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Biocidal Activity of Ficus carica Extract against Sylepta Derogate on OKRA

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***Abstract:*-- Sylepta derogate a prominent pest of okra cultivated in the field Mylaudy of Kanyakumari District,Tamil Nadu causes both leaf curling and defoliation of okra leaf..Medicinal plant extract ,especially botanical insecticides,are currently studied more and more because of the possibility of their use in plant protection. Biological activity of plant Ficus carica bark with leaf extract using ethanol solvent were studied against 2nd,3rd,4th,5th instar larvae of leaf roller Sylepta derogate..Larval mortality was observed after 24,48,72hrs of exposure.Both extract showed higher larval mortality .The results suggest ethanol extract of leaf with bark of ficus Carica have the potential to be used as an eco-friendly approach for the control of the agricultural pests ,Sylepta derogate..**

***Index Terms*— Sylepta derogate,Ficus carica,ethanol and petroleum ether.**

I. INTRODUCTION

Okra(Abelmoschusesculentus) is an economically important vegetable crop grown in tropical and subtropical parts of the world.It is quite popular in India,easy for cultivation, dependable and adaptable to varying moisture conditions..One of the important insect pest affecting the yield potential of Okra include leaf roller,Sylepta derogate(Fab.The present study was an attempt to assess the larvicidal activity of ethanolic extracts of Ficus carica against S.derogate.

II. MATERIAL AND METHOD

Collection of Insect pest

During prelimnary screening with the laboratory trial,the larvae of S.derogata were collected from the crop field and identified by Entomologist at Entomology Resaerch Station ,St. Xaviour College ,Pallayamkotai

Plant Materials

The leaves with bark of ficus carica were collected from Marunthuvazhmalai hills grown in Mylaudy of Kanya Kumar District. Then it was washed with water,dried in shade at room temperature and powdered with the help of mechanical device and sieved to get the powder. Preparation of Extract

Ethanolic extraction of Ficus carica(bark and leaves)

50 g of powder was soaked in in 100ml of water.This was kept as stock solution.From the stock soution 1ml,2ml,3ml,4ml were taken out and made into 10ml by adding 9.9ml,9.8ml and 9.7ml and 9.6ml distilled water correspondingly.

Screening for larvicidal activity of ethanolic extracts of Ficus carica against Sylepta derogate.

Larvicidal effects of Ficus carica were assessed using the standard method of WHO (1996)with some modification. Different concentration of plant extract were prepared from 4 to 15(µg/dl)in 100ml of water in plastic cups.In each cup,ten 2nd,3rd,4th, instar larvae were released.Each experiment was conducted with 5 replicates and control.No food provided during the treatment.Observations were made on 24,48,72 hours after treatment.Dead larvae were assessed by non wriggling movement and settlement of the larvae in the bottom of plastic cups.The LC50 value for each concentration was calculated

Data analysis

The mortality responses of larvae Sylepta derogate expose to Ficus carica extract were subjected to probit analysis(Finney,1971).For calculating LC50 and other statistics at 95%upper confidence limit and lower confidence limit was calculated by using the software developed by Reddy et al.,(1992).

PLOT STUDY

Okra was cultivated in many pot including original and replicates (screened). Plant in which lowest concentration of the ethanolic extract of ficus carica was sprayed in all the pots .Control plant was not sprayed at the same time maintained one as control (unscreened).Anioke(1988)

