Ecological Monitoring: Moth Trapping

John Owen

JOwen@live.harper.ac.uk

Moths in Ecology

- Important component of food webs

“Each chick can eat 100 caterpillars a day, so to feed a brood of ten, adults need to find as many as 1,000 caterpillars a day.”

Source - BTO

Image Hedera Baltica https://www.flickr.com/photos/hedera_baltica/

‘one bat can eat up to 3,000 insects in one night!’

The Wildlife Trusts

Image: Derek Keats https://www.flickr.com/photos/93242958@N00/48979552292

Pollination Services

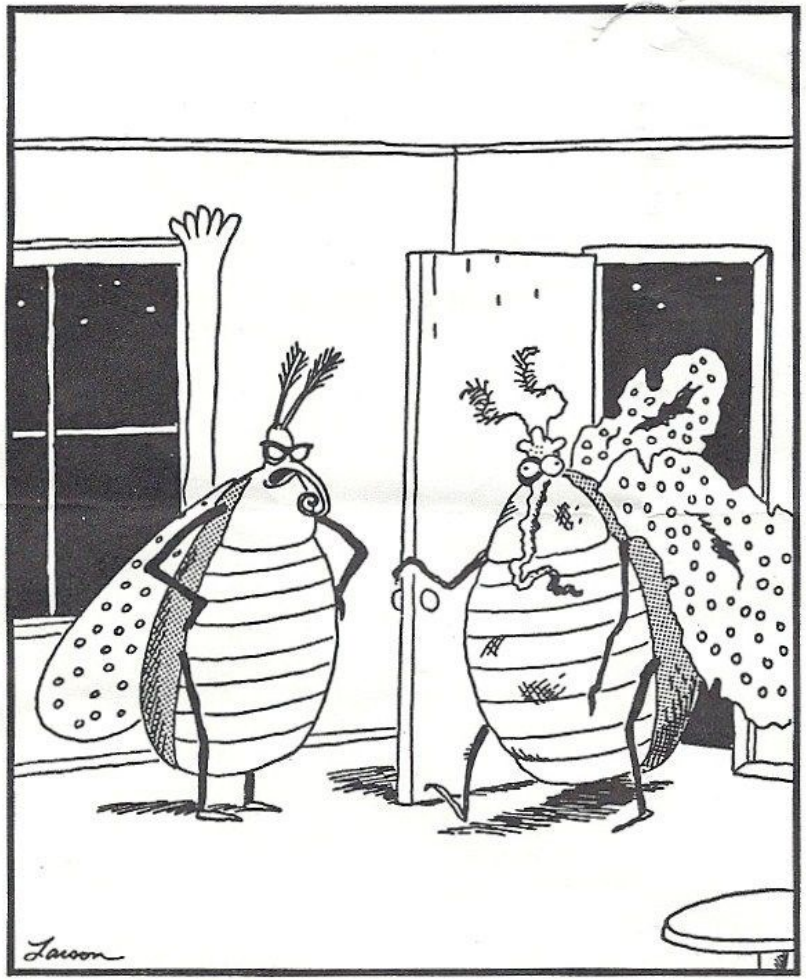
Imagecredit|credit=WineCountryInn|captureDate=August 15, 2010|location=Vail|source=Meredith Tally|caption=Hummingbird Moth|description=A Whitelined Sphinx Hummingbird Moth sips nectar from a columbine, the state flower of Colorado, White River National

