

ANTS AND PLANTS

Article and photographs by MARK W. MOFFETT

FRIENDS AND FOES



With a pollen-sprinkled head, an ant enters an alpine forget-me-not on a Colorado ridge too

cold for most pollinators. Ants and plants often—but not always—act as allies.

Engulfed by plant resin 90 million years ago, a *Sphecomyrma freyi* worker in amber (below) was the first known ant specimen from the Cretaceous period. Modern ants can suffer the same fate, such as one (right) trapped in resin spilling from the trunk of a rain forest tree in French Guiana.

Sphecomyrma, found in 1966, proved to be a classic missing link, intermediate between modern ants and their wasp ancestors. Yet it was apparently already social, as are today's ants, with a queen atop the

pyramid of a highly organized colony. The fact that ants live in colonies means that they can be especially valuable to plants when they act as defenders. In return for sugary rewards a colony can send out workers to guard every square millimeter of a plant's surface. And because workers do everything for the common good—protecting their food source and the reproducing queen are their foremost tasks—they sacrifice themselves at an instant's

notice. So the workers' thorough coverage and extreme devotion to duty make them highly desirable for any plant that finds a way to make use of a colony's efforts.

Of course, for the same reasons that ants can be one plant's best buddy, they can just as easily be another plant's worst enemy. If the tenacious ants want to take something plants, or humans, don't want to give (leaves in the case of leafcutters, seeds in the case of seed predators, or coleslaw in the case of a picnic), they often take it with sheer force of numbers.

In my global quest to document the relationship between ants and plants, I have seen many intriguing interactions, some rarely photographed, such as the ant acting as a potential pollinator on the previous pages and other examples on the pages that follow.

Naturalist MARK W. MOFFETT's odyssey into the world of ants has included GEOGRAPHIC articles on marauder ants (August 1986), trap-jaw ants (March 1989), leafcutter ants (July 1995), and part one of "Ants and Plants" (February 1999).





