristics was enclosed with the bag.

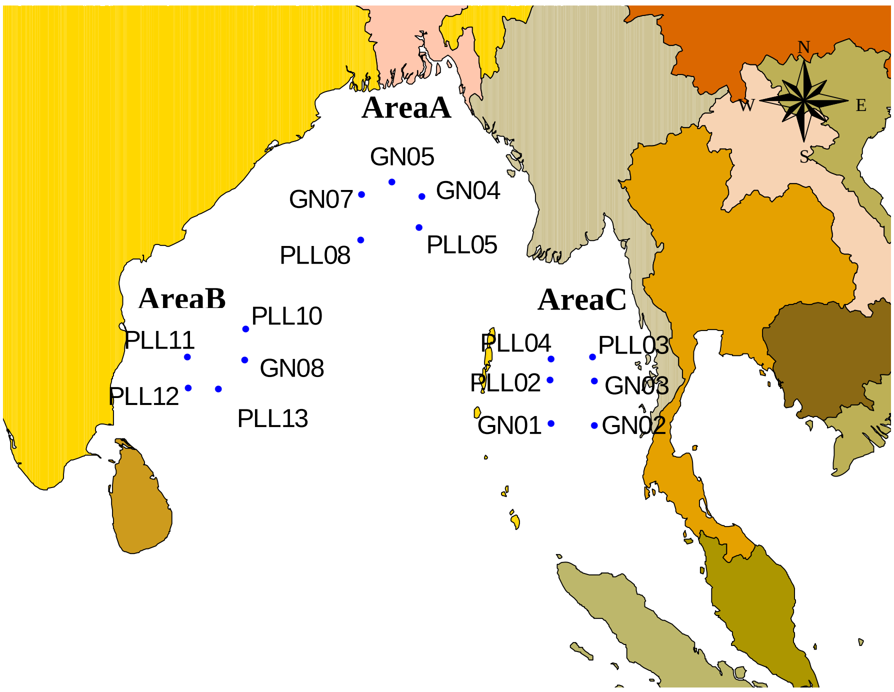


Figure 1. Map of tuna longline (PLL) and drift gillnet (GN) operated in the Bay of Bengal.

Table 1. The sampling site in the Bay of Bengal.

Station	Date	Time	Lat	Long
PLL1	10-11/Nov/07	18.20	11°05'.80 N	095°41'.80E
PLL2	11-12/Nov/07	18.20	11°46'.00 N	094°58'.90E
PLL3	13-14/Nov/07	17.46	12°34'.30 N	096°26'.70E
PLL4	15-16/Nov/07	17.31	12°30'.30 N	094°59'.70E
PLL5	17-18/Nov/07	17.31	16°55'.60 N	090°25'.90E
PLL6	19-20/Nov/07	17.32	18°31'.10 N	090°26'.70E
PLL7	21-22/Nov/07	18.00	17°31'.50 N	089°28'.20E
PLL8	23-24/Nov/07	17.31	16°30'.70 N	088°24'.50E
PLL9	25-26/Nov/07	17.30	18°30'.40 N	088°28'.30E
PLL10	28-29/Nov/07	18.03	13°30'.00 N	084°30'.1E
PLL11	1-2/Dec/07	18.27	12°32'.90 N	082°24'.90 E
PLL12	2-3/Dec/07	18.00	11°31'.80 N	082°26'.10 E
PLL13	3-4/Dec/07	18.28	11°29'.60 N	083°28'.10 E
GNT1	6-7/Nov/07	17.55	10o18.60 N	095°00.30 E
GNT2	7-8/Nov/07	18.21	10°14.80 N	096°29.40 E
GNT3	12-13/Nov/07	18.54	11°45.20 N	096°30.00 E
GNT4	18-19/Nov/07	18.49	17°59.30 N	090°32.00 E
GNT5	20-21/Nov/07	17.45	18°28.0 N	089°29.00 E
GNT6	22-23/Nov/07	18.38	16°30.00 N	089°30.90 E
GNT7	26-27/Nov/07	17.30	18°03.10 N	088°27.40 E
GNT8	29-30/Nov/07	17.57	12°27.40 N	084°23.70 E

Remark: PLL=tuna longline, GNT= drift gillnet

AT THE LABORATORY

The stomachs were defrosted before analysis in three steps.

1. The stomach content was sorted into large categories as fishes, cephalopods or parasite.

2. The different items constituting the categories were sorted and counted for each, remarkable organ are used to determine the number of item in the stomach such as upper or lower beaks of cephalopods. Specimens of fish were preserved in a 10% buffer formalin solution for 24 hour then change to 70% alcohol. However the beaks of the cephalopods were kept in 70% alcohol at the initial step to prevent decalcification

3. Prey and other item were identified to group, family and, whenever possible, to species level. The identification of fishes was based on descriptions given in a variety of FAO Volume 2, 4, 5 and 6 (2001a, 2001b, 2001c and 2001d), cephalopods and beak of cephalopod was base on Clarke (1962 and 1986) and Kubodera (2003). The parasites was identified to group based on Smith *et al.* (2007).

