

Collecting methods for (mostly) moths



SWRS Lepidoptera Course, Aug. 2011
Chris Schmidt
Canadian National Collection of Insects
Ottawa, CAN

Collecting methods for moths

- aerial netting
- pheromone traps
- rearing
- light trapping
- baiting

Aerial netting

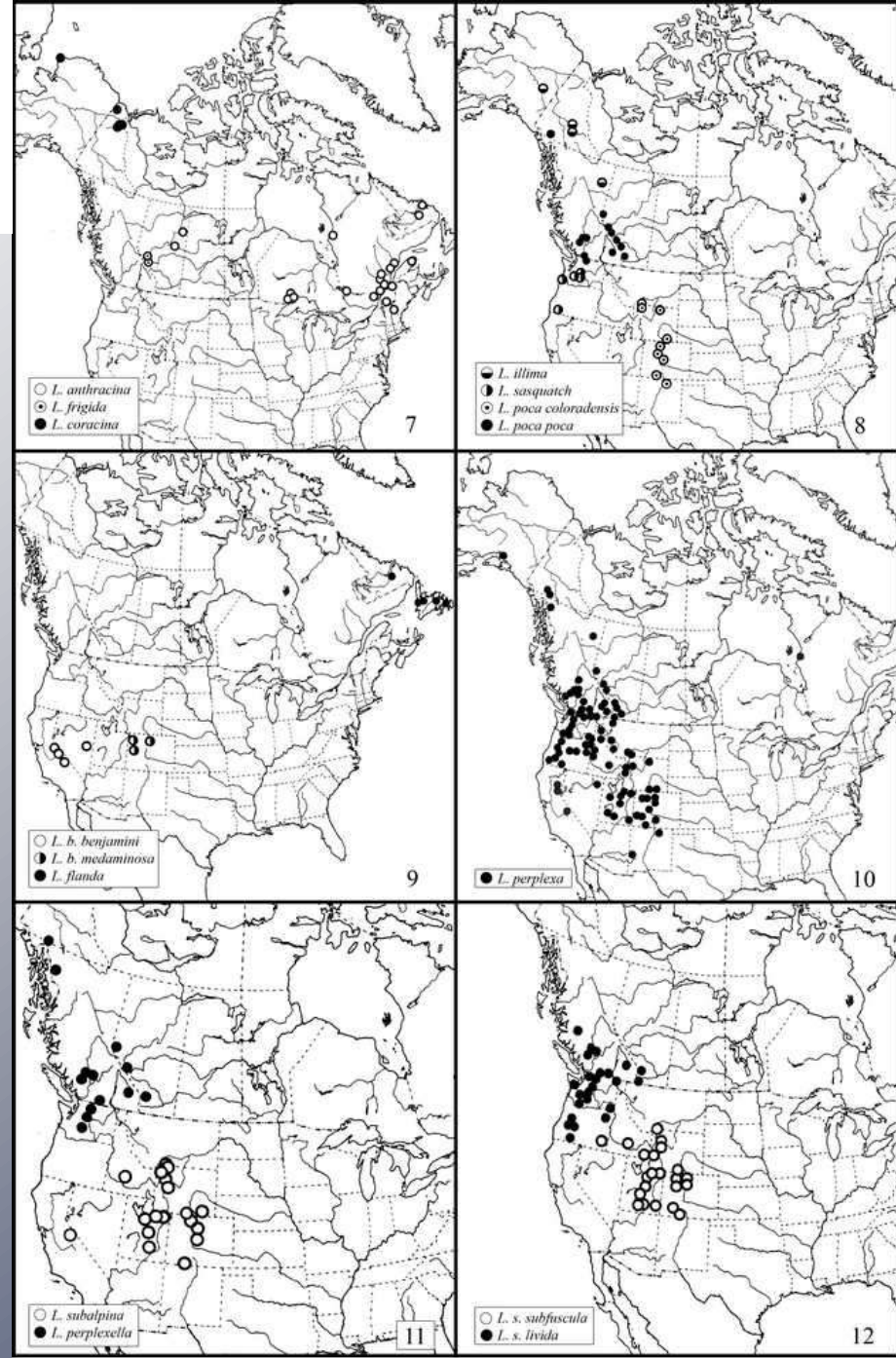
- primary method for sampling butterflies
- v. important collecting method for day-flying- and micro-moths
 - many diurnal moths under-represented in collections
 - diff't 'search image' needed compared to butterflies – most very fast/'buzzy', overlooked by butterfly enthusiasts

