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FY BTech

PREPARATION OF NATURAL PESTICIDES FROM CUSTARD APPLE SEEDS

Guide:
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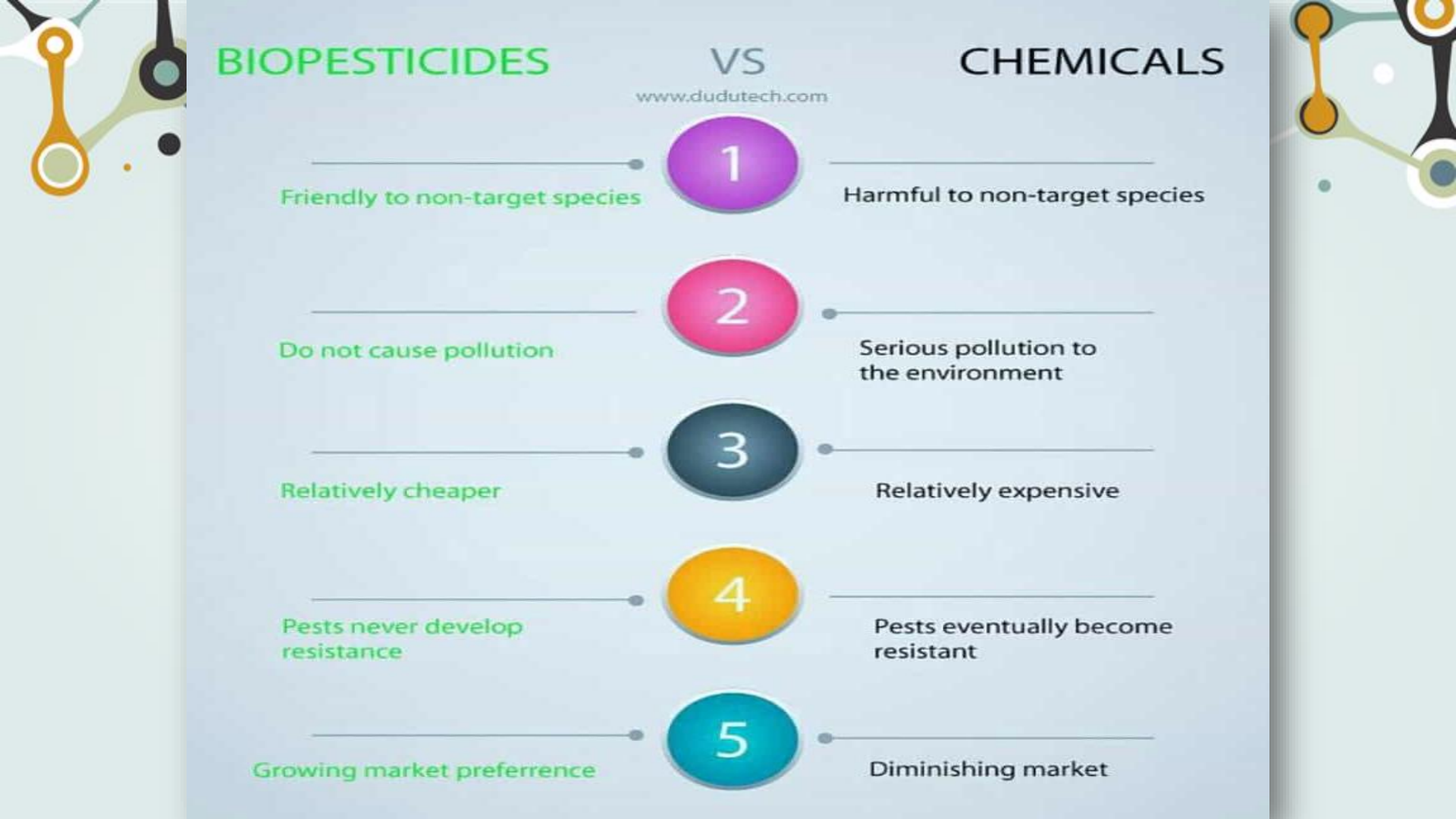
Introduction

