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Polymeric nanoparticles as carrier systems for herbicides

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Herbicides have been used throughout the ages to eradicate weeds. However, the indiscriminate uses of these chemicals cause problems related to their persistence and mobility in the environment, in addition to their various toxic effects on non-target organisms. A viable solution to minimize the toxic effects of agrochemicals is based on the development of nanocarriers systems, such as, polymeric nanoparticles. In this context, poly (epsilon-caprolactone) and chitosan/tripolyphosphate nanoparticles loaded with herbicides (atrazine or paraquat) were developed in order to produce an efficient and less toxic herbicidal formulation. Colloidal stability and physicochemical characterization of these nanoparticles were evaluated. Cytotoxicity and genotoxicity assays showed that the nanoencapsulated herbicide formulations were less toxic than the pure compound and the herbicidal activity showed that the effectiveness of atrazine and paraquat was preserved or increased after encapsulation. As conclusion, the encapsulation of herbicides in nanoparticles can provide a useful means of reducing adverse impacts on human health and the environment, and that the formulation therefore has potential for use in agriculture.

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Preparation of silver nanoparticles by using biological and chemical method and study of their antibacterial activity

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Silver nanoparticles play one of the major roles in the nanotechnology industry and have a wide-spread application in the field of electronics, agricultural and medical domains. In this paper, chemical as well as biological methods for the synthesis of silver nanoparticles are mentioned. For the chemical synthesis, sodium dodecyl sulphate was used as a stabilizing agent and silver nitrate as a metal salt precursor. Hydrazine hydrate and citrate of sodium were used as reducing agents. Biosynthesis method is an eco-friendly and economical technique for the synthesis of silver nanoparticles. For biological synthesis, the leaf extracts of *Murraya koenigii and Azadirachta indica* were used as reducing agents. The prepared nanoparticles were characterised by UV-Visible spectroscopy. The absorption spectrum obtained in UV-Vis confirmed the formation of silver nanoparticles by different reducing agents. The antibacterial activity was investigated on two types of bacteria, *Escherichia coli and Pseudomonas aeruginosa*, which are mainly present in sewage water by using Kirby-Bauer disc diffusion technique. Zone of inhibition indicated the antibacterial effect of silver nanoparticles.

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