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Research Article

Structural and functional insights of STAT2-NS5 interaction for the identification of NS5 antagonist – An approach for restoring interferon signaling

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Abstract

Dengue is a mosquito-borne viral infection caused by Dengue virus (DENV) and is an emerging concern in public health affecting billions of people worldwide annually with no effective drugs available till now. Immunogenic and highly conserved properties of Non-Structural Protein 5(NS5) in DENV makes it a potent marker to identify DENV

Open Access Article

Performance of Force-Field- and Machine Learning-Based Scoring Functions in Ranking MAO-B Protein–Inhibitor Complexes in Relevance to Developing Parkinson's Therapeutics

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Optimization study of Physiological and nutritional factors on MCP (Monocrotophos) Pesticide Degrading Microbes.

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ABSTRACT

Background and Objective: Biological decomposition of pesticides is the most important and effective way to remove pesticides residues from the environment , on this concept total 20 different bacterial strains were isolated using Mineral salt medium (MSM) by enrichment method from agricultural farms in Sivagangai District, Tamilnadu, India respectively. Capacity towards degradation was carried out for all the isolates by poisoned food technique on MSM medium with different concentration of Monocrotophos (MCP).So removal of pesticide is important to purification of our environment. Methodology:MCP biodegradation study also conducted in liquid medium with eight bacterial strains, those selected based on initial screening viz., BKGP002, BVGN0003, BAGP004, BAGN005, BSGP006, BKGN007, ten001. The ability of these strains to mineralize the MCP was analyzed under different culture condition. Isolates assessed in Minimal salt broth containing 250ppm to 2000ppm of pesticides were analysed using ANOVAincluding Tukey testsat different temperature levels viz., 25°C, 35°C, 45°C and different pH levels viz., pH 3, pH 6, pH 7, pH 8, pH 9 and different nitrogen sources viz., Urea, NH3NO4, NaNO4, NaNO3 respectively. They are the main effectors of all the transformations occurring in the biota. Further these individual bacterial strains were targeted for further studies.Result: Among the isolates gravimetric analysis revealed that BKGP002, BAGN005 and BKGN007, were capable of utilizing 80% to 92% of MSM Medium amend with 500ppm MCP. The optimum growth has been recorded at 35°C and pH 7 with suitable nitrogen source as Pseudomonas stutzeri (Gene bank accession Number KY287931), Bacillus licheniforms(Gene bank accession Number KY287928), and Bacillus sonorensis (Gene bank accession NumberKY287930).Conclusion: In the present study, the result revealed that the nitrate reduction by MCP degrading organism was severally influenced by various carbon sources, temperature pH.

Keywords: Soil, MCP (Monocrotophos), Pesticide, ANOVA, Bacterial isolate, biodegradation.

INTRODUCTION

Microorganisms plays an important role for transformation of phosphorous in water and sediments and the phosphate ions are reported strongly absorbed by sediments with a high content of slit and clay [1]. Monocrotophos (MCP) is still widely used in India for the protection of cash crops such as cotton, sugarcane, groundnut, tobacco, maize, rice, soybeans, and vegetables [2]. Use of microbes for effective detoxifying, degrading and removal of toxic compounds from contaminated soil and water has emerged as an efficient technique to clean up polluted environments [3]. From the great microbial population existing in soil, some types show the capability to degrade some types of pesticides through specific pathway, such as using it as a nutrients or as carbon and energy sources due to the chemical nature [4]. One such common pesticides group is organophosphates, some bacteria strains have the ability to convert OP pesticides into sulfons or oxons or some other degradation products [5]. Numerous problems associated with pesticides application are their possible persistence in the ecosystem and therefore, their possible incorporation into the food chain affects ecosystems and human beings [6]. Pesticides can be degraded by microbial, chemical and photo degradation processes in the environment. Nonetheless, microbial degradation is considered the major determining factor of the organophosphrus fate in the environment and is often the main process of pesticide degradation in soils, representing the safest, least disruptive and most cost-effective treatment method [7, 8].