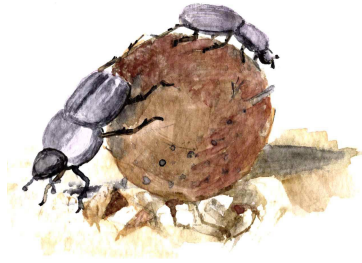


# NATURE DETECTIVES



Fall 2019



## Dung and Burying Beetles Reuse and Recycle

Bees and other pollinators get a lot of praise. That's good because they play a vital role in the lifecycle of plants. But don't overlook the beetles that reuse and recycle poop and dead animals. Without **dung beetles** and **burying beetles** our world would not be so sweet. Picture in your mind what your street would look like if nobody ever picked up the garbage. Yuck! Did you ever wonder what happens to all the "garbage" in nature? These cool beetles take care of part of it.

### The Poop R&R Squad

**Dung beetles** deal with poop such as cow dung and deer droppings. Unfortunately, they say "No thanks!" to dog poop. They prefer the dung of mammals that eat plants.

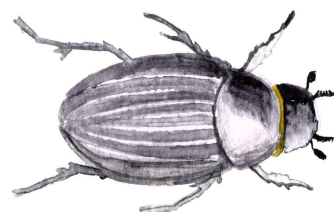
Some kinds of dung beetles roll poop into balls that weigh more than the beetles. Like miniature acrobats, they propel their sphere over the ground. The male beetle pushes while the female sits on top of the ball and turns it with her legs. Their goal is to roll it into a tunnel they've dug for a nest site to raise their young.

### The Dead Body R&R Squad

**Burying beetles** are a type of *carrion* beetle. They specialize in actually burying their carrion (dead animal) discoveries. They typically deal with the bodies of mice and small birds.

They begin by digging a pit underneath the carcass. Strange as it may seem, they remove the fur or feathers from their find. As they work, they line the pit area with that fur or feathers. They also remove the skin then push the body into a round shape. The process of burying the body takes hours, and they still have work to do to make it ready to nurture the larva stage of their young.

For more incredible facts on dung beetles and burying beetles that live in Boulder County, read on.

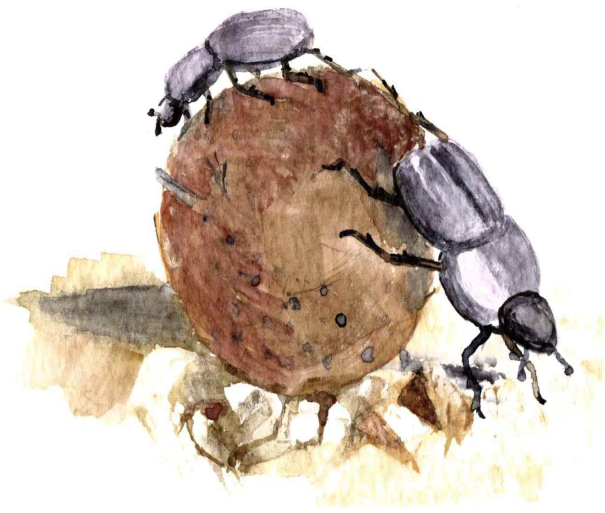


## Location, Location, Location for **Dung Beetles**

Worldwide there are about 6,000 different species of dung beetles. Colorado dung beetles were likely more numerous when huge herds of bison were roaming the land. Many of those beetles died off when there were no more bison.

Besides the dung beetles that roll poop, there are beetles that carry bits of poop into a nest tunnel, and others that simply set up housekeeping in the poop where it sits. All three kinds work to make safe nests for their young. Underground nests are more easily guarded from rival dung beetles as well as flies and other poop scavengers. When the dung is carried underground, it also stays moist longer. Beneath the ground, the beetle eggs and young are better protected from predators that have a taste for insect eggs and hatched grub-like larvae.

### Finding and Guarding Dung



The beetles have sturdy wings to fly around searching for perfect dung. They use their sensitive antennae to sniff the air for the wafting odor of poop. They use their legs to dig a tunnel for their find or to dig under it and into it. Spurs on their back legs help the rollers move their dung balls. Other dung beetles may try to claim the same tasty poop so they work quickly to get it to their nest.

Dung beetles will fight rival dung beetles to protect their food. Strong legs and horn-like shapes at the top of their head allow them to push and try to flip competitors. The strongest beetle usually wins and the rival beetle retreats.

### Beetles Old and Young Savor Nutritious Dung

Digestion doesn't remove all the nutrients from swallowed foods so dung still has a lot of nutrition remaining. The moisture in fresh dung provides a nourishing soup sipped by adult beetles. The female lays her eggs on the dung, and both parents may stick around to guard the eggs and food supply. When the eggs hatch, the newly emerged larvae have ready-to-eat meals of poop.

