# EXPERIENCES OF BHANDARA DISTRICT FARMERS ON BIOPESTICIDES FOR PEST CONTROL

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**A B S T R A C T**

**Biopesticides are ecofreindly pesticides which are obtained from naturally occurring substances(biochemicals) microbes and plants. Botanical Biopesticides are nothing but harmful pests controlled by using plant materials. There was a wide range of plants grown naturally of which some plants are poisonous. The presence of certain physical and chemical properties in the poisonous plant serves against pest as the biopesticides. Some aromatic odour serves as insect repellent. Plant species, Ocimum basilicum, Marigold corriandrum, etc.Organic food production and consumer demand is increasing recent times in developed and developing countries. The increased demand in organic food and beverages is due to awareness among the consumer and producer about negative consequences associated which synthetic chemical pesticides. By realizing health benefits and ecosafely several government and nongovernmental organisation are also supporting conventional farmers to switch over organic farming practices. In this scenario, green pesticides from plant origin are given enormous import in recent times to develop better alternatives to chemical pesticides by considering eco friendliness, multiple mode of action against insect pests.**

**Keywords:Biopesticides, Poisonous, Organic food, Ecosafely.**

## Introduction

Thousand of million tonnes crops are being destroyed every year in our country by the pest despite using synthetic pesticides. Since synthetic pesticides are known to cause pollution and excerpt hazardous effects on the health, plants and animals. Prehistorically many plant and their parts are used extensively for the protection of crop against pest in field as well as in storage. Naggappan Raja et al.[1] indicate in general Botanical pesticides are eco chemical isolated from parts of the plant such as leaves, roots, barks, fruits, seeds or seed kernels. By nature, several higher plants have the ability to produce numerous secondary metabolites which will be unpalatable to insect pests. Some of the secondary metabolites alter the behaviour and life cycle of insects pests which are called as semiochemicals. Mark G. Wright [2] Biological control of invasive insect pests has a long history of success biological control has made great progress in this regard during the past few decades biological control has significantly to reducing the environment impact of agriculture pest management. Classical biological control of insect pests is likely to become increasingly important in the rate of invasion by insect pests worldwide. So, far use of synthetic chemical pesticides has been the widely used approach for reducing the estimated 45% gross crop loss due to pests and disease. Devid orr. Sriyanka lahiri [3] Biological control has an extremely long association with agriculture pest management programmes throughout the world. Biological control on a larger scale is the increasing public demand for local and organic foods.

## MATERIALS AND METHODS

Field investigations were carried out in different villages of the Bhandara district to study the plant species which are having insecticidal properties. The site was located in Maharashtra state of India. The local area of site 4087 km/ sq (1578 sq m) the average annual rainfall is 1327 mm. To study the plant species which are

having insecticide properties .A good number of farmers who were practicing organic farming were interviewed and their experiences and observations were recorded. Farmers who were practicing organic farming used plants materials as biopesticides such as roots, leaves, barks, pods, flowers, seeds etc. in the form of decoction, powder extract, infusion etc. to control various pests, The present work is based on the experiences of farmers and their experimental results with regards to botanical pesticide.

## RESULT

The present findings is based on real experiences of farmers who used these plant species were employed for controlling variety of insect pests.These plant
species have given satisfactory results to farmers to control various insect pest at certain extent without any side effects.The plants which were documented in crop field used by farmers for production of Biopesticides are given below with their detail information

### 1 *Allium sativum*

(Family – *Amaryllidacea*)
Botanical name :- *Allium sativum*
Common name :- Lasan (garlic)
Part used as biopesticides:- Decocation of bulbs.
Mode of use :- 200 gm bulbes boiled in 1 litre water.
Name of pest :- Aphids
Garlic is a species in the onion genus *Allium sativum.*
Chemical constituents are sulphur amino acid (thiosulbinates) control as biopesticides.

