Scientists worry that vines are taking over the American tropics

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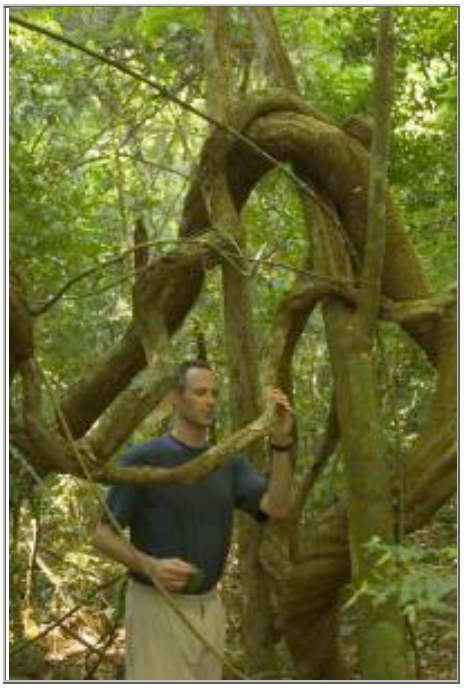
Courtesy Smithsonian Tropical Research Institute
and World Science staff

Sleeping Beauty's kingdom was overgrown by vines when she fell into a deep sleep. Now, scientists worry that real vines are taking over the American tropics.

Data from each of eight sites tested show that vines are overgrowing trees, according to a research group.



Stefan Schnitzer examines a liana, a type of woody vine, in Panama. (Credit: Beth King, STRI)

"We are witnessing a fundamental structural change in the physical make-up of forests that will have a profound impact on the animals, human communities and businesses that depend on them," said research team member Stefan Schnitzer of the Smithsonian Tropical Research Institute in Panama and the University of Wisconsin

at Milwaukee.

Tropical forests hold more than half of the Earth's land species and much of the planet's carbon. If vines take over tropical forests, researchers say, the rainforests' role in the the larger environment, such as through water cycling and carbon storage, may change in ways that are hard to predict.

"In 2002, Oliver Phillips, a professor at the University of Leeds in the U.K., published a controversial study claiming that vines were becoming more common in the Amazon," said Schnitzer. "By pulling together data from eight different studies, we now have irrefutable evidence that vines are on the rise not only in the Amazon, but throughout the American tropics," added the investigator, whose team has received a grant of more than $1 million from the U.S. National Science Foundation to study the problem.

On Barro Colorado Island in Panama, the proportion of vines in tree crowns has more than doubled over the past 40 years, researchers said. In French Guiana, liana vines increased 60 percent faster than trees from 1992 to 2002. Similar reports came from from Brazil, the Bolivian Amazon and subtropical forests in South Carolina in the United States.

Trees have stout trunks that take a lot of time and energy to produce. Vines exploit trees, growing quickly on slender stems up into the forest canopy, where their leaves may compete for light with those of the supporting trees.

Scientists are unsure as to why lianas are gaining the upper hand. They may survive seasonal droughts that are becoming more common as climate becomes more variable, researchers speculated. They may recover more quickly from natural disturbances such as hurricanes and El Niño events and from human disturbances like logging, clearing land for agriculture and road building. In several experiments, lianas were found to respond more quickly than associated trees to an increase in atmospheric carbon dioxide, such as what scientists believe occurs with human-induced global warming.

In North American forests, invasive vines such as kudzu, oriental bittersweet, English ivy and Japanese honeysuckle often reduce native tree regeneration and survival, although there is no obvious trend as there is in the American tropics, according to researchers. Two studies of forests in tropical Africa did not detect vine overgrowth.

The authors propose to take advantage of the widespread network of large-scale, long-term monitoring plots-the Smithsonian Institution Global Earth Observatory network coordinated by the Center for Tropical Forest Science-combined with experiments to reveal what gives vines a competitive edge over trees.