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Untapped agricultural biomass into a value-added product: An enzymatic approach

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Lignocellulosic biomass serves as a reservoir of sugars, which could be used as a potential source for alternative energy and value-added products. Since, the lignocellulose is made up of a complex framework of various components, utilizing it as a readily available material for value addition is a tough task. Usage of chemicals coupled with physical or biological treatments provide a promising way of accessing lignocellulose. In this study, bambara biomass was chosen as a raw material; comprehensive characterization of the biomass was performed to evaluate their potential as a new lignocellulosic feedstock. Xylan, the major hemicellulose component of the biomass was chosen as the source of interest and was extracted by alkaline method. The alkaline extraction of biomass reduced the damage of polysaccharide chains, which could further be explored for desirable product synthesis. The extracted xylan was characterized by NMR and monosaccharide analysis and confirmed as glucuronoxylan. The bambara xylan was further subjected to hydrolysis by the enzyme

β-xylanase, yielding Xylooligosaccharides (XOS), with properties suited for use as a prebiotic. Further, a novel prebiotic spread using Bambara and Amadumbe starch was prepared which contained XOS as the dietary fiber. The new spread enriched with prebiotic offers consumers the benefit of having a healthy diet with improved dietary fiber.

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