

General Entomology

Lecture (1)

Dr. Sanaa Alhadidi

Biology Department

Collage of Science

University of Diyala



Lecture Topics

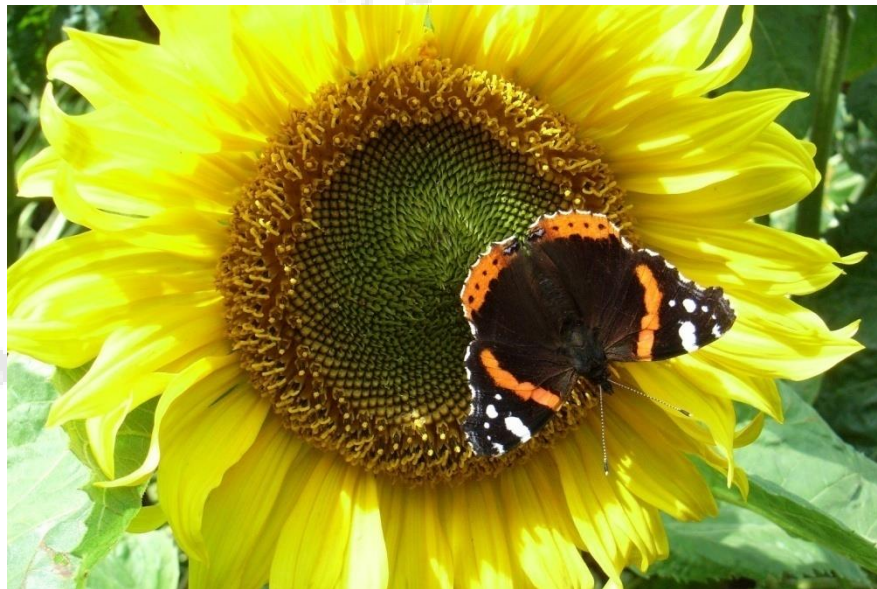
- **What is Entomology**
- **Why we study insects?**
- **Phylum Arthropoda: General characters and Classification**

Dr. Sanaa Alhadidi

What is Entomology?

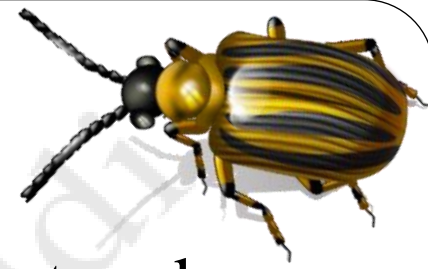
Entomology = the study of insects (development, anatomy, physiology, life history, behavior, environment, and classification).

An entomologist = a person who studies or is an expert in insects.





