Brackish-water Fishery Resources

by

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CEYLON has about 300,000 acres of coastal brackish-water areas of which about 100,000 acres constitute shallow lagoons, tidal flats, mangrove swamps and saline marshes, and the rest deeper lagoons and estuaries. While the former represent a vast potential resource with regard to fish farming; the latter are the sites of important fisheries. W. H. Schuster (1951) estimated the average natural production of our brackish waters to be less than 20 lbs. per acre per annum. Since then estimates have been made by the author for a rich lagoon, the Negombo lagoon, a poorly productive lagoon, the Ratgama lake (Dodanduwa) and studies are in progress of some of the other lagoons. The natural production of the Ratgama lake was estimated in 1959 to be 18.5 lbs. per acre per annum while that of Negombo lagoon was estimated in 1960 to be 65 lbs. per acre per annum.

It is reasonable to estimate the average production of Ceylon's brackish-waters to be 25 lbs. per acre per annum. Thus the total production is about 3,350 tons per annum. Considering the fact that the Island's present total production is 90,000 tons per annum, the brackish-waters contribute 3.7 per cent. of it. Schuster (1951) further states that the natural production in the brackish-waters of other countries is around 80 lbs. per acre per annum. In order to increase our average natural production to this value it would seem necessary to consider the nature, biology and fish resources of the brackish-waters and draw some conclusions with regard to their proper exploitation.

Brackish-Water. Definition and Classification

H. C. Redeke in 1922 defined brackish-waters as those which result from the mixing of fresh waters with marine waters. Although there is a tendency in some classifications of brackish-waters to include all waters from the fresh to the highly saline inland lakes, the final resolution at a Symposium on the classification of brackish-waters held in Venice in 1958 restricted it to Redeke's definition, i.e., "those littoral marine waters which become diluted because of the inflow of continental fresh waters." Thus all our brackish-waters come within the scope of Redeke's definition. They consist of the river estuaries, lagoons, estuarine bays, and saline lakes (salt lewayas).

Redeke (1922) proposed the following classification of brackish-waters according to chlorinity content:

	Chlorinity Content (gr./L.)
Oligohaline brackish-water	0·1— 1·0
Mesohaline brackish-water	1·0—10·0
Polyhaline brackish-water	10·0—

Subsequently, G. Brunelli (1933), I. Valikangas (1933) and others adopted and elaborated on Redeke's system. However, a serious objection to their system was that they referred to static conditions of salinity, whereas in reality they are subject to fluctuations of a daily nature in respect of the tides, of a seasonal nature in respect of the rains (and thawing of ice in spring or evaporation in summer), and of a spatial nature. In the latter case, a layer of fresh water can flow out to the sea over a layer of denser sea water which ocillates underneath in relation to the tides, as in case of an estuary.

Hence the 1958 Venice Symposium on brackish-waters adopted the following classification with approximate salinity ranges for universal application:—

Zone	*Salinity ‰*
Hyperhaline	>∽ 40
Euhaline	∽ 40—∽ 30
Mixohaline	(∽ 40) ∽ 30—0·5
Mixoeuhaline	>∽ 30 but < adjacent euhaline sea.
Mixohaline (Mixo-) polyhaline	∽ 30—∽ 18
(Mixo-) mesohaline	∽ 18—∽ 5
(Mixo-) oligohaline	∽ 5—∽ 0·5
Linnetic (fresh water)	<∽ 0·5

The Salt Lewayas of Hambantota are examples of hyperhaline waters. The constituents of hyperhaline waters are in the same proportion as those of sea water, although the total concentration of salts in the former is higher. The inland salt lakes which are found in other countries are, on the other hand, different owing to their higher carbonate content and different Ca: Mg ratios.

