Smart Nanomaterials Technology

Azamal Husen *Editor*

Nanomaterials from Agricultural and Horticultural Products

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Contents

Various Metabolites and Bioactive Compounds from Fruits, and Their Use in Nanoparticles Synthesis and Applications

Arshi Siddiqui, Pragyesh Dixit, Hira Moid, and Uzma Afaq

Abstract Commercially valuable bioactive compounds find a vast range of applications in the medical, pharmaceutical, cosmetic, agriculture and food industry. Nanotechnology is a promising and rapidly emerging field of science. Due to their vast range of applications in the medical, pharmaceutical, cosmetic, agriculture and food industry, bioactive compounds (e.g., flavonoids, phenolic acids, alkaloids, and carotenoids) are commercially valuable goods. Controlled elicitation is one of the promising techniques for enhancing the production of bioactive chemicals in plants. Nanoparticles (NPs) are novel elicitors of bioactive chemicals in plants and could impact the plant's secondary metabolism. The biological production of nanoparticles is becoming more widely recognized as a rapid, environmentally benign, and easy to scale up method. Metallic nanoparticles synthesized from microorganisms and plant extracts are stable and monodispersed when synthesis parameters including pH, temperature, incubation time, and mixing ratio are well controlled. The goal of this chapter is to outline fruit extract NPs synthesis and their various applications.

Keywords Green synthesis · Nanoparticles · Plant extraction · Phytochemicals · Bioactive compounds

1 Introduction

Nanotechnology is a multidisciplinary technical pool that includes physics, chemistry, biology, medicine, and material science, with applications ranging from material and medical science to personal care goods [14-18, 33, 34]. Nanoparticles (NPs)

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