

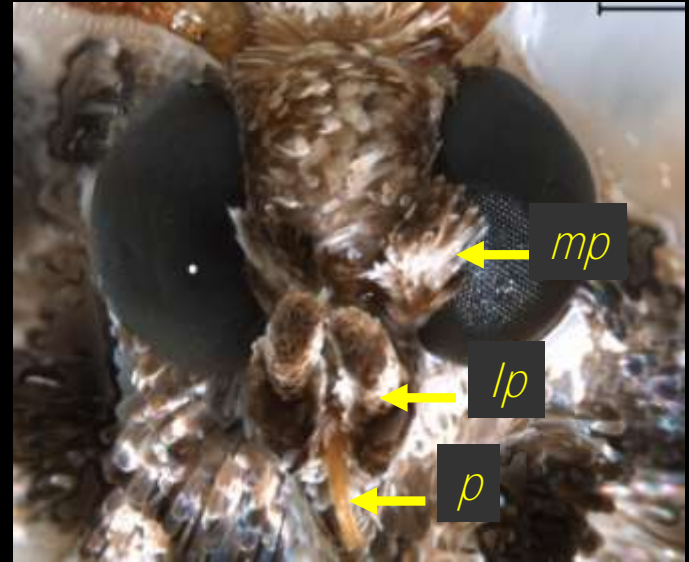
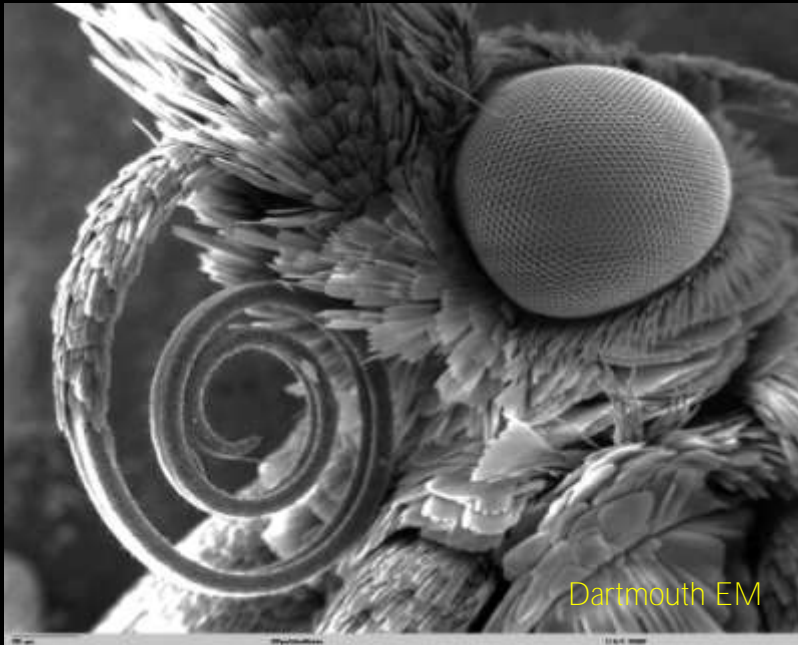
# Overview of Pyraloidea



Richard L. Brown  
Mississippi Entomological Museum

# Pyraloidea

- Proboscis scaled basally
- Maxillary proboscis present



# Pyraloidea

- Proboscis scaled basally
- Maxillary proboscis present
- Abdominal tympani present