Darwin’s Moth

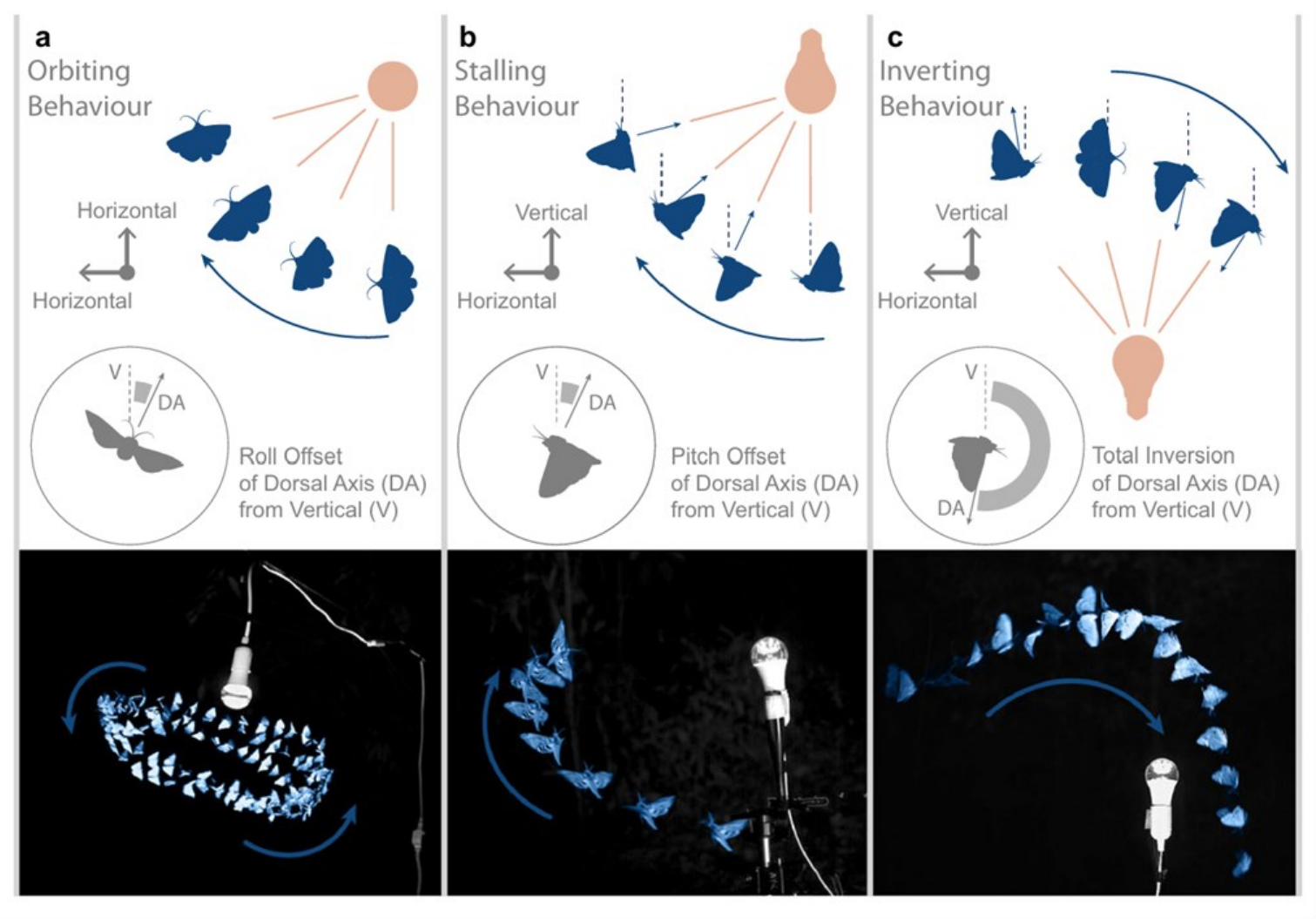
Image:- Edward Rook https://www.flickr.com/photos/edwardrooks/8704559327

Moths in Ecology

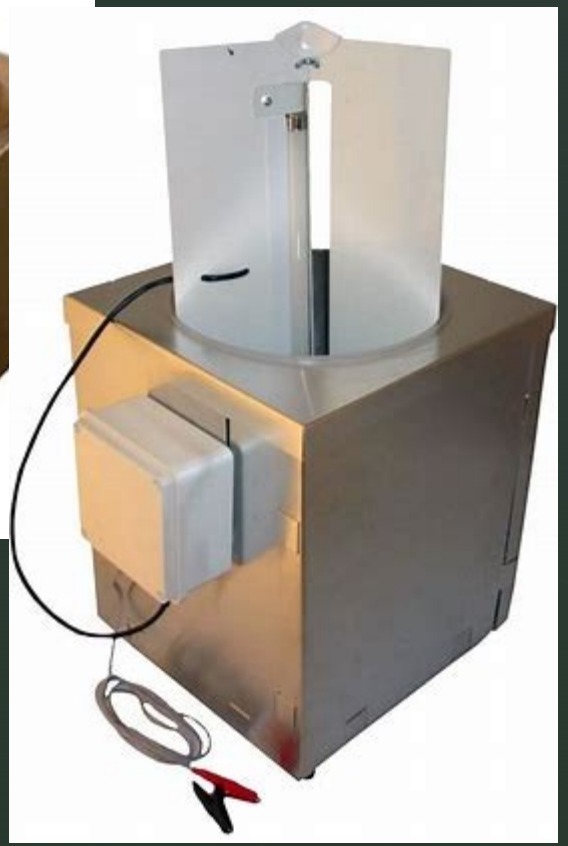
- Hyperdiverse Order
- Diverse Range of Habitats and Niches
- Easy to Monitor & Identify
- Attractive Subject for Citizen Science



"Good heavens—just *look* at you! You've been down at the Fergusons' porch light, haven't you?"



Fabian, S.T., Sondhi, Y., Allen, P.E. et al. Why flying insects gather at artificial light. Nat Commun 15, 689 (2024). https://doi.org/10.1038/s41467-024-44785-3



The Robinson Trap

Pros & Cons

- Best Retention Rates
- Bulky
- EXPENSIVE!!!

