

## Aqueous extracts of selected botanicals on *Helicoverpa armigera* (Hubner)

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### Abstract

Long before the structures of plants, herbs or natural derivatives were known, they were widely utilized as pesticides in agriculture. Rotenone, pyrethrum, neem, additionally, essential oils include 4plants types that are currently utilized commercially for pest management; other varieties, including as ryania, nicotine, sabadilla, piperamides, and isobutylamide compounds, are no longer in use. Additionally, ecdysteroids (phytoecdysone) and juvenoids (methoprene as well as quinoprene) were evaluated as IPM (integrated pest management) mechanisms in recent years. However, water extraction as well as vacuum extraction were proposed as methods of pest control from the perspective of farmers. I will briefly explain the use of vegetable canvases, water extracts and maquillages in pest control. I have used *Azadirachta indica* A. It is briefly described how economic pests such as *Helicoverpa armigera* (Hübner) are affected by Jesus, *Vitex negundo*, *Calotopsis gigantea*, *Pongamia pinnata*, *T. villosa*, *Pedallium murex*, *Vitex negundo* Linn., *Tephrosia purpurea* (Linn.), *H. arifolia* Linn., *P. aquilinum*, and *Christella parasitica*. The average mortal view of their role in pest control and tomato production in the field is recorded.

**Keywords:** Natural derivatives, *Helicoverpa armigera*, pest control

### Introduction

There are a lot of reports on efforts to find as well as progress new and harmless insecticides, mostly in last 30 years, because of perceived benefits of natural botanical insecticides, especially their specificity, preservation of non-target creatures, especially mammals, as well as use in small, at times, very small quantities. Both governmental as well as commercial universities have launched a vigorous investigation program as a result of these considerations. As a result, botanical pesticides have gained more attention and interest as natural insecticides for IPM techniques (Roselle *et al.*, 2008)<sup>[22]</sup>.

Nevertheless, tools of association can be stocked (or overstocked) by "natural" scientists of origin. Many of the human and insect pests are evaluated in the same way as normal "synthetic" pesticides, and a "low risk" status should be established. The use of pesticides is an economically important and important business. Pest control contributed to development of pest resistance, pestre-emergence as well ascontamination of environment. Employing conventional chemistry poses a threat to environment and there is concern about the development of chemical resistance. Safe alternative crop protection warehouses such as vegetable gardens need to be developed. Environmentally friendly pest control methods can be developed using abundant natural sources of therapeutic medicines. This includes developing pest management programs (Desai and Swadeshi, 2000)<sup>[4]</sup>.

According to a study, there are 112 fruit borers in southern and eastern Asia, belonging to 44 families, including fruit borer *H. armigera* (Noctuidae: Lepidoptera), one of the most common polyphagous fruit borers (Chari Hue and Patel 1983)<sup>[3]</sup>. An estimated 74 cultivated species and a few wild species are found in India (Ranga Rao *et al.*, 2008)<sup>[21]</sup>. (Hindi *et al.*, 2002; Mushtaq Ahmad *et al.*, 2007; Kodandaram & Dhingra, 2007)<sup>[12, 18]</sup>. Sahayaraj (1998)<sup>[23]</sup> and Sahayaraj and Paulraj (1998)<sup>[23]</sup> found that *H. armigera* can be effectively controlled by treating the fruit borer fresh.

Recent studies by Sahayataraj (2002), Raman *et al.* (2007)<sup>[20]</sup>, and Sahayaaraj and Ravi (2007) have documented usage of several treatments (methanol, aqueous) to control this pest in tomato field environments. However, resistance has developed to many common supermarket pests (Dhingra *et al.*, 1998; Patel and Koshia, 1999)<sup>[5, 19]</sup>. Hosts may have different records, and some of authoritative ones have been recommended for its administration (Gurjar,1997; Bajpai & Sahgal,2000; Sundararajan & Kumuthakalavalli, 2000, 2001; Kulat *et al.*, 2001; Sahayaaraj *et al.*, 2000)<sup>[2, 15, 31, 32]</sup>. *Azadirachta indica* A. Jesus, *Calotopsis gigantea*, *Vitex negundo*, *Pongamia pinnata*, *Ipomoea cornea*, and *Tephrosia purpurea* have all been found to cause resistance in this study. It was investigated how stamped forms such *Pedallium murex*, *T. villosa*, *Vitex negundo* Linn., *Christella parasitica*, *H. arifolia* Linn., *P. aquilinum*, and *Helicoverpa armigera* (Hübner) affected the economy and important jobs.

