



DIGGING THE UNDERGROUND LIFE

Naked mole-rats (*Heterocephalus glaber*) are rodents found in the hot tropical regions of the Horn of Africa. When he first described a naked mole-rat in 1842, the famous German naturalist Eduard Rüppell suspected he had encountered a diseased specimen—because the animal had no fur and permanently protruding teeth. Only after several more specimens had been collected did it become apparent that their weird appearance, variously described as resembling saber-toothed sausages or miniature walruses, was normal.

Naked mole-rats live in a maze of underground tunnels that may extend more than a mile in length and as deep as 8 feet beneath the soil surface. Their burrows contain both nest chambers, tended by sterile worker animals, and several toilets, which the animals use religiously to avoid contamination of their living space. To locate the roots, tubers, and small onion-like bulbs they eat, mole-rats must dig through the soil, expanding their tunnels using their chisel-like, ever-growing incisor teeth. They occasionally make an opening to the outside world to kick excavated soil to the surface, where it forms small volcano-shaped mounds—the only aboveground signs of the vast colonies below.

Given this strictly subterranean existence, it is not surprising that naked mole-rats have evolved a set of characteristics highly suited to life in dark, dank burrows. Here are a few:

ANATOMY

BLOOD: Naked mole-rats have a greater number of red blood cells per unit volume, and the hemoglobin in the red blood cells has a higher affinity for oxygen than that of most other mammals, so their blood is better at capturing what little oxygen there is.

BODY: Streamlined, long, cylindrical shape, with very short limbs that enable the animals to run backwards and forwards with equal speed

EARS: No external ears, only openings in the sides of the head

EYES: Very small eyes, which the animals often don't bother to open, that are only able to distinguish light from dark

METABOLISM: Their mass-specific metabolic rate is about 70 percent that of other rodents, meaning their tissues use oxygen at a slower rate.

TEETH: Tusk-like teeth that protrude through the skin, enabling naked mole-rats to close their lips while using their teeth to dig through the soil without getting dirt in their mouths

WHISKERS: Face whiskers and whisker-like hairs located on the body and tail detect objects in the mole-rat's path, pick up vibration signals, and generally sense the underground environment.