Analysis of full and empty stomachs was calculated in percentage of each taxon/group of tunas. Cluster analysis (Kruskal and Wish, 1978) was carried out based on a Bray-Curtis similarity matrix of appropriately transformed species abundance data (only number of prey taxon/group). Analysis of similarities (ANOSIM) and Similarity percentages (SIMPER) were used for analysis of tunas and prey species similarity and species ranking of average dissimilarity between assemblages, respectively (Carr, 1997).

RESULTS AND DISCUSSION

SIZE DISTRIBUTION

The sizes distribution of frigate tuna from AreaA and kawakawa from Areas A nad C caught with drift gillnet, range of sizes found 30.5 to 39.8 cm and 17.3 to 41.0 cm, 0.56 to 1.15 kg and 0.07 to 1.05 kg, respectively (Figures 1A-1D). Kawakawa in AreaC is smaller than fish caught from AreaA. While skipjack tuna caught from drift gillnet in Areas A, B and

C, range of sizes were 17.6 to 70.0 cm, 0.07 to 6.35 kg (Figures 1E-1F). Skipjack tuna caught from AreaB is bigger sizes than Areas A. Yellowfin tuna was caught from pelagic longline in AreaA and drift gillnet in AreaC, range of sizes were reported 17.30 to 129.0 cm, 0.06 to 38 kg (Figures 1G-1H). Fish caught from longline is bigger sizes than fish from drift gillnet, the stomach content found only fish from drift gillnet in AreaC. Bigeye tuna caught from drift gillnet in Areas A and C, range of sizes was reported 24.4 to 46.0 cm, 0.22 to 2.0 kg (Figures 1I-1J). It is found only juvenile fish. Sizes range of sword fishes were 120 to 280 cm, 5 to 100 kg (Figures 1K-1L), its were caught from both gears in Areas A, B and C. Sizes of fish from AreaC is the biggest, followed by fish from Areas A and B.