### Materials and methods

#### Collection and rearing of pest

In Dharmapuri area, Tamil Nadu, large stages of *Helicoverpa armigera* from tomato crops were collected and placed on plastic boxes (21.028 × 9.0cm) of tomato vendace (var. TMV 7) in humid conditions (temperature of 29 ±1°Celsius, 65 to 75 percent ARH, and 11L & 13 pho d.p.). A 5 percent vitamin mixture (multivitamin pill) was added to concoction to enhance oviposition. To allow even plastic from bathrooms to be placed on tomato pieces, eggs were cleansed with 10 percent formaldehyde and then put in plastic bags.

#### Plant material

Healthy *Azadirachta indica* plants A. Juss., *Coleus ambonicus* Lour., *Calotopsis gigantia* Linn., *Hemionitis arifolia* (Brun) T., *Pedallium murex* Linn., *Ipomea carnea* Jacq., *Cristella parasitica* (L.) H. Lev., *Tephrosia purpuprea* (Linn.), *P. aquilinum*, *Pongiamia pinnata* Pierre,

*Crystella parasitica*, *T. villosa*, *Vitex negundo* Linn., *Tridax procumbens*, as well as *H. arifolia* had been harvested from several locations in Dharmapuri district of Tamil Nadu, India. Morning saw collection of plant material, and Gamble (1936) [8] and Matthew (1991) [16] of Carnatic flora were used to identify a few chosen plants.

### Aqueous extraction of plant material

Locally, from Dharmapuri district of Telugu, scientific as well as healthful theoretical ideas had been employed to make jaggery, which was then dried for ten days in shade. The jaggery was fixed at room temperature in the laboratory until use. For extraction, 550 g prototype was used for use in a domestic mixer. 250 g of the powder was sent from the stock to be employed twice in a Soxhlet device with 500 ml of water for approximately 24 hrs. After extraction, distillation was done, solvent and the obtained arc was removed and used in the refrigerator for 4 weeks. These raw arcs are used to prepare stock NASA. The prescribed quantity (100 works/drug) of raw arc obtained from the actual process was singled to obtain it in solid form. A semi film of emulsifiers percent TVine 80 (Mumbai) was shared with water arc to ensure full amount of substance present in water. After combining 10g of powder with 100ml of distilled water in a beaker for 4 to 6 hrs, mixture had been dried with a cotton cloth to create an aqueous solution containing the plant extracts, strata, as well as fruits. The material was stored in a glass container in the office. The deferred substance thus prepared was taken as 10% and diluted with distilled and emulsified water at 0.5,1.0,2.0,4.0 & 6.0 percent concentrations, 0.1 percent of 80 is added for every experiment (Senthil Nathan *et al.*,2007) [30].

### Toxicological Studies

Aqueous concentrations ranging from 0.5 to 16.0% and aqueous drop concentrations ranging from 1-8% percent were used in bioassays conducted on fourth-instar *H. armigera* (12 hours old). Ether, water, actone, as well as drop of Tween 80 as a surfactant were applied to tomato sketches as a control. For every treatment trial, at least five elements per concentration were used, and each treatment was split into six groups (n=30). Potato-attacked tomato (TMV 7) with varying *P. murex* leaf, root, and fruit concentrations. Both were air-dried and dried aboard the ship. Using a hand tomato leaf, 0.5 cc of the test substance was applied to each tomato leaf. Five leaves or larvae each day were gathered from each replicate. Laila was given treatment extract on tomato fruits for the first two days. Every 24 hours, unfed larvae were removed, and for four days in a row, newly treated larvae were left in their place. Every 24 hours, mortality was noted, and at 96 hours, the final mortality was noted. If necessary, mortality was adjusted using the Abbott (1925) [1] formula. Using Probit Analysis, the deadly quantum of six replicates was determined to be the Valuable Default Concentrate (LC50) (Finney, 1971) [6]. For this investigation, 45 m was used. A 36 m<sup>2</sup> area was chosen for each treatment. Three sub-plots were created from each plot (130. 3 m<sup>2</sup>). On the 40th and 60th days of cultivation, the treatment arcs were made with a hand arc at a flow rate of 0.1 liter per minute early in morning (6:30-7:30am). Only water was visible in one area, which was used as a control. A graphic representation of the kit sampling process was used, along with the number of patients and treatments. Each sub-plot used a total of 30 rockets as MA, and the pest level was reported in kits/10

treatments. Four days prior to and following the combination of treatment arcs, sampling was conducted. Every arc's normal mapping was noted. Total profit divided by total cultivation costs is the cost-benefit ratio.

