

生物策略表

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| 類別 | 生物策略 (Strategy) |
| 生物策略 STRATEGY | 少年的友誼能幫助終生 Juvenile Friendships Help Throughout Life |
| 生物系統 LIVING SYSTEM | 寬吻海豚 (Bottlenose dolphin) |
| 功能類別 FUNCTIONS | # 種內合作 # Cooperate Within the Same Species |
| 作用機制標題 | 寬吻海豚很早就建立了終生的友誼，這將通過共享信息、合作和其他方式使它們受益。 Bottlenose dolphins develop lifelong friendships early on that will benefit them through shared information, cooperation, and other means. |
| 生物系統/作用機制 示意圖 (確認版權、註明出處；畫質) |  <p>https://asknature.org/strategy/juvenile-dolphins-choose-friends-to-help-through-life/#the-strategy (影片連結)</p> |
| 作用機制摘要說明 (SUMMARY OF FUNCTIONING MECHANISMS) | |

我們的早年如何幫助我們為成年期的需求做好準備？

雖然有些物種在年輕時就達到性成熟並產生許多後代，但海豚（如人類和大象等其他大型社會物種）在早期生命中具有較長的發育階段。從斷奶到第一次懷孕，這個階段大約持續 10 年，對於發展成人所需的人際關係和生存技能似乎至關重要。

研究人員想了解更多海豚利用這個幼年期來發展這些技能的方式，以及對成年雄性和雌性的不同要求是否會從幼年如何度過他們的時間中看出。對澳大利亞鯊魚灣的一群寬吻海豚背鰭上的獨特標記進行編目，他們能夠從出生到成年跟蹤個體。

成年後，雌性海豚會照顧（並餵養）後代 3-4 年。相比之下，成年雄性海豚花更多的時間與其他雄性群體進行社交，並且不參與撫養幼體。這導致每個性別都需要一套不同的技能才能成年後取得成功。

在雄性和雌性海豚中，海豚都會仔細選擇他們的朋友，花更多的時間與這些人在一起，並在他們的一生中加強這些聯繫。對於男性來說，這有助於他們形成聯盟，從而提高他們在獲得配偶方面的成功。一些男性被發現保持這些牢固的友誼超過 30 年。

年輕的雌性花在覓食上的時間明顯多於雄性。這有助於他們為未來懷孕和飼養小海豚 (calf) 的高能量需求做好準備。作為成年人，雌性傾向於與其他雌性及其後代分組，這為小海豚提供了一些保護，同時也促進了信息的共享。

研究人員觀察到海豚分享有關使用工具捕獲魚類獵物的創造性方法的知識。其中一項策略於 1984 年在鯊魚灣海豚中首次觀察到，海豚嘴裡叨著一塊海綿來保護它的鼻子，同時在沙質海底紮根。這種方法使海豚能夠找到隱藏在沙子中的底棲魚。這種海綿工具方法主要從母親傳給她們的雌性小海豚——這是世代知識轉移的教科書示例。

海豚似乎也與他們的朋友分享這些覓食策略，進一步證明了他們一生中建立的社會連結 (social bond) 的重要性。（參見相關策略：海豚從同齡人那裡學習新行為）。

幼年雌性似乎明白這些友誼對發展很重要，並花時間與分享這些創造性覓食策略的無關雌性建立聯繫。當雌性彼此分享此類信息時，它們也可以提高小海豚的存活率。

How do our early years help to prepare us for the demands of adulthood?

While some species reach sexual maturity at a young age and produce many offspring, dolphins (like humans and other large social species such as elephants) have a prolonged development stage in early life. From weaning to first pregnancy, this stage lasts about 10 years, and appears crucial for developing the relationships and survival skills needed as adults.

Researchers wanted to know more about the way that dolphins use this juvenile period to develop these skills, and whether the different demands on adult males and females would be seen in the ways that juveniles spend their time. Cataloging unique markings on the dorsal fins of a group of bottlenose dolphins in Shark Bay, Australia, they were able to follow individuals from birth to adulthood.

As adults, female dolphins care for (and feed) offspring for 3-4 years. In contrast, adult male dolphins spend more time socializing in groups with other males, and aren't involved in raising the young. This leads each sex to require a different set of skills needed to succeed as adults.

In both males and females, dolphins choose their friends carefully, spending more time with these individuals and strengthening these bonds throughout their lives. For males, this helps them form alliances that boost their success in securing a mate. Some males have been found to maintain these strong friendships for more than 30 years.

Young females spend significantly more time foraging than males. This helps to prepare them for the future high energy demands of pregnancy and raising a calf. As adults, females tend to group with other females and their offspring, which provides some protection to the calves while also facilitating the sharing of information.

Researchers have observed dolphins sharing knowledge about creative ways to use tools to capture fish prey. One of these strategies, first observed in the Shark Bay dolphins in 1984, involves a dolphin holding a sea sponge in its mouth to protect its nose while rooting through the sandy sea floor. This method enables dolphins to find bottom-dwelling fish that hide in the sand. This sponge-tool method is passed down from mothers primarily to their female calves—a textbook example of generational knowledge transfer.

Dolphins also appear to share these foraging strategies with their friends, further demonstrating the importance of the social bonds developed throughout their lives. (See related strategy: Dolphins learn new behaviors from their peers).

Juvenile females seem to understand that these friendships are important to develop, and spend time bonding with unrelated females who share these creative foraging strategies. When females share this type of information with each other, they can boost the survival of their calves as well.

文獻引用 (REFERENCES)

“少年時期似乎對於發展生存和繁殖所必需的技能 and 關係至關重要。這表明在幼年期延長的類群（例如靈長類動物（包括人類）、大象和海豚）中，延遲性成熟的成本可能會被發育過程中的社會經驗和學習所抵消。

“The juvenile period appears to be critical for developing both skills and relationships necessary for survival and reproduction. This suggests that the costs of delayed sexual maturity in taxa with prolonged juvenile periods—such as primates (including humans), elephants, and dolphins—may be offset by social experience and learning during development. (Galezo et al. 2020:2)

“……我們調查了另一種覓食策略“脫殼”的傳播，其中該種群中的一些海豚以被困在大型海洋腹足動物殼內的獵物為食……我們表明脫殼行為主要通過非垂直[或非親代傳播]後代]社會傳播。通過統計環境和遺傳影響，我們的研究結果代表了齒鯨覓食策略非垂直傳播的第一個證據。這項研究表明，海豚的覓食行為存在多種傳播途徑，突出了鯨類和類人猿在文化行為傳播性質上的相似之處。”

“... we investigated the spread of another foraging strategy, “shelling”, whereby some dolphins in this population feed on prey trapped inside large marine gastropod shells... we show that shelling behavior spreads primarily through non-vertical [or non-parent-to-offspring] social transmission. By statistically accounting for both environmental and genetic influences, our findings thus represent the first evidence of non-vertical transmission of a foraging tactic in

toothed whales. This research suggests there are multiple transmission pathways of foraging behaviors in dolphins, highlighting the similarities between cetaceans and great apes in the nature of the transmission of cultural behaviors.” (Wild et al., 2020)

參考文獻清單與連結 (REFERENCE LIST) Harvard 或 APA 格式

Juvenile social dynamics reflect adult reproductive strategies in bottlenose dolphins
Integrating Genetic, Environmental, and Social Networks to Reveal Transmission Pathways of a Dolphin Foraging Innovation

延伸閱讀: Harvard 或 APA 格式 (取自 AskNature 原文; 若為翻譯者補充, 請註明)

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/juvenile-dolphins-choose-friends-to-help-through-life/#the-strategy>

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