

Significance of mangrove conservation in fishery production and living conditions of coastal communities in Sri Lanka.

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Supporting information

Table S1: Summary of floral and faunal diversity indices of three sites

	Pambala		Marawala		Chilaw	
	Flora	Fauna	Flora	Fauna	Flora	Fauna
Shannon index (H')	-2.679	-3.028	-2.372	-2.913	-2.139	-2.564
Evenness	-0.966	-0.899	-0.899	-0.942	-0.892	-0.887

Table S2: Fauna observed in the three study sites

Family name	Species name	Common name	Percentage individuals per site %		
			Pambala	Marawala	Chilaw
Ardeidae	<i>Egretta garzetta</i>	Little Egret	4.30	10.96	8.65
Ardeidae	<i>Ardeola grayii</i>	Indian Pond Heron	2.15	4.11	3.78
Phalacrocoracidae	<i>Phalacrocorax niger</i>	Little Cormorant	1.08	1.83	0.00
Alcedinidae	<i>Alcedo atthis</i>	Common Kingfisher	1.43	3.65	1.08
Corvidae	<i>Corvus splendens</i>	House crow	3.23	7.31	20.54
Charadriidae	<i>Vanellus indicus</i>	Red – wattled Lapwing	1.08	2.28	2.16
Oriolidae	<i>Oriolus Xanthornus ceylonensis</i>	Black-hooded Oriole	0.72	2.28	2.16
Sciuridae	<i>Funambulus palmarum</i>	Palm squirrel	3.94	5.48	2.16
Libellulidae	<i>Rhyothemis singulate singulate</i>	Variegated Flutterer	3.58	0.00	0.00

Libellulidae	<i>Brachythemis singulata</i>	Asian Groundling	2.15	0.00	0.00
Formicidae	<i>Oecophylla smaragdina</i>	Weaver Ant	11.11	0.00	0.00
	<i>Odontomachus simillimus</i>		6.09	6.39	0.00
Scutelleridae	<i>Scutiphora sp.</i>	Metallic Shield Bug	3.94	5.02	0.00
Tetragnathidae	<i>Tetragnatha sp.</i>		0.72	0.00	0.00
Vespidae	<i>Phimenes flavopictus</i>	Potter Wasp	1.08	0.00	0.00
Portunidae	<i>Scylla 2ingula</i>	Mud crab	11.83	8.68	5.41
Grapsidae	<i>Chiromantes sp</i>		3.94	5.48	4.86
	<i>Neosarmatium sp.</i>		3.94	2.74	3.78
Gobiidae	<i>Periophthalmus sp</i>		0.36	0.00	0.00
Littorinidae	<i>Littorina scabra</i>		4.66	5.48	4.86
Ellobiidae	<i>Cassidula musterina</i>		4.30	3.20	8.11
Potamididae	<i>Cerithidea ingulate</i>		6.09	4.11	7.57
Ostreidae	<i>Saccostrea sp</i>	Rock oysters	7.17	5.94	14.05
Varanidae	<i>Varanus salvator</i>	Water Monitor	0.36	0.46	0.00
Colubridae	<i>Ptyas mucosa</i>	Rat Snake	0.36	0.00	0.54
Testudinidae	<i>Geochelone elegans</i>	Indian Star Tortoise	0.36	0.46	0.00
Cuculidae	<i>Eudynamys scolopaceus</i>	Asian koel	1.43	1.83	2.16
Accipitridae	<i>Haliastur indus</i>	Brahminy kite	2.51	4.11	1.62
Portunidae	<i>Scylla serrata</i>	Mangrove Crab	6.09	8.22	6.49

Table S3: Occupation diversity in the three study sites

Occupation	Pambala	Marawala	Chilaw	total	%
Business-normal	0	1	1	2	0.8
Business-Fishing related	2	1	2	5	2.1
Campus student	1	0	0	1	0.4
Carpenter	1	2	1	4	1.7
Driver	1	1	0	2	0.8
Field officer	1	0	0	1	0.4
Fish selling	0	3	6	9	3.8
Fishing	19	27	24	70	29.2
Foreign job	1	0	0	1	0.4
Garment	1	0	0	1	0.4
Housewife-fishing household	25	21	22	68	28.3
Ice factory	1	0	0	1	0.4
Livestock	1	2	0	3	1.3
Mill	1	0	0	1	0.4
No job	7	7	9	23	9.6
Petrol shed	1	0	0	1	0.4
Sales assistant	1	2	2	5	2.1
Shop- normal	1	2	1	4	1.7
Shop-fish selling	2	3	4	9	3.8
Shrimp farming	2	3	12	17	7.1
Small fishery labourer	1	0	0	1	0.4
Tailor	1	0	0	1	0.4
Teaching	1	3	0	4	1.7
Three wheel hiring	2	1	3	6	2.5

