

紅樹林

知多少

Know More about Mangroves



紅樹林是獨特的潮間帶濕地生態系統，主要分布於熱帶及亞熱帶的近岸地區。由於紅樹林經常受潮水沖刷，泥土基質鬆軟，植物的根部不但難以穩固，並且要面對水中的高鹽份。此外，紅樹的根部在潮漲時被水淹浸，因此出現缺氧的情況；潮退時泥土因暴露於空氣和陽光下，會變得乾燥和炎熱。在這種特殊的環境下，紅樹發展出不同的結構和生理機制，以作適應及生存。

香港的紅樹林廣泛分布於新界西北、西貢、吐露港和大嶼山的海岸，而在米埔內后海灣拉姆薩爾濕地更可找到香港最大片的紅樹林。

Mangroves form a unique intertidal wetland ecosystem and are mainly distributed at the coastal areas of tropical and subtropical regions. Due to the impacts of tidal flushing, mangroves are difficult to establish as the substratum is unstable. In addition, mangroves need to cope with high water salinity and anaerobic condition when their roots are submerged during high tide, and the dry and hot environment when the soil is exposed during low tide. In order to adapt to such tough environmental conditions, mangroves have developed different structures and physiological mechanisms for survival.

In Hong Kong, mangroves are widely distributed along the coast of the north-western New Territories, Sai Kung, Tolo Harbour and Lantau Island. The largest patch of mangrove in Hong Kong is found at the Mai Po Inner Deep Bay Ramsar Site.

紅樹林的價值和功用

Functions and Values of Mangroves

紅樹林無論在生態、環境及經濟方面都起着重要的作用。
Mangroves have significant ecological, environmental and economic importance.

社會及經濟價值

- 沿海居民可從紅樹林獲取食物和發展經濟：
 - 部分紅樹的植株及果實可供食用及製成飼料，亦有一些紅樹具有藥用價值；
 - 木蠟及秋茄樹(水筆仔)等品種的單寧酸可製成鞣料和染料；
 - 紅樹林的落葉碎屑可用於養殖基圍蝦。
- 紅樹林是大眾生態旅遊的理想地方。

Social and Economic Values

- Seaside residents can use mangroves to obtain food and develop the economy:
 - The fruits and leaves of some mangrove plants are edible and can be used to produce animal feeds, while some species have medicinal values.
 - Tannin extracted from mangrove plants like *Bruguiera gymnorhiza* and *Kandelia obovata* can be used to make tanning material and dye.
 - Fallen leaves of mangroves can be used to rear shrimps at *gei wai*.
- Mangroves can be ideal places for recreation and eco-tourism.

環境及生態價值

- 紅樹林對維持海洋及海岸地區的生態系統非常重要：
 - 為動物提供多元化的生境
 - 濃密的樹冠可供動物棲息和繁殖；
 - 錯綜複雜的根部結構所形成的空間，為細小的動物提供庇護及孕育場所。
 - 落葉碎屑給魚、蝦、貝及蟹類提供充足的糧食；或被微生物分解，為紅樹林植物提供養料。
- 紅樹林像一道天然屏障，抵擋由風暴引起的風浪衝擊，保護沿岸的城市和農田免受破壞。

Environmental and Ecological Values

- Mangroves are very important for maintaining the ecological systems of the ocean and coastal region:
 - They provide diverse habitats for animals
 - The dense canopy provides roosting and breeding grounds for wildlife.
 - The space formed by the complex root structures provides shelters and nursery grounds for small animals.
 - Fallen leaves are food for fishes, shrimps, shellfishes and crabs; or become nutrients for plants in the mangroves after decomposed by micro-organisms.
- Mangroves act as a natural barrier to protect the shorelines and coastal areas from damages by storms and waves.

