

生物策略表

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| 類別 | 生物策略 (Strategy) |
| 生物策略 STRATEGY | 桑寄生的花朵吸引特定的傳粉者 (Flowers of the red mistletoe attract specific pollinators) |
| 生物系統 LIVING SYSTEM | 桑寄生科 Loranthaceae |
| 功能類別 FUNCTIONS | #不同物種之間合作/競爭 #散佈種子 #授粉 #保護免受動物危害 #Cooperate/compete between difference species #Disperse seeds #Pollinate #Protect from animals |
| 作用機制標題 | 紅桑寄生花朵為特定傳粉者專一設計，避免不想要的訪花者到來 (The flowers of the red mistletoe protect from unwanted visitors by utilizing a pollinator-specific design.) |
| 生物系統/作用機制 示意圖 |  |
| 作用機制摘要說明 (SUMMARY OF FUNCTIONING MECHANISMS) | |
| <p>很多植物與鳥類有共生關係 (symbiotic relationship)，當鳥類從植物的花朵中吸取花蜜時，同時亦會在花朵之間傳播花粉，幫助異花授粉。</p> <p>正當很多植物展開花朵來吸引最多訪花者時，紐西蘭的桑寄生 (red mistletoe) 花朵卻是閉合的，而且只能被兩種鳥類打開，分別是圖伊鳥/簇胸吸蜜鳥 (tui, <i>Prosthemadera novaeseelandiae</i>) 以及紐西蘭鈴鳥 (bellbird, <i>Anthornis melanura</i>)。當這兩種鳥在吸取花蜜時，花朵會彈開，將花粉灑落在鳥的身上，確保牠們會攜帶花粉到另一棵拜訪的桑寄生。</p> <p>桑寄生與圖伊鳥及紐西蘭鈴鳥的關係是互惠互利的 (mutually beneficial)，桑寄生利用成熟但閉合的花朵傳遞訊號給鳥類，表示花朵中的花蜜尚未被其他鳥類取食。這減少了鳥類覓食搜尋所需的時間。圖伊鳥及紐西蘭鈴鳥因此最有可能拜訪桑寄生而非其它植物物種，因為牠們知道能不斷地獲得花蜜。同時也增加了桑寄生能成功地異花授粉的機會。</p> <p>此策略是由 Paige Kuplic 及 Seth Gale Wyrick 所提供。</p> <p>Many plants have a symbiotic relationship with birds, where birds extract nectar from the flowers of plants, and while doing so transfer pollen between flowers, helping to cross-pollinate</p> | |

them.

While many plants open their flowers in order to maximize the number of visitors, the red mistletoe of New Zealand has closed flowers that can only be opened by two birds, the tui and the bellbird. When the bird goes to get the nectar the flower “pops” open, showering pollen all over the bird, ensuring that it will carry pollen to the next mistletoe it visits.

This relationship between the red mistletoe and the tui and bellbird is mutually beneficial. The ripe sealed flower of the mistletoe signals to the birds that the nectar inside has not been eaten by another bird. This reduces the amount of time the birds have to spend foraging. The tui and bellbirds are therefore more likely to visit mistletoes over other plant species, because they know they will consistently receive nectar. This increases the chances of successful cross-pollination for the mistletoe.

This strategy was contributed by Paige Kuplic and Seth Gale Wyrick.

文獻引用 (REFERENCES)

「一種熱帶桑寄生物種把鮮紅色的花朵微微閉合起來，直到被飢渴而好奇的鳥類所拜訪。桑寄生花朵的拜訪者知道如何打開它們，並將鳥喙伸進花蕾的縫隙中。花蕾立刻彈開，一連串的花藥往下翻轉並擊中鳥類的前額。」 (Attenborough 1995: 117)

「這暗示著爆炸性開花 (explosive opening) 可能是如何演化來的。鳥類從變得可能更有效率地覓食而得益，因為花蕾的花蜜尚未被其他鳥類（或昆蟲）所吸取：為鳥類而設的一次性開瓶 (tamper-proof twist-top) 快餐。桑寄生亦可以從更忠實的傳粉者拜訪下得益。」 (Ladley 1995: 1)

“One of the tropical species of mistletoe keeps its bright red flowers slightly closed until it is visited by a thirsty and inquisitive bird. Its visitor knows how to open them and inserts its beak into a slit in the bud. Immediately, the bud springs open and a battery of anthers flip down and strike the bird’s forehead.” (Attenborough 1995: 117)

“This suggests how explosive opening could have evolved. Birds benefit by being able to forage more efficiently, because buds have not had their nectar harvested by any other bird (or insect): tamper-proof twist-top fast food for birds. The mistletoe may benefit through more faithful pollinator attention.” (Ladley 1995: 1)

參考文獻清單與連結 (REFERENCE LIST)

Attenborough, D. (1995). *The private life of plants*. Princeton University Press.

Ladley, J. J. and D. Kelly. (1995). Explosive New Zealand mistletoe. *Nature* 378: 766.

<https://www.nature.com/articles/378766a0>)

延伸閱讀

生物系統延伸資訊連結 (LEARN MORE ABOUT THE LIVING SYSTEM/S)

<https://en.wikipedia.org/wiki/Loranthaceae>

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<https://asknature.org/strategy/flowers-of-the-red-mistletoe-attract-specific-pollinators/>