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Study on the occurrence of some bony fishes of MaGyi Coastal area and its vicinities

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Abstract

In the present study, a total of 19 species belonging to 16 genera, 14 families and 2 orders (Clupeiformes and Perciformes) were recorded during the study period, from June, 2005 to April, 2006. In the study period, Chirocentridae, Clupeidae and Siganidae were found abundant, Carangidae, Centropomidae, Lutjanidae, Mullidae, Scombridae, Serranidae and Stromateidae were found common, Caesionidae, Drepanidae, Mugilidae and Scianenidae were found rarely in the study area. Many species are major components in commercial fisheries and others have no market values in the study area.

Key words: Abundant, Bony fishes, commercial captured fisheries, MaGyi Coastal area, occurrence

Introduction

MaGyi coastal area is a part of the Rakhine Coastal Region, and rich in natural resources. There has been rapid expansion in the fishing industry in the recent years. Historical accounts of world's major fishing grounds has recorded that uncontrolled exploitation of a fish stock would soon lead to depletion and eventual collapse of the industry (Cusing, D.H., 1968). A proper management practice in fishery resources is important for a sustainable development in fishery sector.

Although there have been many studies on the flora and fauna of coastal regions and mangrove estuaries, works on the biology of marine fishes in MaGyi coastal area have little information. At the present study, most of the fish studied are commercially important marine fishes. The present study deals with systematic account and seasonal appearance and distribution of marine fish species encountered in the coastal areas and mangrove tidal creeks at MaGyi and Chaungtha coasts in Ayeyarwady Division.

In the study areas the main commercial fish species are *Parastromateus niger*, *Scomberoides lysan*, *S. commersonianus* (Carangidae), *Amblygaster leiogaster* (Clupeidae), *Lates calcarifer*

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(Centropomidae), *Lutjanus johnil*, (Lutjanidae), *Epinephelus coioides* (Serranidae), *Siganus jarvus*, *S. vermiculatus* (Siganidae) and *Pampus argenteus* (Stromateidae). They are widely distributed in the delta area and also found frequently in the Rakhine and Thanintharyi coasts (Tint Hlaing, 1971).

The abundance of fishes can be estimated by evaluation and monitoring the monthly occurrence of each species and their numbers in a given study area. Some basic knowledge on the seasonal abundance of fishes play an important role in fishery science.

The aim of the present study is to provide the base-line data on seasonal occurrence and abundance of some commercially important marine fishes in MaGyi and adjacent coastal areas (Chaungtha), to provide species biodiversity of the study area, to provide the environmental parameters that support the species occurrences.

Material and Methods

Description of the study area

The study was carried out in MaGyi coastal area, tidal creek and its vicinities (Chaungtha). It is a part of Rakhine Coastal Region of the Bay of Bengal (Fishing area 57) (see figure 1). These areas are some parts of the fishing grounds (area 57) of marine fishes and influence by the Delta area of Ayeyarwady division. In the study areas, the tides are semidiurnal pattern and have two-time tidal cycles in a month, the spring tide and neap tide alternately. The tidal range is approximately 7-10 ft. The salinity ranges are 15 ‰ to 32 ‰ in MaGyi tidal creek. In monsoon period, the salinity was dropped down to 15‰ due to heavy rainfall and discharge of fresh water run-off. In summer, mean salinity was increased to its maximum range in the creek. In coastal area, the salinity reached its maximum 32‰ (summer) and its minimum 15‰ in rainy season (June-September). Similarly, the temperature of sea water (in creek and coastal area) reaches maximum to 30±1°C in summer and average temperature is 27±1°C in the rainy season.

MaGyi tidal creek is surrounded by mangrove swamp in some parts of the study area. The bottom of creek is rocky. The coastal area is mostly sandy and mud swamp with occasional rock outcrops and rock boulders.

