**FEDERAL POLYTECHNIC MUBI**

**DEPARTMENT OF CHEMICAL ENGINEERING TECHNOLOGY**

**COURSE TITLE Project Seminar**

**COURSE CODE CHE 217**

**PROPOSED TOPIC Production of Chemical Insecticide using Neem oil.**

**NAME OF CANDIDATE(S) James Johnson**

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**SUPERVISOR Mal. Taofeek A. Ayodele**

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**1.0 Introduction**

Chemical insecticides have been instrumental in modern agriculture for protecting crops from pests, and to increase agricultural products. However, the adverse effects of synthetic insecticides on human health and the environment have raised concerns and highlighted the need for environmentally friendly alternatives. In recent years, there has been a growing interest in exploring natural compounds as potential insecticides. One such compound is neem oil, derived from the seeds of the neem tree (*Azadirachta indica*).

The production of chemical insecticides using neem oil involves the extraction of bioactive compounds from the oil and their formulation into a suitable product for application. Several extraction methods have been employed, including solvent extraction, cold pressing, and steam distillation. Among these, solvent extraction is commonly used due to its efficiency in obtaining a high yield of bioactive compounds (Koul *et al.,* 2021).

After extraction, the crude neem oil extract undergoes purification and concentration to remove impurities and increase the concentration of bioactive compounds. Techniques such as filtration, centrifugation, and chromatography are used for purification, while concentration is achieved through methods like evaporation or solvent recovery (Roy *et al.,* 2019).

Formulation and stabilization are crucial steps in the production of neem oil-based insecticides. The bioactive compounds extracted from neem oil are formulated into a suitable product, such as emulsifiable concentrates, wettable powders, or granules. Formulation techniques aim to enhance the stability, dispersibility, and efficacy of the insecticide. Stabilizers may be added to improve shelf life and maintain the bioactivity of the formulated product (Vimala et al., 2018).

Neem oil-based insecticides offer several advantages over synthetic insecticides, which contribute to their growing popularity. Firstly, neem oil is derived from a renewable and sustainable source, making it an environmentally friendly alternative. It is biodegradable, reducing the persistence of harmful residues in the environment (Isman, 2021). Secondly, neem oil exhibits broad-spectrum activity against a wide range of insect pests, including aphids, caterpillars, beetles, and mites (Mishra *et al.,* 2022). Furthermore, neem oil-based insecticides have shown low toxicity to humans and non-target organisms, minimizing the risks associated with their use (Pavela, 2021).

**1.1 Statement of the Problem**

The problem at hand is the need for an effective chemical insecticide derived from neem oil. Although neem oil has proven insecticidal properties, there is a requirement for a refined and concentrated formulation that can efficiently control a wide range of pests. The challenge lies in developing a production process that extracts neem oil, purifies it, formulates it into a potent insecticidal solution, and ensures its proper application for effective pest control. Finding a solution to these challenges will provide farmers and agricultural practitioners with an organic and sustainable method to combat pest infestations while promoting crop health and reducing reliance on synthetic chemical insecticides.

**1.2 Aim and Objectives**

The aim of this study is to produce chemical insecticides using neem oil and the specific objectives are;

1. To extract oil from Neem seed.
2. To purify and concentrate the extracted bioactive compounds to enhance their concentration and remove impurities.
3. To formulate neem oil-based insecticides using optimized techniques and evaluate their stability, dispersibility, and shelf life.
4. Evaluate the efficacy of neem oil-based insecticides against a range of insect pests under laboratory and field conditions.

**1.3 Scope of the Study**

This study is aimed at the production of chemical insecticides using neem oil and evaluate its effectiveness in controlling insect pests. The research will focus on the extraction and formulation processes, as well as the bioactivity and stability of the resulting insecticides. Field trials will be conducted to assess their efficacy and compare them with synthetic insecticides.

**1.4 Significance of the Study**

The significance of the study is to produce chemical insecticide using neem oil. Production of chemical insecticides using neem oil has the potential to provide an eco-friendly and sustainable alternative to synthetic insecticides. This study will contribute to the existing knowledge by providing insights into the production process, formulation techniques, and efficiency of neem oil-based insecticides. The findings will be valuable for farmers, researchers, and policymakers involved in pest management and sustainable agricultural practice.

**1.5 Methodology**

The method to be used are; collection of Neem seed, particle size reduction, drying, oil extraction and finally characterization.

**1.6 Expected Result**

At the end of this research the qualitative oil from the Neem seed will be produced and used for the production of chemical insecticide.

**1.7 References**

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