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Larvicidal activity of plant extract of *Triumfetta pentandra* (malvaceae) against agricultural insect Pest *Spodoptera litura* and *Helicoverpa armigera*

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Abstract
Larvicidal activity of plant extract of *Triumfetta pentandra* against agricultural insect pest *Spodoptera litura* and *Helicoverpa armigera.* The Plant extract in deferent solvent were prepared various concentrations for 5%, 2.5%, 1`25% and 0.625% and tested against fourth instar larvae of *Spodoptera litra* and *Helicoverpa armigera*. Then agricultural insect pest *Spodoptera litura* larval mortality were recorded for highest percentage in 5% plant extract of *Triumfetta pentandra* (ethyl acetate) on larval mortality were 87.23% and followed by 2.5% concentration of larval mortality in 69.12%, 1.25% concentration of larval mortality were 47.56% and then 0.625% concentration of larval mortality in recorded 31.92% at 24hrs respectively. Then agricultural insect pest *Helicoverpa armigera* larval mortality were recorded for highest percentage in 5% plant extract *T. pentandra* on larval mortality were 81.23% and followed by 2.5% plant extract of *T. pentandra* larval mortality in 66.54%, 1.25% concentration of larval mortality were 40.52% and then 0.625% concentration of larval mortality in recorded 27.90% respectively. The future generation former men used for *Triumfetta pentandra* against target agricultural insect pest *Spodoptera litura* and *Helicoverpa armigera* controlled by plant based properties respectively

Keywords: *Spodoptera litura, helicoverpa armigera, l*arvicidal activity, *triumfetta pentandra* and agricultural insect pest

Introduction

India is the largest agricultural products producer, consumer and exporter country and third ranks in agricultural outputs in worldwide [2]. In agricultural insect pest affected directly the growing part of the crop. Results are agricultural products totally loss 20 to 30% of revenue [3].

These insect pests have been control by lost fifty years synthetic insecticides. However indiscriminate use in several problems as resistance, resurgence of pests and also affected from water, soil, air and food. Among the human health and disrupt the ecosystem [5].

Human health affected in hormonal imbalance, nerve imbalance and circulatory disorder (DDT-Dichlorodiphenyl Trichlorothane) [4]. The World Health Organization estimated to 2, 00,000 people are killed worldwide [19]. Most of the country search for insect pest control program alternative source of natural plant product. There are many plant secondary metabolites affected in agricultural insect pest behavior, development of reproduction and identification of novel effective insecticidal compounds properties to combat increasing rates of the plant growth and more than 10,000 low molecular mass compounds as secondary metabolites of plants [6, 11, 13]. Therefore the properties of plants products is phenols, coumarins, flovonoids, phenylpropanoid derivatives, tannins, quinines,isoprene derivatives, cardiotonicheterosides, alkaloids, and cyanogene glycosides [10, 17].

There are more than 2400 plant species to 189 families are said by sources of bioactive compounds. Furthermore antifeedant ant larvicidal activities of *Phyllanthus niruri, Abutilion indicum, Senna auriculata* and *Solanum trilobatum* [12, 14, 16]. The insect pest herbivorous lepidopteran larvae one of the most important crop pests and can eat the various parts of the host plants [9]. In Indian agricultural many larvae cause damage plant and the army worm *Spodoptera litura* and cotton bollworm *Helicoverpa armgera* [8].

The aim of in this research was to evaluate the plant leaf properties of *Triumfetta pentandra* against control the selected the agricultural field insect pests *Spodoptera litura* and cotton bollworm *Helicoverpa armgera.*

Materials and Methods

In present study, the selected plants were collected kolli hills, Namakkal, Tamilnadu, India and to prepare extract in various solvents like hexane, chloroform, ethyl acetate and water. The crude extracts were stored clean borosil vial at 4^0c. The selected agricultural insect pest's larvae of *Helicovrpa armigera* and *Spodoptera litura* were collected from nearby agricultural land Arignar Anna Government Arts College Namakkal, Tamilnadu, India. The insect larvae reared in pg and research department of zoology, Arignar Anna Government Arts College Namakkal, Tamilnadu, India. These laboratory reared larvae were used for larvicidal assay at room temperature 28 ± 2^0c, RH 75±5% [17].