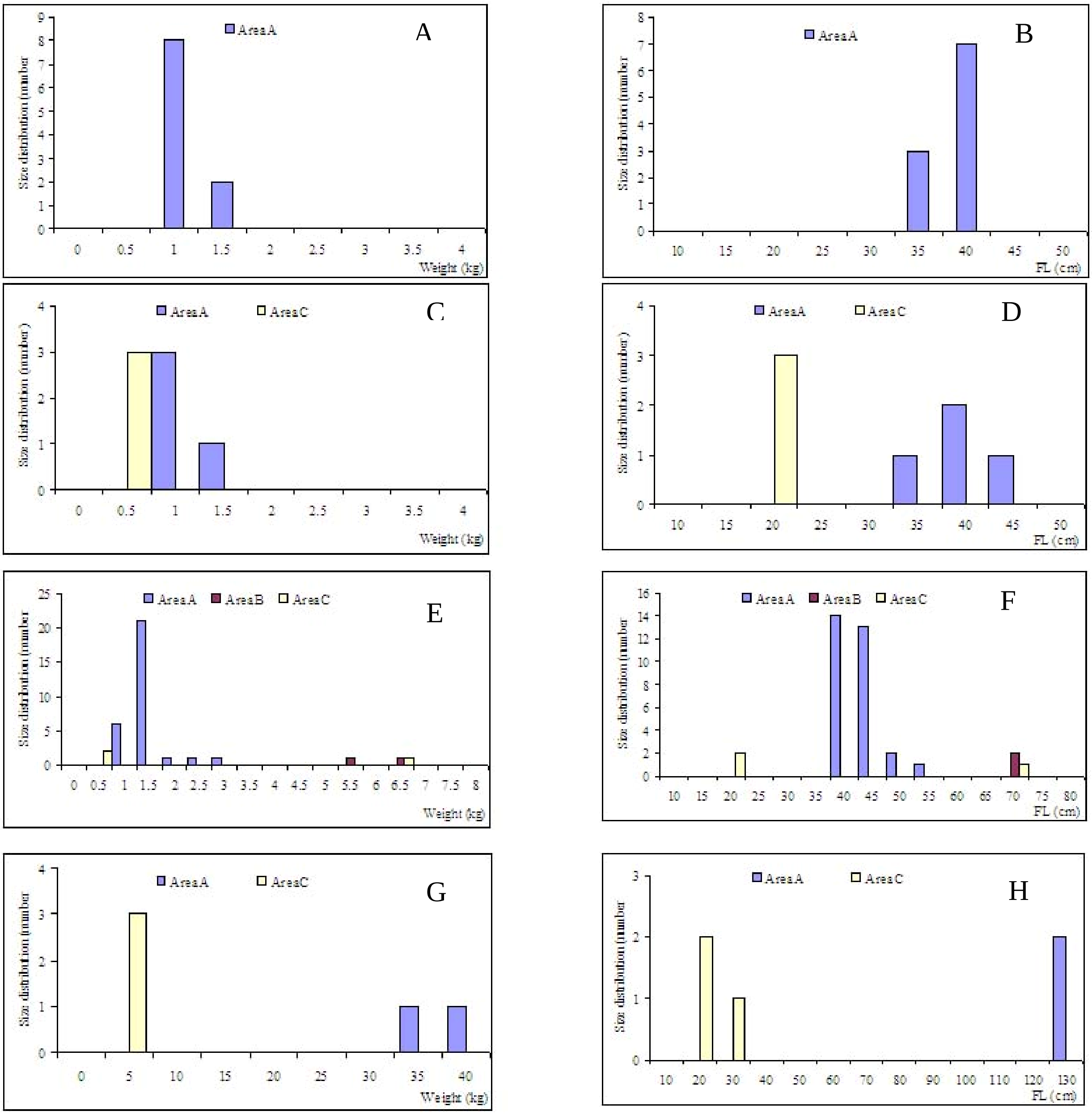


Figure 2. Size distribution of frigate tuna (A and B), kawakawa (C and D), skipjack tuna (E and F) and yellowfin tuna (G and H).

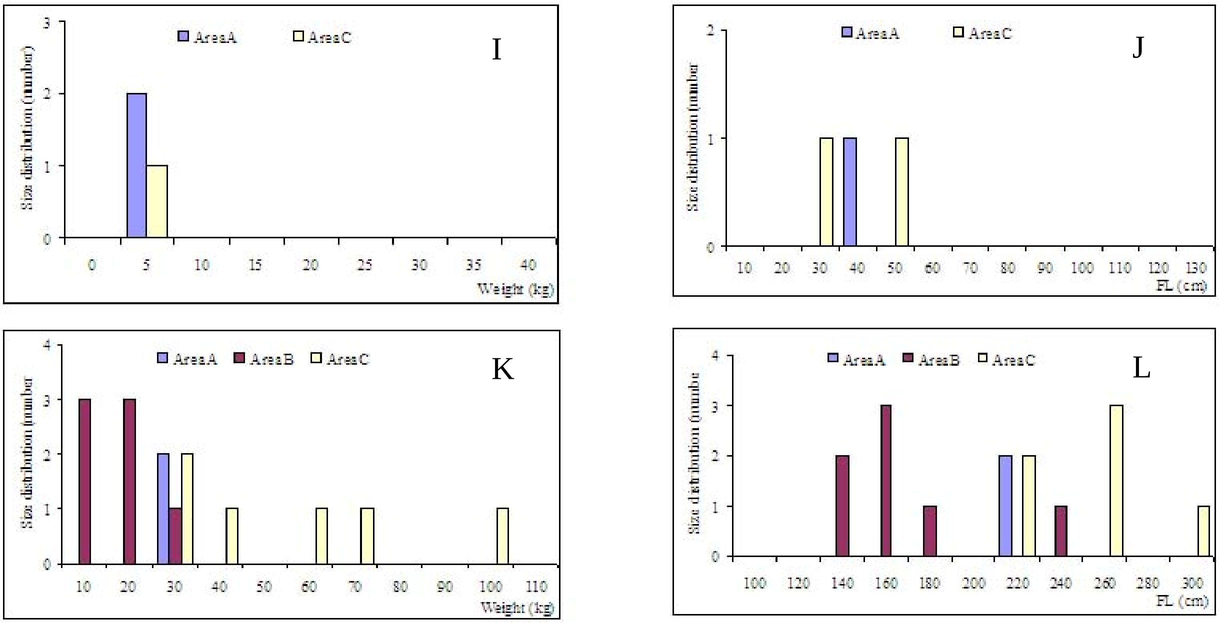


Figure 2 con't. Size distribution of bigeye tuna (I and J) and swordfish (K and L).

STOMACH CONTENT

From 68 stomach samplers of tunas and tuna-like species found 44 empty stomachs (Table 2). All of kawakawa samples found empty stomach, the rest fish samples found prey and parasite in their stomach as 35 % of total samplers. The stomach content was identified to be 3 groups, namely cephalopod (60.70% in weight and 44.83% in number), fish (38.85% in weight and 5.75% in number), and parasite (0.45% in weight and 49.42% in number), it show in Figure 3. This study found the percentage of prey and parasite in the stomach (35 %) less than the previous study from Nootmorn *et al.* (2007) in the Andaman Sea. Thier reported 94 % of non-empty stomach of tunas and tuna-like species from tuna longline in the Andaman Sea, the main forage of tuna were reported cephalopods, followed by fishes and deep-sea shrimp.

Usually it is difficult to collect tuna's stomach content on commercial fisheries, especially in the eastern Indian Ocean. As tunas from longline are eviscerated, and for the purse seine most of tunas's stomach samples were empty that concerns the fishing time that operate in very early morning when tunas have not yet feeding (Panjarat, 2006; Nootmorn *et al.*, 2001).