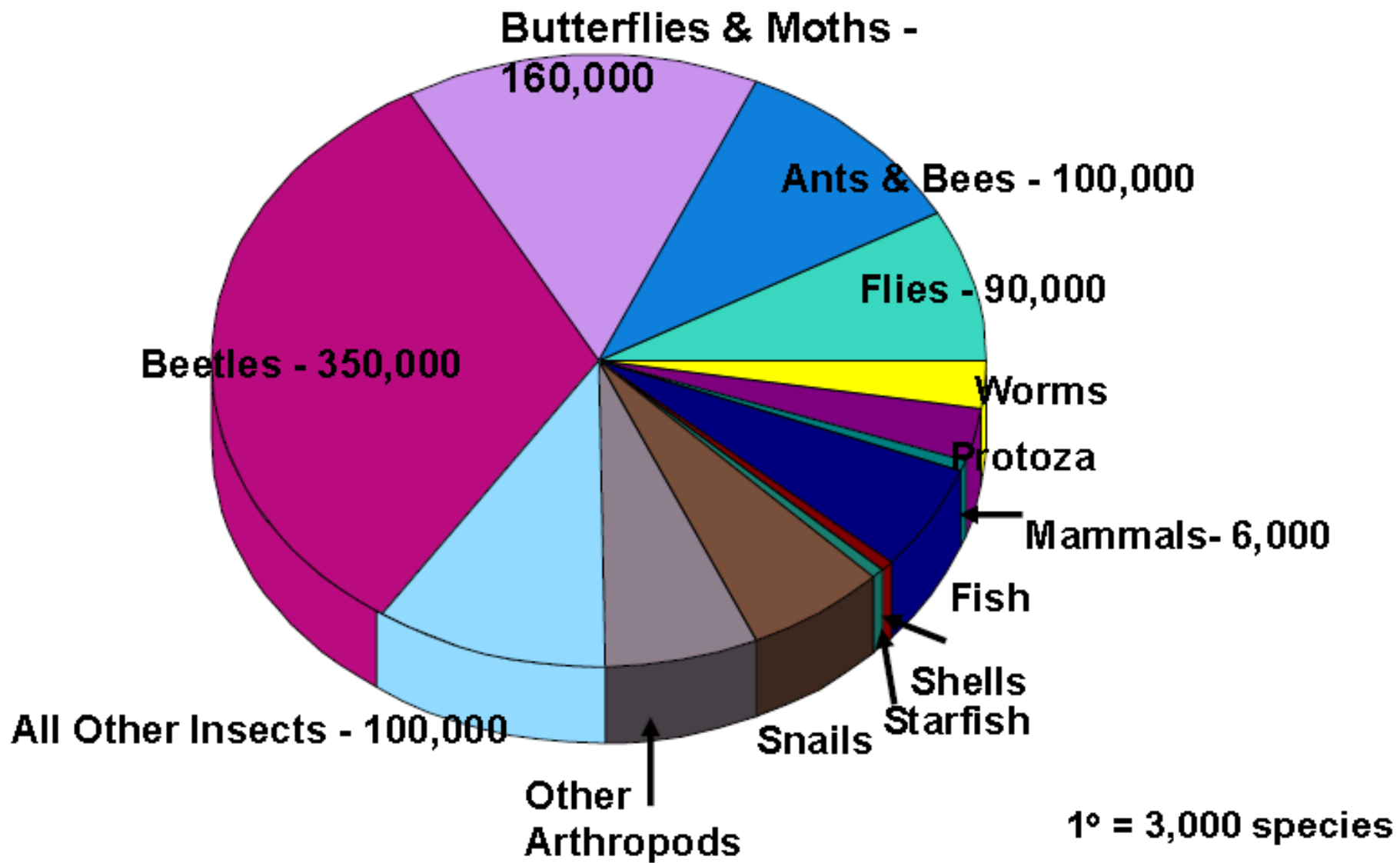
Why study insects?



Insects have a huge influence in our lives > direct and indirect; positive and negative.

- More insect species than any other animal.
- More than 80% of known species.
- Insects have conquered virtually every type of environment – land, air, water.





~3/4 of all animals are Insects (~750,000 species)

Why study insects?

- **Insects have changed history:**
 - Bubonic plague carried by fleas killed 3 times more than WW1.
 - **They have influenced art and culture:** Poetry, paintings, films, etc.



Insect benefits

- **Decomposition** of dead animals, vegetation, etc.
- **Food and other products** (silk , honey & wax).
- **Pest control** > reduce pests (predators& parasitoids).
- **Genetic research** > use insects as study model.
- **Investigation of crimes** > insects' habitats or stage.
- **Maggot Therapy (MT)** > treat skin infections.
- **Pollination**> increases crop yields.
 - An estimated value of what pollinators pollinate in the UK is ~£1 billion & \$15 billion in US.

<http://news.bbc.co.uk/1/hi/8015136.stm>

<http://www.ars.usda.gov/News/docs.htm?docid=15572>

Insects impacts

- **Plant pests** > reduce crop yield.
- **Attack stored food & clothes.**
- **Animal pests** > infected livestock (sheep, cows, etc.).
- **Disturb Human**> itching.
- **Human pests** > transmit disease e.g., Malaria.
- **1.5-3 million people die from malaria each year (300 children/hour)(US \$ 1.7 billion in funds were committed to malaria control internationally in 2009).**