Physiological adaptation of species

Brackish-water organisms are primarily affected by the salinities prevailing in their environment and their concomitant osmotic and ionic properties. A logical result is that a given species occupies a range of salinity that it is physiologically adapted to tolerate. This is not merely the maintenance of body fluids at a certain osmotic pressure or composition. L. C. Beadle and others have shown that for proper functioning of nervous and muscular tissues a certain difference in the internal and external concentration of certain ions has to be maintained in those cells. The adaptation of brackish-water species to different salinities, therefore, involves the maintenance of normal functioning tissues in a fluctuating and/or unfavourable environment.

The fauna

The fauna of brackish waters could be considered under three categories.

(i) Allochthonous fauna from fresh waters sources.

(ii) Autochthonous fauna, which constitute species which are principally or only found in brackish waters.

(iii) Allochthonous fauna from the sea.

The following analysis was made from the provisional brackish water faunal list in Table II furnished at the end of this paper:—

TABLE I

	Total No.	*No. edible*
1. *Allochthonous fresh water species*		
Fishes	7	5
2. *Autochthonous fauna*		
Fishes	38	30
Prawns	1	1
Molluscs	5	2
Crabs	1	1
3. *Allochthonous fauna from the sea*		
Fishes	80	65
Prawns	6	6
Molluscs	3	2
	142	112

Out of about 112 edible species found in our brackish waters, 65 per cent. of them are migrants from the sea, 30 per cent. are autochthonous and only 5 per cent. are from fresh water sources. On the whole, 70 per cent. are allochthonous i.e., the bulk of the populations, especially of the larger forms, is maintained by continuous migration from the neighbouring sea and fresh waters.

Nutrients in water

The quick growth of the fauna in brackish waters and the recruitment of allochthonous species depends on the amount of food available. This is to a large extent determined by the fertility of the water. Rivers bring in organic and nitrogenous matter while sea water brings in its rich supply of potassium and calcium. Brackish water being a mixture of both is a relatively fertile medium for the production of fish food. The capacity of brackish water for yielding fish food, in turn, depends on the quantity of phytoplankton and filamentous algae that it can produce. The productivity of fish depends on the presence of fish and other aquatic animals which can convert the available plant food into fish protein.

Exploitation of the resources

Besides the several species of fish which are caught by methods ranging from the rod-and-line and cash-net to drag-nets, stationery fish kraals and nylon drift nets, the crustacea, molluscs and holothurians form a considerable portion of Ceylon's brackish water fishery resources. There are many species of commercially important prawns, the Negombo, Mullaitivu, Batticaloa, Jaffna, Balapitiya and Panadura lagoons being well-known for them. Methods of large scale prawn capture range from cast-nets to stationery bamboo kraals (seen in the Panadura, Balapitiya and Puttalam lagoons) and staked nets with wings and a cod end as seen in the Negombo lagoon. The latter are operated during low tide at nights. The green lagoon crab (*Scylla serrata*) is caught in baited traps, and the Puttalam, Negombo, Nilaveli and other lagoons are famous for it. The blue crab (*Portunus pelagicus*) also occurs in large quantities during certain seasons and are caught by various nets.

Beche-de-mer is harvested from the larger high-salinity lagoons and forms one of our export products. Among the molluscs, the Window Pane oyster (*Placuna placenta*) has been the source of much state revenue in past decades. Although this bivalve is commercially important for its shells which are used as window panes in countries such as the Philippines, Ceylon's interest has been from the point of view of the pearls which it produces. The following table shows the details of the last window pane oyster fishery which was held during 1953-55:—

Year	*Annual value of lease Rs.*	*Total No. of oysters gathered*	*Lesee's ⅔ share*	*No. opened*	*No. of tolas of pearls*
1953	35,561	2,167,350	1,442,100	1,041,000	175·4
1954	35,561	4,862,250	3,241,500	2,983,400	718·0
1955	35,561	5,139,000	3,436,000	1,692,000	720·0
1956	Beds rested				
1957	Beds totally destroyed by 1957 floods.				

