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Comparative Studies of Insecticides and Synthesized Bio-pesticides †

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Abstract: Insecticides and pesticides act as a broad spectrum for pests and are particularly harmful to birds and humans in many circumstances. Most harmful insecticides have been banned in various countries because of their high toxicity but are still available in developing countries like India. There have been many deaths recorded because of these chemicals and other insecticides. This is high time to shift towards safe alternatives as novel nanoemulsion formulation, which can be used instead of the toxic insecticide. A nanoemulsion refers to a colloidal system consisting mainly of aqueous phase-water, a surfactant for stability, and oil of choice, and in this experiment, it has been prepared using castor oil. Therefore, the double nanomaterial was prepared using the same starting materials, and nanoparticles were added separately and characterized by using DLS and zeta potential techniques. Studies were conducted to confirm the antimicrobial and insecticidal activities of different nanoemulsions. The efficacy and effects of synthesized double nanomaterial were compared against the commercial insecticide. The LC 50 value is found using the acute toxicity test. The soil and leaf parts of the plant that was exposed to the test materials are subjected to a residual analysis test. In conclusion, the purpose of this report is to demonstrate the toxic effects of insecticides on various parameters such as aquatic life and soil microbes and to provide a possible future harmless green alternative in the form of nanoemulsions to reduce the toxic effects of existing pesticide and insecticides from the environment.

Keywords: insecticides; nanoemulsion; acute toxicity test; residue analysis.

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Conflicts of Interest

The authors declare no conflict of interest.