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NIT Rourkela secures patent for eco-friendly film for medical products

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Material using a natural bioplastic produced by bacteria that grows on sugarcane molasses

Researchers from the Department of Biotechnology and Medical Engineering at National Institute of Technology (NIT) Rourkela have created a new biodegradable composite film to potentially replace commonly used plastic materials in the healthcare sector.

The developed innovation addresses the issue of non-biodegradable medical plastics disposal while meeting the market demand for sustainable biomaterials.

The research team including Dr Angana Sarkar, Associate Professor, along with her research graduate Dr Pritam Bajirao from the Department of Biotechnology and Medical Engineering, NIT Rourkela, have secured a patent titled, "Biodegradable and Antimicrobial Bio-composite Film and Process for Preparing Thereof," for the developed innovation.

Healthcare products such as wound dressings and bandages, are usually made using petroleum-based non-biodegradable plastics. The waste from these products resulting in environmental pollution. Although bioplastics such as polyhydroxyalkanoates (PHAs) offer a potential alternative, their large-scale adoption is limited due to their brittleness and slow degradation capabilities.

To address these challenges, researchers from NIT Rourkela have created a material using a natural bioplastic produced by bacteria that grows on sugarcane molasses. To make the developed bio material mechanically strong and flexible, naturally extracted neem oil was mixed with the composite. This unique process resulted in development of a material that can serve as an alternative to plastic-based products used in the medical field.

The technology can be used in a variety of healthcare-based products such as antimicrobial films, coatings, and sustainable healthcare products, as well as plastic-free bandages and wound dressings.

The estimated production cost of the developed bio-composite film is Rs 14.33 for a 44.18 cm square (approx.) indicating strong potential for economical scale-up.