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III. RESULTS AND DISCUSSION

In my present study when second instar S.derogata was exposed to Ficus carica ethanolic extract 100 percent mortality was recorded at a concentration 10µg/dl for a period of 24h.At 4µg/dl concentration the mortality was 20percent after 72h(Table 1). Probit analysis of the mortality response showed that the 24h LC50 was 7.669µg/l (Table2) 48h,7.191 µg/l (Table 3 and 72h,6.036 µg/l(Table 4).When third instar S.derogata was exposed to Ficus carica ethanolic extract 100 percent mortality was recorded at a concentration 11µg/dl for a period of 24h.At 5µg/dl concentration the mortality was 20percent after 72h). Probit analysis of the mortality response showed that the 24h LC50 was 8.8082µg/l 48h,7.387 µg/l (Table7)and 72h,6.661 µg/l. When forth instar S.derogata was exposed to Ficus carica ethanolic extract 100 percent mortality was recorded at a concentration 13µg/dl for a period of 24h.At 5µg/dl concentration the mortality was 20percent after 72h. Probit analysis of the mortality response showed that the 24h LC50 was 8.957µg/l. 48h,8.052 µg/l and 72h,7.143 µg/l When fifth instar S.derogata was exposed to Ficus carica ethanolic extract 100 percent mortality was recorded at a concentration 12µg/dl for a period of 24h.At 6µg/dl concentration the mortality was 20percent after 72h Probit analysis of the mortality response showed that the 24h LC50 was 9.474µg/l, 48h,9.486 µg/l and 72h,8.338µg/l.
Table 1

Mortality response of second instar of Sylepta derogate to ethanolic extract of ficus carica

S.no	Concentration (µg/dl)	Percent mortality		
		24h	48h	72h
1	4		10	20
2	5	10	20	30
3	6	20	30	40
4	7	30	50	60
5	8	50	60	80
6	9	60	70	90
7	10	100		

Table2

Profit analysis of mortality response of second instar of Sylepta derogate to ethanolic extract of ficus carica exposed for 24hrs.

(1) Dose %	(2) No.	(5) Mor. %	(6) Log dose	(7) Emp. Pro.	(8) Work Pro.	(10) Wt. Coef.	(11) Weight w	(12) wx	(13) wy	(14) y
5.00	10	10.00	1.70	3.72	3.34	3.89	0.21	2.08	8.10	3.14
6.00	10	20.00	1.78	4.16	4.14	4.16	0.47	4.71	19.60	3.93
7.00	10	30.00	1.84	4.48	4.81	4.49	0.63	6.27	28.14	4.60
8.00	10	50.00	1.90	5.00	5.39	4.98	0.60	6.01	29.93	5.18
9.00	10	60.00	1.95	5.25	5.90	5.09	0.47	4.71	23.96	5.70
10.00	10	100.00	2.00	7.33	6.36	6.87	0.30	3.02	20.76	6.16

STATISTICS

SW= 26.800 SWX= 50.156 X Bar= 1.871
SWY=130.482 Y Bar= 4.869

SWX*X= 94.060 SWY*Y= 652.956 SWXY= 245.801

b Value = 10.022

Regression Equation y = 10.022x -13.89

If y=5.0 then x = 1.885 This corresponds to dose of 7.669

Varaiance 0.0006 Chi-square 4.45 (with 4 Deg. of freedom p)

Lower Limit 1.8380 Log Dose 1.8846 Upper Limit 1.9311

Table3
Profit analysis of mortality response of second instar of Sylepta derogate to ethanolic extract of ficus carica exposed for 48hrs.
Calculation of Log-dose/profit Regression Line Analysis

STATISTICS

(1) Dose %	(2) No. %	(5) Mor. dose	(6) Log Pro.	(7) Emp. Pro.	(8) Exp. Pro.	(9) Work Coef.	(10) Wt.	(11) Weight	(12) wx	(13) wy	(14) Y
4.00	10	10.00	1.60	3.72	3.67	3.72	0.34	3.36	5.38	12.51	3.67
5.00	10	20.00	1.70	4.16	4.18	4.16	0.50	5.03	8.55	20.92	4.18
6.00	10	30.00	1.78	4.48	4.59	4.48	0.60	6.01	10.69	26.90	4.59
7.00	10	50.00	1.84	5.00	4.94	5.00	0.63	6.34	11.70	31.70	4.94
8.00	10	60.00	1.90	5.25	5.24	5.26	0.63	6.27	11.93	32.96	5.24
9.00	10	70.00	1.95	5.52	5.51	5.53	0.58	5.81	11.35	32.12	5.51

SW= 32.820 SWX= 59.595 X Bar= 1.816
SWY=157.111 Y Bar= 4.787
SWX*X= 108.609 SWY*Y= 763.311 SWXY= 287.379
b Value = 5.216

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Regression Equation y = 5.216x -4.68
If y=5.0 then x = 1.857 This corresponds to dose of 7.191
Varaiance 0.0012 Chi-square 0.11 (with 4 Deg. of freedom p)

Lower Limit 1.7878 Log Dose 1.8566 Upper Limit 1.9255

Table4

Profit analysis of mortality response of second instar of Sylepta derogate to ethanolic extract of ficus carica exposed for 72hrs.