The Skinner Trap

Pros & Cons

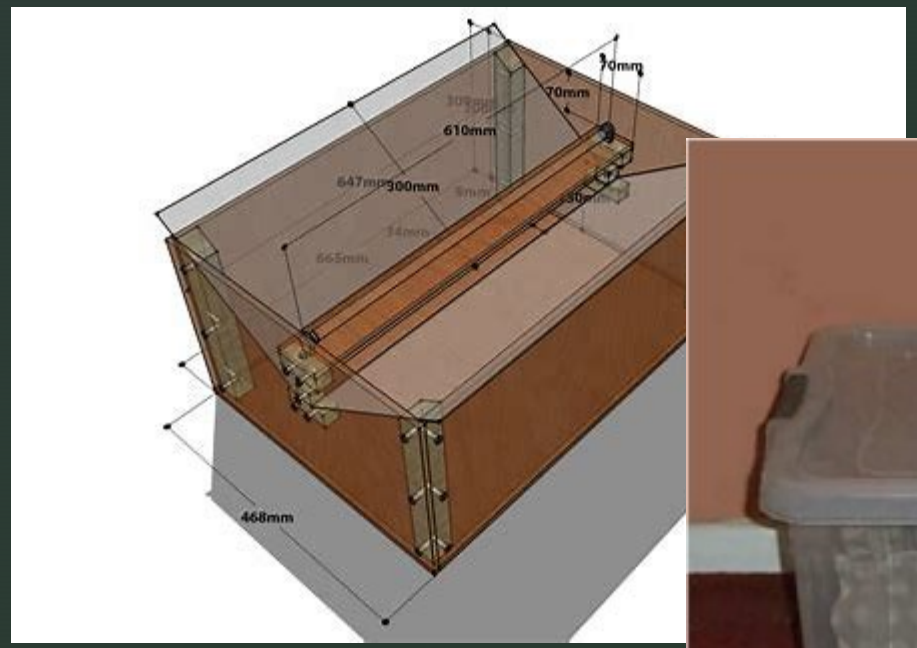
- Less Expnsive
- Not by Much!!
- Slightly Less Retention???
- You Can Check the Catch
- Packs Flat

The Heath Trap

Pros & Cons

- Cheapest

Make Your Own!!!




a
b
c

Light Source

Mercury Vapour

Pros & Cons

- Best Catch Rates
- Run Hot
- BRIGHT!!!
- They’re Banned

Actinic Tubes

Pros & Cons

- Slightly Less Effective Than MV
- Less Intrusive
- Available at Different Wattages
- Easy To Use Away From Home

LED

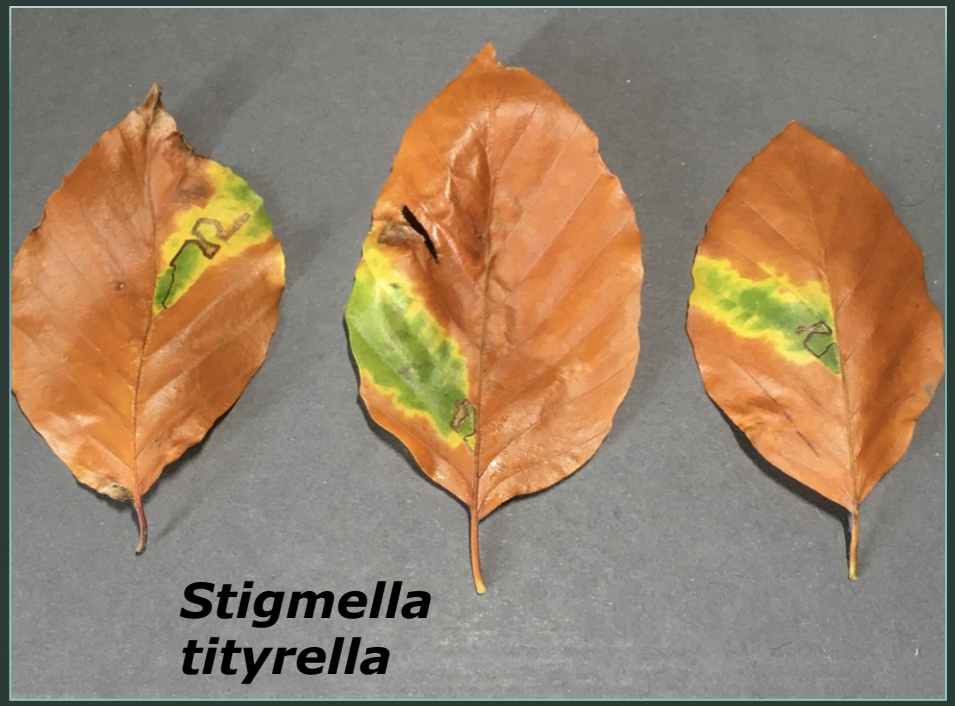
Pros & Cons

- Slightly Less Effective Than Actinic But Still Effective
- Less Intrusive
- Battery Efficiency
- Very Easy To Use Away From Home

Power

- Mains
- 12V Battery
- Generator

Sugaring



Leaf Mines

Pheromone Lures

What Can Moth Records Tell Us?

Image - https://biol420.opened.ca/the-near-miss-moth/

What Can Moth Records Tell Us?

- The Rothamsted Insect Survey
- Network of c. 70 - 80 Run Every Night Since 1968
- Moth Numbers Have Declined 31% over 47 years
- Sharpest Declines are in Coastal and Woodland Moths