Larvicidal activity of plant extracts *Triumfetta pentandra* against *S. litura* and *H.*
armigera. Treated with different concentrations of crude solvent extract in 5%0, 2.5%, 1.25% and 0.625% host leaf discs wet and tested for fourth instar larvae of *S. litura* and *H. armigera* and leaf disc no choice method [7]. Each experiment 5 replicates maintained. For all experiments and all concentration results values recorded in 24hrs larval mortality and calculated in the formula Abbott 1925 [1].

$$Percentage of larval mortality = \frac{percentage\ of\ mortality \in treated - mortality \in control}{100 - percentage of\ mortality \in control}$$

Statistical analysis

Determination of lethal concentration LC_{50} and LC_{90} represent by 50 percentage of larval mortality and 90 percentage of larval mortality on *H. armigera* and *S. litura.* LC_{50} and LC_{90} were calculated along with 95% confidence level by probit analysis using SPSS Software 16.00.

Results and Discussion

Larvicidal activity of plant extract of *Triumfetta pentandra* against agricultural

insect pest *Spodoptera litura* and *Helicoverpa armigera.* The Plant extract in deferent solvent were prepared various concentrations for 5%, 2.5%, 1`25% and 0.625% and tested against fourth instar larvae of *S. litra* and *H. armigera*. Then agricultural insect pest *S. litura* larval mortality were recorded for highest percentage in 5% plant extract of *Triumfetta pentandra* (ethyl acetate) on larval mortality were 87.23% and followed by 2.5% concentration of larval mortality in 69.12%, 1.25% concentration of larval mortality were 47.56% and then 0.625% plant extract of larval mortality in recorded 31.92% at 24hrs values and LC_{50} (LCL-UCL), LC_{90} (LCL-UCL)X^2 the values in 1.55 (1.12-191), 5.07 (4.40-6.13) 3.095.

Along with chloroform extract on 0.625%, 1`25%, 2.5% and 5% then larval mortality were recorded in 23.83%, 32.74%, 49.92%, 67.94% and $LC_{50}$ (LCL-UCL), $LC_{90}$ (LCL-UCL)$X^2$ the values in 2.99 (2.50-3.59), 7.88 (6.55-10.27) 1.686. Together with hexane extract on 0.625%, 1`25%, 2.5% and 5% then larval mortality were recorded in 16.76, 21.29, 37.74, 51.38% and LC_{50} (LCL-UCL), LC_{90} (LCL-UCL)X^2 the values in3.20 (2.52-4.19), 10.05(7.77-15.31) 2.249. Along with water extract on 0.625%, 1`25%, 2.5% and 5% then larval mortality were recorded in water 26.69, 39.21, 48.28, 61.21% and LC_{50} (LCL-UCL), LC_{90} (LCL-UCL)X^2 the values in 3.40 (2.65-5.81), 7.00 (5.02-13.88) 0.079 respectively. Then larvicidal, antieedant and ovicidal activities of medicinal plant leaf were tested against *Helicoverpa armigera* and *Spodoptera litura* [20]. Then the leaf, seed, bark, seed coat and roots of *Jatropha curcas* were extracted various solvent and tested against third instar larvae of *Plutell xylostella* and *Halicoverpa armigera* [9].

The lavicidal, antifeedant, ovicidal and insect growth inhibitory activities of *Barleria longiflora* tested against *Helicoverpa armigera* and *Spodoptera litura* [20]. Among, the lavicidal, antifeedant, pupicidal activities of *Atalantia monophylla* against *Spodoptera litura* [3].

Larvicidal and ovicial activities of crude extracts, fractions and compounds A and B in plants leaf extract tested against *S.litura* [11]. Larvicidal and ovicial activities of crude extracts petroleum ether, chloroform, and ethyl acetate tested in *Spodoptera litura* and *Helicoverpa armigera* [19].

Then agricultural insect pest *Helicoverpa armigera* larval mortality were recorded for highest percentage in 5% plant extract (ethyl acetate) on larval mortality were 81.23% and followed by 2.5% plant extract larval mortality in 66.54%, 1.25% plant extract larval mortality were 40.52% and then 0.625% plant extract of *Triumfetta pentandra* larval mortality in recorded 27.90% values and LC_{50} (LCL-UCL), LC_{90} (LCL-UCL) X^2 the values in 1.56 (1.01-2.01), 6.00(5.06-7.62) 3.645. Along with hexane extract on 5%, 2.5%, 1`25%, 0.625% and then larval mortality were recorded in 53.12, 36.34, 22.39, 18.36 % and LC_{50} (LCL-UCL), LC_{90} (LCLUCL)X^2 the values in4.49 (3.76-5.75), 10.22 (8.18-14.35) 0.771.

