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1182 Exploited marine fishery resources off Tuticorin along the Gulf of Mannar coast

Tuticorin coast of Gulf of Mannar is endowed with rocky bottom, coral reefs and sea grass beds with characteristic flora and fauna. It also acts as home for several endangered marine mammals, sea cows and marine turtles. These resources were exploited by a variety of gears during 2000-2005. Average annual catch for the period was 36,851 tonnes (Table 1). Major gears and their contribution to the fishery are trawls (67.2%), mini-trawls (4.0%), gillnets (22.8%), hooks and line (3.3%) and shore seines (2.7%). Bony fishes belonging 73 families under 14 orders form the major catch (91.7%), (Table 2,3). Other constituents of the catch are elasmobranchs (3.66%), crustaceans (1.93%), molluscs (1.8%), seacucumber (0.01%) and other non-edible biota (0.09%).

Order: Clupeiformes

Clupeids represent 20.4% of the total fish catch with an average annual production of 7,501 tonnes.

Family: Clupeidae

Clupeidae support 14.6% of the total catch with an annual average of about 5,380 tonnes during 2000-'05. Sardines form the mainstay of fishery and represent 66.6% of the clupeid catch. Fishery was supported by 9 species of sardines and one species each of white sardine and rainbow sardines. Species supporting sardine fishery are *Sardinella gibbosa, S. sirm, S. albella, S. longiceps, S. clupeoides, S. dayii, S. fimbriata, S. melanoptra* and *S. sidensis.* Fishery of white sardine was supported by *Esculosa thoracata* and rainbow sardine by *Dussumieria acuta.* Shads, pellonas, ilishas, sprats etc. support 4.3% of the clupeid fishery.

Family: Engraulidae

Anchovies form 4.8% of the total marine production. About 1,757 tonnes of anchovies were landed annually. White baits supported about 30.8% of the anchovy fishery. Their catch was dominated by *Stolephorus indicus, S. bataviensis* and *S. devisi. Thryssocles* supported 58.1% of the anchovy fishery. Dominant species in the fishery are *Thryssocles mystax, T. malabaricus* and *T. setirostris. Coilia dussumieri* and *Setipinna taty* constituted 11.1% of the anchovy fishery.

Family: Chirocentridae

Dorabs form nearly 1.0% of total marine

Table 1. Major exploited marine resources, average annual catch and percentage contribution by weight of Tuticorin coast during 2000-2005.

Sl. No.	Major groups	Catch (kg)	% of total catch
1.	Teleosts	33792749	91.70
2.	Elasmobranchs	1347426	3.66
3.	Crustaceans	710426	1.93
4.	Molluscs	664245	1.80
5.	Seacucumber	4699	0.01
6.	Other groups	331841	0.90
	Total	**36851387**	**100.00**

Table 2. Major orders representing the exploited bony fish resources of Tuticorin region, number of suborders and families under different order and their relative abundance during 2000-2005

Sl. No.	Order	Sub-orders (No)	Families (No)	% in total catch	% in bony fish catch
1.	Elopiformes	-	2	0.78	0.85
2.	Clupeiformes	-	3	20.35	22.20
3.	Anguiliformes	-	3	0.06	0.07
4.	Siluriformes	-	2	1.04	1.14
5.	Gonorhynchiformes	-	1	0.03	0.03
6.	Myctophiformes	-	2	1.62	1.77
7.	Atherineformes	-	1	0.08	0.09
8.	Beloniformes	-	3	1.88	2.05
9.	Beryciformes	-	1	0.18	0.20
10.	Syngnathiformes	-	2	0.05	0.06
11.	Scorpioniformes	-	1	0.20	0.22
12.	Perciformes	9	41	58.50	63.80
13.	Pleuronectiformes	-	4	0.23	0.25
14.	Tetradontiformes	-	7	6.52	7.11
15.	Other bonyfishes	-	-	0.17	0.18
	Total	**9**	**73**	**91.70**	**100.00**

Table 3. Composition of the families of fishes contributing to the exploited marine bonyfish fishery resource of Tuticorin during 2000-2005.

