SRI LANKA'S MANGROVES

What are Mangroves?

Mangroves are woody, seed bearing, highly specialised plants ranging in size from shurbs to tall trees. They occur along sheltered intertidal coastlines in association with estuaries and lagoons.

Mangroves are characterised by their ability to grow on land periodically flooded by seawater, and in anaerobic and acidic soils. Although mangroves grow in saline environments, they have the usual plant requirements for freshwater, nutrients, oxygen and sunlight. Many of the individual species possess unique adaptations which enable them to thrive in an environment where other plants cannot grow. Associated with this vegetation are many species of fish crustaceans and molluscs.

Sri Lanka's Mangroves

The mangroves in Sri Lanka are composed of 14 species of true mangroves and 12 species of mangrove associates. The most extensive mangroves occur in Puttalam-Kalpitiya area in association with estuaries. Dense localized stands also occur in association with estuaries in the Southern, South western and North eastern coasts e.g. Koggala lagoon, Kalametiya lagoon, and Kokilai Lagoon. Location of mangroves areas are shown in Fig. 17.

Know the Common Mangrove Plants

Fig. 1

Rhizophora mucronata (Kadol) Fig. 1

Mangrove trees with prop roots growing on the waters edge. Leaf apex is mucronate. The flower has 4 sepals, and 4 petals with long stalks.
Seeds are viviparous.
R. apiculata looks like *A. mucronate*
but can be easily distinguished from, it by the the sessile flowers.

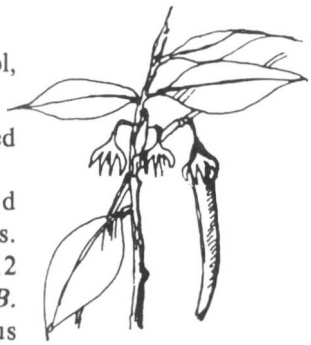


Fig. 2

Bruguiera gymnorhira (Malkadol, Sirikanda) Fig. 2

B. gymnorhiza can be identified by the
viviparous seeds and the red coloured calyx with 12–16 sepals. In *B. sexangula* there are 10–12 sepals which are not red *B. cylindrica* also has viviparous fruits but there are only 7–8 green sepals.

Fig. 3

Ceriops tagal (Punkanda/ Rathugas Fig. 3

C. tagal flowers are small and greenish yellow.
There are 5–6 petals and sepals.
The viviparous fruits have a this and long nypocotyl.

Fig. 4

Sunneratia caseolaris (kirilla) Fig. 4

They have stumpy preumatophores.
There are 6–9 green sepals and 6 petals in the flower.
S. caseolaris flowers are red and *S. Alba* flowers are white.
The fruit has a presistent calyx and style.

Fig. 5

Avicennia marina (Manda/ Madagas) Fig. 5

Trees with pencil-like pneumatophores. Flowers are yellow and emit the fragrance of bee's honey.
A marina leaf apex is pointed and *A. officinalis* leaf apex is rounded.

Fig. 6

Aegiceras corniculatum (Heenkadol) Fig. 6

White flowers are borne on slender stalks. There are 5 petals and stamens inserted in the corolla tube. The viviparous fruit is curved.

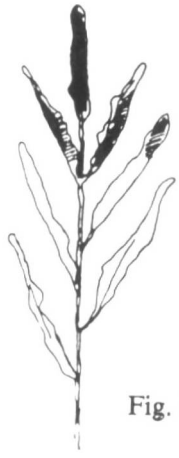


Fig. 11

Acrostichum aureum (Karen koku) Fig. 11

The only mangrove fern. Has erect rhizome. Leaves are pinnate and leathery. Sori are found along the veihs.

Acanthus ilicifolius (Mulli/Katu ikkili) Fig. 7

Shrub with thorny leaves and stem. The sessile flowers are purple. Calyx has 4 sepals and the fruit is a capsule.