A survey conducted by the author in 1959 showed that a fairly extensive oyster bed which remained after the 1955 fishery was totally destroyed by the major floods of 1957. A thick layer of brown silt covered the bed of oysters and no successful spatfall had taken place up to 1959.*

Rational exploitation and increase of production

Quite often brackish water fishermen complain about poor fish catches these days as compared with those of earlier times. One reason for this is that, with the general rise in population, there has been an increase in the number of fishermen in brackish waters. Together with these there has also been an improvement of some of the fishing methods. Consequently there has been a drop in the catch per unit of effort. This has to be expected in lagoons and

*A thorough survey conducted by the authour in May 1966 showed that no successful spatfall had yet taken place. Not even one live oyster could be collected by the several experienced divers who helped in the survey.

estuaries since, by virtue of their size and the nature of the fauna, they can sustain only a limited natural population. Many of them are at present being over-exploited while their connections with the sea are seasonally or completely closed, or while artificial barriers such as traps prevent the recruitment of fauna from the sea.

With regard to over-exploitation, E. S. Russel's (1931) algebraic expression shown below is worthy of consideration:

$$S_2 = S_1 + (A + G) - (C + M)$$

S_2 = wt. of fishable stock at the end of the year.

S_1 = wt. of fishable stock at the beginning of the year.

A = Addition of fishable individuals from younger recruits growing up during the year.

G = Increase in weight by growth of both S_1 and A after the latter has entered the fishery.

C = weight fished during the year.

M = weight of dead fish due to natural and other causes.

In totally unexploited or virgin grounds $S_2 = S_1 + (A + G) = M$. Since there is a limit to the amount of food that a limited body of water can produce S_2 should be equal to S_1 on virgin grounds. Hence (A + G) should be equal to M. When fishing is carried out up to a point, there is addition and growth of individuals to replace those caught. If this is overdone, the result would be over-fishing and damage to the fishery. " Rational fishing is fishing at the optimal intensity " (A. C. Hardy, 1959). This would mean that a rational fishery tends to maintain $S_2 = S_1$.

In the context of our brackish water fisheries, a sure way of increasing the production of the brackish waters is to increase A. This could be achieved by (i) removing sand bars which are always or seasonally formed at the mouths of lagoons and estuaries; (ii) deepening and widening the connections between such brackish water bodies and the sea; (iii) prohibiting the erection of traps, kraals and nets which prevent or hinder the entry of marine recruits; (iv) providing sanctuaries for autochthonous breeding populations and (v) introduction of suitable species of fish into waters which are cut off from the sea always or during a greater part of the year. In the latter case milkfish (*Chanos*) and Grey mullet (*Mugil*) fry and fingerlings which are abundantly available during their breeding seasons are suitable. Other non-carnivorous species which could be similarly stocked are *Etroplus suratensis* and *Tilapia mossambica*. The latter may have to be avoided where other important fisheries exist, owing to its prolific breeding habits and potentialities for crowding out, by sheer force of numbers, other important brackish water species.

Increase of fish production can also be achieved by avoiding the capture of fingerlings and other undersized stages of fish. Regulation of the mesh sizes of nets and traps used in brackish waters would be necessary.

Culture operations

Brackish water fish production can also be considerably increased by culturing suitable species. In terms of Russel's expression, fish culture involves techniques of rearing suitable species in ponds in such a way that the weight harvested at the end of the growing period or year (S_2) is equal to the weight of fish (S_1) stocked at the beginning of the growing period, plus the weight of other individuals (A) entering the ponds accidentally through the sluice screens, plus the weight added on by growth (G) of both S_1 and A, minus the weight of fish caught during the growing period (C) either intentionally by the farmer or due to poaching by others, and minus the weight of fish dying (M) due to natural causes or unfavourable food and water conditions prevailing in the ponds.

