

SPECIES COMPOSITION OF FISH CAPTURED BY
TRAWLERS IN THE WADGE BANK

by

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ABSTRACT

The paper describes the composition of the trawl catches from the World Bank, grouping the numerous species into two main categories, i.e. resident and migrant and then reclassifying them into market categories, indicating the approximate percentages of occurrence. A list of species trawled is given.

INTRODUCTION

The demersal trawler fishery forms one of the major commercial fisheries of Ceylon. The first commercial trawler fishery was initiated by a private company, The Ceylon Fisheries Ltd., in 1928. In 1945 the Government of Ceylon commenced trawling operations on the Wadge Bank and since then there has been a gradual expansion of the fishery, and by 1966 the Government-sponsored Ceylon Fisheries Corporation was operating one steam powered side trawler and five motor operated stern trawlers on the Wadge Bank.

The composition of some of the predominant species of fish found in the Wadge Bank have been listed by Malpas (1926), Pearson and Malpas (1926), Munro (1955), Sivalingam and Medcof (1957) and Mendis (1965, 1967). The present paper discusses the composition of various species of fish caught in the bottom trawl nets by the commercial trawlers of Ceylon operating on the Wadge Bank. The data relating to the species composition has been compiled chiefly from the catch returns of these trawlers, together with observations made on board the trawlers and catches landed by trawlers in Colombo.

Mention should be made that some of the results are partly new and partly confirmatory of those recorded previously by earlier workers.

CATEGORIES OF FISH IN THE TRAWLER FISHERY

The list of the species observed in the bottom trawl nets is given in the Appendix.

The fish captured fall into two major groups:

- (a) Resident species
- (b) Migrating species

The resident varieties are found inhabiting the bank throughout the year. The migratory species are seasonal, being most abundant during the South-west monsoon period. These features have been discussed at length by earlier workers. (Sivalingam, 1955, 1957b, Sivalingam & Medcof 1957, Mendis, 1965, 1968).

Pearson and Malpas (1926) in their observations on the possibilities of commercial trawling on the Wadge Bank have classified the majority of the demersal fish as Class I while the species comprising of sharks, dogfish, skates and species like *Acanthurus* spp. and *Balistes* spp. as Class II. In their report no mention is made of the migrant species.

With the Department of Fisheries commencing trawling for demersal fish using the trawler Raglan Castle, there was a large influx of the resident demersal fish in the Colombo market. The market in Colombo prior to demersal trawling was for species captured by beach seines and other traditional methods along the coastal waters of Ceylon. Initially there was no ready sale for these miscellaneous varieties of demersal fish. These varieties for convenience were designated "mulletts" or "rock fish" and is now a popular group of fish with the consumers. The term "mullet" though a misnomer has since come to stay as a general or collective term for most of the demersal species, although it should strictly be used for those species of fish belonging to the family MULLIDAE.

Resident Varieties

There are numerous species of fish occurring on the Wadge Bank throughout the year and these comprise a more or less constant and regular stock. To this resident stock are included those edible species belonging to the families LETHRINIDAE, LUTIANIDAE, PLECTORHYNCHIDAE, SERRANIDAE, ACANTHURIDAE, MULLIDAE, SCOLOPSIDAE and EPHIPPIDAE, all of which are generally referred to as "mulletts" or rock fish. The "mulletts" are subdivided on the basis of their colour, into grey and red varieties. The grey varieties are usually composed of the following species, *Lethrinus nebulosus* Forskal, *Lethrinus mahsencides* Valenciennes, *Lethrinella miniata* Schneider, *Spilotichthys pictus* Thunberg, *Epinephalus undulosus* Quoy and Gaimard, etc. Those comprising the main bulk of the red varieties are *Lutianus rivulatus* Cuvier, *Lutianus rangus*, *Lutianus malabaricus* Schneider, *Lutianus waigiensis* Quoy and Gaimard, etc.

In addition to these varieties the catches also consist of several species of small sized fish commonly referred to as "small mulletts". Among

them the younger stages of the earlier mentioned varieties and species like *Scolopels dubiosus*, *Holocentrus rubrum* Forskal, *Myripristis murdjan* Forskal, *Heniochus acuminatus* Linnaeus, *Ephippus orbis* Bloch, and *Acanthurus matoides* Valenciennes are often predominant.

Slow moving flat fishes, *Cynoglossus* spp. are also encountered though in very small quantities. Resident species of skates like *Himantura uarnak* Forskal are also common.

There are several species which are discarded and not brought to shore as they have been found to be nonedible. To this category are included species like *Diodon hystrix* Linnaeus, *Ostrosomus tuberculata* Linnaeus, *Chelonodon patoca* Hamilton - Buchanan, *Arothron* spp. etc.

Mention should be made that *Diodon hystrix* Linn. on certain occasions outnumber the edible species caught in a single haul. There have been occasions while fishing in deep waters, the net has come up with large quantities of *Pterois volitans*.

Migrant Varieties

The importance of the migratory varieties of fish of the Wadge Bank fishery, has been dealt with at length by Sivalingam (1957b) and Mendis (1968). Species like the king fishes (CARANGIDAE), Catfish (TACHYSURIDAE) and certain elasmobranchs, like dogfish, appear on the Bank, in large numbers during the South-west monsoon period, though small numbers of these varieties are occasionally caught in the trawlers during the other periods too.

(i) Carangid fishes: During the south-west monsoon period the carangids contribute to a high percentage of the commercially important species. Numerically, *Gnathanodon speciosus* Forskal, *Citula chrysophrys* Bloch, *Citula malabaricus* Bloch and Schneider and *Caranx oarangus* Bloch dominate the catches, while *Citula armatus* Forskal, *Seriola nigrofasciata* Ruppell, *Caranx stellatus* Endoux and Souleyet, *Alectis ciliaris* Bloch, and *Trachyrops crumenophthalmus* Bloch although not so abundant are also important species making up a large portion of the fishery. These carangid fishes swim about in large shoals in mid-water and more towards the bottom of the ocean for the purpose of feeding as indicated by the presence of small bottom dwelling crabs, shrimps and bivalve molluscs in their stomach contents.

(ii) Catfish: Among the catfish, *Netuma thalassinus* Ruppell is the predominant species found in the Wadge Bank. This species is also common during the south-west monsoon period, a feature already reported by Sivalingam (1957) and Mendis (1968). Though not valued commercially in its fresh state, the catfish are much in demand in the dry fish industry.

(iii) Elasmobranchs: Among the elasmobranchs comprising of dogfish and sharks, *Caracharias palasorrah* Cuvier, *Caracharias maculoti* Muller and Henle, and *Caracharias melanopterus* Quoy and Gaimard are the common species met with. Very often these species occur in large numbers during the south-west monsoon periods and are predominant in many hauls. The species of dogfish mentioned above though grouped as "inferior" varieties find a ready market in the by-products industry.

Pelagic Fish in the Trawler Catches

The pelagic species *Shyraena jello* Cuvier, *Scomberomorus commersoni* Lacepede, *Scomberomorus lineolatus* Cuvier, *Scomberomorus guttatus* Bloch and Schneider are those species trapped in the demersal trawl nets. Although these pelagic species constitute some of the most important food fishes of Ceylon, their presence in the trawler catches is very insignificant.

Percentage Composition of Species

Pearson and Malpas (1926) have shown that 87.1% of Class I fish and 11.7% of Class II fish (comprising of sharks, skates, *Acanthurus* spp. and *Balistes* spp.), and 1.2% of inedible species are available on the Wadge Bank. With the recent expansion of the trawler fishery it has become necessary to categorize the fish into several grades, based on consumer preference as follows:

<u>Grade</u>	<u>Composition</u>
A	<i>Scomberomorus</i> spp.
B	Carangid varieties, <i>Sphyraena jello</i>
C	<i>Pampus chinensis</i> , <i>P. argenteus</i> , <i>Parastromateus niger</i> , "mulletts" (<i>Lethrinus</i> spp. <i>Lutianus</i> spp. <i>Epinephalus</i> spp. <i>Spilotictithys</i> spp. etc.)
D	Smaller carangids, <i>Trachurops crumenophthalmus</i> , <i>Sphyraena jello</i> (small)
E	Smaller forms of "mulletts" (including <i>Scolopsis dubiosus</i> , <i>Myripristis murdjan</i>) <i>Drepane punctata</i> , <i>Acanthurus</i> spp. <i>Epinephalus tawina</i> , <i>E. bleekeri</i> , <i>Megalaspis cordyla</i>
F	Sharks, <i>Carcharias</i> spp. , <i>Odonus niger</i> , <i>Abalistes stellaris</i>
G	Sharks
H	<i>Netuma thalassinus</i> , small forms of <i>Drepane punctata</i> , skates