Fig. 7

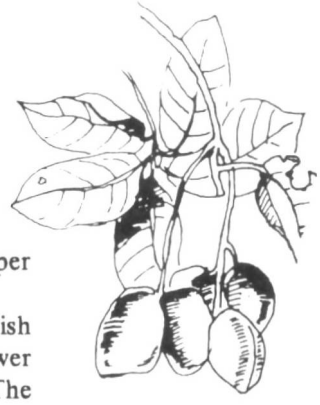


Fig 12

Heretiera littoralis (Etuna) Fig. 12

The leaves are green on the upper surface and sivery below.
The unisexual flowers are yellowish green and bell shaped. The flower has 5 sepals but no petals. The fruit has a keel.

Fig. 8

Excoecaria aggalocha (Thela) Fig. 8

Dioceious trees with latex. Mature leaves are red Male flowers occur in the axils of leaves. Female flowers occur on branches, as spikes. There are 3 sepals, 3 stamens and no petals.

Fig. 13

Lumnitzera racemosa (Bariyal) Fig. 13

Small tree with purpish bark and spirally arranged leaves. Flowers are white with 5 petals. Calyx green with 5 sepals. 5–10 stamens.

Xylocarpus granatum (Mutti Kadol) Fig. 9

Small trees with dark brown petiole and bark. Flowers are borne on long branches. They have 4 sepals and 4 petals. The Fruit is large and round with corky, leathery covering.

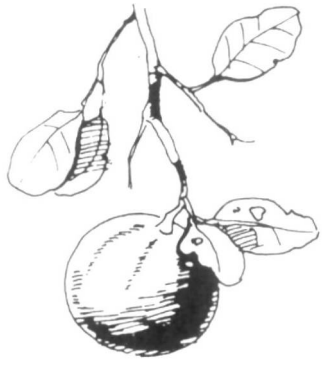


Fig. 9

Dalichandrone spathacea (Diya danga) Fig. 14

Trees with glossy leaves. 3–4 flowers occur in clusters. Flowers are white with a long corolla tube. The fruit is follicle, about a foot long.

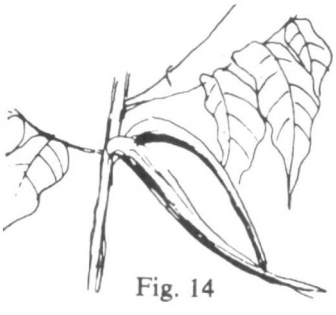


Fig. 14

Fig. 10

Nypa fruticans (Gin pol) Fig. 10

The only mangrove palm with an inflorescence forming a large fruiting head.

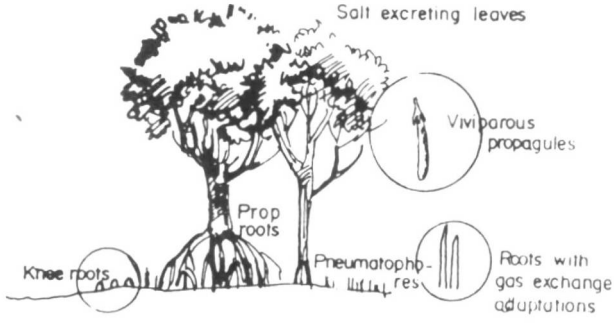


Fig. 15

Salt excreting leaves Viviporaus propules Prop roots Knee roots Preunotaphotes Roots with gas exchange adaptations

Adaptations of Mangrove Plants

Mangrove plants are woody, halophytes specialized to live in a saline environment. They have specialized adaptations to live in this environment.

Prop Roots and Stilt Roots

Since mangroves live on a loose substrate, there are prop roots arising from the branches and stilt roots arising from the main stern to another the plants to substrate (Fig. 15).

These roots also help to filter out the salt entering the plants. e.g. *Rhirophora.*

Salt Secreting Glands

Some mangrove speices have salt secreting glands through which excess salt is removed from the plants e.g. *Avicennia. Acanthus* and *Aegieras.*

Air Breathing Leaves

In order to avoid water loss through transpiration, the cuticle is thick and the water storage tissue is extensive.

Air Breathing Roots

Since mangrove soil is poor in oxygen, air breathing roots pneumatophores grow upwards from the soil surface. Gas exchange takes place through the opening of these roots, e.g. *Avicennia, Sonneratia.*

There are also knee-roots that grow upwards from the soil surface in the form of bent knees which are capable of breathing air e.g. *Bruguiera.*

Vivipary

To meet the hostile conditions of the environment, viviparity is another adaptation to ensure a late developmental stage of the embryo when it is released from the mother plant e.g. *Rhirophora, Bruguiera, Ceriops, Aegiceras.*

Know the Common Mangrove Animals

Some of the common mangrove animals are shown in Fig. 16 and their names listed below:

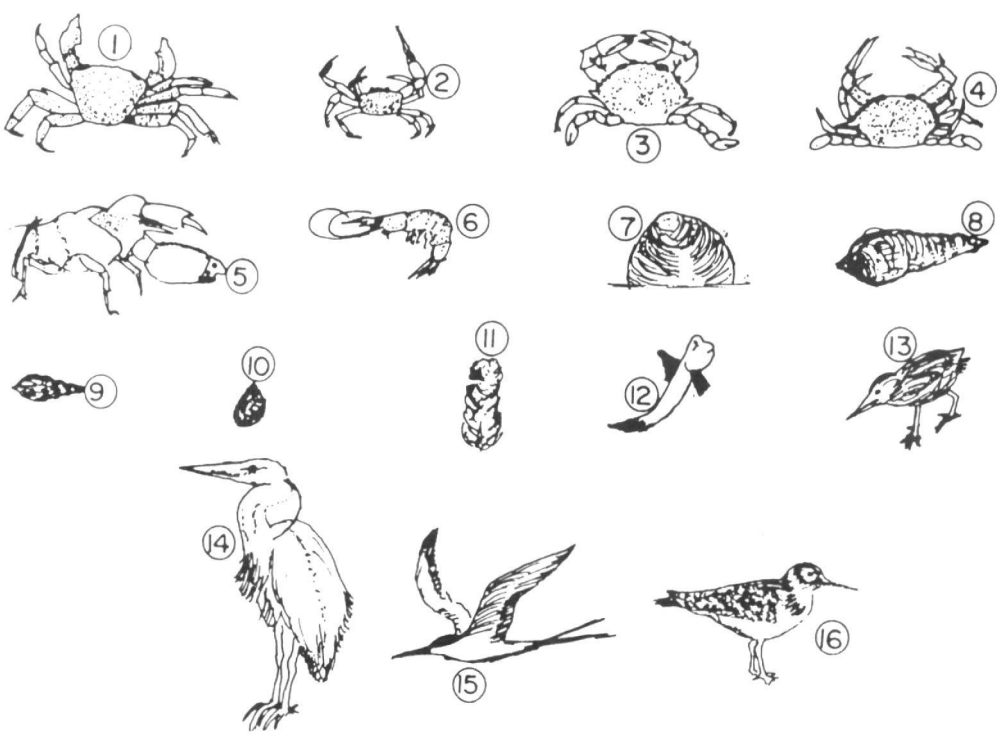


Fig.16

Key to Fig.16

1. Grapsid crab – mada kakuluwa
2. Fiddler crab – thani andu kakuluwa
3. Lagoon crab – *(Scylla serratal)* – kalapu kakuluwa
4. See crab *(Portunus pelagious)* – smakkali
5. Muti lobster *(Thalassina anomala)* mada pokirissa
6. White prawn *(Penaeus indicus)* – kalissa
7. Mangrove claim *(Geloina coaxans)* mutti
8. Telescope shell *(Telescopium telescopium)*
9. Mudfiat shell *(Cerithides cingulata)* uri
10. Mangrove periwinkle *(Littoraria acabra)* – kadol beli
11. Mangrove oyster *(Saccostrea/Crassostrea* sp.) –kavati
12. Muti skipper *(periphthalmus)* – Diya huna
13. Little green heron *(Butorides striatus javanicus)* – kadol koka
14. Egret *(Egretta)* – Al kokka
15. Terns and gulls – Mudu lihiniya
16. Sand pipers – Silibilian