Table 2. Tunas and tuna like species samples and stomach

Tunas and tuna like species	Stomach		Total
	Non-empty	Empty	
Auxis thazard	5	5	10
Euthynnus affinis	0	7	7
Kasuwonus pelamis	3	25	28
Yellowfin Tuna	4	1	5
Bigeye Tuna	1	2	3
Swordfish	11	4	15
Total	**24**	**44**	**68**

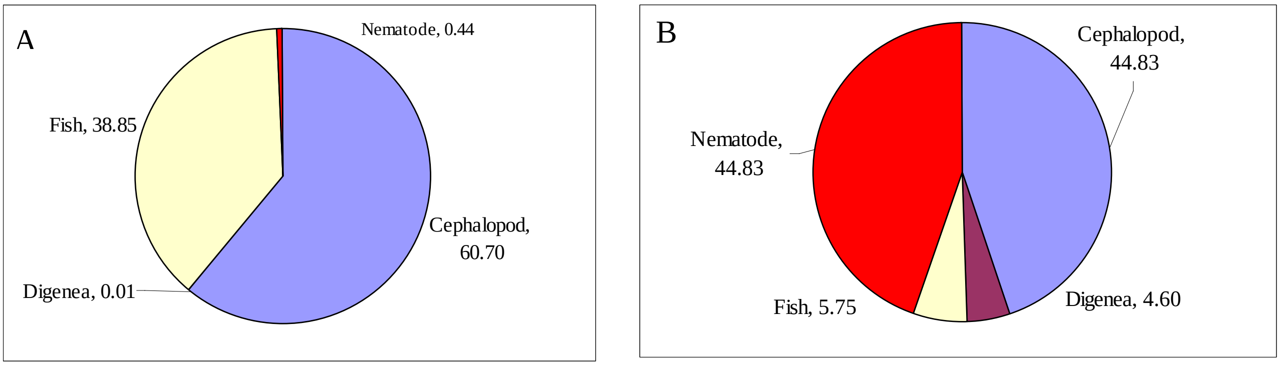


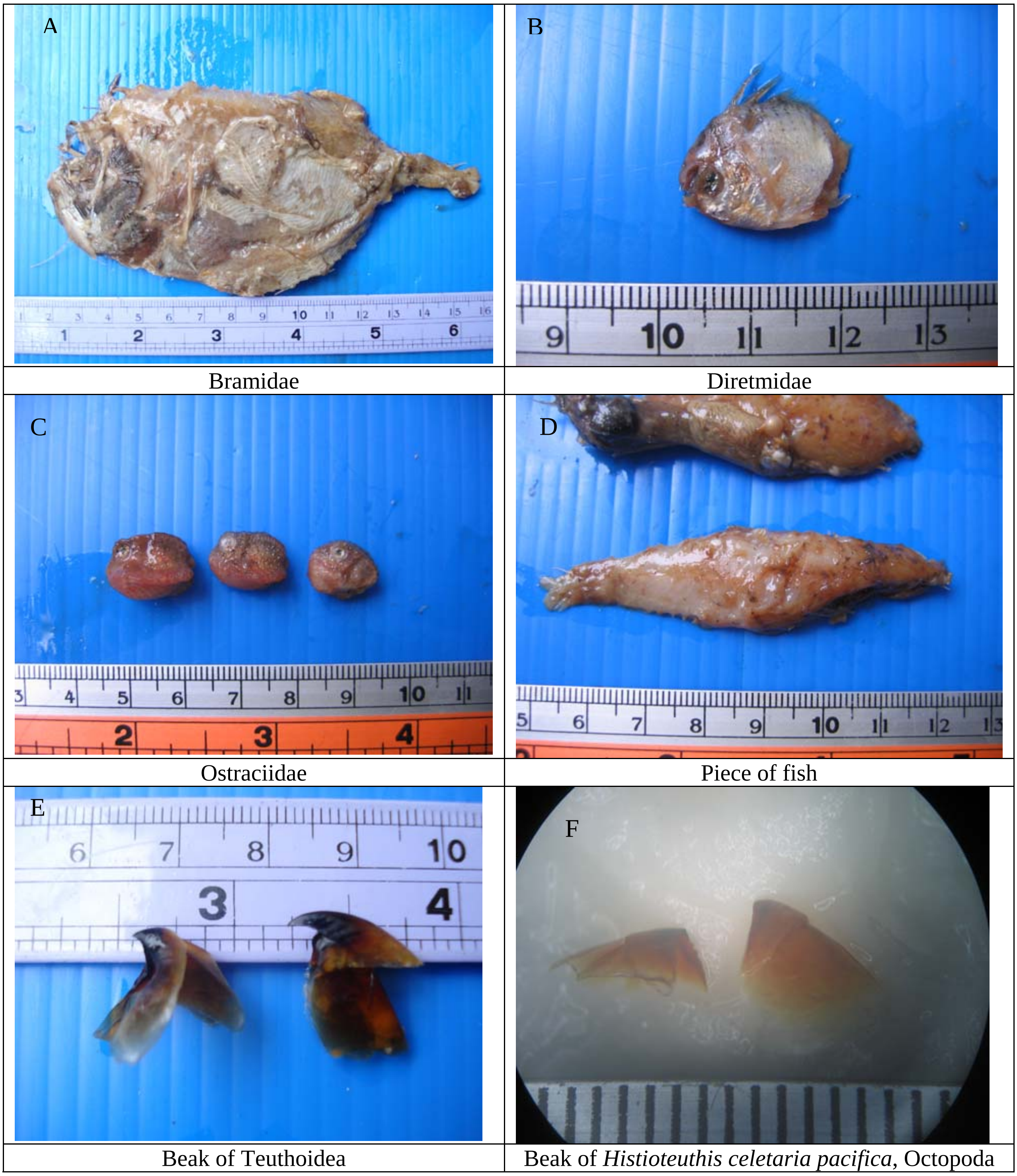
Figure 3. Percentage of prey and parasite composition of tunas and tuna-like species in the Bay of Bengal (A = in weight and B = in number).

Fish prey identified 3 families and 1 unidentified fish, Illustrates show in Figures 4A-4D, respectively. Fish composition composed of Bramidae, Ostraciidae, Diretmidae, and 1 unidentified fish (13.49, 0.37, 0.11 and 24.88% of total sample weight, respectively). Remarkable, this study found Indo Pacific mackerel and round scad in stomach of tunas; we checked from the operation cruise, they used their fish as bait for catching pelagic longline. We left this data for calculation diet composition. Cephalopod was identified 2 families and 1 species, namely Teuthoidea and Octopodidae. Their comprised Teuthoidea (include beak, pen and eye) 60.69 % and beak of *Histioteuthis celetaria pacifica*, Octopoda 0.01 % of total samples weight (Figures 4E and 4F).

Parasite was identified to be 2 groups, namely Nematode (black and white Nematodes) and Digenea, its composed 0.44% and 0.01% of total samples weight. Figures 5A, 5B and 5C are illustrated of parasites.

The diet composition in number was found cephalopod as the main composition, followed by fishes and Nematode (Figure 3B). Cephalopod found beak of Tuethoidae as the main composition, followed by beak of *Histioteuthis celetaria pacifica*, Octopoda (count all upper and lower beaks). While, the fish component found Ostraciidae, Bramidae, Diretmidae and 1 unidentified fish (1.72, 0.57, 0.57 and 2.87 % of total number of samples, respectively).

The result from this study showed cephalopod (in number and weight), fish (in number and weight) as the main prey of tunas in the Bay of Bengal, same as the previous study in Andaman Sea (Nootmorn *et al.*, 2007).



A: Bramidae; B: Diretmidae; C: Ostraciidae; D: Piece of fish; E: Beak of Teuthoidea; F: Beak of *Histioteuthis celetaria pacifica*, Octopoda

Figure 4. Fish and cephalopod composition dieted of tunas and tuna-like species in the Bay of Bengal.

Black Nematode

White Nematode

Digenea

Figure 5. Parasite of tunas and tuna-like species in the Bay of Bengal.

Table 3 show the stomach content of frigate tuna, skipjack, yellowfin tuna, bigeye tuna and swordfish.

Frigate tuna caught in AreaA, stomach content was found 2 groups, namely Teuthoidea and fish. This species is epipelagic in neritic and oceanic waters. Feeds on small fish, squids, planktonic crustaceans (megalops), and stomatopod larvae. Because of their abundance, they are considered an important element of the food web, particularly as forage for other species of commercial interest. Preyed upon by larger fishes, including other tunas (Fishbase, 2008).

Skipjack was found Teuthoidea as the main forage, followed by fish (non-identified species), whereas found 2 groups of parasites, Digenea and Nematode (black). Skipjack caught from AreaA, it found only Digenea in the stomach, in AreaB found Teuthoidea and non-identified fish, in AreaC found Teuthoidea as forage and Nematode (black) as parasite. Fishbase (2008) reported skipjack whereas found in offshore waters; larvae restricted to waters with surface temperatures of 15°C to 30°C. Exhibit a strong tendency to school in surface waters with birds, drifting objects, sharks, whales and may show a characteristic behavior like jumping, feeding, foaming, etc. Feed on fishes, crustaceans, cephalopods and mollusks; cannibalism is common. Spawn throughout the year in the tropics, eggs released in several portions. Preyed upon by large pelagic fishes. Also taken by trolling on light tackle using plugs, spoons, feathers, or strip bait.

Juvenile of yellowfin tuna caught in AreaA, stomach content was found 2 groups, namely Teuthoidea and non-identified fish. FAO (2001c) reported yellowfin tuna in the western central Pacific, as oceanic species; found below the themocline in large fish. They feed on many kinds of organisms, particularly fishes, squids and crustaceans. Nootmorn *et al.*

(2007) reported this species were caught only in the Andaman Sea at depth of water range from 41-80 m. Size of fish in length and weight is 120-138 cm and 20-31 kg. Stomach content found fish (unidentified fish (1), Ostraciidae), cephalopod (Octopoda) and deep-sea shrimp (Aritridae). Panjarat (2006) reported the diet of this species in the same area, compose of fishes (Tetraodontidae, Priacantidae, Balistidae and Syngnathidae) and cephalopod (Loliginidae and Teuthoidea). The previous studies reported high diversities of prey than this study cause of fish sample from pelagic longline.

Juvenile of bigeye tuna caught in AreaC, the forage comprised of Teuthoidea, Ostracidae, Diretmidae and non-identified fish. Fishbase (2008) reported this species occur in areas where water temperatures range from 13°-29°C, but the optimum is between 17° and 22°C. Variation in occurrence is closely related to seasonal and climatic changes in surface temperature and thermocline. Juveniles and small adults school at the surface in mono-species groups or mixed with other tunas, may be associated with floating objects. Adults stay in deeper waters. Feed on a wide variety of fishes, cephalopods and crustaceans during the day and at night.