Examples of diurnal moths



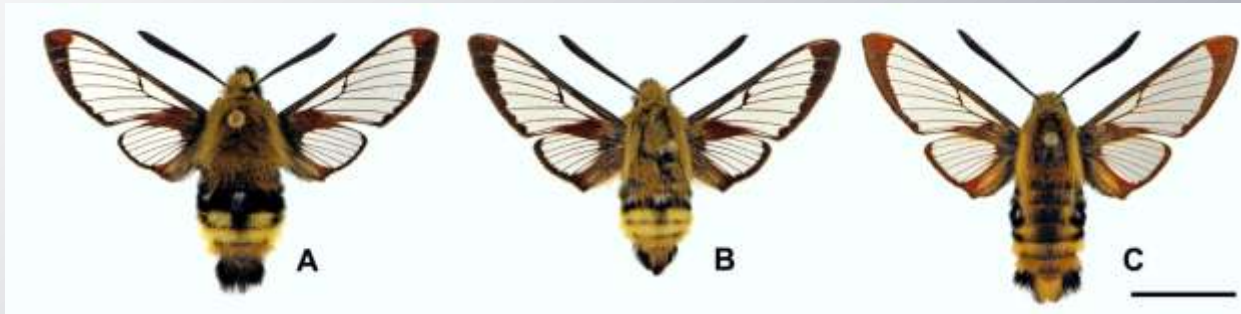
large proportion of high-elev'n species are diurnal

Alpine groups still poorly known;
Lasionycta: 43 species, 17 new
 (Crabo & Lafontaine 2009)



Diurnal moths

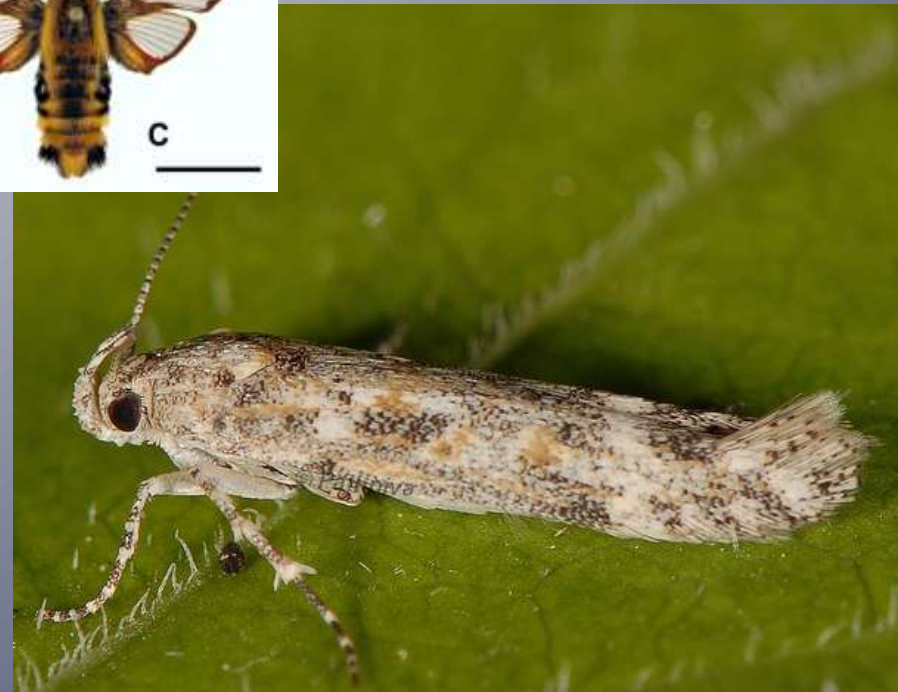
Diurnal moths often under-represented in collections



