

# Thuja Occidentalis 200: A Promising Ally in the Battle Against *Leucinodes orbonalis* in *Solanum melongena*

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## ABSTRACT

Agro-homoeopathy, a specialized field of homeopathy, offers a non-toxic approach to managing garden and agricultural pests. This study evaluates the efficacy of Thuja Occidentalis 200 in controlling Leucinodes Orbonalis, a devastating pest affecting Solanum Melongena (eggplant). Traditional pesticides used to combat this pest have adverse effects on both human health and the environment. The research aims to provide an eco-friendly alternative to pest control by using homeopathic remedies. Thirty Solanum Melongena plants were divided into three groups: an intervention group treated with Thuja Occidentalis 200CH, a reference group treated with insecticides, and a control group. The results of this study will contribute to safer and more sustainable agricultural practices.

**Keywords:** Agro homoeopathy, Solanum melongena, Thuja occidentalis 200C, Chemical pesticides, Leucinodes Orbonalis (Fruit borer and Shoot borer).

## INTRODUCTION

Eggplant (*Solanum melongena* L.) is identified as one of the most valuable veggies packed with essential nutrients. It is a delicate, tropical perennial often cultivated as a tender or half-hardy annual in temperate climates. It is being widely cultivated

throughout the world in tropical and subtropical climates. Nutritionally, eggplant is low in fat, protein, and carbohydrates. It is rich in dietary fiber, sugar, sodium, and potassium. It also contains important vitamins like A, B6, C, D and calcium, iron, and magnesium. It is widely used in its native Indian cuisine. Eggplant, due to its texture and bulk, can be used as a meat substitute in vegan and vegetarian cuisine. The juice of eggplant significantly reduces weight, plasma cholesterol levels, and aortic cholesterol content.<sup>[1]</sup>

*Leucinodes orbonalis* (Guenne, 1854)<sup>[2]</sup> is commonly known as Shoot and fruit borer. Belongs to the Pyralidae family. It is a pest that produces creamy white eggs.

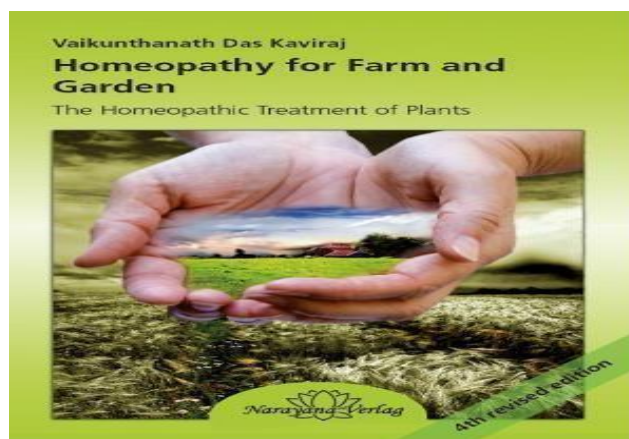
Active year-round in moderate climates, the female lays around 250 eggs on developing fruits and shoots. Larva is pink in color, it then develops into a grayish boat-shaped cocoon (pupa) and finally develops into a medium-sized moth, its tributary has black and brown patches and dots on white color, and its hind wings are opalescent with black dots. The staging stage is Larvae of *Leucinodes orbonalis*<sup>[3]</sup>. Brinjal fruit and shoot borer (BFSB) is a very important pest on brinjal and is one of the main impediments to brinjal production across the country. It is an internal borer that damages the tender shoots and fruits. The yield loss varies from season to season and from location to location.

