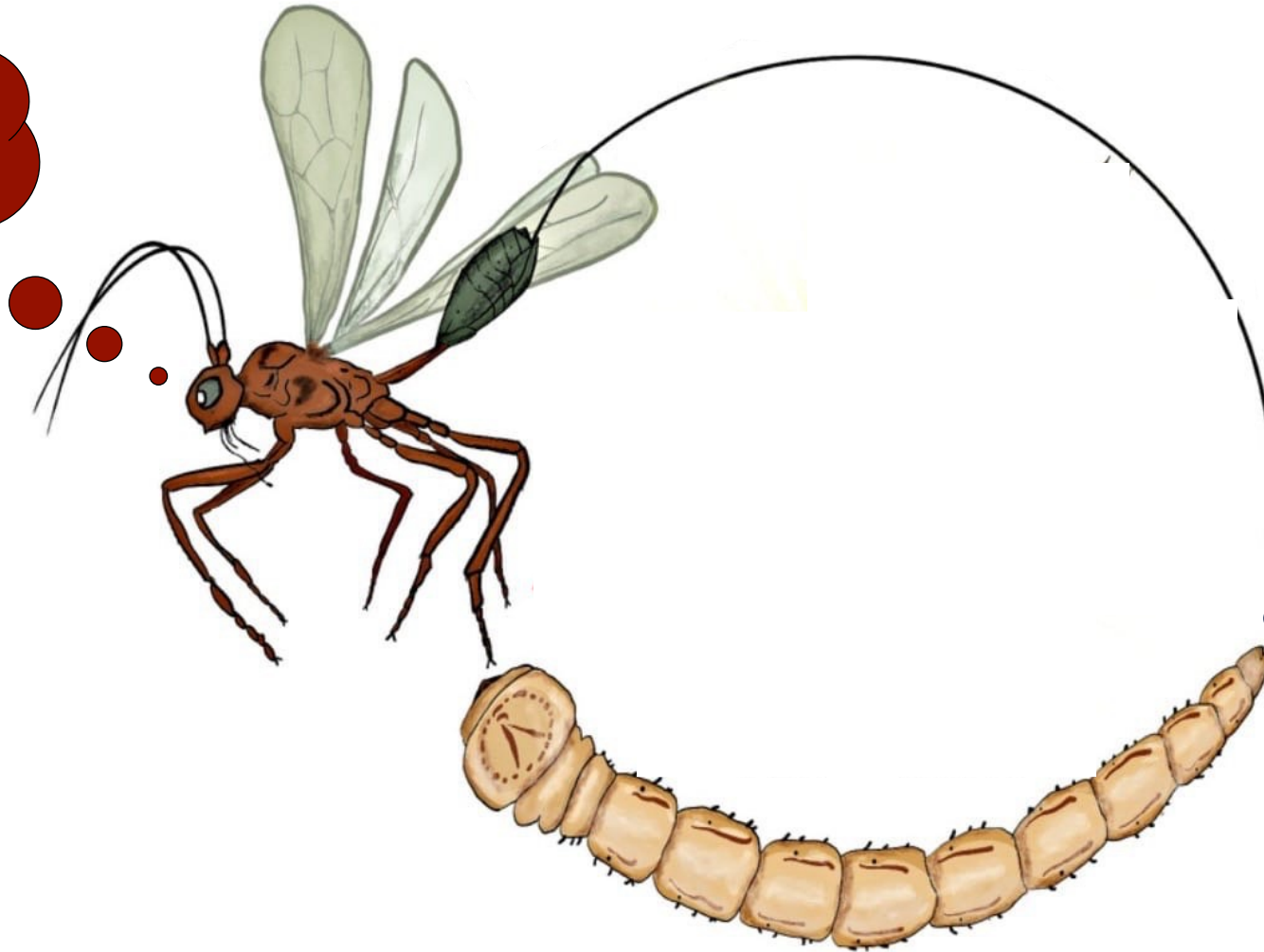


Parasitoids reared from flat headed borer infested logs

I am not letting anyone to id me that easily!



Haha! They will have to id me first to id you properly for their benefits – but guess what? You have already killed me prematurely!!

