International Journal of Fauna and Biological Studies
Available online at www.faunajournal.com

IJFBS
International Journal of Fauna And Biological Studies

ISSN 2347-2677
IJFBS 2017; 4(2): 120-123
Received: 19-01-2017
Accepted: 20-02-2017

Fida Hussain Magsi
Department of Entomology, Sindh Agriculture University, Tandojam, Sindh, Pakistan

Tajwar Sultana Syed
Department of Entomology, Sindh Agriculture University, Tandojam, Sindh, Pakistan

Anees-Ur-Rehman Memon
Department of Entomology, Sindh Agriculture University, Tandojam, Sindh, Pakistan

Zakir Ali Bhutto
Department of Entomology, Sindh Agriculture University, Tandojam, Sindh, Pakistan

Babar Hussain Chang
Department of Entomology, Sindh Agriculture University, Tandojam, Sindh, Pakistan

Maqsood Ahmed Chandio
Department of Entomology, Sindh Agriculture University, Tandojam, Sindh, Pakistan

Abid Ali Soomro
Department of Entomology, Sindh Agriculture University, Tandojam, Sindh, Pakistan

Naveed Ali Channa
Department of Entomology, Sindh Agriculture University, Tandojam, Sindh, Pakistan

Correspondence
Fida Hussain Magsi
Department of Entomology, Sindh Agriculture University, Tandojam, Sindh, Pakistan

Effect of different tobacco extracts on the population buildup of sucking complex in okra crop

Fida Hussain Magsi, Tajwar Sultana Syed, Anees-Ur-Rehman Memon, Zakir Ali Bhutto, Babar Hussain Chang, Maqsood Ahmed Chandio, Abid Ali Soomro and Naveed Ali Channa

Abstract
In order to compared the effect of different tobacco extracts on the population buildup of sucking complex in okra crop at experimental field of Latif Farm Sindh Agriculture University Tandojam. The following leaf extracts of tobacco varieties (T1= Hazaropattar tobacco, T2= Desi tobacco, T3= Balkhi tobacco, T4= Gurakhu tobacco and T5= Control were distributed and sprayed on the crop. The observations were recorded on population of white fly, jassids and aphid before and after spraying. The results showed that the efficacy of different tobacco extracts against major sucking insect pests at different treatments. Average reduction in the population of white fly on spray were 58.02%, 65.23%, 68.74%, and 71.46%, examined for T1, T2, T3 and T4, respectively. The results indicated that maximum mean reduction in the population of white fly against different tobacco leaf extract were examined for T4 (86.58%) followed by T3 (85.95%), T2 (83.71%), and T1 (79.83%). The average reduction in the population of jassids on spray was 47.31%, 37.22%, 34.76% and 54.81% examined for T1, T2, T3 and T4, respectively. Further results indicated that maximum population reduction of jassids against tobacco leaf extracts on spray were examined for T4 (88.51%) followed by T1 (83.99%), T2 (76.14%), and T3 (74.28%). Furthermore an average population reduction of aphids on spray was 54.71%, 53.86%, 53.60% and 63.55% examined for T1, T2, T3 and T4, respectively. The results indicated that the maximum population reduction of aphids against tobacco leaf extracts on spray were examined for T4 (92.22%) followed by T3 (87.75%), T1 (86.99%) and T2 (85.89%).