Since fish farming in ponds generally involves increase of weight of stocked fish in limited areas it is imperative that (i) it should be carried out in ponds constructed on fertile soils capable of yielding good fodder for the fish or in ponds whose fertility is improved by means of chemical and organic fertilisers. Suitable artificial food could also be introduced into the ponds but this would mean a higher cost of production; (ii) M should be reduced to a minimum by proper water management, maintaining good food conditions and by minimizing predation by carnivorous species of fishes and other animals; (iii) the value of C, by poaching or premature capture should also be minimized. It goes without saying that fish farming will not be a successful venture unless there is a good caretaker or honest watcher in charge of the farms; (iv) finally, the ponds should have optimum stocking values (S_1) in relation to the size of the ponds and the food available during the growing period.

Resources for fish farming

Ceylon is fortunate in that milkfish breeds in the Gulf of Mannar. There are two fry seasons, April to June and October to December. However only four months are suitable for large scale fry collection—April, May, June and November. It has been found, after a four year survey in the Mannar area, that the average catch per man hour per hectare of tide-pools is 500 and that a hectare could yield about 4,000 fry per day. The fry potential of the Mannar area has been estimated 400,000,000 per annum. Besides milkfish, grey mullet (*Mugil*) fry and fingerlings are available in even greater abundance and throughout a greater part of the year. Grey mullet could be farmed either pure or together with milkfish in ponds.

From the point of view of farming fish, suitable land for ponds would also come under the scope of resources. As stated earlier there are 100,000 acres of shallow lagoons, tidal flats, mangrove swamps and saline marshes in Ceylon. The Ceylon Fisheries Corporation plans to develop 25,000 acres of fish farms during a ten year period. Suitable shallows lagoon areas and mangrove swamps are available at Kalpitiya (9,000 acres), Mannar (2,000 acres), Elephant Pass and Jaffna (10,000 acres), Mullaitivu (5,000 acres), Batticaloa (1,000 acres) and other places. The fry requirements for 25,000 acres (at 8,000 fry per acre, taking into consideration mortalities) has been estimated at 200,000,000 per annum. A fry farm in Mannar is part of the Corporation's plans. Prawn farming is also envisaged with an experimental and prawn fry survey period of three years.

Experiments on milkfish culture

The results of experiments carried out at the Experimental and Demonstration Fish Farm at Pitipana indicate that milkfish and grey mullet farming can be carried out successfully in Ceylon. Experimental harvests have yielded 1,720 lbs. per acre per harvest. However, 1,200 lbs. per acre per annum is taken as a conservative target for the private fish farmer to strive at. According to Hickling (1962) a hectare of fish ponds in Taiwan will produce an average of 800 to 1,200 kg (i.e., approximately 800—1,200 lbs. per acre) per annum. The production in Formosan ponds goes up to 2,000 kg per hectare (1,840 lbs. acre) per annum (Hora and Pillay, 1962).

With regard to the 25,000 acres of fish farms envisaged by the Corporation a statement by Hickling (1962) deserves mention. " It is true that the huge Indonesian pond systems were built mainly in days when labour was far less costly than today. But today we have mechanical earth moving equipment able to do the work of armies of hand labourers. To my mind this is one of the great potentials for fish production in the world today. So I have read with particular pleasure that it is now proposed to construct 1,000 acres of brackish water ponds in British Guiana for the culture of prawns ".

Other culturable resources

Among the other culturable species in Ceylon's brackish waters are non-carnivorous fishes such as *Etroplus suratensis* and *Siganus vermiculatus*, molluscs such as the edible oyster (*Ostrea* species, the Bentota oyster) and the green lipped bivalve (*Mytilus* spp.), prawns such as *Penaeus monodon* (Karuvandu issa) and *Penaeus indicus* (kiri issa) and others. Much experimentation and research into the biology and life history of these and other species have to be carried out in order to exploit them for farming.

