Realistic Bugs

Coleoptera

Vancouver Community College
BIOL 1100
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September. 23, 2024

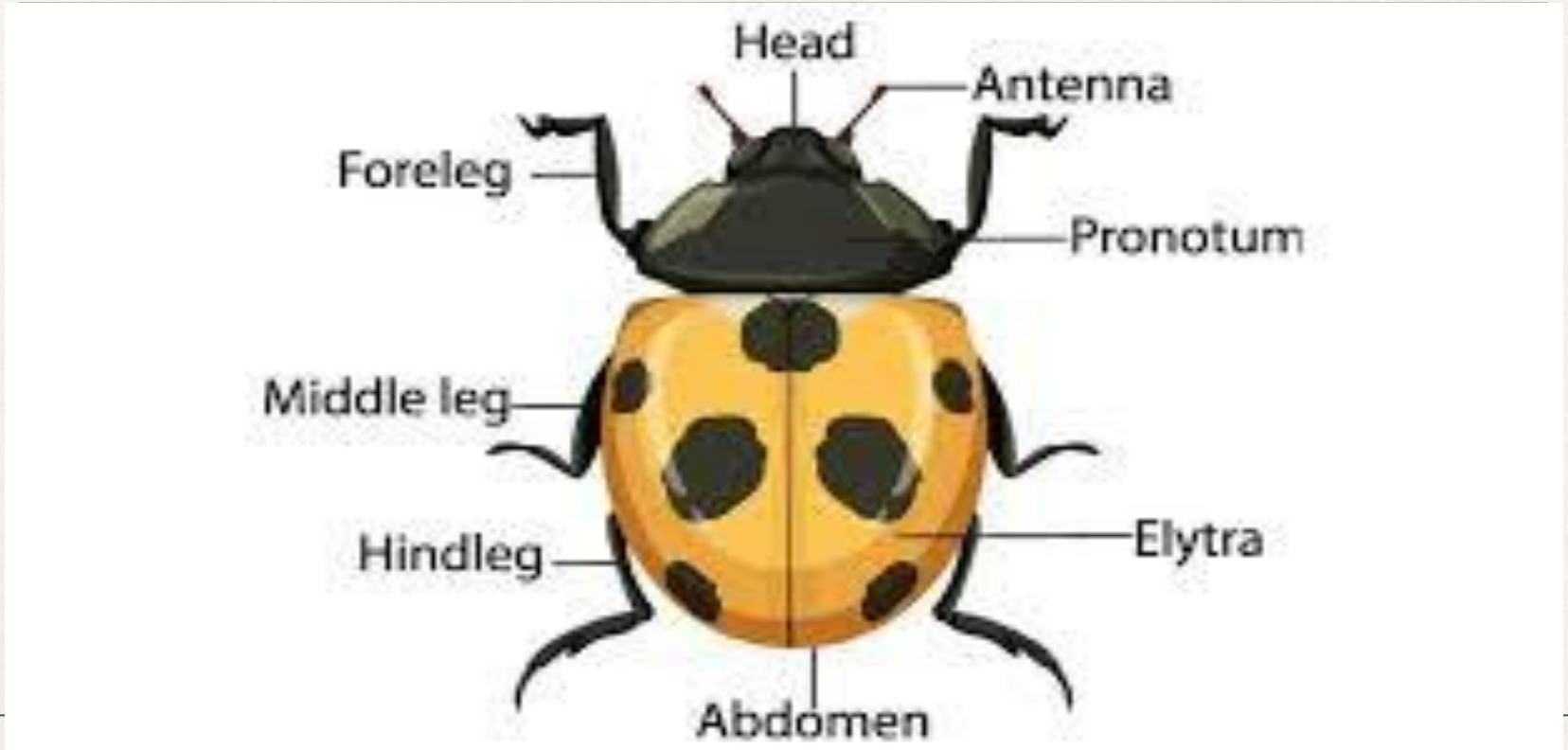
Diversity

- **Coleoptera**, commonly known as beetles, are the most diverse and species-rich insect group on Earth
- Over **380, 000 species** are described, making up **~25% of all animal species.**
- Many species **are yet to be described**
- Beetles exhibit **morphological and ecological diversity**
- They play **key roles in most ecosystems**