Keywords: Okra, tobacco extracts, population buildup, sucking complex, Pakistan

1. Introduction
The okra crop is infested by a number of insect pests like *Amrasca biguttula biguttula*, *Earias vittella, Bemisia tabaci, Helicoverpa armigera, Thrips tabaci, Aphis gossypii, Acrocercops bifasciata,* and *Nezara viridula* [1]. Among them white fly *Bemisia tabaci*, Jassid *Amrasca devastans* and Aphid *Aphis gossypii* are the major sucking insect pests of okra [2]. *B. tabaci*, is the notorious insect pest of okra which reduce the growth of okra but also transmit disease [3]. The white fly has more than 500 host plant species in which it has a reproductive and cosmopolitan ability to disperse and breed year around, regarding these phenomena white fly has developed resistance among many classes of insecticides [4]. As temperature dropped greatly during Jan-Feb the population of white fly also decrease and as temperature increase in April-May the pest infestation increased markedly. As well as RH (80-90%), with related temperature (36-38 °C) in Sep-Oct were found favorable in increase of white fly population. Recently jassid *Amarasca biguttula biguttula* is also increasing severe damage to vegetables and ornamental crops and it is very importantly leading pest among sucking insect pests which attack on okra crop [5]. Both nymphs and adults suck the cell sap from the lower surface of the leaves and during feeding also inject toxic saliva into plant tissues by which effected leaves of the plant turns to yellow and curl which automatically make un-functional photosynthetic activity of plants [6]. Jassids damage on okra from early seedling to fruit settings which results about 50% loss in okra yield [7]. Aphid *Aphis gossypii* is found all over the world in tropical regions. It remains active in optimum temperature. Aphid is a polyphagous insect and found on upper and lower surface of leaves near the base of the plant [8]. Aphids are vectors of viruses especially on cucurbit crops. The Extensive loss of cell sap results not only in low vigor but also inhibits plant growth. Moreover, all these sucking insect pests cause a great damage by sucking the plant sap. Insect pests cause 35-40% crop yield losses and ultimately

increase the level of damage up to 60-70% in optimal conditions [9]. The use of synthetic insecticides a quick method to control insect pests due to its quick knock down effects but it's also regarded that because of indiscriminate use of synthetic insecticide such problems in our environment are created *viz*: pest resistance, pest resurgence, chemical residues, destruction of beneficial fauna and environment [10] [11]. According to [12] about 2.5 million tons of pesticides are being applied worldwide every year and its application is also increasing time to time. As compare to 1990-91 in Pakistan application of pesticide is increased double in 2009-10 [13, 14] were also evaluated insecticide residue in vegetables due to heavy application of synthetic insecticides. Due to heavy residual effects of synthetic insecticides now a day's some botanical extracts are introduced and applying widely against sucking insect pests on vegetables. Bio-pesticides are very effective in small quantities, decompose quickly and they have less pollution problems. Bio-pesticides are less toxic to non-targeted natural enemies and generally affect only the target pest [15]. Therefore, keeping in view the losses caused by the sucking insect complex to the okra crop in Pakistan the present study is planned to evaluate most suitable and eco-friendly approach to control the sucking insect pest of okra through different tobacco varieties.

2. Material and Methods

The study was carried out at experimental field of Latif Farm Sindh Agriculture University Tandojam to determine the effect of different tobacco extracts on the population buildup of sucking complex in okra crop. The experiment was laid out in a randomized complete block design with 5 treatments and 5 replicates and five leaves were observed from each plant from top, middle and bottom. Each sub-plot size was measured as 5×4 meter plots with 75×60 cm spacing. The crop was sprayed with the following treatments.

2.1 Treatments

T1 Hazaropattar tobacco
T2 Desi tobacco
T3 Balkhi tobacco
T4 Gurakhu tobacco
T5 Control

The 2 kg leaves of each tobacco variety were grounded separately. The powder of the leaves of each variety was put and well mixed in 2 liter of water. The material was left for overnight, after 12 hours it was sieved by muslin cloth to have extract to be sprayed on okra crop. The pre-treatment count of sucking insects (white fly, jassids and aphid) population were recorded one day before spray by selecting 5 plants at randomly from each replication and tags were examined carefully and there average was workout. The post treatment count was made after 24, 48, 96, 120 hours and one week intervals. Experiment was also revised after 15 days. To observe the effectiveness of each tobacco variety, the reduction percentage of pest population was calculated by using [16] formula.

The collected data were subjected to statistical analysis using analysis of variance to know the significance of differences among treatments, and LSD (Least Significance Difference) test was also employed to compare different treatments for their efficacies against sucking insect pests of okra.

3. Results

In order to compared the effect of different tobacco extracts on the population buildup of sucking complex in okra crop at experimental field of Latif Farm Sindh Agriculture University Tandojam. The following leaf extracts of tobacco varieties (T1= Hazaropattar tobacco, T2= Desi tobacco, T3= Balkhi tobacco, T4= Gurakhu tobacco and T5= Control were distributed and sprayed on the crop.

