

研究人员一直无法理解小巧的蝴蝶是如何用它们巨大但低效的翅膀飞行的。现在，一项新的研究表明，蝴蝶进化出了一种有效的合拢和拍打翅膀的方式来产生推力。

The **fluttering** flight patterns of butterflies have long inspired poets, but baffled scientists. The **delicate** creatures have unusually large wings, which are **aerodynamically** inefficient. But now using **high-speed cameras** and a wind tunnel, researchers say they have **solved the puzzle**.

一直以来，蝴蝶翩翩起舞的飞行模式赋予诗人灵感，却困扰了科学家。这种小巧脆弱的生物长有异常巨大的翅膀，这从空气动力学的角度来看，效率很低。但现在，通过使用高速摄像机和风洞试验技术，研究人员称他们已经解开了这个谜题。

When taking off, the **leading edges** of the butterfly's wings come together to form an **air pocket**. This improves the efficiency of the wing **clap**, pushing the butterfly forward at speed. The researchers say that this **flying trick** has helped the **slow-moving** creatures escape predators and thrive.

在起飞时，蝴蝶翅膀的前缘并合，形成一个气穴。这提高了拍动翅膀的效率，推动蝴蝶快速前进。研究人员说，这个飞行技巧帮助了行动缓慢的蝴蝶逃脱捕食者的追捕，并茁壮成长。

The authors believe the discovery could prove useful in other spheres. Some **drone** devices and **underwater** vehicles already use **propulsion** systems based on a wing clapping motion, but with limited success. The researchers say that the natural approach developed by butterflies could dramatically improve the performance.

此研究的作者们认为，这一发现可能会在其它领域派上用场。一些无人机装置和水下航行器已经使用了基于拍翅运动原理的推进系统，但成效甚微。研究人员说，由蝴蝶演变出的自然方法可能会大大提高推进系统的性能。

1. 词汇表

fluttering	拍打、颤动（翅膀）
delicate	小巧脆弱的
aerodynamically	空气动力学方面，空气动力学地
high-speed cameras	高速摄像机
solved the puzzle	解决了谜题
leading edges	前缘
air pocket	气穴
clap	拍动
flying trick	飞行技巧
slow-moving	行动缓慢的
drone	无人机
underwater	水下的
propulsion	推进，推动力

2. 阅读理解：请在读完上文后，回答下列问题。（答案见下页）

1. True or false? *Scientists have always been able to explain how butterflies can fly with large, inefficient wings.*

2. What did researchers use to solve the mystery of butterfly flight?

3. When taking off, which parts of the butterfly come together to form an air pocket?

4. In which area, according to the authors, could the discovery prove useful?

3. 答案

1. True or false? *Scientists have always been able to explain how butterflies can fly with large, inefficient wings.*

False. The fluttering flight patterns of butterflies have long baffled scientists.

2. What did researchers use to solve the mystery of butterfly flight?

Researchers used high-speed cameras and a wind tunnel to solve the puzzle.

3. When taking off, which parts of the butterfly come together to form an air pocket?

The leading edges of the butterfly's wings.

4. In which area, according to the authors, could the discovery prove useful?

According to the authors, it could dramatically improve the performance of propulsion systems used in drone devices and underwater vehicles.