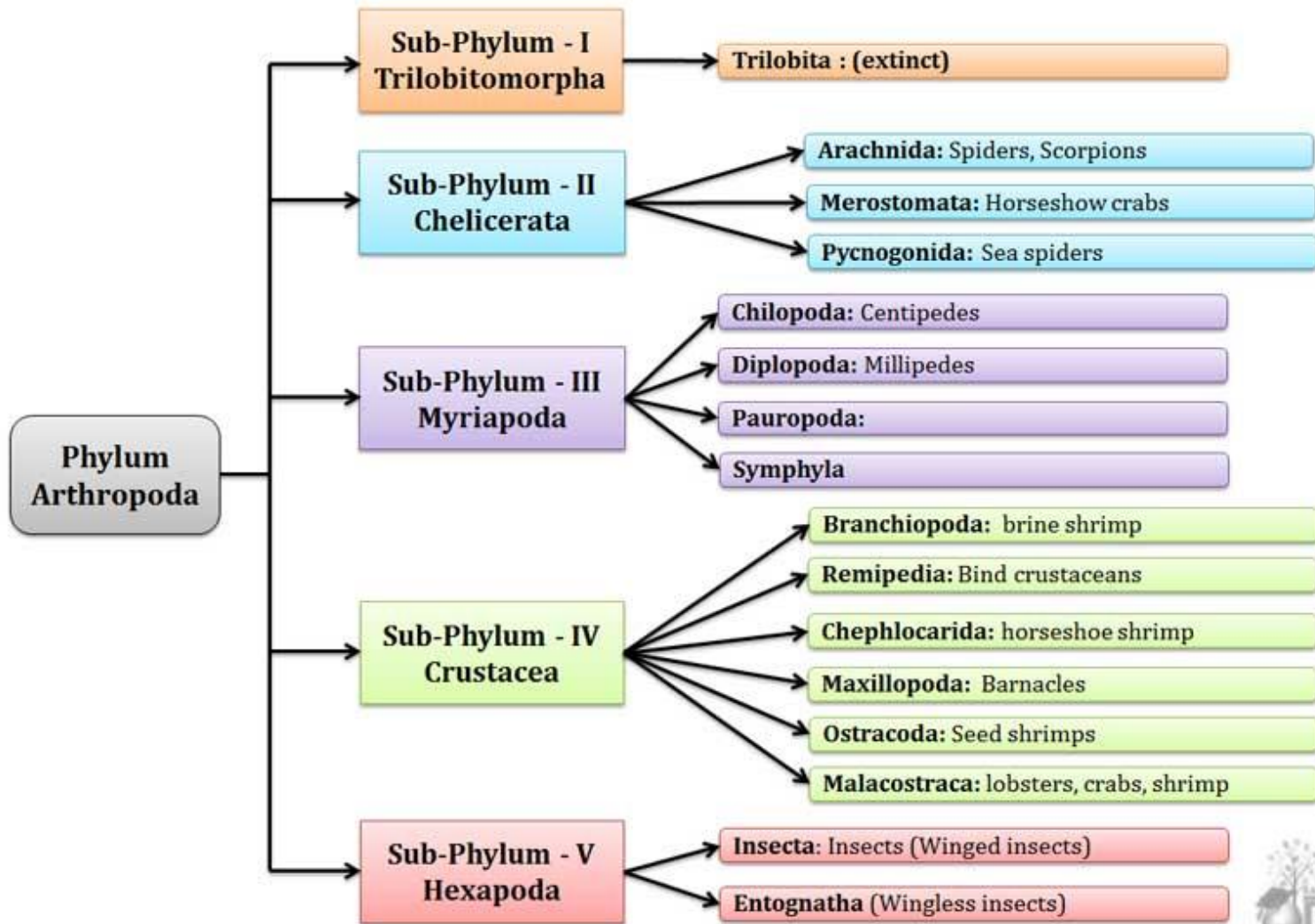


(WHO – World Malaria Report 2009

http://whqlibdoc.who.int/publications/2009/9789241563901_eng.pdf)

Arthropoda

Classification of Phylum Arthropoda (Mind Map)



Main General Characters of Arthropoda

- Body structure shows **bilateral symmetry**.
- They are **triploblastic**.
- Found in all types of habitats – land, water and soil.
- They have paired, segmented appendages.
- Body is segmented into three regions – **Head, Thorax & Abdomen**.
- Body cavity is filled with blood and is called the haemocoel.
- Blood (haemocoel) is white in colour.
- Exoskeleton is hardened and is made of chitin.

Main General Characters of Arthropoda

- Arthropoda have ventral nerve cord.
- Digestive tract is complete with the mouth and anus at opposite ends of the body.
- They have an open circulatory system with dorsal heart and arteries.
- Respiration is through the general body surface or by gills in aquatic species and through trachea or book lungs in terrestrial species.
- Sexes are separate and sexual dimorphism is exhibited.