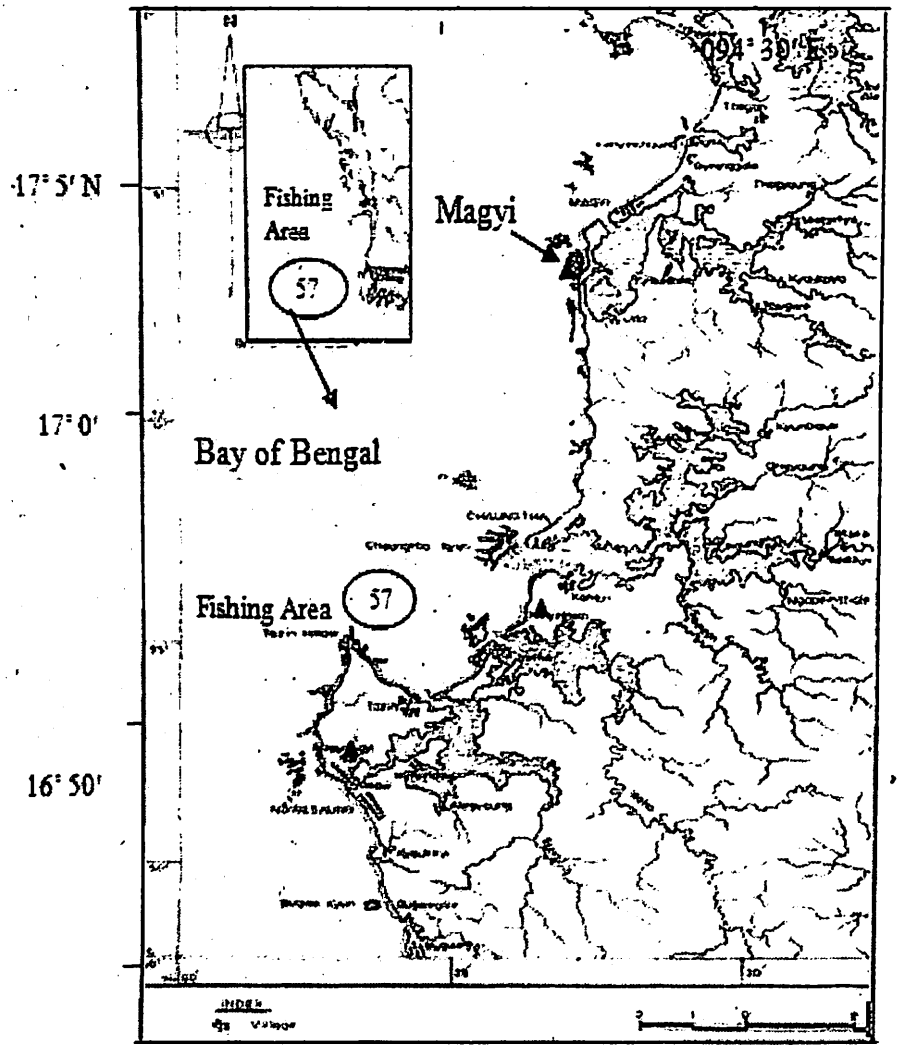
Some parts of the coastal areas are involved with the fringing coral reefs that are connected to the land and generally in parallel to the coast. They are largely absent near the mouth of tidal creek. Fringing reefs are usually narrow, their width range from a few tens to a few hundreds meters.

Sampling methods

The samplings were made at the monthly intervals, from June, 2005 to April, 2006. The samples were collected by using a bag net, a gill net, and hook-and-line. The bag net is about 8 meter in length , mouth aperture is about 3.5 meter and mesh size is 5 mm. Bag net is set at the mainstream of current at the ebb tide for sampling fish in the creek. The gill net is about 30 m long and mesh size is 10 mm. The long-line with various sizes in hooks is especially set out in the coral-reef region. Its length is about 50 m and the hooks are attached in two and a half foot apart. The samples were kept in plastic bags and bottles with 10 % formalin. It is more preferable to sort out big fishes (>30 cm. TL) from the samples and to store them in 20 % formalin.

Species identification

In the present study, the samples were identified by following the methods of Day.F. (1978), F.A.O. Species Identification Sheet (1974) Vol. I-IV and Tint Hlaing (1971).



▲ - study site

Fig. 1. Map showing the study areas

Results and Observations

In the present study, the total of 19 species belonging to 16 genera, 14 families and 2 orders (Clupeiformes and Perciformes) were collected at

MaGyi coastal area and its vicinities (Chaungtha). The occurrence of species encountered in these study areas were shown below.

