

Common weed

(Brazilian peppertree)

helps fight deadly superbug

By [Lena H. Sun /Med Expo](#)



Cassandra Quave, an ethnobotanist at Emory University, in her lab with berries from the Brazilian peppertree.

The red berries of a weed found in the southern United States contain a compound that can disarm a deadly superbug, according to research published Friday.

Researchers from Emory University and the University of Iowa found that extracts from the Brazilian peppertree, which traditional healers in the Amazon have used for hundreds of years to treat skin and soft-tissue infections, have the power to stop methicillin-resistant *Staphylococcus aureus* (MRSA) infections in mice. The study was published in Nature's Scientific Reports.

Cassandra Quave, an Emory University scientist who studies how indigenous people use plants in healing practices, said researchers pulled apart the chemical ingredients of the

berries and tested them in mice infected with these superbug strains. The mice developed skin lesions where the bacteria were injected. The researchers then injected some mice with the pepper extracts, and their lesions shrunk. Instead of destroying the bacteria, the ingredients in the fruit weakened the bacteria by preventing them from producing the toxins it uses as weapons to damage tissue. The extracts from the fruit repress a gene that allows the bacterial cells to communicate with one another.

“It weakens the bacteria so the mouse’s own defenses work better” to clear the infection, she said. The plant extracts prevented the formation of skin lesions in mice injected with MRSA, but didn’t harm the skin tissues or the normal, healthy bacteria found on skin.

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The discovery may hold the potential for new ways to treat and prevent antimicrobial-resistant infections, an enormous global problem that was the focus of a rare high-level United Nations summit last fall.

MRSA has become a serious threat to human health; in 2011, it was responsible for more than 80,000 invasive infections and more than 11,000 deaths in the United States, according to federal statistics.

Antimicrobial resistance refers to infections that have evolved the ability to withstand drugs that ought to stop them. The medicines include antibiotics, which act on bacteria, as well as drugs to fight fungal, viral or parasitic infections. Fighting bacteria with drugs designed to kill them helps fuel the problem of antibiotic resistance if stronger bacteria can survive and evolve to become “super bugs.”

“But instead of always setting a bomb off to kill an infection, there are situations where using an anti-virulence method may be just as effective, while also helping to restore balance to the health of the patient,” said Quave.

Plants have been used repeatedly in traditional medicine over the centuries, and knowledge about their use is passed down from generation to generation, which points to their efficacy, she said.

“People don’t save that knowledge over centuries” if something doesn’t work, she said. “We’re trying to answer the question: does this work against bacteria, and how does it work, and is it safe to use?”

The Brazilian peppertree, a shrubby tree native to South America, is an invasive species throughout the southern United States, and particularly in Florida, where it’s sometimes called the Florida holly or broad leaf peppertree, and is considered a noxious weed. The woody plant has long been a staple in Brazilian traditional medicine. Its leaves and bark are used to treat wounds, ulcers, burns and skin infections, Quave said.

Less is known about the plant’s fruit, which was used traditionally as topical poultices for infected wounds and ulcers.

From an ecological standpoint, Quave said it makes sense that invasive weeds have a chemical advantage that may help protect them from diseases so they can spread more easily in a new environment.

But she said the average person shouldn't try to use the weed to make their own medicine. "Not everything that is natural is safe," she said.

Her lab at Emory is doing additional research to confirm the safest and most effective way of using the plant extract. Researchers would still need to conduct preclinical trials to test its medicinal benefits.



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