The farmers use different pesticides and insecticides which are expensive and cause harmful effects on human health. Some of the insecticides that the farmers use is Dimethoate 30% [4], Emamectin benzoate 5% [5], Quinalphos 25% etc. These insecticides cause clinical effects on human health, that includes headache, sweating, nausea, vomiting, diarrhea, loss of coordination, muscle twitching, superficial gastritis, mild central nervous system depression, aspiration pneumonia etc. From the studies done and observed that these insecticides can have an impact on brain function by inhibiting acetyl cholinesterase enzyme in nervous system, resulting in excess acetylcholine at nerve terminals. [6] Homeopathy is a branch of medicine that was developed in the late 18th century by Samuel Hahnemann, a German physician. It is based on the principle of "Similia Similibus Curenter" which means that a substance that causes symptoms in a healthy person can be used to treat similar symptoms in a sick person when it's highly

diluted. Homeopathic remedies are prepared through a process of serial dilution and succussion (vigorous shaking). [7]

Agro-homoeopathy is a specialized area in the field of Homoeopathy which mainly deals with the treatment of gardens and agricultural practices [8]. The use of Homoeopathic remedies for plants started with the pioneering works of Kolisko on wheat germination [9]. It is cost-effective and an alternative to chemical fertilizers thus helping to increase the yield and farmer's income [10]. Homoeopathy strengthens the energy and vitality of plants. Even prevents the damage caused by abiotic stress and will promote a dynamic balance within the plant and of plants with soil, water, and environment [11].

*Thuja occidentalis* is one of the remedies in Homoeopathic Materia Medica. Homeopathically, *Thuja Occidentalis* is used in humans for conditions like Condylomata, Polyps, warts, Hemorrhoids, cancer, Abortion, Fatty tumors.



## LITERATURE REVIEW

Vaikunta Das Kaviraj is a Dutch homeopath and pioneer in Agro-homoeopathy, author of the book "Homeopathy for Farm and Garden". He reported his experiences of using *Thuja Occidentalis* in controlling different pests like Beetles, Bugs, Caterpillars, Flies, Katydids, Leaf miners, Maggots, Mites, Moths, Sawfly, Scale, Thrips, Wasps, Shoot and Fruit borers. [12]

The study was to assess the insecticidal,

molluscicidal, nematocidal activity against different pests by Priya Srivasthava, P.Kumar, D.K.Singh, V.K. Singh, with titled "Biological Properties of *Thuja Occidentalis* Linn". The result says that *Thuja Occidentalis* Linn has the Larvicidal activity, Insecticidal activity, nematocidal activity, molluscicidal along with Antibacterial, Antifungal, Anti-inflammatory, Anticancer and Antiviral activity. [13]

Another Study was conducted to assess the Management of insect and pests that attack eggplant (*Solanum melongena* L.) especially Fruit borer and shoot borer by Sudhanshu Bala Nayak, K. Sankara Rao and S. Mekala. Where some of the insecticides effectively managed the pest but it resulted in insecticide resistance, adverse effects to humans as well as non- target organism and environment to avoid such effects, eco-friendly management was adapted to incorporate into the Integrated Pest Management (IPM) program of brinjal.<sup>[14]</sup>

### **MATERIALS & METHODS**

The field experiment was conducted during summer season in the premises of MNR Homoeopathic medical college and hospital. The soil of the experimental field was silt clay loam in texture, pH is maintained between 6.0 – 6.5 and temperature is around 65<sup>0</sup>F – 85<sup>0</sup>F at night. The experiment was laid out with design for 30 plants (10 plants in each group) in three groups: Group A (Intervention), Group B (Reference), and Group C (Control). Group A received treatment with *Thuja Occidentalis* 200CH, Group B served as a reference group treated with conventional chemical insecticides, and Group C acted as the control group without any treatment. Fertilized soil is used for plantation, Sunlight, water and nutrients will be equally supplied for all groups.

The Inclusion criteria, Healthy plants was chosen while transplanting into pots and the Exclusion criteria include Unhealthy, diseased and stunted plants. The selected medicine for the experimental treatment was *Thuja Occidentalis* 200CH. This homoeopathic remedy was procured from Sharda Boiron Laboratories Ltd (SBL), a reputable homoeopathic pharmaceutical company. The specific batch used in the study was identified by Batch Number K1000076, ensuring traceability and quality control. The method employed for administering the medicine involved the use of foliar sprayers, which were utilized to apply the medicine directly onto the plants. This method ensures precise delivery of the

medicine to the target areas of the plants, facilitating optimal absorption and effectiveness. F1 hybrid *Solanum melongena* seeds are collected from an authorized agricultural institution i.e. Kalash seeds Pvt. Ltd. mantharoad, Jalna-431 203. (India) for experiment.

