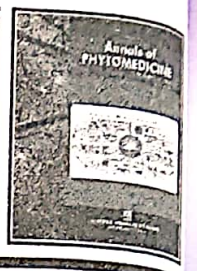
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Cassava (*Manihot esculenta* Crantz) resistant starch: Structural and pharmacological perspectives

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Abstract

Cassava (*Manihot esculenta* Crantz) resistant starch (RS) has emerged as an important functional dietary component due to its beneficial effects on glycemic regulation, gut health, and metabolic wellness. This review highlights the structural mechanisms, phytochemical interactions, and pharmacological significance of resistant starch formation in Cassava. Structural characteristics including amylose content, crystallinity, hydrogen bonding, and chain organization strongly influence gelatinization, retrogradation, and enzymatic resistance of starch granules. Thermal processing and cooling enhance the formation of resistant starch fractions, particularly RS3, while amylose-lipid and amylose-phenolic interactions promote RS5 formation. Cassava also contains bioactive phytochemicals such as flavonoids, phenolics, carotenoids, and phytosterols that contribute antioxidant, anti-inflammatory, hypoglycemic, and prebiotic activities. Physiologically, resistant starch escapes small intestinal digestion and undergoes colonic fermentation, producing short-chain fatty acids, especially butyrate, which improve gut microbiota composition, insulin sensitivity, and metabolic homeostasis. The review further discusses the influence of genotype selection and processing technologies on resistant starch enhancement and digestibility. Overall, Cassava resistant starch represents a promising phytomedicinal and nutraceutical ingredient for the development of low-glycemic functional foods targeting diabetes, obesity, and other metabolic disorders.

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