



考察紅樹林生態系統 Study of Mangrove Ecosystem

姓名 Name

組別 Group

日期 Date:

學習目標 Learning goals:

完成課程後，學生應能 After the course, students should be able to:

1. 辨認在紅樹林常見的生物，並將其分類；
Classify and identify living organisms commonly found in a local mangrove habitat;
2. 觀察生物如何適應環境 Observe how living organisms adapt to the environment;
3. 識別生態系統中生物與生物之間的關係
Identify interrelationships between living organisms in an ecosystem;
4. 在紅樹林量度和記錄非生物因素 Record and measure abiotic factors in a mangrove ecosystem;
5. 使用簡單取樣工具 Use simple sampling tools;
6. 在實驗室執行簡單水質測試 Do simple chemical analysis of water sample in the laboratory;
7. 組織和分析數據作簡報之用 Analyze and organize data for presentation;
8. 與他人合作進行科學探究 Cooperate with others and work together in a scientific investigation;
9. 欣賞自然，尊重生物 Appreciate nature and respect living things.

程序 Schedule

9:00 - 09:50	簡介 Briefing
10:00 - 13:00	考察 Field work
13:00 - 14:00	午膳 Lunch
14:00 - 15:00	實驗工作 Laboratory work
15:00 - 15:30	資料整理 Data processing
15:30 - 16:15	分組匯報 Group presentation
16:15 - 16:30	討論及總結 Discussion & summary

儀器和工具 Equipment and tools

1	寫字夾板 (x1) Clipboard	10	膠整理盤 (x1) Plastic tray
2	光強度計 (x1) Light meter	11	小鏟 (x2) Trowel
3	風速計 (x1) Anemometer	12	樣方 0.5 x 0.5米 (x1) Quadrat
4	電子溫濕計 (x1) Digital themohyrometer	13	手套 (x2 對) Gloves
5	土壤溫度計 (x1) Soil thermometer	14	膠整理盤 (x1) Plastic sorting tray
6	金屬篩 (x1) Metal sieve	15	取水樣瓶 (x1) Water sampling bottle
7	鑷子 (x2) Forceps	16	圖鑑 (x1 set) Pictorial Guide
8	水桶 (x2) Bucket	17	平板電腦 (x1) Tablet computer
9	膠袋 (x1) Plastic bag		

衣著 Clothing:

1. 穿著長袖上衣和長褲能更有效防止蚊蟲叮咬，亦可減低被太陽曬傷的機會，不應穿著短褲。 Long-sleeved shirt and trousers for better protection against mosquito and insect bites, as well as preventing sunburn. Shorts are not recommended.
2. 不應穿著拖鞋或涼鞋，而應穿著運動布鞋，以減低腳部受傷的機會。 A pair of plimsolls for preventing injuries. Slippers and sandals are not recommended.

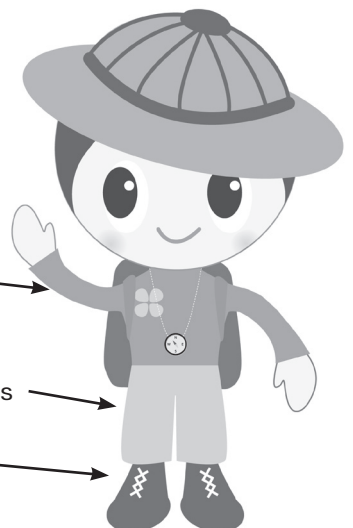
安全 Safety:

1. 避免踏進泥土過度鬆軟的區域。蠔殼可致嚴重割傷，必須小心。
Avoid stepping onto slimy areas. Beware of oyster shells which could cause serious wound.
2. 留意潮水，當潮水漲至膝蓋時，從速離開。
Leave the area once the knees were submerged by the incoming tide.

長袖上衣
Long-sleeved shirt

長褲 Trousers

運動布鞋
Plimsolls



6. 記錄植物 Recording plants

- i. 辨認3種真紅樹品種 (通常生長在較接近海水位置)和2種類紅樹品種 (通常生長在較近陸地位置)。Identify 3 species of true mangrove plants (usually growing closer to the sea) and 2 species of associated mangrove plants (usually growing at the back shore far away from the sea).
- ii. 細心觀察並記錄每種紅樹和類紅樹的適應特徵。Observe carefully and record the adaptive features of each mangrove and associated mangrove species.

植物名稱 Plant name	有助紅樹於鬆軟基質上 固定的根部特徵 Root features enhancing better anchorage on unstable substratum	有助紅樹於缺氧基質 進行氣體交換的根部 特徵 Root features enhancing better gaseous exchange in water-logged soil:	有助於紅樹調節植物組 織內含鹽量和水份的葉 部特徵 Leaf features related to regulation of water potential and salt content in plant tissue	有助紅樹減低海潮對種 子散播的衝擊的生殖系 統特徵 Modifications of reproductive system to minimize impact of tide on seed dispersal
<input type="checkbox"/> 真紅樹 True mangrove <input type="checkbox"/> 類紅樹 Associated mangrove				
<input type="checkbox"/> 真紅樹 True mangrove <input type="checkbox"/> 類紅樹 Associated mangrove				
<input type="checkbox"/> 真紅樹 True mangrove <input type="checkbox"/> 類紅樹 Associated mangrove				
<input type="checkbox"/> 真紅樹 True mangrove <input type="checkbox"/> 類紅樹 Associated mangrove				
<input type="checkbox"/> 真紅樹 True mangrove <input type="checkbox"/> 類紅樹 Associated mangrove				

實驗室工作 Laboratory work

7. 水質測試 Water test

- i. 用折光儀量度海水樣本的鹽度。Use an refractometer to measure salinity of the water sample.
- ii. 以過濾法量度海水樣本的總懸浮物。Use filtration method to measure total suspended solids of the water sample.

8. 觀察紅樹葉結構 (延伸活動) Observation on structure of mangrove leaves (Extended activity)
將紅樹和類紅樹的葉橫向切片,置於顯微鏡底下觀察。Do cross sections of the mangrove leaves and examine under the microscope.