Finally, it could be stated that if the natural production of Ceylon's brackish waters can be stepped up to 80 lbs. per acre per annum (the figure quoted for other countries by Schuster, 1951) by the methods outlined above the total production from natural brackish waters would be 10,000 tons per annum. This, together with a potential of 15,000 tons from the 25,000 acres of fish ponds envisaged by the Corporation, would result in stepping up the annual production from the present 3,350 tons to 25,000 tons.

TABLE II

Provisional List of Species Found in Brackish-Waters of Ceylon

A.—ALLOCTHONOUS FISHES FROM FRESH WATER SOURCES

	Family	Scientific Name	Common Name	Sinhalese	Tamil
1.	Anguillidae	Anguilla bicolor Mc Clelland 1845	Fresh water eel	Kalu arndha	Vilarngu
2.	Do.	Anguilla nebulosa Mc Clelland 1845	Fresh water eel	Pulli arndha	Pulli vilarngu
3.	Muraenidae	Gymnothorax polyoranodon (Bleeker) 1853	Fresh water moray		
4.	Cyprinodontidae	Panchax panchax blochii (Arnold)	Lesser top minnow	Udda	
5.	Symbranchidae	Symbranchus bengalensis (Mc Clelland) 1845	Pygmy eel	Potta arndha	
6.	Cichlidae	Tilapia mossambica (Peters) 1852	Tilapia	Japan korali	
7.	Do.	Etroplus maculatus (Bloch) 1785	Spotted etroplus	Ran koraliya	

B.—AUTOCHTHONOUS BRACKISH-WATER SPECIES

(Species so far reported only or mainly from brackish-waters of Ceylon)

(*a*) FISHES

	Family	Scientific Name	Common Name	Sinhalese	Tamil
1.	Dussumieridae	Ehirava fluviatilis Deraniyagala 1929	Estuarine sprat	Ehirava	
2.	Megalopidae	Megalops cyprinoides (Broussonet) 1782	Tarpon	Ileya, Mareva	Marua
3.	Elopidae	Elops machnata (Forskal) 1775	Giant herring	Mannava, Ranava	Manna
4.	Dorosomidae	Nematalosa nasus (Bloch) 1795	Long ray bony dream	Suthara koiya, Katugoiya	Koi meen
5.	Tachysuridae	Tachysurus venosus (Valenciennes) 1840	Veined Cat-fish		
6.	Do.	Tachysurus maculatus (Thunberg) 1792	Spotted cat fish	Gal angkutta	Kalla keluru
7.	Do.	Tachysurus caelatus (Valenciennes) 1840	Engraved cat fish	Anguluwa	Keluru
8.	Do.	Tachysurus subrostrtus (Valenciennes) 1840	Short nosed catfish	Uru anguluwa	Keluru
9.	Do.	Osteogeneiosus militaris (Linnaeus) 1758	Soldier cat fish	Gal anguluwa	Keluru
10.	Do.	Osteogeneiosus stenocephalus Day 1875			
11.	Do.	Hexanematichthys sona (Hamilton–Buchanan) 1882			
12.	Do.	Pseudarius jatius (Hamilton–Buchanan) 1882			
13.	Do.	Pseudarius jella (Day) 1858	Small eye cat fish		
14.	Do.	Aroides dussumieri (Valenciennes) 1840	Dussumier's cat fish		
15.	Do.	Nethuma thalassinus Rüppel 1835	Giant cat fish	Thora anguluwa	Ven keluru
16.	Bagridae	Macrones gulio (Hamilton–Buchanan) 1822	Long whiskered cat fish	Mada anguluwa	
17.	Muraenidae	Pseudechidna brummeri (Bleeker) 1858			
18.	Ophicthydae	Calleschelys longipinnis (Kner and Steidachner) 1867			
19.	Do.	Pisoodonophis cancrivorous (Richardson)	Burrowing Snake eel	Galhiriya	
20.	Do.	Ophicthys rhyctidermatoides (Bleeker) 1852	Wrinkled skin snake eel	Panu malu	

