

Effect of additives, single sugar α -linked glucuronic acid-based oligosaccharide (SSGO) on structure and mechanical properties of bacterial cellulose

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The ultra fine compact fiber network structure and tensile strength of BC makes it extra crystalline material with superior mechanical properties and multiple applications. Addition of certain supplementary carbon sources to the culture media not only enhance the BC production but also affect its structural composition and mechanical properties. In their presence, the BC production persists for relatively longer time resulting in high micro fibril secretion and strengthens the BC fibers. In the present work different concentrations i.e. 0, 1, 2 and 4% of a by-product, single sugar α -linked glucuronic acid-based oligosaccharide (SSGO), were added to the culture media of BC. The production of BC was greatly enhanced with the addition of SSGO. The structural variations occurring in BC with the addition of SSGO were monitored via FE-SEM, XRD and FTIR analysis techniques. Besides enhancing production, the mechanical properties including tensile strength and Young's modulus of the BC produced with the addition of SSGO were significantly improved.