A Cleaner Cure: Medical Bioplastics Derived From Seaweed

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Plastic pollution and microplastics are major environmental concerns, especially in the healthcare industry, which relies heavily on single use plastics. This project investigated whether biodegradable bioplastics made from seaweed-derived polymers could replace traditional petroleum based plastics. Bioplastic films were created using agar-agar and alginate with glycerin as a plasticizer and spirulina as a reinforcing additive. Different variations were tested to examine how composition affects material properties. Mechanical testing was conducted at the University of Tulsa at the Weston Lab, measuring tensile strength and elongation, while additional tests evaluated water absorption, water vaporization, and biodegradability. Results showed that spirulina-reinforced agar films had the highest strength and stiffness, while alginate films with higher glycerin content were more flexible. The findings demonstrate that seaweed based bioplastics have similar mechanical properties of conventional plastics while offering improved biodegradability, making them promising materials for certain medical and single use healthcare applications.

Awards Won: