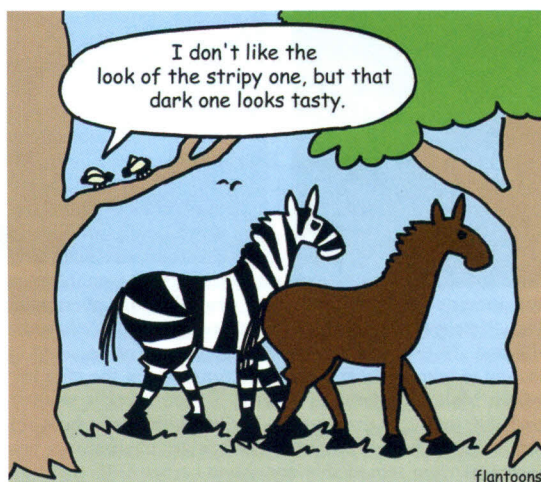


## HOW THE ZEBRA GOT ITS STRIPES



If there was a 'Just So' story for how the zebra got its stripes, I'm sure that Rudyard Kipling would have come up with an amusing and entertaining camouflage explanation. But would he have come up with the explanation that Gábor Horváth and colleagues from Hungary and Sweden have: that zebra's stripes stave off blood-sucking insects?

Horseflies (tabanids) deliver nasty bites, carry disease and distract grazing animals from feeding. According to Horváth, these insects are attracted to horizontally polarized light because reflections from water are horizontally polarized and aquatic insects use this phenomenon to identify stretches of water where they can mate and lay eggs. However, blood-sucking female tabanids are also guided to victims by linearly polarized light reflected from their hides. Explaining that horseflies are more attracted to dark horses than to white horses, the team also points out that developing zebra embryos start out with a dark skin, but go on to develop white stripes before birth. The team wondered whether the zebra's stripy hide might have evolved to disrupt their attractive dark skins and make them less appealing to voracious bloodsuckers, such as tabanids.

Travelling to a horsefly-infested horse farm near Budapest, the team tested how attractive these blood-sucking insects found black and white striped patterns by varying the width, density and angle of the stripes and the direction of polarization of the light that they reflected. Trapping attracted insects with oil and glue, the team found that the patterns attracted fewer flies as the stripes became narrower, with the narrowest stripes attracting the fewest tabanids.

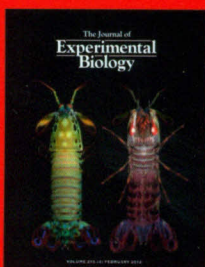
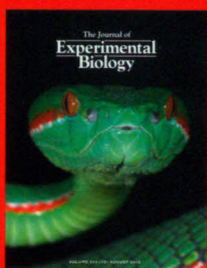
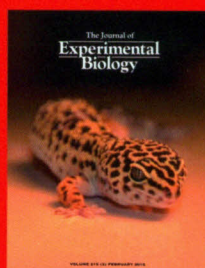
The team then tested the attractiveness of white, dark and striped horse models. Suspecting that the striped horse would attract an intermediate number of flies between the white and dark models, the team was surprised to find that the striped model was the least attractive of all.

Finally, when the team measured the stripe widths and polarization patterns of light reflected from real zebra hides, they found that the zebra's pattern correlated well with the patterns that were least attractive to horseflies.

'We conclude that zebras have evolved a coat pattern in which the stripes are narrow enough to ensure minimum attractiveness to tabanid flies', says the team and they add, 'The selection pressure for striped coat patterns as a response to blood-sucking dipteran parasites is probably high in this region [Africa]'.

Egri, Á., Blahó, M., Kriska, G., Farkas, R., Gyurkovszky, M., Åkesson, S. and Horváth, G. (2012). Polarotactic tabanids find striped patterns with brightness and/or polarization modulation least attractive: an advantage of zebra stripes. *J. Exp. Biol.* **215**, 736-745.

The Journal of  
**Experimental  
Biology**  
Highlights



2012



## PREFACE

As 2012 draws to a close, it is time to reflect on yet another eventful year at *The Journal of Experimental Biology*, and what better way to do that than to compile the annual Highlights booklet featuring a selection of articles and light-hearted illustrations from the journal's Inside JEB column. Published in each issue of the journal, Inside JEB articles briefly summarise the key revelations from a piece of research and the background story behind the facts. Reporting a range of novel discoveries, from hygienic bees that cleanse contaminated brood to the effect of chocolate on snail memories, Inside JEB reflects the wide range of subjects covered by the journal – from neuroethology and biomechanics to eco- and comparative physiology.

In addition to making research accessible to specialists and non-specialists alike, the journal has continued to strengthen the links that it has established with the media in recent years to raise the public profile of integrative biology. High-impact stories that made the news this year included an explanation for why zebras have stripes, the discovery that false killer whales squint acoustically and the first observations of bioluminescence from the deep-sea benthos.

