ABSTRACT

The increasing environmental concerns associated with traditional leather production have driven research into sustainable biomaterials. This study explores the development of bioleather from symbiotic cultures of black tea and green tea, utilizing the microbial fermentation process to generate bacterial cellulose. The production process involved optimizing growth conditions such as fermentation time, temperature, and nutrient composition to enhance cellulose yield and quality. The bioleather samples were evaluated based on their mechanical properties, including tensile strength, flexibility, and durability, as well as their water resistance and biodegradability. The results indicate that bioleather derived from black tea symbionts exhibited superior tensile strength and elasticity compared to green tea-derived samples, while both demonstrated promising water resistance and biodegradability. These findings suggest that tea-based symbiotic cultures present a viable and sustainable alternative to animal leather, with potential applications in fashion, upholstery, and biodegradable materials. The study underscores the importance of microbial cellulose in advancing eco-friendly material science and encourages further research into scalability and commercial viability.

Keywords: *Bioleather, bacterial cellulose, sustainable materials, microbial fermentation, green technology.*