Order / Sub-order	Family	% in total	Order / Sub-order	Family	% in total
Elopiformes				Gerridae	0.26
	Elopidae	0.16		Apogonidae	0.07
	Megalopidae	0.69		Sillaginidae	1.26
Clupeiformes				Echeinidae	0.02
	Clupeidae	15.92		Leognathidae	8.23
	Engraulidae	5.20		Lobotidae	0.03
	Chirocentridae	1.08		Emmelichthydae	0.21
Anguilliformes				Drepanidae	0.31
	Anguilidae	0.04		Platacidae	0.04
	Muraenidae	0.02		Scatophagidae	0.09
	Muraenesocidae	0.01		Chaetodontidae	0.05
Siluriformes				Pomacanthidae	0.38
	Aridae	0.97		Menidae	0.11
	Plotosidae	0.17	Mugilloidei		
Gonorhynchiformes				Mugilidae	0.16
	Chanidae	0.03	Sphyraenoidei		
Myctophiformes				Sphyraenidae	5.20
	Myctophidae	0.01	Polynemoidei		
	Synodontidae	1.76		Polynemidae	0.17
Atheriniformes			Labrodei		
	Atherinidae	0.09		Scaridae	1.05
Beloniformes			Acanthuroidei		
	Exocoetidae	0.24		Acanthuridae	0.37
	Hemiramphidae	0.54		Siganidae	0.79
	Belonidae	1.27	Scombroidei		
Beryciformes				Scombridae	6.59
	Holocentridae	0.20		Trichiuridae	0.75
Syngnathiformes				Gemphylidae	0.07
	Syngnathidae	0.01	Xiphioidei		
	Fistularidae	0.05		Xiphidae	0.001
Scorpioniformes				Istiophoridae	0.20
	Platycephalidae	0.22	Stromateoidei		
Perciformes				Stromatidae	0.15
Percoidei				Ariommidae	0.10
	Serranidae	2.30	Pleuronectifirmes		
	Centropomidae	0.28		Psettodidae	0.07
	Lutjanidae	1.68		Bothidae	0.02
	Lethrinidae	5.49		Soleidae	0.09
	Ambassidae	0.00		Cynoglossidae	0.07
	Pomadasydae	0.61	Tetradontiformes		
	Rachycentridae	0.47		Triodontidae	0.11
	Carangidae	14.08		Tetradontidae	0.16
	Nemipteridae	5.43		Triacanthidae	0.001
	Sciaeneidae	1.83		Ballistidae	6.71
	Mullidae	3.50		Diodontidae	0.07
	Priacanthidae	0.45		Ostracidae	0.05
	Teraponidae	0.30		Molidae	0.01
	Coryphaenidae	0.09	Other bony fishes		0.25
	Lactaridae	0.54			

production. Fishery was supported by *Chirocentrus dorab* and *Chirocentrus nudus.* Former dominated the fishery and support 94.2% of the catch.

Order: Perciformes

They constitute about 58.5% of the total catch. Fishes belonging to 41 families under 9 sub-orders supported the fishery. They include pelagic and demersal fishes with distribution ranging from coastal to oceanic waters. About 62.1% of their catch was constituted by families Carangidae, Leiognathidae, Scombridae, Lethrinidae, Nemipteridae and Shpyraenidae.

Family: Carangidae

Carangidae support 12.9% of the total marine production with an annual average catch of about 4,791 tonnes. Fishery was supported by 47 species belonging to 19 genera. Most dominant species in the fishery are *Selar crumenophthalmus* (13.2%), *Caranx carangus* (12.8%), *Decapterus russelli* (8.1%), *Scomberoides commersonianus* (7.8%), *Selaroides leptolepis* (7.0%), *Caranx ignobilis* (6.9%), *Gnathanodon speciosus* (5.8%), *Atule mate* (5.1%) and *Megalapsis cordyla* (5.0%).