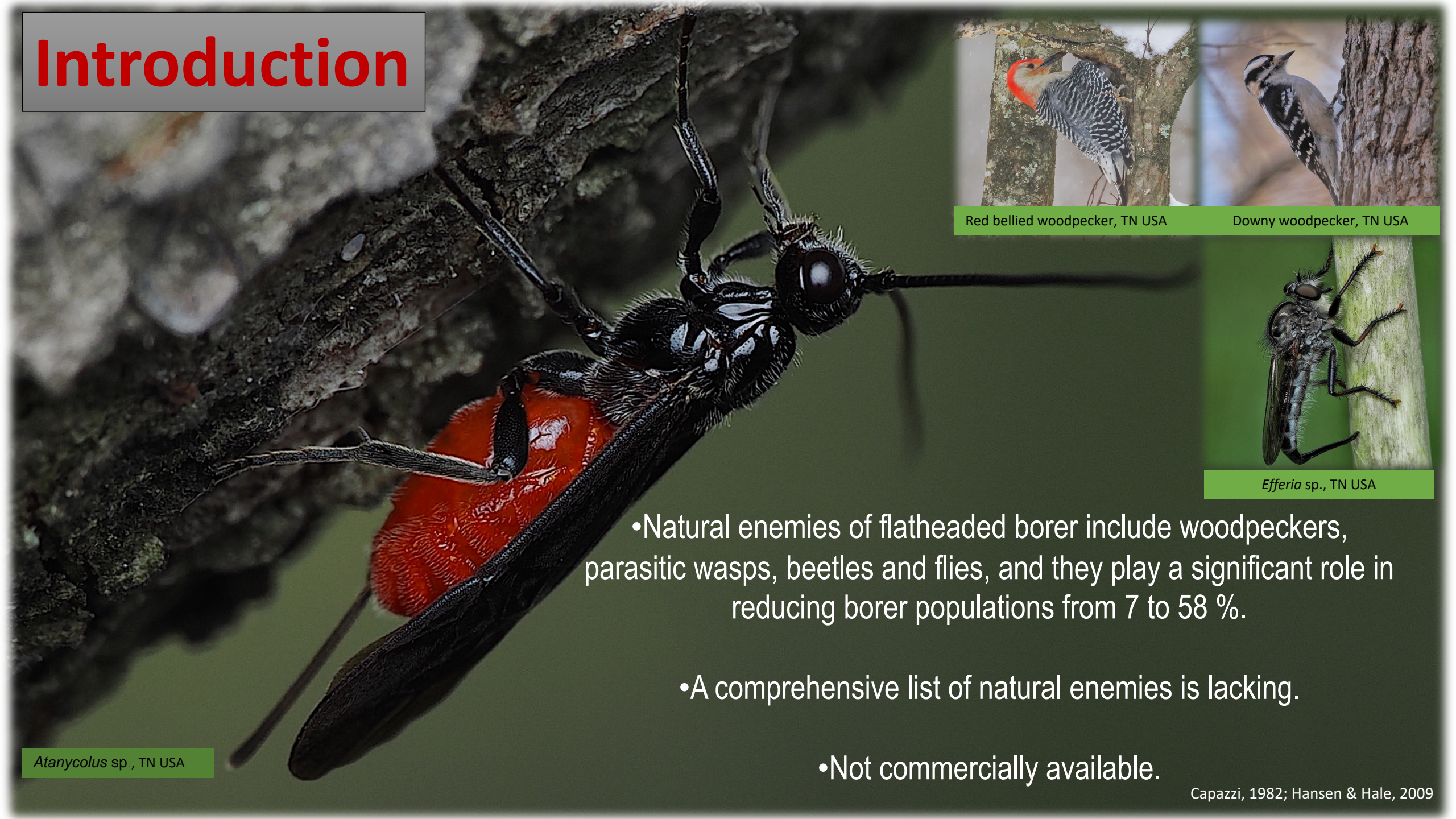


TENNESSEE
STATE UNIVERSITY

Alfred Johnson, Axel Murillo, Nadeer Youssef, Paul O'Neal, Jason Oliver & Karla Adesso

Tennessee State University, Otis L. Floyd Nursery Research Center, 472 Cadillac Lane, McMinnville, TN 37110, The US.

Introduction



Red bellied woodpecker, TN USA



Downy woodpecker, TN USA



Efferia sp., TN USA

Atanycolus sp , TN USA

- Natural enemies of flatheaded borer include woodpeckers, parasitic wasps, beetles and flies, and they play a significant role in reducing borer populations from 7 to 58 %.

- A comprehensive list of natural enemies is lacking.

- Not commercially available.

Hymenoptera

Ichneumonoidae

Chalcidoidea

Ichneumonidae

Braconidae

Chalcididae

Eurytomidae

Eupelmidae



- 1. *Xorides* sp.
- 2. *Dolichomitus* sp.

