CFAES

The Lepidoptera: Butterflies, Moths, and Skippers.

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Objectives

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I. What makes an insect a Lepidoptera
II. Biological characteristics of the Lepidotera
   I. Numbers
   II. Life Cycle
   III. Larvae
   IV. Generations
   V. Overwintering
   VI. Food
III. Butterflies vs. Moths vs. Skippers

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Order Lepidoptera

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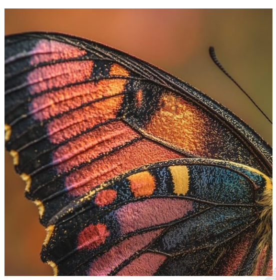
- Derived from the Greek words for *lepidos* = scale and *pteron* = wings
- Refers to the characteristic of the insects in the order of having scales covering their wings



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Scales

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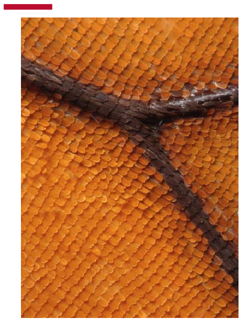

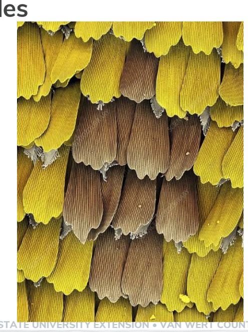

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Scales

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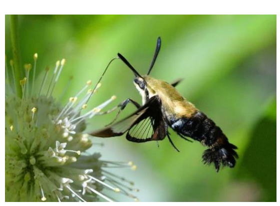
- **There are exceptions:**
  - The Clearwing Moths



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Order Lepidoptera

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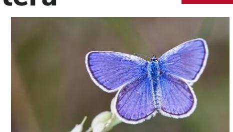
- One of the 4 largest, most advanced groups of insects
- Over 180,000 known species world-wide
- Over 11,500 known species in North America
- Many are threatened or endangered species due to habitat loss or over collection



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Complete Metamorphic Insect

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- Eggs – Laid singularly to massive clusters
- Larvae – Caterpillars
- Pupae – Semi-stationary/immobile stage
- Adults – Butterflies, Moths and Skippers
  - Microleps


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Lepidopteran Life Cycle

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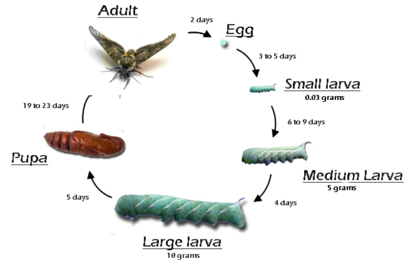

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Eggs

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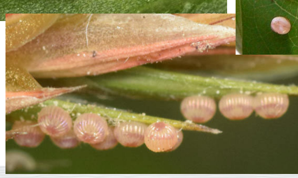

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Egg Mass and 1st Instar Larvae

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Caterpillars

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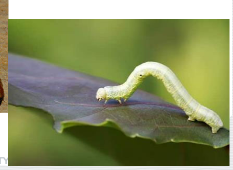
- **Larvae: hornworms, armyworms, cutworms, silkworms, loopers, woolly bears, carpenter worms, etc.**



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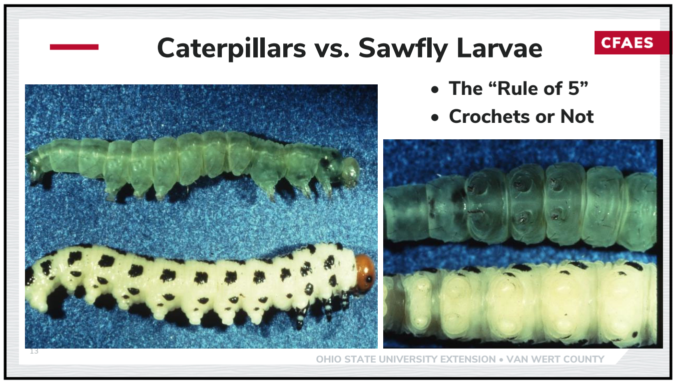