Swordfish was found 6 groups in the stomach content; the main composition is Teuthoidea, followed by Bramidae, non-identified fish, Octopoda *(Histioteuthis celetaria pacifica*), Nematode (black) and Nematode (white) in all areas. In AreaA found 4 groups; Teuthoidea, Bramidae, non-identified fish and Nematode (black), AreaB found 4 groups; Teuthoidea, Octopoda, Nematode (black) and Nematode (white), while, AreaC found 3 groups; Teuthoidea, Nematode (black) and Nematode (white). Swordfish are widely distribution throughout the study area at water depth range 10-132 m. Nootmorn *et al.* (2007) reported the diet composed of cephalopod (Teuthoidea, Argonautidae and Octopoda), deep-sea shrimp (Aritridae) and fish (*Thyrsiles atun*, *Cubiceps caeruleus*, Gempylidae). Their study found higher diversity of prey than present study while the groups of prey same as this study. FAO (2001c) reported swordfish in the western central Pacific, they are an epi- and mesopelagic, oceanic species, usually found in surface waters until 550 m. Adults are opportunistic feeders, known to forage for their food from the surface to the bottom over a wide depth range. They food on pelagic squids where abundant, that is same as this study.

Table 3 Stomach content of tuna and tuna-like species by Area in the Bay of Bengal.

Tunas	Area	Group	Family	Weight (gram)	Number
Frigate tuna	**A**	Cephalopod	Teuthoidae	10	1
		Fish	Pieces of fish	40.05	-
Skipjack tuna	**A**	Digenea	Digenea	0.08	8
	B	Cephalopod	Teuthoidea	15.1	2
		Fish	non-identified	53	2
	C	Cephalopod	Teuthoidea	2.83	7
		Nematode	Nematode(black)	0.07	5
Yellowfin tuna	**A**	Cephalopod	Teuthoidea	6.67	1
		Fish	non-identified	10.3	1
Bigeye tuna	**C**	Cephalopod	Teuthoidea	25.8	2
		Fish	Diretmidae	0.68	1
		Fish	non-identified	1.07	1
		Fish	Ostraciidae	2.23	3
Swordfish	**A**	Cephalopod	Teuthoidea	57.49	26
		Fish	Bramidae	81	1
		Fish	non-identified	45	1
		Nematode	Nematode(black)	0.96	18
	B	Cephalopod	Teuthoidea	32.09	25
		Cephalopod	Octopoda	0.07	1
		Nematode	Nematode(black)	0.3	3
		Nematode	Nematode(white)	0.21	3
	C	Cephalopod	Teuthoidea	214.48	13
		Nematode	Nematode(black)	1.03	41
		Nematode	Nematode(white)	0.06	8
Total				600.57	174

Table 4 show the stomach content of tunas by type of fishing gears. Stomach content from drift gillnet was found 3 families of prey and 2 groups of parasite were identified. Most of these prey items were Teuthoidea (14 individuals), followed by Ostraciidae (3 individuals), Diretmidae (1 individuals) and non-identified fish (3 individuals), white the parasite found Digenea (8 individuals) and Nematode (black) (7 individuals). On average, 1.62 prey and 1.15 parasite were found per stomach. Cephalopod dominated the diet by occurrence and number. Stomach content from longline was found 3 families of prey and 2 groups of parasite were identified. Most of these prey items were Teuthoidea (63 individuals), followed by Bramidae (1 individuals) and non-identified fish (2 individuals), white the parasite found Nematode (black) (60 individuals) and Nematode (black) (11 individuals). On average, 4.79 prey and 5.07 parasite were found per stomach. Cephalopod dominated the diet by occurrence and number same as stomach from drift gillnet.

Table 4 Stomach content of tuna and tuna-like species by fishing gears in the Bay of Bengal.

Fishing Gears	Tunas	Prey						Parasite		
		Cephalopod		Fish						
		Octopodidae	Teuthodidea	Bramidae	Diretmidae	Ostraciidae	non-identified	Nematode (white)	Nematode (black)	Digenea
Drift gillnet	Bigeye tuna		2		1	3	1			
	Skipjack		9				2		5	8
	Swordfish		2						2	
	Frigate tuna		1							
Longline	Swordfish	1	62	1			1	11	60	
	Yellowfin tuna		1				1			

