



Photos by Jeff Janowski/Special

University of Georgia researcher Jaap de Roode handles an adult monarch butterfly as he prepares to take samples from the butterfly's abdominal scales to test for any parasitic behaviors. Below, assistant professor of ecology Sonia Altizer and de Roode show off a monarch pupa and caterpillar. Altizer has been researching how long-distance migration in animals affects the spread and impact of their diseases as part of a project called MonarchHealth, which involves volunteers, schoolchildren and nature center visitors, as well as university scientists.

# Monitoring the monarch

By Michelle McLachlan  
Correspondent

Armed with butterfly nets, rearing boxes, tweezers and cotton swabs, volunteers across North America and Hawaii collect and study colorful, winged creatures or their caterpillar antecedents.

Meanwhile, scientists at the University of Georgia nurture caterpillars in plastic tubs — the type used to stash leftovers or organize small toys — and store full-grown monarchs, labeled and folded into envelopes, in a lab refrigerator. (Yes, they're alive: a bit sluggish from the cool temperatures, but alert enough to

dine on milkweed the researchers tuck into their paper homes once a week.)

Both these “citizen scientists” and their professional counterparts at the university are taking part in a project called MonarchHealth. Monarch butterflies often carry a parasite called *Ophryocystis elektroscirrha*, which infects their digestive tracts and is passed from mother to offspring.

Individual volunteers, schoolchildren and nature center visitors, as well as university scientists, catch butterflies or caterpillars, which they raise to adulthood. They gently swipe butterfly bellies with cotton swabs. In the



field, volunteers slip the swabs into special envelopes and send them to assistant professor Sonia Altizer's UGA lab, where researchers test them for parasites.

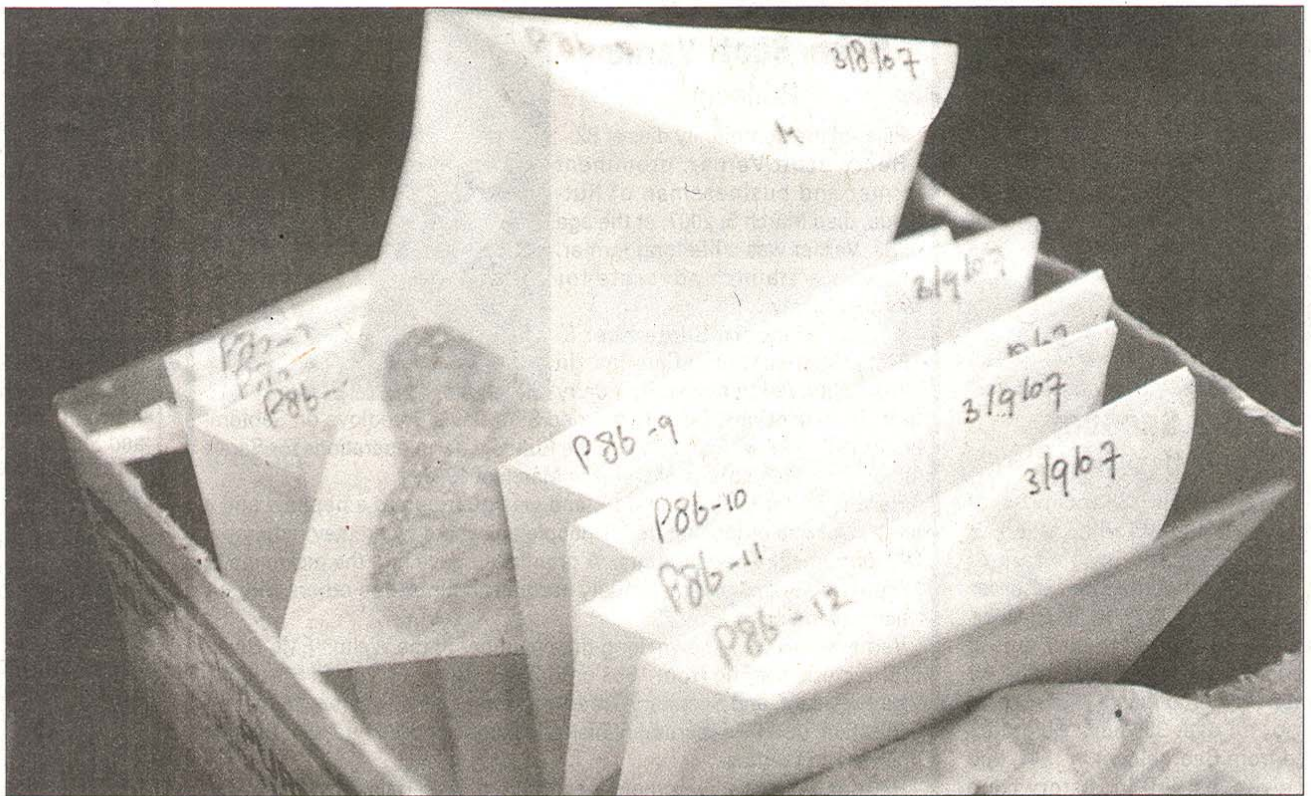
## HEALTHY MIGRATIONS

Some monarchs, such as the population in the central and eastern United States, and southern Canada, migrate long