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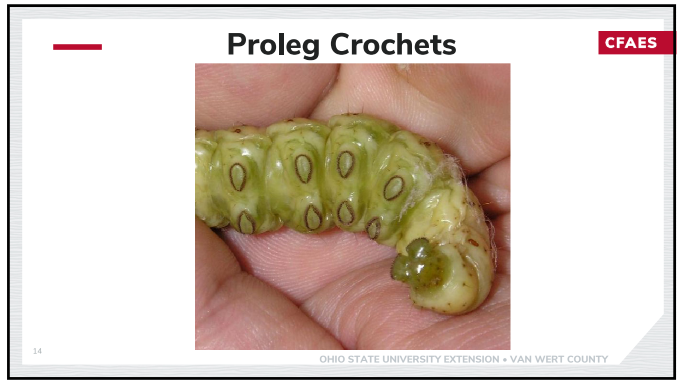

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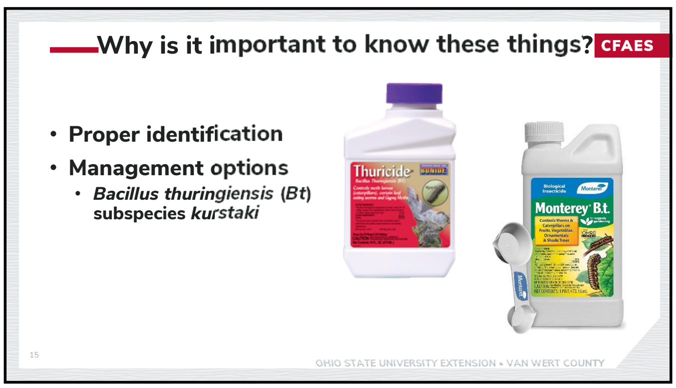

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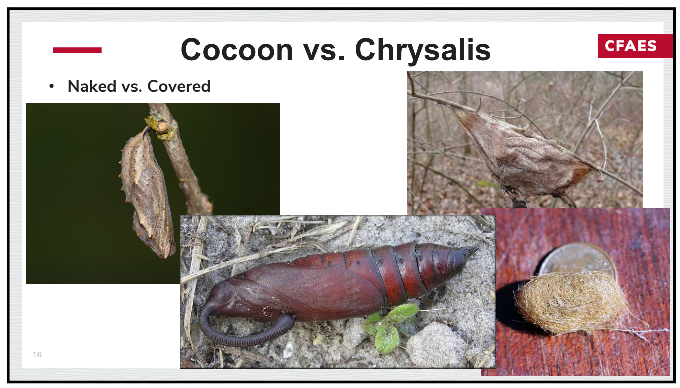

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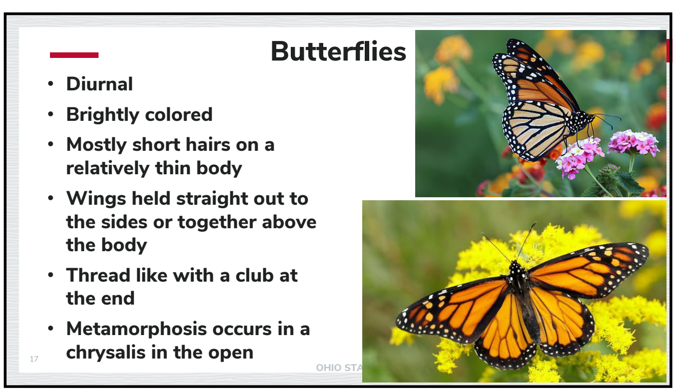