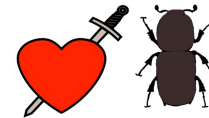


- 1. *Wroughtonia* sp.1
- 2. *Wroughtonia* sp.2
- 3. Doryctinae -1
- 4. Doryctinae-2
- 5. *Atanycolus* sp.
- 6. Braconinae
- 7. Alysiini
- 8. *Heterospilus* sp.
- 9. *Spathius* sp.
- 10. Agathidini



- 1. *Phasgonophora* *sulcata*

- 1. *Eurytoma morio*



Red bud



Oak



- 1. *Metapelma spectabile*
- 2. *Eupelmus pini*



Red Maple

USA: TN: Warren Co.
McMinnville, TSU NRC
35°42'28" N/85°44'40" W
September, 2018-21
Nadeer N. Youssef
Garrett Roper

Hymenoptera

Ichneumonoidae

Chalcidoidea

Ichneumonidae

Braconidae

Chalcididae

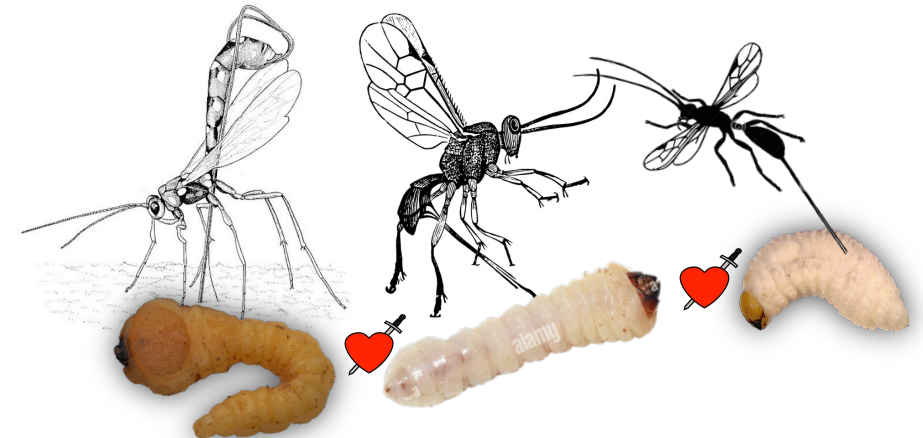
Eupelmidae

1. *Xorides* sp.

1. *Wroughtonia* sp.1
2. *Wroughtonia* sp.2
3. Doryctinae -1
4. Doryctinae-2
5. *Atanycolus* sp.
6. Braconinae
7. *Heterospilus* sp.
8. *Spathius* sp.

1. *Phasgonophora sulcata*

1. *Metapelma spectabile*



**ORNAMENTALS
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ARCHIVES**

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**Joe Capizzi (Extension Entomologist), Jeff
Miller (Entomologist) and Jim Green
(Extension Ornamentals Specialist),
Oregon State University, Corvallis, OR
97331**

**FLATHEADED APPLE TREE BORER & PACIFIC FLATHEADED BORER: Live
Larvae - Dead Trees**

Plant damage caused by flatheaded wood borers, *chrysobothris*:

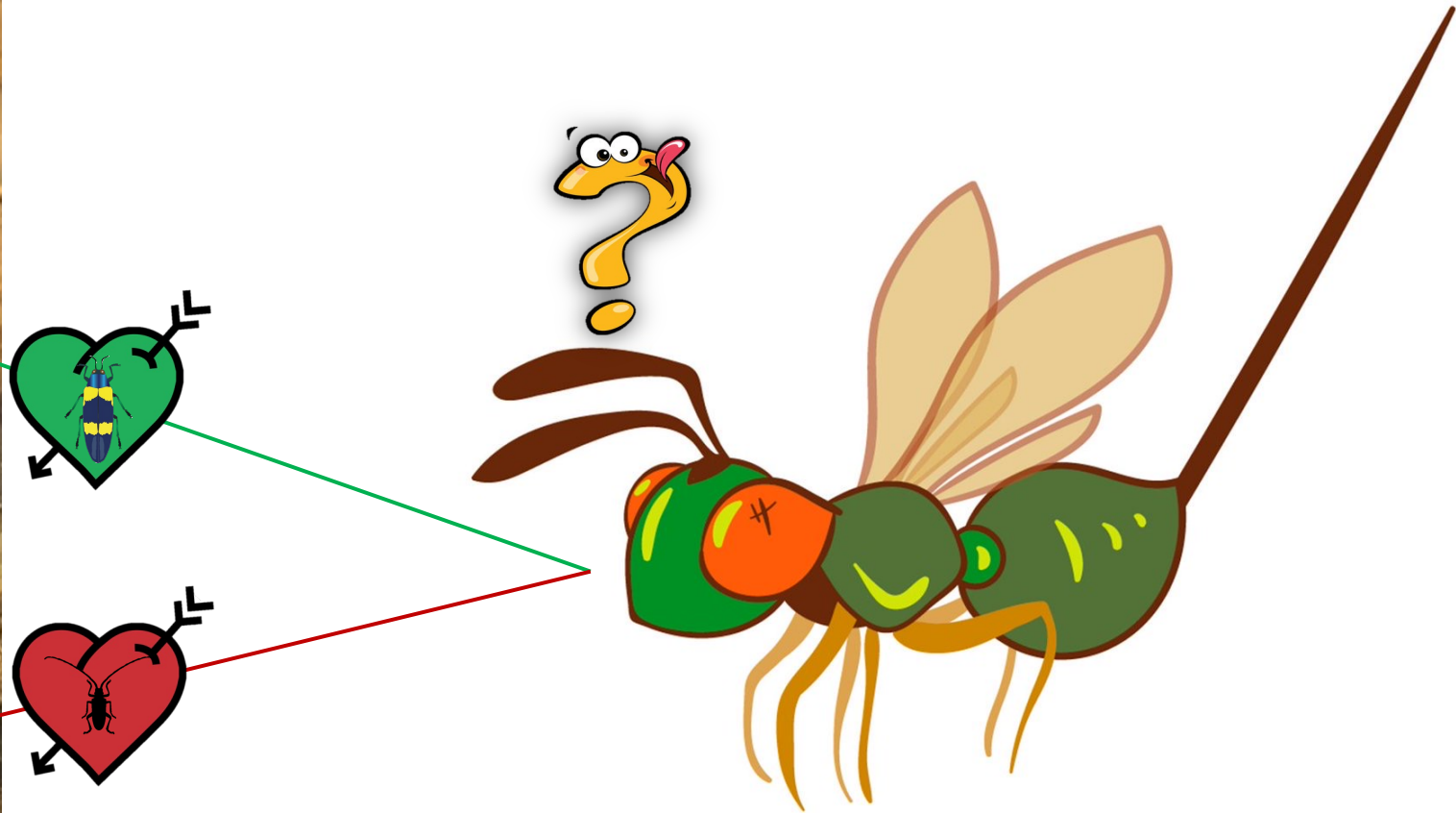
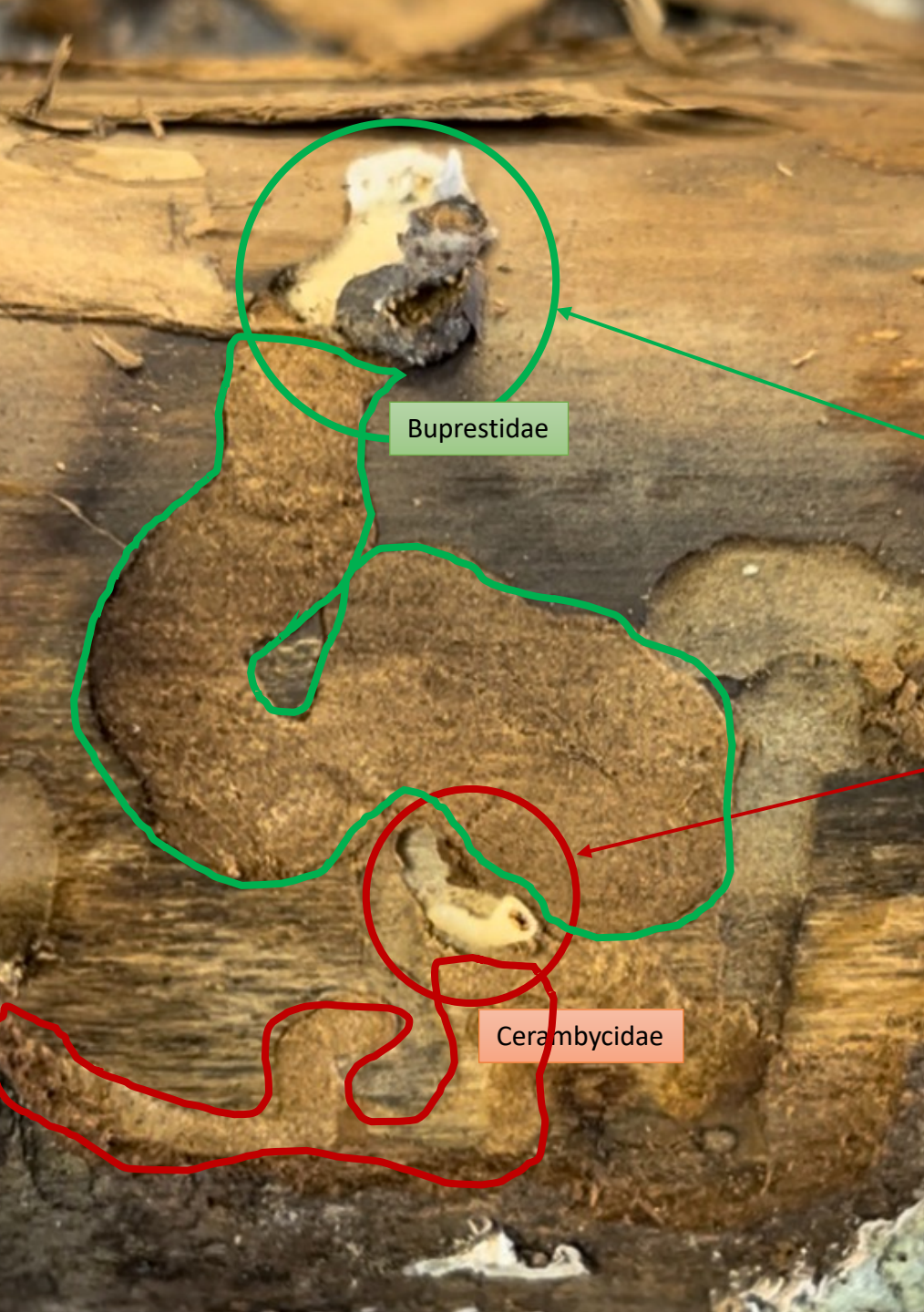
Flatheaded wood borers attack weakened or stressed plants. A single larva is capable of girdling and killing a young tree.