Family: Leognathidae

Silver bellies constitute 7.5% of the total marine production with an average annual production of 2,781 tonnes. Fishery was supported by 12 species of the genera, *Leiognathus, Gaza and* Secutor. Most dominant species in the catch were *Leiognathus dussumieri, L. barbis, L. bindus* and *Gaza minuta.*

Family: Scombridae

Mackerel, tuna and seerfish supported the fishery with an average annual production of 2,196 tonnes. They form 6.6% of the total catch. Mackerel fishery was supported by *Rastrelliger kanagurta* and represent 18.8% of scombroid catch. Tuna represent 50.4% of scombroid catch and the fishery was supported by 7 species, *Euthynnus affinis* (46.8%), *Thunnus albacares* (26.6%), *Auxis thazard, Auxis rochei, Katsuwonus pelamis, Sarda orientalis* and *Thunnus tonggol.* Seerfishes represent 30.8% of scombroid catch. Fishery was supported by *Scomberomorus commerson* (96.2%), *S. lineolatus, S. guttatus* and *Acanthocybium solandri.*

Family: Lethrinidae

Pigface breams constitute 5.1% of the total catch with an average annual production of 1,854 tonnes. Fishery was supported by six species and dominated by *Lethrinus nebulosus* (90.1%). Others in the fishery are

Lethrinus miniatus, L. harak, L. ornatus, L. lentjan and *L. kallopterus.*

Family: Nemipteridae

Threadfin breams (*Nemipterus* spp.) and monocle bream (*Scolopsis* spp. and *Parascolopsis* spp.) together form 5% of the total marine fish production with an average annual catch of 1,836 tonnes. About 61% of the catch was supported by threadfin breams and the fishery was represented by *Nemipterus delagoae, N. japonicus* and *N. mesoprion.* Fishery of monocle bream was supported mainly by *Scolopsis bimaculatus* and *S. bilineatus.*

Family : Sphyraenidae

They form 4.8% of the total catch with an average annual production of 1,758 tonnes. Fishery was supported by *Sphyraena jello, S. barracuda, S. picuda* and *S. obtusata.*

Family: Mullidae

Goatfishes form 3.2% of the marine fish catch. Fishery was supported by species of the genera *Parupeneus, Upeneus* and *Mulloides.* Fishery was supported mainly by *Parupeneus indicus* and *Upeneus bensasi.*

Family: Serranidae

Groupers represent 2.1% of the marine fish production. About 84% of the catch was supported by *Epinephelus tauvina, E. undulosus, Cephalopholis sonneratti* and *Epinephelus malabaricus.* Other species supporting the fishery are *Epinephelus longispinis, E. areolatus, E. chlorostigma* and *E. bleekeri.* Few other species also occur occasionally in the catch in few numbers.

Family: Sciaenidae

Craokers form 1.7% of the fish catch. Fishery was supported mainly by *Otolithes ruber, Nibea maculata, Protonibea diacanthus, Johnius dussumieri, Johnius sina* and *Pseudosciaena coiber.* These species represent 97% of the croaker catch.

Family : Lutjanidae

Snappers constitute 1.5% of the total catch. Fishery was supported by species of the genera *Lutjanus, Pristipomoides* and *Macolo.* Common species in the fishery are *Lutjanus rivulatus, L. fulviflammus, L. argentimaculatus, L. johni, L. russelli, L. lineolatus* and *L. vaigiensis.* They form 99% of the catch.

Other important families of the order Perciformes

Snake mackerels (family Gempylidae) form 0.15% of the total catch. *Neoepinula orientalis, Lepidocybium flavobrunneum, Ruvettus pretiosus cocco, Thyrsitoides*

marleyi, *Thyrsites atun* and *Gempylus serpens* supported the fishery. Hairtails (family Trichiuridae) represent 0.7% of the total fish production. Fishery was supported by *Trichiurus lepturus*. (99.4%) and *Lepturacanthus savala.*

Billfishes and marlins (family Istiophoridae) in the fishery are represented by *Istiophorus platypterus* and, *Makyra indica*. Sword-fishes (family Xiphidae) in the fishery were represented mainly by *Xiphias gladius* and occasionally by *Tetrapturus brevirostris.* Silver pomfret (family Stromateidae) fishery was supported by *Pampus argentius* and *Pampus chinensis.* Fishery of Ariommas (family Ariommidae) was supported by *Psenes indicus*. Surgeon fish (family Acanthuridae) fishery was supported mainly by *Acanthurus* spp. Catch of rabbitfishes (family Siganidae) was dominated by *Siganus canaliculatus* and *Siganus javus.* Parrotfish (family Scaridae) fishery was supported by several species.

