

SCARAB BEETLES

SCARABAEIDAE (LATREILLE, 1802)

NATURAL HISTORY SUMMARY BY JACOB EGGE, PHD

Classification

Kingdom: Animalia

Phylum: Arthropoda

Class: Insecta

Order: Coleoptera

Family: Scarabaeidae

Description

The family Scarabaeidae is comprised of a diverse assemblage of beetle species with over 27,000 described. Shape varies widely, but most are stout-bodied with antennae that have 10 segments and a 3-7 segment opposable club (Ratcliffe and Jameson 2005). The pronotum may or may not be ornamented with horns or tubercles. Front legs are often broad and adapted for digging. Well-known representatives include Japanese beetles (*Popillia japonica*) (an agricultural pest), Dung Beetles (Scarabaeinae and Aphodiinae), June Beetles (Cetoniinae and Melolonthinae), Rhinoceros Beetles (Dynastinae), and the Goliath Beetle (*Goliathus goliathus*) (one of the heaviest insects) (Ratcliffe and Jameson 2005).

Distribution

Scarabs are globally distributed with the exception of Antarctica and marine environments.

Diet

The so-called “Dung Beetles” feed on the dung of large herbivores. Some species live in the dung while others roll perfectly spherical dung balls over large distances to bury them. However, not all scarabs feed on dung. Diets vary widely and include carrion, fungi, vegetation, pollen, fruits, compost, roots (Ratcliffe and Jameson 2005).

Habitat and Ecology

Many Scarabs are nocturnal, but some are diurnal. The Dung Beetle, in particular, can be placed into one of three functional groups: Rollers, dwellers, and tunnellers. Rollers gather dung into a ball, roll it to a brood chamber and lay their eggs in the dung ball. Tunnellers dig vertical tunnels below a dung pile and bring the dung into these tunnels where they also lay their eggs. Dwellers live in the dung pile and lay their eggs directly in the dung. It is thought that competition for food and space may have driven the divergence of these three different strategies. (Dung Beetles of Africa 2017).

Reproduction and Life Cycle

Scarabs often deposit their eggs in soil or dung. Larvae emerge from eggs as grubs and spend all of their time underground, buried in debris. Some species exhibit parental care for a larval brood ball. Larvae may overwinter below the frost line in the soil in places where winters are cold. Pupation occurs in response to some sort of environmental cue such as precipitation or temperature (Ratcliffe 1991; Richter 1958; Woodruff 1973).

Conservation Status

Some species are threatened by habitat loss and by collectors, however most Scarab species' populations are stable. There are currently no Scarabs listed as species of concern in Washington.

Cultural Significance

Egyptians worshiped the Sacred Scarab (*Scarabaeus sacer*) as the embodiment of the sun god (Foley). Rhinoceros Beetles are popular pets in parts of Asia where they are also used in gambling fights (Micke 1996).

Specimen Specific Detail

Most of the Scarabs from the [Burton Ostenson Museum of Natural History](#) at Pacific Lutheran University (PLU) and here on display, were collected by Jens Knudsen, a biology professor at PLU in the 1950's and 1960's. However, there are a number of specimens collected by other contributors as recently as 2000. The species shown

are an example of the great variation in size, shape, and color exhibited by Scarabs in Washington and other representatives from California, Texas, and Hawaii.

Literature Cited

Dung Beetles of Africa. 2017. Available at:

<http://dungbeetlesforafrica.wixsite.com/scarabresearchgroup/biology-ecology-behaviour>.

Accessed on September 2, 2017.

Foley, K. Ancient Egyptian Amulets – Scarabs. Johns Hopkins Archaeological Museum. Available at

<http://archaeologicalmuseum.jhu.edu/the-collection/object-stories/ancient-egyptian-amulets/scarabs/>. Accessed on September 2, 2017.

Micke, T. 1996. Xylotrupes-Rhinoceros beetle: The Sumo wrestlers of the animal world. Articles

Extra. Available at <http://www.articlesextra.com/beetle-fight-xylotrupes-thailand.htm>.

Accessed on September 2, 2017.

Ratcliffe, B.C. 1991. The Scarab Beetles of Nebraska. Bulletin of the University of Nebraska State Museum 12: 1-333.

Ratcliffe, B.C. and M. L. Jameson. 2005. Generic Guide to New World Scarab Beetles. University of Nebraska-Lincoln State Museum. Available at

<http://www.museum.unl.edu/research/entomology/scarabcentral.html> Accessed on

September 2, 2017.

Ritcher, P.O. 1958. Biology of Scarabaeidae. *Annual Review of Entomology* 3: 311-334.

Woodruff, R.E. 1973. Arthropods of Florida and Neighboring Land Areas. Volume 8. The Scarab

Beetles of Florida (Coleoptera: Scarabaeidae). Part 1. The Laparosticti (Subfamilies: Scarabaeinae, Aphodiinae, Hybosorinae, Ochodaeinae, Geotruperinae, Acanthocerinae).

Florida Department of Agriculture and Consumer Services, Contribution No. 260 Bureau of Entomology, Gainesville, Florida. 220 pp.