Calculation of Log-dose/profit Regression Line Analysis

(1) Dose %	(2) No. %	(5) Mor. dose	(6) Log Pro.	(7) Emp. Pro	(8) Exp. Pro.	(9) Work Coef.	(10) Wt. w	(11) Weight	(12) wx	(13) wy	(14) Y
4.00	10	20.00	1.60	4.16	3.95	4.20	0.41	4.05	6.49	17.00	3.92
5.00	10	30.00	1.70	4.48	4.53	4.47	0.58	5.81	9.87	25.98	4.51
6.00	10	40.00	1.78	4.75	5.01	4.75	0.64	6.37	11.33	30.28	4.98
7.00	10	60.00	1.84	5.25	5.42	5.25	0.60	6.01	11.09	31.56	5.39
8.00	10	80.00	1.90	5.84	5.77	5.84	0.50	5.03	9.57	29.38	5.74
9.00	10	90.00	1.95	6.28	6.08	6.26	0.41	4.05	7.91	25.36	6.05

STATISTICS
SW= 31.320 SWX= 56.258 X Bar= 1.796
SWY=159.564 Y Bar= 5.095

SWX*X= 101.435 SWY*Y= 827.621 SWXY= 288.903
b Value = 6.051
Regression Equation y = 6.051x -5.78
If y=5.0 then x = 1.781 This corresponds to dose of 6.036
Varaiance 0.0009 Chi-square 1.00 (with 4 Deg. of freedom p) Lower Limit 1.7215 Log Dose 1.7806 Upper Limit 1.8397.

IV. RESULT AND DISCUSSION.

Chinnaperumal et al.,2008 reported the highest larval mortality was found in peel methanolextract of C.sinensis,flower ethyl acetate extract of O.canum and leaf aetone extract of O.sanctum against the larvae of S.derogate(LC50=20.27).In the Present Study when second instar S.derogata was exposed to Ficus carica ethanolic extract 100 percent mortality was recorded at a concentration 10µg/dl for a period of 24h.At 4µg/dl concentration the mortality was 20percent after 72h.Probit analysis of the mortality response showed that the 24h LC50 was 7.669µg/l 48h,7.191 µg/l and 72h,6.036 µg/l

Ogbala et al.,2015 observed abscission are caused by the larval stages of S.derogate were found to be ellipsoidal,erregular and spherical puncture.In my present study S.derogata form the same symptoms in pot(unscreened) which had not sprayed .Kamaraj et al.,2008 reported the caterpillar roll up the leaves in funnel shape and feed from the margin by remaining inside.In the present study ,pot unscreened ie.,which haven't sprayed showed the presence of S.derogate and rolled the leaf .The aqueous neem kernel extract sprayed significantly less on crops infested by the S.derogate produced higher fruit yield than crops that were unsprayed(Anaso and Lale2002).Anaso (2003) reported that the neem seed oil and aqueous neem seed extract caused significantly less damage by the S.derogate and had higher yield than unsprayed pot.In present study leaf sprayed with extract on original and duplicates pot (screened) prevent the entry of S.derogate form fruits showed good yield

The aqueous seed extracts of A.indica were applied at the rate of 30,50,75 100g/l to control S.derogate and reported high fruit yield of okra plant in Ghana(Obeng-Ofori 2003).In my present study Lowest concentration of ethanolic extracts of ficus carica showed potential effect against the larvae S.derogate and the okra yield was found tobe high.

V. CONCLUSION

On viewing the above discussion ,many authors repoted effect of plant extract against the larvae S.derogate. From my work I am also concluding that ethanolic extract of Ficus carica showed 100% mortality against the Larvae S.derogate from my present study .So by spraying this lowest Concentration of this extract into the Field it will prevent the S.derogate infesting the crops so by that leaf will not rolled,defoliate and thus photosynthesis will takes place and during harvesting the farmers will attain high yield

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