Classification of Arthropods

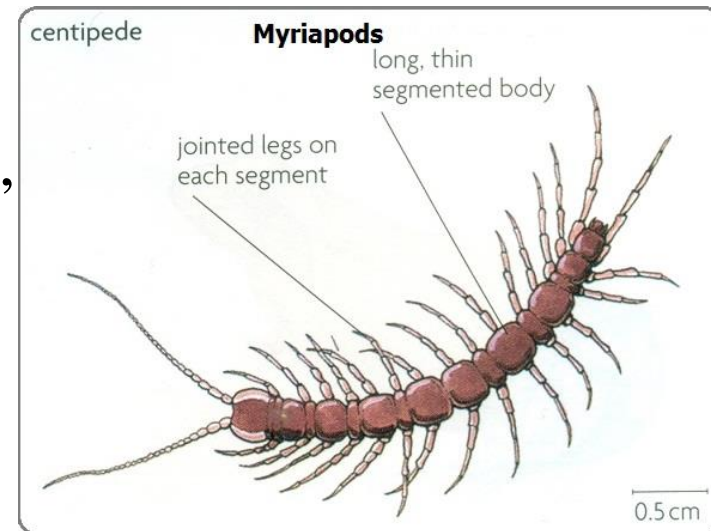
- **Trilobita**

- extinct species.
- marine species.
- had flattened, oval-shaped bodies.
- few inches long.



- **Myriapods**

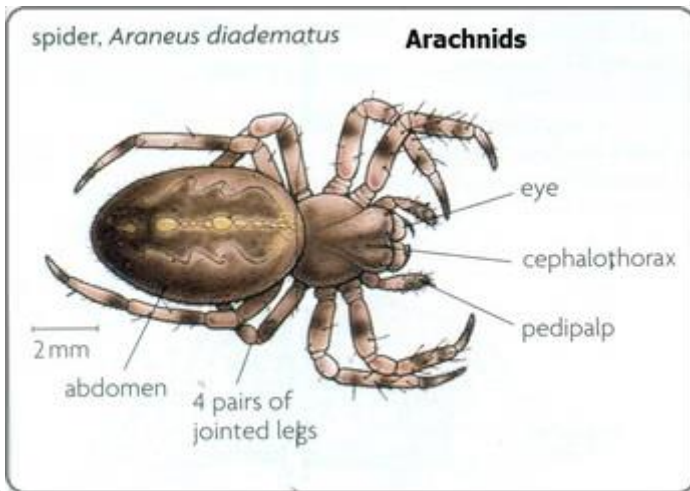
- Myriapod = “many feet” (10-750 feet).
- terrestrial animals and are nearly all herbivores (plant-eaters), except the predatory centipedes
- $\approx 13,000$ species



Classification of Arthropods

- **Chelicerata**

- $\approx 70,000$ species (mostly predatory)(e.g., spiders, scorpions, mites)
- characteristic is a pair of specialized appendages “**chelicerae**”.
- Chelicerae are pointed mouthparts > grasp and immobilize prey.
- Body = 2 main regions: **cephalothorax** (8 segments), & **abdomen** (12 segments, no appendages & followed by the tail, or telson).



