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VARIOUS CROPS IMPROVEMENT OF BIOPESTICIDES AGAINST COMMON PESTS

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ABSTRACT

The world population is going to increase in incredible rate. To feed and cover this population from beat land and fast depleting crop yields would be the great concern and challenge to the future generation. Furthermore the use of genetically modified crops, hybrid seed, fertilizers and pesticide in the agricultural field is major concern today. Pesticide at present is an essential tool to increasing the yield and to protect the economically important crops from pest, insects, fungi, nematode and weeds. Biopesticides products (including beneficial insects) are now available commercially for the control of pest and diseases. The overall aim of biopesticides research is to make these biopesticides products available at farmhouse level at a reasonable price, and this would become a possible tool in the integrated pest management strategy. Moreover, biopesticides research is still going on and further research is desirable in many aspects including bioformulation and areas such as commercialization. There has been a substantial regeneration of commercial awareness in biopesticides as demonstrated by the extensive number of agreements between pesticide companies and bioproduct companies which allow the development of effective biopesticides in the market. This paper has reviewed the important and necessary defection of major biopesticides in the past. The future prospects for the progress of new biopesticides are also discussed.

KEYWORDS: modified crops, pest, insects and fungi.

INTRODUCTION

1.1 Definition of pesticide

A chemical or biological substance, designed to kill or retard the growth of pests that damage or interfere with the growth of crops, shrubs, trees, timber and other vegetation desired by humans, is called pesticide. Practically all chemical pesticides, however, are poisons and pose long-term danger to the environment and humans through their persistence in nature and body tissue. There are mainly two types of pesticides: (A) Bio- Pesticides and (B) Chemical pesticides.

(A) BIO PESTICIDES

Bio pesticides are certain types of pesticides derived from such natural materials as animals, plants, bacteria and certain minerals. For example, canola oil, baking soda and Neem.Bio-Pesticides are of three types. And they are as follows.

A.1 Microbial Pesticides

Microbial pesticides can control many different kinds of pests, although each separate active ingredient is relatively specific for its target pest. For example, there are fungi that control certain weeds, and other fungi that kill specific insects. The most widely used microbial pesticides are subspecies and strains of *Bacillus thuringiensis*.

A.2 Plant-Incorporated-Protectants

Plant-Incorporated-Protectants are pesticidal substances that plants produce from genetic material which are added to the plant. For example, scientists can take the gene for the *Bacillus thuringiensis* pesticidal protein, and introduce the gene into the plant's own genetic material. Then the plant, instead of the *Bacillus thuringiensis* bacterium, manufactures the substance that destroys the pest.

A.3 Biochemical Pesticides

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.[1]

PESTICIDE

The haphazard use of synthetic pesticides in agriculture, horticulture, forestry, animal husbandry and in public health has created some adverse problems. Though these pesticides

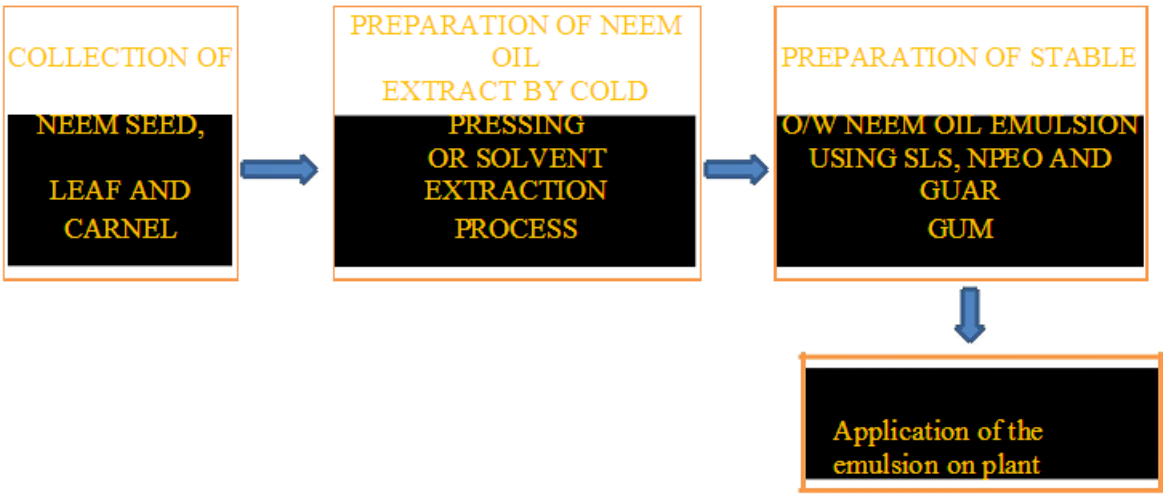
still constitute one of the essential components of IPM, reduction in synthetic pesticides consumption is visualized by all concerned e.g. government, farmers, pesticide industries, rural development agencies etc. Also, the motion of replacing them with plant products is widely congratulated. Tomato (Lycopersicon esculentum Mill) is one of the most important vegetables, mostly grown in home gardens and by the market gardeners. It can be used both in fresh or processed farm. Tomato is attacked by a number of pests including Tomato fruit worm (Helicoverpa armigera) Larvae of fruit worm are polyphagus it can attack tomato fruit at any stage of growth decreasing its market value.[2]

"*Because of its fleshy nature, tomato fruit is attacked by a number of insect pests and diseases, resulting in the consumption of large amounts of pesticides which leave their toxic residues. As it is a short-duration crop and gives high yield, it is important from an economic point of view.*"

