



# 共生世界多面睇 (下花山) The Symbiotic World (Ha Fa Shan)

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. 描述和解釋生物之間的各種關係 Describe and explain the different types of relationships between organisms;
2. 使用數量錐體和生物量錐體來表達生物間的攝食關係及各營養級的能量流 Use pyramid of numbers and biomass to represent the feeding relationships between and energy flow between different trophic levels;
3. 辨認和分類一些本港常見生物品種 Identify and classify some common species in Hong Kong;
4. 對生物行為和外在外特徵進行深入觀察 Observe the external features and behaviour of living organism;
5. 與他人合作進行考察和資料整理工作 Cooperate with others to conduct field investigation and data processing;
6. 製作簡單科學報告 Make simple scientific report;
7. 欣賞大自然之美和尊重生物 Appreciate the wonder of nature and respect living things.

## 程序 Schedule

09:00 - 09:45	簡介 Briefing
09:45 - 12:30	考察 Field work
12:30 - 13:30	午膳 lunch
13:30 - 14:15	顯微鏡觀察 Microscopic observation
14:15 - 15:15	數據分析 Data analysis
15:15 - 16:15	分組匯報 Group presentation
15:15 - 16:30	討論及總結 Discussion & summary

### 你知道嗎？ Do You Know?

生境類型複雜多變的中國是地球上其中一個生物多樣性最高的國家。根據中國科學院發佈的《中國生物物種名錄2023版》，中國有超過47,000種植物和69,000種動物。

China, with its complex and diverse habitats, is one of the most biodiverse countries on Earth. According to the "Catalogue of Life China 2023" published by the Chinese Academy of Sciences, China has over 47,000 plant species and 69,000 animal species.



## 儀器和工具 Equipment and tools

1	寫字夾板 Clipboard (x1)	
2	平板電腦 Tablet computer (x1)	
3	雙筒望遠鏡 Binocular (x1)	
4	微距望遠鏡 Macroscope (x1)	
5	圖鑑 Pictorial Guides (x1)	
6	立體顯微鏡 Stereomicroscope (x1)	

## 衣著 Clothing

1. 不應穿著短褲。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。  
Shorts are not recommended. Long-sleeved shirt and trousers for better protection against mosquito and insect bites, as well as preventing sunburn.
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. 避免踏足陡斜和濕滑的岩石表面。  
Avoid stepping on steep and wet rock surfaces.
2. 切勿闖入植物生長茂密的地方，以免觸及蜂巢或被植物割傷。  
To prevent being attacked by wasps from disturbed wasp nests or being injured by plant leaves and thorns, do not get into places with dense vegetation.



## 1. 深入觀察共生生物 Comprehensive observation of symbiotic living organisms

沿途尋找和深入觀察5對共生生物，拍攝相片和影片。在可行情況下，將生物帶回實驗室並利用立體顯微鏡觀察其形態特徵。

Along the survey route, find 5 pairs of symbiotic living organisms and do comprehensive observation. Take photo and video records. Collect the samples and observe their morphological structures under the stereomicroscope in the laboratory whenever possible.

### 第一對生物 The first pair of organisms

涉及的生物名稱 Name of living organisms involved		
生物的形態特徵和行為 Morphological features and behaviour of the living organisms involved		
生物之間的關係概述 Brief description of the relationship between the living organisms		
共生關係類型 Type of relationship		

### 第二對生物 The second pair of organisms

涉及的生物名稱 Name of living organisms involved		
生物的形態特徵和行為 Morphological features and behaviour of the living organisms involved		
生物之間的關係概述 Brief description of the relationship between the living organisms		
共生關係類型 Type of relationship		



## 第三對生物 The third pair of organisms

涉及的生物名稱 Name of living organisms involved		
生物的形態特徵和行為 Morphological features and behaviour of the living organisms involved		
生物之間的關係概述 Brief description of the relationship between the living organisms		
共生關係類型 Type of relationship		

## 第四對生物 The fourth pair of organisms

涉及的生物名稱 Name of living organisms involved		
生物的形態特徵和行為 Morphological features and behaviour of the living organisms involved		
生物之間的關係概述 Brief description of the relationship between the living organisms		
共生關係類型 Type of relationship		

## 第五對生物 The fifth pair of organisms

涉及的生物名稱 Name of living organisms involved		
生物的形態特徵和行為 Morphological features and behaviour of the living organisms involved		
生物之間的關係概述 Brief description of the relationship between the living organisms		
共生關係類型 Type of relationship		



## 2. 其他共生生物實例 Other examples of symbiotic living organisms

找尋更多的共生關係實例，並用與上述同樣的方法記錄。

Search for more examples of symbiotic relationships, use the same methods as above to do records.

## 3. 一棵樹上的生物（延伸活動） Living organisms on a tree (Extended activity)

找尋一棵有較多生物的樹，仔細觀察樹上每種生物，記錄生物數量和生物之間的關係。

Find a tree with some organisms living on it. Carefully search for every species on the tree, and record the number of each species and the relationship of each species with the tree.

生物名稱 Name of the organism	個體數量 Number of individuals	生物之間的關係概述 Brief description of the relationship between the living organisms

## 討論 Discussion

### 1. 詳細報告 A detailed report

選擇其中一對共生生物，詳細闡述和解釋當中的關係。

Choose a pair of symbiotic living organisms to describe and explain their relationship in detail.

### 2. 相同與不同 Similarities and differences

比對各個實地觀察到的生物關係，描述和解釋相同和不同之處。

Compare and contrast the examples of symbiotic relationship observed in the field. Describe and explain the similarities and differences.

### 3. 攝食關係和能量流 Feeding relationships and energy flow

利用食物鏈、食物網和數量錐體來表達一棵樹和其他生物之間的攝食關係和各營養級的能量流。

Use a food web, pyramids of numbers and biomass to represent the feeding relationships between a tree and the living organisms on it as well as the energy flow between different trophic levels.