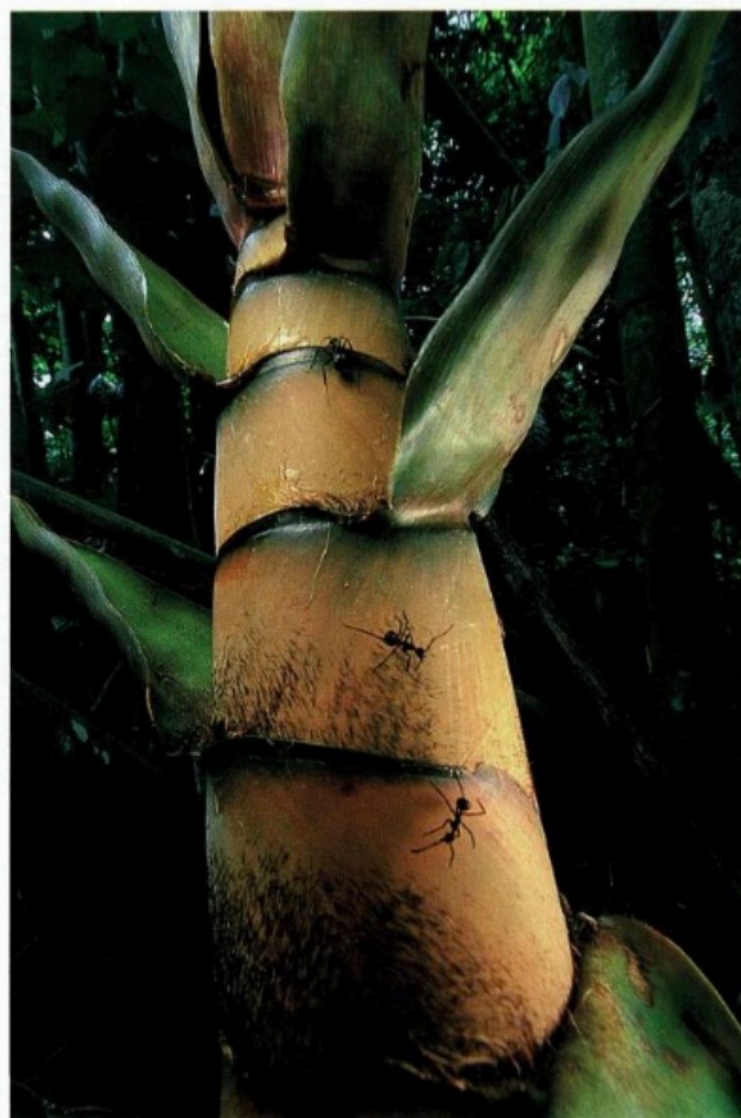
A CLOSE-KNIT BUNCH

High in a tree, weaver ants grab an adjacent leaf and stem with mandibles and toes and pull, gradually binding them together. In the Old World tropics a single weaver colony may have dozens of leafy nests, defended fiercely. Some treetop ant species construct nests of mulched plant material called carton; others live in dead wood, canopy soil, or hollow twigs.

GOOD EATS



Sometimes plants lure ants with nectar and other foods. *Ectatomma tuberculatum* ants in Peru drink a sweet sap that oozes from green spots along the petal margins of passion flower blooms (facing page). With open jaws, workers aid the plant by keeping pests from invading the flower. Likewise, *Myrmecaria* ants (right) defend a young bamboo in Malaysia in exchange for nectar found between the plant's segments. This *Camponotus* ant (top right) prefers the nectar when it has been digested and excreted by another insect, which itself escapes the ant's wrath. On plants in French Guiana, caterpillars—soon to become metalmorph butterflies—ply ants with a liquid excreted from the end of their abdomens. Grapelike clusters on their heads (top) appear to produce chemicals that keep the ants alert to potential threats to the caterpillars. While the ants are distracted from guarding the plants, the caterpillars feast.





NOMADS' MARCH

While many ants tend aphids and mealybugs for their honeydew excrement, the migrating herdsman ants of Malaysia, *Dolichoderus cuspidatus*, take this lifestyle to the extreme. In fact these ants and their mealybugs literally cannot live without each other. The ants tend the mealybugs, place them on plants to feed, and diligently stand guard (middle left). The ants' nests are temporary, consisting of



10,000 exposed and interlinked bodies (above). Hidden within are the queen and the young—and thousands of mealybugs, mostly adult females that give birth there. In true nomadic fashion, like Bedouin with goats and camels, the ants shift the site of their bivouacs to transport the mealybugs to fresh pastures (top left). The queen, surrounded by guards, marches alongside (bottom left).

STICKY SITUATION

In South Africa the flowers of *Erica masonii* have petals as sticky as flypaper, but ants persist in climbing the flower despite fatalities. Why should some flowers reward ants, while this one kills them? Perhaps because *Erica* grows in poor soils, it has no nectar to spare. Only sunbirds—the plant's pollinators—extract nectar without getting glued.