Alypiodes geronimo [MONA 9313]

AZ Cochise Co, Huachuca Mts, Aug 10 1923
(Smithsonian collection)

AZ Pima Co, Baboquivari Mts, 1-15 Aug 1921
Poling leg (Smithsonian collection)



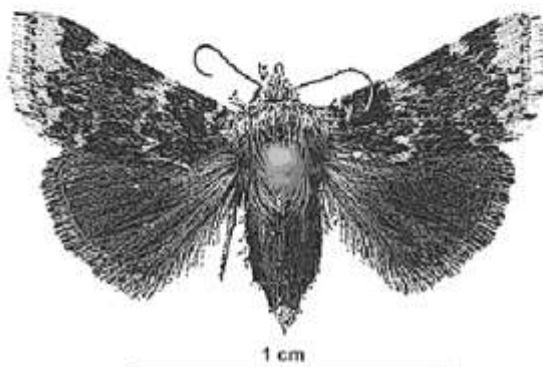


COSEWIC Assessment and Status Report

on the

Gold-edged Gem *Schinia avemensis*

in Canada



ENDANGERED
2006

COSEWIC
COMMITTEE ON THE STATUS OF
ENDANGERED WILDLIFE
IN CANADA



COSEWIC
COMITÉ SUR LA SITUATION
DES ESPÈCES EN PÉRIL
AU CANADA



Specimen storage

- use a killing jar (pinching won't work)
- field storage – remove from kill jar ASAP and layer in cotton or field-pin
- micro-moths should be kept live (1 per vial) until ready to pin

Pheromone trapping

- use of synthetic pheromones (available for economically important groups: Sesiidae)



Pheromone trapping

- baiting with 'calling' virgin females (reared)
- ideal for diurnal, tough-to-catch species, especially Saturniidae, Lasiocampidae, Lymantriidae



Orgyia antiqua (me, circa 2005)

Hyalophora (Tuskes et al. '96)

Rearing

- great way to get good specimens, but also v. valuable biological data (larvae, hosts, behaviour, etc)
- search for larvae or confine wild-caught females (see Wagner's "Caterpillars of Eastern N. Am." book)



Light trapping

- various light trap types

	Pros	Cons
live traps	<ul style="list-style-type: none">- photography- release unwanted- no killing agent needed	<ul style="list-style-type: none">-process time-check early!-not suitable for inventory/taxonomy
kill traps	<ul style="list-style-type: none">- large volume, high qual.- best for faunal inventories	<ul style="list-style-type: none">-killing agent-dead moths
sheet collecting	<ul style="list-style-type: none">- more micros/Geometrids- choose target specimens	<ul style="list-style-type: none">-sleep deprivation!-bias to early-fliers-site/habitat sampling more limited

Light trap types

- bucket trap (or variations thereof)
 - most commonly used; live or kill-type



Bucket



Robinson



Skinner



Light trapping

- light placement – location, location, location!
- lights do not attract moths from more than about 20 ft (6m) away
- best bucket traps are only about 40% efficient
- only sampling a small area within a small timeframe of the flight period, and few are females
- you won't “kill all the moths”!