F: Ichneumonidae
Xorides sp.



F: Ichneumonidae
Dolichomitus sp.





F: Braconidae

Wroughtonia sp.1



F: Braconidae

Wroughtonia sp.2



100 μ m

F: Braconidae

SF: Doryctinae-1



F: Braconidae

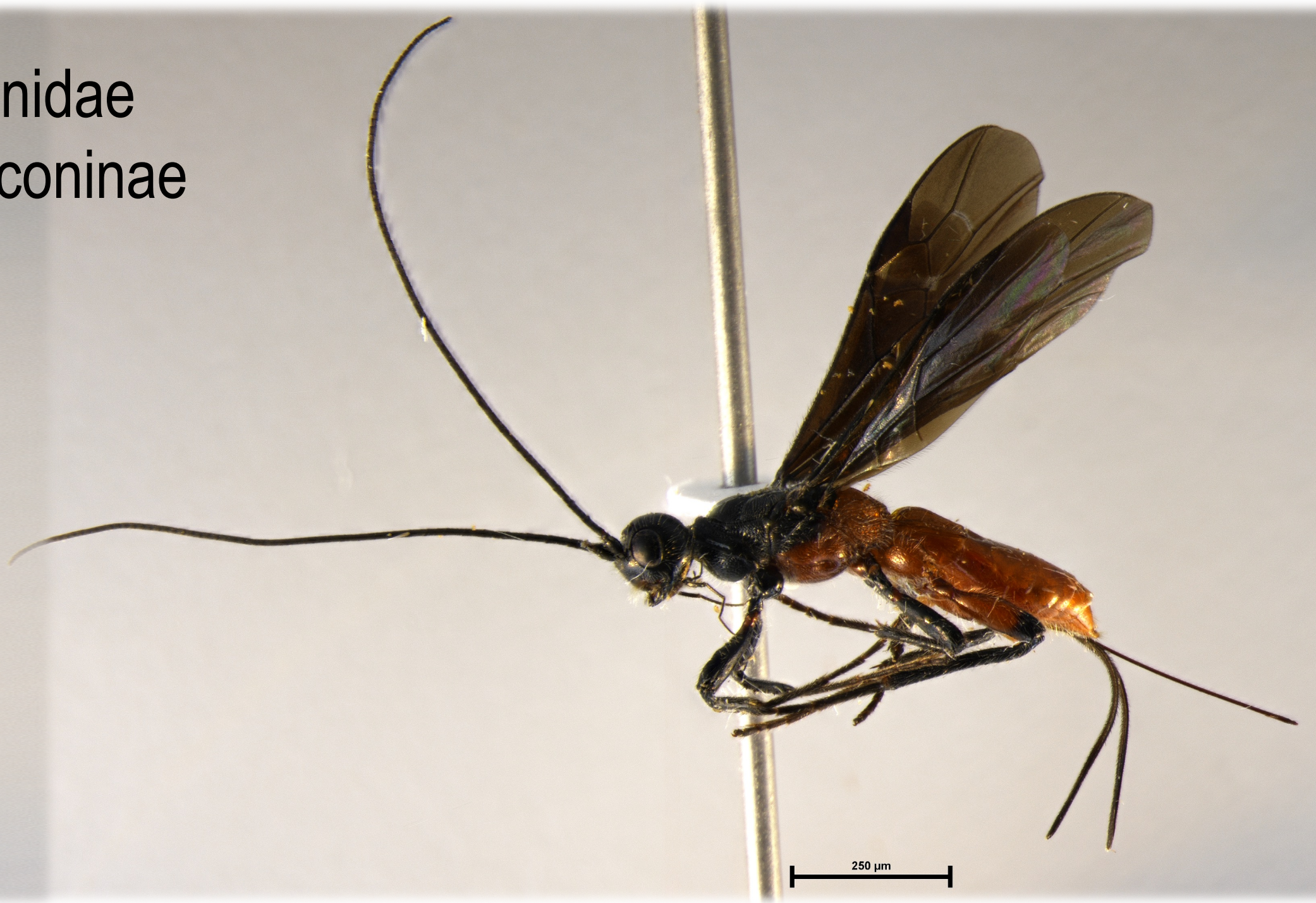