Adaptations of Mangrove Animals

Most mangrove crabs belong to the family grapsidae and ocypoddae. They are semiterrestrial and live in burrows which invariably terminate below the water table. When they come out of the burrow they can remain on land for a long time because their branchial chamber can be kept moist for a long time. Burrowing is an adaptation found in many mangrove animals. The Mud-skipper is a fish unique to mangroves. Its eyes, gills, fins and the tail are modified for terrestial life. It uses its pelvic and pectoral fins to skip and climb. Mangrove oysters are capable of getting attached to mangrove roots. They close their shells as the tide recedes.

What are the uses of Mangroves

From time immemorial mangroves have been used by coastal communities to provide many of their needs. Some of these are:

* Several species of fish prawns; crabs-and molluscs are harvested.
* Mangrove timber is used as fuelwood, for beams and poles in structures, for construction of fish traps, fish kraals and brush piles, as boat building materials and as tool handles and furniture. Mangrove timber is strong and resistant to insect attacks.
* The bark of *Rhizophora* sp. and *Ceriops tagal* is used for extraction of tanning for dyeing fishing nets.
* The bark of *Bruguiera* is crushed and used as a poultice for minor cuts and injuries.
* Leaves of *Avicennia* serve as green fertilizer.

Mangrove ecosystems provide other important services to coastal communities. Some of these are:

* They serve as nursery grounds for fish, prawns and crabs and support fisheries production in coastal water. Adults of many of these species live in the sea, while juveniles migrate to the mangroves to feed and then return to the sea.
* They produce leaf litter and detrital matter. The leaf litter is broken down by bacteria, fungi and other micro-organisms which in turn are a valuable sources of food for marine animals in estuaries and coastal waters.
* They protect the shore of the lagoons and the estuaries from erosion.
* They reduce pollution of nearshore coastal waters by trapping and or absorbing pollutants.
* They are important recreational grounds and provide opportunities for bird watching.
* Because of the high diversity of mangrove plants and animals, and their adaptations, they are ideal field laboratories for biology students.

Let's Protect our Mangroves

Over the past thirty years or so, Sri Lanka's coastal zone has witnessed a rapid conversion of its mangroves for various uses such as aquaculture and housing development. This combined with pollution has reduced the benefits of the mangrove habitat for fisheries and sustainable fuelwood protection.

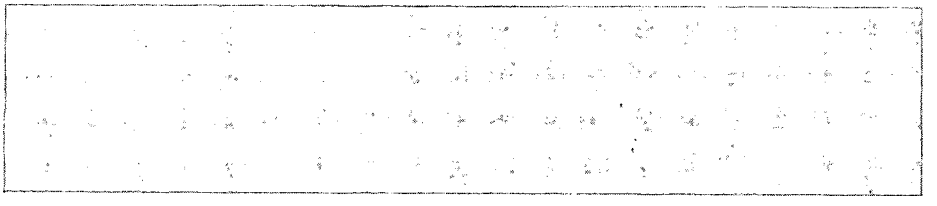
Mangroves are not "wastelands" or "marginal lands" of little or no value waiting to be "developed". They are one of the most valuable natural resources of Sri Lanka.

If you live near mangroves, remember that

* Mangrove areas should not be cleared for housing, aquaculture or other development.
* Mangrove trees should not be haphazardly cut down to provide fuelwood or construction material.

Sri Lanka's limited mangrove resources are threatened. Let's refrain from further destruction. Our government agencies, universities and non governmental organisations are now working together to ensure sustainable use of mangrove resources. Let's plan to replant and restore Sri Lanka's mangroves for the future.

(Courtesy - Coast Conservation Department)



DISTRIBUTION OF MANGROVE VEGETATION IN SRI LANKA.

