INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X
Impact Factor: 6.078

(Volume 7, Issue 2 - V7I2-1225)
Available online at: https://www.ijariit.com

Effect of neem treatment on the total sugar content of mango midge fly

Pallavi Kohirkar
kohirkarpallavi@gmail.com
NES Science College, Nanded, Maharashtra

ABSTRACT

Neem was proved to be an eco-friendly & best insecticide. Neem components show multiple effects against different insects. In present work neem leaves were used for the gall treatment. Total sugar content of mango midge larvae was determined in this investigation. After 24hrs of treatment larval sugar was found to be deceased significantly (p>0.01).After 48hrs and 72hrs it showed moderately significant (p>0.05) decrease.After 72hrs ,7days and 15 days this decrease was more significant (0.001).

Keywords: *Azaditachtin, Mango Leaf Galls, Midge Fly*

1. INTRODUCTION

Neem is one of the botanical products used as insecticide. Various neem products have been extensively researched for their phyto-chemical & exploitation in pest control program. Azadirachtin is the major component which is the predominant insecticidal active ingredient seeds, leaves and other parts of the tree.Neem components show multiple effects against different insects. Midge fly is the causative agent of the mango leaf gall.In present work the effect of neem extract on total sugar content of midge larvae was studied.This treatment was the part of the work to control the midge infestation from the mango tree.

2. MATERIAL AND METHODS

In present work fresh neem leaves were used for the gall treatment fresh leaves were collected and washed thoroughly with tap water. Then it was ground into a fine paste by adding little amount of water. One gram of this paste was added to the 100 ml of distilled water. Thus 1% neem extract spray was prepared and in the same manner 2%,3%,4%,5% neem sprays were prepared. Likewise, alcoholic neem sprays also prepared and used for the treatment. The gall infested branches were selected and treatment was given at regular interval of time I.e. 24 hrs,48 hrs, 72 hrs, 7 days and 15 days. Then after galls were superficially cut & larvae were separated out. Almost 30 number of same instar larvae were taken and total sugar analysis was done in laboratory by using Anthrone method suggested by Sadasivam&Manickkam(1997).

3. OBSERVATIONS AND RESULTS

Table 1: Effect of 1% Neem spray on Total Sugar Content of midge larvae*(The Total Sugar Content expressed in terms of mg/gm wet wt. is the average of 5 samples ± S.D.)

Period	Name of sample	Total Sugar Content ± S.D.	% Change	Student "t" Test	Level of significance
24 hrs.	Control	62.16 ± 22.51			--
	Aqueous	70.92 ± 0.90	14.09	4.21	P > 0.01
	Alcoholic	67 ± 0.73	7.79	2.32	P < 0.05
48 hrs.	Control	73.12 ± 0.81			
	Aqueous	72.08 ± 0.80	1.42	20.86	P > 0.001
	Alcoholic	68.92 ± 0.50	5.74	16.91	P > 0.001

72 hrs.	Control	70.84 ± 1.09			
	Aqueous	69.86 ± 0.76	1.38	3.82	P > 0.05
	Alcoholic	71.88 ± 0.46	1.47	2.93	P > 0.05
7 days.	Control	73.68 ± 0.75			
	Aqueous	69.36 ± 0.09	5.86	11.89	P > 0.001
	Alcoholic	68.42 ± 0.29	7.14	17.44	P > 0.001
15 days.	Control	74.2 ± 1.39			
	Aqueous	71.1 ± 0.59	4.17	7.72	P > 0.001
	Alcoholic	71.06 ± 0.53	4.23	7.57	P > 0.001

