Mangroves of Sri Lanka

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1 author:

Kithsiri Ranawana
University of Peradeniya

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Mangroves of Sri Lanka

K.B. Ranawana

Department of Zoology, University of Peradeniya, Peradeniya, Sri Lanka

INTRODUCTION

Mangroves are salt tolerant woody plant communities of trees and shrubs found along sheltered lagoons, bays and estuaries in the tropics. These unique intertidal plant communities of different families show remarkable adaptations to survive in saline and water-logged soils. Since mangroves are usually found in soft intertidal sediments their distribution is governed by the tidal amplitude. While occupying a margin between land and sea, mangrove swamps attract faunal components from adjoining terrestrial and aquatic ecosystems in addition to the species that have taken advantage of living in mangrove swamps permanently. Land mammals, reptiles, and birds use the landward periphery of a mangrove swamp for food and shelter sites, while crabs, prawns, and fish migrate into the mangrove swamp for the same purpose. Macnae, (1969) and Macintosh (1982) showed that there is usually a considerable tidal out—flow of mangrove plant litter into coastal waters and a smaller, but comparable inflow of freshwater borne materials from landward sources. Therefore, the mangrove ecosystem is an open one, interacting with adjoining ecosystems and extending its influence far beyond the intertidal zone. The term mangrove has been used to refer to the plant community as well as its component species.

MANGROVES IN SRI LANKA

The width of a mangrove forest depends on the tidal amplitude (Macnae, 1969) and in Sri Lanka where tidal amplitude is very low (75 cm), mangroves are usually limited to rather narrow belts. The major mangroves in Sri Lanka are located around Jaffna, Wadamarchchi, Thondaimanar lagoons (northern coast) Kokkilai, Navaru, lagoons, Trinkomalee, Kathiraveli, Valaichcenai, Batticaloa, Pothuvil (astern coast) Weligama, Gintota (southern coast) Balapitiya, Bentota, Nogambo and Chillaw lagoons, Puttalam lagoon, and Mannar (western and northwestern coasts). Amarasinghe (1989) and Pinto (1986) described mangroves in Sri Lanka as being discontinuously distributed along the coast around lagoons, bays and estuaries covering an area between 8,000—7,000 ha. However, a recent estimate by Edirisinghe et al., (2010) showed that the extent of mangroves in Sri Lanka is about 15,670 ha, and their distribution in the coastal districts of the island is shown in Figure 1.

MANGROVE SPECIES COMPOSITION

Although records on the true mangrove species from Sri Lanka are inconsistent, occurrence of 21 species of mangroves (Jayathissa, 2012) is widely accepted now (Table 1). The most common and widely distributed true mangroves species are Avicennia marina (Family: Avicenniaceae), Rhizophora mucronata, Rhizophora apiculata, Bruguiera gymnorrhiza, B. sexangula (Family: Rhizophoraceae), Excoecaria agallocha (Family: Euphorbiaceae), Sonneratia caseolaris, (Family: Sonneratiaceae) Aegiceras corniculatum, (Family: Myrsinaceae) and Lumnitzera racemosa (Family: Combretaceae) Occurrence of Nipa fruticans (Family: Palmaceae) is limited to a few river mouths in the Southern and Western provinces while Xylocarpus granatum (Family: Meliaceae) also shows restricted distribution in these two provinces. Lumnitzera litoria (Family: Combretaceae) is restricted to a few locations in Madu Gaga estuary.

*Corresponding Author’s Email: kithsiri.r@gmail.com*
Figure 1: Distribution and extents of mangroves in the coastal districts of Sri Lanka.
(Source: Edirisinghe et al., 2010)
<table>
<thead>
<tr>
<th>Family</th>
<th>Species</th>
<th>Family</th>
<th>Species</th>
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<tr>
<td>Rhizophoraceae</td>
<td><em>Rhizophora mucronata</em></td>
<td>Sterculaceae</td>
<td><em>Heritiera littoralis</em></td>
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<td></td>
<td><em>Rhizophora apiculata</em></td>
<td>Palmae</td>
<td><em>Nipa fruticans</em></td>
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<td><em>Bruguiera gymnorrhiza,</em></td>
<td>Meliaceae</td>
<td><em>Xylocarpus granatum</em></td>
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<td></td>
<td><em>Bruguiera cylindrica</em></td>
<td>Lythraceae</td>
<td><em>Pemphis acidula</em></td>
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<td><em>Bruguiera sexangula</em></td>
<td>Euphorbiaceae</td>
<td><em>Excoecaria agallocha</em></td>
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<td></td>
<td><em>Ceriops tagal</em></td>
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<td><em>Excoecaria indica</em> (= <em>Sapium indicum</em>)</td>
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<td></td>
<td><em>Ceriops decandra</em></td>
<td>Avicinnaceae</td>
<td><em>Avicennia marina</em></td>
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<tr>
<td>Sonneratiaceae</td>
<td><em>Sonneratia caseolaris</em></td>
<td>Rubiaceae</td>
<td><em>Avicennia officinalis</em></td>
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<td></td>
<td><em>Sonneratia alba</em></td>
<td></td>
<td><em>Scyphiphora hydrophyllacea</em></td>
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<tr>
<td>Myrsinaceae</td>
<td><em>Aegiceras corniculatum</em></td>
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<tr>
<td>Combretaceae</td>
<td><em>Lumnitzera racemosa</em></td>
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<td></td>
<td><em>Lumnitzera littoria</em></td>
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(Source: Jayathissa, 2012)