### **MATERIALS AND REQUIRMENTS:**

Coconut coir, otherwise known by trade names like ultra-peat, cocopeat and coco Tek. Coconut coir helps in water retention along with a growing medium. Foliar sprayers help in formulating water and medicine according to the dosage and also helps in applying the pesticide or *Thuja occidentalis* directly to the plant.

### **PROCEDURE:**

Procured seeds are sowed in a seed tray on 06/03/2023, 50 seeds are sowed and on day 17th i.e., 23/03/2023 the height of plant is 6cm and the number of leaves is 4-5 for each plant. Transplantation of healthy plants are done on 22nd day (28/03/2023) to pots into 3 groups A, B, C. All the requirements like water and sunlight were provided equally to all groups. All the essential nutrients for the plants in bags are supplemented once in two weeks i.e. vermicompost. Then after *Thuja occidentalis* 200CH in Group A plants i.e. 5drops in one liter of water with 50 succussions(shakes) once in a week. In Group B chemical insecticides are administered Thiamethoxam 25%-2g and Emamectin Benzoate 5%-3g per one liter once in two weeks. Group C is a control group, plants in this group are provided with adequate nutrients same as other groups but do not get exposed to any kind of medicine or pesticide. Temperature, pH is monitored regularly. Plants after vegetative growth started flowering on 52 to 54th days i.e. (28/04/2023- 30/04/2023) in Group A where plants are treated with *Thuja occidentalis* 200CH and in Group C plants started flowering on 53 to 57 days i.e. (29/04/2023- 02/04/2023) but in Group B where the plants are treated with chemical pesticides were little delayed in flowering i.e. 55 to 60

days (01/05/2023 – 05/05/2023). Administration of Thuja and Chemical pesticides to plants in their respective groups were started soon after a month from the date of transplantation of plants into soil

bags.

**STATISTICAL ANALYSIS** - ANOVA Test is adopted

**Table 1: Data statistics result**

Source of variation	Sum of Squares (SS)	Degree of Freedom (DF)	Mean square	F-Ratio
Between Groups	SSC=4428.50	6	738.08	MSC÷MSE=3.462
Within Groups	SSE=2983.96	14	213.14	
Total	7412.46	20		

With the Degree of freedom, i.e.  $V_1=6$  and  $V_2=14$ , the critical F ratio from the table is 2.84 and the calculated value for  $P < 0.05$  is 3.46. As the Calculated value is greater than Table value.

Null Hypothesis (HO). It supports Research Hypothesis (HR). Hence, the research is significant.

Hence this analysis report does not support

**RESULT**



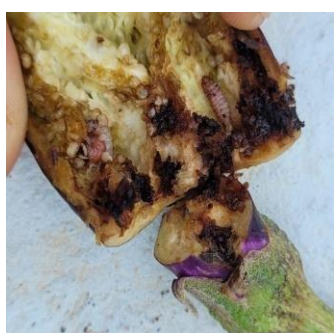
**Fig 1: 10<sup>th</sup> day(saplings)**



