



NO-TAXI-FUNCTION

Insect

**A Key to Identify
Insect Orders in
Michigan**

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This is a dichotomous key developed to help you identify different insect orders located in Michigan. Begin by determining if the insect has wings present or not. Answer the following questions about the insect and the key will direct you to the next number and hopefully help you correctly identify the insect in question.

This key will include information such as characteristics of the wings, antennae, and body structure of the insect. We have included visual examples of the defining characteristics, however, the insect or characteristic depicted may not correspond with your specimen exactly. The key will also ask specific questions relating to features not easily viewed by the human eye, such as tarsi, so be sure to have a hand lens available. In addition to describing specific information on insect orders, the key will also feature some “Fun Facts” about specific insects. Look for this symbol.



Have a “Bugtastic Time!”

Double click on the Blue “Order” word to be directed to the insect database.

Bugtastic Glossary

Main Body Parts:

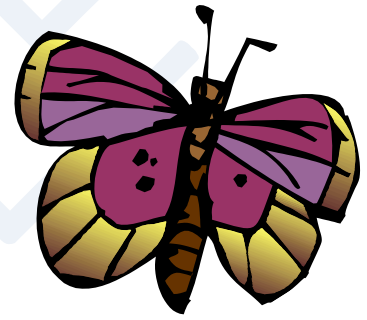
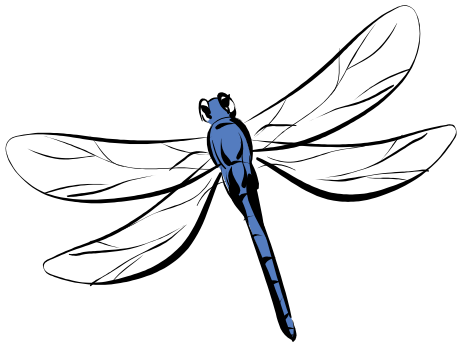
- Head: first part of an insect's body where antennae are attached and where the eyes are found
- Thorax: middle part of an insect's body where head and wings are attached (between the head and abdomen)
 - Prothorax: first segment where the first pair of legs are attached
 - Mesothorax: second segment that has the middle legs and forewings (front) if present
 - Metathorax: third segment where hind wings and legs are present
- Abdomen: last part of an insect's body

Specialized Body Parts:

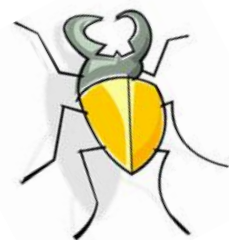
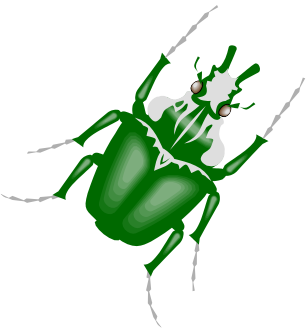
- Pronotum: covering that comes up over the prothorax
- Cerci: pair of sensory appendages (pincers/claws) located at the back of the abdomen
- Tarsi: bottom portion of an insect's leg that can be 1-5 segments (feet)
- Scales: tiny, hair-like fibers that make up a moth's or butterflies' wings
- Compound eye: visual organ that is made up of thousands of lenses that are joined together to make one eye
- Cross Veins: microscopic veins found in between visual veins, located on wings
- Beak: protruding, snout-like mouthpiece

I. Does the insect have wings?

a. Yes.....Go to #2



b. No.....Go to #17



2. Does the insect have one pair of wings?



a. Yes..... **Diptera**
(Ex: flies, mosquitoes)

Example:



Photo Credit: Amanda McCreless



b. No.....Go to #3

Example:



Photo Credit: Amanda McCreless

3. Do the two pairs of wings differ greatly in structure, with the first being thick and hard or fibrous?

a. Yes.....Go to #4

Example:



Photo Credit: Amanda McCreless

b. No.....Go to #7

Example:

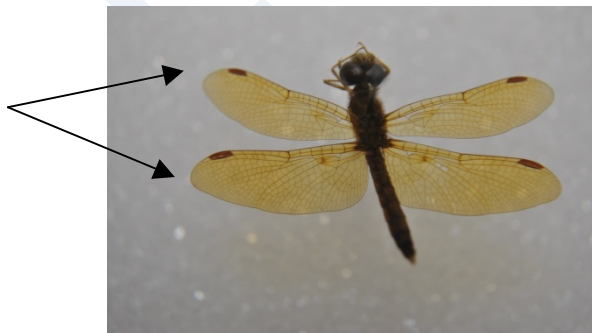


Photo Credit: Amanda McCreless



Photo Credit: Amanda McCreless

4. Are the first pair of wings stiff, and do they meet in a straight line down the middle of the back?

a. Yes.....Go to #5

Example:

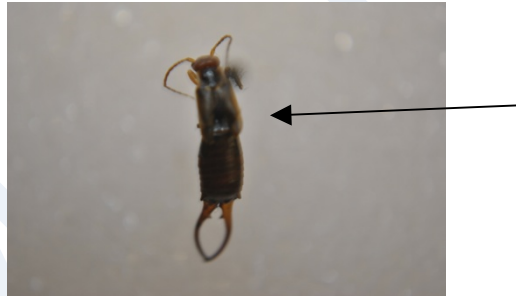


Photo Credit: Amanda McCreless

b. No.....Go to #6

Example:



Photo Credit: Amanda McCreless

5. Is there a pair of significant claw like cerci (appendages) at the tip of the abdomen?

a. Yes..... **Dermaptera**

(Ex: earwigs)

Example:



Photo Credit: Amanda McCreless

b. No..... **Coleoptera**

(Ex: beetles)

Example:



Photo Credit: Amanda McCreless



Photo Credit: Amanda McCreless

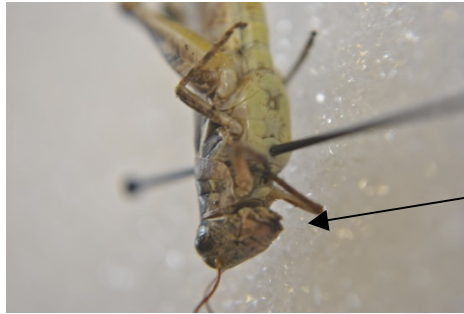
6. Does the insect have:

chewing mouthparts, front wings that are fibrous and heavily veined, and hind wings folded like a fan?

Photo Credit:
Amanda McCreless

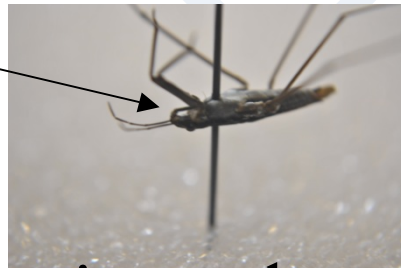
a. Yes.....Go to # 25

Example:



b. No.....Go to 6-I

Example:



6-I. Does the insect have:

sucking mouthparts and front wings that are fibrous at the base, membranous and overlapping at the tip?



a. Yes.....**Hemiptera**



(Go to # 28 to find the suborder)

(Ex: true bugs)

7. Are the mouthparts like a twisting tube and the wings covered with scales?

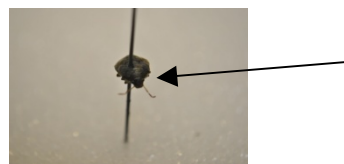
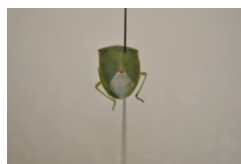
a. Yes.....**Lepidoptera**
(Ex: butterflies, moths)

Examples:



No.....Go to #6

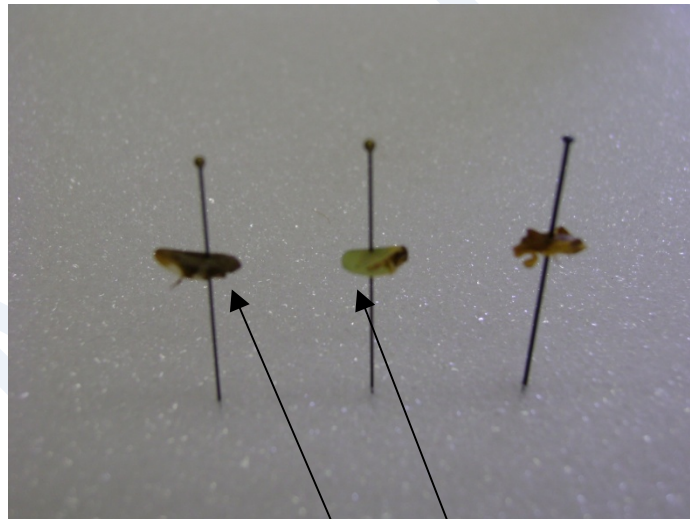
Examples:



8. Are the insects wings roof-like, slanting downward and outward from the middle of the back?

a. Yes.....Homoptera

(Ex: leaf hoppers, cicadas, thornbugs)



Examples:

b. No.....Go to #9



Photo Credit: Amanda McCreless

9. Is the insect slim and moth like, with long, slim antennae and wings that are widest past the middle?

a. Yes.....Trichoptera

(Ex: caddisflies)



b. No.....Go to # 10

Example:



Photo Credit: Amanda McCreless

10. Do the wings have a small number of or no cross veins (tiny veins that cross noticeable veins)?

a. Yes.....Go to # 11



Example:

b. No.....Go to # 12

Examples:



II. Does the insect have chewing mouthparts and rear wings somewhat smaller than the front wings?

a. Yes.....Hymenoptera

(Ex: bees, wasps, hornets, ants)

Examples:



b. No.....Thysanoptera

(Ex: silverfish, thrips)

Examples:



12. Are there two or three long, slim, tail-like appendages on the tip of the abdomen?

a. Yes....**Ephemeroptera**

(Ex: mayflies/fishflies)



Examples:

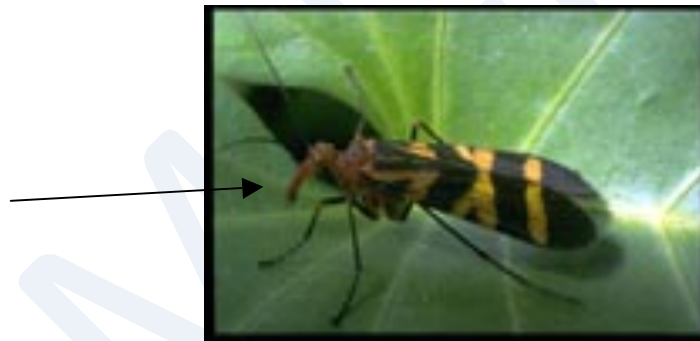
b. No.....Go to #13



13. Does the head have an elongated tube like beak with chewing mouthparts at the tip?

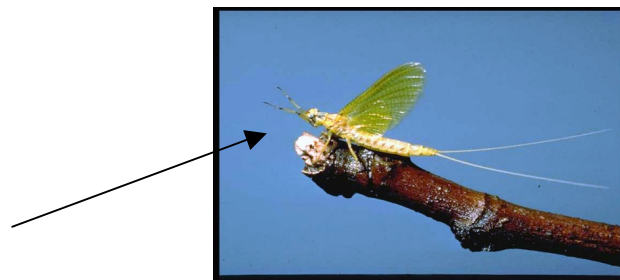
a. Yes.....Mecoptera

(Ex: scorpionflies)



Examples:

b. No.....Go to # 14



14. Does the insect have antennae that are not easily seen, long narrow wings, and a long slim abdomen?

a. Yes.....**Odonata**
(Ex: dragonfly, damselfly)



Examples:

b. No.....Go to # 15

Example:



15. Does the insect have two short cerci (appendages) on the end of its abdomen and front wings narrower or different than the rear wings?

a. Yes.....Plecoptera

(Ex: stonefly)



Examples:

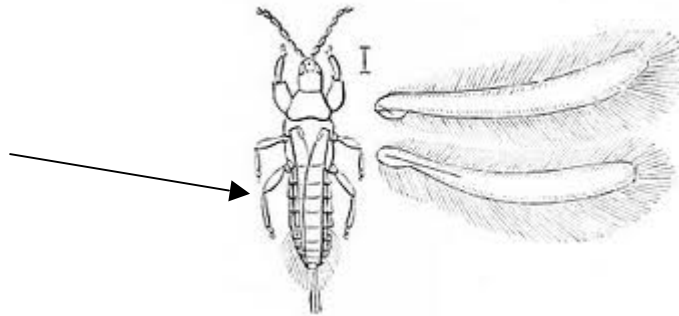
b. No.....Go to # 16



16. Do the insect's tarsi (feet) have 5 segments?

a. Yes.....Go to #29

Example:



b. No..... Isoptera

(Ex: termites)



Examples:

17. Is the insect antlike,
with a narrow waist?

a. Yes.....Hymenoptera

(Ex: ants, bees, wingless wasps)



Example:

b. No.....Go to #18

Example:



18. Is the insect antlike, but with a wide waist?

Photo Credit: Amanda McCreless

a. Yes.....Isoptera

(Ex: termites)



Examples:

b. No.....Go to #19



19. Is the insect small and flattened, with chewing mouthparts and a head about as wide as its body?

a. Yes.....Go to # 20



Example:

b. No.....Go to # 21



20. Are the antennae long,
and composed of many
segments?

a. Yes.....Psocoptera

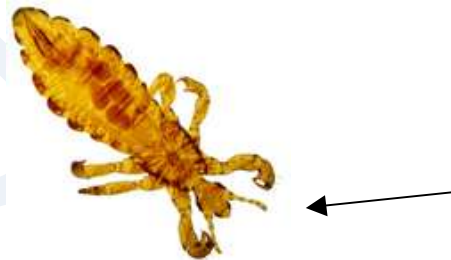
(Ex: bark or book lice)



Examples:

b. No.....Mallophaga

(Ex: chewing lice)

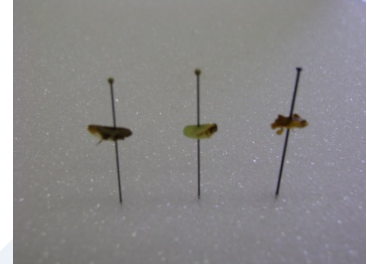


21. Is the insect's body soft and rounded, with two short tubes projecting from the abdomen, and with a small head?

Photo Credit: Amanda McCreless

a. Yes.....Homoptera

(Ex: leafhoppers, cicada, thornbugs)



Examples:

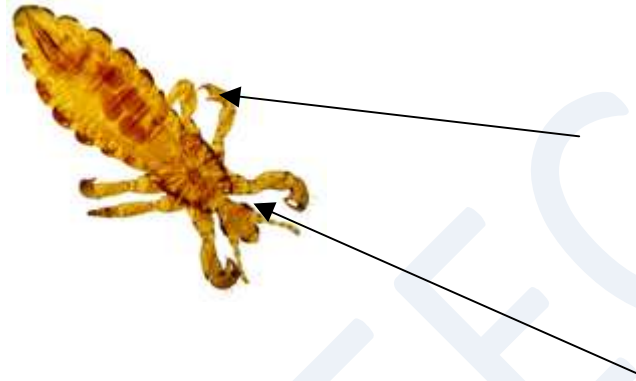
b. No.....Go to # 22



22. Is the insect very small, with a flattened body, a hook like claw on each leg, and sucking mouthparts?

a. Yes.....Anoplura

(Ex: sucking lice (mammal host))