保育紅樹林

Conservation of Mangroves

為使我們的下一代有機會繼續欣賞和可持續利用紅樹林資源，我們應該：

- 加強公眾對紅樹林的認識和保育；
- 定期監察本地紅樹林的狀況；
- 避免踐踏紅樹的根部及其幼苗；
- 不要挖掘沙泥；
- 不要干擾野生動物及破壞紅樹林；
- 請保持安靜，因為生物對噪音很敏感；
- 切勿亂拋垃圾及污染海水。

In order to allow future generations to continue to appreciate and use mangrove resources sustainably, we should:

- Promote public awareness and conservation of mangroves.
- Periodically monitor the conditions of local mangroves.
- Avoid trampling the roots of mangrove plants and their seedlings.
- Do not dig-up the sand and mud.
- Do not disturb the wildlife and damage mangrove plants.
- Keep quiet as animals are sensitive to noise.
- Do not litter or pollute sea water.

紅樹對嚴峻環境的適應

Adaptation to Tough Environmental Conditions

乾旱 Desiccation

潮退時，泥土暴露於空氣及陽光，因此變得非常乾燥，使環境欠缺水份。During low tide, the soil becomes very dry when exposed to the air and sunlight, depleting water in the environment.

厚角質層 Thick layer of cuticles

葉面具厚厚的蠟質角質層，以減少水份因蒸發而流失。A layer of thick waxy cuticles on the leaf surface reduce water loss by evaporation.



葉片反光 Light reflection

葉底滿布細小而重疊的銀白色鱗片，可反射陽光以降低植物的溫度及減少水份的流失。Numerous overlapping, tiny, and silvery white scales (indumenta) cover the underside of the leaf. These scales reflect sunlight and hence lower the plant temperature and reduce water loss.

銀白色的葉底
Silvery white ventral leaves

儲存水份組織 Water retention tissues

葉片內具有多層用來儲存水份的組織。There are multiple layers of water retention tissues in the leaves to store water.



繁殖體
Propagules

高濃度鹽份 Salinity stress

泥土由於長時間被海水淹沒，故含有高濃度的鹽份，影響植物的生長。The salinity of soil is high due to prolonged inundation by sea water. This affects the growth of plants.

鹽腺 Salt glands

鹽份會透過葉面的鹽腺排走。Salt is excreted through the salt glands on the surface of mangrove leaf.



鹽份從鹽腺排出
Salt excreted from salt glands

儲存鹽份 Accumulation of excess salt

部份鹽份會儲存在一些較老的葉中，藉著落葉排鹽。Excess salt is accumulated and stored in old leaves and are removed when the leaves are shed.

排斥鹽份 Expelling salt

有些紅樹的根部能排走鹽份，從而防止鹽份被植株吸收。Some mangroves have roots that can expel salt, preventing salt from entering the plant.



板根
Buttress roots

升高根
Stilt roots

缺乏氧氣 Anaerobic condition

潮漲時，植物的根部因被水淹沒而無法進行氣體交換。During high tide, the roots are submerged and thus hinder gaseous exchange.

出水通氣根 Pneumatophores

由纒狀根所發展出來的直立氣根，潮漲時，它們仍然能在水面呼吸。Rise up above water for breathing, these specialised root-like structures are outgrowths of the system of cable roots, helping the plant to breathe above the water surface even at high tide.



出水通氣根
Pneumatophores

膝狀根 Knee roots

由根部向上屈曲而成，形狀有如膝蓋。與出水通氣根一樣，潮漲時，它們仍能接觸空氣，進行氣體交換。Knee roots emerge as root loops from the underground root system, and they resemble bent knees. Similar to pneumatophores, they remain in contact with the air and allow gaseous exchange at high tide.



膝狀根
Knee roots

不穩固的基質 Unstable substratum

泥土由於長期受到潮水沖刷，變得鬆軟及不穩固，植物難於固定。Due to the continual tidal erosion, the substratum becomes soft and unstable for plants to anchor.

纜狀根 Cable roots

根部如電纜般向四周伸展，使植物能牢固扎根於泥土中。Cable-like roots spread all around the plant and enable it to anchor firmly in the soil.

支柱根或升高根 Prop roots or stilt roots

由紅樹的樹幹及莖部向外分支而成的根，能額外支撐及穩定植物。These are aerial roots that extend from the trunks and lower branches. They provide extra support and stabilise the plants.

