

Sunflower pollen sponge to soak up oil spills from water

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Oil spills are difficult to clean up and can result in damage to a marine ecosystem. Now, a promising ‘eco-friendly’ sponge alternative has been developed from sunflower pollen to help tackle this problem.

A team of scientists led by Nanyang Technological University, Singapore ([NTU Singapore](#)) has created a reusable, biodegradable sponge that can soak up oil and other organic solvents from contaminated water sources.

To form the sponge, the NTU team first transformed the pollen grains from sunflowers into a pliable, gel-like material through a chemical process akin to conventional soap-making. The process resulted in the formation of pollen sponges with 3D porous architectures.

To make sure the sponge selectively targets oil and doesn’t absorb water, the scientists coated it with a layer of stearic acid (a type of fatty acid found commonly in animal and vegetable fat). This renders the sponge hydrophobic while maintaining its structural integrity.

In lab experiments, the scientist demonstrated that the sponge has the ability to absorb oil contaminants of various densities, such as petrol and motor oil. It was found that the sponge had an absorption capacity in the range of 9.7 to over 29.3 g/g.¹ This is comparable to commercial

polypropylene absorbents, which are petroleum derivatives and have an absorption capacity range of 8.1 to 24.6 g/g.

The sponge was also tested for its durability and reusability and it was found that it could be used for at least 10 cycles.

The research team, made up of scientists from NTU Singapore and Sungkyunkwan University in South Korea, believes that these sponges, when scaled up, could be an eco-friendly alternative to the current options.

“Using a material that is found abundantly in nature also makes the sponge affordable, biodegradable and eco-friendly.” said Professor Cho Nam-Joon from the NTU School of Materials Science and Engineering, who led the study.

The findings from the research were published in [Advanced Functional Materials](#) in March.

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1. g/g is a unit of measurement for absorption capacity. It refers to how many grams of contaminant can adhere to per gram of the material that absorbs.