Phylum:	Chordata
Subphylum:	Vertebrata
Class:	Osteichthyes
Order1:	Clupeiformes
Family 1:	Chirocentridae
Genus:	*Chirocentrus*
Species:	*C. nudus* (Swainson, 1839)
Family 2:	Clupeidae
Genus:	*Amblygaster*
Species:	*A. leiogaster* (Valenciennes,1847)
Order 2:	Perciformes
Family 1:	Caesionidae
Genus:	*Caseio*
Species :	*C. cuning* (Bloch, 1791)
Family 2:	Carangidae
Genus:	*Carangoieds*
Species:	*C. armatus* (Ruppell, 1830)
Genus:	*Scomberoides*
Species 1:	*S.commersonianus* (Lacepède, 1802)
Species 2:	*S. lysan* (Forsskål, 1775)
Genus:	*Parastromatus*
Species:	*P. niger* (Bloch, 1795)
Family 3:	Centropomidae
Genus:	*Lates*
Species:	*L. calcarifer* (Bloch, 1796)
Family 4:	Drepanidae
Genus:	*Drepane*
Species:	*D. punctata* (Linnaeus, 1758)
Family 5:	Lutjanidae
Genus:	*Lutjanus*

Species 1:	*L. fulviflamma* (Forsskål, 1775)
Species 2	*L. johnii* (Bloch)
Family 6:	Mugilidae
Genus:	*Mugil*
Species:	*M. cephalus* (Linnaeus, 1758)
Family 7:	Mullidae
Genus:	*Upeneus*
Species:	*U. taeniopterus* (Cuvier, 1829)
Family 8:	Sciaenidae
Genus:	*Nibea*
Species:	*N. soldado* (Lacepède, 1802)
Family 9:	Scombridae
Genus:	*Scomberomorus*
Species:	*S. commerson* (Lacepède, 1801)
Family 10:	Serranidae
Genus:	*Epinephalus*
Species:	*E. coioides* (Forsskål, 1775)
Family 11:	Siganidae
Genus:	*Siganus*
Species 1:	*S. javus* (Linnaeus, 1766)
Species 2:	*S. vermiculatus* (Valenciennes, 1835
Family 12:	Stromateidae
Genus:	*Pampus*
Species:	*P. argenteus* (Euphrasen, 1788)

***Chirocentrus nudus* (Swainson, 1839)**

Common name: En – white fin wolf herring

Local name: Nga da lwe

Material examined: 4 specimens; size range: 30 to 45 cm..

Habitat and biology: This species is pelagic, occurs inshore, including brackish waters. Voracious predators of small schooling fishes, it was

reported in water temperatures of 26.0-29.0°C. It feeds mainly on small fishes, but perhaps also crustaceans. It is reef-associated and amphidromous species.

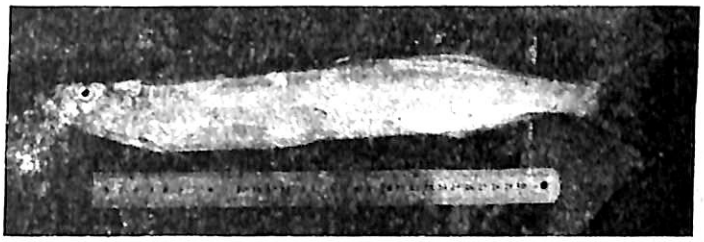


Fig. 2. *Chirocenturs nudus* (Swainson, 1839)

***Amblygaster leiogaster* (Valenciennes, 1847)**

Common name: En – Smoothbelly srdinella

Local name: Nga than than

Material examined: 5 specimens; size range: 20 to 30 cm..

Habitat and biology: Pelagic and neritic species; inhabits over mud banks or mud and sand, from fresh and brackishwater to marine, within a depth of 25 m and also found in large schools and enter very shallow water (1 m depth). They feed on copepods, zoea larvae, larval bivalve and gastropods. Caught in beach seines, gillnets and high opening bottom trawls.

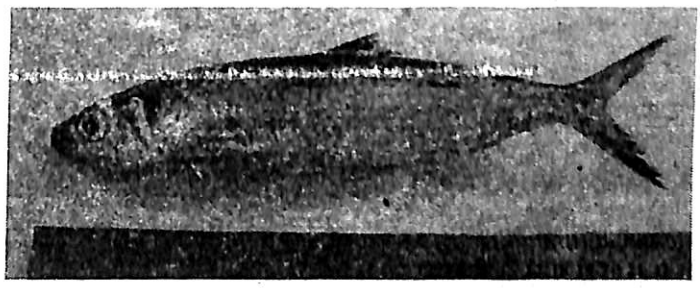


Fig. 3. *Amblygaster leiogaster* (Valenciennies, 1847)

Caseio cuning (Bloch, 1791)

Common name: En – redbelly yellowtail fusilier

Local name: Nga wun ne

Material examined: 5 specimens; size range: 20 to 35 cm..