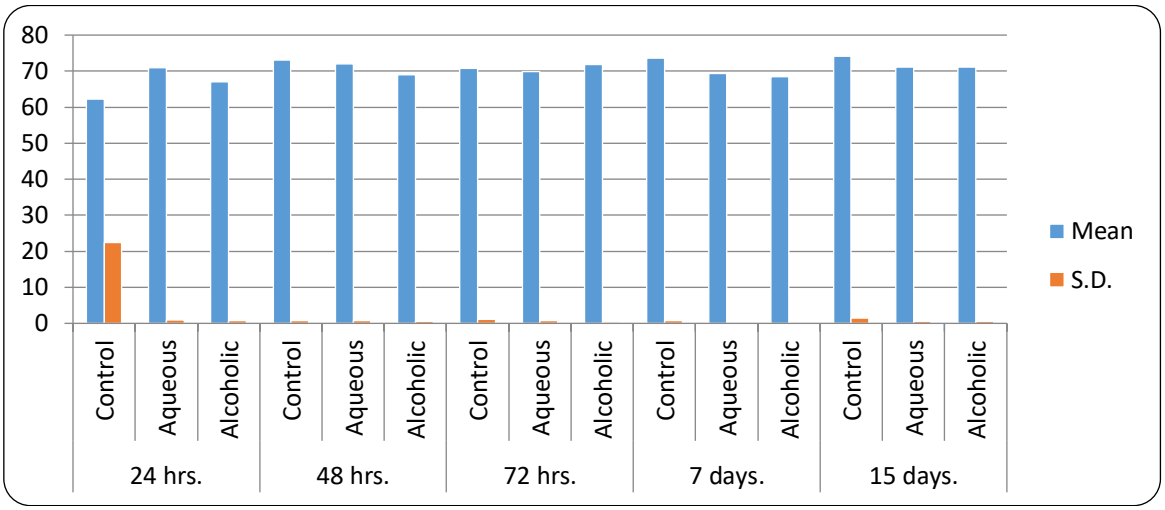


Table: 2: Effect of 2% Neem spray on Total Sugar Content of midge larvae (* The Total Sugar Content expressed in terms of mg/gm wet wt. is the average of 5 samples ± S.D.)

Period	Name of sample	Total Sugar Content ± S.D.	% Change	Student "t" Test	Level of significance
24 hrs.	Control	74.94 ± 1.05			--
	Aqueous	73.16 ± 0.55	2.37	5.66	P > 0.01
	Alcoholic	72.26 ± 0.42	3.57	7.52	P > 0.001
48 hrs.	Control	74.72 ± 1.0			
	Aqueous	72.72 ± 0.43	2.67	5.93	P > 0.01
	Alcoholic	71 ± 0.63	4.97	13.72	P > 0.001
72 hrs.	Control	74.02 ± 0.72			
	Aqueous	72.86 ± 0.54	1.56	6.21	P > 0.01
	Alcoholic	71.48 ± 0.16	3.43	7.65	P > 0.001
7 days.	Control	75.12 ± 1.15			
	Aqueous	72.72 ± 0.59	3.19	7.22	P > 0.001
	Alcoholic	71.82 ± 0.76	4.39	11.88	P > 0.001
15 days.	Control	75.08 ± 1.03			
	Aqueous	72.18 ± 0.40	3.86	8.16	P > 0.001
	Alcoholic	70.98 ± 0.51	5.46	12.70	P > 0.001

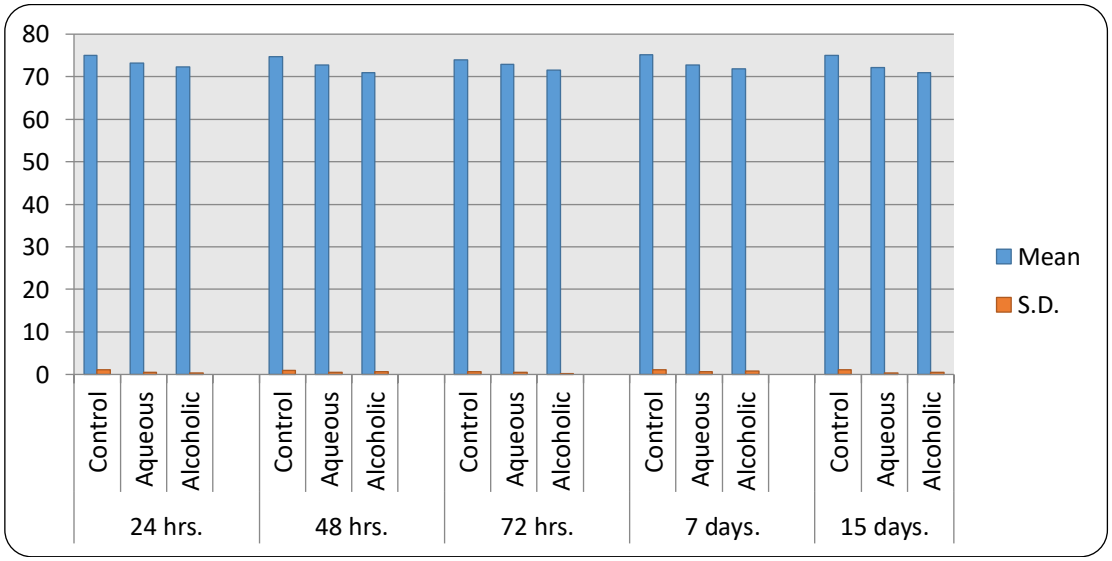


Table 3: Effect of 3% Neem spray on Total Sugar Content of midge larvae (* The Total Sugar Content expressed in terms of mg/gm wet wt. is the average of 5 samples ± S.D.)