Distribution

- Beetles live in **most climates**, except **Antarctica and high altitudes**
- Found on **subantarctic islands**, near the Arctic, and on **mountaintops**
- **More species** are in the **tropics**, but **temperate regions** have **higher individual abundance**

Body Plan


Head
Antenna
Foreleg
Pronotum
Middle leg
Hindleg
Elytra
Abdomen

Beetle Morphology

Coleoptera

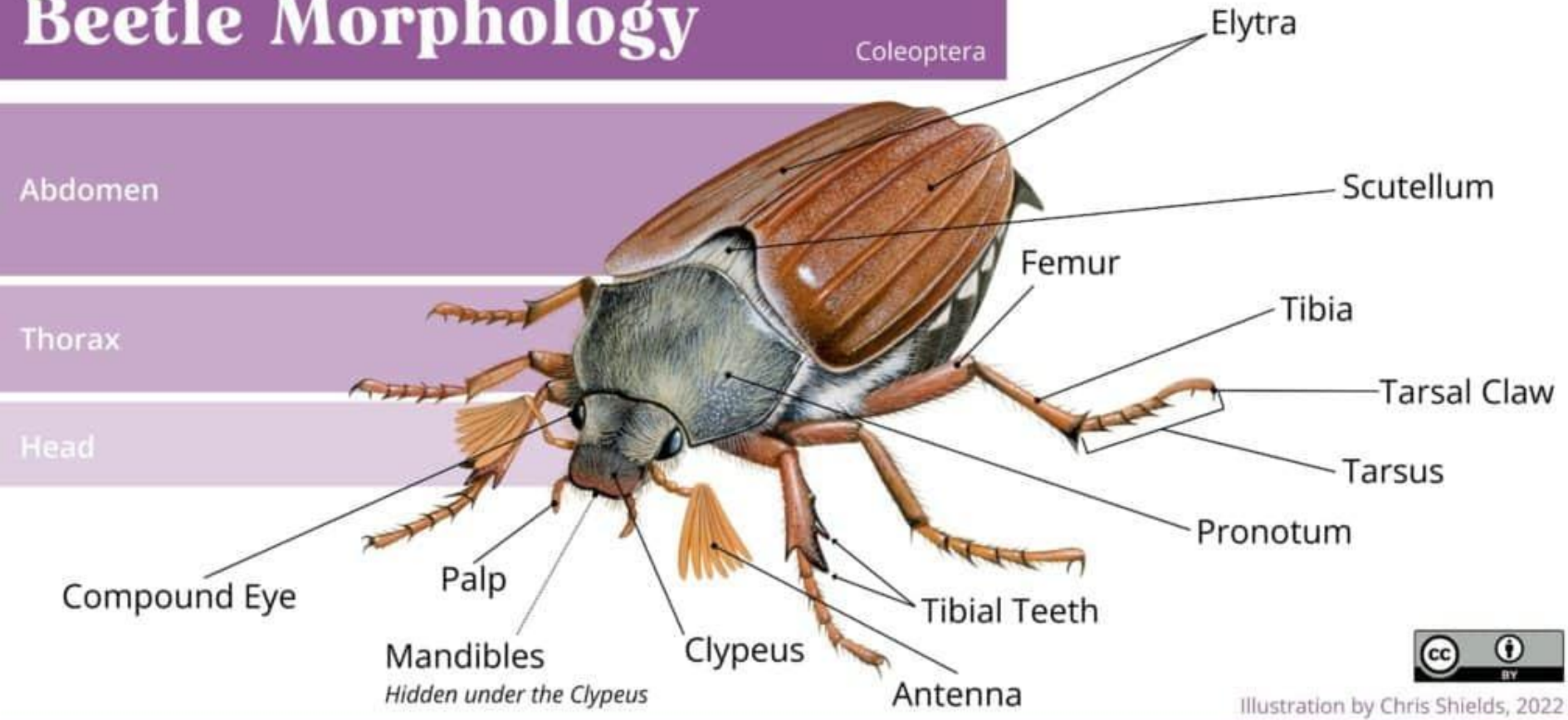


Illustration by Chris Shields, 2022

Field Studies Council

Royal Entomological Society

Made possible with Heritage Fund

Methods of Locomotion

- **Walking / Running** with six legs
- **Flying** using hindwings, protected by hardened forewings (elytra)
- **Swimming** with paddle-like legs (aquatic species)
- **Burrowing** with strong legs

