

Fungi that break down hardwood trees can do the same with plastic, study shows

July 27 2023, by Bob Yirka



Decaying tree from the study site. Credit: R. N. Attanayake, CC-BY 4.0 (creativecommons.org/licenses/by/4.0/)

A team of plant and molecular biologists from the University of Kelaniya and the University of Peradeniya, both in Sri Lanka, reports

that many types of fungi that break down hardwood trees can also break down polyethylene, a common kind of plastic. In their study, reported in *PLOS ONE*, the group tested 21 species of hardwood-decaying fungi in their lab.

Prior research has identified approximately 430 [species of fungi](#) and bacteria that are able to break down different kinds of plastic. In this new effort, the researchers have found another species—a type that breaks down hardwood trees.

The work began when a member of their group noticed that several types of [fungi](#) were able to break down dead hardwood trees growing in a [forest reserve](#). Prior research has shown that breaking down hardwood is no easy feat—the [wood](#) is bound by lignin, a strong polymer.

Prior research has also found that the fungi are able to break down such material by using powerful enzymes. The team wondered if the fungi might be able to break down man-made polymers such as polyethylene. To find out, they collected 50 samples from the forest.

Back in the lab, the team isolated the fungi by species and then set them apart in small sample jars. They then placed sheet plastic in some of the jars, and both plastic and wood in some of the others. All the jars were stored at 28 to 30° C for 45 days. At that point, each of the jars and their contents were studied to determine whether the fungi had eaten some of the wood or plastic. This was accomplished using an ordinary scale—when fungi break down wood, the lignin is converted to [carbon dioxide](#), which is released into the air, leaving the wood lighter.

The team found that all the types of fungi tested did indeed break down the sheet plastic. They also found that more plastic was eaten in the absence of wood. The findings may contribute to efforts to use fungi to process at least some of the massive amounts of plastic waste that are

produced each year around the world.

More information: Prameesha Perera et al, Wood decay fungi show enhanced biodeterioration of low-density polyethylene in the absence of wood in culture media, *PLOS ONE* (2023). [DOI: 10.1371/journal.pone.0288133](https://doi.org/10.1371/journal.pone.0288133)

© 2023 Science X Network

Citation: Fungi that break down hardwood trees can do the same with plastic, study shows (2023, July 27) retrieved 28 April 2024 from <https://phys.org/news/2023-07-fungi-hardwood-trees-plastic.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.