The Garden Tiger – *Arctia caja*

90% decline in 50 years

The Footman Moths - *Eilema spp.*

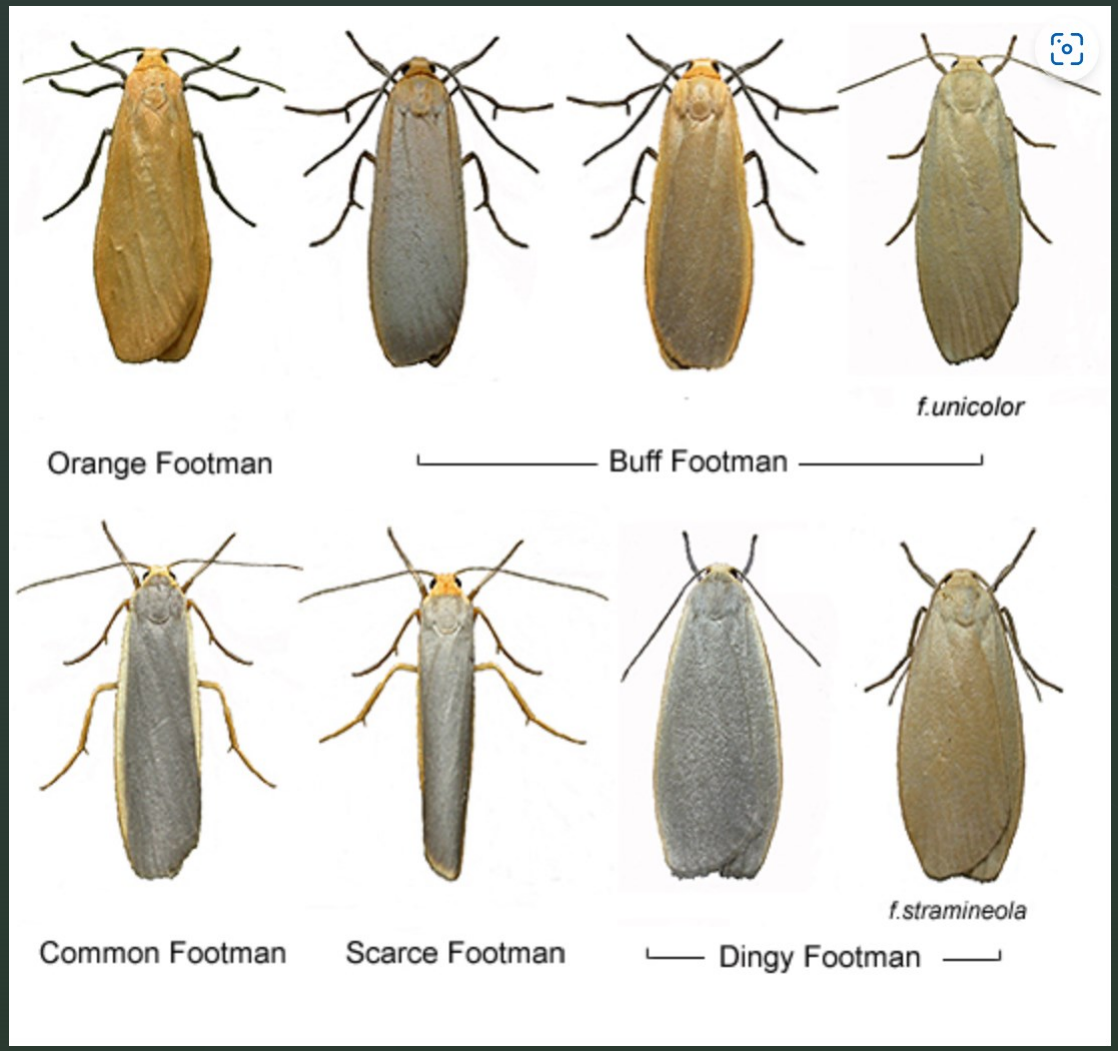


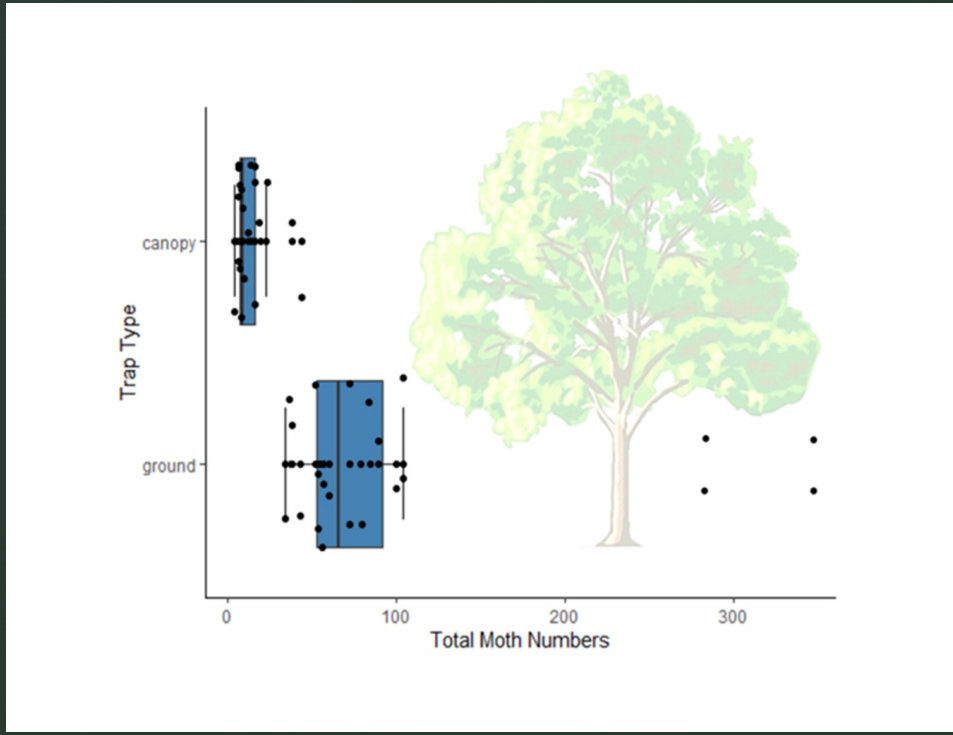
Image by kind permission of Trevor Pendleton www.eakringbirds.com

