The same extracts that make okra gloopy can be used to remove microplastics from wastewater | Photo source Neha Deshmukh on Unsplash

REMOVING MICROPLASTICS FROM WATER WITH OKRA

SUSTAINABILITY

Researchers have found that natural materials like okra can remove microplastics from water at least as well as commonly used chemicals

Spotted: If you have ever eaten a gumbo, you may be aware that one of the main ingredients—okra—is an excellent thickener. Researchers have recently discovered that the same extracts that make cooked okra gloopy can be used to remove microplastics from wastewater. Microplastics are, as the name suggests, pieces of plastic 5 millimetres or smaller. Studies suggest that these are now so prevalent they have been found on every continent and inside the human body – even inside the placenta of unborn babies.

Microplastics are typically removed from wastewater in a two-step process – by first skimming off any floating pieces, and then removing the rest using flocculants, 'sticky' chemicals that attract the microplastics and form large clumps that then sink to the bottom of the water. However, some common flocculants are themselves potentially harmful. For example, polyacrylamide, can break down into toxic chemicals. Instead, the researchers turned to non-toxic alternatives.

The team tested polysaccharide extracts from several foods, including fenugreek, cactus, aloe vera, okra, tamarind, and psyllium. They found that polysaccharides from okra combined with those from fenugreek worked best at clumping microplastics in ocean water, while combining polysaccharides from okra and tamarind worked best with freshwater. Overall, these plant-based polysaccharides worked either as well as or better than traditional flocculant polyacrylamide.

According to lead researcher Dr. Rajani Srinivasan, of Tarleton State University, in Texas, the plant-based flocculants can be used in existing water treatment processes. "The whole treatment

method with the nontoxic materials uses the same infrastructure," says Srinivasan. "We don't have to build something new to incorporate these materials for water treatment purposes."

Plastic, it turns out, is everywhere – in water, food – even our bodies. As awareness grows about the ubiquity of microplastics, researchers and environmentalists are working to find new ways to remove these pollutants. Some recent innovations include using mussels as natural filtration devices and replacing plastic seed coatings with a natural, biodegradable film.

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Takeaway:

While microplastics themselves may not be toxic, substances that are toxic can become attached to the microplastics and carried into the body. This makes it imperative that we find better ways to remove microplastics from the environment. Srinivasan and her team plan to continue refining their use of plant-based polysaccharide flocculants, adjusting the ratios and combinations to optimize removal of different microplastics from different water sources. They will also be working on ways to scale up their non-toxic flocculants, with an eye toward the eventual commercialisation of this method.