AIM OF STUDY

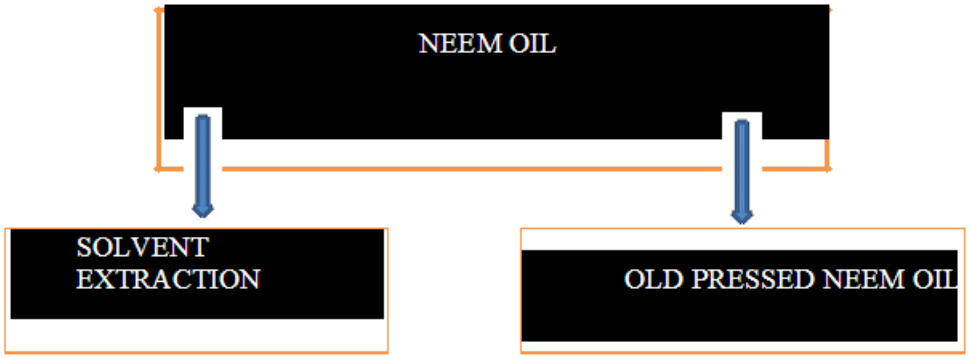
The aim of this study is to develop a Bio-Pesticide formulation from Neem Oil. In this study we developed stable Neem Oil emulsion using various surfactant and surface combining agents. Also in this study we prepared Neem Extract from Neem leaf using water and cow urine which can be used in garden crops.

SCHEMATIC DIAGRAM OF THE PROJECT



MATERIALS AND METHODS

NEEM OIL EXTRACTION PROCESS



Neem leaf extract

Vijayalakshmi K. et.al (1995) used 5 litres of water, 1 kg of green neem leaf for Neem leaf extract preparation. Since the quantity of leaves required for the preparation of this extract is quite high (nearly 80 kg are required for 1 hectare), this is used for nursery and kitchen gardens. The leaves are soaked overnight in water. The next day, they are ground and the extract **is** filtered. The extract is suited for use against leaf eating Caterpillars,Grubs, Locusts and Grasshoppers. To the extract, emulsifier is also added. The advantage of using neem leaf extract is that it is available throughout the year. There is no need to boil the extract since boiling reduces the azadirachtin content. Hence the cold extract is more effective. Some farmers prefer to soak the leaves for about one week, but this creates a foul smell.[3]

SOLVENT EXTRACTION OF NEEM

Materials

Neem Leaf: collected from a village of south 24 parganas, Kolkata.

Water: Pond water.

Cow Urine: collected from a village of south 24 parganas, Kolkata.

NEEM OIL EXTRACT EXTRACTION BY WATER FROM NEEM LEAF

PROCEDURE

1) Firstly fresh neem leaf from Neem tree was collected.
2) Neem leaf was smashed.
3) 5litre water in a container was measured.
4) Then the water was heated to boiling temperature.
5) When vaporization is just started then 1kg neem leaf soaked and immediately covered.

6) After that some covered given to the container to stop the vapor and others ingredient.
7) Leave the container in moderate temperature place for 24 hours or 48 hours.
8) After 24 hours or 48 hours those wet leaf were taken in a cloth and extract well.
9) Finally stirred the mixture vigorously and filtered by cloth.
10) Now our neem oil cultured is ready for use.

DOSAGE FOR APPLICATION

1 liter of that solution is mixed with 9 liters of fresh water and after that sprayed on affected area.

Generally 10 to 14 days interval spraying was given good result for pest control.

SUGGESTION: for each application time fresh Neem oil extract is required. Also at the time of mixing with water some amount of soap should mixed with the water for better mixing of extract with water.

RESULT AND DISCUSSION

Table1: Results on 0.5 gm SLS, 1gm SLS and 5% Neem Oil.

SLS concentration	Time in Minute	observation	REMARKS
0.5gm	1	Stable	At SLS concentration of 0.5gm emulsion stability was 25 minute.
	5	Stable	
	10	Stable	
	15	Stable	
	20	Stable	
	25	Stable	
	27	Slide oily layer	
	30	Slide oily layer	
	40	Thick oily layer	
1gm	1	Stable	**REMARKS**
	5	Stable	At SLS concentration of 1gm emulsion stability was 60 minute.
	10	Stable	
	30	Stable	
	40	Stable	
	45	Stable	
	50	Stable	
	60	Stable	
	90	Slide oily layer	
	100	Thick oily layer	
	120	Thick oily layer	

Table 2: continue Sample S1: results on 2.5gm, 2.75gm SLS and 5% neem oil.

SLS concentration	Time	Observation	REMARKS
2.5gm	1hr	Stable	At SLS concentration of 2.5gm emulsion stability was 8days.
	2hr	Stable	
	3hr	Stable	
	1days	Stable	
	2days	Stable	
	3days	Stable	
	4days	Stable	
	7days	Stable	
	8days	Stable	
	9days	Slide oily layer	
	12days	Thick oily layer	

Table 3: continue sample S1: result on 2.85gm SLS and 5% neem oil.

SLS concentration	Time	observation	REMARKS
2.85gm	1hr	Stable	**At SLS concentration of 2.85gm emulsion stability was 30 days. It was best result in this project**
	3hr	Stable	
	1days	Stable	
	5days	Stable	
	7days	Stable	
	10days	Stable	
	15days	Stable	
	20days	Stable	
	30days	Stable	

In this study we prepared stable neem oil emulsion using SLS. From the above sample S1 and table 1 to table 4 we observed that the emulsuon was stable for one month at 1.9% SLS concentration with 5% neem oil. Also from the sample s1 it was found that if we increase the concentration of SLS, from 0.5 % to 1.9 %, emulsion stability will increased and at a certain concentration emulsion became stable. Also from the study it was found that if emulsion were prepared at SLS concentration above 1.9%, then foaming of the sample was not decreased and creaming occurred. So from that observation of table 1, 2, 3, and 4 it may be confirmed that in this study the emulsion stability was maxima at 1.9% SLS concentration.[4,5]

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