

Wild Wednesday 14 October 2020 by Walt Anderson

Like a good political investigative reporter, a pocket gopher is good at digging up dirt. Typically, antisocial, secretive, and a member of the radical underground, a gopher stays out of the limelight (and sunlight), so few people know about them unless they have the misfortune of having a garden or lawn filled with them. Sometimes they are confused with moles, though those other fossorial critters tend to live in more humid environments and eschew Arizona. When I look at all their amazing adaptations, I have to admit that I dig gophers!

First, these are the Hercules of the rodent clan. Moving dirt, especially in Arizona's rocky soils, requires musculature that a human body builder would envy. Short powerful forelimbs, an enlarged reinforced skull for muscle attachments, and ever-growing incisors to loosen dirt or gnaw tough roots enable using 360 – 3400 times the energy expenditure of a mammal moving aboveground!

Their short tails and their long whiskers, both with abundant nerve endings, give them extreme sensitivity, yet you still can't rub them the wrong way, for their soft, short fur permits them to move forward or backward in narrow tunnels. Though temperature and humidity are fairly constant in their tunnels, these chambers are low in oxygen and high in carbon dioxide, a particular problem when you do the heavy lifting that they do.

Our pocket gophers deal with low-oxygen environments with higher blood oxygen-carrying capacity thanks to increased levels of hemoglobin and red-blood cells. High CO₂ concentrations in the blood can lead to respiratory acidosis; in humans working underground, this is more than a minor problem! Our little geoengineers have built-in buffering capacity, which may be complemented by the buffering ability of their nitrogenous wastes. Who would have thought!?

Like beavers, pocket gophers are keystone species, having ecosystem impacts disproportionate to their abundance. They aerate soils and move soil nutrients around, often increasing plant diversity and productivity. Their tunnels support plenty of other critters taking advantage of the subway system. And everybody above ground (owls, hawks, foxes, and many more) wants to eat them; they look and function as super-nutritious burritos in food webs.

Gophers create mounds where they push dirt out that they have excavated. They can be vulnerable at those times of surface exposure. They can consume roots and tubers without surfacing (sometimes pulling an entire plant underground!), but they also venture out short distances to harvest more nutritious plant parts, which is how I was able to get these photos. Like any good vegetarians, they select higher quality greens when they can get them, but they can do surprisingly well on "leftovers" that just about nothing else (except, perhaps, javelinas) can eat. Their digestive efficiency is above 70%, putting the domestic cow at 50-60% to shame.

The Botta's Pocket Gopher is perhaps the most widely distributed mammal in Arizona, occupying our lowest deserts clear up to the alpine zone. Individual populations are often insular, separated from other populations and thus locally adapted to soil conditions. It's possible that some of these populations may be distinct species, which could have conservation implications if we want to protect native diversity. They can have serious conflicts with humans (e.g., chewing cables, eating crops), but away from "civilization," they are vital ecosystem components.

Do a good literature search if you want to gopher more information.



Gophers have no need for good eyesight in their underground lairs, though their hearing and sense of smell are quite good. Their fusiform shapes help them move through narrow tunnels, and their narrow hips enable quick turnarounds in tight spaces.



Gopher incisors are kept sharp (don't test that with a finger) and continue to grow throughout life, enabling them to cut tough roots and break up dirt clods as they tunnel. Their claws are marvelous digging tools, and their stout arm bones are mighty humerus.



These “geomorphic agents” move soil and nutrients around in ways similar to those of prairie dogs, those squirrely rodents that are far more social. Pocket gophers like social distancing, though they get together once in a while so that some become den mothers.



Gophers are hoarders, having enormous fur-lined cheek pouches that enable them to transport food to store in subterranean chambers; it's always cache and carry. That bulging oval below the ear is one of his two saddlebags filled with grass. This individual is molting its fur. My hair looks something like that during the Covid-induced tonsorial neglect.



One homebody gopher decided to dine-in from the safety of its burrow. These critters are tough enough to eat cactus despite the spines and the oxalic acid content. Some herbalists insist that cactus products have anti-aging qualities, though it doesn't seem to work for pocket gophers, who have a life expectancy of one to three years. Live hard; die young.



I highly recommend gopher-watching. Watch for their active mounds. Step lightly, as they feel movement through the soil. A wiggling plant may indicate gopher nibbling just below. Even if you just find the diggings, marvel at this incredible lifestyle and the ecological impacts of this furry little burrito. And know that much of a gopher's life is still unknown; you could perhaps gopher a PhD!