

# What is a MANGROVE?

The term 'mangrove' refers either to the highly-adapted plants found in tropical intertidal forest communities or to the whole forest habitat.



## Why are Mangroves HARSH HABITATS?

Organisms living in mangroves have to cope with daily fluctuations in salinity and temperature with the ebb and rise of the tide.



Organisms have to tolerate low oxygen levels in the soft and unstable mud. Bacteria living in the mud undergo anaerobic (without oxygen) respiration and produce hydrogen sulphide gas. This gives the mangroves the characteristic rotting egg smell!

## Why are Mangroves UNIQUE?

There are only 50 to 60 species of trees that can live in this habitat, of which 30 species can be found locally. Many adaptations allow mangrove trees to survive in this harsh habitat. Read on to find out more!

# WONDROUS ROOTS!

Mangrove plants developed aerial roots to cope with living in unstable, water-logged and oxygen-poor mud. During low tides, they are exposed and are able to take in atmospheric air.

### Types of Aerial Roots:

- Prop roots of Bakau (Rhizophora spp.)** are branched, looping aerial roots that arise from the main trunk and lower branches. They not only allow gaseous exchange to occur but also firmly anchor the plants to the soft mud.



- Kneel roots** develop in (*Bruguiera* spp.) when the tip of the horizontal root loops before continuing its growth. At the loop, there is secondary thickening on the upper side so that a knoblike structure is raised above the mud and allows the roots to "breathe".

- Buttress roots of Nyireh (Xylocarpus granatum)** are long and plank-like. They are strong and help to anchor the tree to the mud.



- Pneumatophores** are erect lateral branches of the horizontal roots that stick out to "breathe". The cable-like roots spread laterally, sometimes for many metres, away from the main trunk.



- Some mangrove plants have **normal roots** such as *Ceriops*.



## WHERE are the Mangroves?



Perapat (*Sonneratia* spp.) develops large, vertical pneumatophores.



Apogon (*Xylocarpus* spp.) have thin, pencil-like pneumatophores.



## PLANTS IN THE MANGROVES

These plants are able to tolerate some saltwater that our common mangrove plants can't. They are found growing on mud flats near rivers and the landward side of the mangrove forest.

### Top of the WORLD!

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### The MOST COMMON Mangrove Trees in Singapore



Age-appropriate mangrove plants are used in the mangrove forest.



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## The LONG SEEDLINGS!

Members of the family Rhizophoraceae of plants are long-seeded plants. These propagules are known as 'propagules' that are used to grow new mangrove trees.

### COMPARISON OF THE 3 COMMONEST

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## MANGROVE ANIMALS

The mangrove forest is home to a variety of animals, including snails, crabs, fish, and birds.

### SNAILS!

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### CRABS!

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### FISHES!

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### MUDSKIPPER!

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### REPTILES!

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## MAMMALS

The mangrove forest is home to a variety of mammals, including the Singapore flying squirrel and the mangrove deer.



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## BIRDS

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## FISHES

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## WATERBIRDS

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## USEFUL PLANTS

Many mangrove plants have medicinal or industrial uses. Some are used for timber, while others are used for medicine.



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