Examination of the recent catches brought in by the trawlers indicated that approximately 66% of the total catch consisted of the "mulletts" (17% of which were *Lethrinus mahsenoides* and *Lethrinus nebulosus*), 10% consisted of the various species of carangids, 10% of *Netuma thalassinus*, 12% of dogfish and skates, while the balance 2% consist of miscellaneous species of fish.

A study of the last haul from the trawlers returning from the Wadge Bank during a six-month period ranging from January 1967 to June 1967 were found to have the following percentage composition of the species.

<u>Species</u>	<u>Approx. percentage</u>
<i>Lutianus argentimaculatus</i>)	
<i>Lutianus sebae</i>)	
<i>Lutianus sanguineus</i>)	5%
<i>Pristipomoides typus</i>)	
<i>Lethrinus nebulosus</i>)	
<i>Lethrinus mahsenoides</i>)	14%
<i>Spilotichthys pictus</i>	9%
<i>Epinephalus undulosus</i>	7%
<i>Lutianus waigiensis</i>	2%
<i>Gymnocranius griseus</i>	4%
<i>Gnathanodon speciosus</i>)	
<i>Carangus carangus</i>)	
<i>Citula</i> spp.)	11%
Other carangids)	
<i>Pomadasys</i> sp.	4%
<i>Acanthurus matoides</i>	3%
<i>Odomus niger</i>	4%
<i>Upeneus</i> sp.	1%
<i>Netuma thalassinus</i>	5%
Elasmobranchs (dogfish, sharks, skates)	15%
Other edible species	11%
Discarded species (<i>Pterois volitans</i> , <i>Diodon hystrix</i> , <i>Fistularia petimba</i> , etc.)	5%

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Appendix

Species of Fish Observed in the Wadge Bank Trawling Grounds

TACHYSURIDAE

Netuma thalassinus Ruppell (3,4)

FISTULARIDAE

Fistularia petimba Lacepede (2,3)

CENTRISCIDAE

Centriscus scutatus Linnaeus (4)

SYNGNATHIDAE

Hippocompus kuda Bleeker (2)

HOLOCENTRIDAE

Holocentrus rubrum Forskal (4)

Myripristis murdjan Forskal (4)

SPHYRAENIDAE

Sphyraena jello Cuvier (3,4)

Sphyraena acutipinnis Day (2,4)

POLYNEMIDAE

Polynemus sextarius Bloch (2)

Polynemus sexfilis Valenciennes (2)

SERRANIDAE

Epinephelus undulosus Quoy and Gaimard (2,3,4)

Epinephelus flavocaeruleus Lacepede (2)

Epinephelus diacanthus Valenciennes (2)

Epinephelus areolatus Forskal (2)

Epinephelus bleekeri Bailliant & Pocourt (2)

Epinephelus meera Bloch (2)

Epinephelus fuscoguttatus Forskal (2)

Epinephelus tawina Forskal (4)

Epinephelus malabaricus Schneider (2,4)

THERAPONIDAE

Therapon jarbua Forskal (4)

PRIACANTHIDAE

Priacanthus tayenus Richardson (2)

Priacanthus hamrur Forskal (2)

SILLAGINIDAE

Sillago sihama Forskal (2)

LACTARIIDAE

Lacatarius lacatarius Schneider (2)