Examples:

b. No.....Go to # 23



23. Is the insect very small and narrow (flattened laterally) with sucking mouthparts?

a. Yes.....Siphonaptera

(Ex: fleas)

Examples:



b. No.....Go to # 24



24. Is the insect:

Delicate with chewing mouth- parts and threadlike “tails” and antennae?

a. Yes.....**Thysanura**

(Ex: silverfish)

Example:



b. No.....Go to 24-I

24-I. Very small with a springlike lever folded under its abdomen which it uses for leaping?

a. Yes.....Collembola

(Ex: springtail)



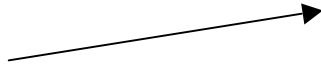
b. No.....Go to # 25

Example:

25. Does the insect have long, broad hind legs that are designed for jumping?

a. Yes.....Orthoptera

(Ex: grasshoppers, crickets, katydid)



b. No.....Go to #26

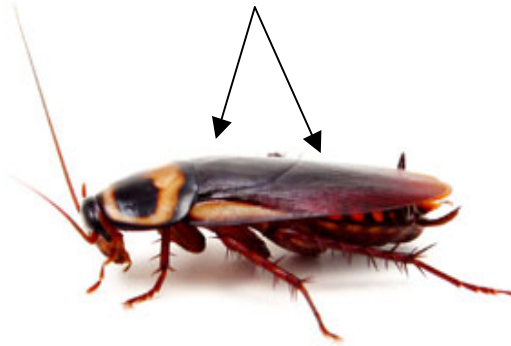
26. Does the insect have a shield like flat body, head partially or completely covered by pronotum? Was it found in a dark place?

a. Yes.....**Dictyoptera**

(formerly **Blattodea**)

(Ex: cockroach)

Examples:



b. No..... Go to # 27



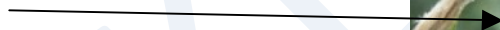
27. Does the insect have a long, thin stick like body and legs, and resembles a tree twig?

a. Yes.....**Phasmida**
(formerly **Phasmatodea**)
(Ex: walking stick)

Examples:



- b. No.....**Dictyoptera**
(formerly **Mantodea**)
(Ex: praying mantis)



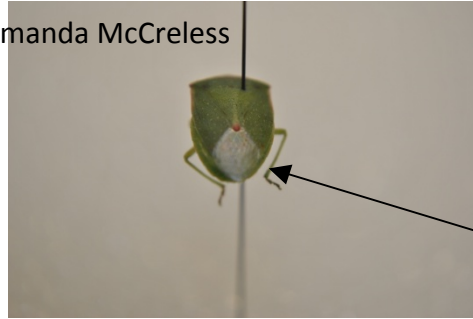
28. Does the insect have a beak like mouth part toward the front of the head? Do the wings form a triangle shape (called a scutellum)?

- a. Yes.....**Heteroptera**
(Ex: stinkbugs)

Photo Credit: Amanda McCreless

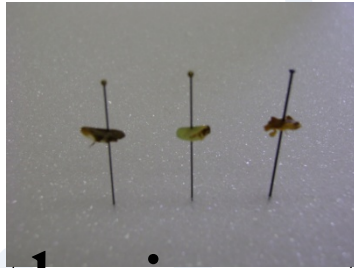
Photo Credit: Amanda McCreless

Example:



- b. No.....Homoptera
(Ex: leafhoppers, cicada, thornbugs)

Example:



29. Does the insect have large wings with dark patches held over the roof like body when at rest?

- a. Yes.....Megaloptera
(once part of Neuroptera)

(Ex: dobsonfly, alderfly)

Examples:



b. No..... Neuroptera

(Ex: lacewing, antlion)



References

Key adapted from:

Imes, Rick. *The Practical Entomologist*. New York: Quarto Publishing plc, 1992. Print

Information obtained from:

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Images obtained from:

- Personal collection: Captured, pinned, and identified by Sara Mitchell. July 2010, Lapeer, MI. BIO 531- Field Studies for Life Science Educators under Dr. Leslie Mertz.
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