

Bio-polymer Materials for Sustainable Consumer and Medical Applications

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Abstract : With the ubiquity of 3D printing technology in the last decade, a wide array of material choices are available for Fused Deposition Modelling (FDM) 3D printing technology. Exploration into creating printable bio-polymers has also seen progress recently in attempts to further the sustainability agenda and circular economy. By tackling waste and pollution via recycling and reusing, food by-products resulting from mass food production may see opportunities for renewed value and alternate applications through 3D printing. To date, many pure polymers, blends, as well as composites have been developed specifically for FDM printing contexts to heighten the physical performance of final printed products. This review article covers general information on various FDM printed polymers and composites while exploring experiments designed to create printable biopolymers made from reused food by-products. The biopolymer-based composites preparation is described in detail, while their advantages and disadvantages are also discussed. In addition, this article shares knowledge and highlights experimentation that aims to achieve acceptable 3D-printed biopolymer composite properties that may address the functional requirements of different application contexts. Furthermore, the article describes a brief overview of the potential applications of such bio-polymers and the future scope in this field.

Keywords : food by-products, bio-polymers, FDM, 3d printing

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