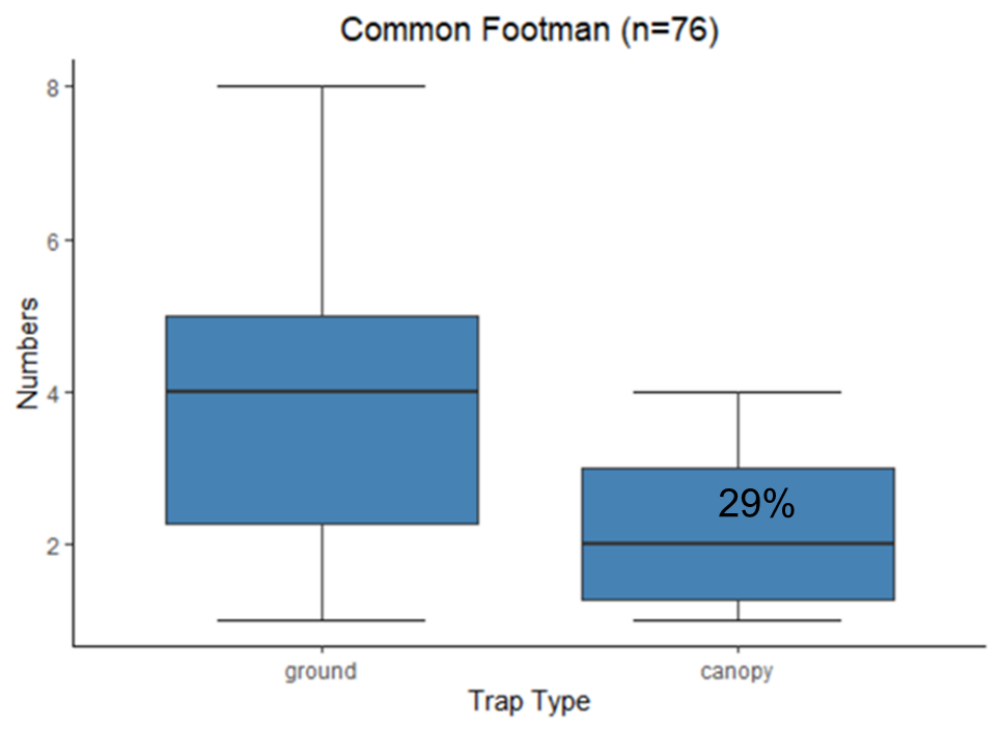
1979 – 2016

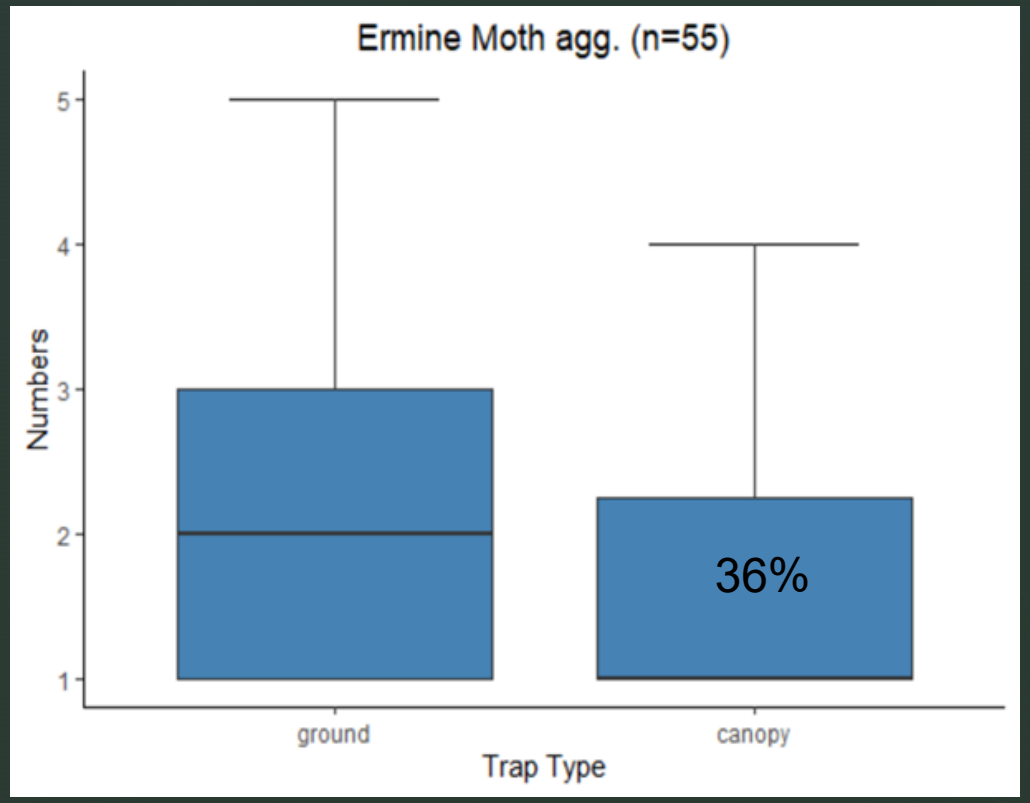
- Common Footman – 49%
- Scarce Footman – 629%
- Dingy Footman – 5500%
- Orange Footman – 10,000%