Table S4: Mangrove species in Sri Lanka

True mangrove species		Mangrove Associates	
Family	Species Name	Family	Species Name
Acanthaceae	<i>Acanthus ilicifolius</i>	Aizoaceae	<i>Sesuvium portulacastrum</i>
	<i>Avicennia officinalis</i>	Amaranthaceae	<i>Suaeda maritima</i>
	<i>Avicennia marina</i>		<i>Suaeda nudiflora</i>
Amaranthaceae	<i>Salicornia brachiata</i>	Apocynaceae	<i>Cerbera odollam</i>
Arecaceae	<i>Nypa fruticans</i>		<i>Cerbera manghas</i>
Combretaceae	<i>Lumnitzera littorea</i>	Arecaceae	<i>Phoenix zeylanica</i>
	<i>Lumnitzera racemosa</i>	Asteraceae	<i>Sphaeranthus indicus</i>
Euphorbiaceae	<i>Excoecaria agallocha</i>	Bignoniaceae	<i>Dolichandrone spathacea</i>
	<i>Excoecaria indica</i>	Convolvulaceae	<i>Ipomoea pes-caprae</i>
Fabaceae	<i>Cynometra iripa</i>	Fabaceae	<i>Acacia farnesiana</i>
		Goodeniaceae	<i>Scaevola taccada</i>

	<i>Derris trifoliata</i>	Lamiaceae	<i>Clerodendrum inerme</i>
Lythraceae	<i>Sonneratia alba</i>	Lythraceae	<i>Pemphis acidula</i>
	<i>Sonneratia apetala</i>	Malvaceae	<i>Heritiera littoralis</i>
	<i>Sonneratia caseolaris</i>		<i>Hibiscus tiliaceus</i>
Meliaceae	<i>Xylocarpus granatum</i>		<i>Thespesia populnea</i>
	<i>Xylocarpus rumphii</i>	Pteridaceae	<i>Acrostichum aureum</i>
Primulaceae	<i>Aegiceras corniculatum</i>	Tamaricaceae	<i>Tamarix indica</i>
Rhizophoraceae	<i>Bruguiera cylindrica</i>		
	<i>Bruguiera gymnorrhiza</i>		
	<i>Bruguiera sexangula</i>		
	<i>Ceriops tagal</i>		
	<i>Ceriops decandra</i>		
	<i>Rhizophora apiculata</i>		
	<i>Rhizophora mucronata</i>		
Rubiaceae	<i>Scyphiphora hydrophyllacea</i>		

(IUCN, 2007)

S4 Faunal survey methodology

Birds, mammals, reptiles, amphibians, mollusks, crustaceans and insects

1. Birds

For our bird survey, 50 m transects were laid from the lagoon toward the land, the survey was conducted in the morning and evening once a month for a period of 12 months. In the morning (7 am – 10 am) and in the evening (3 pm – 5 pm) each transect was surveyed at 30 min intervals. Only bird sightings were counted. Birds were identified using a field guide (‘A Field Guide to the Birds of Sri Lanka’ By John Harrison) and also with the help of an experienced FOGSL (Field Ornithological Group of Sri Lanka) member who participated in the survey.

2. Mammals

The same transects used for the floral survey were used for mammals. The mammal survey was conducted during day time and each siting was recorded and identified using the field guides (‘A Photographic Guide to Mammals of Sri Lanka’ by Gehan de Silva Wijeyeratne)

3. Crabs

Crabs were surveyed using random transect sampling. Transects were surveyed during 6 pm – 8 pm once a month for 12 months. We used ‘Strip-count surveys’ which are one of the simplest

methods of obtaining meristic data to estimate the size and density of animal populations. The method involves an observer walking along a predetermined line (transect) and counting all individuals observed within a predetermined distance either side of the centre line. No baits are used. In the field, a local guide helped to identify the individuals by local names and all these individuals were photographed and sent to a crab identification expert for further identification.

4. Reptiles

Reptiles were observed by randomized walks along the same transects used for mangrove flora survey. The random surveys using Visual encounter survey method was employed. Individuals were identified using the field guide 'A Photographic Guide to Snakes & Other Reptiles of Sri Lanka by Ansem De' by Silva, Indraneil Das. No animals were collected during the survey.

5. Insects

An insect survey was carried out in the same transects used for floral survey, insects were collected with aerial nets (in flight) and sweeping nets (mangrove vegetation). Beating of shrubs was conducted using long sticks and a cloth on the ground to collect the falling insects. Sweeping or beating was performed five to six times per hour. Insects were identified in the field using guides (1. 'Dragonflies of Sri Lanka' by Matjaž Bedjaniè, Karen Conniff, Gehan de Silva Wijeyeratne 2. 'Butterflies of Sri Lanka and South India' by Gehan de Silva Wijeyeratne). They were photographed and released.

6. Amphibians

For an amphibian survey we used the same transects and recorded and photographed all the sightings during the transect walk, we identified amphibians in the field using the field guide ('Amphibians of Sri Lanka: A Photographic Guide to Common Frogs, Toads and Caecilians' by Ansem De Silva)

7. Mollusks

Generally, there is no standard methodology for this type of search, so we used wading, observing from shore and fishing boats. Preliminary visits to visually locate populations of mollusks were the first step we used in understanding distribution and occurrence. The most basic type of survey

we used was a cursory visit, or incidental observation. This can be as simple as picking up a shell on the shore or observing it in the water and recording the location and date.

As edible species of oysters, mussels, cockles, and gastropods are collected extensively for local consumption we identified them with the help of local fishermen and used photographs for further confirmation of identified samples.