SF: Doryctinae-2



100 μ m

F: Braconidae

SF: Braconinae



F: Braconidae
Atanycolus sp.



F: Braconidae
T: Alysiini



F: Braconidae

Heterospilus sp.

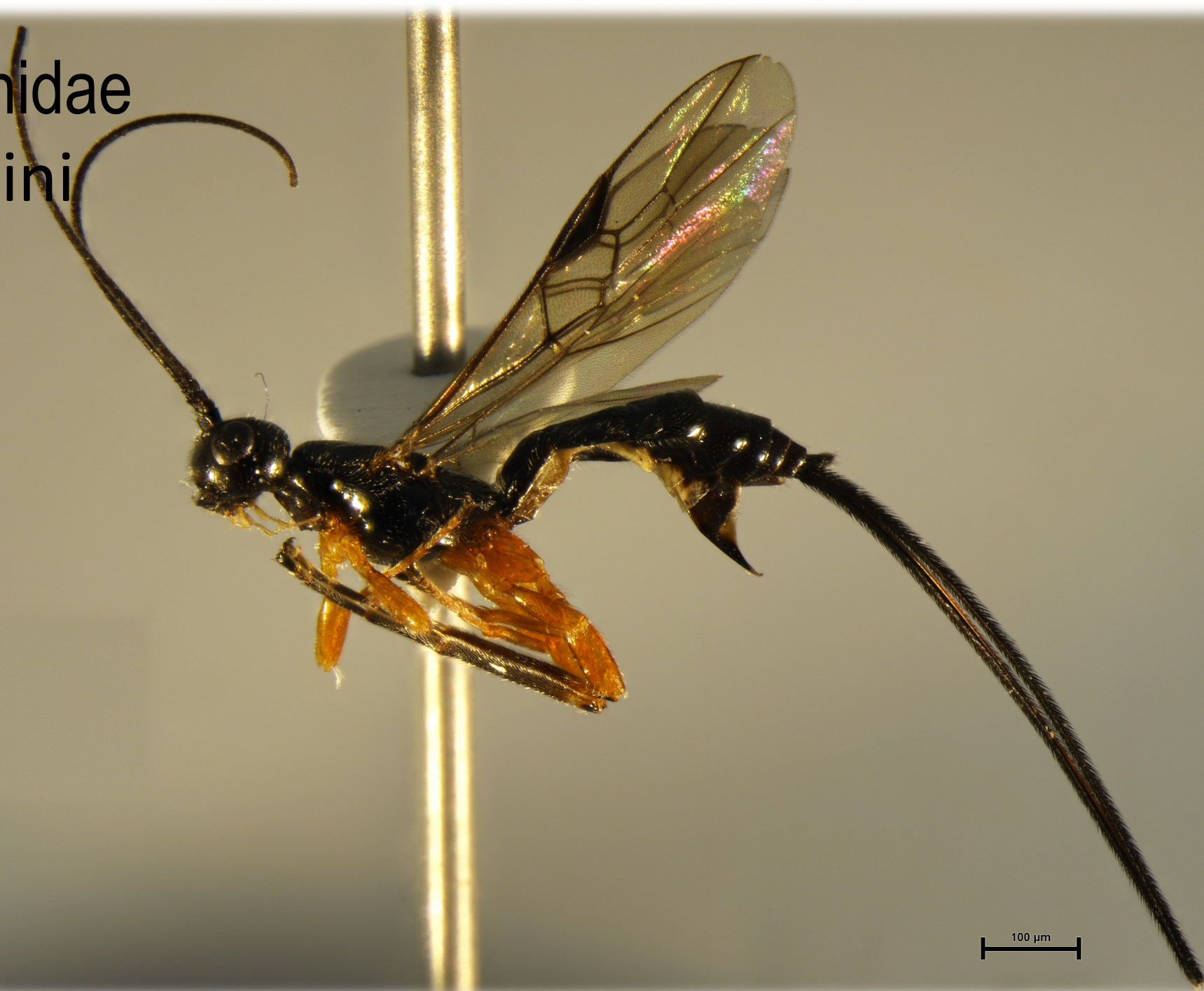


F: Braconidae
Spathius sp.