Habitat and biology: This species inhabits coastal areas, over rocky and coral reefs or close to the bottom, shallow reefs to 30 m depth. They form schools in mid-water and feeds on zooplankton. Captured by trawls, set nets, fish traps and gill nets.

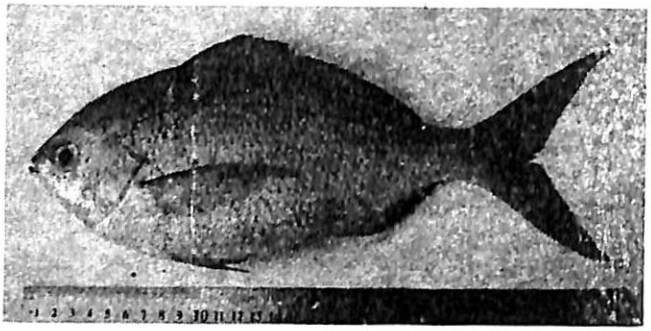


Fig. 4. *Caseio cuning* (Bloch, 1791)

Carangoieds armatus (Ruppell, 1830)

Common name: En – longfin trevally

Local name: Zar gyan

Material examined: 5 specimens; size range: 20 to 30 cm..

Habitat and biology: This species is reef-associated fish and may occurred rocky and coral coastlines; small groups of adults often swim along the edges of reefs, semi-demersal. Juveniles may occur in estuaries and brackish waters, depths from 5 m to 25 m, they feed on small fishes and crustaceans. Fishing by hand-lines, hook-and-line and bottom trawls.

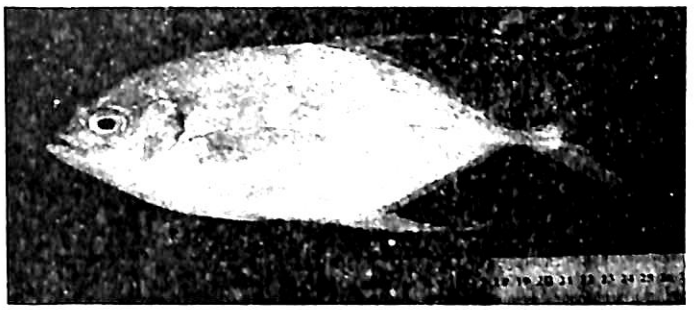


Fig. 5. *Carangoieds armatus* (Ruppell, 1830)

***Scomberoides commersonianus* (Lacepède, 1802)**

Common name: En – Talang queen fish

Local name: Nga lat warr

Material examined: 5 specimens; size range: 30 to 40 cm..

Habitat and biology: They are pelagic, neritic species, and inhabit coastal waters, usually near reefs, over sandstone with coral, mud and sand but occasionally estuaries. Swim in small groups. Primarily, this species is a daytime feeder on fish, cephalopods and other pelagic prey. Juveniles found in estuaries and brackish waters: generally intolerant of low salinities and turbid water. Caught in drift nets, gillnets, seines and on hood-and-line. Smaller sized fish are occasionally caught by trawls and purse seines.

Fig. 6. *S. commersonianus* (Lacepède, 1802)

***Scomberoides lysan* (Forsskål, 1775)**

Common name: En – Doublespotted queenfish

Local name: Nga lat warr

Material examined: 5 specimens; size range: 50 to 75 cm..

Habitat and biology: This species is reef-associated pelagic fish and may occurred only in relatively clear waters, adults in clear lagoon and seaward reefs, juveniles in shallow inshore and brackish waters. Mainly solitary but sometimes forms small loose schools; descending to feed on fishes near the bottom towards sunset; adults feed on small fishes and crustaceans while juveniles feed on scales torn from schooling fishes. Caught by pelagic drift nets.

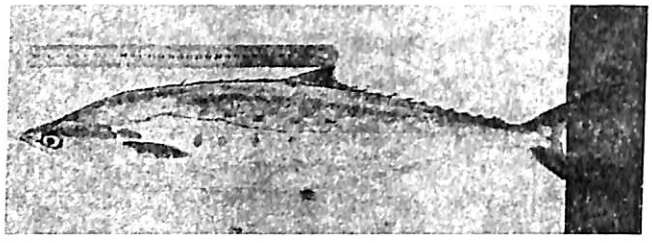


Fig. 7. *Scomberoides lysan* (Forsskål, 1775)

***Parastromatus niger* (Bloch, 1795)**

Common name: En – Black pomfret

Local name: Nga moke mei

Material examined: 5 specimens; size range: 30 to 40 cm..

