

生物策略表

類別	生物策略 (Strategy)
生物策略 STRATEGY	植物提供住宿供許多物種 (Plant provides housing for many species)
生物系統 LIVING SYSTEM	蟻巢玉 <i>Hydnophytum moseleyanum</i>
功能類別 FUNCTIONS	#不同物種之間合作/競爭 #維持生物多樣性 #Cooperate/compete between different species #Maintain biodiversity
作用機制標題	蟻植物透過與 50 個物種的共生關係維持生物多樣性 (An ant-plant maintains biodiversity through symbiotic relationships with 50 species.)
生物系統/作用機制 示意圖	
作用機制摘要說明 (SUMMARY OF FUNCTIONING MECHANISMS)	
<p>有時候，單一物種的植物或動物可以對一個範圍內的其他物種有巨大影響。例如，一個河狸的群落可以形成慢水流 (slow-water) 棲息地供魚類、鳥類、蛙類、水獺及其他物種。在澳洲北部的西南太平洋，巴布亞紐幾內亞的海岸紅樹林中，研究人員發現了一個物種的植物支持著十幾種以上的其他物種。</p> <p>這種植物是蟻巢玉 (<i>Hydnophytum moseleyanum</i>)。它是稱為附生植物 (epiphyte) 的眾多植物之一，生長在植物的表面上。苔蘚、蕨類以及鳳梨科都是附生植物的例子。這些生物利用植物作為在森林樹冠中取得更高位置的手段，以利從雨水或霧氣中獲得養分及水氣，但它們很少會傷害植物。</p> <p>蟻巢玉是一種蟻植物 (ant-plant)，一種與螞蟻互利共生生活的植物。在這種模式的關係中，植物提供有遮蔽處給螞蟻居住，而螞蟻則提供養分給植物。蟻植物有膨大而有中空腔室 (cavities) 的莖部，有些是平滑也有些有瘤 (wartly)。螞蟻居住在平滑的腔室中，廢棄物置放在有瘤的腔室中。植物則從廢棄物中吸取養分。</p>	

蟻巢玉與某些和螞蟻相關的物種形成另一型式的關係。偏利共生 (commensalism)，即植物在這種關係中並沒有從其他物種中獲得益處，但仍提供居住空間及水分。其他物種可能還能從螞蟻處獲得一些資源。科學家發現有 50 個物種生活在蟻巢玉中，全部皆使用其膨大的莖部。這些物種中有 11 種是螞蟻，而最普遍的是虹琉璃蟻屬 (*Philidris*)，這與蟻植物有互利共生關係。

其他 39 個物種包括例如蟑螂、白蟻、跳蟲、鼠婦、蟋蟀、衣魚、黃蜂，甚至是少數的螃蟹及蜥蜴。這種互利共生及偏利共生的組合，似乎在支持許多生物和維持紅樹林物種多樣性中起重要的作用。

Sometimes, a single species of plant or animal can have a huge effect on the other species in an area. For example, a beaver colony can create slow-water habitat for fish, birds, frogs, otters, and other species. In coastal mangrove forests of Papua New Guinea, in the southwestern Pacific Ocean north of Australia, researchers found that a single species of plant supports dozens of other species.

This plant species is *Hydnophytum moseleyanum*. It's one of many organisms, called epiphytes, that grow on the surfaces of plants. Mosses, ferns, and bromeliads are examples of epiphytes. These organisms use the plant as a way to get higher in the canopy of a forest to gain access to nutrients and moisture from rain or fog, but they rarely harm the plant.

Hydnophytum moseleyanum is an ant-plant, which is a plant that lives in a mutualistic relationship with ants. In this type of relationship, the plant provides a sheltered place for the ants to live, while the ants provide nutrients to the plant. The ant-plant has a swollen stem containing cavities, some smooth and some warty. The ants live in the smooth cavities and deposit wastes in the warty ones. The plant absorbs nutrients from that waste.

Hydnophytum moseleyanum and some of the ants associated with it form another type of relationship with other species. It's called commensalism, where the plant gets nothing from the other species but provides them living space and the moisture within it. The other species probably also get some resources from the ants. Scientists found 50 species living on *Hydnophytum moseleyanum*, all using the swollen stem. Eleven of those species were ants and the most common were from the genus *Philidris*, which has the mutualistic relationship with the ant-plant.

The other 39 species include, for example, cockroaches, termites, springtails, sow bugs, crickets, silverfishes, wasps, and even a few crabs and lizards. This combination of mutualism and commensalism appears to play an important role in supporting many organisms and maintaining species diversity in the mangrove forests.

文獻引用 (REFERENCES)

「有很多生態學研究關於螞蟻以介乎宿主與共生體之間的互動關係而居住於蟻植物 (myrmecophytes)。然而，蟻植物中的其他居住者 (occupants) 幾乎沒有被研究過。研究所所有居住者及樹棲動物相 (arboreal fauna)，對於釐清牠們的共生關係非常重要。我們調查了在附生性蟻植物，巴布亞紐幾內亞紅樹林的蟻巢玉 (*Hydnophytum moseleyanum*) 中完整的居住者動物相。動物相非常多樣，由 11 個螞蟻物種以及 39 個其他動物物種所組成。幾乎所有居住者物種都是兼性偏利共生者 (commensals facultatively)，使用蟻植物內的空間作為居住地。附生性蟻植物的出現，應該對於維持樹棲生物多樣性起顯著的作用，因為蟻植物提供了遮蔽及水分供樹棲動物，因而顯著地增加了可能作為牠們居所的地方。」 (Maeyama et al. 1997: 93)

“There are many ecological studies of ants occupying the myrmecophytes in relation to the interactions between hosts and symbionts. However, the other occupants of myrmecophytes have been scarcely studied. It is very important to investigate all the occupants and arboreal fauna to clarify their symbiotic relationships. We surveyed the complete occupant fauna inhabiting the epiphytic myrmecophytes, *Hydnophytum moseleyanum* in mangrove forests in Papua New Guinea. A diverse fauna was revealed, that was composed of 11 ant species and 39 species of other animal groups. Almost all the occupant species would be commensals facultatively utilizing the space inside the myrmecophytes for their inhabitation. The existence of the epiphytic myrmecophytes should play a significant role for the maintenance of arboreal biodiversity because myrmecophytes provide the shelters and moisture for arboreal animals and markedly increase potential sites for their dwelling.” (Maeyama et al. 1997: 93)

參考文獻清單與連結 (REFERENCE LIST)

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延伸閱讀

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

撰寫/翻譯/編修者與日期

譚國銓翻譯 (2021/03/22)；趙怡嫻編修 (2021/04/20)

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