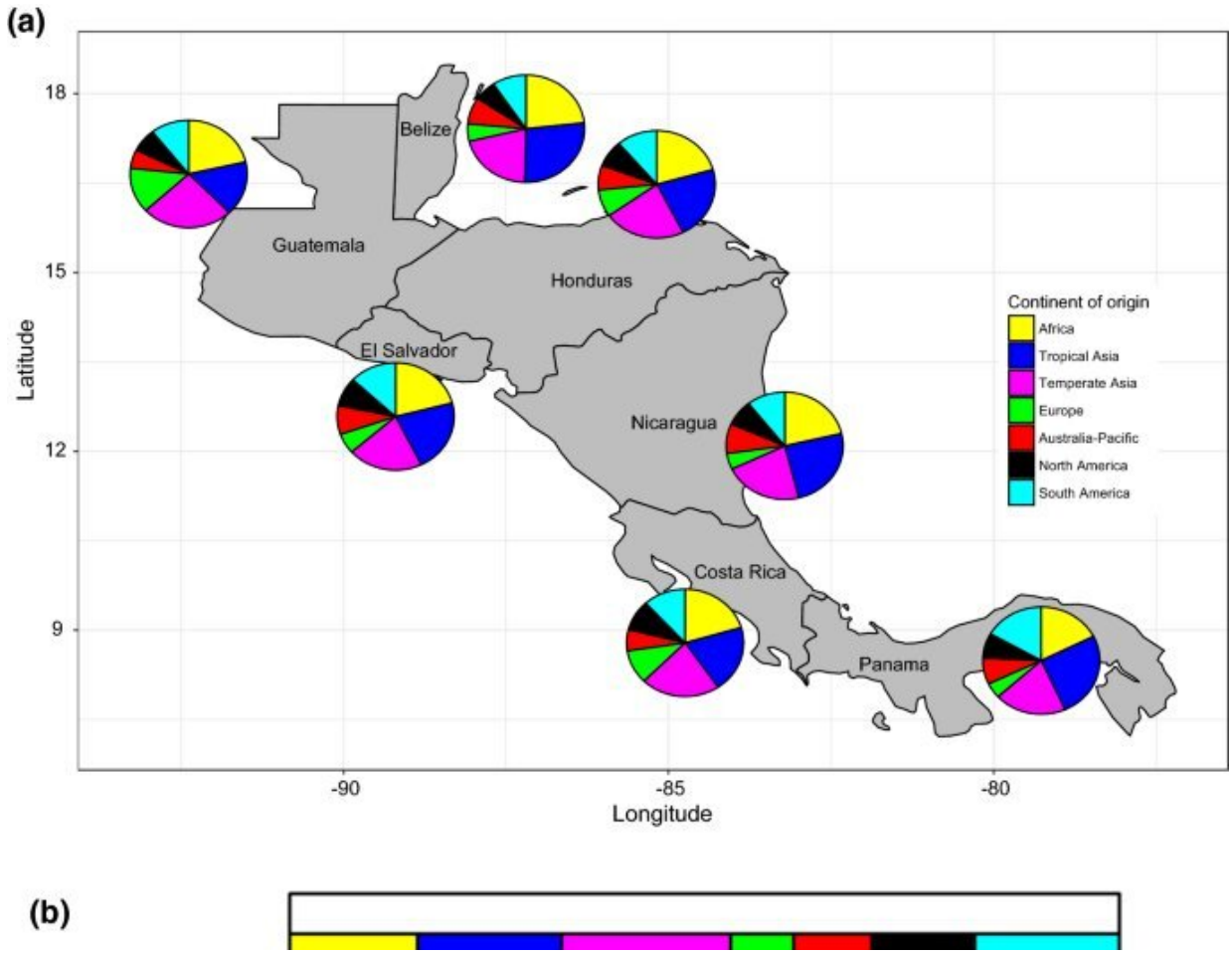
Researcher aims to uncover details of plant invasions in tropics

December 8 2022, by Elaina Hancock



Credit: *Biological Invasions* (2022). DOI: 10.1007/s10530-022-02968-3

Invasive species of plants have a knack for settling in new settings and

making big changes to an ecosystem, even leading to extinctions of native species.

