



INTRODUCING THE ALL-ELECTRIC CAR FROM THE ALL-ELECTRIC CAR COMPANY. Join the Movement @CODAAutomotive

- News Articles Videos Images Books
- Health & Medicine Mind & Brain Plants & Animals Earth & Climate Space & Time Matter & Energy Computers & Math Fossils & Ruins

Science News

Share Blog Cite Print Email Bookmark

How Butterflies Fly Thousands Of Miles Without Getting Lost Revealed By Researchers

ScienceDaily (Aug. 18, 2005) — Jerusalem -- While "navigation" systems in automobiles are a fairly new (and still costly) innovation, monarch butterflies have managed for millennia to navigate their way for a distance of some 3000 miles (4800 kilometers) each fall from Canada to Mexico (and vice-versa in the spring) without losing their way.

See Also:

Plants & Animals

- Insects (and Butterflies)
- Biology
- Birds
- Biochemistry Research
- Behavioral Science
- Animals

Reference

- Difference between a butterfly and a moth
- Monarch butterfly
- Caterpillar
- Fish migration

The phenomenon of long-range bird migration is a well-known one, but not in the insect world. Also, among birds their migration route is a round-trip one, which they make more than once in their lifetimes, while for the monarch it is strictly a one-way trip for each butterfly. How do these creatures do it?

The mystery of the mechanisms involved in this remarkable phenomenon has been resolved by a team of scientists who did this by exploring the infinitesimal butterfly brain and eye tissues to uncover new insights into the biological machinery that directs this delicate creature on its lengthy flight path.

The research team, led by Prof. Steven Reppert of the University of Massachusetts Medical School,

included Dr. Oren Froy, now of the Faculty of Agricultural, Food and Environmental Quality Sciences of the Hebrew University of Jerusalem. Others involved were from the Czech Academy of Sciences and the University of California, Irvine. Their latest findings were published in a recent issue of Neuron magazine, constituting a continuation of their earlier work, published in the journal Science.

While light in general is essential to the functioning of the "biological clock" in the butterfly brain -- governing its metabolic cycles, including its "signal" to migrate -- the researchers discovered that it is specifically the ultraviolet band of light that is crucial to the creature's orientation. The butterflies have special photoreceptors for ultraviolet (UV) light in their eyes which provide them with their sense of direction.

They proved that this ultraviolet "navigation" is crucial by placing butterflies in a "flight" simulator. When a UV light filter was used in the simulator, the butterflies lost their orientation

Further probing revealed a key wiring connection between the light-detecting navigation sensors in the butterfly's eye and its brain clock. Thus, it was shown that input from two interconnected systems -- UV light detection in the eye and the biological clock in the brain -- together guide the butterflies "straight and true" to their destination at the appointed times in their two-month migration over thousands of miles/kilometers.

Email or share this story: | More

Story Source:

Adapted from materials provided by The Hebrew University of Jerusalem, via EurekAlert!, a service of AAAS.

Need to cite this story in your essay, paper, or report? Use one of the following formats:



Monarch butterfly (Danaus plexippus). (Image courtesy of Iowa State University Extension)

Ads by Google

Covidien Healthcare

Covidien's New Technology Helps To Reduce Patient Recovery Time. www.Covidien.com

Top 10 Hottest Fragrances

Upto 90% Off Pupa In Stock, Free Shipping. Order Now! US.FragrancePrices.Net/

Free Wedding Butterflies.