Habitat and biology: This species is reef-associated pelagic fish and inhabits coastal areas with muddy substrate. Found near the bottom during the daytime and near the surface at night. They enter estuaries; normally forms large schools and swims on its side near the surface. They feed on zooplankton, small fishes and crustaceans. Fishing by drift gill nets, lift nets, seines, traps and bottom trawl.

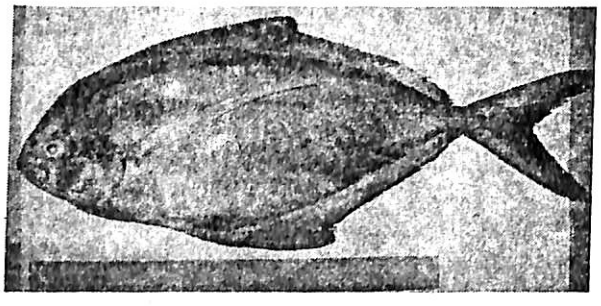


Fig. 8. *Parastromatus niger* (Bloch, 1795)

Lates calcarifer (Bloch, 1796)

Common name: En – Giant seabass

Local name: Kakatit

Material examined: 5 specimens; size range: 25 to 37 cm..

Habitat and biology: This species is demersal fish and may occurred common in coastal waters, estuaries and lagoons down to about 40 m, in relatively clear to turbid waters; it is a catadromous fish, inhabiting rivers before returning to the estuaries to spawn, and a protandrous hermaphrodite. Larvae and uoung juveniles live in brackish temporary swamps associated with estuaries, and immature juveniles live inhabit the upper reaches of rivers. They have preference for cover on undercut banks, submerged logs and overhanging vegetation; feed on fishes and crustaceans, juveniles also eat insects. Caught with bottom trawls, handlines, bottom gillnets and traps.

Fig. 9. *Lates calcarifer* (Bloch, 1796)

Drepane punctata (Linnaeus, 1758)

Common name: En – Spotted sicklefish

Local name: Nga pa lai

Material examined: 5 specimens; size range: 25 to 30 cm..

Habitat and biology: This species is reef-associated benthic and neritic fish and occurs on mud or sand bottoms, reefs, estuaries and harbors as juveniles. Found near the coral and rock reefs when adults. They feed on bivalve, mollusk or other invertebrates and benthic fishes. Fishing by bottom trawl, setnet, trap and sometimes in gillnet.

Fig. 10. *Drepane punctata* (Forsskål, 1775)

***Lutjanus fulviflamma* (Forsskål, 1775)**

Common name: En – Black spot snapper

Local name: Nga parr ni

Material examined: 5 specimens; size range: 25 to 35 cm..

Habitat and biology: This species is reef-associated fish and inhabits shallow waters around mangroves, muddy and rocky and coral reefs. They feed on bivalve, mollusk or other invertebrates and small fishes. Caught mainly with handlines, hook-and-line, bottom longlines, traps and bottom trawls.

Fig. 11. *Lutjanus fulviflamma* (Forsskål, 1775)

***Lutjanus johnii* (Bloch)**

Common name: En – John's snapper

Local name: Nga parr ni

Material examined: 5 specimens; size range: 25 to 38 cm..

Habitat and biology: This species is reef-associated demersal fish and inhabits shallow waters and mangrove areas, adults probably frequent coral reef areas and juveniles found in mangrove estuaries. They feed on fishes and benthic invertebrates including shrimps, crabs and cephalopods. Caught mainly with handlines, hook-and-line, bottom longlines, traps and bottom trawls.

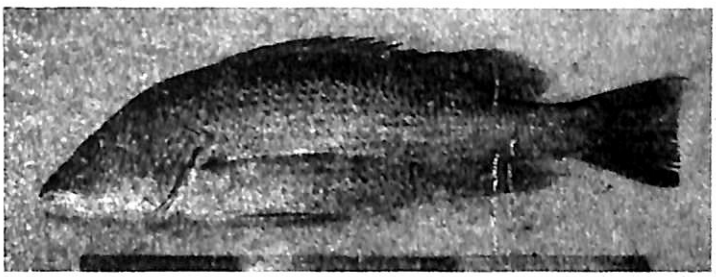


Fig. 12. *Lutjanus johnii* (Bloch)

***Mugil cephalus* (Linnaeus, 1758)**

Common name: En – Flathead mullet

Local name: Ka ba lu

Material examined: 5 specimens; size range: 25 to 32 cm..

