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A REVIEW: DEVELOPMENT OF COW URINE BASED BIOINSECTICIDE

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Abstract

Bio insecticides are based on naturally occurring microorganisms, plant extracts or other materials. Bio insecticides have been safely used for over 63 years and are generally subjected to reduced regulation compared to conventional chemical pesticides. Crop protection has relied heavily on synthetic chemical insecticides, but their availability is now declining as a result of new legislation and the evolution of resistance in pest populations. Therefore, alternative pest management tactics are needed. Bio insecticides may include natural plant-derived products, which include neem leaves, custard apple leaves, ruui leaves and arni leaves. Certain cow urine and other chemicals having insecticide properties.

Keywords: Insecticides, Microorganisms, Cow urine, Insecticidal properties, etc.

1. INTRODUCTION

Bio insecticides are types of chemicals extracted from natural materials such as plants, animals, bacteria or certain minerals and these chemicals can be used for controlling pests. For example, canola oil/baking soda with pesticidal applications are considered bio pesticides. As costs of using synthetic chemicals became apparent, there was resurgence in academic and industrial research of bio pesticide. Development of new and useful bio pesticides has continued to increase rapidly since the mid-1990s. In fact, more than 100 bio pesticide active ingredients have been registered in the U.S. since 1995. Many of these have been introduced commercially in a variety of products¹. Agriculture is adversely affected by numerous pests like bacteria, fungi, weeds and insects, leading to reduced yield and poor quality of

the produce [1]. Since 1960s, the most common method for pest control has been the intensive use of synthetic pesticides. Such pesticide was adopted in 1940s with the use of dichloro-diphenyl-trichloroethane (DDT), followed by other organophosphate and carbonate pesticides [2]. Thereafter, Green Revolution technology of crop production could increase food production in developing countries through the intensive use of inputs like chemical fertilizers and pesticides etc. Albeit, the use of the agrochemicals helped a lot in increasing agricultural productivity; they have caused adverse effects on soil health, water quality, produce quality and developed problems like insect resistance, genetic variation in plants, toxic residues food and feed. Moreover dependence on chemical pesticides and their indiscriminate use caused several detrimental effects on the Recognizing the ill effects of the agrochemicals such as pesticide resistance,

pest resurgence, outbreak of secondary pests, pesticide residues in the produce, soil, air and water [3], it has become important now to develop alternatives of these synthetic agro-inputs. The need of the day is to produce maximum from the diminishing natural resources and protect the produce from post-harvest losses without adversely affecting the environment. Use of bio fertilizers and bio pesticides can play major role in dealing with these challenges in a sustainable manner.

1.1 Types of Bio pesticides:-

Bio pesticides can be considered as dividing into three major classes:-

1. Microbial pesticides consist of microorganism (e.g. bacterium, fungus, virus or protozoan) as the active ingredient. Microbial pesticides can control many different kinds of pests, although each separate active ingredient is relatively specific for its target pest(s). For example, there are fungi that can control certain weeds, and other fungi that can kill specific insects.
2. Biochemical pesticides are naturally occurring substances that control pests by non-toxic mechanisms. Conventional pesticides, by contrast, are generally synthetic materials that directly kill or inactivate the pest. Biochemical pesticides include substances, such as insect sex pheromones, which interfere with mating, as well as various scented plant extracts that attract insect pests to traps. Because it is sometimes difficult to determine whether a substance meets the criteria for classification as a biochemical pesticide, responsible authority would establish a special committee to make such decisions.
3. Plant-Incorporated-Protectants (PIPs) are pesticidal substances that plants produce from genetic material that has been added to the plant. For example, scientists can take the gene for the B.t. pesticidal protein, and introduce the gene into the plant's own genetic material. Then the plant, instead of the B.t. bacterium, manufactures the substance that destroys the pest.

Table No. 1: Crop wise consumption of pesticide in India (%)

Crop	percentage
Cotton	44.5
Paddy	22.8
Jowar	8.9
Fruits and Vegetables	7.0
Wheat	6.4
Arhar	2.8
Other	7.6
Total	100.00

2. METHODOLOGY

- In this project our methodology is to make organic bioinsecticide by using basic raw materials found from various different plants leaves such as neem plant leaves, arni plant leaves, custard apple leaves, beshram plant leaves, rui plant leaves, etc.
- In addition we use cow urine as a extracting solvent. with the help of references, we studied the main constituents present in the above plant leaves is benificiated for making useful bioinsecticide. The stepwise procedure we conducted from basic raw materials to final desired product are as follows
- Firstly we collect all the basic fresh leaves from plants. then wash with normal water, The purpose of washing leaves is to remove the dust and pollution externally stick on the surface of leaves.
- After complete washing of each leaves, it is cut or chopped into fine peaces having size upto 3 to 4 mm, the purpose of cutting leaves into small size is to increase the surface area for better extraction for fermentation process.
- Then we weigh it upto 500 grams of each leaves, after weighing this measured quantity of material we insert this chopped leaves into five litre of cow urine solution and adding litre of tap water in the same container.
- Keeping this material for 6-7 days is approximately (150-160 hrs) for fermentation purpose and observe the changes takes place in the process of fermentation the important implementation of fermentation process is that extracting the antibacterial and antifungal agent or constituent present in the leaves by cow urine and solvent water.
- After fermentation process ferment material is sent to the distillation unit, distillation is method of separating pure liquid from low volatile plant material by using difference in their boiling point. and by maintaining the reflux in order to enhance the purity of insecticide.
- Finally the distillate solution is collected in the separator where 80-85 % of pure insecticide is obtained and rest of water is removed from bottom of separator or by heating process.
- The pure extract liquid solution that we called as insecticides is sent to the filtration for filtering purpose.

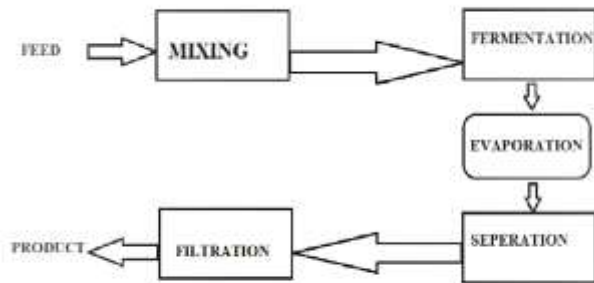


Fig-1: Flow chart of the unit operations

3. CONCLUSION

Generation of bio insecticide is important need of current scenario of farming because of adverse affect of chemical insecticide. In this study it is observed that lot of efforts have been done to develop the bio insecticide. Cow urine is the single most important ingredient in the bio insecticide,

This helps to control the pest and insects on the crop. Other ingredients such as Neem leaves (*Azadirachta indica*), Arni leaves (*Clerodendrum phlomidis*), Sitafal leaves (*Annona reticulate*), Rui leaves (*Calotropis gigantea*), Beshram leaves (*Ipomoea carnea*) are the generalized bio insecticides from the review of well published research work it can be concluded that good quality bio insecticide can be developed from the natural farming resources.

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