**Fig 2: 17<sup>th</sup> day**



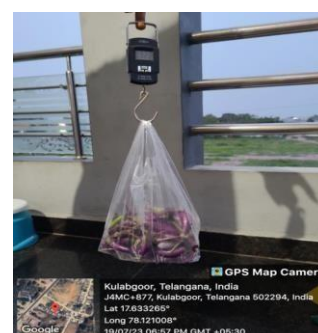
**Fig 3: 63<sup>rd</sup> day**



**Fig 4: Borers inaffected fruit**



**Fig 5: Yield of oneharvest.**



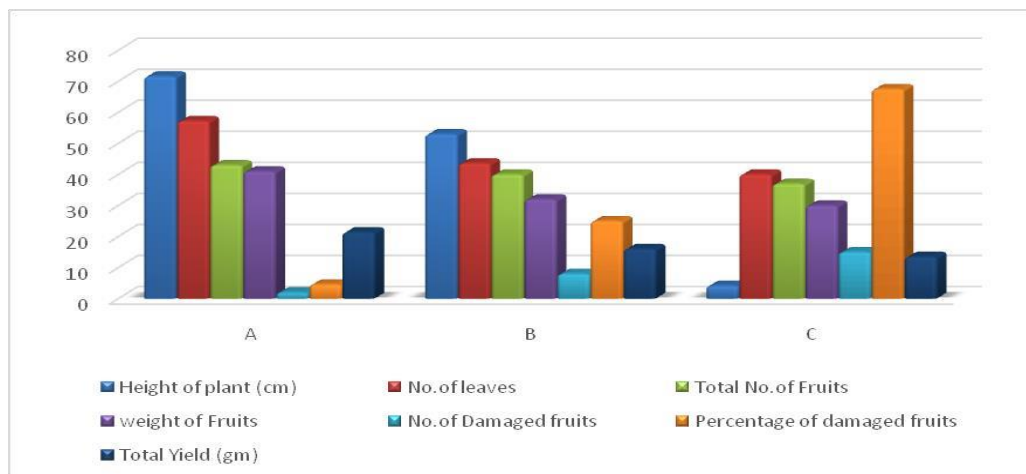
**Fig 6: weighingthe yield.**

In terms of shoot and fruit borers' eradication, both thuja 200 and chemical pesticides acted affectedly compared to control group. But thuja group plant gave more yield than other groups. Thuja 200 has

shown a significant influence on eradicating *Leucinodes orbonalis* while enhancing yield, there by contributing to increased economic output and cost effectiveness.

**Table 2: Variation of different groups**

Groups	Height of plant (cm)	No ofleaves	Total No.of Fruits	Weight offruits(gm)	No. of Damagedfruits	Percentage of damagedfruits	Total Yield(gm)
A	71.6	57.2	43	41	2	4	21.39
B	53	43.6	40	32	8	20	16
C	45.2	40	37	30	15	40	13.5



**Fig7: Variation of parameters in different groups**

## DISCUSSION

The study demonstrated the effectiveness of *Thuja occidentalis* 200CH in managing *Leucinodes orbonalis* infestation on *Solanum melongena*, leading to improved plant growth and yield compared to chemical insecticides and control groups. Both *Thuja occidentalis* 200CH and chemical insecticides resulted in better shoot height and healthier fruits compared to the control group. However, *Thuja occidentalis* 200CH showed superior performance in terms of fruit quality, with fewer damaged fruits and higher total yield.

In India, brinjal cultivation is vital for small, marginal, and resource-poor farmers, covering significant agricultural land and providing essential income. With high demand and consumption rates, brinjal contributes significantly to the Indian economy and population's nutritional needs.

The study highlights the potential of agro-homeopathy in reducing pesticide use and improving farming practices, indicating future research opportunities in plant growth, yield enhancement, and soil health management in agriculture. These findings underscore the importance of sustainable and eco-friendly approaches in modern agricultural practices for long-term

environmental and economic benefits.

## CONCLUSION

In conclusion, this research presents *Thuja Occidentalis* 200CH as a promising eco-friendly solution for pest control in organic farming, reducing reliance on potentially harmful chemical fertilizers. By effectively managing *Leucinodes Orbonalis* infestation and enhancing yield, *Thuja Occidentalis* 200CH contributes to sustainable agricultural practices and increased economic output. However, further large-scale studies are warranted to validate these findings. Additionally, analyzing plant growth and yield comprehensively is crucial for a more thorough understanding of the subject. The highly significant p-value obtained underscores the robustness of the results and their statistical significance.

### Declaration by Authors

**Ethical Approval:** Not required

**Conflict of Interest:** The authors declare no conflict of interest.

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