Habitat and biology: This species may occurs in the coastal marine, estuaries and freshwater; adults in the sea generally over mud banks and young and juveniles ascend rivers, estuaries or very close to shore and also in rice fields and mangrove swamps, schools larger during breeding season; great tolerance of changes in salinity. They feed on minute bottom living invertebrates and on organic material contained in mud and sand; also on floating algae. Fishing by gill nets, beach seines and bottom setnets.

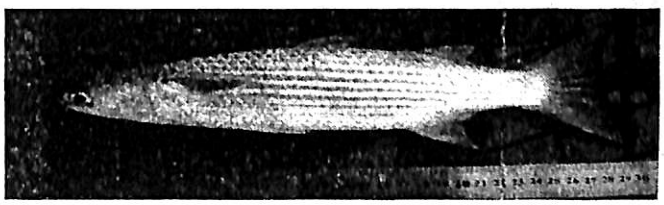


Fig. 13. *Mugil cephalus* (Linnaeus, 1758)

Upeneus taeniopterus (Cuvier, 1829)

Common name: En – Finstripe goatfish

Local name: Kyo war

Material examined: 5 specimens; size range: 8 to 15 cm..

Habitat and biology: This species is reef-associated demersal fish and inhabits shallow waters and mangrove areas, adults probably frequent coral reef areas and juveniles found in mangrove estuaries. They feed on fishes and benthic invertebrates including shrimps, crabs and cephalopods. Caught mainly with handlines, hook-and-line, bottom longlines, traps and bottom trawls.

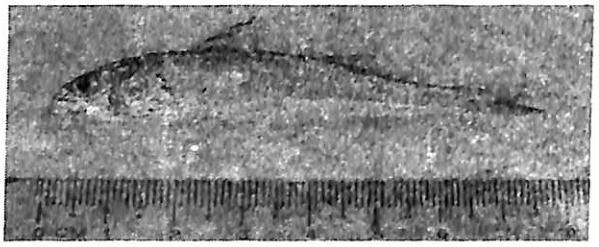


Fig. 14. *Upeneus taeniopterus* (Cuvier, 1829)

Nibea soldado (Lacepède, 1802)

Common name: En – Soldier croaker

Local name: Nat ka daw

Material examined: 5 specimens; size range: 20 to 30 cm..

Habitat and biology: This species inhabits over shallow muddy bottoms or a mixture of mud and sand in coastal waters. Also found shallow water to 40 m depth; it is bottom-dwelling species and feed on benthic invertebrates and small fishes; fishing by bottom trawls, traps, hand lines and bottom set nets.

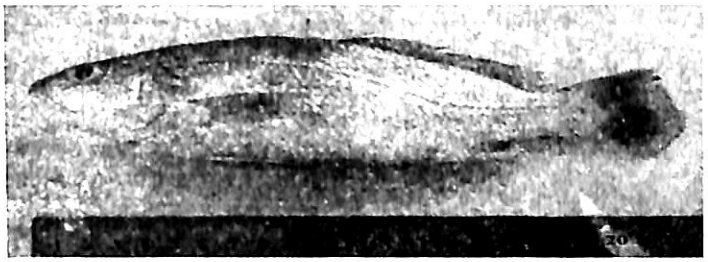


Fig.15. *Nibea soldado* (Lacepède, 1802)

***Scomberomorus commerson* (Lacepède, 1801)**

Common name: En – Narrowbarred Spanish mackerel

Local name: Bee zin

Material examined: 5 specimens; size range: 60 to 75 cm..

Habitat and biology: This species is pelagic fish and inhabits near edge of continental shelf to shallow coastal waters, often of low salinity and high turbidity. Also found in drop-offs, and shallow or gently sloping reef and lagoon waters. Usually hunts solitary and often swim in shallow water along coastal slopes. It found in small school at depths between 15 to 200 m; descending to feed on fishes near the bottom towards sunset; feed chiefly on small schooling fishes (sardines, anchovies and clupeids); caught with pelagic driftnets.