	Family	Scientific Name	Common Name	Sinhalese	Tamil
21.	Hemiramphidae	Zenarchopterus dispar (Valenciennes) 1846			
22.	Syngnathidae	Michrophis brachyurus (Bleeker) 1853	Short tailed pipe fish		
23.	Do.	Dorichthys cuncullus (Hamilton–Buchanan) 1882	Pipefish		
24.	Do.	Syngnathus specifer djarong (Bleeker) 1853		Ala theliya	
25.	Ambassidae	Ambassis commersoni Cuvier 1828		Katilla	
26.	Do.	Ambassis urotaenia (Bleeker) 1852		Katilla	
27.	Do.	Ambassis gymnocephalus (Lacepede) 1802		Gon katilla	
28.	Gerridae	Gerremorpha Setifer (Hamilton–Buchanan) 1822		Oleya, Katu oleya	Uddan
29.	Cyprinodontidae	Panchax melastigma Mc Clelland 1839		Handaya	
30.	Toxotidae	Toxotes chatareus (Hamilton–Buchanan)	Archer fish	Dhimittha	
31.	Cichlidae	Etroplus suratensis (Bloch) 1785		Koraliya	
32.	Eleotridae	Eleotris fusca (Schneides) 1801	Brown gudgeon	Bin tholla	
33.	Do.	Butis butis (Hamilton–Buchanan) 1822	Flat headed gudgeon	Vaneya	
34.	Do.	Ophiocara porocephala (Valenciennes)			
35.	Gobiidae	Glossogobius giurus (Hamilton–Buchanan) 1882		Waligowa	Uluvai
36.	Do.	Mugilogobius valigouva (Deraniyagala) 1936			
37.	Do.	Acentrogobius griseus (Day)			
38.	Periophthalmidae	Periophthalmus koelreuteri (Pallas) 1770		Dhiyahuna	
		(b) PRAWNS			
39.	Palaemonidae	Macrobrachium rosenbergi (De Man)	Blue estuarine prawn	Anduissa	
		(c) CRABS			
40.	Portunidae	Scylla serrata (Forskal) (found in high salinity lagoon and estuaries and coastal areas)	Green lagoon crabs	Kalapu kakuluwa	
		(d) MOLLUSCS			
41.		Ostrea sp.	Edible oyster	Kavatti	
42.	Thiaridae	Faunus sp.			
43.	Corbiculidae	Polymesoda sp.			
44.	Do.	Cerithidea sp.		Oori	Oori
45.	Do.	Placuna placenta (Linnacus)	Window-pane oyster	Muthu bella	Muththu sippi

C.—ALLOCHTHONOUS FAUNA FROM THE SEA

	Family	*Scientific Name*	*Common Name*	*Sinhalese*	*Tamil*
			(a) FISHES		
1.	Clupeidae	Kowala Coval (Cuvier) 1829	White Sardine	Sudu Sudaya	Vellai soodai
2.	Do.	Harengula Ovalis (Bennet) 1830	Spotted Herring	Koramburuwa	
3.	Do.	Macrura kelee (Cuvier) 1829		Koiya	Koi Meen
4.	Albulidae	Albula vulpes (Linnaeus) 1758		Vauva, Miya	
5.	Engraulidae	Thrissira baelama (Forskal) 1775		Bilee lagga	Netholi
6.	Chanidae	Chanos chanos (Forskal) 1775	Milk fish	Vaikka	Palaimeen

