

VARIATION IN THE FEMALES FRENULUM IN TORTRICIDAE (LEPIDOPTERA)

PART 3: TORTRICINAE

Sabrina Monsalve, Universidad Jorge Tadeo Lozano, Bogotá, Colombia

John W. Brown, Systematic Entomology Laboratory, USDA, National Museum of Natural History, Washington DC, 20013

Introduction

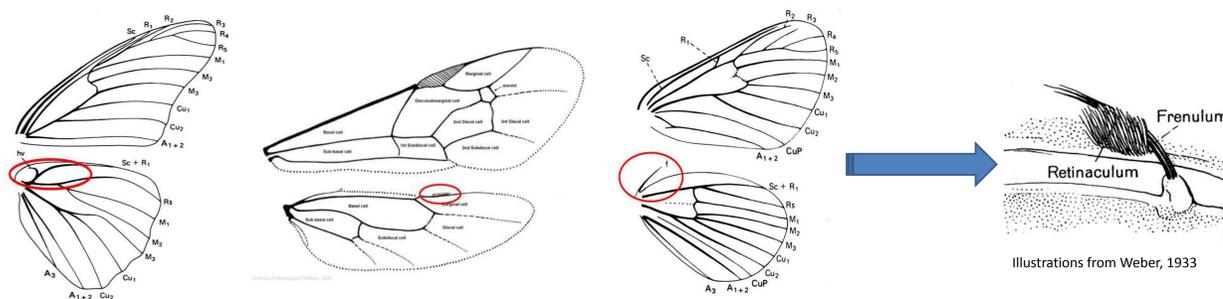
Relevance of the study

- Variation of the structure reported rarely.
- 2-bristled frenulum was hypothesized to represent synapomorphy for various clades.
- Evaluate phylogenetic significance.
- Is the character informative at any level?



Description of frenulum

Wing structure composed of bristles that function in wing coupling for flying.



Butterflies (Lepidoptera)
amplexiform coupling

Wasps (Hymenoptera)-hamuli

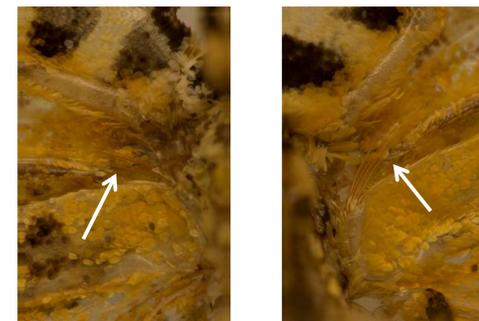
Moths (Lepidoptera)-frenulum.
Illustrations from Borror *et al.*, 1989

Materials and methods

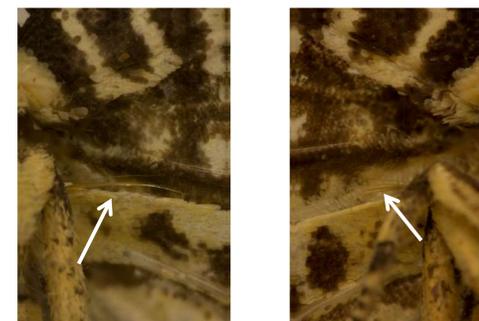
- Pinned adult moths were examined under a 30-40x dissecting scope.
- Sex determination using genitalia.
- Counting number of bristles (free tips) on each wing.
- Examination of 3,822 female individuals of 1,093 species from 255 genera of Tortricinae.
- 1 male and 5 females were scored from each available species in the Smithsonian Institution collection in Washington DC.

Results and discussion

- The number of bristles in the females vary from 1 to 8.
- Asymmetry on the same specimen in 18%.
- A 3-bristled frenulum is most common in the following tribes: Epitymbiini, Sparganothini, Euliini, Atteriini, Orthocomotini, Arotrophini and Tortricini with percentages varying from 71% to 100% and in tribes such as Schoenotenini, Cnephasiini and Archipini with varying percentages between 51% and 64%.
- Cochyliini a 2-bristled frenulum was more common (59%).
- Ceracini 37% of the individuals had 4-bristled frenulum and another 37% of the specimens had other configurations of bristles, almost always being more than 4.



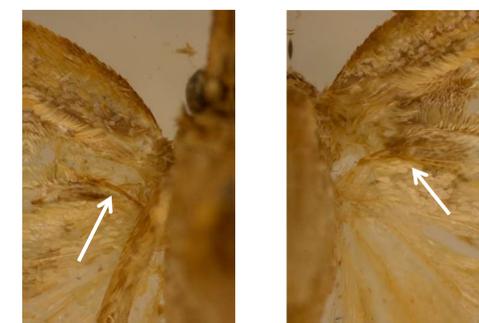
Cerace onustana (Ceracini)
Ventral view of right and left wing with 5&5 bristles.



Cerace stipatana (Ceracini)
Ventral view of right and left wing with 6&8 bristles.



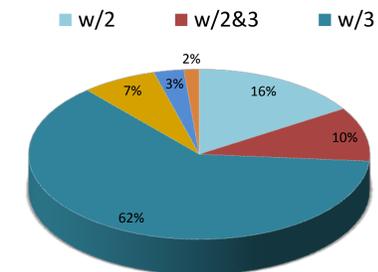
Proeulia tenotias (Euliini)
Ventral view of right and left wing with 3&3 bristles.



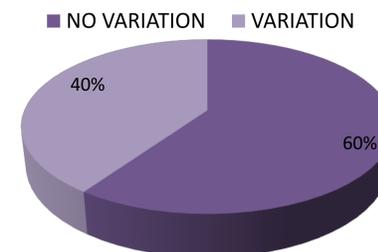
Sparganothis eulogata (Sparganothini)
Ventral view of right and left wing with 4&2 bristles

Photos by Lucrecia Rodriguez

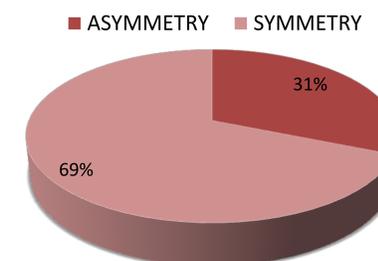
FRENULUM COMPOSITION



INTRASPECIFIC VARIATION



SYMMETRY



Conclusions

- The third and final study of the variation in the structure in Tortricidae.
- 3-bristled frenulum is the dominant condition in all tribes except in Ceracini and Cochyliini.
- Variation in the character not informative at the species or generic level, but suggested trends at the tribal level.

Acknowledgments

To the Director's office and Cristián Samper, the Smithsonian's Natural Museum of Natural History who provided financial support through the NHRE program.
To Jason Dombroskie and Winnie Lam for gathering data.
To Karrie Donovan and Lucrecia Rodriguez for their graphic and photo support on this poster.
To Luis Ernesto Beltran, Francisco Gutiérrez, Gonzalo Fajardo and Catalina Amaya from UJTL for their support and teachings in Bogotá, Colombia.

References

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