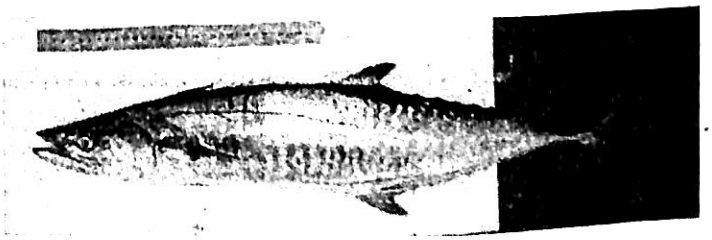


Fig.16. *Scomberomorus commerson* (Lacepède, 1801)

***Epinephalus coioides* (Forsskål, 1775)**

Common name: En – Orange-spotted grouper

Local name: Kyauk nga

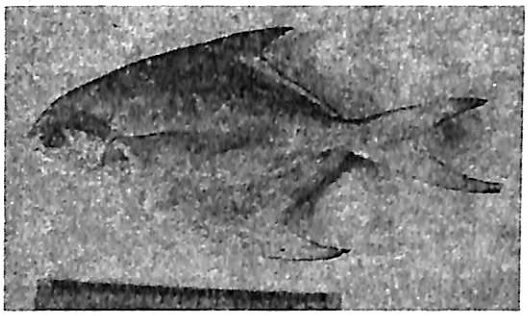


Fig. 20. *Pampus argenteus* (Euphrasen, 1788)

Table. 1. The habitats and occurrence of species encountered in MaGyi coastal area and its vicinities

Sr,	Species	Sampling site				Seasonal occurrence					
		Coastal area		Tidal creek							
		coastal	Coral	mangrove	estuaries	Summer	Rainy	Winter	rare	common	abundant
1	*Chirocentrus nudus*	*		*	*	*	*				*
2	*Caseio cuning*	*	*						*		
3	*Carangoides armatus*	*				*	*	*		*	
4	*Scomberoides lysan*	*				*	*	*		*	
5	*Scomberoides commersonianus*	*				*	*	*		*	
6	*Parastromatus niger*	*				*	*	*		*	
7	*Lates calcarifer*	*		*	*	*	*			*	
8	*Amblygaster leiogaster*	*			*	*	*	*			*
9	*Drepane punctata*	*	*		*	*	*		*		

Sr,	Species	Sampling site				Seasonal occurrence					
		Coastal area		Tidal creek		Summer	Rainy	Winter	rare	common	abundant
		coastal	Coral	mangrove	estuaries						
10	*Lutjanus fulviflama*	*	*	*	*	*	*	*		*	
11	*L. johnii*	*	*			*	*	*		*	
12	*Mugil cephalus*	*			*	*	*		*		
13	*Upeneus taeniopterus*	*				*	*			*	
14	*Nibea soldado*	*					*	*	*		
15	*Scomberomorus commerson*	*				*	*	*		*	
16	*Epinephalus coioides*	*	*	*	*	*	*			*	
17	*Siganus jarvus*	*	*		*	*	*	*			*
18	*S. vermiculatus*	*	*		*	*	*				*
19	*Pampus argenteus*	*				*	*			*	

Discussion

The mangrove environment provides the living space for a dependent biota of more than 2000 species of fish, invertebrates and epiphytic plants (Lawrence S. Hamilton *et al.*, 1984).

The compositions of fish species were different according to the season and their habitats. Geographically, due to the discharge of freshwater run-off into the creek during the monsoon period, occurrence and abundance of fish species differ within the tidal creek. Most of the collected species in the study areas (MaGyi and Chaungtha) were commonly occurred in rainy season and some were found rarely in winter and early summer.

In the study period, 14 families were involved in MaGyi tidal creek and coastal area. Among these, 3 families, such as Chirocentridae, Clupeidae, and Siganidae were abundant, 7 families, such as Carangidae, Centropomidae, Lutjanidae, Mullidae, Scombridae, Serranidae and Stromateidae were mostly found common. All were commonly appeared in rainy season. Four families, such as Caesionidae, Drepanidae, Mugilidae and Scianenidae were rarely found all the year round (table.1). *Lates calcarifer* (Centropomidae) was recorded in a minimum number in summer months, but maximum was collected in rainy season in both study areas.