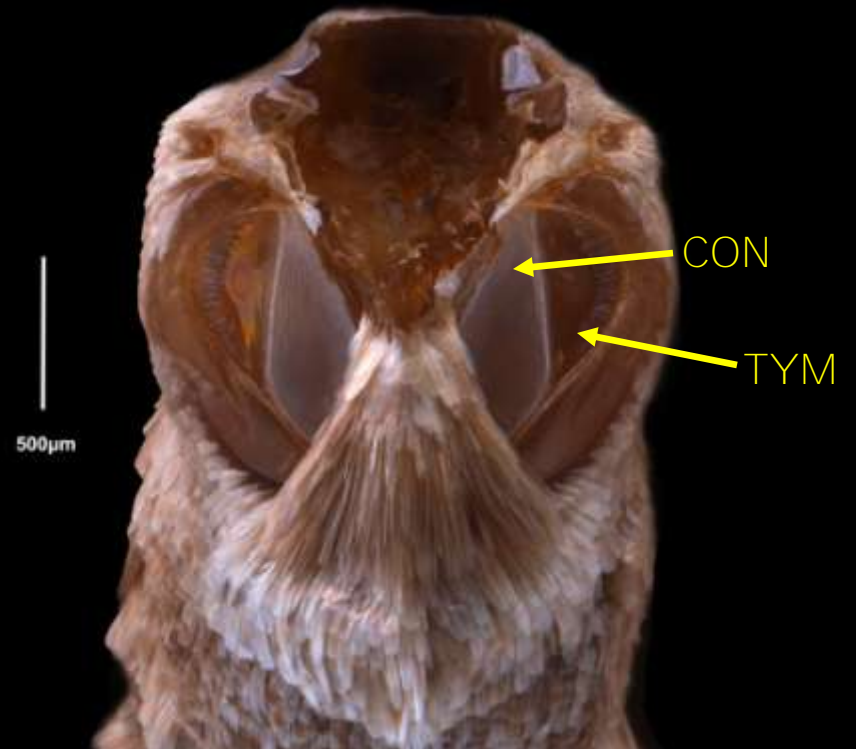
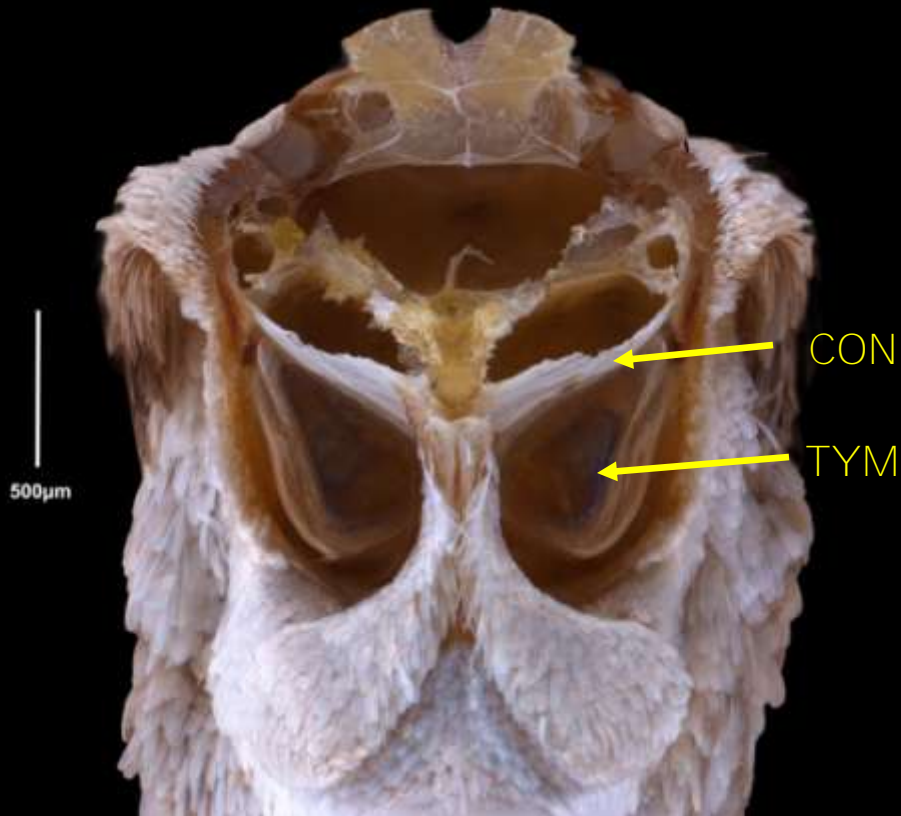




# Tympanum

Crambidae - conjunctiva  
at angle to tympanum

Pyralidae - conjunctiva in  
same plane with tympanum



# Crambidae

- Biologies and behaviors known for relatively few species.
- Only 13 of 58 species of *Pyrausta* and three of 23 species of *Donacaula* with known hosts.