Feeding Style

- Coleoptera includes herbivores, carnivores, scavengers, and detritivores
- Ladybugs are predominantly carnivorous as they feed on aphids, mites and small insects although some species feed on plants and fungi
- The most well-known prey are aphids, which are major agricultural pests
- One ladybug can eat up to 50 aphids were day
- When prey is limited, some species of ladybugs will resort to eating pollen nectar or fungus
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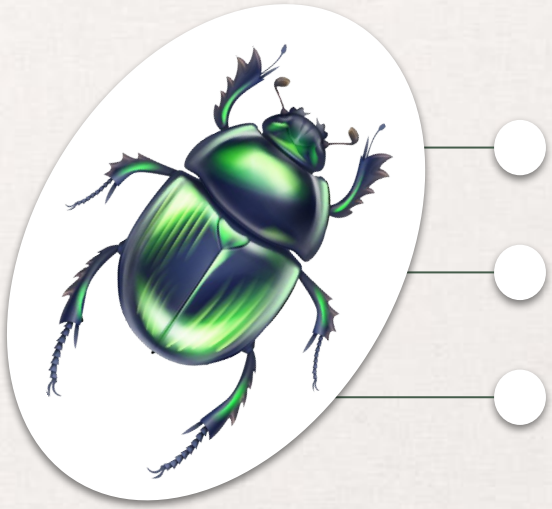
- In times of food scarcity, ladybugs may display cannibalism among larvae or unhatched eggs

Defense Mechanism



- Many beetles have hard exoskeletons that protects them from predators
- Chemical defenses are also common such as the Bombardier beetles release hot poisonous chemicals from their abdomen to deter predators
- Brightly coloured beetles often use aposematism (warning colours) to signal toxicity while others use camouflage to blend into their environment

Unique Features

Coleoptera are known by their elytra, hardened forewings that protect their delicate hind wings and body

Many species have strong mandibles which is the lower jaw bone which is needed for chewing

Beetles go through complete metamorphosis : egg → larva→pupa→adult stage

Some beetles such as the stag beetles have large antler-like jaws used for combat

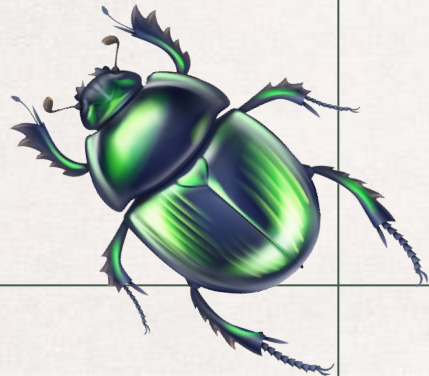
Reproduction

Beetles lay eggs in environments that suit their larvae feeding habits such as soil, plant matter or inside decaying wood

Mating rituals can vary for example male stag beetles engage in fights with their large mandibles to win over females

Most beetles do not care for their young after egg-laying
But some beetles provide parental care such as burying beetles tend to their young by feeding their larvae regurgitated pre-digested food

A female can lay hundreds to thousands of eggs throughout her lifetime



Any other interesting or unsual

Navigation:

Dung beetles use the Milky Way to navigate while rolling dung

Symbiosis
Some beetles live in close relationships with other organisms such as ants where they either help exploit the colony

Fireflies use **bioluminescence** for mating communication

A ladybug larva can eat even more pests than an adult

Ladybugs are often uses as biological control agents in agriculture as they are released into field and garden to control aphid population. Many farmers/gardeners purchase ladybugs for this purpose

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