- A **pesticide** is mixture of substances that **prevents, destroys, repels**, or **mitigates** any **pest**.
- A pest is an **animal or plant** that can **injure the environment or the health** of populations in that environment.
- Custard Apple (Annona reticulata) seed oil contains **ACETOGENIN** i.e. responsible to act as **bio-pesticide**.
- Pesticides are **vital tools** that help farmers require for growing **healthy crops, protecting** the **food supply** against damage caused by the **weeds** and **insects**.
- **Natural** pesticides can also be called **organic** or **biopesticide**. These are **derived** from the **ground, plants** or **even animals**.
- Organic pesticides are being **promoted** heavily in **recent years** due to its **benefits** and **risk** as well.


BIOPESTICIDES
VS
CHEMICALS
www.dudutech.com
1
Friendly to non-target species
Harmful to non-target species
2
Do not cause pollution
Serious pollution to the environment
3
Relatively cheaper
Relatively expensive
4
Pests never develop resistance
Pests eventually become resistant
5
Growing market preferrence
Diminishing market

Problem statement:

- **Synthetic** pesticide is **dangerous** to human **health and environment**.
- Consuming foods from chemical pesticide sprayed plantations will give **adverse health effects** by disrupting our **hormonal growth** and leads to **cancer**.
- **Environmentally**, it effects our **food chain** besides **creating** and **worsening land pollutions**.

Objective:

Therefore, we aim to **develop natural pesticide from custard apple seed oil** to help **reduce** and **stop** this **poisoning** to **species, organisms, risk** of human **health and environment** from further prolong disaster.

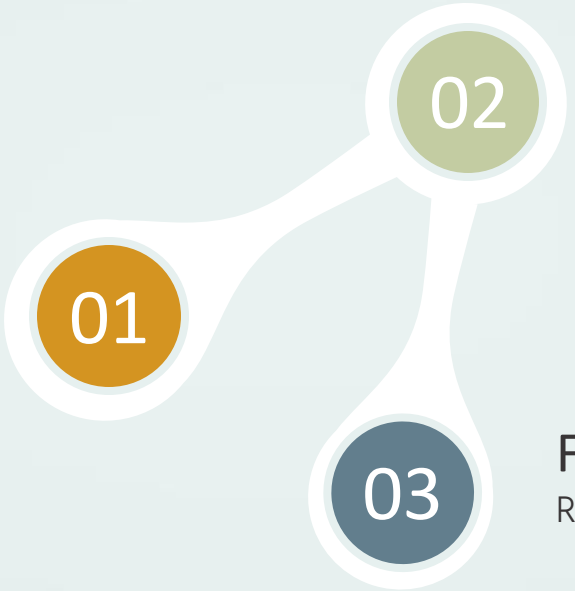
Chemicals Required

Distilled water and Methanol

Instruments Required

Mortar and pestle , Funnel, Filter paper, Spatula, Small Beaker, Soxhlet, cotton wool, Custard Apple Seeds, Round bottom flask , Condenser, Retort Stand , spray bottle , Heating Mantle, Thermometer, Burner, Weighing scale

Methodology



SOXHLET EXTRACTION

Continuous extraction of seed oil from mixture.

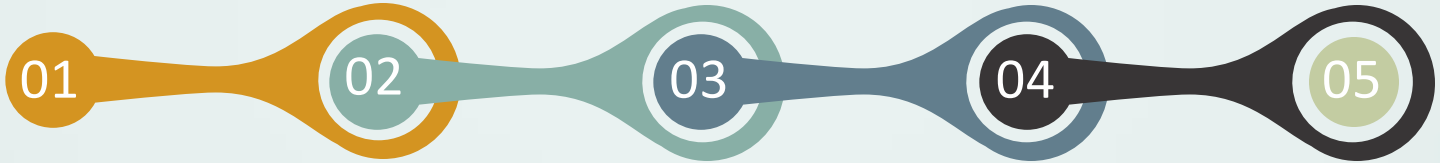
SIMPLE DISTILLATION

Seperation of oil and Methanol.