板根 Buttress roots

板根是支柱根的其中一種形態，結構形狀似刀，同樣能為植物提供額外的支撐。As a form of prop roots, buttress roots have a blade-like appearance. Buttress roots can provide extra support to the plant.

繁殖困難 Reproduction problems

鬆軟不穩的泥土會減低種子的萌芽率及幼苗的存活機會。The soft and unstable substratum hinders germination of seeds and survival of the seedlings.

胎萌現象 Vivipary

種子在果實中發芽，並在母株上發展成繁殖體(胚軸)，待成熟後才脫離母株，插在泥土中成長。Seedlings develop within the buds and then develop into propagules (droppers) attached to the parent plant. When the propagules become mature, they detach from the parent plant and anchor in the soil.

木質果實 Woody fruits

有些紅樹具有木質果實，易於在水面上飄浮，有助散播種子到更遠的地方。Some mangrove species have woody fruits which give them extra buoyancy for seed dispersion in water.



木質果實
Woody fruits

香港濕地公園

Hong Kong Wetland Park

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香港濕地公園紅樹林浮橋位置
Location of Mangrove Boardwalk
in Hong Kong Wetland Park

真紅樹和類紅樹

True Mangroves and Mangrove Associates

紅樹可分為「真紅樹」和「類紅樹」。真紅樹生長在潮間帶地區，並發展出獨特的機制或形態去適應該等環境；類紅樹則生長在較接近內陸的紅樹林邊緣。

Mangrove species are generally grouped into "true mangroves" and "mangrove associates". True mangroves growing in the saline intertidal zones have developed unique morphological, physiological and reproductive mechanisms to adapt to such environment. Mangrove associates grow on the terrestrial margin of the mangrove communities.

香港濕地公園常見的類紅樹
Common examples of mangrove associates in Hong Kong Wetland Park



海欖果 *Cerbera manghas*



黃槿 *Cuban Bast Hibiscus tiliaceus*

香港濕地公園的紅樹

Mangrove Plants in Hong Kong Wetland Park

秋茄樹 (水筆仔) *Kandelia obovata*

香港常見的紅樹之一，它的繁殖體形狀修長，看似一枝筆，而且生長在水邊，故被稱為「水筆仔」。它的花呈白色，萼片5至6片。

This is one of the most common species of mangrove plants in Hong Kong. It has elongated and pen-like propagules. The flowers are white in colour with 5-6 sepals.



白色的花
White flowers



修長的繁殖體
Elongated propagules

木欖 Many-petaled Mangrove *Bruguiera gymnorhiza*

樹汁含有高濃度的化學物質—丹寧酸，可被提煉成紅色的染料，這亦是「紅樹」這名稱的其中一個由來。花紅色，紅色的花萼於果期仍然可見，繁殖體「雪茄」狀。

The sap of this plant contains high concentration of tannin, a chemical which can be extracted and used as red dye. This is also one of the reasons why mangroves are called "red trees" in Chinese. The flowers are red. Their reddish calyces will remain during the fruiting period. The propagules are cigar-shaped.



紅色的花萼
The reddish calyx



葉
Leaves

蠟燭果 (桐花樹) *Aegiceras corniculatum*

蠟燭果因繁殖體形似「蠟燭」而得名。它的葉較圓，葉柄微紅色，葉尖微凹。葉面具有鹽腺，因此葉面不時會出現鹽的結晶體。

Its propagules look like candles, hence it has the Chinese name "candle mangrove". The leaves are round-shaped, with pale red petiole and a small notch at the tip. There are salt glands on the leaf surface on which salt crystals are often seen.



白色的花
White flowers



「雪茄」狀的繁殖體
Cigar-shaped propagules

蠟燭形的繁殖體
Candle-shaped propagules

鹵蕨 Leather Fern / Mangrove Fern *Acrostichum aureum*

香港紅樹林中唯一的蕨類植物，透過孢子來繁殖。收藏孢子的孢子囊呈深褐色，孢子生於頂端幾對羽片(葉片)的底部。

It is the only fern species found in the mangroves of Hong Kong. It reproduces by spores. The rust red sporecases (sporangia) are located on the underside of the pairs of pinnae near the tip.



