

# MOUNTAINS

## The tiny beetle who acts as janitor and farmer to our forests



### Word from the Smokies

Frances Figart  
Columnist

Maggie Mamantov has chosen what some might consider a rather unusual focus for her PhD research: the dung beetle—a tiny creature that acts as a janitor as well as a farmer for many other species on the planet.

Dung beetles take that old saying, “one man’s trash is another man’s treasure” to a whole new level. Animal poop is their primary food source. They roll it up into a ball and feed it to their young, and in doing so, they help to break down this waste, recycling the nutrients it contains so they are accessible to other organisms, like plants.

“Dung beetles exhibit really interesting behaviors, and I have found that they engage people of all ages and backgrounds,” Mamantov said. “This makes them an excellent organism for citizen science projects and science outreach, with both kids and adults.”

When Mamantov entered the PhD program in ecology and evolutionary biology at the University of Tennessee, Knoxville, she was already interested in invasion biology, which looks at the degradation of native diversity due to the spread of invasive species. Her PhD advisor encouraged her to explore a particular species of dung beetle to study her research questions.

To gain a better understanding of native dung beetle communities in the Appalachian region, Mamantov surveyed her subject in Great Smoky Mountains National Park, taking advantage of the variety of habitat types and elevations in a protected, preserved landscape. Because the Smokies has been above sea level and escaped glaciation for millions of years, it has the perfect conditions to support biodiversity.

Like many researchers drawn to the Smokies, Mamantov collaborated with Discover Life in America, a park partner organization responsible for managing the All Taxa Biodiversity Inventory. The ATBI is a groundbreaking effort that began 22 years ago to identify and try to understand every species living within the park. Some of the world’s leading scientists have contributed to the ATBI, along with park staff, educators, and volunteer citizen scientists. Together they have found 9,718 species new to the park and 1,025 species completely new to science!

“Dung beetles play a vital role in their ecosystem as decomposers,” said DLI’s Director of Science and Research, Will Kuhn. “Without them, we would literally be in deep doo doo! Every year, these small insects help to break down millions (perhaps billions) of tons of waste from domestic livestock, like cattle, as well as native animals.”

While Mamantov hasn’t discovered any previously unknown species of dung beetle, her work is contributing to DLI’s and the park’s understanding of

the distribution and seasonality of a number of dung beetle species. Like many insects, dung beetles are under threat from climate change, which is one reason it’s important to protect them in ecosystems all over the planet.

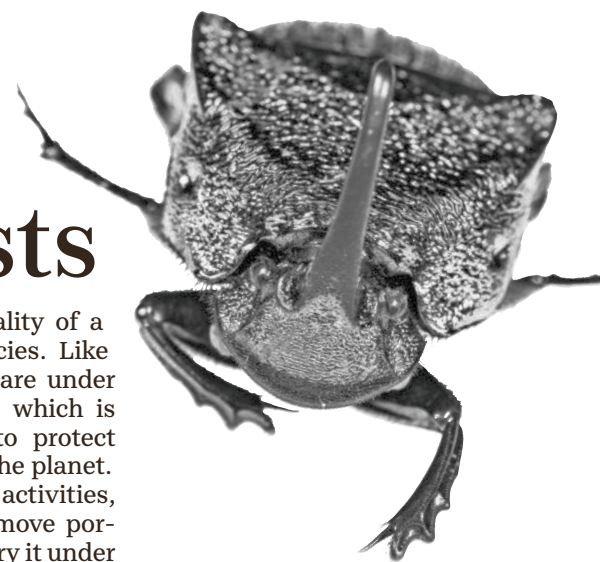
As part of their breeding activities, these industrious beetles remove portions of a dung source and bury it under the soil. This behavior has a three-pronged benefit: it adds nutrients, aerates the soil, and disperses seeds. This dung burial decreases pasture fowling and reduces pests like flies. So, dung beetles are crucial for sustainably producing pasture-raised meat and, in this way, provide millions of dollars’ worth of ecosystem services.

“Dung beetles are negatively impacted by the use of insecticides and antibiotics in meat production,” Mamantov said. “So, an important way to help dung beetle communities thrive is by buying diary and meat products produced by organic farms that don’t use harmful insecticides and antibiotics.”

Much of a dung beetle’s life cycle takes place underground. This makes it difficult to observe them, which presents the biggest logistical challenge for the intrepid scientists who are willing to study these shy, behind-the-scenes bugs.

“Understanding the behavior of burrowing animals is really important,” Mamantov said, “but it is definitely challenging, and you have to be creative in how you design your studies.”