Mullets (family Mugilidae) fishery was supported by *Liza tade, Mugil cephalus* and *Valamugil speigleri.* Fishery of threadfins (family Polynemidae) was supported by *Eleutheronema* spp and *Polynemus* spp. Dolphin fish (family Coryphaenidae) fishery was supported by *Coryphaena hippurus* and *Coryphaena equiselis.* Silver biddies (family Gerreidae) in the fishery were represented by *Gerres oyena, G. filamentosus, G. abbreviatus* and *Pentaprion longimanus.* Fishery of barramundis and seaperches (family Centropomidae) was supported by *Lates calcarifer* and *Psammoperca waigiensis.* Sand whitings (family Sillaginidae) form 1.2% of total catch and was supported by a single species, *Sillago sihama.* Other groups with fishery supported by single species are false trevallies (family Lacataridae) by *Lactarius lactarius*, bulls eyes (family Priacanthidae) by *Priacanthus hamrur* and black kingfishes (family Rachycentridae) by *Rachycentron canadus.*

Other families and their contribution in the marine production are Teraponidae (0.28%), Pomadasidae (0.56%), Apogonidae (0.06%), Echeneidae (0.02%), Lobotidae (0.03%), Emmelichthydae (red baits) (0.19%), Drepanidae (0.28%), Platacidae (0.04%), Scatophagidae (0.08%), Chaetodontidae (0.05%), Pomacanthidae, (0.35%), Maenidae (0.1%) and Ambassidae.

Other finfishes:

Triggerfishes (order Tetradontiformes) form 6.52% of total catch. Fishery was supported by ballistids (family Balistidae), puffer fishes and blowfishes (family Triodontidae and

Tetradontidae), tripodfishes (family Triacanthidae), porcupinefishes (family Diodontidae), trunkfishes (family Ostraciidae) and sunfishes (family Molidae). Ballistids form 94.3% of the groups catch with an average annual production of 2,269 tonnes. Catfish (Order: Siluriformes) fishery was supported by two families, Tachysuridae (Ariidae) and Plotossidae. Tachysuridae represents about 85% of the catfish catch and is represented mainly by *Arius* spp and to a small extends by *Batrochocephalus* spp. Fishery of Plotossidae was supported by *Plotossus* spp.

Lizardfishes and allies (order Myctophiformes) form 1.62% of the catch. About 99.4% of the catch was by lizardfishes (family Synodontidae) and the rest by lanternfishes (family Myctophidae). *Saurida tumbil* dominated their catch. Flyingfishes, halfbeaks and needlefishes (order Beloniformes) form 1.9% of the total catch. About 11.7% of the catch was by flyingfishes (family Exocoetidae), 26.3% by hallfbeaks (family Hemiramphidae) and the rest (62%) by needlefishes (family Belonidae). Flyingfish fishery was supported by *Cypselurus spylopterus*, halfbeaks by *Hemirhamphus far* and *H. georgii* and needlefish by *Ablennes hians, Tylosurus crocodilus crocodylus, Strongylurus leiura* and *Strongylurus appendiculata*. Flatfish (order Pleuronectiformes) fishery was supported by soles (family Soleidae), spiny turbots (family Psettodidae), tonguesoles (family Cynoglossidae) and lefteye flounders (Bothidae) in the order of dominance. Tarpoon and ladyfish (order Elopiformes) fishery was supported by tarpoon, *Megalops cyprinoids* (family Megalopidae) and ladyfish, *Elops machnata* (family Elopidae). Fishery of milkfish (order Gonorhynchiformes) was supported by a single species, *Chanos chanos* (family Chanidae). Eel (order Anguilliformes) fishery was supported by families Angullidae, Muraenidae, Muraenisocidae and Ophichthidae.

Others occurring in the fishery are silversides of the family Atherinidae (order Atheriniformes), squirrelfishes of Holocentridae (order Beryciformes), pipefishes and seahorses of Syngnathidae, flutemouths of Fistularidae (order Syngnatiformes) and flatheads of family Platycephalidae (order Scorpioniformes). They together support 0.52% of the marine fish production. Other bony fish to the tune of 0.23% of the total fish catch is yet to be identified.

