Arthropod Classification



Welcome

Welcome to the first unit in ENY 3005/5006, the Principles of Entomology! During this unit you will learn what an insect really is. Surprisingly, most people really don't know!

Journal Assignment: Please post a discussion topic titled "Bug Story". This story should be a short introduction of yourself along with a story involving an insect. Please see the syllabus for grading information and journal due dates.



Objectives

- 1. Define classification.
- 2. Describe the hierarchy in classifying any organism.
- 3. Describe what Linnaeus did for classification.
- Give an example of an organism's classification, from its domain to its kingdom to the species level.
- 5. Describe the characteristics of the phylum Arthropoda.
- 6. Differentiate the major arthropod classes and orders.





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Learning Game Placeholder Learning Game: Choices Title: Which are insects?

Answers

Insects	Non-Insect Arthropods	
Grasshopper	Tick	
Beetle	Scorpion	
Caterpillar	Millipede	
	Crayfish	
	Spider 7	
The second s	Roly-poly	

Were you surprised to find that a millipede is not an insect, but a caterpillar is? By the end of this unit, you will be an arthropod expert. Wait, what is an arthropod? Well, read on.

Classification System

What things do we classify?

How do we know where to place living organisms?



Scientists have a system of classification to determine where different organisms belong and how they are related.

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As science progressed, the classification scheme was adapted to include information about how organisms are related to each other This modern system is known as taxonomy or cladistics. Annelids Onvchophorans Arachnida Merostomata Annelid Ancestor Man Crustacea ropou Chilopoda Scientists use all the tools at their Diplopoda disposal to classify organisms including, 9 collection, preservation, observation, genetic material and computers. Insecta

Classification Scheme

Taxonomy

Classification - Scheme of categorizing organisms Taxonomy - Basic work of recognizing, describing, naming, and classifying of insects.

Nomenclature - The science of naming living organisms.





Nomenclature

- · Multiple common names (nicknames), but only one true scientific name.
- · Based on Latin.
- · Binomial Nomenclature (2 parts)
 - 1. Genus
 - 2. species or specific epithet

(The genus name should be capitalized, and both the genus and species names should be italicized.)



Father of Classification

Carolus Linnaeus (1707-1778) the "Father of Classification."

In 1735, he wrote Systema naturae, which addressed the classification of animals, plants, and minerals. Two years later, he wrote *Genera plantarum*, an explanation for classifying plants. Linnaeus fine-tuned the classification system in 1753 when he wrote a 2volume book called Species plantarum. Species plantarum was the first book to actually assign plants to a specific genera and species. Using this same format in 1758, Linnaeus wrote the 10th edition of Systema naturae and classified approximately 7,700 species of plants and 4,400 species of animals.

SYSTEMA NATURE. 12



Classification: The Three Domain System











Arthropod Characteristics

- · Segmented Body
- · Jointed external skeleton (exoskeleton)
- · Paired jointed appendages on each segment
- Dorsal brain
- · Ventral nerve cord
- · Open circulatory system
- Dorsal heart
- Molts

There is a set of characteristics, besides just the jointed feet or appendages, that distinguishes arthropods from other animals. As was mentioned previously in the lion example, in order to be classified as a chordate, an organism usually has a dorsal nerve cord and usually has a tail (either short or long) that extends beyond the anus. However, an arthropod has neither of these characteristics.

Fill out question #2 on your study guide as you read.

cockroach brain

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Arthropod Similarities hylum Arthropoda – Exoskeleton made of Chitin Externally segmented bodies One pair of appendages per segmen Appendages modified for feeding Ventral nerve cord and dorsal brain Class Insecta 6 legs 3 body segments Order Orthoptera – grasshopper Family Tettigoniidae – katydid Genus Scudderia – bush katydid Species Scudderia furcata - fork-tailed bush katydid

fork-tailed bush katydid

Note: The species name includes the genus name too. If someone asks for a species name, be sure to give both the genus and species name

What is an insect? "Look, I caught an insect!" And you replied, "No, that's not an insect. That's a millipede." "Why?' Now, how would you go about explaining why the millipede is a millipede and an insect is an insect? To understand what an insect is, we first need to learn about arthropods 21 (members of the Phylum Arthropoda)

Arthropod Activity Phylum Arthropoda Insects Isopods Spiders Ticks Crabs Mites Scorpions Crawfish Millipedes Lobster Centipedes

ACTIVITY -Take some time to do the arthropod activity now. This activity is NOT a graded assignment, but the information you gain by completing this task is fair game for the exam.







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Arachnid Orders (Continued)





Acari (Ticks & Mites)

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Pseudoscorpiones (Pseudoscorpions)

U1 Arachnid Quiz Point Value: 10 Please match the correct Arachnid order name to its description. You should drag the order name and click it in place next to the correct description Acari Uropygi Araneae Opiliones PROPERTIES Properties... Edit in Quizmaker ng, '

Arachnid Order Quiz Answers: 1. Uropygi. "Any of numerous arachnids of tropical and warm temperate regions, resembling a scorpion but having an abdomen that ends in a slender, nonvenomous whip." Whipscorpions 2. Opiliones. "Any of numerous spiderlike arachnids having a compact rounded body and extremely long, slender legs." *Harvestmen* 3. Araneae. "Any of numerous predaceous arachnids most of which spin webs that serve as nests and as traps for prey." Spiders Scorpiones. "Any of numerous arachnids widely distributed in warmer parts of the world, having a long, narrow, segmented tail that terminates in a venomous sting." Scorpions Acari. "Any of numerous bloodsucking arachnids, somewhat larger than the related mites and having a barbed proboscis for attachment to the skin of warm-blooded vertebrates: some ticks are vectors of disease. Also any of the numerous small to microscopic arachnids including species that are parasilic on animals and plants or that feed on decaying matter and stored foods." *Ticks & Mites* Pseudoscorpiones. "Any of several small arachnids that resemble a tailless scorpion and that feed chiefly on small insects." *Pseudoscorpions*





Class Crustacea

- Exoskeleton of chitin
 Some hard with calcium (crawfish)
- · Periodic molting The free-swimming larvae or nauplius has an unsegmented body and three pairs of appendages.
- Two or three body segments head, thorax or
- cephalothorax, and abdomen Has a carapace/shield
- Two pair of antennae
- One median eye and two lateral eyes.
 Three pair of biting mouthparts mandibles and two sets of maxillae
- · First pair of thoracic appendages often modified into pincers
- Breathe with gills
 Sexual reproduction

Crustacean orders



Isopoda



Decapoda

Fill out your study guide table (see question 7a).

Characteristics

Class Chilopoda nocturnal

- one pair of legs per segment
- · one pair of antennae
- jaws
- 2 pair of maxillae
- · carnivorous
- exoskeleton



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Class Diplopoda

- · two pair of legs per segment
- · chewing mouthparts
- detritivorous eat decaying organic matter
- exoskeleton

Class Insecta Characteristics · exoskeleton of chitin

head thorax abdomen



- o Head
- o Thorax
- o Abdomen
- · 3 pair of mouthparts
- · 1 pair of antennae
- · compound and simple eyes
- · 3 pair of legs
- · varied appearance





millipede

Learning Game: Choices Title: Review Quiz

Summary Table

	Arachnids	Crustaceans	Insects
Mouth Parts	Chelicera	Mandibles	Mandibles
Body Regions	Two	Two	Three
Antennae	None	Two Pair	One Pair
Legs	4 Pair (8)	Many	3 Pair (6)

