A Sheep in Wolf's Clothing: Tephritid Flies Mimic Spider Predators

Mather, Monica H. and Roitberg, Bernard D.

1987. Science Vol. 236 p. 308-310

Presented by Erick Holke

February 26, 2013

Evolution Spring 2013

Mimicry and Conspecifics

- There are many types of mimicry:
- 1.) Aggressive mimicry
- 2.) Batesian mimicry
- 3.) Defensive mimicry

- Conspecifics: an organism belonging to the same species as another organism.
- The jumping spiders avoid this

Mimicry and Conspecifics (With highlighted type of mimicry it is

- There are many types of mimicry:
- 1.) Aggressive mimicry
- 2.) Batesian mimicry
- 3.) Defensive mimicry

- Conspecifics: an organism belonging to the same species as another organism.
- The jumping spiders avoid this

Implications of Mimicry and Conspecifics

- Mimicry leads to less predation
- If conspecific species mate, these gametes have an advantage over heterospecific gametes
- Since avoid this, then there will not be an advantage since it doesn't occur
- This experiment tested to see how useful this type of mimicry was

Background at the time

- Knew a lot about Aggressive Mimicry and Batesian mimicry

- Zebra spiders are territorial
- They also know that conspecifics are not prey

Study

- Snowberry flies, the zebra spider
- 1.) Did mimicking predators help snowberry flies to not be preyed on as much?
- 2.) Was it the wing pattern that helped them achieve less predation?

Experiment

- Captured the spiders and flies out in the wild
- Fed the spiders and then let them starve
- Had a glass dome and when the spider reached reactive zone, could show two behaviors
- Compared the time the spiders spent in the reactive zone with different prey types

1.) Did mimicking predators help the snowberry flies to not be preyed on as much?

Prey Type	Sample (n)	Flee (%)	Pounce (%)	Time in reactive zone
Spider	40	47.5 a	5	32.9 plus minus 7.2
House Fly	40	2.5 b	60	77.9 plus minus 12.1
Snowberry fly	76	32.8 ac	20	58.4 plus minus 8.7
Blackened-wing Snowberry fly	33	12.1 bc	38	95.7 plus minus 17.15

Yes, mimicking predators help the snowberry flies to avoid predation

2.) Is it the wing pattern that helps them achieve less predation?

Type of Snowberry fly	Sample (n)	Flee (%)
Nondisplaying	31	9.7
Displaying	45	46.6
Nondisplaying, blackened wings	11	0.0
Displaying, blackened wings	21	19.0

Yes, the wing pattern helps the snowberry flies prevent less predation

Wrap up

- 1.) Mimicking the predator is a useful way to avoid predation
- How useful is this mimicry compared to Batesian or Aggressive mimicry?

Wrap up

- 1.) Mimicking the predator is a useful way to avoid predation
- How useful is this mimicry compared to Batesian or Aggressive mimicry?

- 2.) The display of the wings were important in the flies avoiding predation
- What would happen if part of the wings were damaged? How would the spiders react to the flies then?

References

- Mather, Monica H. and Roitberg, Bernard D. A Sheep in Wolf's Clothing: Tephritid Flies Mimic Spider Predators. Science Vol. 236, 1987. Pages 308-310.
- 2006. Conspecific Definition. http://www.biology-online.org/dictionary/Conspecific
- Jacques, Alan R. and Dill, Lawrence M. Zebra Spiders May Use Uncorrelated Asymmetries to Settle Contests. The American Naturalist, Vol. 116, No. 6 (Dec., 1980), pp. 899-901
- Lasbury, Mark E. Lions And Tigers and Ligers, Oh My!. 2012. http://biologicalexceptions.blogspot.com/2012/08/lions-and-tigers-and-ligers-oh-my.html
- Leckie, Seabrooke. Along came a spider. 2008. http://seabrookeleckie.com/tag/zebra-spider/

Discussion

- Do you think having a different animal might bring out another result compared to having a spider, as the predator?
- What implications does the zebra spider not using conspecifics mean in the genetic variation between species?
- How might the pre-experiment changed the actual experiment in this case?