### Benefits of Dung Beetles and Survival Threats

Leftover underground bits of dung nurture plant roots. And, roots grow well in soils loosened by the beetles' burrowing. Less dung on the surface helps grazing animals by reducing the numbers of flies and disease-causing parasites such as worms.

When humans use pesticides to kill flies and treat hooved animals for parasites, dung beetles die too. Without dung beetles on the job, poop piles up, attracts more biting flies, and can smother plants. Scientists are studying how to help more dung beetles survive.



## Carry On Carrion Beetles

The greatest variety of carrion beetle species (9 species) is found in the foothills of Boulder County (about 5,500'-8,000' elevation). That's not surprising because more kinds of animals live in the foothills than in the mountains or on the plains grasslands. Dead animals, called carrion, provide nest sites for these beetles. Some simply lay their eggs in carrion, and when the eggs hatch, the carcass is the food source for the larvae. **Burying beetles** are carrion beetles that raise their young from egg to pupa stage as a joint effort by both parents.

### Strange but True, the Life of a Burying Beetle



Burying beetles search by smell for recently dead small birds or rodents such as mice. As the beetles fly along, they use their antennae to detect the aroma of carrion from quite a distance. If several burying beetles arrive, the males fight males and the females fight each other until the weaker beetles leave the carcass to the strongest pair. The winning pair work together to bury the carcass. Burying helps protect their find from other scavengers and predators.

Burying begins with digging beneath the body. After the beetles remove all the fur or feathers and skin from the carcass, they cover the body with their saliva and fluid from their anus, which slows down decay or rotting. They push the flesh into a ball and make a pit in it. The pit will soon house their young.



The female lays her eggs in the nest hole dirt. After the larvae hatch, a parent makes a noise to call them to the pit.

When the larvae have crawled onto the carrion ball, the parents feed them much like baby birds are fed. The parents take bites of the flesh, chew it, then regurgitate it for their young. Such parental care is rare in the insect world, except among social insects like bees or ants. Once the beetle larvae are bigger, they can take bites themselves.

### Guarding Against Intruders

Tending the young is mostly the job of the female while the male spends his time guarding against other insects that would like an easy meal. After several days, each mature larva digs into the dirt and forms a pupa. Once the larvae start to pupate, the parents' jobs are done, and they leave to fly to new carrion.

After the pupae develop into adults, they dig to the surface and fly in search of their own carrion. Adults may feed on bigger carrion when not raising young.



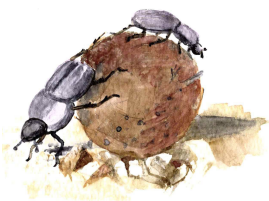
### Carrion Beetles and Mites Help Each Other

Some **mite species** hitch a ride on carrion beetles. The mites eat eggs that various flies lay on or near dead animals. Mites ride along when beetles fly to fresh carrion, getting transported to food the mites couldn't find by themselves.

In turn, the beetles have fewer competitors eating their food. By eating fly eggs, mites reduce the number of fly larvae that would have hatched. The fly larvae, called maggots, compete with carrion beetles by also eating decaying animals.

## Follow that Beetle!

Many dung beetles are active in the daytime, and use the position of the sun to guide their travel. Other beetles work the night shift and use the moon for navigation. Studies have shown some beetles use the stars to find their way.



When a dung beetle rolls a ball of poop away, it has to go in a straight line as fast as possible. The beetles are often moving upside down and backwards to accomplish this!

That's why being able to use the light of the sun, moon, and stars helps.

Try the tricks below to see if you can navigate like a beetle.

### Watch the Sky

Notice the path the sun takes during the day (don't look directly at the sun—it will damage your eyes!). At night, notice the path the moon takes. Are the paths similar? Do you think these paths change during the year?

### Practice Your Rolling Skills

If you have a large ball, go outside in your yard and try rolling the ball with your feet while walking on your hands. If you can do that, then try it again, and keep the ball going in a straight line this time. Can you do the beetle roll?



### Observe



See if you can spot a dung beetle rolling a poop ball on open space property where grazers such as deer or elk share the habitat. One kind of dung roller, called a **tumblebug**, has been found on a trail near Rabbit Mountain. Tumblebugs are named for their clumsy rolling skills.

If you don't find a dung beetle, follow any beetle you do find. Watch it without disturbing it, and see where it goes and what it does. You might make a sketch of it in a notebook, and write down your observations.

See how many different beetles you can study.



American carrion beetle



**Sherlock Fox says:** Humans need to protect amazing dung and carrion beetles for the health of our ecosystems. Many beetle species have disappeared from our land, and the American carrion beetle is on the U.S. Endangered Species list.



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