Together with chloroform extract on 5%, 2.5%, 1`25%, 0.625% and then larval mortality were recorded in 61.24, 43.42, 32.43, 20.33% and LC_{50} (LCL-UCL), LC_{90} (LCLUCL)X^2 the values in 3.56 (2.99-4.42), 9.06 (7.35-12.37) 2.011. Along with water extract on 5%,

2.5%, 1`25%, 0.625% and then larval mortality were recorded in water 60.31, 43.53, 31.53, 20.54% and LC_{50} (LCL-UCL), LC_{90} (LCL-UCL) X^2 the values in 3.63 (3.04-4.53), 9.23 (7.46-

12.69) 1.874 respectively.

Larvicidal activity results of plant crude extracts in various solvent and there crude extract fraction to use chromatography technique and fraction tested against various concentration in *H. armigera* and *S. litura.* Effective fraction identification and isolated from compounds to use future farmer men in controlled be an insect pest managing program [15].

Table 1: Larvicidal activity of plant extracts of *Triumfetta pentandra* against agricultural insect pest *Spodoptera litura*

Solvent extract	Concentration (%)	Larval mortality	LC_{50} (LCL-UCL)	LC_{90} (LCL-UCL)	X2
Hexane	5%	51.38±2.64	3.40 (2.65-5.81)	7.00 (5.02-13.88)	0.079
	2.5%	37.74±4.39			
	1.25%	21.29±2.10			
	0.625%	16.76±2.65			
Chloroform	5%	67.94±4.93	2.99 (2.50-3.59)	7.88 (6.55-10.27)	1.686
	2.5%	49.92±2.30			
	1.25%	32.74±3.72			
	0.625%	23.83±4.24			
Ethyl acetate	5%	87.23±3.67	1.55 (1.12-191)	5.07 (4.40-6.13)	3.095
	2.5%	69.12±5.32			
	1.25%	47.56±6.59			
	0.625%	31.92±5.30			
water	5%	61.21±4.31	3.20 (2.52-4.19)	10.05 (7.77-15.31)	2.249
	2.5%	48.28±4.21			
	1.25%	39.21±4.43			
	0.625%	26.69±6.37			

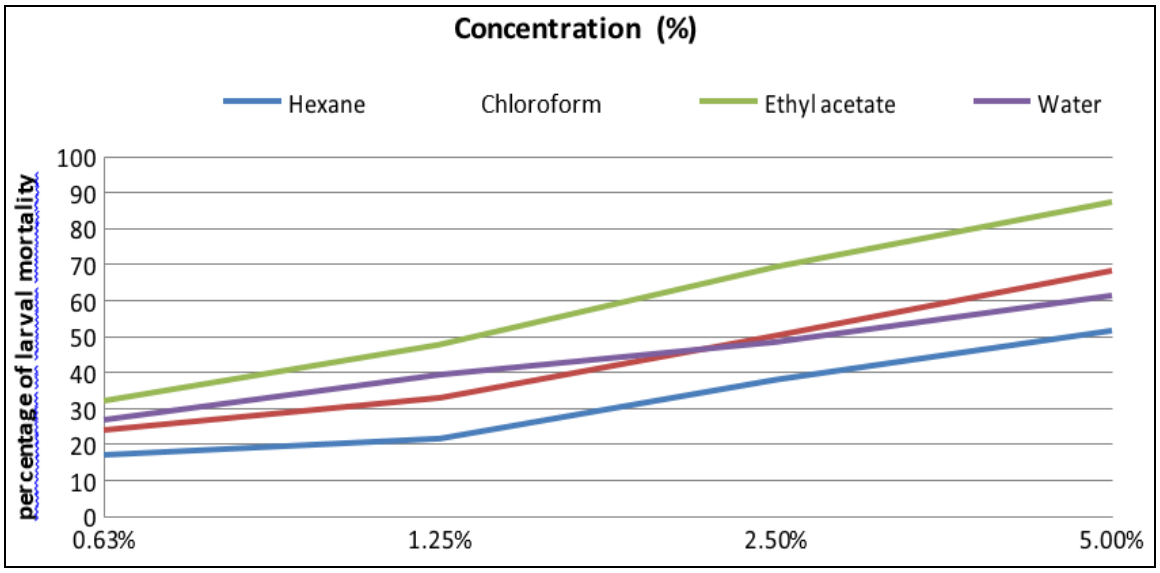

Fig 1: Larvicidal activity of plant extracts of *Triumfetta pentandra* against agricultural insect pest *Spodoptera litura*

