Electrospun tamarind seed polysaccharide combined with polyethylene glycol-based nanofibers development

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Abstract: Tamarind seed polysaccharide (TSP) was extracted from the seed of Tamarindus indica Linn., a natural polymer used in food and pharmaceutical industries. It is highly viscous, mucoadhesive and biocompatible applied to oral controlled release, drug delivery system both design and dosage forms. This work aimed to extract TSP from three sources and two varieties; sweet and sour tastes and developed electrospun nanofibers from the selected TSP combining to polyethylene glycol. Kernal powder of tamarind seed was slurried into a clear solution, set aside overnight and then centrifuged at 6000 rpm. for 20 min. to separate all foreign matter. The TSP solution was used for electrospinning experiment and the precipitate was collected, dried in the oven and stored in a desiccator. The dried TSP was analysed by 1H NMR, FT-IR SEM and XRD. The electrospinning of TSP combined with 4% (w/w) of polyethylene glycol (PEG) into 20%, 40%, 50% and 60% (TSP: PEG) was operated at 15 kV, 15 cm. and feed rate 1 ml/hr. The 50% (TSP: PEG) was the best results with the appropriated nanofiber compared to others after SEM analysis. Future research will focus on electrospinning of TSP-based natural active ingredients.

Keywords: Electrospinning; Tamarind seed polysaccharide; Nanofibers