Kuhn said research like Mamantov’s



Great Smoky Mountains National Park hosts several native and introduced dung beetle species such as *Phanaeus vindex*, shown here. PHOTO COURTESY OF DAN MELE/DISCOVER LIFE IN AMERICA

into the little-studied life forms like dung beetles not only helps park leaders make better management decisions, it could also hold the key to maintaining the balance of life as we know it on this planet.

“Dung beetles may be tiny,” he said, “but, like other decomposers, they play a mighty role in the sustaining the proper function of our ecosystems.”

Want to learn more? Watch a video of a talk by Maggie Mamantov about dung beetles on Discover Life in America’s YouTube channel.

Frances Figart is the editor of *Smokies Life* magazine and the Creative Services Director for the 34,000-member Great Smoky Mountains Association, an educational nonprofit partner of Great Smoky Mountains National Park. Reach her at frances@gsmassoc.org.

## Sheriff Miller changes use of force policy

Mackenzie Wicker Asheville Citizen Times  
USA TODAY NETWORK

ASHEVILLE – Buncombe County Sheriff Quentin Miller has released an updated use of force policy requiring deputies and officers to intervene if one of their colleagues uses excessive force, the office announced Aug. 28.

Excessive force can be physical or psychological, Miller’s release says.

The new policy also mandates that any use of force be reported, with supervisors being notified of all deputies on the scene of the incident.

“We believe in reform and this is what it looks like,” Miller said. “All of our deputies at the sheriff’s office will undergo training on this policy each year they are on the job.”

The new duty to intercede clause reads:

“If a deputy or a detention officer ob-



Hundreds of protesters swarmed the streets of downtown Asheville in response to the killing of George Floyd on May 31. ANGELI WRIGHT/CITIZEN TIMES

serves another deputy, detention officer or employee using force clearly beyond that which is objectively reasonable under the circumstances existing at the time, the deputy or detention officer

shall intercede to prevent the use of unreasonable force when in a position to do so. Intervention may initially be verbal but should progress to physical intervention when necessary to prevent physical harm. Thereafter the deputy or detention officer shall promptly report the incident to a supervisor as outlined in the Personnel Complaints policy.”

The policy also restricts the use of shooting at moving vehicles unless, “no other option is available to the deputy to stop an imminent threat of death or serious bodily injury to the deputy or another person.”

It calls for SBI to be notified in “any incident involving the use of force where death or life-threatening injuries reasonably appear to have occurred.”

The changes went into effect Aug. 28 following an internal review and evaluation that included command staff and supervisors from across the sheriff’s of-

fice, according to the release, which adds that deputies and detention officers read and reviewed the policy beforehand.

This comes amid a summer of protests calling for racial justice reform, particularly among law enforcement, following the May 25 death of George Floyd, a Black man, while in Minneapolis police custody.

The movement has maintained steam for months as reports and videos continue to surface showing Blacks and other people of color shot or hurt during interactions with officers.

Most recently, video has circulated showing Kenosha, Wisconsin, police shooting Jacob Blake seven times in the back. Blake survived the incident but has been paralyzed from the waist down, according to his father. The shooting has reinvigorated demonstrations in some areas.

## Biltmore open for autumn color, Christmas tours

Mackensy Lunsford Asheville Citizen Times  
USA TODAY NETWORK

ASHEVILLE – If you’ve forgotten to consider what this year’s fall color will bring, you’re not alone.

Biltmore Estate, Western North Carolina’s heavyweight tourism draw, is already looking ahead, and for good reason.

It’s been a rough year for tourism in general, and a historic year for the lavish estate, which for the first time since World War II locked the gates in March and temporarily furloughed most of its

workers.

The estate reopened in May, but still had to cut about 400 jobs in July. Now, estate officials are looking ahead to the typically bustling fall and holiday months. Fall sounds glorious, at least the color-soaked version that estate horticulture director Parker Andes describes.

“The heat and afternoon thunderstorms of summer will soon be a memory as the seasons begin to change in October,” he said in the estate’s official fall color report. “Late summer garden annuals perk up with the cooler nights,

only to be replaced with chrysanthemums later in the month.”

By mid-October, the fall gardens should be in peak bloom, with the first autumn color appearing on native dogwoods and sourwoods along estate roadsides and pastures.

“These early trees hold color through the season and add to peak color at the end of October with sugar maples, red maples, hickory and gum trees giving the best show,” he said.

Shortly thereafter, on Nov. 6, Christmas returns to Biltmore and lasts through Jan. 10.

During that time, the estate still plans to open Biltmore House for its candlelight evening tours, with tickets ranging from \$94-\$314.

The 8,000-acre estate, anchored by the 250-room French chateau completed in 1895, serves as an escape for about 1.4 million visitors annually.

Even so, COVID-19 is still a reality, and estate rules say guests older than 2 years old must wear masks in public indoor spaces and anywhere where 6 feet of social distancing can not be maintained.

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