# Crambidae

Ultrasonic courtship songs of *Ostrinia furnacalis* -  
Asian Corn Borer Moth (Nakano et al., 2008, PNAS).

# Selected Subfamilies of Crambidae

- Scopariinae
- Crambinae
- Spilomelinae
- Schoenobiinae
- Acentropinae
- Pyraustinae

# Scopariinae

- Small with distinctive forewing pattern.
- Larvae in roots/stems of mosses, ferns and vascular plants.
- Eugene Munroe - MONA
- *Scoparia*, *Eudonia*



*Scoparia biplagata*

J. Vargo



J. Davis



# Crambinae

- 2nd largest subfamily
- Larvae primarily on roots or stems of grasses and sedges.
- Many pest species



*Crambus whitmerellus*

J. Vargo



*Euchromius californicalis*

B. Barker



*Argyria nummulalis*

E. Martinez



*Diatraea  
crambidoides*

J. Vargo

# Crambinae

- 2nd largest subfamily
- Larvae primarily on roots or stems of grasses and sedges.
- Many pest species
- Many species with shiny white scales or longitudinal pattern.
- Bernard Landry
- *Crambus*, *Euchromius*, *Argyria*, *Diatraea*



*Crambus whitmerellus*

J. Vargo



*Euchromius californicalis*

B. Barker



*Argyria nummulalis*

E. Martinez



*Diatraea  
crambidoides*

J. Vargo



# Spilomelinae

- Largest subfamily
- Formerly in Pyraustinae
- Many agricultural pests
- *Desmia*,  
*Herpetogramma*,  
*Palpita*, *Diaphania*.



*Palpita gracialis*

V. d. Broeke



*Desmia funeralis*

M. White



*Diaphania indica*



*Herpetogramma thestealis*

J. Vargo

# Schoenobiinae

- Brown or white without fasciae, often with longitudinal streaks.
- Semi-aquatic. Larvae boring in stems of marsh grasses and sedges



*Donacaula melinellus*

J. Vargo



*Rupela tinctella*

G. Grammer

# Schoenobiinae

- Brown or white without fasciae, often with longitudinal streaks.
- Semi-aquatic. Larvae boring in stems of marsh grasses and sedges
- Edda Martinez - 23 spp of *Donacaula* in U.S.
- *Donacaula*, *Rupela*, *Leptosteges*



*Donacaula melinellus*

J. Vargo



*Rupela tinctella*

G. Grammer



# Acentropinae (=Nympulinae)

- Aquatic habitats
- One group in lotic habitats, larvae with gills, e.g., *Petrophila*.



*Petrophila  
jaliscalis*

J. Vargo

# Acentropinae (=Nympulinae)

- Aquatic habitats
- One group in lotic habitats, larvae with gills, e.g., *Petrophila*.
- One group in lentic habitats, larvae lacking gills, e.g., *Elophila*.
- Eugene Munroe - MONA



*Chrysendeton medicinalis*

S. Scott



*Elophila gyralis* M. Drelling



*Petrophila jaliscalis*

J. Vargo

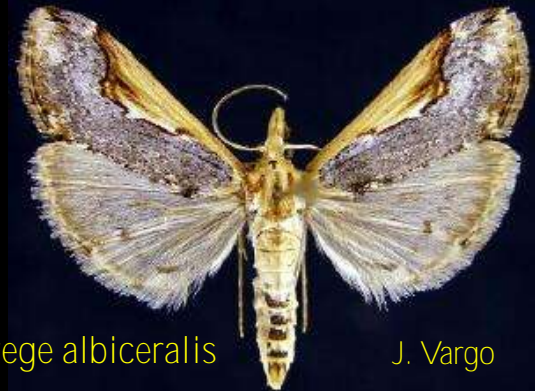
# Pyraustinae

- Third largest subfamily
- Many pest species
- Some species with colorful wings, especially with red and yellow.
- Eugene Monroe - MONA