**IMPORTANCE OF MANGROVES**

Mangroves are of benefit to man both directly and indirectly. Some mangrove tree species (especially *Rhizophora*, *Bruguiera*, and *Sonneratia*) provide wood suitable for construction of houses and canoes (Amrasinge, 1988). But today the main use of mangrove wood is for piles and temporary house constructions. Bark of some mangrove trees, especially *R. apiculata*, and *C. tagal* contain high percentage of tannin (20.7% and 17.3%) respectively and extracts of this tannin can be used for tanning leather (Balasooriya et al., 1982). It has also been used to dye cotton fish nets and sails of the boats and ships. But with the introduction of nylon fishing nets and mechanized boats, the use of mangrove tannin extracts has decreased in importance. The mangrove palm *N. fruticans* provides alcohol, sugar and vinegar in Malaysia (Maclae, 1968), but is not widely used in Sri Lanka. *Nypa* leaves are used as thatching material for the houses in the vicinity of the mangrove areas. Leaves of some mangrove species, especially *Avicennia* spp. are preferred as fodder by goats and cattle. In addition to this, mangrove leaves are used to a limited extent as green manure. Fisherman in some parts of Sri Lanka, particularly those living around the Negombo Lagoon use branches of some mangrove trees (especially *Lumnitzera* and *Rhizophora* sp.) for the brush pile fisheries (locally known as masathu). Fruits of *Sonneratia caseolaris* is used to make a soft drink, and tender leaves of *Acrostichum aurerum* are eaten as a curry (Amrasinghe, 1988).

Mangrove communities contribute significantly to the food chain in coastal areas of the tropics. Numerous species of tropical finfish and shellfish depend upon the mangrove derived material for food. Many of these are commercially important. The clams and crabs occurring in mangrove swamps are also an important source of protein for a large section of low-income people in many tropical countries (Linden and Jernelov, 1980).

Most of the penaeid shrimp species depend upon mangroves for shelter and food during the larval and juvenile stages of their development. These shrimp species are highly valued for its taste (as a gourmet dish) and subjected to intensive fishery all over the tropics. These shrimps spawn in near shore waters, and the newly hatched larvae are transported to the mangrove swamps along the coasts where they remain until they reach the juvenile stage and subsequently migrate offshore (Linden and Jernelov, 1980).

The mangrove ecosystem forms nursery grounds not only for marine species of fish and shellfish but also for some freshwater species. One example is the genus *Macrobranchiam*. Here, the mature females migrate from freshwater rivers and lakes to the mangrove swamps along the coasts where they remain until the eggs hatch into free swimming larvae. After completion of
the pelagic larval stage, the larvae metamorphose to benthic larval forms and crawl back upstream to freshwater habitats (Linden and Jernelov, 1980).

Mangroves also play an important role in shoreline protection as their well-developed root system prevent erosion of coastal and estuarine areas. Decaying organic residues and other particles carried by tides as well as run off and drainage sediments are trapped by the closely set root systems of genera such as Rhizophora, Avicennia, and Sonneratia. This often leads to an accretion of existing land areas but they are partly balanced by erosion taking place from other areas resulting in dynamic and changing coastal geomorphology (Macnae, 1969).

THREAT TO MANGROVES

Mangroves in Sri Lanka are seriously threatened due to development activities such as hotel building and expansion of human settlements along the coastal line. Further, urbanization, water pollution, erosion and prawn farming are major causes (Kumarasinghe, 1999). Mangroves are perhaps the most misused coastal ecosystems in Sri Lanka (De Silva and Balasubramanium, 1984). Protection of mangroves should include prevention of i) outright destruction from filling, ii) drainage and flooding, iii) any alteration of hydrological circulation patterns, iv) introduction of fine grained materials which might clog the aerial roots such as clay, and v) oil spills.

Where mangroves have been destroyed, they can be restored through careful planning and replanting procedures. Mangroves of Sri Lanka are disappearing fast and immediate action should be taken to stop the destruction of this valuable ecosystem.

REFERENCES


