

Science News

Toucans in the Forest Ecosystem

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by Molly Michelson



In ecosystems, every organism plays a part. From the smallest microbe to the fiercest predator to the tallest tree, each species contributes to making its community healthy. But this role isn't always obvious.

Take the colorful [toucan](#) and the palm tree [Euterpe edulis](#) in the Brazilian rainforest. Scientists have long understood that the palm's seeds are dispersed by not only the large birds, but smaller birds, too. The birds eat the seeds, fly-off and poop—spreading the palm seeds far and wide.

But the past 100 years have seen many changes in the rainforest. Since the 1800s, the forest has become more and more fragmented, mostly due to agricultural development such as the planting of coffee and sugar cane. By creating this patchwork of forest and farmland, humans have affected the rainforest in many ways.

According to a new study in the journal [Science](#), the numbers of toucans have declined in the forest patches, and the palm trees in those areas have responded by producing much smaller seeds.

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These palms generally produce different-sized seeds. Different sized-birds with different-sized beaks distribute the seeds evenly. But with the toucan and other large birds, such as large [cotingas](#), absent from the ecosystem, only the small-seeded palm trees are reproducing. The birds are basically changing the evolutionary trajectory of these trees.

Researchers, led by [Mauro Galetti](#) from the Universidade Estadual Paulista in São Paulo, Brazil, collected more than 9,000 seeds from 22 different palm populations and used a combination of statistics, genetics, and evolutionary models to determine that forest fragmentation displaced many toucans. They also considered the influence many environmental factors, such as climate, soil fertility, and forest cover, but none could account for the change in palm seed size over the years in the fragmented forests.

For palm tree seeds, size matters. “Small seeds are more vulnerable to desiccation and cannot withstand projected climate change,” explains Galetti. The rainforest is projected to be drier as the climate warms, and the smaller seeds are less equipped than larger seeds for survival in these conditions.

See, every organism plays an important part.

“Unfortunately, the effect we document in our work is probably not an isolated case,” says Galetti. “The pervasive, fast-paced extirpation of large vertebrates in their natural habitats is very likely causing unprecedented changes in the evolutionary trajectories of many tropical species.”

Image: Lindolfo Souto