The largest size group was found on July and August. *Amblygaster leiogaster* (Family-Clupeidae) was found most abundant in all year round, and also recorded in both coastal area and tidal creek. A large number was collected in early rainy season. The average length of this species is 20-30 cm. TL, in the study period. In the family Siganidae, *Siganus jarvus* was most abundant in all the year round and *S.vermiculatus* was common in summer and rainy season. All these were occurred in both coastal area and estuaries. The largest size of the family, 30-35 cm. TL size group was found in August and September. *Chirocentrus nudus* (Chirocentridae) was also found most abundant in the study areas. Carangidae, Centropomidae, Lutjanidae, Mullidae, Serranidae and Scomberidae were appeared very common in the whole year and occur only in the coastal area, but *Lates calcarifer* (Centropomidae), *Lutjanus fulviflama* (Lutjanidae) *and Epinephalus coioides* (Serranidae) were found in coastal and mangrove estuaries. *Carangoieds armatus, Lutjanus fulviflamma, Lutjanus johnii, Scomberoides lysan, S.commersonianus* and *Epinephelus coioides* were collected in large number in rainy season. And also found common in winter and summer. The largest size in Lutjanidae 25-35 cm. (TL) was found in September and October, 2005. In family Serranidae, 27-35 cm. TL size group was mostly found in July and September in the study period. *Upeneus taeniopterus* (Mullidae), *Pampus argenteus* (Stromateidae) and *Mugil cephalus* (Mugilidae) were commonly found in summer and rainy season, but rarely in winter. *Mugil cephalus* (Mugilidae) was recorded as maximum numbers in early rainy season and 25-32 cm. (TL) size group was collected in July and August, 2005 .

In the study period, 14 families and 19 species were found in Chaungtha coastal and tidal creek (Uto) which is adjacent to MaGyi Coastal area. Chaungtha coastal and tidal creek provides proper habitats for most marine fishes because of abundant food supplies. In these study area, the

families Carangidae, Centropomidae, Clupeidae, Lutjanidae and Siganidae were found as the most abundant fish group. In family Carangidae, *Scomberoides lysan* and *S. commersonianus*, the biggest size range 50-75 cm. (TL) was found in MaGyi area. They were most abundant in summer and raining season in coastal area and did not find in the tidal creek. *Carangoides armatus* was also found in summer and rainy season in the coastal and estuaries which was a rare species in the study area. *Parastromatus niger* was found common in the whole year along the coastal area. It was more common in summer and rainy season, but found rarely in winter, 2005. It was found that the maximum numbers were collected from April to August and a few numbers were collected in December and January, and the largest size range was 30-40 cm. (TL) in April and May, 2006. *Lates calcarifer* (Centropomidae) was found more abundant in the tidal creek in summer months and also found in the coastal water in rainy season (spawning season). It was recorded as the maximum numbers from March to September, 2005, in both study areas. The biggest size of the species, 25-37 cm. (TL) size group, was found in September and October, 2005. In family Clupeidae, *Amblygaster leiogaster* was found more abundant in rainy season and winter, which occurs along the coastal area, but was not found in tidal creek. The maximum numbers of these species were collected from September to November, 2005. The biggest, 30-35 cm. (TL) size group, was found in November and December, 2005. In family Lutjanidae, *Lutjanus fulviflamma* and *L. johnii* were collected in the coastal and coral reef area and are also found in the estuaries. These species were collected as maximum numbers in rainy season, especially from August to October in the study period. A few numbers were collected in winter. The largest size of *L. johnii*, 25-38 cm. (TL) size group, was found in August and September and *L. fulviflamma*, 25-35 cm. (TL) size group, was found in December; *L. johnii* was more common than other species. In family Siganidae, *Siganus jarvus* was found more abundant the whole year round. This species were found in the coastal and estuaries. The maximum numbers of this species were collected in June and July, 2005, and the largest size, 25-35 cm. (TL) size group was found in July and August, 2005. A few numbers were collected in winter. In the same family, *S. vermiculatus* was found more common in rainy season, which was collected from coastal and estuaries. The maximum numbers were collected in summer.The largest size, 20-27 cm. (TL) size group was found in August.

In the study area, Chirocentridae, Mugilidae, Sciaenidae, Serranidae and Stromateidae were found more common in the rainy season. Serranidae, *Epinephelus coioides* families were found more common in summer and in the rainy season. The species of family Serranidae were reef associated fishes. *E. coioides* was also found in brackish region (Hla Win, *et. al.*, 2008). The maximum number of fishes was collected in the rainy season and a few numbers in early summer during the study period. The families, Drepanidae, Mullidae and Caesionidae, were found rarely. *Drepane punctata* is found rare all the year round. The largest size of this species, 25-30 cm.(TL), was found from October to December.

The present study indicates that a proper management practice of fishery resources is important for a sustainable development in fishery sector.

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