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Garlic Polysaccharides as Promising Functional Food Ingredients

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Abstract: The incidence of chronic non-communicable diseases has increased steadily nowadays, such as metabolic disorders, hyperglycemia, hyperlipidemia and hypertension, resulting in enormous medical costs and a significant decline in people's quality of life. Natural active ingredients are increasingly being applied in the prevention and treatment of chronic diseases due to their lower risk of side effects and good efficacy. Garlic (*Allium sativum* L.) originated in Central Asia and has been consumed worldwide for its unique flavour and medicinal properties. As one of the main active components of garlic, garlic polysaccharide (GP) can be acquired directly from water extraction or recovered from garlic processing wastewater to maintain the sustainable agricultural development. GP is an inulin-type fructosan which has a (2→1)-linked β-D-Fruf backbone with (2→6)-linked β-D-Fruf side chains with the total molecule weight less than 10,000 Da that belong to the neokestose-based fructans family. It has been reported that GP has certain antioxidant and immune effects, and its phosphorylation or selenylation derivatives can further enhance the original efficacy. GP showed high oil adsorption ability. It can significantly reduce the total cholesterol level of diabetic mice, showing its hypolipidemic effect. Besides, GP exhibited the superiority to reverse intestinal flora disorders while relieving symptoms of Alcoholic liver fibrosis and Dextran Sodium Sulfate-Induced Colitis mice. Garlic polysaccharides could be obtained by extraction, chromatographic purification and spray drying into fine particles powder with white colour, odourless, good water solubility and stability that are served as promising functional food ingredients.

Keywords: garlic polysaccharide, hypoglycemia, hypolipidemia, intestinal microflora