


生物策略表

類別	生物策略 (Strategy)
生物策略 STRATEGY	站姿與皮膚凹槽可以獲得雨水 (Stance and skin channels harvest rainwater)
生物系統 LIVING SYSTEM	德州角蜥 <i>Phrynosoma cornutum</i> (Texas horned lizards)
功能類別 FUNCTIONS	#獲取、吸收、或過濾液體 #Capture, absorb, or filter liquids
作用機制標題	德州角蜥的身體能藉由張開的姿態和皮膚鱗片間的凹槽來獲得雨水 (The body of Texas horned lizards captures rainwater via splayed stance and interscalar channels on the skin.)
生物系統/作用機制 示意圖	
作用機制摘要說明 (SUMMARY OF FUNCTIONING MECHANISMS)	
<p>「在暴雨期，觀察過圈養的德州角蜥會表現出一種印刻行為 (stereotyped behavior)，稱為『雨水獲得 (rain-harvesting)』。這個行為牽涉到 (1) 將腹部拱起成弓形；(2) 將四肢張開且加以伸展；(3) 使身體呈背腹 (dorso-ventral) 面的扁平狀，並向兩側旁延展；(4) 將頭部與尾部壓低；(5) 將上下顎張開與閉起；(6) 飲用體背表面所獲得的水分。經由腸道回收染色的水分，證實吞入的是來自外皮的水。利用掃描式電顯照片，可說明流經這些鱗片間凹槽的水，顯然是藉由毛細現象 (capillary action)，由體表帶到上下顎。降雨量少時，水會經由鱗片間凹槽流入上下顎，但在降雨量大時，可能會因為重力片流 (gravitational sheet flow) 而增加流到上下顎的水分。這個以外皮獲得水分的系統，類似於兩種報導過的飛蜥 (<i>Moloch horridus</i> 和 <i>Phrynocephalus helioscopus</i>) 之鱗片間水分傳輸。</p> <p>顯然地，<i>Phrynosoma</i> 和 <i>P. helioscopus</i> 在雨水獲得方面具有相似的行為。這是第一份提供蜥蜴以外皮攔截和傳輸自然降雨，並當作飲用水的觀察報導。」(Sherbrooke 1990: 302)</p> <p>“During rainstorms, Texas horned lizards in enclosures were observed to exhibit a stereotyped behavior termed ‘rain-harvesting.’ The behavior involves: (1) raising the abdomen in an arch; (2) splaying and extending the legs; (3) dorso-ventral flattening and lateral spreading</p>	
文獻引用 (REFERENCES)	

of the body; (4) lowering the head and tail; (5) opening and closing the jaws; and (6) drinking water collected on the dorsal body surface. Ingestion of integumentally-derived water was verified by recovery of dyed water from the gut. SEM stereophotographs illustrate the interscalar channels through which water is carried, apparently by capillary action, over body surfaces to the jaws. During light rainfall water flow to the jaws occurs within interscalar channels, but during heavy rainfall gravitational sheet flow may increase the amount of water arriving at the jaws. This integumental rain-harvesting system is similar to reported interscalar water transport in two agamid lizards, *Moloch horridus* and *Phrynocephalus helioscopus*.

Apparently, *Phrynosoma* and *P. helioscopus* have similar behaviors for rain-harvesting. This is the first report to provide observations of a lizard obtaining water from natural precipitation for drinking by integumental interception and transport.” (Sherbrooke 1990: 302)

參考文獻清單與連結 (REFERENCE LIST)

Sherbrooke, W. C. (1990). Rain-harvesting in the lizard, *Phrynosoma cornutum*: behavior and integumental morphology. *Journal of Herpetology* 24: 302-308.

(<https://www.jstor.org/stable/1564398>)

Sherbrooke, W. C. (2004). Integumental water movement and rate of water ingestion during rain harvesting in the Texas horned lizard, *Phrynosoma cornutum*. *Amphibia-Reptilia* 25:29-39.

(<https://doi.org/10.1163/156853804322992814>)

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/Texas_horned_lizard

撰寫/翻譯/編修者與日期

連浚翔翻譯 (2019/05/13)；朱天愛編修 (2020/03/03)；譚國鏊編修 (2020/04/10)；紀凱容編修 (2020/11/26)；施習德編修 (2020/12/27)

AskNature 原文連結

<https://asknature.org/strategy/stance-and-skin-channels-harvest-rainwater/>