孢子囊
Sporangia

銀葉樹 Coastal Heritiera *Heritiera littoralis*

能生長至20米高。其板根使植物固定在鬆軟不穩的泥土上。葉底銀白色，木質的果實能在水中漂浮，有助傳播，並且有隆起的脊，成熟時褐色。

Coastal Heritiera can grow up to 20 metres in height. Their buttress roots offer good support on the soft and unstable substratum. The leaves have silvery white undersides. The woody fruits can float and disperse in water, and have a ridge on the surface. They are brown in colour when mature.



板根
Buttress roots



能浮水的果實
The floating fruits

香港濕地公園常見的紅樹林動物

Common Animals in the Mangroves of Hong Kong Wetland Park

小白鷺 Little Egret

香港最常見的鷺鳥，全年都在香港棲息。擁有長長的頸和腳，腳趾黃色，黑色的嘴尖而長。

This is the most common egret found in Hong Kong. It is a resident bird which stays in Hong Kong all year round. It has a long neck and long legs. This bird's toes are yellow and its black bill is sharp and pointed.



雙齒擬相手蟹 *Parasesarma bidens*

背甲綠色，螯足橙紅色，背甲兩邊各有兩隻尖銳的前側齒。主要食用落葉，是紅樹林生態系統中重要的枯枝落葉層消費者。

It has a greenish carapace and two reddish orange chelae. There are sharp anterolateral teeth on each side of the carapace. It feeds on fallen leaves and is an important leaf litter consumer in the mangrove ecosystem.

石磺 Seashore Slug

棕灰色無殼軟體動物，橢圓形，身上具細小的疣粒，有兩條短觸角，眼睛長在其尖端。以腐殖質及海藻為食物。

This marine gastropod mollusc has no shell and the brownish grey body is oblong in shape marked with warts and papillae. There are two short tentacles with eyes at the tips. It feeds on detritus and algae.



褶痕相手蟹 *Sesarma (Parasesarma) plicata*

背甲前半部黃黑相間，後半部紅褐色，螯足掌及兩指均為橙紅色。雜食性，除腐葉、藻類及動物性腐肉外，也會捕食甲殼類及蠕蟲。

The anterior part of its carapace has black and yellow stripes while the posterior is reddish brown. The chelipeds and pincers are reddish orange. This is an omnivore feeding on leaf litter, algae, carrions, as well as preying on crustaceans and worms.



弧邊招潮蟹
Uca (Tubuca) arcuata (雄性 Male)

招潮蟹 Fiddler Crab

招潮蟹是紅樹林泥灘的住客。潮退時牠們會在洞口外活動，當遇到危險時便立即退回洞裡。雄性其中一隻螯足特別大(其重量可達體重的一半)，用於求偶、搏鬥及保衛領土；而雌性則擁有一隻小螯足，功能與雄性的小螯足一樣，用來攝食泥土中的有機物質。

香港有記錄的招潮蟹共有6個品種，而在香港濕地公園裡最常見的為弧邊招潮蟹。牠也是公園的泥灘上體型最大的招潮蟹，背甲長達22毫米，寬達40毫米。

Fiddler crabs are residents in the mudflats of the mangroves. They move around on the mudflat in low tide and retreat to the burrows when in danger. One of the chelae of the male is bigger (weighs half of its body weight) which is used for courtship, fighting and defence. The female has a pair of small chelae. Similar to the male's small chela, they are used for feeding on the organic matters in the sediments.

There are 6 species of fiddler crabs in Hong Kong. *Uca (Tubuca) arcuata* is the most common fiddler crab in Hong Kong Wetland Park. It is also the biggest fiddler crab in the mudflats at the Park with the carapace boasting up to 22 mm and 40 mm in length and width respectively.



雌性 Female

雄性 Male

萊灰蝶 Chocolate Royal

小型蝴蝶，有一對翅尾及假眼。翅膀背面深褐色並有金屬紫斑。幼蟲以秋茄樹的樹葉為食物。

This is a small butterfly which has a pair of wing tails and eye spots. The upper side of the wings is dark brown in colour with metallic purple streaks. Its larvae feed on the leaves of one of the mangrove plants, *Kandelia obovata*.