Acid Rain

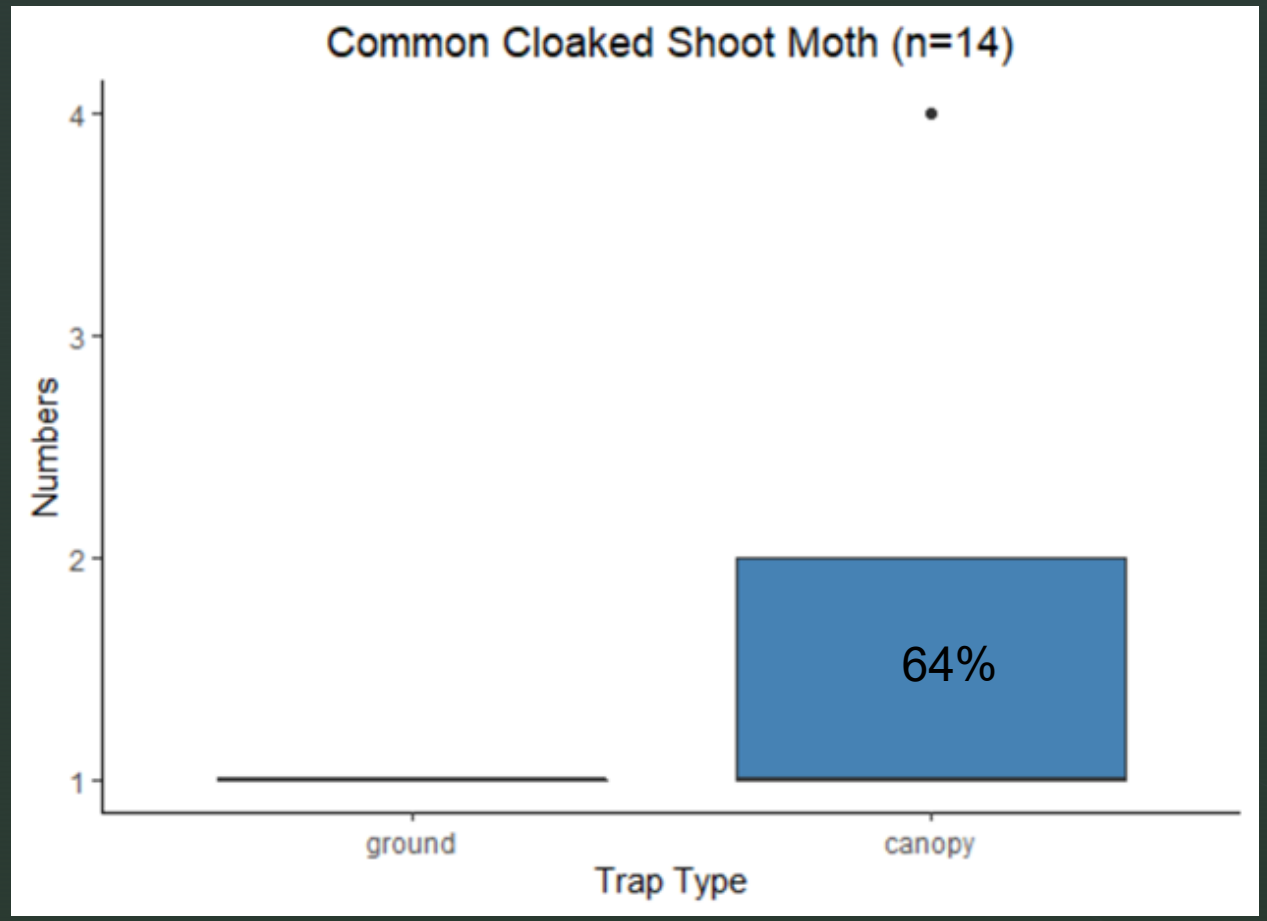
Common Footman
- *Eilema lurideola*



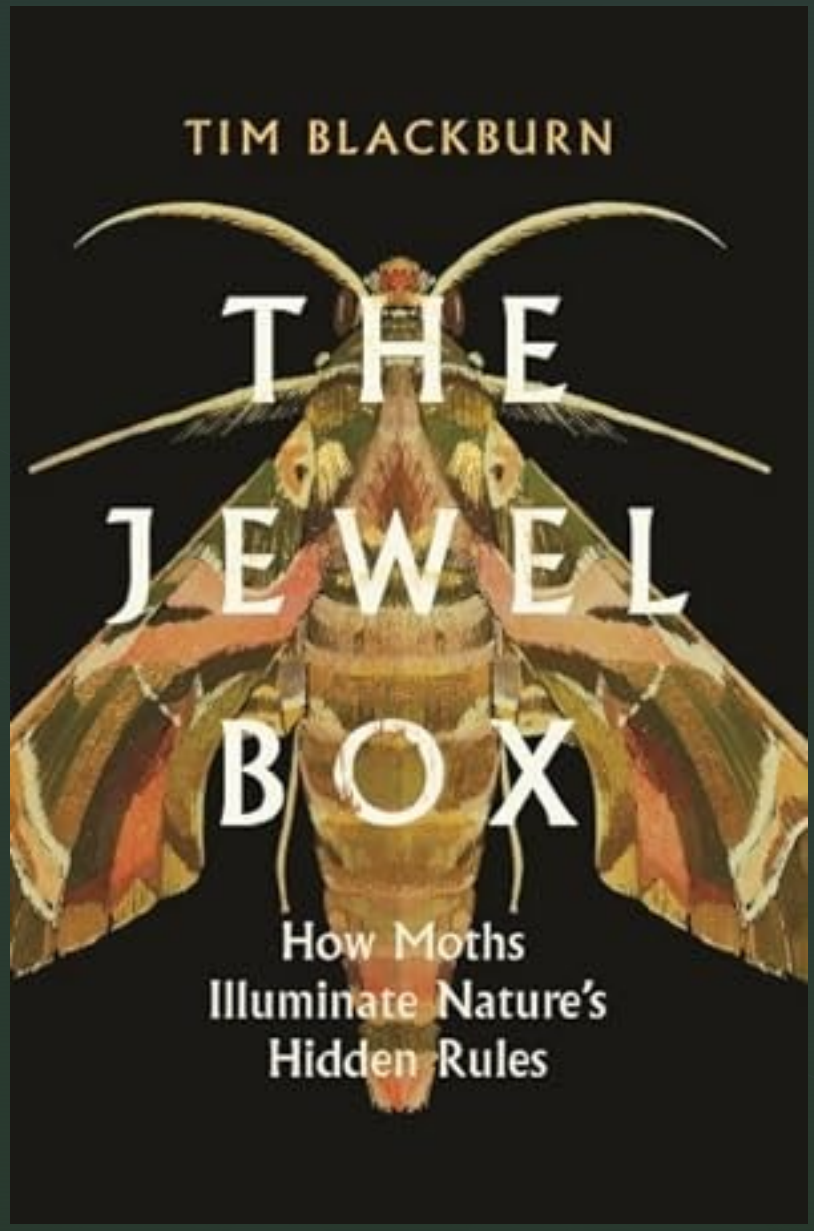