### *2 Anona squamosa*

*(Fam*ily – *Annonaceae)*
*Bot*anical Name :- *Anona squamosa*
*Com*mon name :- Sitaphal
Name of pest :- Aphids
Parts used for biopesticides seeds & leaves.
Mode of used :- 200 gm leaves & 200 gm seed in 1 litre water.
chemical constituents are: Diterpenoid, methyl corydaldline alkaloids oxophoen

### *3 Calotropis procera*

(Family – *Apocynaceae)*
Botanical Name :- *Calotropis procera*
*C*ommon name :- Nano ankado
Part used as biopesticides:- Crushed leave
Name of pest :- Termites & heliothis
Mode of use :- 500 gm leaves boiled 1 litre water
Chemical constituents is benzyl alcohol

### *4 Calatropis gigantean*

(Family – *Apocynaceae*
Botanical Name :- *Calatropis gigantean*
Common name :- Ankado
Part used biopesticides :- Crushed leaves
Name of pest :- Termites & heliothis
Mode of use :- 500 gm leaves in 1 litre water
Chemical constituents calotropbenzo, Farinose and sucrose

### *5 Thevetia peruviana*

Family – *Apocynaceae )*
Botanical Name :- *Thevetia peruviana*
Common Name :- Pili Kaner
Part used for Biopesticides:- Decoction of whole plant.
Name of Pest: - Termites
Mode of use: - 500 gm leaves and fruit boiled in 2 litre water.
It is an evergreen tropical shrub or small tree & height up to 7 m.
They are covered in waxy coating to reduce water loss.
Chemical constituents is B- glactosides methyl .

### *6 Nerium indicum*

*Family- Apocynaceae )*
*Bo*tanical Name :- Nerium indicum
Common name :- Lal Kaner
Parts used :- Decoction leaves
Name of pest :- Heliothis & Termites
Mode of use :- 1 kg leaves boiled in 1 litre water
The mostly part of that Nerium indicum contain toxins. It is cultivated in all over the world.
Chemical constitute is oleandrin, neriodin, adynerin control as biopesticides.

### *7 Aristolochia bracteata*

(Family- A*rstolochiaceae )*
Botanical Name :- *Aristolochia bracteata*
The common name :- kidamars
Mode of use :- 200 gm leaves boiled in half litre water.
Part used as biopesticides :- Leaves extract...
The *Aristolochia bracteata* is herb which has more than 400 species in India.

The plant usually gathered from the wild and cultivated in India.
*Chemical constituents tylophorinine* is control as biopesticides.

### *8 Brassica juncea*

Family – *Brassiceace)*
Botanical Name :- *Brassica juncea*
Common name:- Rai
Part used as biopesticides :- decoction of leaves
Name of pest :- Thrips
Mode of use ;- 200 gm leaves with half 10 litre water
*Brassica juncea* is herb plant.
Chemical compound is sterols

### *9 Caesalpinia bonducella*

Family – *Caesalpiniaceae)*
Botanical Name :- Caesalpinia bonduella
Common name :- kochka
Part used as biopesticides: - Leaves extract
Name of pest:- Aphids & leaf hoppers
Mode of use:- 300 gm leaves crushed with inhalf litre water.
Chemical compound is alkaloids,
Flavonolds, and glycosides control as biopesticides.

### *10 Carica papaya*

Family-*Caricaceae)*
Botanical Name :- *Carica papaya*
Common Name :- papita
Part used as Biopesticides: - Leaves extract.
Mode of use: - 300 gm leaves crushed in half litre water.
The Carica papaya, branched tree usually single stem growing from 5 – 10 m
Chemical constituent proteins, lipids crude fibre, carotene acids.

### *11 Capparis deciduas*

Family – *Capparidaceae)*
*Bota*nical Name :- *Capparis decidua*
Common Name :- Karira , kair
Part used as Biopesticides :- Root bark, fruit & flower.
Name of Pest :- Beetel.
Mode of Use :- Powder 1 – 3 g / 1 litre water.
It is a small branched tree or shrub .
The plant height is 5 meter (15 feet) and in which the pink fleshy berries are readily eaten by birds.
Chemical constituents – capparivine isocapparilline (alkaloids) methyl-2-butenyl-g-glucoside control as biopesticides.

