



Artificial Light and Arthropods

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Presented by Dirk Bockmühl



Why are birds at airports?

- Ecological services:
 - Food
 - Nesting material
 - Roosting sites



Insects are a major food-source

- Main culprits of collisions at airports around Windhoek:

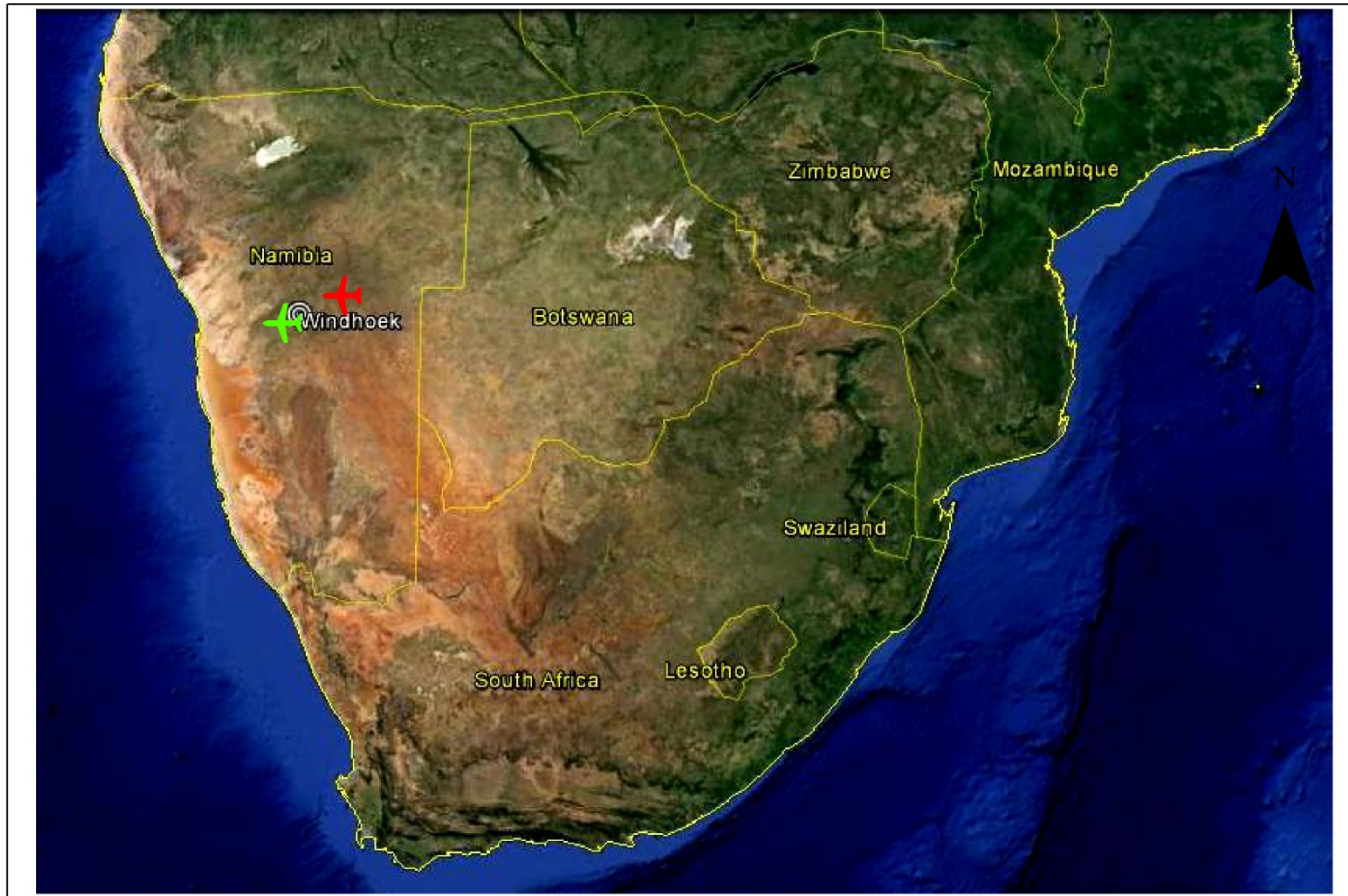


Photos: Internet; Dirk Bockmühl; Morgan Hauptfleisch

Insects are also attracted to light at night (phototaxis)



