



Among the research team members are (from far left) NTU PhD student Mohammed Shahrudin Ibrahim, NTU masters student Deng Jingyu, NTU research fellow Zhao Ze and Professor Cho Nam-Joon. To make the sponge, the research team first transformed tough pollen grains into a soft gel-like material, before freeze-drying the material. PHOTOS: NTU

In their tests, the team found that the sponge could absorb oil contaminants such as motor oil at a rate comparable with commercial oil absorbents. They also tested for its reusability by soaking it in silicon oil repeatedly and then squeezing it. The team found the process could continue for 10 cycles.

NTU-S. Korean uni team creates eco-friendly sponge for oil spills

Yeo Shu Hui

Scientists from Nanyang Technological University (NTU) and South Korea's Sungkyunkwan University have created an environmentally friendly sponge from sunflower pollen to tackle water pollution such as marine oil spills.

Professor Cho Nam-Joon from the NTU School of Materials Science and Engineering said his team initially started looking at pollen for pharmaceutical drug delivery applications.

During their research, they discovered that pollen – known as the diamond of the plant kingdom for its hard exterior – could be transformed into soft, gel-like microgel particles. This shed new light on its potential as a material.

Prof Cho said: "When we first discovered that ultra-tough pollen

grains could be transformed into spongy microgel particles, this excited us because the microgel particles were a bit like Play-Doh and could be made into various shapes.

"From that point, curiosity drove us and we eventually found the right set of conditions and steps to make the sponge and we saw many great application possibilities, including oil absorption."

Researchers around the world have been looking for more eco-friendly ways to tackle oil spills.

The cleanup methods for oil spills currently include using chemical dispersants to break oil down into small droplets, or absorbing it with expensive, unrecyclable materials, such as polymer and synthetic materials, which may worsen the damage to the marine ecosystem.

Prof Cho described pollen not used for pollination as a biological waste and the research team took three years to develop the sponge,

which is affordable, biodegradable and reusable.

In their tests, the team found that the sponge could absorb oil contaminants such as motor oil at a rate comparable with commercial oil absorbents. They also tested for its reusability by soaking it in silicon oil repeatedly and then squeezing it. The team found the process could continue for 10 cycles.

These findings made the pollen sponge a good alternative to existing methods of handling oil spills.

The researchers plan to expand the size of the sponge to meet industry needs, and are looking to work with non-governmental organisations and international partners to test it in real-life settings.

Prof Cho said: "We hope our innovative pollen materials can one day replace widely used plastics and help to curb ... plastic pollution."

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