


生物策略表

類別	生物策略 (Strategy)
生物策略 STRATEGY	產生多重色彩外觀的薄層 (Layers create multihued appearance)
生物系統 LIVING SYSTEM	赤裸蜣螂 <i>Gymnopleurus virens</i>
功能類別 FUNCTIONS	#改變光線/顏色 #Modify light/color
作用機制標題	甲蟲的背甲因為其超薄層以螺旋斜紋方向排列，而呈現多重色彩 (Carapace of beetle appears multihued because of ultrathin layers in a corkscrew orientation.)
生物系統/作用機制 示意圖	
作用機制摘要說明 (SUMMARY OF FUNCTIONING MECHANISMS)	
文獻引用 (REFERENCES)	
<p>「赤裸蜣螂 (<i>Gymnopleurus virens</i>) 這種甲蟲的外殼能夠改變顏色，從中心的紅色到邊緣變成綠色，或是從綠色變成藍色…外殼是由數千層的超薄層 (ultrathin layer) 所構成，每層連續的薄層 (each successive layer) 都比上一層稍微偏轉。Brink 說：『這是一種螺旋前進效應 (corkscrew effect) 』。」</p> <p>「這種螺旋前進的構造使外殼只會反射一部分的光線，這些光線有著相同的螺旋前進方向，稱為圓偏振光 (circularly polarized light)。Brink 說：『當螺旋前進方向匹配時，你就能得到幾乎 100% 驚人有效的反射率。』。」</p> <p>「研究團隊亦發現了外殼中有瑕疵 (defect)，其中一層薄層偏轉了大約 90 度。這種情形改變了薄層之間間隔，使得外殼可以反射不只一種波長的光線。這些瑕疵結合外殼的形狀而產生虹光現象。」 (New Scientist 2007: 17)</p> <p>“<i>Gymnopleurus virens</i> beetles have shells that change from red in the centre to green around the edges or from green to blue...the shells are made of thousands of ultrathin layers,</p>	

with each successive layer slightly twisted in relation to the one above. 'It's a corkscrew effect,' says Brink.

“This corkscrew structure causes the shell to reflect only that portion of light which has the same corkscrew orientation - known as circularly polarised light. 'When the corkscrews match, you get astonishingly efficient reflection of almost 100 per cent,' says Brink.”

“The team also found that the shells have defects, in which a layer swings around by 90 degrees. This in turn changes the spacing between the layers, allowing the shell to reflect more than one wavelength of light. These defects combine with the shell's shape to give it its iridescence.” (New Scientist 2007: 17)

參考文獻清單與連結 (REFERENCE LIST)

New Scientist. (8 April, 2007). Beetle's beauty lies in imperfection. *New Scientist*. Retrieved from: <https://www.newscientist.com/article/dn11557-beetles-beauty-lies-in-imperfection/>

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/gymnopleurus_virens
https://www.onezoom.org/life/@gymnopleurus_virens
<https://eol.org/pages/1028212>

撰寫/翻譯/編修者與日期

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AskNature 原文連結

<https://asknature.org/strategy/layers-create-multihued-appearance/>