CARANGIDAE

<i>Decapterus russelli</i> Ruppell	(4)
<i>Megalaspis cordyla</i> Linnaeus	(3,4)
<i>Alectis indica</i> Ruppell	(3)
<i>Alectis ciliaris</i> Bloch	(2,4)
<i>Atropus atropus</i> Bloch	(3)
<i>Gnathanodon speciosus</i> Forskal	(2,3,4)
<i>Selar mate</i> Cuvier	(2,3,4)
<i>Selar malam</i> Bleeker	(2)
<i>Selar kalla</i> Cuvier	(2,4)
<i>Carangoides oblongus</i> Cuvier	(2)
<i>Carangoides chrysophrys</i> Cuvier	(2,3)
<i>Citula malabaricus</i> Bloch & Schneider	(3,4)
<i>Citula armatus</i> Forskal	(2,4)
<i>Carangoides gymnotethoides</i> Bleeker	(3,4)
<i>Carangoides ferdau</i> Forskal	(2,3,4)
<i>Caranx sexfasciatus</i> Quoy & Gaimard	(3,4)
<i>Caranx melampygus</i> Cuvier & Valenciennes	(2,3,4)
<i>Caranx ignobilis</i> Forskal	(3,4)
<i>Caranx stellatus</i> Eudoux & Souleyet	(4)
<i>Caranx carangus</i> Bloch	(3,4)
<i>Trachurops crumenophthalmus</i> Bloch	(3,4)
<i>Seriola nigrofasciata</i> Ruppell	(2,4)
<i>Selaroides leptolepis</i> Cuvier	(2)
<i>Naucrates ductor</i> Linnaeus	(4)
<i>Chorinemus lysan</i> Forskal	(4)
<i>Chorinemus sancti-perti</i> Cuvier	(4)

RACHYCENTRIDAE

<i>Rachycentron canadus</i> Linnaeus	(2,4)
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MENIDAE

<i>Mene maculata</i> Bloch	(2,4)
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LUTIANIDAE

<i>Aprion virescens</i> Valenciennes	(2,4)
<i>Pristipomoides typus</i> Bleeker	(2,4)
<i>Lutianus argentimaculatus</i> Forskal	(2,4)
<i>Lutianus rivulatus</i> Cuvier	(1,2,3,4)
<i>Lutianus fulviflamma</i> Forskal	(2)
<i>Lutianus russelli</i> Bleeker	(2)
<i>Lutianus waigiensis</i> Quoy & Gaimard	(2,3,4)
<i>Lutianus kasmira</i> Forskal	(2)
<i>Lutianus vitta</i> Quoy & Gaimard	(1,2)
<i>Lutianus lineolatus</i> Ruppell	(1,2)
<i>Lutianus lutianus</i> Bloch	(2)
<i>Lutianus sanguineus</i> Cuvier	(2,4)
<i>Lutianus malabaricus</i> Schneider	(2,3,4)
<i>Lutianus sebae</i> Cuvier	(2,4)
<i>Lutianus rangus</i> Cuvier	(3,4)

CAESIODIDAE

Caesio chrysozonus Cuvier (2)

NEMIPTERIDAE

Odontoglyphis tolu Valenciennes (2)

Nemipterus japonicus Bloch (2)

Nemipterus bleekeri Day (2)

GERRIDAE

Pentaprion longimanus Cantor (2)

LEIOGNATHIDAE

Leiognathus fasciatus Lacepede (2,4)

Leiognathus equulus Forskal (2,4)

POMADASYIDAE

Pomadasye hasta Bloch (2,4)

Pomadasye maculatus Bloch (2,4)

Rhonciscus furcatus Schneider (2)

Pomadasye olivaceus Day (2)

Pomadasye argyreus Valenciennes (2)

SCOLOPSIDAE

Scolopsis vosmeri Bloch (4)

Scolopsis bimaculatus Ruppell (2,4)

Scolopsis dubiosus (3,4)

PLECTORHYNCHIDAE

Gaterin schotaf Forskal (2)

Spilotichthys pictus Thunberg (2,3,4)

SCIAENIDAE

Johnius dussumieri Cuvier (2)

Johnius aneus Bloch (2)

Otolithus ruber Schneider (4)

LETHRINIDAE

Lethrinella miniata Schneider (1,2,3,4)

Lethrinus nebulosus Forskal (1,2,3,4)

Lethrinus mahsenoides Valenciennes (4)

Lethrinus ornatus Valenciennes (2,3)

Lethrinus rhodopterus Bleeker (2)

Lethrinus microdon Valenciennes (2)

Lethrinus ramak Forskal (2)

PENTAPODIDAE

Gymnoaranius griseus Schlegel (2,4)