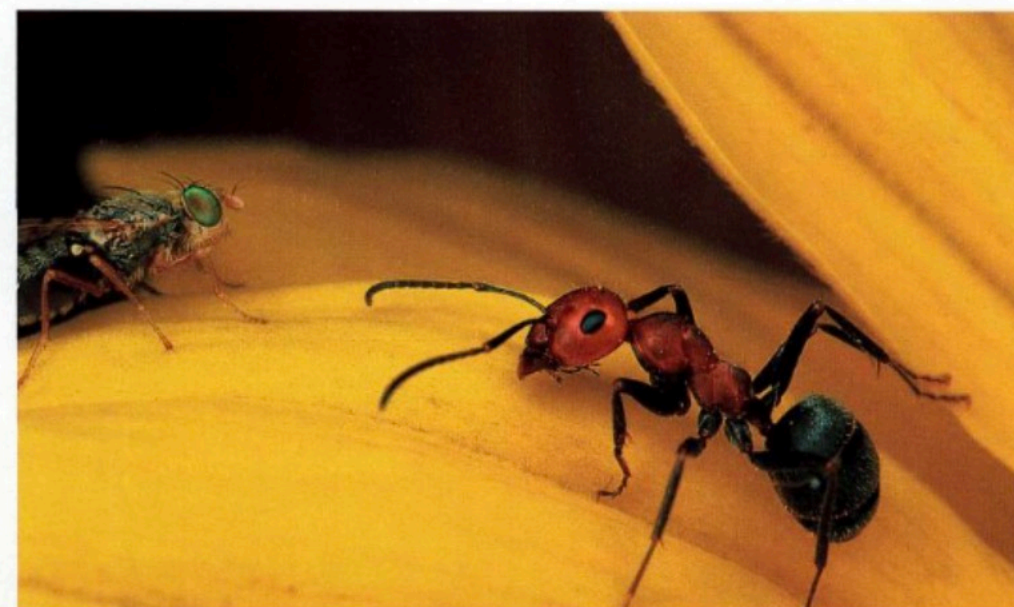




BAD ANT, GOOD ANT

In Namibia, a rare sighting: an African species of the marauder ant, most often found in Asia. Workers retrieve seeds (above right) and tear them apart for a meal. Other ants, rather than destroying seeds, bury them as if they were gardeners. In the unique *fynbos* shrubland near Cape Town, South Africa (top), entomologist Hamish Robertson examines one of the 1,300 plants that depend on such ants. As payoff for being planted, each seed provides its ant assistant with a meal: the soft,

nutritious elaiosome at its tip (above left). Not all fynbos ants are deserving, however. These Argentine ants, accidentally introduced into South Africa from South America, eat elaiosomes and discard the seeds without burying them, thus jeopardizing the fynbos community. Half a world away in Colorado a plant helper, a species of *Formica* ant (right), drives off a fly that attacks embryos of the Aspen sunflower. Sometimes allies, sometimes enemies, the dramas of ants and plants never end. □



NATIONAL GEOGRAPHIC

On Assignment



RASHAD GHORBANOV

■ CASPIAN SEA

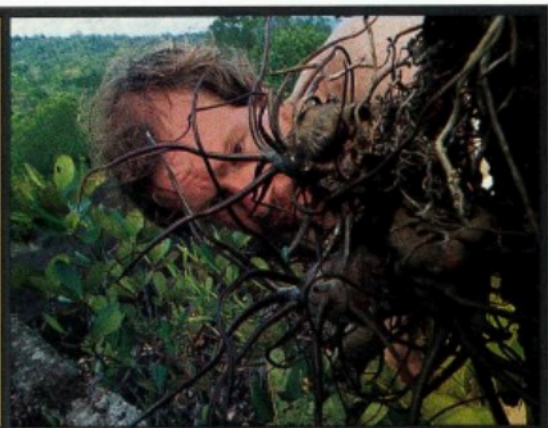
Facing a Sea Change

While shooting Azerbaijani sailors in a chemical weapons defense drill, Reza (above, with camera) recalls, "Their commander said to me, 'Do you want me to bring out some real chemicals?'" Reza swiftly declined. The Iranian-born photographer grew up vacationing on the Caspian's southern shores but has lived in exile in Paris for 18 years. "In Persian there is a word, *darya*, which translates as 'sea' but also means something that is complex and multifaceted. The Caspian is, in both senses of the word, *darya*."

■ ANTS AND PLANTS

An Eye for the Smallest Detail

"I have no taste for pursuing an ape for ten years and only seeing it once. I can always find my critters," says Berkeley, California-based photographer Mark W. Moffett. In French Guiana he tracked tiny quarry on the tangles of an epiphyte (right). For this three-part story—the first installment was published in February—Mark traveled "to every continent except one, and I only missed Antarctica because there aren't any ants there."



MARK W. MOFFETT