COMMUNITY STRUCTURE OF TUNAS, PREY AND PARASITE

Ordination analysis categorized tunas, prey and parasite taxon/group into 3 assemblages, whereas illustrated in Figure 6 and Table 5. GroupA composed of Digenea in stomach of skipjack caught from drift gillnet in water depth range 10-26 m in AreaA, groupB found Nematode (black) in stomach of a skipjack and swordfish from drift gillnet in the water depth range 10-26 m in Areas B and C, and swordfishes from pelagic longline in the water depth range 80-132 m in all areas. GroupC found Teuthoidea from bigeye tuna caught by drift gillnet in AreaC (water depth range 10-20 m), frigate tuna caught by drift gillnet in AreaA (water depth range 10-20 m), yellowfin tuna caught by pelagic longline in AreaA at water depth 69 m, swordfishes from pelagic longline in all areas in water depth range 60-110 m. GroupC is the highest in number and diversity of predator than groups B and A. ANOSIM showed significant differences between groups (R =1; groups A and B, A and C ; R = 0.908 group B and C). Table 5 showed the species list and average number of prey and parasite based on a breakdown of average similarity for each assemblage. Groups B and C have the higher total number of prey and parasite group found more than group A. The result present abundance in number of parasites and cephalopod, it will be one indicator for grouping the community of large pelagic fish in the Bay of Bengal. Nootmorn *et al.* (2007) reported the community of tunas and prey taxon in the Andaman Sea was categorized into 5 assemblages, group 1 composed of found unidentified fish (1), Teuthoidea, Octopoda, Gempylidae and *Cubicepe caeruleus* in stomach of swordfish and sail fish in Thai water, group 2 found Teuthoidea, Argonautidae, Octopoda, Aristridae and Carangidae in stomach of blue marline, sailfish, yellowfin tuna in Thai water and sword fish in Myanmar water. Group 3 found Aristridae, Teuthoidea, *Cubicepe caeruleus*, other cephalopod, Octopoda from sword fish in Myanmar water and sword fish and yellowfin tuna in Thai water. Group 4 found only unidentified fish from sailfish caught in Myanmar water. Group 5 found *Thyrsiles atun* and

Gympylus serpens in stomach of sail fish and sword fish in Thai water. Their study is high assemblages and diversity of prey than this study. Type of prey in the previous study is key to divided the groups of fish community because the previous study didn't identified the group of parasite and denied to bring this group to analyze.

Table 5 Breakdown of average similarity between group 1, 2, 3 into contributions from taxon list and average number of prey and parasite in the Bay of Bengal.

Prey Taxon	Group A	Group B	Group C
Teuthoidea		1.5	4
Nematode (black)		8.25	0.09
Digenea	1.6		
Number of predator	5	8	11

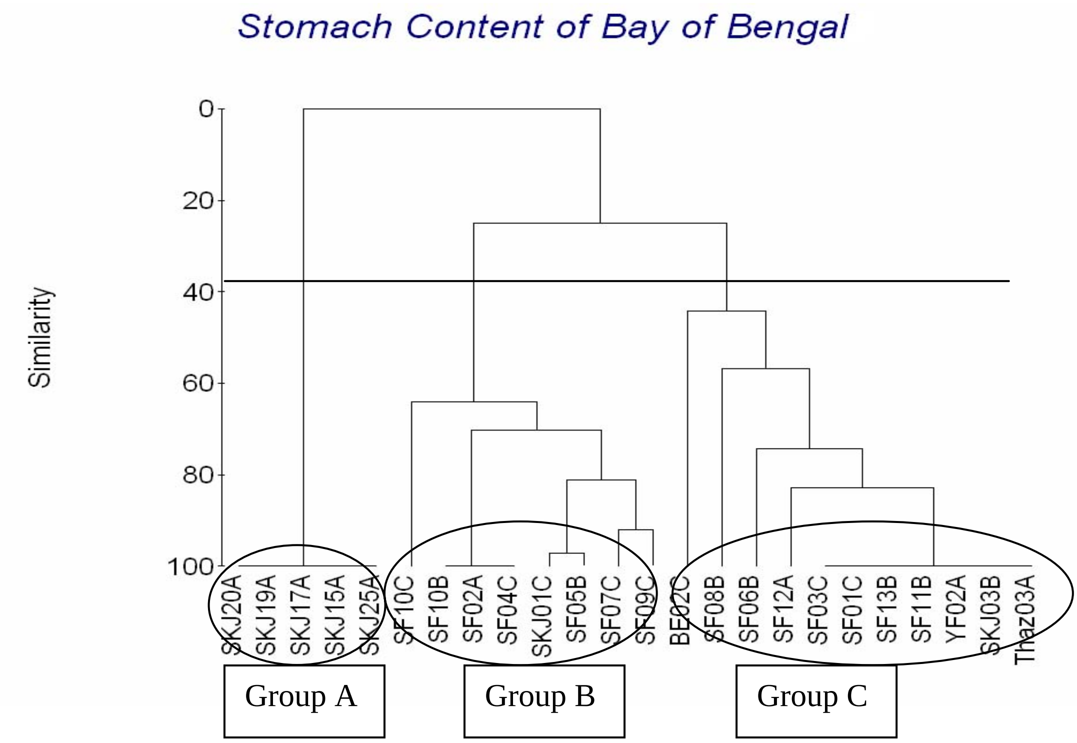


Figure 6. Dendrogram using group-average linking on Bray-Curtis taxon similarities. The 3 groups defined at arbitrary similarity level of 40 % are indicated. A, B and C fill in the behind of label samples, as Bangladesh, Indian and Myanmar waters.