Period	Name of sample	Total Sugar Content ± S.D.	% Change	Student "t" Test	Level of significance
24 hrs.	Control	74.24 ± 0.64			--
	Aqueous	74.34 ± 0.40	0.13	0.46	P < 0.05
	Alcoholic	73.54 ± 0.30	0.94	2.69	P > 0.05
48 hrs.	Control	74.14 ± 0.40			
	Aqueous	73.9 ± 0.25	0.32	1.39	P < 0.05
	Alcoholic	73.42 ± 0.31	0.97	5.30	P > 0.01
72 hrs.	Control	74.26 ± 0.84			
	Aqueous	72.88 ± 0.51	1.85	5.35	P > 0.05
	Alcoholic	71.36 ± 0.29	3.90	8.69	P > 0.001
7 days.	Control	74.92 ± 0.92			
	Aqueous	71.7 ± 0.55	4.29	11.82	P > 0.001
	Alcoholic	71.4 ± 0.12	4.69	8.80	P > 0.001
15 days.	Control	75.64 ± 1.27			
	Aqueous	70.58 ± 0.28	6.68	11.35	P > 0.001
	Alcoholic	70.78 ± 0.44	6.42	11.94	P > 0.001

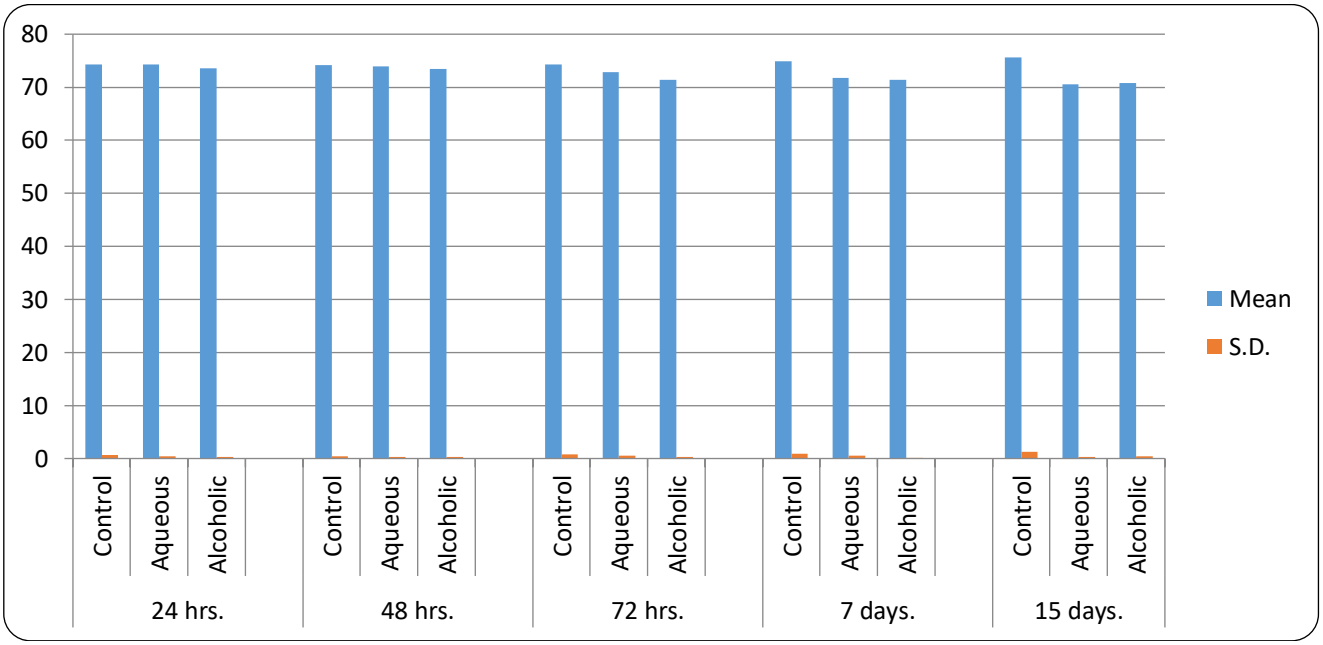


Table 4: Effect of 4% Neem spray on Total Sugar Content of midge larvae *(The Total Sugar Content expressed in terms of mg/gm wet wt. is the average of 5 samples ± S.D.)