The study areas



Hosea Kutako International Airport



Eros Airport



Country borders

Base image: Google Earth (2013)

PHASE 1

Eros Airport &

Hosea Kutako International Airport

We set up an experiment (Phase 1)

- 50 x light traps;
 - Some with white light;
 - Some with yellow light;
 - Some with orange light; and
 - Some with no light (control)



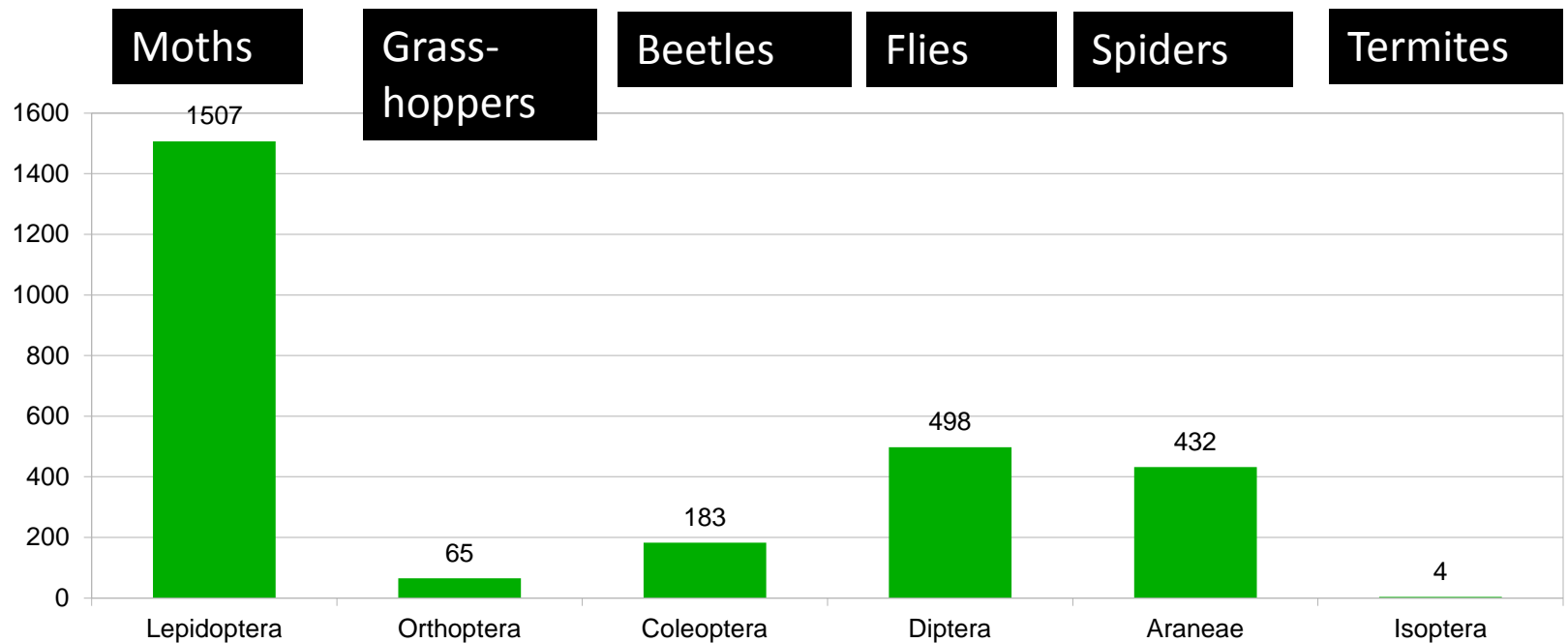
Photos: M. Hauptfleisch



What we found (Phase 1) -

Arthropods:

Number of arthropods attracted to light



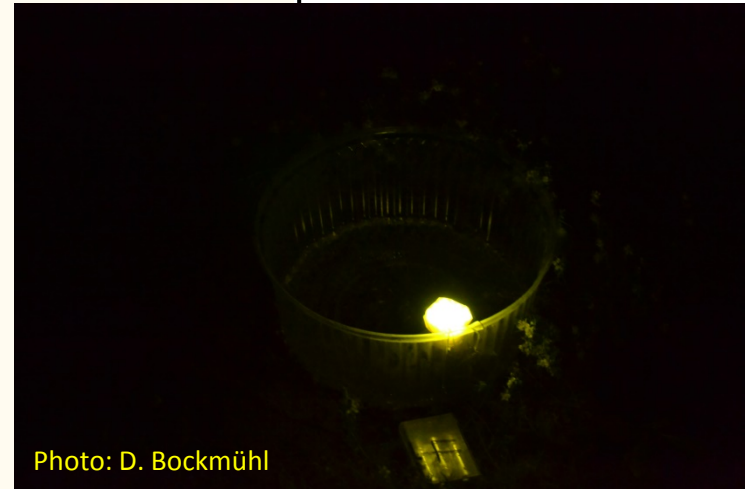
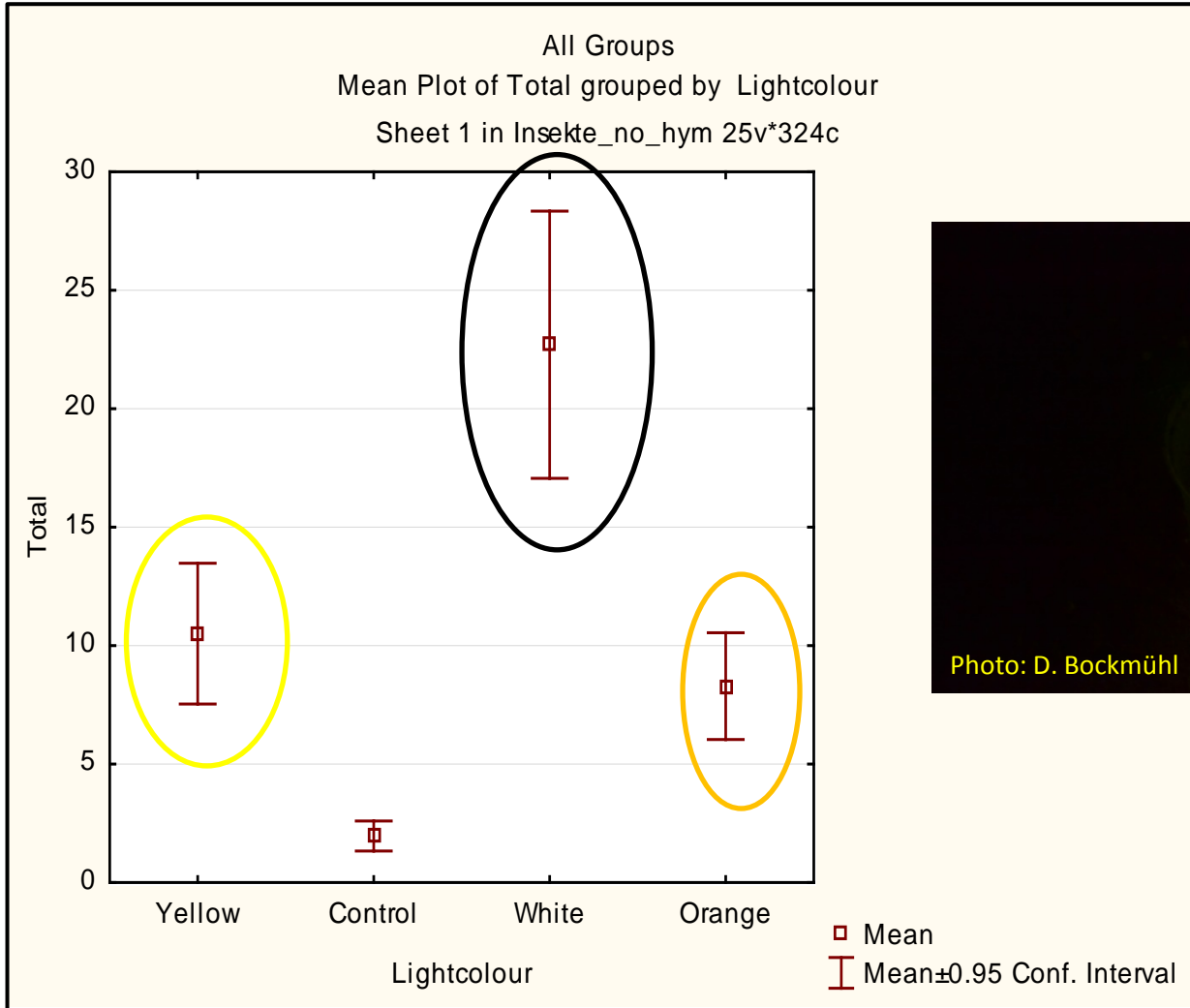
What we found (Phase 1) - Arthropods:

Percentage contribution to trap success per arthropod order found in stomach contents of birds

Arthropods found in stomach content (Hauptfleisch, 2011)	Percentage contribution to trap success
Coleoptera	4.76% (183)
Orthoptera	1.74% (65)
Diptera	13.18% (498)
Lepidoptera	39.89% (1507)
Arachnida	11.33% (432)
Isoptera	0.10% (4)

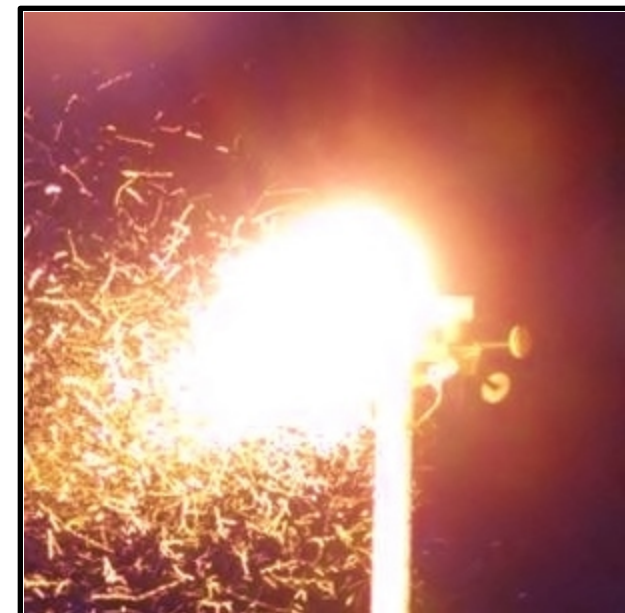


What we found (Phase 1) – Artificial Lights:



What we concluded (Phase 1)

- By filtering the white apron lights at the airport with yellow or orange, the attraction to arthropods should be reduced significantly.



PHASE 2

Hosea Kutako International Airport

What we did (Phase 2)

- **Insects:**

- Collected on the apron at Hosea Kutako (using the quadrat-method); identified; counted; dried; and weighed



Photos: C. D'Alton



What we did (Phase 2)

- **Birds:**

- **Observed; counted; and identified on the apron at Hosea Kutako and in an area away (non-mowed) from the apron, using the point-count-distance survey method.**



What we found (Phase 2) - Birds:

- **Unmown grassland:**
 - Greater species richness;
 - 62% were medium - high risk.
- **Apron:**
 - 82% were medium - high risk.