白胸苦惡鳥 White-breasted Waterhen

香港最常見的秧雞。背部呈深灰褐色，嘴部青黃色，額、臉至腹部為白色。愛跑甚於飛行，常發出像普通話「苦惡…苦惡…」的叫聲。

This is the most common rail in Hong Kong. This bird has a dark brownish grey body and a greenish yellow bill; it also has a clean white face, breast and belly. It prefers running on ground rather than flying. The calling of this bird resembles the sound of "kuo-oo, kuo-oo" in Mandarin.



各種紅樹適應環境的特徵

Adaptation characteristics of different mangrove species

環境特徵 Environment Conditions	高濃度鹽份 Salinity stress		不穩固的基質 Unstable substratum		乾旱 Desiccation		缺氧 Anaerobic condition		繁殖困難 Reproduction problems		
	鹽腺 Salt glands	儲存鹽份 Accumulation of excess salt	排斥鹽份 Expelling salt	支柱根或升管根 Prop roots or stilt roots	板根 Buttress roots	厚角質層 Thick layer of cuticles	葉片及光反射 Leaf and light reflection	儲水水份組織 Water retention tissues	膝狀根 Knee roots	胎動現象 Vivipary	木質果實 Woody fruits
秋茄樹(水筆仔) <i>Kandelia obovata</i>			✓	✓					✓	✓	✓
鹵蕨 Leather Fern / Mangrove Fern <i>Acrostichum aureum</i>									✓		
木欖 Many-petaled Mangrove <i>Bruguiera gymnorhiza</i>	✓		✓	✓	✓	✓			✓	✓	✓
銀葉樹 Coastal Heritiera <i>Heritiera littoralis</i>						✓	✓	✓			✓
蠟燭果(桐花樹) <i>Aegiceras corniculatum</i>	✓		✓	✓					✓	✓	✓

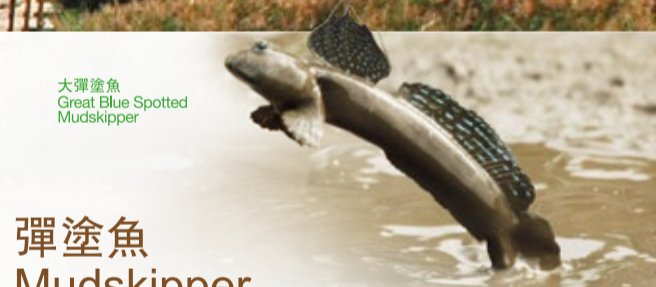
彈塗魚 Mudskipper

彈塗魚是紅樹林泥灘的另一常客。牠們入水能游，出水能跳。離水後，仍可透過充滿水份的鰓腔及濕潤的皮膚呼吸。牠可借助尾部在泥面上彈跳，強壯的胸鰭能支撐身體在泥面上爬行。大大的眼睛長在頭頂。

香港常見的彈塗魚有兩種。細小的彈塗魚呈深灰褐色，身上佈滿斑點及斜紋，身長可達10厘米，以細小無脊椎動物及昆蟲為主要食物。大彈塗魚身長可達20厘米，顏色深灰，身上有金屬藍色斑點，食物以藻類和有機物質為主。

Mudskipper is another common resident in the mangroves and mudflats. They can live in water and on land. After leaving the water, they can breathe through the moist skin and the water-filled gill chambers. They can also make leap on the surface of the mudflat with the aid of the tail. They have strong pectoral fins to support the body and crawl on land. Their big eyes are protruding at the top of the head.

Two species of mudskipper are commonly found in Hong Kong. The Shuttles Hoppfish has a deep brownish grey body with spots and patterns. Its body can be up to 10 cm in length. It preys on small invertebrates and insects. The Great Blue Spotted Mudskipper has a dark grey body with metallic blue spots on each side. It can grow to 20 cm long. It mainly feeds on algae and organic matters.



大彈塗魚
Great Blue Spotted Mudskipper



彈塗魚 Shuttles Hoppfish