


生物策略表

類別	生物策略 (Strategy)
生物策略 STRATEGY	葉子阻止草食行為 (Leaves Deter Herbivory)
生物系統 LIVING SYSTEM	樺木 <i>Betula</i> (Birch)
功能類別 FUNCTIONS	#保護免受動物危害 #生態系統中合作 #Protect From Animals #Cooperate Within an Ecosystem
作用機制標題	一些樺樹的葉子會透過吸收附近植物散發的節肢動物排斥化學物質，可能有助於阻止草食行為 (The leaves of some birch trees may help deter herbivory by adsorbing arthropod-repelling chemical compounds emitted from neighboring plants.)
生物系統/作用機制 示意圖	
作用機制摘要說明 (SUMMARY OF FUNCTIONING MECHANISMS)	
<p>「植物散發的半揮發性化合物 (semi-volatile compound) 在20–25°C有低汽化率 (vaporization rates), 因此可能殘留在葉片表面。節肢動物半揮發性驅蟲劑 (arthropod-repellent) 對鄰近植物的被動性吸附 (passive adsorption), 可以傳遞產生聯合抗性的訊息, 減低鄰近植物受到草食生物 (herbivore) 的損害。</p> <p>「我們發現當樺木屬植物 (birch, <i>Betula</i> spp.) 在實地實驗 (field setup) 中與杜香 (<i>Rhododendron tomentosum</i>) 混合種植時, 會吸收並重新釋出 (re-release) 杜香所製造的半揮發性C15驅蟲劑ledene、杜香醇 (ledol) 和palustrol...」</p> <p>「在評估聯合抗性時, 我們發現雜食性 (polyphagous) 的象鼻蟲 (green leaf weevil, <i>Polydrusus flavipes</i>) 和秋白尺蠖 (autumnal moth, <i>Epirrita autumnata</i>) 幼蟲都偏好垂枝樺 (<i>B. pendula</i>) 多於杜香。象鼻蟲亦較偏好取食沒有曝露在杜香葉片下的樺樹葉片, 多於兩者混合生長下的葉片。在野外, 混合生長環境下的蚜蟲 (<i>Euceraphis betulae</i>) 密度降低。」</p> <p>「我們的結果推斷, 植物/樹木物種可能會被更具草食生物抗性之異種 (heterospecific) 鄰近植物的半揮發性化合物所保護。」(Himanen et al. 2010: 722)</p> <p>“Plant-emitted semi-volatile compounds have low vaporization rates at 20–25°C and may therefore persist on surfaces such as plant foliage. The passive adsorption of arthropod-repellent</p>	

semi-volatiles to neighbouring foliage could convey associational resistance, whereby a plant's neighbours reduce damage caused by herbivores.

“We found that birch (*Betula* spp.) leaves adsorb and re-release the specific arthropod-repelling C15 semi-volatiles ledene, ledol and palustrol produced by *Rhododendron tomentosum* when grown in mixed association in a field setup...”

“In assessments for associational resistance, we found that the polyphagous green leaf weevils (*Polydrusus flavipes*) and autumnal moth (*Epirrita autumnata*) larvae both preferred *B. pendula* to *R. tomentosum*. *P. flavipes* also preferred birch leaves not exposed to *R. tomentosum* to leaves from mixed associations. In the field, a reduction in *Euceraaphis betulae* aphid density occurred in mixed associations.

“Our results suggest that plant/tree species may be protected by semi-volatile compounds emitted by a more herbivore-resistant heterospecific neighbour.” (Himanen et al. 2010: 722)

文獻引用 (REFERENCES)

參考文獻清單與連結 (REFERENCE LIST)

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

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AskNature原文連結

<https://asknature.org/strategy/leaves-deter-herbivory/>