Sustainable fabric made from tree bark could cut MRSA infection rates

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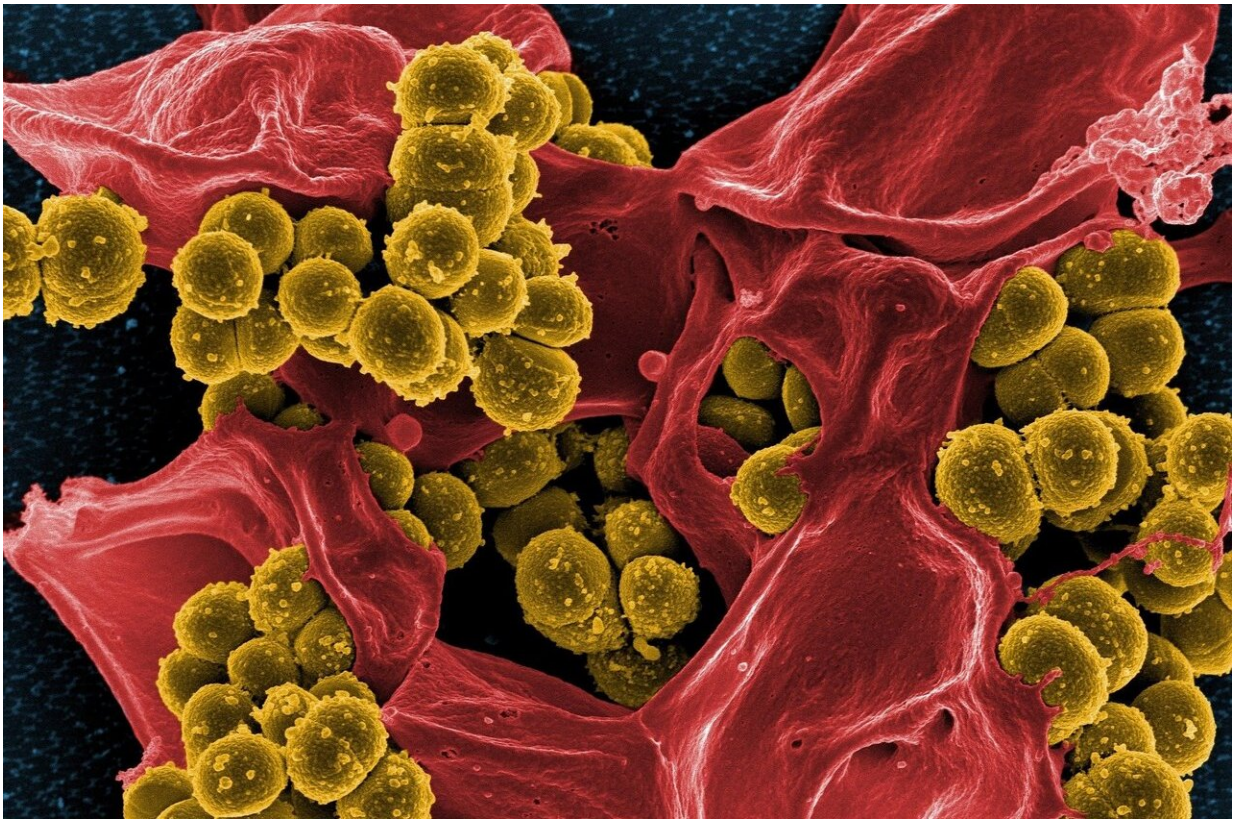

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A traditional Ugandan cloth that uses tree bark to make sustainable textiles could be used to treat skin wounds after new research shows it has antimicrobial properties to fight against tough infections such as

MRSA.

MRSA—Methicillin-resistant Staphylococcus aureus—is an infection caused by bacteria that is resistant to many different antibiotics.

But new research from science and textile researchers published in the Journal of Applied Microbiology examined the feasibility of using bark cloth as an antimicrobial fabric within wound care management. It found that Ugandan bark cloth could stop the growth of MRSA by more than 99 percent.

Ugandan bark cloth is a non-woven fibrous structure harvested from the Mutuba tree in Uganda. It is a highly sustainable and renewable product as its harvesting does not destroy the tree and can continue to be harvested for up to 100 years.

The findings present a significant advance in the search for natural fabrics that could be deployed for healthcare applications.

Post-antibiotic era

Dr. Jonathan Butler, lead author and Senior Lecturer in Microbiology at Manchester Metropolitan University, said: "As society approaches a post-antibiotic era, new antimicrobial interventions are urgently needed, both as treatment options and infection prevention strategies.

"But also due to the growing pressure to reduce the environmental impact of everything we do, there is an ever-increasing need for greener, more sustainable healthcare technologies. Current wound dressing technology predominantly focuses on utilizing synthetic antimicrobial materials, which when disposed of is a big contributor of environmental pollution.

"To my knowledge, this is the first published report where an unmodified, sustainable natural whole bark cloth made by traditional methods has been employed as an antimicrobial fabric against MRSA."

Co-author Dr. Kirsten Scott, Course Leader at Istituto Marangoni, added: "While there are anecdotal reports of bark cloth's antibacterial properties within rural Ugandan communities, this research has tested and proved its efficacy against a specific and serious cause of wound infections."

Antimicrobial resistance is a major global issue and it is estimated that by 2050, mortality rates associated with antimicrobial-resistant infections will exceed 10 million people every year, superseding cancer as the leading cause of global mortality.

Healthcare-associated infections are a major cause of death and it is estimated that between seven and 10 percent of hospitalized patients will develop an infection type—MRSA being a predominant cause.

Promising results

The study, a collaboration between the University's researchers from the Faculty of Science and Engineering, Manchester Fashion Institute and Istituto Marangoni in London, found that the bark cloth retained its antimicrobial properties against MRSA after standard washing procedures, which is one of the biggest challenges for antimicrobial fabric production. This means that the fabric remains antimicrobial for longer.

Dr. Prabhuraj Venkatraman, a Senior Lecturer in Textile Technology at Manchester Metropolitan said: "Our research demonstrated that bark cloth has a distinct texture with the criss-cross arrangement of fibers that has a porous structure, varied thickness and high moisture absorbency.

These properties make it ideal for medical applications such as wound dressings that supports the moist wound healing concept."

The researchers say the results are promising and present an interesting sustainable material for further research into potential commercial fabric use for skin and healthcare applications. Last year, researchers at Manchester Metropolitan University also found that Ugandan bark cloth could also support sustainable fashion initiatives.

More information: J.A. Butler et al. A traditional Ugandan Ficus natalensis bark cloth exhibits antimicrobial activity against methicillin-resistant Staphylococcus aureus, *Journal of Applied Microbiology* (2020). DOI: 10.1111/jam.14945

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