Elasmobranchs:

Elasmobranchs form 3.7% of the total fish production with an average annual production of about 1,347 tonnes. Sharks, rays and

skates supported the fishery.

Order: Lamniformes

Sharks represent 14.43% of the elasmobranch catch. Fishery was supported by families of Carcharhinidae, Echinorhinidae, Hemiscyllidae, Alopidae, Sphyrnidae and Squalidae. Carcharhinidae represent 45.1% of shark catch. Species supporting the fishery are *Scoliodon laticaudus, Carcharhinus melanopterus, C. bleekeri, C. limbatus, Galeocerdo cuvieri* and *Rhizoprionodon acutus.* Fishery of bramble shark (family Echinorhinidae) was supported by *Echinorhinus brucus.* They represent 10.2% of the shark catch. Longtail carpetsharks (family Hemiscyllidae) represent 30.6% of shark catch and was supported by *Chiloscyllium indicum.* Fishery of thresher shark (family Alopidae) was supported by *Alopias vulpinus,* hammerhead shark (family Sphyrnidae) by *Sphyrna zygaena* and *Sphyrna blochii,* dogfish shark (family Squalidae) by *Centrophorus moluccensis.* Whale shark (family Rhiniodontidae), *Rhincodon typus* is available along the region, but do not form any fishery.

Order: Rajiformes

Rays represent 81.5% of the elasmobranch catch. Fishery was supported by families, Trygonidae, Rhinopteridae, Myliobatidae and Mobulidae. Stingrays (family Trygonidae) support 74.8% of the ray catch. Fishery was supported by *Himantura bleekeri, H. uarnak, Dasyatis kuhlii, Dasyatis imbricatus, Pastinachus sephen* and *Gymnura poecilura.* Fishery of cow ray (family Rhinopteridae) was supported by *Rhinoptera javanica,* eagle rays (family Myliobatidae) by *Aetobatus narinari* and devil rays (family Mobulidae) by *Mobula diabolus.* Skates represent 4.1% of the elasmobranch catch. Fishery was supported by *Rinobatus granulatus* and *Rhinobatus djiddensis* of the family Rhinobatidae.

Crustaceans:

Crustaceans form 1.93% of the marine fish production. Prawns, crabs and lobsters supported the fishery. Prawn fishery was represented by families, Penaeidae, Palaemonidae and Solinoceridae. Common species in the fishery are *Penaeus semisulcatus, P. indicus, P. merguiensis, Penaeopsis uncta, Parapenaeopsis maxilliped, Nematopalaemon tenuipes, Solenocera* sp., *Penaeus latisulcatus, P. japonicus, P. monodon, Metapenaeus dobsoni, Parapenaeopsis stylifera* and *Trachypenaeus* sp.

Fishery of lobster was supported by spiny lobsters (family Palinuridae) and slipper lobster (family Scyllaridae). Common species in the

fishery are *Panulirus ornatus, P. homarus, P. versicolor, P. penicillatus, P. polyphagus, Puerrulus sewelli* and *Thenus orientalis.* Crab fishery was supported mainly by *Portunus pelagicus, Portunus sanguinolentus, Charibdis cruciata* and *Scylla serrata.* Large quantities of non-edible deep-sea crabs were also landed by trawls.

Molluscs

Fishery of molluscs was supported by cephalopods, gastropods and bivalves. They form 1.8% of the total fish production. Squids (order Teuthoidea), cuttlefishes (order Sepioidea) and octopuses (order Octopoda) support cephalopods fishery. Common species in the catch are *Loligo duvauceli, Doryteuthis* sp, *Loliolus* sp, *Sepia pharaoni, Sepia aculeate, Sepioteuthis lessoniana, Sepia prashadi, Sepiella ineremis* and *Octopus* spp. Other molluscs contributing to the fishery are bivalves and gastropods. Among them targeted fishery exists only for sacred Chanks, *Xancus pyrum.*

Seacuccumbers

Seacucumber in trawl fishery was represented by *Holothuria spinifera.* They form up to 0.01% of the total catch. Several other species were also available along the region and were exploited by various means.

Miscellaneous biota

Other non-edible components like *Squilla,* echinoderms, molluscan shells etc are grouped as miscellaneous. They form about 0.9% of the total catch of the region.

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