

Artificial butterfly in flight and filmed (w/ Video)

May 20 2010

A group of Japanese researchers, who publish their findings today in *Bioinspiration & Biomimetics*, have succeeded in building a fully functional replica model - an ornithopter - of a swallowtail butterfly, and they have filmed their model butterfly flying.

Among the various types of [butterflies](#), swallowtails are unique in that their wing area is very large relative to their body mass. This combined with their overlapping fore wings means that their flapping frequency is comparatively low and their general wing motion severely restricted.

As a result, swallowtails' ability to actively control the aerodynamic force of their wings is limited and their body motion is a passive reaction to the simple flapping motion, and not - as common in other types of butterfly - an active reaction to aerodynamics.

To prove that the swallowtail achieves forward flight with simple flapping motions, the researchers built a lifelike ornithopter in the same dimensions as the butterfly, copying the swallowtail's distinct wing shape and the thin membranes and veins that cover its wings.

Using motion analysis software, the researchers were able to monitor the ornithopter's aerodynamic performance, showing that flight can be realised with simple flapping motions without feedback control, a model which can be applied to future aerodynamic systems.

More information: Journal paper:

iopscience.iop.org/1748-3190/5/2/026003

Provided by Institute of Physics

Citation: Artificial butterfly in flight and filmed (w/ Video) (2010, May 20) retrieved 19 April 2024 from <https://phys.org/news/2010-05-artificial-butterfly-flight-video.html>

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