

Your old sofa - and much more - could be composted, say scientists

February 22 2010

(PhysOrg.com) -- Polyurethane plastics used to make a host of products from furniture fillings to shoe soles, cable insulation and paints - and which can be difficult to recycle - could soon be degraded in compost heaps, thanks to a study at the University of Manchester.

Dr Geoff Robson and his team at the Faculty of Life Sciences have found that certain fungi can degrade the plastic in soil. Furthermore the rate of degradation increases when the volume of these fungi is increased or nutrients are added to the soil to boost the fungi's activity.

They are now carrying out further studies to make sure the degradation of polyurethanes does not adversely affect the composting process or its products.

Dr Robson, whose Biotechnology and Biological Sciences Research Council (BBSRC) funded study is published in the [Applied and Environmental Microbiology](#), said: "This is a significant finding. Polyurethanes are used to make many, many products and can take up a large amount of volume in landfill sites, which are rapidly running out of space. This makes it a major environmental pollutant.

"This study opens the possibility that fungi could be used to degrade these materials instead of dumping them into landfill sites."

The team placed polyurethane pieces in soil containing fungi and bacteria. As the polyurethane, which is made from petroleum, degraded,

the number of fungi increased as they digested the byproducts, showing that it was indeed the fungi that were breaking down the plastic.

Dr Robson added: “Fungi which naturally occur in soils have a remarkable capacity to degrade dead plants and animals, playing a pivotal and essential role in [nutrient cycling](#) in the environment. This study demonstrates some of these fungi also have the ability to degrade man-made polyurethanes.

“We demonstrated increased degradation of polyurethanes when buried in soil either by enhancing the activity of fungi already present by adding nutrients to the soil or by adding specific fungi to the soil that had previously been isolated from the surface of degrading polyurethane.”

The team is now investigating how best to apply their findings to polyurethane waste management. One possible method would be to spray fungi onto the polyurethane but another method would be to compost polyurethane along with other compostable materials - using already existing facilities.

Dr Robson, a biochemist and plant biologist who has studied fungi for many years, said: “Fungi are the classic underdogs. If we didn’t have fungi, we wouldn’t be here - we would be buried under mountains of stuff that they break down for us. They are also a treasure chest of pharmaceutical products, producing not just penicillin but also other antibiotics and immunosuppressant drugs. They are used to make arachadonic acid, the fatty acid essential for brain development in babies and used in baby milk formula, and their enzymes are used to turn milk into cheese, make bread dough rise better, clean our clothes in detergents and make fruit juice amongst many, many other applications.

“There is very little research on [fungi](#) compared to other microorganisms and only a fraction of them are actually known - around 20% have been

identified.

“This latest finding just shows what amazing organisms they are.”

Provided by University of Manchester

Citation: Your old sofa - and much more - could be composted, say scientists (2010, February 22) retrieved 20 September 2024 from <https://phys.org/news/2010-02-sofa-composted-scientists.html>

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