Table 2: Larvicidal activity of plant extracts of *Triumfetta pentandra* against agricultural insect pest *Helicoverpa armigera*

Solvent extract	Concentration (%)	Larval mortality	LC_{50} (LCL-UCL)	LC_{90} (LCL-UCL)	X2
Hexane	5%	53.12±4.32	4.49 (3.76-5.75)	10.22 (8.18-14.35)	0.771
	2.5%	36.34±3.25			
	1.25%	22.39±4.34			
	0.625%	18.36±4.55			
Chloroform	5%	61.24±3.25	3.56 (2.99-4.42)	9.06 (7.35-12.37)	2.011
	2.5%	43.42±6.32			
	1.25%	32.43±5.36			
	0.625%	20.33±6.43			
Ethyl acetate	5%	81.23±4.24	1.56 (1.01-2.01)	6.00 (5.06-7.62)	3.645
	2.5%	66.54±2.52			
	1.25%	40.52±5.35			
	0.625%	27.90±6.40			
water	5%	60.31±3.51	3.63 (3.04-4.53)	9.23 (7.46-12.69)	1.874
	2.5%	43.53±5.35			
	1.25%	31.53±4.53			
	0.625%	20.54±5.45			

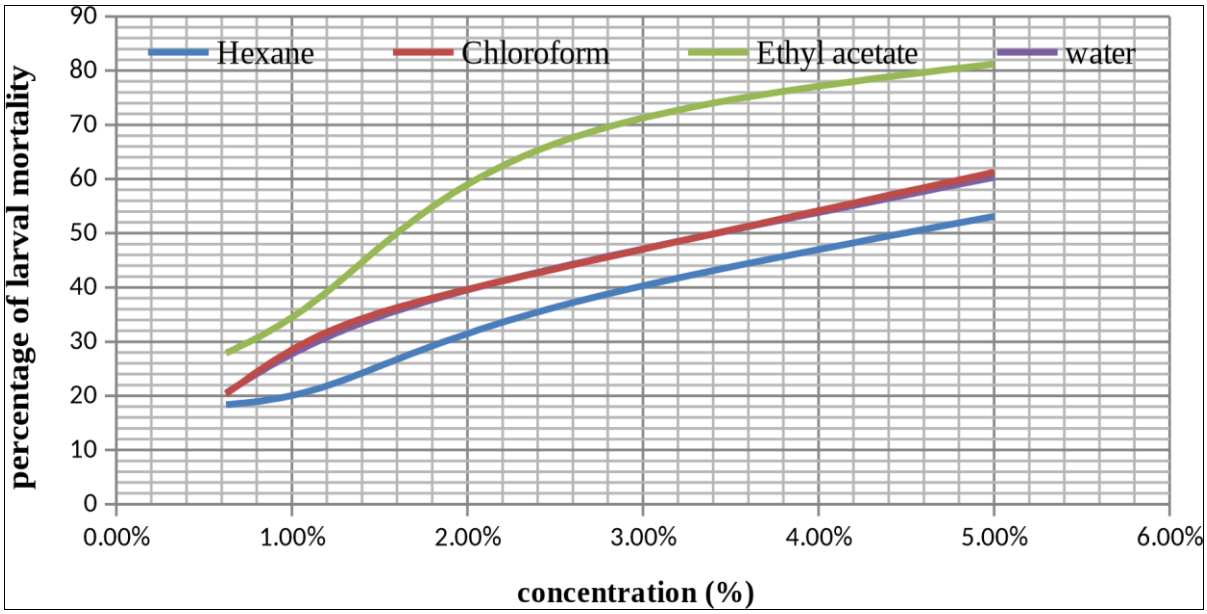

Fig 2. Larvicidal activity of plant extracts of *Triumfetta pentandra* against agricultural insect pest *Helicoverpa armigera*

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