distances from their summer breeding grounds to their wintering grounds. Others migrate a shorter distance or not at all.

See **MIGRATION** on D4

Monarch butterflies are placed in waxpaper envelopes and coded while being researched at the University of Georgia's ecology labs under the guidance of assistant professor Sonia Altizer, who is tracking long-distance migration and the effects of diseases.



Jeff Janowski/  
Special

## MIGRATION OF MONARCHS MAY CEASE IN 20 TO 30 YEARS from D1

Among the long-distance travelers, fewer than 8 percent are infected with parasites. But in the monarch population west of the Rockies, which migrates a shorter distance, some 30 percent are infected. And in southern Florida, where the monarch population stays put year-round, more than 85 percent carry parasites.

The question for researchers is this: Why do the migrating monarchs have fewer parasites? And why are they healthier the farther they roam?

MonarchHealth is one component of a larger project for which Altizer was just awarded a five-year, \$679,000 grant from the National Science Foundation. Called a CAREER grant, it is designed to promote projects that incorporate research with public science education.

"Monarch butterflies are an ideal species for weaving together science and education," said Altizer, because they are charismatic, non-threatening and abundant, making the butterflies attractive and easy for volunteers to work with.

"When people think about butterflies, they just don't think about them getting sick," she said.

But because monarchs do indeed contract parasites, there

are things they can teach scientists about disease.

UGA researcher Jaap de Roode, for example, studies how parasites evolve. Theoretically, it's in the best interest of a parasite not to kill its host: a shorter life for the host means fewer opportunities for the parasite to reproduce.

But *Ophryocystis elektroscirra*, which is closely related to the parasite that causes malaria in humans, can make it more difficult for monarchs to fly or reproduce, sometimes shortening their life spans or even preventing caterpillars from becoming butterflies.

Studying virulence — the tendency for a parasite to kill or sicken its host — may reveal how human interventions, such as spraying for malaria-carrying mosquitoes, affects the development of disease.

Scientists are not trying to cure monarchs, though.

"It's something you do with people — get rid of their parasites," said Roode, "but not with wild animals."

Parasites play an important role in the monarchs' ecosystems and may affect the butterflies' own evolution. And monarchs are not an endangered species.

But their migration is a threat-

ened phenomenon, says Altizer.

### THE BUTTERFLY EFFECT

It is sometimes said that the flapping of a butterfly's wings in one part of the world can cause a hurricane on the other side of the globe.

Each year, monarchs of eastern North America cause a stir felt in many parts of the world. More than 100 million monarchs travel up to 3,000 miles from Canada and the United States, where they reproduce in summer, to Mexico.

After a two-month trek, they hibernate in colonies in the central Mexican mountains. The butterflies descend the slopes in February to mate, and their offspring return to the northern habitats of their parents.

Scientists estimate that within 20 to 30 years, these amazing journeys may be over. Because of global warming, the monarchs' dietary staple, milkweed, has begun growing year-round in progressively northern regions. With a year-round food source, the butterflies would have little reason to migrate.

The 60-square-mile region in which monarchs hibernate also is threatened by deforestation.

The Mexican government banned logging there in 1986, but much of the area is communally owned by peasant families, who depend on forest resources for survival. As a result, the monarch winter habitat continues to be logged.

Organizations such as the World Wildlife Fund and the Monarch Butterfly Sanctuary Foundation are looking for solutions that accommodate both butterflies and people.

The threats to the monarchs' intriguing migration are another reason the species is ideal for public education programs, says Altizer.

For many young volunteers, catching butterflies or rearing caterpillars for MonarchHealth is their first experience with nature. The project is an opportunity for participants to become familiar with the monarch habitats that surround them and help many understand the need for conservation.

"If we can protect a species with such diverse habitat needs and coordinate efforts in three different countries (Canada, the United States and Mexico)," Altizer said, "we should be able to go a long way toward saving other species."