

Tropical or sub-tropical climate with temperatures above 20 C. Mangrove vegetation needs this heat and warm ocean waters with no sub-zero temperatures. Consequently mangroves are only located on low latitude, low altitude coasts.

Mangroves form in the **shallow inter-tidal zone**, covered at high tide and exposed at low tide. There needs to be a large tidal range to help move nutrients in and waste out, land a low energy environment to allow fine silt and clay to settle.

They form best in an **estuarine environment** with a large sediment supply to form mudflats that plants can colonise. The brackish water (mixture of salt and fresh) allows the process of **flocculation** to take place. With this tiny particles of silt and clay coalesce to form larger, heavier particles that settle.

Salt tolerant plants (halophytes) are needed to grow in the salty/brackish environment of mangroves. The roots of the trees help to accumulate the silt and clay and consolidate the deposition. Leaves have sunken stomata to limit transpiration.

Behind the red mangrove or in separate basins is the **BLACK MANGROVE**. Here trees have **pneumatophores**, these are roots that grow upwards out of the mud into the air and the tidal water. They also aid stability and take oxygen from above the soil.

MANGROVE FORMATION



Some of the trees in the mangrove are **viviparous**. This is when the seeds germinate while still on the plant. They then fall off and float around for a while before sinking to the seabed, producing new plants that can survive in the harsh tidal environment. This allows the mangrove to spread into new areas.

The halophytic plants on the seaward side of the mangrove is the **RED MANGROVE**. These trees have **prop or stilt roots** that support the plants, stabilise them in the wet mud and help in gas exchange. The wet mud is low in oxygen so the exposed roots take oxygen from the air.

The mangrove undergoes a **succession** from sea to shore where biomass and biodiversity increases. As more and more sediment is trapped the height of the land increases and the landward **WHITE MANGROVE** has no aerial roots and a lower level of salinity.