Light trapping do's and dont's

- placement: along flyways, eg. forest edges, ridge lines (on leeward side), cliff/rock cut edges, natural prominences
- avoid cold air pockets – usually the lowest spots in local topography
- light contrast – place trap in front of trees or topography
- if certain groups are targeted, knowledge of and proximity to host plants/habitat is essential

Baiting

- complementary to light trapping – many species at bait are rare at lights
- excellent way to get females for eggs
- 3 types:
 - sugaring – paint tree trunks
 - sugar roping – wine+sugar on ropes
 - cylinder mesh traps

Baiting

- “Sugaring” basic ingredients – sugar/molasses, yeast, rum, rotten fruit
- see e.g. Winter (2000)

Baiting

Sugar roping – red wine and sugar

- ideal for treeless habitats

Baiting

Cylinder traps

- less portable, but less effort than sugaring
- best for tropical butterflies and certain moth groups (*Catocala*, herminiines, xylenines)

Specimen storage

To avoid rubbed scales:

- keep vibration/shaking/transfer of trap contents to minimum
- remove large, hard-bodied insects (beetles)
- layer in cotton for transport / storage
- can be frozen until processed - remember data label!

Insect Label Standards

- collection data is as important as the specimen itself
- proper format for labels is therefore crucial

What to include on a label

- Absolute minimum:
 - locality
 - date

Should be unambiguous, understandable data:
think of who will be looking at the labels 50
years from now.

Locality data

- use official place names
- GPS co-ordinates are very valuable and virtually guarantee unambiguous locality data
- Google earth and web-based gazeteers
- therefore both locality names & lat-long's are best:

4 mi. W of Portal, Southwestern Res. Stn., 31.012N
109.238W

Date data

- format should be day-month-year
- use whole year (2010 not '10)
- use roman numerals (or letters) for month
 - lower case is preferred to upper case: ii vs. II

eg. 10.viii.2010 or 10.Aug.2010

Other label data

- elevation
 - name of collector(s)
 - collecting method (eg. UV It.)
 - habitat (brief!), time of day
-
- unique identifier codes (don't rely on these as sole data source!!!)

Label data format

- recommended sequence:

COUNTRY: state/prov.: locality

latitude & longitude [UTM generally not used]

date, collector

(method, habitat, codes)

- borders look nice but are not needed (and take up unnecessary space)

Printing labels

- generally 4 or 5 lines of text
- use simple fonts: Arial or Univers are good
- final label size should not exceed 6 mm x 17 mm
- use good-quality cardstock:
- 36-40 pound minimum, 60 pound best

Printing labels

- Use India ink or Pigma pens
 - long-term durability: don't use ball-point!

Laser printers

Setting up templates in Excel:

- eg. Arial Narrow 10-pt. font, print at 40% reduction (Print Preview -> Setup -> 40%)

Example: label data

CAN: AB: Jasper Natl. Park,
Jasper Lake sand dunes
53.097N 118.004W 3300'
17.May.2006 UV It.
C.Schmidt & J.Dombroskie

CAN: AB: Jasper Natl. Park,
Jasper Lake sand dunes
53.097N 118.004W 3300'
17.May.2006 UV It.
C.Schmidt & J.Dombroskie

CAN: AB: Jasper Natl. Park,
Jasper Lake sand dunes
53.097N 118.004W 3300'
17.May.2006 UV It.
C.Schmidt & J.Dombroskie

CAN: AB: Jasper Natl. Park,
Jasper Lake sand dunes
53.097N 118.004W 3300'
17.May.2006 UV It.
C.Schmidt & J.Dombroskie

CAN: AB: Jasper Natl. Park,
Jasper Lake sand dunes
53.097N 118.004W 3300'
17.May.2006 UV It.
C.Schmidt & J.Dombroskie

CAN: AB: Jasper Natl. Park,
Jasper Lake sand dunes
53.097N 118.004W 3300'
17.May.2006 UV It.
C.Schmidt & J.Dombroskie

References for label data

- “Label Data Standards for Terrestrial Arthropods” (Biol. Survey of Canada)
- see green pamphlet at back or:

<http://www.biology.ualberta.ca/bsc/briefs/brlabelstandards.htm>