### *12 Ipomoea fistulosa*

(Family :- *convolvulaceae)*
Botanical Name :- *Ipomoea fistulosa*
*C*ommon Name :- Gandivel
Part used as biopesticides:- Decocation of leaves.
Name of Pest-Termites.
Mode of use :- 1kg leaves boiled in 5 litre water.
It is also known as pink morning glory.
It is a flowering plant has heart shaped leaves.
Chemical constituents alkaloids B – glucosidase, polyhydroxylated alkaloids as biopesticides

### *13 Croton bonplandianum*

Family – *Euphorbiaceae)*
Botanical Name:*Croton bonplandianum*
Common Name :- Ban tulsi, jungle tulsi.Part used as biopesticides:- decoction of plant
Name of Pest:- Aphids 7 Leaf MinersMode of use:- 500 gm leaves 7 fruit in 1 litre water.It has plants ranging from herbs and shrubs in to trees.It has erect herb stem much branched milky latex properties.Chemical composition beta caryophyllene , germarene D- and caryophyllene oxide.

### *14 Ricinus communis*

Family – *Euphorbiaceae* )
Botanical Name :- *Ricinus communis*
Common Name :- Arandi
Part used for Biopesticide:- Decoction leaves
Mode of use:- 500 gm leaves boiled in 2 litre water.
Name of Pest:- Aphids & thrips
Chemical constituents 19 hydroxycabia, palmitic acid, stearic is control as biopesticides.

### *15 Jatropha curcas*

Family – *Euphorbiaceae* )
Botanical Name :- Jatropha curcas
Common name :- Ratanjot
Part of used :- Dection leaves
Name of pest :- Leaf hopper & leaf minersMode of used :- 1 kg leaves & fruit boiled in 2 litre waterChemical constituents is 5-3-stigmastane-3-6- dione, noviletin control as biopesticides.

***16 Jatropha gossypifolia***

*(*Family- *Euphorbiaceae )*

Botanical Name :- *Jatropha gossypifolia*

Common name :- Ratan jyot

Part of plant :- decoction leaves

Name of pest :- leaf miner & helioths.

Mode of use :- 1 kg leaves & fruit boiled in 2 liter water.

Chemical constituents is methyl-bicyclo-3,3,1 nonan -3-1 a new alkaloid control as a biopesticides.

***17 Derris indica***

(Family – *Fabaceae)*

Botanical Name :- *Derris indica*

Common Name :- Karanji

Mode of Use :- 1 kg leaves boiled in 2 litre water.

Mode of Pest :- Leaf hoppers

Part used as biopesticides :- Decoction of leaves.

It is small to medium sized deciduous or nearly evergreen tree reaching 8-15 meter in height.

The tree is planted for erosion control.

Chemical composition flavonoids

***18 Cassia auriculata***

Family – *Fabaceae)*

Botanical Name :- *Cassia auriculata*

Common Name :- Tarwar.

Part used as Biopesticides :- decoction of leaves.

Name of Pest :- White flies.

Mode of use :- 200 gm leaves boiled in 2 litre water.

It is a much branched shrub and it is perennial plant.

Chemical constituents alkoloids benzyl control as biopesticides.

***19 Cassia fistula***

Family-*Fabaceae)*

*Botan*ical Name :- *Cassia fistula*

*Co*mmon Name :- amaltas

Part used as Biopesticides: - Leaves

Name of Pest: - Mealy bugs

Mode of use: - 500 gm leaves boil in 1 litre water.

Cassia fistula, also known as the golden rain tree, it is a popular ornamental plant .It is a medium size tree growing to 10 – 20 m.

Chemical constituents phenols proanthocyanidins flavonaids control as a biopesticides.

***20 Clerodendrum inerme***

(Family – *Lamiaceae)*

Botanical Name :- *Clerodendrum inerme*

Common Name :- Kadvimendi

Name of pest :- Heliothis, ants & aphids.

Mode of use: - 500 gm leaves boiled in 1 litre water

It is a shrub reach heights of 2 – 3 m and greenish brown colour.

Clerodendrun inerme has simple leaves and opposite.

Chemical constituents B- sitosterol betulinic acid control as biopesticides.

***21 Melia azedarach***

Family- *Meliaceae*)

Botanical Name :- *Melia azedarach*

Common name :- Bakan

Name of pest :- White flies

Part of use :- Decoction leaves

Mode of use :- 1 kg leaves crushed in 1 litre water

The Melia azedarach is a small to medium sized shrub or tree in the meliaceae.

