

## Madera Canyon Species Spotlight:

### **Grant's Rhinoceros Beetle**

Strolling up the Proctor Loop on a sparkling monsoon morning many years ago, Laurie and I were observing the trailside foliage, enjoying the sprinkling of wildflowers and scanning for insects and caterpillars that emerge with the summer rains. Reaching the lower bridge across Madera Creek, we stopped to admire the brilliant green foliage on the grove of Arizona Ash trees that line the stream banks. Looking up into the nearest ash, I noticed a suspicious lump in the upper branches. With the help of a handy old agave stalk, I dislodged the lump and was soon holding a handsome male Grant's Rhinoceros Beetle (also called the Western Hercules Beetle), the largest beetle species in the western U.S.

Grant's Rhinoceros Beetle, *Dynastes grantii*, is an impressive scarab beetle that emerges during the monsoon to feed and mate. Heavily built, at maturity they range from 2" to 3.25" in length with bluish gray color and black spots on their elytra (wing covers). Individual spot patterns are unique; no two beetles are exactly alike! As the name suggests, males sport a pair of magnificent black horns from their head and thorax. The horns reach maximum size in major males; minor males have small horns and females lack horns altogether. Males use their horns to joust over food and females. While major males are busy dueling, minor males sometime sneak in to mate with a contested female! Larval nutrition determines whether a male develops into a major or minor adult. Higher quality food for the grubs- yummy decomposing organic matter- makes the major males.

Adult rhinoceros beetles bury themselves underground during daytime. Strong fliers, they emerge in the evening and zoom up into the tender new growth in the ash trees. With mouth parts much like an old-fashioned wood plane, the beetles scrap off strips of the soft, thin bark to drink the carbohydrate-rich sap that oozes from the wound. Certain ash trees appear to be "sweeter" than others, possibly having more concentrated sugars in their sap, and rhinoceros beetles swarm to these same "favorite" trees year after year.

After mating, females lay their eggs in soft rotting wood. Larvae feed on organic mulch of decaying wood and composting leaves, growing into fat thumb-sized grubs that pupate underground. Like many of our most interesting Sky Island insects, warm summer rains stimulate the pupae to "hatch" into adults that go in search of food and mates. Adult rhinoceros beetles can live for several months in the wild. In captivity they can survive for over a year on a diet of sugary fruit such as cantaloupe and peaches.

Grant's Rhinoceros Beetles are attracted to ultraviolet light and "black-lighting for bugs" used to be an excellent way to attract and see them in the canyon. Otherwise, people would look for the beetles high up in the foliage of ash trees in late July August and September. They readily stand out on the thin branches they prefer to feed upon. One famous tree was the large ash next to the downstream railing on the approach to the lower Proctor Loop Bridge. But in recent years, the rhinoceros beetles have become increasingly scarce, having all but disappeared from Madera Canyon!?

There are several important factors that probably contribute to this recent disappearance. The first is climate change. While an abundant species in the cooler mountains of central Arizona, Grant's Rhinoceros Beetle is less common in the southern Sky Islands. Long-term drought, temperature increases and habitat drying in the region, including Madera Canyon, promotes unfavorable ecological conditions that will add to natural scarcity. Many insects, like rhinoceros beetles, are declining as climatic conditions become more adverse.

The second factor, specific to Madera Canyon, is over-collecting. Drawn by charismatic, valuable species and easy access, the canyon is a famous mecca for arthropod collectors. For decades now Madera Canyon has been hammered by commercial and private collectors every monsoon season. This sustained collecting pressure undoubtedly negatively impacts local insect populations- particularly targeted desirable species of moths and beetles, like Grant's Rhinoceros Beetle- and is exacerbating declines.

The designation of Madera Canyon as a protected area by the Coronado National Forest, prohibiting collection of all plants and animals except for approved research and education, is needed to protect, restore and conserve the Madera Canyon and greater Santa Rita Mountain ecosystem. If such forward-thinking, overdue proactive measures could be timely enacted, maybe someday soon canyon visitors may once again enjoy seeing Grant's Rhinoceros Beetles up feeding in Arizona Ash in Madera Canyon.



Major male Grant's Rhinoceros Beetle