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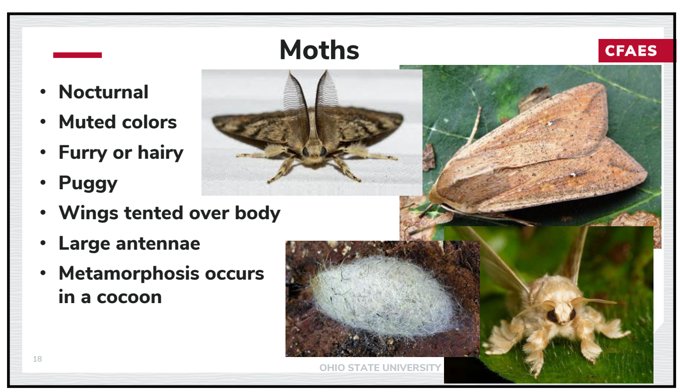

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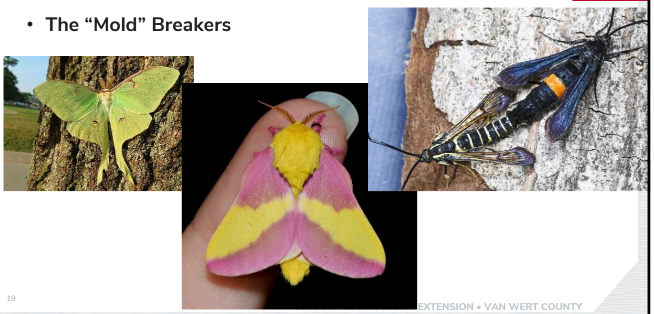
Moths

- The “Mold” Breakers



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Skippers

- Kind of a hybrid between moths and butterflies
- Diurnal
- Furry, puggy bodies
- Some are muted in color and others are brightly colored
- Pupate in plant material tied together with silken threads
- Thread-like antennae that end in a hook-like club

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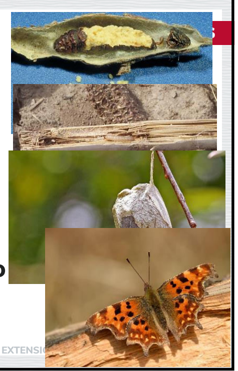
Overwintering

- Depends on the Lepidoteran species
- Examples:
  - Bagworm – Eggs
  - Larvae – European corn borer
  - Pupae – Polyphemus moth
  - Adults – Comma butterfly
- Some do not overwinter in Ohio
  - Migrate south
  - Fly or are blown back into Ohio



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Defenses

- Mimicry
- Chemical sequestration
- Camouflage
- Stinging hairs
  - Urticating hairs
- Hearing

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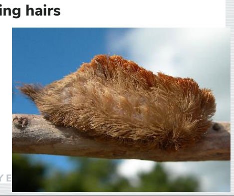

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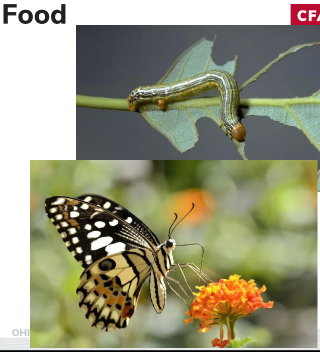
Food

- Caterpillars
  - Chewing Mouth Parts
  - Phytophagous
  - Carnivorous
- Adults
  - Sipping Mouth Parts
  - Nectar feeders
    - Puddling
  - Do Not Feed as adults



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Management

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- Depends on what one is trying to protect
- Biocontrol
- Soft chemistry
- Hard chemistry

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Caterpillar Parasitoids (Wasps)

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Caterpillar Parasitoids (Wasps)

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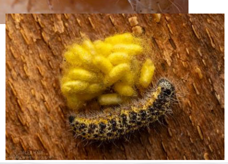

- Parasitic natural enemies
- Many species
  - For example, species in the genus *Cotesia*
- Female wasp lays one (1) egg into caterpillar

Egg divides multiple times to produce many clones of itself

Each clone develops into a new wasp = Polyembryonic

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Polyembryonic Parasitic Wasps

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- Larvae emerge through the body wall of the host caterpillar
- Spin silken cocoons
  - Attached to the host or near the dead body of the host caterpillar

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Emergence of the adults comes later

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- Adult parasitoid emerges, departs, leaves "un-capped" cocoons behind

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