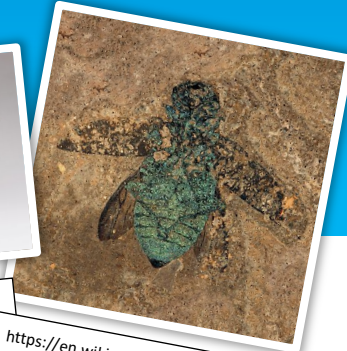


Order Coleoptera

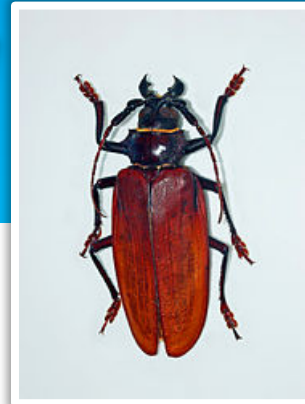
Beetles (koleos = sheath, pteron = wing)



<https://en.wikipedia.org/wiki/Beetle>



<https://en.wikipedia.org/wiki/Beetle>



https://en.wikipedia.org/wiki/Titan_beet



https://en.wikipedia.org/wiki/Stag_beetle

Worldwide Diversity

Roughly 400,000 species of beetles have been described so far. This is roughly 40% of all described insect species and 25% of all described animals. Many beetles are important agricultural pests (think boll weevil), but many serve in the role of decomposers (of both plant and animal materials), as carnivores, or as herbivores. Beetles are holometabolous (passing through life stages of egg, larva, pupa, and adult).

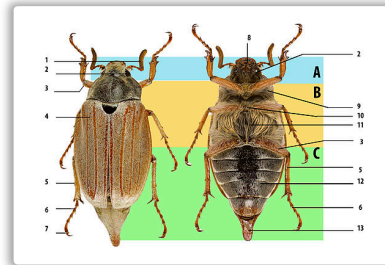
Fun fact

There are nearly as many species of weevils (family Curculionidae) (over 70,000) than there are species of vertebrates (80,500). Source:

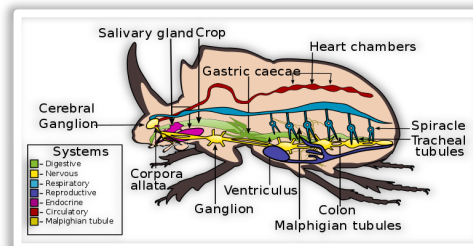
<https://www.currentresults.com/Environment-Facts/Plants-Animals/estimate-of-worlds-total-number-of-species.php>.

Illinois species

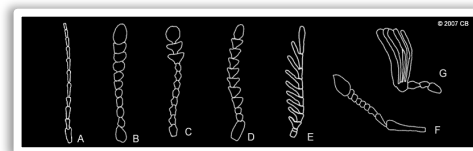
There are roughly 20,000 species of insects known from Illinois. About 40% are estimated to be species of beetles.



Anatomy of adult scarab beetle (source: <https://en.wikipedia.org/wiki/Beetle>)



Internal beetle anatomy (source: <https://en.wikipedia.org/wiki/Beetle>)



Variations in beetle antennae (source: <https://www.kerbtier.de/Pages/Themenseiten/enKoerperbau.html>)

Classification

The higher-level classification of beetles is fairly well documented (and confirmed by molecular analyses). Our current understanding of relationships is shown in the image to the right. Keep in mind that over 400,000 species are sorted into these groups. Source:

<https://en.wikipedia.org/wiki/Beetle>.

Diversity

“A 2015 study provided four independent estimates of the total number of beetle species, giving a mean estimate of some 1.5 million with a "surprisingly narrow range" spanning all four estimates from a minimum of 0.9 to a maximum of 2.1 million beetle species...

Beetles are found in nearly all habitats, including freshwater and coastal habitats, wherever vegetative foliage is found, from trees and their bark to flowers, leaves, and underground near roots - even inside plants in galls, in every plant tissue, including dead or decaying ones.

The heaviest beetle, indeed the heaviest insect stage, is the larva of the goliath beetle, *Goliathus goliatus*, which can attain a mass of at least 115 g (4.1 oz) and a length of 11.5 cm (4.5 in). Adult male goliath beetles are the heaviest beetle in its adult stage, weighing 70-100 g (2.5-3.5 oz) and measuring up to 11 cm (4.3 in). Adult elephant beetles, *Megasoma elephas* and *Megasoma actaeon* often reach 50 g (1.8 oz) and 10 cm (3.9 in).

The longest beetle is the Hercules beetle *Dynastes hercules*, with a maximum overall length of at least 16.7 cm (6.6 in) including the very long pronotal horn. The smallest recorded beetle and the smallest free-living insect (as of 2015), is the featherwing beetle *Scydosella musawasensis* which may measure as little as 325 µm in length.” Source:

<https://en.wikipedia.org/wiki/Beetle>.

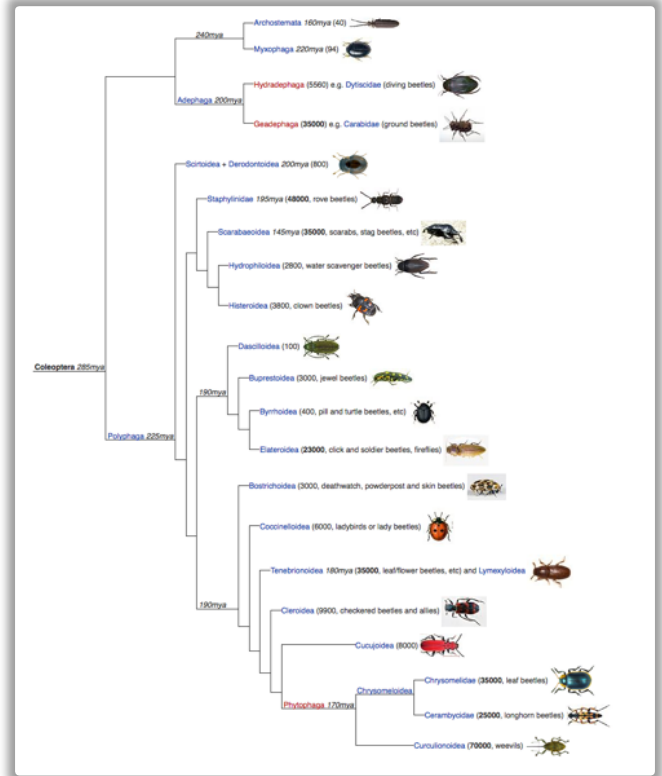
Geological history

Beetles are first known from the Pennsylvanian (roughly 318 million years ago). Source:

<https://en.wikipedia.org/wiki/Beetle>.

The earliest weevil is known from Jurassic deposits (roughly 210 million years ago). Source:

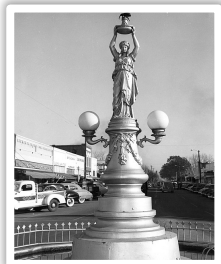
<https://en.wikipedia.org/wiki/Beetle>.



Beetle classification (source: <https://en.wikipedia.org/wiki/Beetle>)



Dung beetles [Scarabaeidae] (source: https://en.wikipedia.org/wiki/Dung_beetle)



The boll weevil is one of the few insects with its own monument in the U.S. (in Enterprise, AL) (source: https://en.wikipedia.org/wiki/Boll_Weevil_Monument)