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A molecular gel with diverse applications

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Singapore: Under the guidance of professors from IIT-Madras and Pondicherry University, a team of students have developed a new type of gel molecule. It is made from inexpensive and renewable raw materials, and is called glucose triazole hydrogenated cardanol conjugate (GTHCC). This gel, the research for which was published in the Royal Society of Chemistry's journal "RSC Advances", could be useful in pharmacology, cosmetics, electronics, pollution control, and also for lubrication.

Pondicherry University professor Mr H Surya Prakash Rao and his team prepared the gel from glucose and a product obtained from liquidizing cashew nut shell, a by-product of the cashew industry while IIT-M professor Mr Ashok K Mishra and his team discovered the gelling properties of the molecule.

Mr Rao said that the challenge had always been in discovering stcturally simple molecular gels extracted from inexpensive and renewable raw materials using convenient procedures. The hydrogel was stable under acidic as well as basic conditions. Glucoside (sugar) based gels are susceptible to hydrolysis under acidic conditions limiting their applications. However, this gel is robust and stable under acidic or basic condition and can be prepared readily.

Mr Mishra, highlighting another aspect, said, "GTHCC exhibits gelling properties even at a very low concentration of 0.3 gram per litre with different solvents. There are a very few molecular gels like this that are simple and synthesised from easily available materials. This novel molecule may have good potential in diverse applications like drug delivery agents, cosmetics and petroleum oil scavenging."