CONCLUSION AND FUTURE DIRECTION

The vertical distribution of large pelagic fish, tunas and tuna-like is known to differ. The depth of hook data in present study suggests that this pattern of all tunas distributed overlap considerably. Frigate tuna and kawakawa are neritic tuna, their distributed in the depth of water range 10-30 m. Skipjack tuna distributed in all areas at the depth of water range 10-30 m. Yellowfin tuna distributed off Bangladesh and Myanmar waters at depth of water range 10-69 m. Whereas, juvenile of bigeye tuna was found in the same areas of yellowfin tuna in the depth of water range 10-26 m. Swordfishes was widely horizontal all the Bay of Bengal and vertical distributions (10-132 m). In fact, all these species were caught from drift gillnet and pelagic longline in the Bay of Bengal, diet of these fishes occurred 35 % of total stomach samplers. The prey composition was identified to be 2 groups, namely fish and cephalopods. Parasite was identified to be 2 groups, Nematode and Digenea. Then, the forage of tuna in study area was mainly cephalopods, followed by fish. Fish prey composed of 3 families; Ostraciidae, Bramidae, Diretmidae, and 1 unidentified fish. Cephalopod was identified 1 families and 1 species, namely Teuthoidea and *Histioteuthis celetaria pacifica,* Octopoda. Diet data were comparison between surface and deep swimmers made, which caught with drift gillnet and pelagic longline, respectively. The result showed higher the number of prey and parasite from deep swimmers (4.79 prey and 5.07 parasite per stomach) than surface swimmers (1.62 prey and 1.15 parasite per stomach). Cephalopod dominated the diet by occurrence and number in predator stomach from both gears.

Community of predator, prey and parasite was categorized into 3 assemblages and significant differences between groups, groupA composed of found Digenea in stomach of skipjack caught from drift gillnet in Bangladesh water, groupB found Nematode (black) in stomach of a skipjack and swordfish from drift gillnet in Indian and Myanmar waters, swordfishes from pelagic longline in all areas. GroupC found Teuthoidea from bigeye tuna caught by drift gillnet in Myanmar water, frigate tuna caught by drift gillnet and yellowfin tuna caught by pelagic longline in Bangladesh water, swordfishes from pelagic longline in all areas. Groups B and C showed higher in total number and diversity of predator, prey and parasite groups than groupA. The result from this study present abundance in number of parasites and cephalopod, it will be indicator to grouping the community of large pelagic fish in the Bay of Bengal.

The results of present study provide an example of interesting questions concerning tunas trophic ecology that may be answered. These data will provide a more complete picture of complex trophic dynamics of mixed-species tunas aggregation, as well as seasonal trends in feeding and aggregation behavior. The preliminary picture of pelagic fish ecology in the Bay of Bengal during November and December 2007 was investigated. **Predator**: Frigate tuna is neritic species. The stomach content was found Teuthoidea and fish. Skipjack are widely distribution throughout the study area at water depth range 10-30 m. Teuthoidea as the main forage, followed by fish (non-identified species), whereas found 2 groups of parasites, Digenea and Nematode (black). Skipjack caught from Bangladesh water, it found only Digenea in the stomach, in Indian water found Teuthoidea and non-identified fish, in Myanmar water found Teuthoidae as forage and Nematode (black) as parasite. Yellowfin tuna (juvenile fish) caught from Myanmar waters, prey was found Teuthoidea and non-identified. Juvenile of bigeye tuna caught in Myanmar water at depth of water range 10-26 m, the forage comprised of Teuthoidea, Ostracidae, Diretmidae and non-identified fish. Swordfishes are widely distribution throughout the study area at water depth range 10-132 m. The diet was reported cephalopod (Teuthoidea and Octopoda) and fish (Bramidae and unidentified fish). **Prey:** pelagic squid, Teuthoidea is the main composition of cephalopod, it is high abundance and widely distribution in the water depth 10-120 m. *Histioteuthis celetaria pacifica,* Octopoda is distributed in water depth 60 m. Deep-sea fish: Ostraciidae found the highest abundance in water depth range from 10-20 m in Myanmar, while Diretmidae found in same area of Ostraciidae. Bramidae found at water depth range 40 m in Bangladesh water. **Parasite:** Nematode (black) was the main composition, mostly found in stomach of swordfish, it caught from both gears at water depth range 10-132 m. Nematode (white) was found in stomach of swordfish, it caught from pelagic longline at water depth range 60-120 m in Indian and Myanmar waters. Digenea was parasite of skipjack, it caught from drift gillnet at water depth range 10-20 m in Bangladesh water.

In the Bay of Bengal is recognized as one of the area where fisheries resources are under-exploited status. Lack of the field guide and taxonomy of deep-sea species, such as fishes, cephalopods (whole body and beak) is recognized in present study. The taxonomy key will be useful and support for study on the tropic dynamics of large pelagic fish in the Bay of Bengal. To date in the knowledge of ecosystem base on fisheries management is insufficient. The tropic dynamics of pelagic fish and prey should be providing the information on quality of ecology. None/under-exploit of tunas and pelagic squid are fished commercially because there is virtually no deep-sea fishery in the area. Nevertheless, the fact that some species reach a large size and are commonly taken on the basis of exploratory deep-water trawling, jigging and longline, suggests they may have future commercial potential once that suitable deep-sea fishing gears is used in the area.

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