

HOW TO TRANSFORM A POPULAR FRUIT INTO A PLASTIC

A decades-old food additive is transforming into a **VERSATILE, COMPOSTABLE BIOPLASTIC**.

Tamarind seed gum has long been used as a food thickener, but in Japan it is also being developed into a biodegradable plastic that could be used for everything from flexible food packaging and clothing materials to moulded products for automobiles and home appliances.

“Tamarind seed gum is a water-soluble polysaccharide with a high molecular-weight. It is also categorized as a xyloglucan, which are linear polysaccharides that have excellent compatibility and biodegradability,” says Shinji Utsunomiya, from MP Gokyo Food & Chemical in Japan.

PLANT-DERIVED PLASTIC

The gum is made by refining polysaccharide components from the seeds of tamarinds, a sour fruit commonly grown in India and southeast Asia.

Apart from the seeds used to produce food additives, most are thrown away after the fruit is consumed, says Utsunomiya. So tamarind seed gum bioplastics could contribute to a sustainable circular economy in which waste products are repurposed, he says. Tamarind trees also grow well on dry, infertile soils, he adds, and will probably not compete for valuable agricultural land.

MP Gokyo Food & Chemical first began distributing tamarind seed gum on an industrial scale in 1964, marketed under the brand name GLYLOID. In 2021, a new brand, TAMAVISCO, was launched for the cosmetics sector. These products are



▲ Gum extracted from the seeds of tamarinds (pictured) is being used to make a plant-derived and biodegradable plastic that could contribute to a more sustainable circular economy.

used as thickening agents and for making films that limit the passage of gases.

This ability to restrict gases, such as oxygen, means that packaging made from or coated in the gum could help prevent oxidation, extending the shelf life of food products, says Utsunomiya. “Today, many foods are packaged in plastic sheets coated with aluminium, as this combination helps filter moisture and oxygen,” he points out. “However, plastic and aluminium packaging is costly to recycle — so replacing it with biodegradable tamarind gum plastics could contribute to rubbish reduction.”

Today, MP Gokyo has partnered with Kanazawa University to explore tamarind seed gum’s potential. Kanazawa

leads the COI-NEXT project, a Japanese government-funded, multi-institution initiative developing sustainable, plant-derived plastic resources.

For example, MP Gokyo and Kanazawa are using other plant-derived ingredients to improve the ability of their tamarind seed gum plastics to be moulded. The partnership is also examining ways to control tamarind-gum bioplastic textures, says Yoshito Tsuruha, a director of research development at MP Gokyo.

“Tamarind seed gum is already a versatile product in the food industry since its texture can be manipulated in many ways — for some products it can help with thickening, and for some it can help to create a more gel-like texture. As a bioplastic, we believe that combining

tamarind gum with other plant-derived, biodegradable ingredients will enable a deeper breadth of textures and interesting functionalities,” he says. For instance, his team is working to produce more waterproof products with the help of other plant-derived, biodegradable ingredients.

With this continued evolution, the former food additive might soon find its way into many more aspects of our lives, says Tsuruha.

MP Gokyo Food & Chemical is taking a new step forward as the MEDIPAL GROUP from 1 April 2023. ■



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