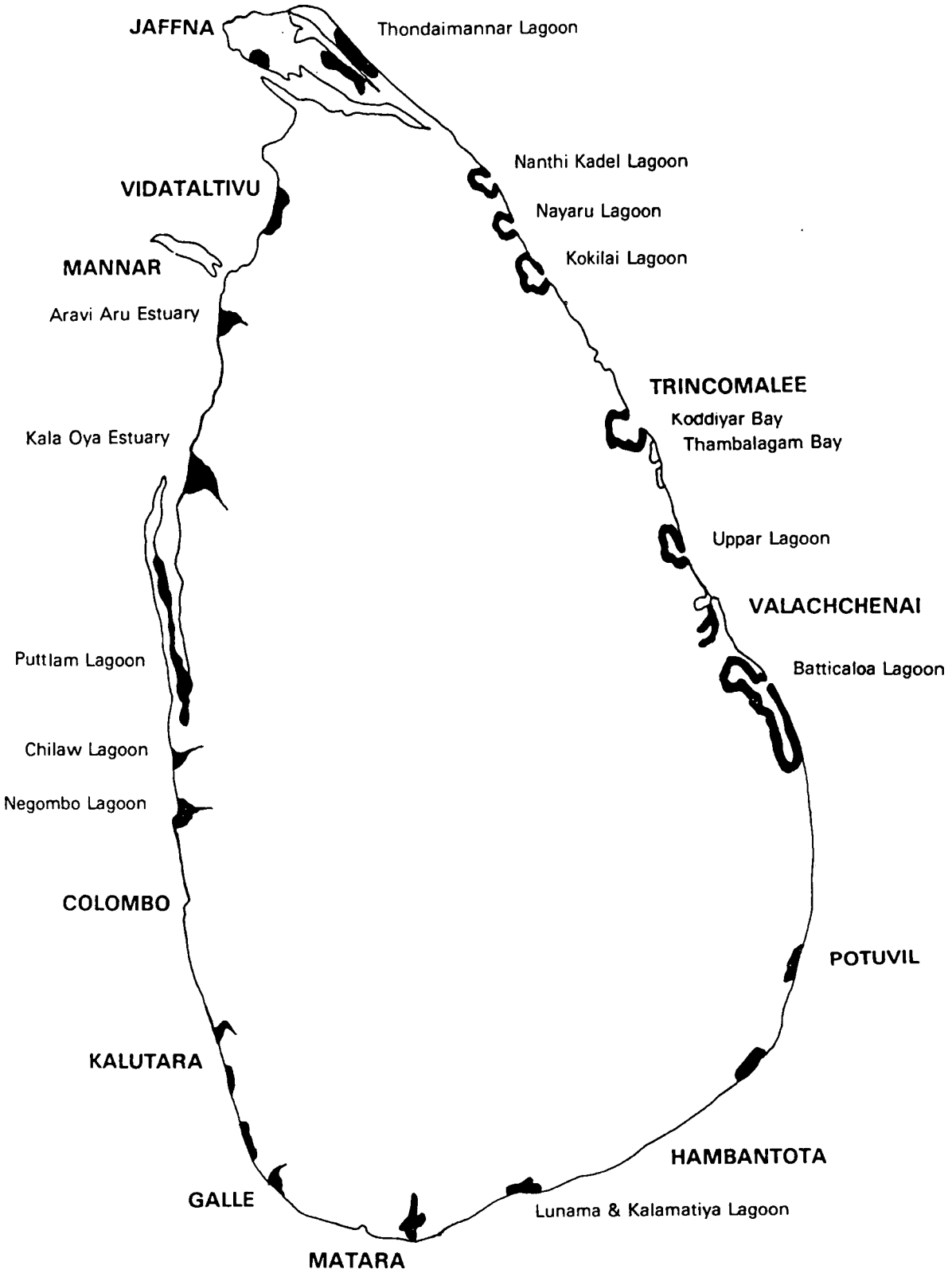


Fig. 17.