

Flora not flourishing in world's hotspots

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Researchers at the University of Calgary have found the biodiversity picture in the region known as the "lungs of the Earth" contradicts commonly held views relating to extinction in that area.

A paper published in *PLoS ONE* by Jana Vamosi and Steven Vamosi outlines that the risk of extinction for plants is higher in countries close to the equator than previously thought.

"The tropics contain many ancient species of plants, leading many to consider tropical species as less susceptible to extinction -- but our study indicates that quite the opposite is, in fact, the case," says Steven Vamosi, an assistant professor in the Department of Biological Sciences at the U of C.

"The extinction risk for plants is high in countries close to the equator and even higher on islands, even after we take into account factors related to human activities and their use of the natural resources."

Previous studies on biodiversity in the tropics have focused on beetles, birds, mammals and molluscs. The Vamosi study mined worldwide databases for the number of plant species at risk in each country of the world, from Falkland Islands in the south to Greenland in the north, and looked at human factors such as GDP, population density and deforestation. Vamosi concentrated on data from vascular plants (ferns, conifers, and flowering plants), which includes such threatened species as the Canada Hemlock, Western Prairie Fringed Orchid, and Desert Lily, among many others.

Vamosi says he was surprised that human activity was not the primary cause of the increasing risk of extinction in the equatorial regions.

"Our findings differ from previous ones in that factors tightly linked to human activity were not particularly important in determining how many plant species were threatened with extinction. Instead, the most important factor seemed to be simply latitude. So, extinction dynamics may be very different between plant and animal species. Plant species near the equator may persist at naturally low population sizes or have small ranges, making them intrinsically more susceptible to a given amount of disturbance."

He adds that he would like to see the findings spur other researchers to bring more data to bear on this issue, given that most attention to date has focused on vertebrates.

Does this study put human disturbance off the hook? Vamosi says: No.

"This is not to say that human activities are not underlying contemporary risk of extinction; instead, it implies that plant species in a tropical country will, on average, be more sensitive to a given amount of human disturbance than those in a temperate country," he says.

Vamosi says that it is estimated that 20 to 45 per cent of species in the tropics are at risk. As a point of reference, in Canada, roughly 2 to 3 per cent are vulnerable to extinction.

Tropical ecosystems are considered the lungs of our planet as 60 per cent of the Earth's plant species are found in tropical rain forests, despite this area containing only 12 per cent of the Earth's land mass. The tropics are an important source of pharmaceuticals as well as food. The area is also habitat for a disproportionate percentage of the Earth's fauna, including butterflies, primates, birds, bats, and losses of tropical plants will often

have disastrous consequences for such species. Because of the interconnectedness of the Earth's ecosystems, species loss near the equator can have significant effects on countries thousands of kilometers away.

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