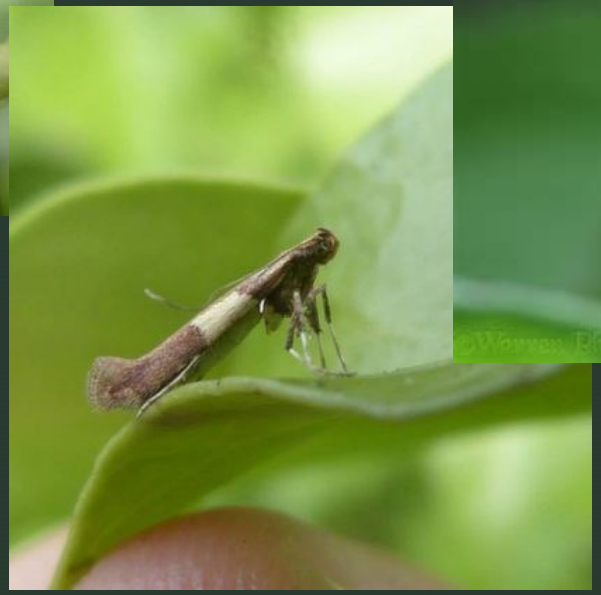
Welch's Two Sample t-test: t = -1.56, df = 24.25, p-value = 0.13



Welch's Two Sample t-test: t = -1.372, df = 4, p-value = 0.242)