Wedding and Memorial Butterflies Order now and get a dozen Free! SouthportButterflies.com/Releases

Email Migration Software

Award Winning Email Migration Product! Download Your Free Trial. www.Transend.com/EmailMigration

Related Stories

How Butterflies Fly Thousands Of Miles Without Getting Lost (Aug. 1, 2005) — While navigation systems in automobiles are a fairly new (and still costly) innovation, monarch butterflies have managed for millennia to navigate their way for a distance of some 3000 miles (4800 ... > read more



Migrating Monarch Butterflies 'Nose' Their Way To Mexico, Neurobiologists Discover (Sep. 25, 2009) — Since the late 1970s

scientists have studied the fascinating annual migration of monarch butterflies from across eastern North America to a single location in Mexico. Neurobiologists have now found ... > read more



As Monarch Butterflies Journey North, Gardeners Can Help Protect Species, Researcher Says (May 11, 2010) — It has been a hard winter for

Monarch butterflies. Low temperatures, storms and habitat destruction have all threatened the butterflies' overwintering population in ... > read more



Monarch Butterflies Reveal a Novel Way in Which Animals Sense Earth's Magnetic Field (Jan. 27, 2010) — Building on prior

Just In:

As Temperatures Rise, World's Lizards Disappear

Science Video News



Saving Butterflies

Waystations for monarch butterflies are sprouting up around the country. With milkweed plants and flowers such as zinnias that produce lots of ... > full story

Civil Engineers Design Walk Through Butterfly Museum Exhibit

Vision Researchers Test Theory on Visual Orientation

Psychologists, Human-Factors Engineers Design Computer-Generated Educational Outings

more science videos

INTRODUCING THE ALL-ELECTRIC CAR FROM THE ALL-ELECTRIC CAR COMPANY. Join the Movement @CODAAutomotive

Breaking News

... from NewsDaily.com

Stem cells regrow crucial hearing cells in mice



Dolphin, turtle deaths eyed for links to oil spill

Pest munches up China fields after GM crop sprays halt

Genes explain why Tibetans thrive in high places

Lizards face extinction from global warming: study

more science news

In Other News ...

Thai troops battle protesters as crisis deepens

Iraq's Qaeda names new "war minister", vows attacks

Afghan protest on civilian deaths turns violent, 1 dead

Pressure mounts on BP as Obama eyes

INTRODUCING THE ALL-ELECTRIC CAR FROM THE ALL-ELECTRIC CAR COMPANY. Join the Movement @CODAAutomotive

Researchers. ScienceDaily. Retrieved May 15, 2010, from http://www.sciencedaily.com/releases/2005/08/050814173536.htm

Note: If no author is given, the source is cited instead.

> [read more](#)



Habitat Destruction May Wipe Out Monarch Butterfly Migration (Apr. 5, 2008) — Intense deforestation in Mexico could ruin one of North

America's most celebrated natural wonders -- the mysterious 3,000-mile migration of the monarch butterfly. The astonishing migration may ... > [read more](#)

[York ends; no bomb found](#)

[Obama was suspected target of Indonesian jihadists: expert](#)
[California governor to update spending cut plans](#)

[more top news](#)

Copyright Reuters 2008. See [Restrictions](#).

Search ScienceDaily

Number of stories in archives: 85,770

Ads by Google

Faculty and Lab Web Sites

The leading designer of web sites for profs, labs, depts and colleges
www.academicwebpages.com

Sale - Butterfly Mirrors

Mr. Giraffe Mirrors! The #1 Selling Kids & Baby Mirror. Free Shipping
www.KidsBabyMirrors.com

Butterfly Photo

ClipArt - Pictures
Butterfly Photo
www.Bing.com

Beneficial Insects & IPM

Organic, All Natural Pest Controls & Integrated Pest Management Services
www.EverwoodFarm.com

Free Subscriptions

... from ScienceDaily

Get the latest science news with our free email newsletters, updated daily and weekly. Or view hourly updated newsfeeds in your RSS reader:

[Email Newsletters](#)

[RSS Newsfeeds](#)

Feedback

... we want to hear from you!

Tell us what you think of the new ScienceDaily -- we welcome both positive and negative comments. Have any problems using the site? Questions?

Your Name:

Your Email:

Comments:

Click button to submit feedback:

Find with keyword(s):

Enter a keyword or phrase to search ScienceDaily's archives for related news topics, the latest news stories, reference articles, science videos, images, and books.