## Results and discussion

### Toxic effects of plant extracts

Remarkably, *H. armigera* showed toxicity to some of the treatments, including *Pedaliium murex* root and *Calotopsis gigantea* followed by the former. The leaf arc of *Vitex negundo* showed the least impact (Table 1). Comparing aquatic and aqueous arcs, former were less harmful. As an illustration, *Tephrosia villosa* fragments showed a very high LC50 (10.125%), followed by fragments of *Tephrosia villosa* (5.6712%). But according to Table 2, root of *Tephrosia purpurea* had lowest LC50 (0.4257%). *Vitex negundo* Linn (4.231), *Pongamia pinnata* Pierre (3.835 percent), *Calotopsis gigantea* Linn (3.244%), *Helicoverpa armigera* (0.081 percent) were all reverse-created by aquatic arch of *Azadirachta indica* followers. The census evaluation was greater and decreased by 0.52kits/10 treatment when *I. cornea* was produced in field during field trials in the control area (Table 3). However, in the control area, *H. armigera* population was typical (2.43kits/10 measure), but in the *I. cornea*-associated area, it decreased by 0.23kits/10 measure. In the scientist's arch, *V. negundo* significantly decreased *H. armigera* population (P < 0.05). On other hand, *I. cornea* extracts with *V. negundo* were important. With 1313kg/ha, *P. aquilinum* produced most tomatoes overall, followed by *H. arifolia*, and *I. cornea*. The production range in control was 1060.50-1120 (Table 3). Nonetheless, Table 4 shows that cost-benefit ratio had been comparable within areas treated with *V. negundo* & *P. pinnata* (1:1.8). Raman *et al.*, (2007) [20].

### Conclusion

The raw arc of piano apple has also been reported to reduce incidence of workmanship and increase crop formation. It's crucial to remember that arcs used in this investigation are leftovers from some scientists' lepidopteran pests. It is unique in that they contain different approved chemicals that act effectively on the target pest. We are currently conducting a thorough chemical analysis of active ingredient in an effort to identify the many chemical kinds and their biochemical analyses. The future use of these extracts in pest management files is also recommended with minimum side effects. Its advantage is that at high doses it acts as a nutrient, while same treatment acts as a low salt element. This also shows that a single use of these extracts gives complete success in pest control. Aqueous extracts of *P. pinnata*, *I. cronia*, as well as *V. negundo* can be used alone or in combination for tomato control and tomato yield increase.

**Table 1:** Impact of aqueous extracts of plants on the LC<sub>50</sub> values of *Helicoverpa armigera* fourth instar.

Plants	Family	Plantparts	LC <sub>50</sub>
" <i>Azadirachta indica</i> A. Juss.	Meliaceae	Leaves	3.898
<i>Calotopsis gigantia</i>	Asclepiadaceae	Leaves	0.693
<i>Pedaliium murex</i> Linn		Leaves	3.768
		Root	2.736
		Fruits	4.394
<i>Pongamia pinnata</i>	Papilionaceae	Leaves	4.547
<i>Tridax procumbens</i>	Asteraceae	Leaves"	2.833

**Table 2:** Various plant products water extracts on incidence and population reduction (in % age) of *H. armigera* and tomato production (Kg/ha).

Treatment	Mean population	Population reduction	Production
<i>A. indica</i>	1.42	69.27	1260
Control	3.10	-	1120
Control	2.05	-	1177
Control	0.76	-	1060.50
<i>C. gigantea</i>	1.26	61.64	1304
<i>C. parasitica</i>	1.45	52.51	1250
<i>H. arifolia</i>	1.45	53.00	1370
<i>I. cornea</i>	0.52	68.42	1312.50
<i>P. aquilinum</i>	1.32	56.73	1400
<i>P. pinnata</i>	1.11	54.15	1154
<i>V. negundo</i>	0.59	77.63	1270.50

**Table 3:** Water extracts of various plants on incidence and reduction (in % age) of *H. Armigera* and cost benefit ratio.

Plants	Incidence	Population Reduction	Cost benefit ratio
Control	2.43	-	1:1.48
Control	0.30	-	1:1.43
Control	2.0	-	1: 1.2
<i>C. gigantea</i>	1.1	55.00	1:2.0
<i>C. parasitica</i>	1.00	41.15	1:1.63
<i>H. arifolia</i>	0.82	33.74	1:1.76
<i>I. cornea</i>	0.22	73.33	1:1.76
<i>P. aquilinum</i>	0.80	32.92	1:1.79
<i>P. pinnata</i>	0.9	45.00	1: 1.8
<i>V. negundo</i>	1.0	50.00	1: 1.8
<i>V. negundo</i>	0.23	76.67	1:1.71

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