

# Orange peels could be made into biodegradable plastic

September 26 2011, By Bryan Nelson

---

Plastic waste is one of the worst forms of trash because it takes so long to degrade, thus overflowing our landfills and polluting our oceans and waterways. But what if we could make plastic from a recycled, natural, biodegradable source?

That's the idea behind a new technology developed by British scientists that uses [microwaves](#) to turn plant-based waste, such as orange peels, into eco-friendly plastic, according to London's The Independent.

Researchers have created a partnership with the juice-making industry in Brazil and have launched the Orange Peel Exploitation Company to demonstrate the technology on a large scale.

"There are 8 million tonnes of orange residue in Brazil. For every orange that's squeezed to make juice, about half of it is wasted," said James Clark, professor of [green chemistry](#) at the University of York in the U.K., and developer of the new approach. "What we've discovered is that you can release the chemical and energy potential of orange peel using microwaves."

The technique works by focusing high-powered microwaves on plant-based material, transforming the tough cellulose molecules of the [plant matter](#) into volatile gases. Those gases are then distilled into a liquid that researchers say can be used to make plastic. The process works at 90 percent efficiency, and it can be used on a variety of plant waste beyond orange peels.

Orange peels are particularly good for this technique because they are rich in a key chemical, d-limonene, which is also an ingredient in many cleaning products and cosmetics.

"The unique feature of our microwave is that we work at deliberately low temperatures. We never go above 200 (degrees Celsius). You can take the limonene off or you can turn limonene into other chemicals," he said. "It works really well with waste paper. It can take a big range of bio-waste material," Clark said.

The [environmental benefit](#) of this technology goes beyond developing a more [biodegradable plastic](#). It also recycles plant waste which is normally discarded. Farmers, factories and power stations that deal with a lot of excess biomass could be a few of the beneficiaries.

"We are talking to farmers who are already concentrating a lot of biomass for palletizing before going to power stations about the possibility of locating a facility in one of these centralized units," Clark said.

**More information:** © 2011, Mother Nature Network.  
Distributed by MCT Information Services

Citation: Orange peels could be made into biodegradable plastic (2011, September 26) retrieved 19 April 2024 from <https://phys.org/news/2011-09-orange-biodegradable-plastic.html>

<p>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.</p>
--