*Ostrinia nubilalis*

J. Vargo



*Loxostege albiceralis*

J. Vargo



*Pyrausta perrubralis*

J. Vargo



*Pyrausta volupialis*

J. Cowles

# Pyralidae - Major subfamilies

- Pyralinae
- Gallerinae
- Chrysauginae
- Epipaschiinae
- Phycitinae



# Pyralidae - Gallerinae

- wax moths



*Galleria melonella*

J. Vargo



*Achoria grisella*

M.V. Smith



# Pyralidae - Pyralinae

- include stored product pests and species with scavenging larvae
- *Pyralis*, *Dolichomia*, *Aglossa*



*Aglossa cuprina*

J. Vargo



*Pyralis farinalis*

J. Vargo



*Dolichoma olinalis*

J. Vargo

# Pyralidae - Chrysauginae

- Mainly Neotropical
- Variety of larval feeding habits
- Tympanum on wings of some species.
- *Clydonoptera*, *Galasa*





# Pyralidae - Epipaschiinae

- Third segment of labial palpus upturned.
- Larvae: leaf rolling, tiers, miners.
- *Epipaschia*, *Pococera*



Macalla zelleri

J. Vargo



Pococera subcanalis

# Pyralidae - Phycitinae

- Largest subfamily
- Leaf-rollers, stem borers, conifer cones, some predaceous on Homoptera
- Many stored product pests
- H. H. Neunzig - MONA



# Pyralidae - Phycitinae

- Cactus moths - native and exotic species



*Melitara dentata*



*Melitara* sp.



Lyle Buss



Photo by Lyle Buss

*Cactoblastis cactorum*



# Cactus Moths and Their Relatives (Pyralidae: Phycitinae)

by Thomas J. Simonsen and Richard L. Brown



## Cactus Feeding Moths - Introduction

[Introduction](#)

[Taxonomic History](#)

[Dissection Methodology](#)

[Identification Key to Genera](#)

[Morphology](#)

[Phylogenetic Relationships](#)

[Evolution of Host Preferences](#)

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The relatively recent introduction of *Cactoblastis cactorum*, the exotic cactus moth, into the Caribbean and subsequently into the United States has generated much research, field surveys, and efforts to prevent the spread of this species into western areas of the United States and Mexico. Other species of cactus moths, e.g., *Melitara*, lack the same level of destructiveness and invasiveness comparable to that of *Cactoblastis*. *Cactoblastis* has been widely studied because of its use as a biological control agent for cactus introduced into Australia, South Africa, and elsewhere. Yet much basic information on morphology, behavior, and other biological attributes are lacking for this important exotic species. The native cactus moths have been studied even less. *Cactoblastis*, with only four significant publications on native species during the past century. Comparative information on the exotic and native cactus moths is essential for distinguishing all stages of the cactus moth from those of native species. In addition, the answers to basic questions regarding the more invasive behavior of *Cactoblastis*, relative to native species, cannot be answered without greater knowledge of the latter.

The exotic *Cactoblastis*, native cactus feeding species, and related non-cactus feeding genera form a monophyletic clade within Pyralidae, subfamily Phycitinae. This web site provides basic information on genera and species of this clade of phycitine moths. More detailed information is provided for *Cactoblastis*, including a video illustrating the technique for preparing genitalia dissections for identifications. Bibliographies for *Cactoblastis cactorum* and all phycitine species in the cactus feeding clade are provided.

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NATURAL  
HISTORY  
MUSEUM

# Final Exam - Which are Pyralidae and which are Crambidae?



Photos by Jim Vargo

# Pyralidae



*Cacozelia basiochrealis*



*Phyciodes mucidella*



*Acrobasis tricolorella*



*Dioryctria rossi*



# Crambidae



*Diathrausta harlequinialis*



*Crambus whitmerellus*



*Mojavia achemonalis*



*Petrophila jaliscalis*



Caramba!

## Acknowledgments

Thanks to Moth Photographers Group and contributors.