While 2012 has been another successful year in terms of public outreach, we continued to expand our presence on the Internet with the launch of a newly designed mobile website. Automatically directing iPhones and Androids to the website, which is optimised for use on devices with small screens, the new facility offers JEB readers improved access to the journal whenever and wherever they like through mobile telephone networks and Wi-Fi technology.

This year, we also branched out by launching an additional section in the journal. Methods & Techniques is a new venue for authors to submit manuscripts reporting innovative methodological advances or significant modifications to recognized methods of data collection and analysis. In addition to outlining the essential components of a technical development, Methods & Techniques papers also validate each new approach by demonstrating its application to real physiological data.

Continuing the theme of improved service, we also implemented publication of Advance Online Articles in May 2012 (<http://jeb.biologists.org/content/early/recent>). Accelerating the publishing process, Advance Online Articles provide subscribers with access to peer-reviewed author manuscripts soon after acceptance by the Editors and prior to thorough copyediting and layout in preparation for official publication. Authors can sign up to receive email alerts – at <http://jeb.biologists.org/cgi/alerts/etoc> – when Advance Online Articles are posted on the journal website to keep up to date with all of the most recent scientific developments in the journal.

And finally, returning to Inside JEB, I would like to mention and thank the other people who have contributed to the section in 2012: Neil Smith, Mike Flanagan and Frank Fish, who continue to contribute light-hearted cartoons, and Yfke Hager, who has written some of the articles. I am also extremely grateful to the authors of each piece of research featured in this collection, who contributed their help and time checking the factual and scientific accuracy, ensuring the value and authority of each article.

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# CONTENTS

- |    |   |    |  |
|----|---|----|--|
| 5  | Parakeets articulate sounds with tongue               | 33 | Jumping spiders identify victims by their antennae           |
| 6  | Penguins time dives by wing beat                      | 34 | How cheetahs outpace greyhounds                              |
| 7  | Hygienic bees cleanse damaged brood                   | 35 | Why slim ants listen to the collective stomach               |
| 8  | Snakes hear through skull vibration                   | 36 | Ants' slope-scaling costs                                    |
| 9  | Bee visual processing more complex than thought       | 37 | Flies anti-track to evade foul smells                        |
| 10 | Temperature gradient produces two-stroke muscle       | 38 | Diving dolphins raise exercise heart rate                    |
| 11 | How lizards take off from a standing start            | 39 | How geckos cope with wet feet                                |
| 12 | Bed bugs less selective than thought                  | 40 | Canaries can't cheat on sexy a syllables                     |
| 13 | Spiders flex leg with muscle to take off              | 41 | Approaching bats reduce volume exponentially                 |
| 14 | Shark skin produces propulsion                        | 42 | Reliability is key for ant decisions                         |
| 15 | Old flies lose sex appeal                             | 43 | Optic flow gives stingless bees impressive vertical accuracy |
| 16 | How the zebra got its stripes                         | 44 | Bright life in the benthos                                   |
| 17 | Buckling zone protects locust legs                    | 46 | Symbiotic algae deliver glucose                              |
| 18 | Tarantulas do not shoot silk from feet                | 47 | Hummingbirds make flying backwards look easy                 |
| 19 | False killer whales focus echolocation clicks         | 48 | Chocolate makes snails smarter                               |
| 20 | Endocannabinoids motivated exercise evolution         | 49 | Hatchling loggerhead turtles pick up dms                     |
| 21 | Preferred hosts don't offer best dining opportunities | 50 | Whale lunges dissected                                       |
| 22 | Manatees should hear looming danger                   |    |  |
| 23 | Insect cuticle tougher than bone                      |    |  |
| 24 | Why ring-tailed lemurs never trot                     |    |  |
| 25 | Waggle dance affects hive mass                        |    |  |
| 26 | Tropical birds downsized organs                       |    |  |
| 27 | Swimming helps simulated turtles stay on course       |    |  |
| 28 | Recipe for a successful touch down: fly style         |    |  |
| 29 | Crayfish compete for comfortable temperature          |    |  |
| 30 | Skates fine-tune cartilage for punting                |    |  |
| 31 | Razor clams turn soil into quicksand to burrow        |    |  |
| 32 | How bumblebees cope with shade and change             |    |  |

# The Journal of Experimental Biology

*The Journal of Experimental Biology* offers graduate students and postdoctoral researchers Travelling Fellowships up to the value of £2,500, to offset travel and expenses involved in collaborative visits to other laboratories.

Applications will be considered by the editors of *The Journal of Experimental Biology*, who will be guided by the excellence of the candidates and the importance and innovative quality of the work to be done.

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- A brief CV
- A publication list
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