Assistant Research Professor in UConn's Institute of the Environment Julissa Rojas-Sandoval explains that invasive plants are non-native species that have been introduced into new areas generally as a result of human activities, and that they are actively spreading, causing harm to the environment, the economy, and human health. Invasive plants may have significant long-term implications for the conservation of native biodiversity, but to combat the problem, we need to know which plants are invasive, where they're from, and how they got there.

Rojas-Sandoval leads an international collaboration including researchers from all Central American countries, working together to compile the most comprehensive databases of invasive plant species in Central America. The collaboration is called FINCA: Flora Introduced and Naturalized in Central America, and their first paper was published this week in *Biological Invasions*.

The collaboration arose to meet a need, says Rojas-Sandoval. "While we have a good understanding of the processes and mechanisms of plant invasions in temperate regions, there is a huge gap in our knowledge about biological invasions in the tropics, and this lack of information is limiting our ability to respond to invasive plants."

Remediation and the impact on the conservation of biodiversity is an important focus, but invasive plants also threaten the social and economic impact aspects of the region. Rojas-Sandoval points out that for places like her native Costa Rica, which relies on eco-tourism and agriculture, the impacts of not dealing with the invasive species could be significant.

It has been suggested that the huge diversity of plants in tropical regions

may provide resistance to invasions, meaning that these ecosystems could be less threatened by invasive species because of the competition between so many different plants, but Rojas-Sandoval has studied this topic for the last 15 years and says the problem is greater than is widely understood.

"Across the tropics, the acceleration in the rates of introduction of non-native plants, as well as increments in the rates of habitat loss and forest degradation, are transforming tropical forests and making them more susceptible and less resistant to invasions," she says.

Rojas-Sandoval explains that, as the juncture between North and South America, Central America is a regional hotspot of biodiversity, home to about 7% of the world's plant and animal species. The region is also very vulnerable to climate change, she says:

"Climate models predict more extreme events for Central America, more and stronger hurricanes, droughts, and other impacts related to climate change. But we don't know how climate change is already impacting both native and invasive plant species across this region. That information is necessary to be able to start doing something."

Rojas-Sandoval and co-author Eduardo Chacón-Madrigal from the University of Costa Rica seized the opportunity and decided to start collecting and compiling any available information to make a comprehensive checklist necessary to address the challenges posed by invasive plants.

They also reached out to other researchers from across Central America to see if they would be interested in collaborating and the timing was fortunate, says Rojas-Sandoval.

"Due to COVID, people were stuck at home and, despite the many

difficulties, we all had extra time to collaborate revising lists of species and providing crucial information for the project," she says.

The team gathered data from herbarium collections in Central America and from collections around the world as well as references from existing botanical surveys, lists of alien species, and other literature.

"We compiled all this information into a list and then sent it to the experts in different countries so they could evaluate it. Then we did a second verification process because we wanted to be completely sure that we were dealing with species that were 100% alien to the region and to validate the occurrence and classification performed by the experts.

"We were able to identify that species from all over the world have been introduced to different countries in Central America, and more than 60% of them have been introduced for ornamental purposes. It is good that we can identify those species, so we know where to focus for later studies."

The team also determined that invasive plants have made their way into all the major habitats in Central America, and the trend is steadily increasing. This information can now be used to generate specific recommendations for the governments or for the local authorities, to use their resources in the best ways possible to have an impact in controlling the invasive species, says Rojas-Sandoval, adding that the best remedy is prevention—alerting people to the issues before the plants even arrive.

For invasive plants that have already been established, it will take education, persistence, and resources to deal with the problem. However, another important aspect of the problem is that developing countries often don't have the additional resources needed to fully address the situation.

"The local authorities and people in Central America and other regions in the tropics are already dealing with so many issues, including poverty, climate change, pollution, and over-exploitation of natural resources that it is even more important to optimize the use of any resources available to mitigate the impact of invasive species," she says. "This is more bad news for many people dealing with so many problems, and it is crucial to increase awareness and support for the issue of biological invasions in the tropics."

"The sooner we start doing something, the better the results will be."

More information: Julissa Rojas-Sandoval et al, Flora introduced and naturalized in Central America, *Biological Invasions* (2022). DOI: 10.1007/s10530-022-02968-3

Provided by University of Connecticut