Period	Name of sample	Total Sugar Content ± S.D.	% Change	Student "t" Test	Level of significance
24 hrs.	Control	71.16 ± 0.67			--
	Aqueous	71.2 ± 0.51	0.05	0.22	P < 0.05
	Alcoholic	69.36 ± 0.15	2.52	5.59	P > 0.001
48 hrs.	Control	71.86 ± 0.45			
	Aqueous	72.2 ± 0.35	0.47	2.44	P < 0.05
	Alcoholic	71.8 ± 0.40	0.08	0.60	P < 0.05
72 hrs.	Control	72.86 ± 1.04			
	Aqueous	68.46 ± 0.39	6.03	12.25	P > 0.001
	Alcoholic	69 ± 0.44	5.29	11.14	P > 0.001
7 days.	Control	73.84 ± 1.03			
	Aqueous	70.26 ± 0.15	4.84	8.54	P > 0.001
	Alcoholic	71.2 ± 0.67	3.57	9.84	P > 0.001
15 days.	Control	75.24 ± 1.25			
	Aqueous	70.88 ± 0.55	5.79	11.61	P > 0.001
	Alcoholic	68.24 ± 0.55	9.30	18.72	P > 0.001

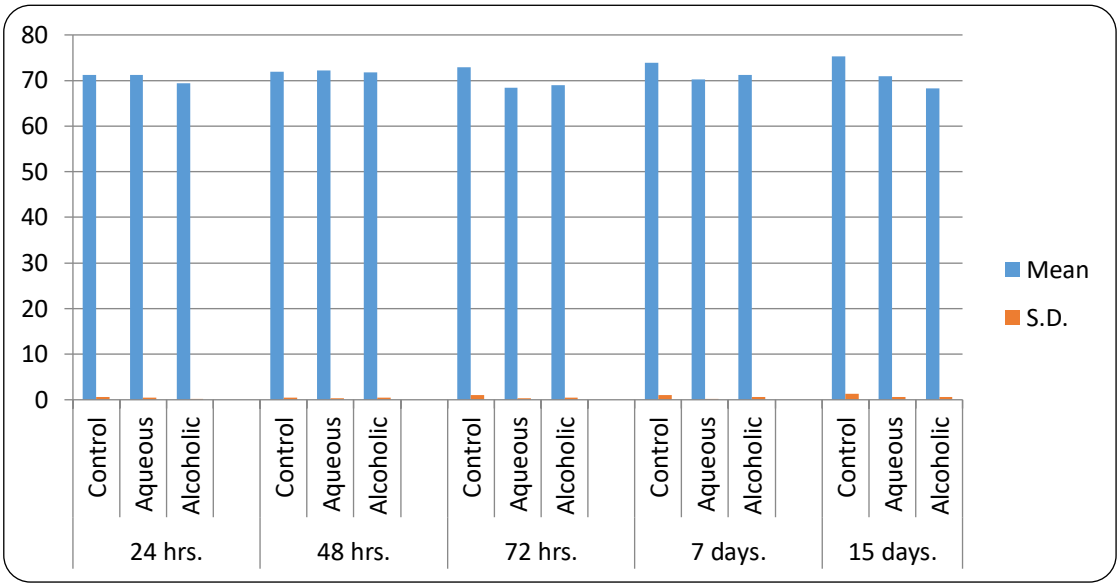
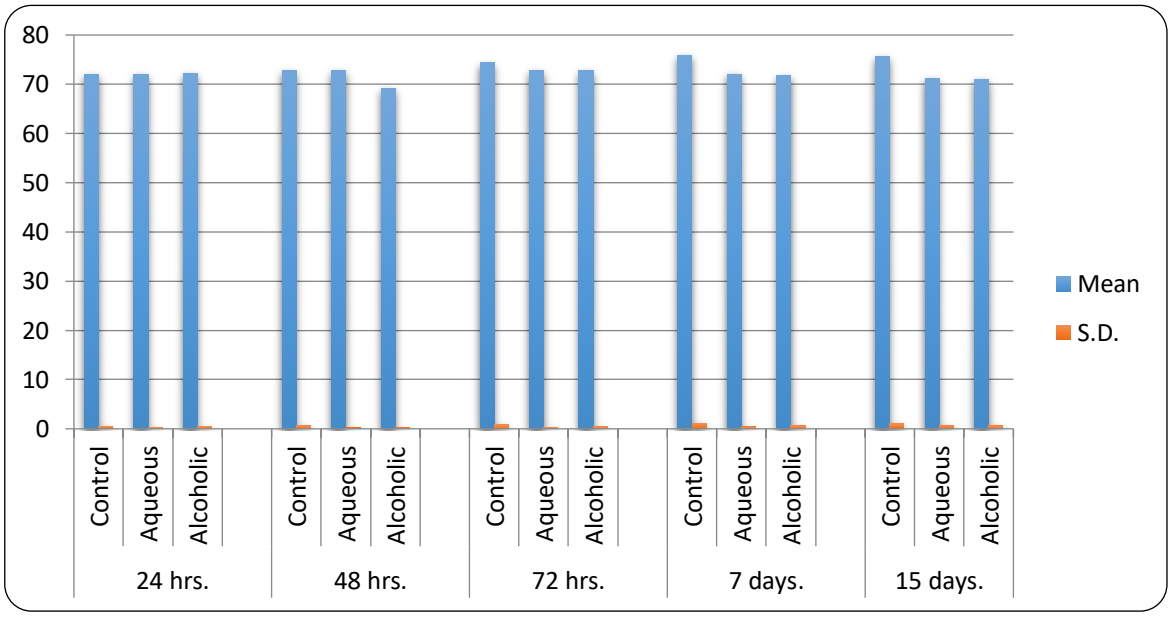


