


生物策略表

類別	生物策略 (Strategy)
生物策略 STRATEGY	整理防水羽毛 (Preening waterproofs feathers)
生物系統 LIVING SYSTEM	鳥類 (Birds)
功能類別 FUNCTIONS	#保護免受真菌危害 #保護免受液體流失危害 #保護免受微生物危害 #Protect from fungi #Protect from loss of liquids #Protect from microbes
作用機制標題	鳥類用尾脂腺製造理羽蠟來保護免於水滲入,和真菌、細菌的危害。 (The uropygial gland of birds protects them from water penetration, fungi, and bacteria by producing preen waxes.)
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>「除了角質層 (stratum corneum) 的屏障,哺乳類和鳥類的腺體脂質 (glandular lipid) 也會累積在表皮外部 (Hadley, 1991)…鳥類尾脂腺的理羽蠟 (preen wax) 會布滿在羽毛上,可防止水分的滲入,以及細菌和真菌的入侵。尾脂腺分泌物含複雜的脂質混合物,其中大多數是酯類蠟質…鳥類和哺乳類的羽毛和毛皮似乎能相當程度的阻止水汽從皮膚進入大氣,雖說皮膚仍是經皮水分散失量 (transepidermal water loss, TEWL) 的主要屏障。」</p> <p>(Cena and Clark, 1979; Webster et al., 1985)</p>	

「以鴿子為例，在經由外皮的水分散失量中，羽毛貢獻了其中總阻力的 5-20%，且羽毛和邊界層合計，總共可提供水汽擴散總阻力的 6-26% (Webster et al., 1985)。因此，調整羽毛或毛皮，以及季節性脫落的類型，都是調節 TEWL 速率的潛在方法。」(Lillywhite 2006: 219)

“In addition to the stratum corneum barrier, glandular lipids are deposited exteriorly to the epidermis in both mammals and birds (Hadley, 1991)...In birds, ‘preen waxes’ from the uropygial gland are spread over feathers to prevent water penetration and ingress of bacteria and fungi. Uropygial secretions contain a complex mixture of lipids in which wax esters usually predominate...In birds and mammals, plumage and pelage appear to impede significantly the passage of water vapor from skin to atmosphere, although the skin remains the principal barrier to TEWL [transepidermal water loss] (Cena and Clark, 1979; Webster et al., 1985).

In pigeons, for example, plumage contributes 5-20% of total resistance to water loss through the integument, and the plumage and boundary layer together account for 6-26% of total resistance to water vapor diffusion (Webster et al., 1985). Therefore, adjustments of plumage or pelage and seasonal shedding patterns are potential means of adjusting rates of TEWL.” (Lillywhite 2006: 219)

參考文獻清單與連結 (REFERENCE LIST)

Lillywhite, H. B. (2006). Water relations of tetrapod integument. *Journal of Experimental Biology*. 209: 202-226. (<https://jeb.biologists.org/content/209/2/202>)

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/Aves>

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AskNature 原文連結

<https://asknature.org/strategy/preening-waterproofs-feathers/>