

# PESTICIDES FROM CUSTARD APPLE PLANT SEEDS AND LEAVES

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## 1. ABSTRACT

Pesticides are essentially used to achieve adequate control of pests. However, we also need to develop measures for minimizing the impact of pesticides on environment and reducing the risk associated with their applications. It is clear that the possibility for exposure to pesticides is greatest among the farm workers.

The Pesticides which are currently used include a wide variety of chemicals and toxic materials which are harmful to humans and environment. In this review, we have worked to produce a natural pesticide which is extracted from the various constituents of custard apple (seeds, leaves) and implemented on selected insects that are being found in field crops.

## 2. INTRODUCTION

A custard apple fruit which is available for a short season is one of the most famous fruit in India. It has a hard, green exterior surface and the main sweet and fleshy fruit is inside this hard body.

Custard apple has countless benefits since it is rich in anti-oxidants & minerals like calcium & potassium.

Pesticides are the toxic substances which are being used on crops by farmers to kill weeds, insects and others to prevent crops. But it also leads to a wide range of human health hazards such as, headaches, respiratory issues, cancers, reproductive harms, etc. Pesticides used can also damage agriculture lands like weakening plant roots and reducing soil fertility.

In this review, we are using the custard apple seeds and its leaves constituents to make organic pesticide for agricultural purposes and gardens.

This organic pesticide will allow farmers to control pests. However, in comparison to chemical pesticides, this can be very easily decomposed by the environment and has no harmful effects on the crops or plants.



Fig. 2.1 Custard Apple Plant

## 3. OBJECTIVES

We are doing this project in order to achieve the following objectives:

- I. To prepare organic pesticides
- II. To create useful pesticides from waste seeds
- III. To make organic pesticides at a very low cost so that they can be available to all.
- IV. To give rise to a new range of pesticides which do not have any harmful effects on the plants and the environment.

## 4. PROCESS DESCRIPTION

The process of making pesticides using custard apple seeds and leaves consists of four stages as described below:

1. Seed treatment
2. Size reduction of seeds
3. Oil extraction
4. Preparation of leaf starch

### 4.1 SEED TREATMENT:

Seed treatment is the first stage in the preparation of the pesticides which includes cleaning and drying of seeds. The moisture of the seeds is needed to be reduced to minimize degradation while in storage and need to be dried to remove its skin.

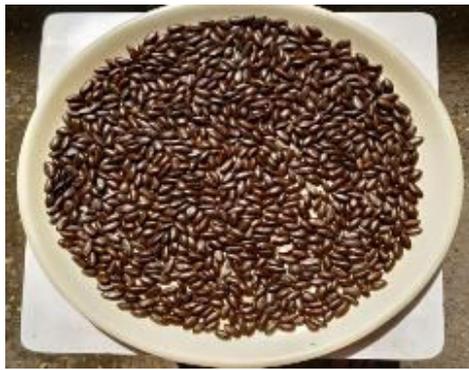


Fig. 4.1.1 Custard Apple Seed

#### 4.2 SIZE REDUCTION

Custard apple seeds are typically reduced in size using an apparatus called as mortar pestle usually called as 'Khal Batta' in Hindi which is easily available in the household kitchen.



Fig. 4.2.1 Seed Powder

#### 4.3 OIL EXTRACTION

For the preparation of pesticide, oil is been extracted using the simple distillation in which we have used hexane as a solvent.

We have taken 20grams of custard apple seed powder and mixed it with 300ml of solvent (hexane) and kept it for the heating process in the simple distillation equipment where it is being maintained at a temperature of 70 C and heated for an hour.

After heating the mixture for an hour, the residue is being filtered and the distillate is separated in the sample bottles which contain some amount of custard apple seed oil. For further estimation of chemical properties, the residue and distillate sample were taken for the GC test where we get the the acid value of the oil and total oil content.



Fig. 4.3.1 Distillation Column

#### 4.4 PREPARATION OF LEAF STARCH:

For leaf starch, custard apple leaves were boiled in 1 liters of water and was heated until the water left was 250ml, the water left after the boiling was leaf starch which was then used with the oil as a pesticide.

### 5. RESULT

SOLUTION	ACID VALUE(mg KOH)
OIL FROM DISTILLATE	0.42

Sr No.	Compound Name	Area(%)
1	Methyl palmitate	3.5
2	Methyl oleate	13.8
3	Methyl stearate	2.6
4	Unknown	20.6

## 6. CONCLUSION

We can conclude that, the natural pesticide produced from custard apple seed oil and leaves proves itself efficient, advantageous, cheap and safety to handle. This pesticide material can be made easily available for every farmer through the India without taking much more efforts. This raw material will be very cheap which minimizes the total cost of processing along with solvent recovery.

## 7. REFERENCES

- 1.Sikdar D.C. "Better Yield with less spray of bio-pesticide",Agro-Bios,Vol.3,pp.15-16,2005
- 2.Weir R.G. and Creswell G.C., "Plant Nutrient Needs", Tropical fruits and nut crops,Vol.1,pp.1-4,1995
- 3.Singh A. "Synthesis Pesticide" Fruit Physiology and Production,Vol.1,pp.340-361,1980.
- 4.Singh A.P. "Integrated pest and Diseases Management",Agro-Bios,Vol.10,pp.24-26,2002
- 5.Parvin Shahnaj Mst, Islam Ekramul M, Rahman Motiur Md., and Haque Ekramul Md. 2, Toxicological evaluation of Annotemoyin-1isolated from Annona squamosa from long evans Rat, Pakistan Journal of Biological science, 6(18), 1593-1596 (2003)
6. Baumer (1995), Burkhill (vol 1) (1985), GTZ/ ICRAF (1990), Vogt 1995; Hamza (1990)
- 7.Shirwaikar A., Rajendran K., Kumar C.D., Bodla R., In vitro antioxidant studies of Annona squamosa Linn. Leaves, Indian J Exp Biol., (42), 803-7 (2004)
- 8.Quality Control Methods for Medicinal Plant Materials, World Health Organization (WHO), Geneva, (1998)