Table 5: Effect of 5% Neem spray on Total Sugar Content of midge larvae * (The Total Sugar Content expressed in terms of mg/gm wet wt. is the average of 5 samples ± S.D.)

Period	Name of sample	Total Sugar Content ± S.D.	% Change	Student "t" Test	Level of significance
24 hrs.	Control	72 ± 0.57			--
	Aqueous	72.06 ± 0.34	0.08	0.28	P < 0.05
	Alcoholic	72.16 ± 0.55	0.22	2.91	P > 0.05
48 hrs.	Control	72.74 ± 0.65			
	Aqueous	72.88 ± 0.19	0.19	0.46	P < 0.05
	Alcoholic	69.16 ± 0.23	4.92	12.41	P > 0.001
72 hrs.	Control	74.4 ± 0.85			
	Aqueous	72.86 ± 0.32	2.06	4.74	P > 0.01
	Alcoholic	72.74 ± 0.48	2.23	6.14	P > 0.001
7 days.	Control	75.82 ± 1.16			
	Aqueous	72.08 ± 0.38	4.93	9.47	P > 0.001
	Alcoholic	71.82 ± 0.63	5.27	12.33	P > 0.001
15 days.	Control	75.6 ± 1.06			
	Aqueous	71.24 ± 0.67	5.76	15.58	P > 0.001
	Alcoholic	71 ± 0.58	6.08	14.82	P > 0.001



4. OBSERVATIONS AND RESULTS

1) Effect of 1% Neem spray on total sugar content of midge larvae

In 24 hrs aqueous neem spray showed significant decrease in total sugar content of midge larvae (P > 0.01). Whereas, alcoholic neem spray showed a insignificant decrease (P < 0.05).

In 48 hrs aqueous and alcoholic neem spray did not show significant decrease in sugar content of midge larvae. Insignificant decrease was observed in 72 hrs. and 7 days of neem spraying whereas the total sugar content was observed to be significantly decreased in 15 days ($P > 0.001$).

2) Effect of 2% Neem spray on total sugar content of midge larvae

After 24 hrs of aqueous neem spraying total sugar content was observed to be decreased significantly ($P > 0.01$).

Alcoholic neem spray showed a highly significant decrease in total sugar content of larvae ($P > 0.001$).

After 48 hrs of aqueous spraying total sugar content of larvae was decreased significantly whereas alcoholic neem spray did not show significant decrease.

72 hrs. of aqueous and alcoholic neem spray showed a significant decrease in total sugar content of larvae ($P > 0.01$ & $P > 0.001$) respectively.

After 7 days and 15 days a highly significant decrease in total sugar content of larvae was observed in both aqueous and alcoholic neem treatment.

3) Effect of 3% Neem spray on total sugar of midge larvae

A insignificant decrease in total sugar content of larvae was observed in 24 hrs of aqueous neem spray ($P < 0.05$). Alcoholic neem spray showed a significant decrease in total sugar content of larvae.

24 hrs of spraying also showed the same results as above. Whereas after 72 hrs of spraying aqueous extract showed moderate decrease but a highly significant decrease was observed in alcoholic neem spray.