	Family	Scientific Name	Common Name	Sinhalese	Tamil
7.	Plotosidae	Plotosus canius Hamilton—Buchanan 1882		Kana magura	Kethudal
8.	Ophicthyidae	Caecula orientalis (Mc Clelland) 1845		Oteliya	
9.	Muraenidae	Thyrsoidea macrura (Bleeker) 1854	Giant moray		
10.	Muraenesocidae	Muraenesox cinereus (Forskal) 1775		Mudu teliya	
11.	Belonidae	Tylosurus strongulus (Van Hasselt) 1823		Dhiya Moralla	Pambu murel
12.	Hemiramphidae	Hemiramphus marginatus (Forskal) 1775		Thani hota muralla	
13.	Do.	Hyporamphus gaimardi (Valenciennes)			
14.	Syngnathidae	Ichthyocampus carce (Hamilton–Buchanan) 1882			
15.	Sphyrinidae	Sphyraena jello Cuvier 1829		Seelava	Jeela
16.	Do.	Sphyraena obtusata Cuvier 1829	Barracuda	Ulava	
17.	Mugilidae	Mugil cephalus (Linnaeus) 1758	Grey Mullet	Thel godaya	Manalai
18.	Do.	Liza strongylocephalus (Richardson) 1846			
19.	Do.	Liza macrolepis (Smith)		Valigodaya	
20.	Do.	Liza tade (Forskal) 1775			
21.	Do.	Liza dussumieri (Valenciennes) 183[illegible]			
22.	Do.	Liza parsia (Hamilton–Buchanan) 882			
23.	Do.	Liza oligolepis (Bleeker) 1859		Godeya	Manolai
24.	Do.	Liza caseasia (Hamilton–Buchanan) 1882			
25.	Do.	Liza waigiensis (Quoy and Gaimard) 1824		Koragodaya	Thiruvan manalai
26.	Do.	Valamugil buchanani (Bleeker) 1853			
27.	Polynemidae	Polynemus heptadactylus Cuvier 1829			
28.	Do.	Polynemus indicus Shaw 1804			
29.	Do.	Polynemus plebius (Broussonet) 1782	Common tassel fish	Bandikalawa	Barmeen
30.	Do.	Eleutheronema tetradactylum (Shaw) 1804		Kalawa	Kalameen
31.	Atherinidae	Allanetta forskali (Ruppell) 1835		Korala babba,	Therakkan
32.	Do.	Pranesus duodecimalis (Valenciennes)			
33.	Latidae	Lates calcarifer (Bloch) 1790	Giant Perch	Modha	Koduwa
34.	Do.	Psammoperca waigiensis (Cuvier) 1828			
35.	Theraponidae	Antisthes putia (Cuvier) 1829		Gonkili, Vairankili	Kove kitchar
36.	Do.	Therapon jarbua (Forskal) 1775		Gonga, Katu gonga, kili	Palin kitchar
37.	Do.	Pelates quadrilineatus (Bloch) 1790			
38.	Do.	Eutherapon theraps (Cuvier) 1829			
39.	Serranidae	Epinephalus merra Bloch 1793		Pulli kossa	Pulli kaleva
40.	Do.	Epinephalus fascial (Forskal) 1785			
41.	Do.	Epinephalus fario (Thumberg) 1793		Pulli kossa	Pulli kaleva
42.	Do.	Epinephalus tauvina (Forskal) 1775		Gal kossa	
43.	Sillaginidae	Sillago maculata Quoy and Gainard 1824			
44.	Kuhlidae	Kuhlia taeniurus (Cuvier) 1829		This nagula	