TIM BLACKBURN
THE JEWEL BOX
How Moths Illuminate Nature's Hidden Rules

Micros



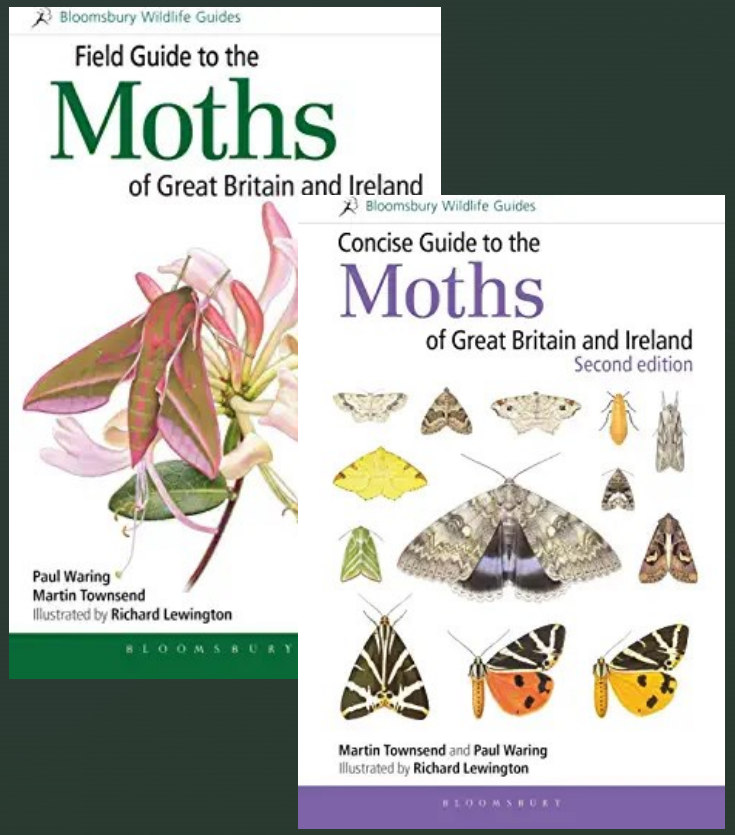

Gordon Woodcock

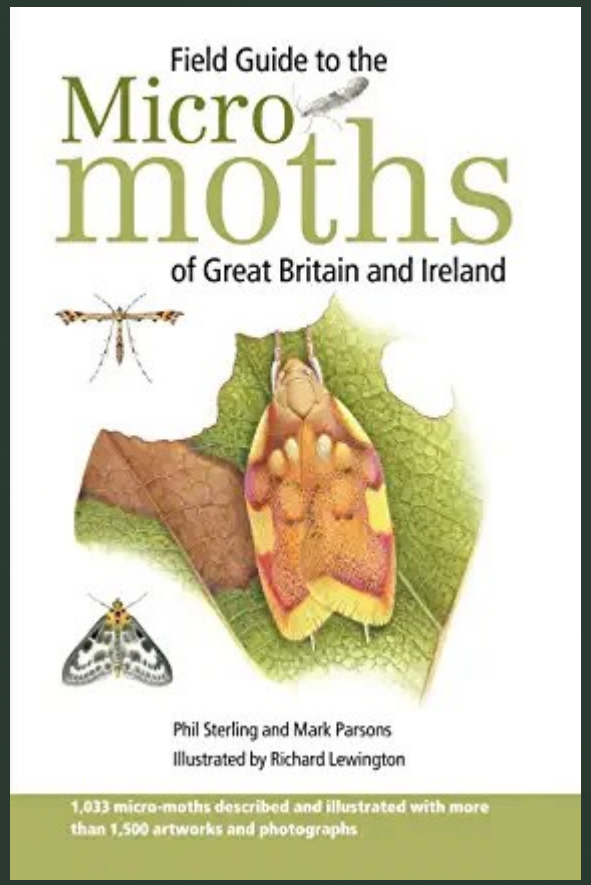
Questions?

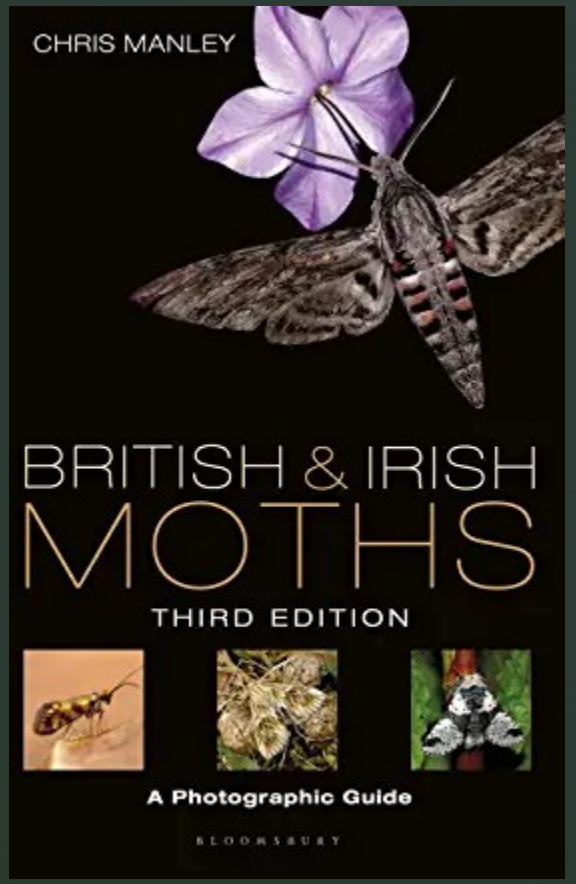
John Owen

JOwen@live.harper.ac.uk

Guide Books


Bloomsbury Wildlife Guides
Field Guide to the
Moths
of Great Britain and Ireland
Paul Waring
Martin Townsend
Illustrated by Richard Lewington
BLOOMSBURY
Bloomsbury Wildlife Guides
Concise Guide to the
Moths
of Great Britain and Ireland
Second edition
Martin Townsend and Paul Waring
Illustrated by Richard Lewington
BLOOMSBURY


Field Guide to the
Micro
moths
of Great Britain and Ireland
Phil Sterling and Mark Parsons
Illustrated by Richard Lewington
1,033 micro-moths described and illustrated with more than 1,500 artworks and photographs


CHRIS MANLEY
BRITISH & IRISH
MOTHS
THIRD EDITION
A Photographic Guide
BLOOMSBURY