After 7 days and 15 days highly significant decrease was observed in was observed in aqueous and alcoholic neem spray.

4) Effect of 4% Neem spray on total sugar content midge larvae

In 24 hrs of spraying aqueous extract significant decrease in total sugar content of midge larvae was observed. Alcoholic neem spray was found to be effective in decreasing the sugar content of larvae significantly ($P > 0.001$). In 48 hrs. of spraying insignificant decrease in total sugar content was observed in both aqueous and alcoholic spray.

Highly significant decrease was found in both aqueous and alcoholic spray after 72 hours, 7 days and 15 days of spraying.

5) Effect of 5% Neem spray on total sugar content of midge larvae:

In 24 hrs of aqueous neem spray the decrease was insignificant whereas, alcoholic neem spray caused a significant decrease in sugar content of larvae.

In 48 hrs of spraying both aqueous and alcoholic neem spray showed insignificant decrease.

While after 72 hrs, the decrease was highly significant ($P > 0.001$). After 7 days of spraying aqueous neem spray was found to be effective by showing highly significant decrease in the sugar content. While alcoholic was not effective as it showed insignificant decrease.

15 days of spraying, showed a highly significant decrease in both aqueous and alcoholic neem spray.

5. DISCUSSIONS

In present investigation, after neem treatment total sugar was fount to be decreased with increase in time and neem percentage.

Effect of crude neem extracts on *Spodopteralittoralis* larvae also showed the same decrease in the total glucose content. The data recorded showed a significant decrease of glucose content throughout the test period. The recorded values were however, significantly decreased by – 12.26, - 12.35 and – 30.79% post the 1^{st}, 5^{th}& 10^{th} day of *Azadirachtaindica* exposure. On the other hand, the post exposure to the dose level of LC_{10} Ccotocynthis extract showed a more highly significant decrease of *S. littoralis* larvae glucose level on the 1^{st}& 10^{th} days. The recorded values were decreased by – 9.63% and – 17.88% respectively compared to the control level. (Sayed *et. al.,* 2011).

The insecticidal potency of *A. indica* being more than the extracts of other tested plants can be attributed to several factors including plant specific differences of the extracted active ingredients, types of the extracted products, differences in their mode of action method of penetration and the behavioural characteristics of the studied plants (Schmutterer, 1990; Roger *et. al.,* 1995).

It is now well established that in many plants including the tested plants especially *A. indica* the activity is due to the presence of saponin (Marston and Hostettmann, 1985; EI-Gengaihi*et. al.,* 1988; Rawi*et. al.,* 1996) triterpenoid (Schmutterer, 1986) Tannin compounds (Klock and Chan, 1982) effect seems to be very specific dependent.

Glucose concentration decreased after the treatment with Alcoholic i.e. neem based insecticide on elm leaf beetle larvae (BitaValizabeh*et. al.,* 2013).

6. CONCLUSION

Present work has proved that aqueous and alcoholic both extracts of neem are effective in controlling larval body sugar content as it acts as an antifeedant,resulting into the decrease in metabolic activities of the larvae.

7. ACKNOWLEDGEMENT

I am thankful to my research guide Dr.P.B.Deshmukh for his never-ending help during this work. I am also grateful to the Principal, N.E.S. Science college, Nanded, Dr.D.U.Gawai , for providing necessary laboratory facilities.

8. REFERENCES

[1] Bita Valizabeh ,Jalali Sndi, Arash, Zibaeean & Marzyesh Oftadeh (2013).Effect of Neem based insecticide Ashook on mortality, biological parameters of elm leaf beetle *Xanthoglerucaluteola.*Mull (Col: Crysomelidae J. Crop. Prot.2(3): 319-330.

[2] Klock, J.A.,Chan,B.(1986).Chemistry & technology ofchemical formulations.Kluwer Academic published Dordrecht/Boston/London

[3] Sadasivam S. & Manickam A. 91997).Biochemical methods.New Age International (p) Limited.4835/24,Ansari Road, Daryaganj, New Delhi 110002,pp6-37.

[4] Schmutterer, H.& K.R.S Ascher(1986).Natural pesticides from neem tree (*Azadirachtaindica*A.juss).Proceedings,3rdinternational neem conference. Nairobi, GTZ, Eschloon, Germany.

[5] Schmutterer,H.(1990).Properties & potential natural pesticides from the neem tree *Azadirachtaindica* Ann.Rev.Ent.35:271-297.

