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DEVELOPMENT OF AN ECO-FRIENDLY NOVEL METHOD TO EXTRACT SOLUBLE DIETARY FIBERS FROM MEDICINAL SEEDS AND THEIR APPLICATION IN POPULAR FMCG FOOD PRODUCTS

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Dietary fibers, comprising indigestible complex carbohydrates, play a vital role in maintaining human health. While insoluble fibers primarily serve as roughage, soluble dietary fibers are associated with crucial health benefits, including regulation of blood glucose uptake, improved cardiovascular function, and prebiotic effects on gut microbiota. In this work, we report an innovative enzymatic approach to isolate 100% soluble dietary fibers from medicinally important seeds—*Trigonella foenum-graecum* (Fenugreek), *Cassia auriculata* (Hartia), and *Samanea saman* (Raintree). The process employs a sequential enzymatic digestion strategy using cellulase, amylase, and protease, resulting in a breakthrough yield of 34% (w/w) soluble fiber with 99.7% solubility in water. This represents a significant improvement over previously reported solvent-driven methods, which achieved yields of only up to 14.2% (w/w). The isolated fibers have been successfully incorporated into various fast-moving consumer goods (FMCG) applications, including cookies, dosas, and khakhra, demonstrating their versatility and market potential. Beyond enhancing digestive health, the functional properties of these fibers—such as gel formation, delayed digestion, reduced fat and glucose absorption, and microbiota enrichment—position them as a promising ingredient for nutraceutical and functional food industries. Ongoing work focuses on detailed fiber characterization (monosaccharide composition, moisture retention, and calorie profiling) and extending applications to products such as chutneys, pastas, and muffins. A patent for this innovation is currently under process.

Keywords: Soluble dietary fiber; Enzymatic isolation; Functional foods; Prebiotics; FMCG applications; Blood glucose regulation

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