100 μ m

F: Braconidae
Agathidini



100 μ m

F:Chalcididae

Phasgonophora sulcata



100 μ m

F:Eurytomidae
Eurytoma morio



100 μ m

F:Eupelmidae

Metapelma spectabile



100 μ m

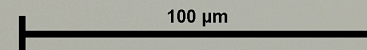
F: Eupelmidae

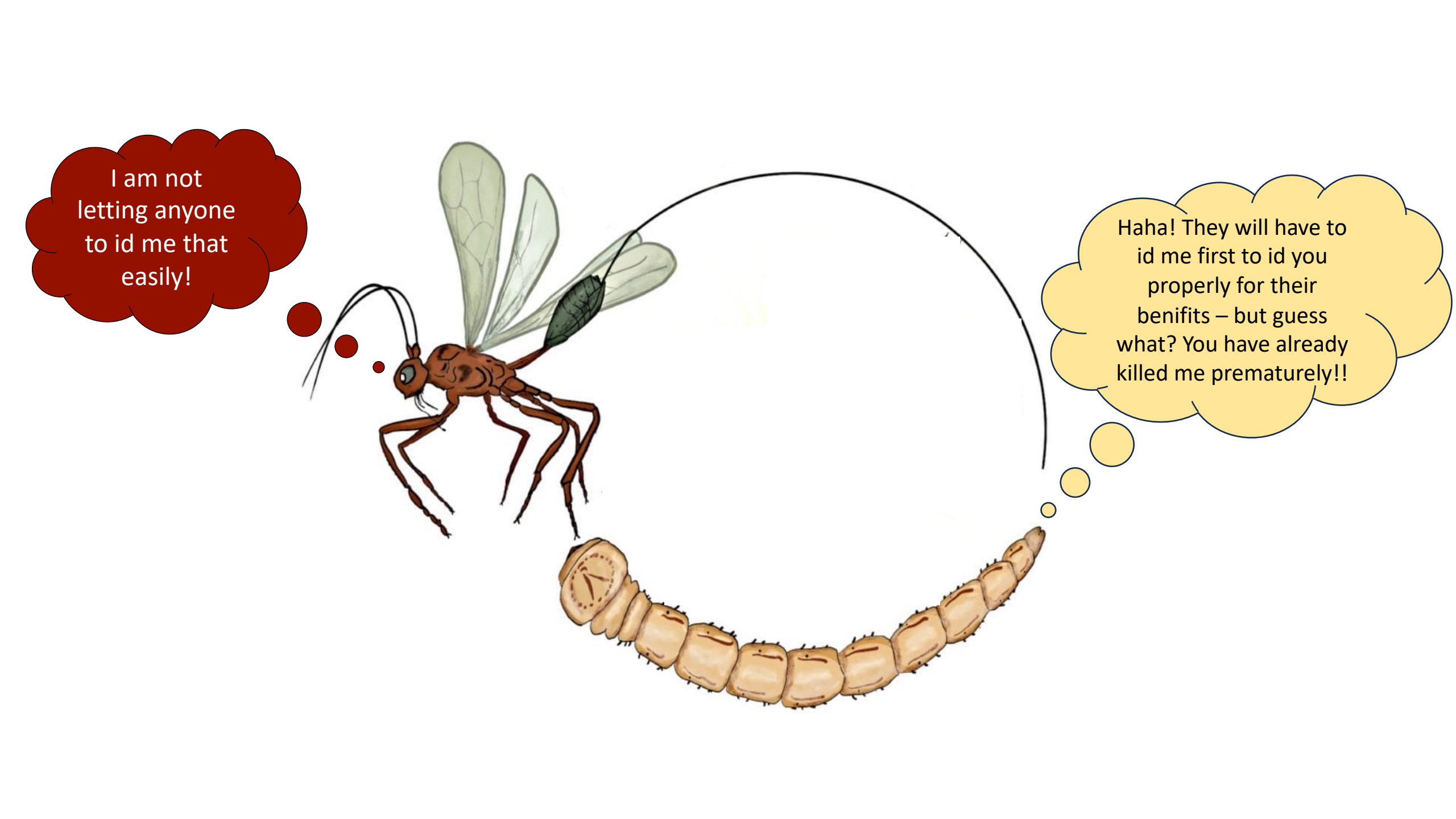
Eupelmus pini



White Pine Weevil

Image not to scale



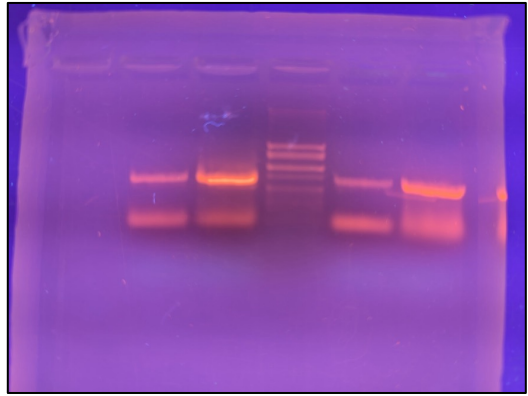


I am not
letting anyone
to id me that
easily!

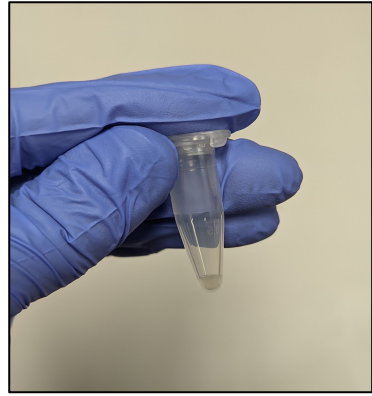
Haha! They will have to
id me first to id you
properly for their
benifits – but guess
what? You have already
killed me prematurely!!

Thankfully- Nadeer have preserved the specimes along with their pupal cases.





PCR was done with primers for *Chrysobothris* and sent for DNA sequencing

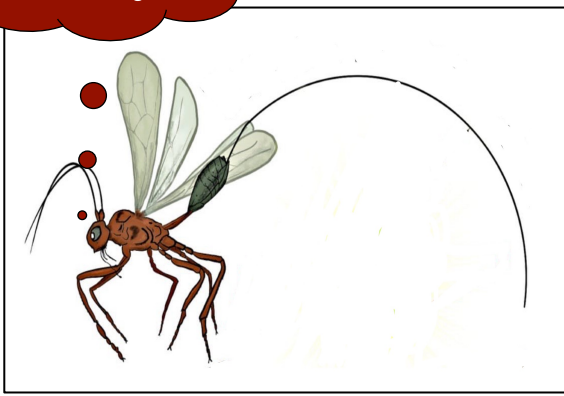