FILTERATION

Removal of Impurities.

Procedure



Seeds into Powder

Seeds were washed, sundried, crushed and grounded into fine powder.

Solvent selection

Take around 135 ml of methanol into a beaker . Weighing of powder.

Soxhlet Extraction

Setting up Soxhlet apparatus and start continuous extraction of seed oil from mixture.

Simple Distillation

Separation of oil and Methanol.

Filteration

Removal of Impurities from oil using filter paper.

Washing seeds

Grinding seeds

Weighing powder

Soxhlet Extraction

Simple Distillation

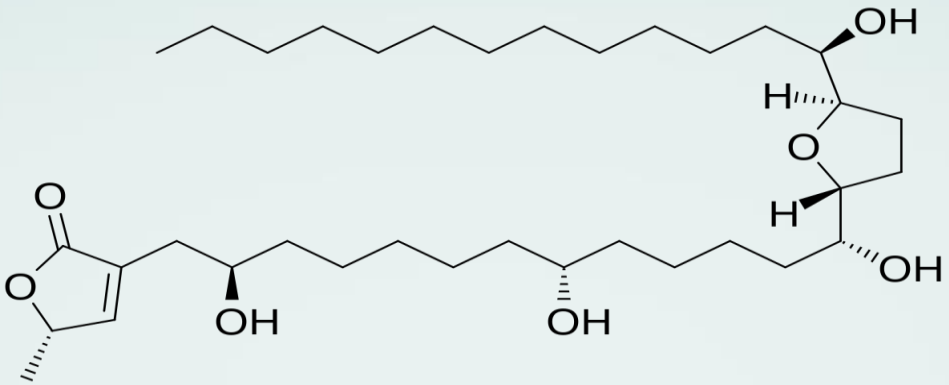
Testing on Plants

Before

Spraying of pesticide

After

ACETOGENIN



Acetogenins are a class of polyketide natural products found in plants of the family Annonaceae. They are characterized by linear 32- or 34-carbon chains containing oxygenated functional groups including hydroxyls, ketones, epoxides, tetrahydrofurans and tetrahydropyrans. They are often terminated with a lactone or butenolide. Many acetogenins are characterized by neurotoxicity. Structurally, acetogenins are a series of C-35/C-37 compounds usually characterized by a long aliphatic chain bearing a terminal methyl-substituted α,β-unsaturated γ-lactone ring, as well as one to three tetrahydrofuran (THF) rings.

Function: Acetogenins are versatile anticancer molecules causing tumor cell death by different mechanisms. They can modulate the exclusion of chemotherapeutics drugs out of cancer cells and are strong apoptosis inducers.

Results

- **Natural pesticide** is produced from custard apple seed.
- **Amount of methanol** solvent used **does not affect function** of pesticide.
- Pesticide was in **liquid form** which enables the **photosynthesis**.
- If the pesticide produced was **in oil form**, it would have **block** the leaf from **trapping sunlight** to produce food.
- Pesticide produced proves itself **efficient, advantageous, cheap, safety** to handle.

This oil can be used against given pests:

White mealybug

Aphids

Termite

Southern Armyworms

Pea Aphids

Head lice

FUTURE SCOPE AND OPPORTUNITIES

- **Consumption** of bio pesticide in **2017-18** in all India consumption was **6560 tons** which **increased** to **7505 tons in year**.
- India is the **second one** under **agricultural land of 159.7 million of hectares** hence there is the **opportunities** for the bio pesticide.
- **Pollution** problem due to the **synthetic Pesticide**, can be **reduced** by bio pesticide.
- Numbers of **diseases** for human as well as animal **can be avoided** with biopesticide uses.
- Some state like **Uttaranchal** and **Sikkim** have declared as an **organic** so will be **wide scope** for bio Pesticide.
- This pesticide **material** can make **easily available** for every former thought the India without taking much more efforts.
- The **raw material** will be **very cheap** which **minimizes** the **total cost** of processing along with **solvent recovery**.
- **Beneficial** for **farmers** as well as **producer**.

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THANK YOU!

Any Questions?