45.	Carangidae	Decapturus russeli (Riippel) 1828		Am paraliya, Koralawa	
46.	Do.	Allectisciliaris Ploch 1778		Kannadi parawa	perum parai
47.	Do.	Megalaspis cordyla (Linnaeus) 1758		Pothu giralawa, giralawa	Vangadi
48.	Do.	Gnathodon speciosus (Forskal) 1775		Kabara parava	
49.	Do.	Caranx sansum (Forskal) 1775		Atanagul parava	Parei
50.	Do.	Chorinemus tala Cuvier 1851		Hankattawa, Pothi kattawa	Thol parei
51.	Do.	Chorinemus lysan (Forskal) 1775		Nil kattawa	Katta
52.	Do.	Trachinotus blochi (Lacèpede)		Kukulu maha	Kutili
53.	Do.	Trachinotus russelli (Cuvier) 1831		Kade mariya, Koliyava	Mukali
54.	Do.	Carangoides malabaricus Bloch 1801		Labu parawa	
55.	Do.	Carangoides gymnostethoides Bleeker 1851		Vattiya	Komalien parei
56.	Lobotidae	Lobotes surinamensis (Bloch) 1790			
57.	Menidae	Mene maculata (Bloch) 1801	Moon fish	Panna, Handhepanna	
58.	Lutianidae	Lutianus argentimaculatus (Forskal) 1775		Thambalaya, Dhala	Adallu
59.	Gerridae	Pertica filamentosa (Cuvier) 1829			
60.	Sciaenidae	Jhonius diacanthus (Lacepede) 1820		Gobeya	Kopeyan
61.	Leiognathidae	Leiognathus equulus (Forskal) 1775		Maskaralla	
62.	Do.	Leiognathus fasciatus (Lacepede) 1803			
63.	Scatophagidae	Scatophagus argus (Linnaeus) 1766	Scat	Illathiya	Ilethi
64.	Siganidae	Siganus vermiculatus Cuvier and Valenciennes 1835		Orava	
65.	Do.	Siganus javus (Linnaeus) 1766		Nava	
66.	Trichuridae	Trichurus haumela (Forskal) 1775			
67.	Do.	Trichurus savala (Cuvier) 1829		Savalaya	Savalai
68.	Eleotridae	Eleotriodes muralis (Valenciennes) 1837			
69.	Do.	Eleotriodes sexgultatus (Valenciennes) 1837			
70.	Gobiidae	Stigmatogobius sadanandio (Hamilton-Buchanan) 1882			
71.	Do.	Callogobius haseltii (Bleeker) 1919			
72.	Cynoglossidae	Cynoglossus lingua (Hamilton–Buchanan) 1882	Tongue sole		
73.	Do.	Cynoglossus macrolepidotus (Bleeker) 1850		Handhalla	Athal
74.	Bothidae	Pseudorhombus arsius (Hamilton–Buchanan)			
75.	Soleidae	Brachirus orientalis (Bloch) 1801		Kalapu patha madiya	
76.	Triacanthidae	Triacanthus brevirostris Schlegel		Angkatilla, thunkatta	Mulluklathi
77.	Do.	Triacanthus biaculeatus (Bloch) 1786			
78.	Tetradontidae	Chelodon patoca (Hamilton–Buchanan)	Blow fish	Petheya	Pethey
79.	Do.	Chelodon fluviatilis (Hamilton-Buchanan) 1882	Blow fish	Petheya	Pethey
80.	Do.	Monotretus cutcutia (Hamilton-Buchanan) 1882			

	Family	Scientific Name	Common Name	Sinhalese	Tamil
			(b) PRAWNS		
81.	Penaeidae	Penaeus canaliculatus Olivier			
82.	Do.	Penaeus monodon Fabricious (1798)	Tiger prawn	Karuvandu issa	Karuvandu raal
83.	Do.	Penaeus semisulcatus de Haan 1850		Kuruttu issa	Kuruttu raal
84.	Do.	Penaeus indicus Milne-Edwards 1837		Elissa, Kiri issa	
85.	Do.	Metapenaeus dobsoni (Miers) 1878		Malissa	
86.	Do.	Metapenaeus monoceros (Fabricius)		Rathissa, Rathandu issa	
			(c) CRABS		
87.	Portunidae	Portunus pelagious (Linne)	Blue sea crab		
			(d) MOLLUSCS		
88.	Ostreidae	Ostrea sp.	Edible oysters		
89.	Mytilidae	Mytilus sp.			
90.	Do.	Pinna sp.	Fan shell		

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