Chemical constituentsismelianonia melianol, melianone, meliandiol, vanillin control as biopesticides.

***22 Azadirachta indica***

(Family – *Meliaceae*)

Botanical Name :- *Azadirachta indica*

Common name :- Neem

Name of pest :- Aphids and ants

Mode of use :- 500gm leaves extracted in 1 litre water

Neem tree grows quickly 50 to 75 feet tall and wide.

Chemical constituents that namely azadirachtin and nima control as biopesticides.

***23 Ficus religiosa***

(Family- *Moraceae)*

Botanical Name :- *Ficus religiosa*

Common name :- peepul

Part used for biopesticides:- decocation of leaves.

Name of Pest :- Leaf hoppers.

Mode of Use :- 1kg leaves boiled in 2 l litre water

It is large dry season deciduous semi evergreen tree and 30 m tall.

The leaves are cordate in shape.
The chemical composition of betasito steryl D glucoside methly oleanolate control as biopesticides.

### *24 Salvadora persica*

Family – *Salvodoracece )*
Botanical Name :- *Salvadora persica*
Common Name :- Piludi
Part used for Biopesticides:- Juice of leaves
Part of Pest: - Leaf hopper
Mode of use: - 500 gm leaves juice in 1 litre water.
Its bark is scabrous & cracked whitish.
Chemical constitution alkaloids methyl control as biopesticides.

### *25 Sapidus laurifolius*

Family – *Sapindaceae )*
Botanical Name :- *Sapidus laurifolius*
Common Name :- Ritha
Part used for Biopesticides:- Foam of f fruits
Name of Pest: - Leaf miners
Mode of use: - 200 gm fruit soaked in 1 litre water
It is a shrub and small trees ranges 8 to 10 m height.
Fruit is small leathery skinned drupe 1 - 2 cm.
Chemical saponins dleanolic acid control as biopesticides.

### *26 Withania somnifera*

Family – *Solanaceae )*
Botanical Name :- *Withania somnifera*
Common Name :- Ashwagandha
Part used as Biopesticides:- Decoction leaves
Name of Pest:- Leaf miner & leaf hoppers
Mode of use:- 500 gm leaves boiled in 22 litre water.
Withania somanifera it is also called Ashwagandha.
It Is a short tender perennial shrub growing 35 to 75 cm.
Chemical constituents are alkaloids steroidal lactones control as biopesticides.

### *27 Lantana camara*

Family- *Verbanaceae*)
Botanical Name :- *Lantana camara*
Common name :- Ghanehris.
Parts used :- decoction of leaves
Mode of use ;- White flies & leaf miners.
Mode of use :- 1 kg leaves boiled in 3 litter water.
*Lantana camara* also known as big – sage wild – glabrous perennial herbs .
Lantana camara, commonly called lantana or shrub verbena.
Chemical constitute 3,7,11- trimethly - 1,6,10- dodecatriene ( 28.86% ) control as biopesticides.

## CONCLUSION

India has vast potential for biopesticides. Biopesticides are eco-friendly pesticides which were obtained from naturally occurring substances (biochemical) microbes and plants. Though the use of biopesticides in a wider way, agriculture and health programmers can be beneficially affected. There are many disadvantages associated with the use of chemical pesticides like genetics variations in a plant population, reduction of beneficial species, damage to the environment or water bodies, poisoning of food and health problem such as cancer which makes biopesticides to comes into picture. Their usage reduces the risk of exposure to chemicals,reduces water pollution , reduces number of application causes less harm to beneficial pest, biodegradable provides better nutritional quality. However it is adopted by farmers in India has to be motivation for maximising gains.The rich traditional knowledge base available with the highly diverse indegeneous communities in India may provide valuable clues for developing newer and effective biopesticides.In India there are many locally plants available which can be easily processed and increased biopesticides consumption. The present finding is based on real experiences of farmers who used these plants species, have given satisfactory results to farmers of Bhandara district to control various insect pest at certain extent without any side effect. Increasing health consciousness Indian citizens have created a demand of organic food. Also the establishments of biopesticides unit in rural areas,were such plants available will also provide employment to the dwellers.

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