Mites

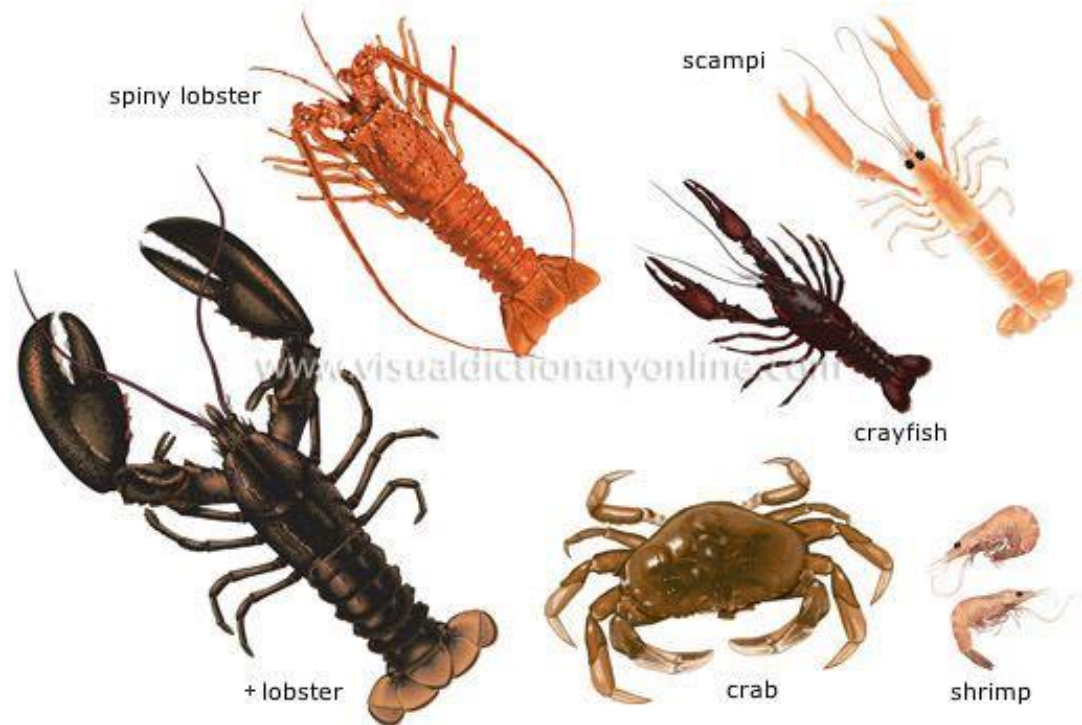


Ticks

Classification of Arthropods

- **Crustaceae**

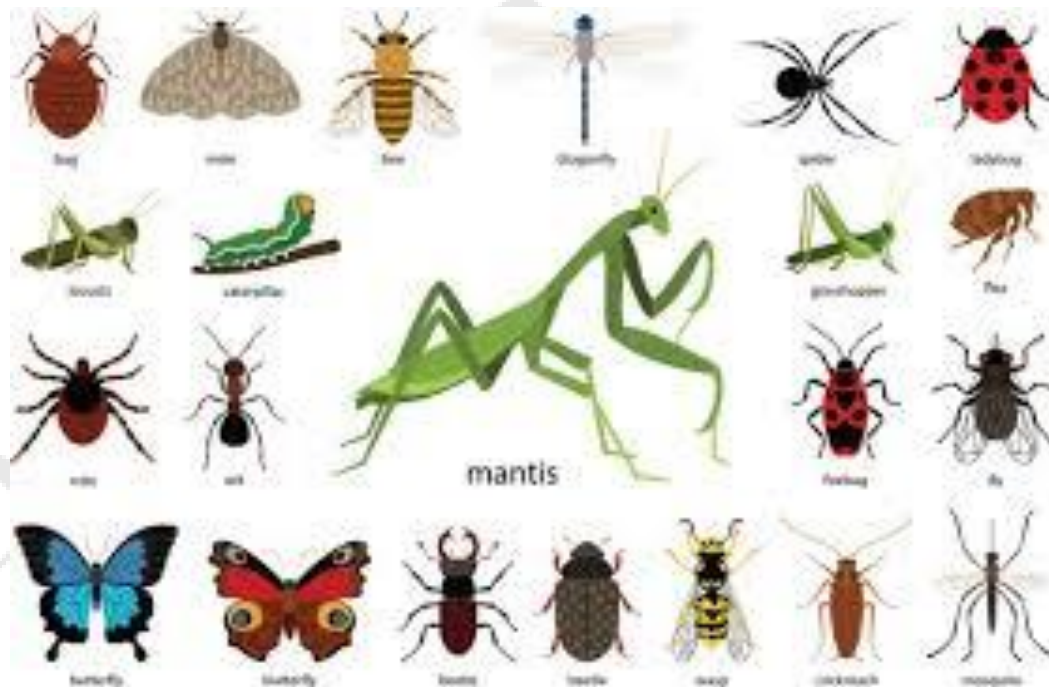
- $\approx 70,000$ species.
- Mainly aquatic species and some are terrestrial.
- A hard exoskeleton made of calcium.
- E.g., lobster, shrimp and crab.



Classification of Arthropods

- **Hexapoda**

- ≈ 1000 species (Collembola, Protura, and Diplura) are all small soil-dwelling animals.
- $\approx 800,000$ species of class hexapoda are insects.
- Insects contain ≈ 29 Order.



Useful websites

<http://www.cals.ncsu.edu/course/ent425/index.html>

<http://www.earthlife.net/insects/anatomy.html>

<http://www.ent.iastate.edu/ref/anatomy/ihop/>

Dr. Sanaa Alhadidi

DON'T PUT TOO MUCH
PRESSURE ON YOURSELF TO
ACCOMPLISH ALL YOUR
DREAMS BY A CERTAIN AGE.
YOU HAVE YOUR ENTIRE
LIFE TO ACCOMPLISH
THINGS. ACCOMPLISHMENTS
ARE VALUABLE AT ANY AGE.



THANK YOU!