DNA was extracted by the protocol by Dr. Kevin Moulton

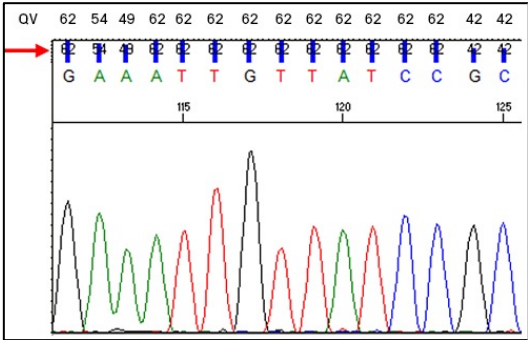


Samples were macerated using liquid Nitrogen to break DNA

Hey *Chryso* they are doing something!



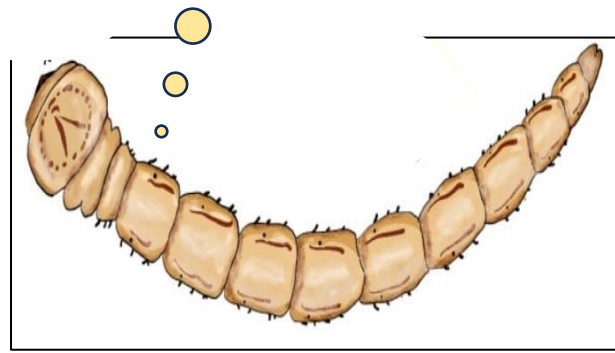
Parasitoids were reared from infested logs



Raw data will be analyzed, and ID will be confirmed blasting samples on NCBI



Are you saying they identified me from the pupal case?





Labena sp.



Horismenus carolinensis



Tetrastichus holbeini



Awaiting emergence

What is happening in 2024

Questions?

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931-743-0442

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Garrett Roper

Angelo Woods

Cheyenne Morales



Smithsonian

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