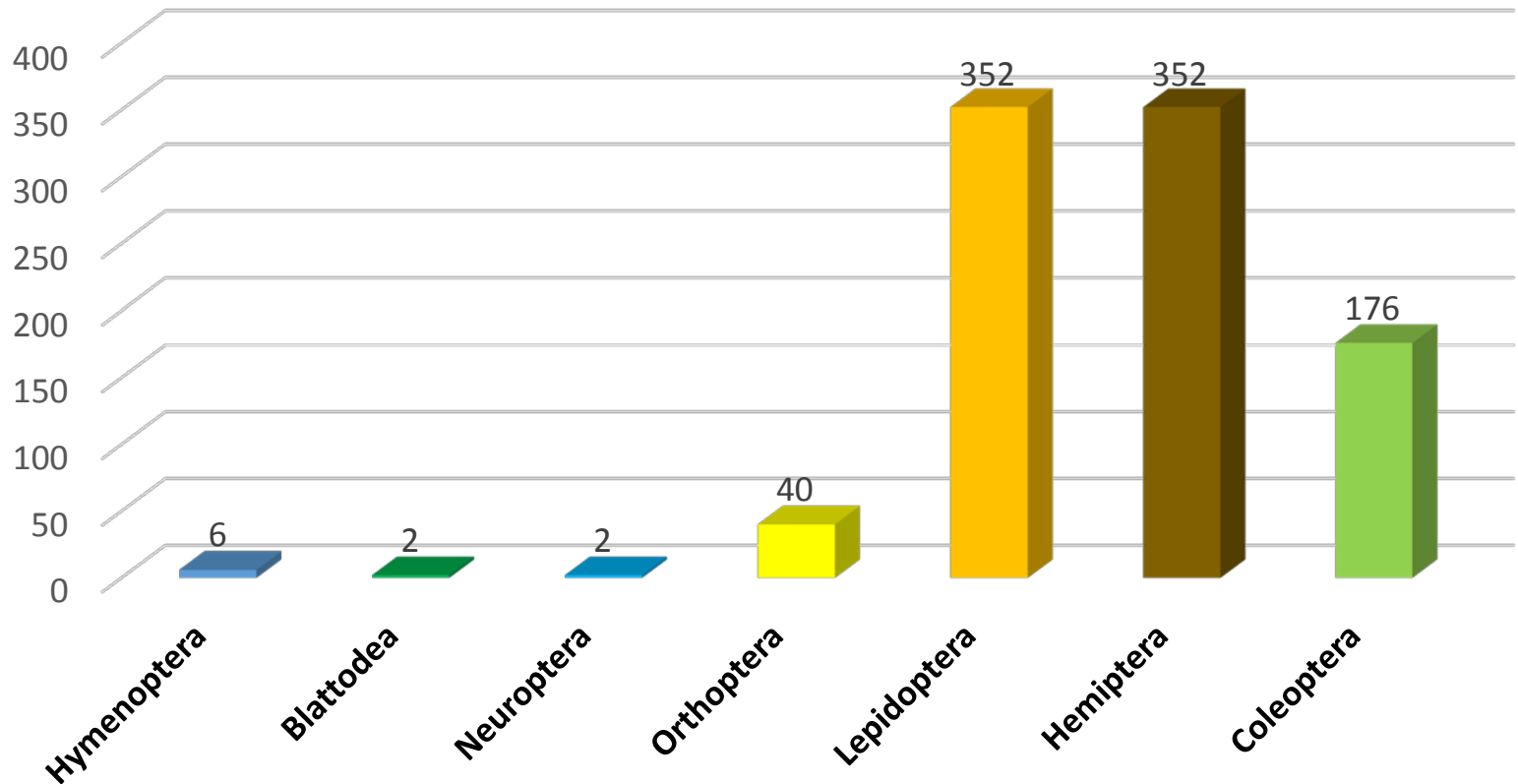
What we found (Phase 2) - Birds:

- Due to the attraction to insects, every second bird was observed feeding on the apron
- Only 2% of birds seen feeding in the unmown grassland



What we found (Phase 2) - Insects:

Total number of individuals collected per Order for the period 25 February 2014 - 01 April 2014.



What we found (Phase 2) - Insects:

- **61% of insects collected belong to the same families as the ones found in the stomach contents of birds**
- **Lepidoptera (moths) are a favourite food source of many insectivorous birds**



Photos: C. D'Alton; D. Bockmühl



Phase 3: Changing of light colour

During this third and final phase, the same methods will be used to observe the insects and birds. The colour of light at the apron will be changed to yellow.



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