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Endophytes: Toward a Vision in Synthesis of Nanoparticle for Future Therapeutic Agents

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ABSTRACT

The development of reliable processes for the synthesis of Nanoparticles is an important aspect of nanotechnology. Biologically synthesized nanoparticles could have innumerable applications in different areas such as reception, catalysts, biolabellers, etc. In the present review, we emphasize the richness of the microbial world which encompasses a plethora of endophytic entities as an emerging tool in the biosynthesis of nanoparticles. The present review is the first of its kind wherein it gives an idea and vision of unexplored applications of endophytes.

Keyword: Microorganisms, Endophytes, Nanoparticles, Biosynthesis, Bioconjugation.

1. INTRODUCTION

Microorganisms create huge biodiversity among the richness of which the microbial world encompasses a plethora of endophytic entities occupying utterly millions of unique biological niches (higher plants) in various, many times unusual, environments. The term *endophyte* (Gr. *endon*, within; *phyton*, plant) was first coined by de Bary (1866) and has become deeply embedded in the literature ever since. At present, endophytic organisms are defined as "microbes that colonize living, internal tissues of plants without causing any immediate, overt nega-

tive effects" [1]. Research on endophytes is of burgeoning importance due to its rich source of novel natural products which are known to have wide applications in the pharmaceutical and agriculture sectors [2]. Microorganisms (bacteria, yeast and fungi) play an important role in toxic metals remediation through the reduction of metal ions; this was considered an interesting fact and these microbes were employed as nanofactories for the synthesis of nanoparticles. Biosynthesis of nanoparticles is an important aspect of nanotechnology.

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