Monotaxis grandoculis Forskal (2)

SPARIDAE

Argyrops spinifer Forskal (2,4)

MULLIDAE

<i>Upeneus luteus</i> Valenciennes	(2)
<i>Upeneus sulphureus</i> Cuvier	(2)
<i>Upeneus vittatus</i> Forskal	(2)
<i>Upeneus indicus</i> Shaw	(1,2,3)
<i>Upeneus cinnabarinus</i> Cuvier	(2)

MONODACTYLIDAE

<i>Monodactylus argenteus</i> Linnaeus	(2,4)
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EPHIPPIDAE

<i>Ephippus orbis</i> Bloch	(2,3,4)
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PLATYCIDAE

<i>Platax teira</i> Forskal	(2)
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POMACANTHIDAE

<i>Pomacanthodes imperator</i> Bloch	(2,4)
<i>Pomacanthodes annularis</i> Bloch	(2,4)
<i>Pomacanthodes semicirculatus</i> Cuvier	(2,4)

SCARIDAE

<i>Callyodon fasciatus</i> Valenciennes	(2,4)
<i>Callyodon dussumieri</i> Valenciennes	(2,4)
<i>Callyodon hardi</i> Forskal	(2)
<i>Callyodon blochi</i> Valenciennes	(2)

ACANTHURIDAE

<i>Acanthurus matoides</i> Valenciennes	(1,2,3,4)
<i>Acanthurus gahn</i> Forskal	(2)
<i>Acanthurus bleeker</i> Gunther	(2,4)
<i>Acanthurus lineatus</i> Linnaeus	(2)
<i>Naso unicornis</i> Forskal	(2,4)
<i>Naso tuberosus</i> Lacepede	(2,4)

SCOMBEROMORIDAE

<i>Scomberomorus commersoni</i> Lacepede	(2,4,
<i>Scomberomorus guttatus</i> Bloch & Schneider	(2,4)
<i>Scomberomorus lineolatus</i> Cuvier	(2,4)

STROMATEIDAE

<i>Parastromateus niger</i> Bloch	(2,4)
<i>Pampus argenteus</i> Euphrasen	(2)
<i>Pampus chinensis</i> Euphrasen	(2)

SCORPAENIDAE

<i>Pterois volitans</i> Linnaeus	(2,4)
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DREPANIDAE

<i>Drepene punctata</i> Linnaeus	(1,2,4)
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CHAETODONTIDAE

- Heniochus acuminatus* Linnaeus (2,4)
Linophora vagabunda Linnaeus (2)

ALUTERIDAE

- Alutera monoceros* Linnaeus (2,4)
Alutera scripta Osbeck (2,4)

OSTRACIONTIDAE

- Ostracion tuberculata* Linnaeus (2,4)
Lactoria fornasini Bianconi (4)
Lactoria cornuta Linnaeus (2,4)
Tetrosomus gibbosus Linnaeus (2)

LATIDAE

- Lates calcarifer* Bloch (4)

BALISTIDAE

- Odonus niger* Ruppell (2,4)
Hemibalistes chrysopterus Bloch (4)
Abalistes stellaris Bloch (2,3,4)
Balistoides viridescens Bloch (2)

TRIACANTHIDAE

- Tricanthus brevirostris* Schlegel (2,4)

TETRAODONTIDAE

- Chelonodon patoca* Hamilton-Buchanan (2,4)
Arothron leopardus Day (2,4)
Arothron stellatus Bloch (2,4)

DIODONTIDAE

- Diodon hystrix* Linnaeus (2,4)

ELASMOBRANCH FISH

CARCHARHINIDAE

- Carcharias palasorrah* Cuvier (4)
Carcharias macloiti Muller & Henle (4)
Carcharias melanopterus Quoy & Gaimard (4)

RHINOBATIDAE

- Rhynchobatus djiddensis* Forskal (4)

TRYGONIDAE

- Amphotistius kuhlii* Muller & Henle (4)
Himantura uarnak Forskal (4)

MOBULIDAE

- Mobula diabolus* Shaw (4)

(1 = Pearson & Malpas, 1926) (2 = Munro, 1955)
(3 = Sivalingam & Medcof, 1957) (4 = Recent records)