3.1 Population buildup of white fly against leaf extracts of tobacco before and after spray

The data in (Table-1) showed that pre-treatment count of white fly 76.00, 86.20, 80.40, 96.20 and 86.80 nymph /five leaf of okra were determined for T1, T2, T3, T4 and T5. After spray, average mortality of white fly were recorded as 58.02%, 67.91%, 74.86%, 79.83%, 76.68% and 61.53% on T1, 65.23%, 73.61%, 80.70%, 83.71%, 81.86% and 71.69% on T2, 68.74%, 73.61%, 82.58%, 85.95%, 84.44% and 76.76% on T3, 71.46%, 78.24%, 83.73%, 86.58%, 85.29% and 78.59% on T4 after 24 hrs, 48 hrs, 72 hrs, 96 hrs, 120 hrs and one week, respectively. On average mortality of white fly on spray were 58.02%, 65.23%, 68.74%, and 71.46%, for T1, T2, T3 and T4, respectively.

The results indicated that maximum efficacy of tobacco leaf extract against white fly after spray were examined for T4 (86.58%) followed by T3 (85.95%), T2 (83.71%), and T1 (79.83%). Analysis of variance showed significant difference between time intervals ($P<0.05$) and treatments ($P<0.05$). Application of tobacco extracts resulted in the decline of pest population up to 96 hours.

Table 1: Population buildup of white fly against leaf extracts of tobacco before and after spray

Treatment	Pre-treatment	Post-treatment						Maximum efficacy (%)
		24 hrs	48 hrs	72 hrs	96 hrs	120hrs	1 week	
T1	76.00	33.00 (58.02)	26.80 (67.91)	23.20 (74.86)	19.00 (79.83)	23.80 (76.68)	46.00 (61.53)	79.83%
T2	86.20	31.00 (65.23)	25.00 (73.61)	20.20 (80.70)	17.40 (83.71)	21.00 (81.86)	38.40 (71.69)	83.71%
T3	80.40	26.00 (68.74)	20.00 (77.36)	17.00 (82.58)	14.00 (85.95)	16.80 (84.44)	29.40 (76.76)	85.95%
T4	96.20	28.40 (71.46)	23.00 (78.24)	19.00 (83.73)	16.00 (86.58)	19.00 (85.29)	32.40 (78.59)	86.58%
T5	86.80	89.80	95.40	105.40	107.60	116.60	136.60	

3.2 Population buildup of jassids against leaf extracts of tobacco before and after spray

The data in (Table-2) showed that pre-treatment count of jassids 58.20, 52.80, 53.80, 60.80 and 45.20 nymph /five leaf of okra were determined for T1, T2, T3, T4 and T5. After spray, average mortality of jassids were recorded as 47.31%, 65.91%, 79.33%, 83.99%, 83.23% and 72.89% on T1, 37.22%, 55.65%, 68.99%, 76.13%, 76.14% and 67.49% on T2, 34.76%, 52.25%, 65.80%, 74.28%, 72.45% and 65.12% on T3, 54.81%, 71.11%, 83.79%, 88.51%, 87.20% and 78.78% on T4 after 24 hrs, 48 hrs, 72 hrs, 96 hrs, 120 hrs and one week, respectively. On average mortality of jassids on spray was 47.31%, 37.22%, 34.76%, and 54.81%, for T1, T2, T3 and T4, respectively.

The results indicated that maximum efficacy of tobacco leaf extract against jassids on spray were examined for T4 (88.51%) followed by T1 (83.99%), T2 (76.14%), and T3 (74.28%). Analysis of variance showed significant difference between time intervals (P<0.05) and treatments (P<0.05). Application of tobacco extracts resulted in the decline of pest population up to 96 hours.

Table 2: Population buildup of jassids against leaf extracts of tobacco before and after spray

Treatment	Pre-treatment	Post-treatment						Maximum efficacy (%)
		24 hrs	48 hrs	72 hrs	96 hrs	120hrs	1 week	
T1	58.20	34.60 (47.31)	24.40 (65.91)	16.60 (79.33)	13.60 (83.99)	15.80 (83.23)	29.60 (72.89)	83.99%
T2	52.80	37.40 (37.22)	28.80 (55.65)	22.60 (68.99)	18.40 (76.13)	20.40 (76.14)	32.20 (67.49)	76.14%
T3	53.80	39.60 (34.76)	31.60 (52.25)	25.40 (65.80)	20.20 (74.28)	24.00 (72.45)	35.20 (65.12)	74.28%
T4	60.80	31.00 (54.81)	21.60 (71.11)	13.60 (83.79)	10.20 (88.51)	12.60 (87.20)	24.20 (78.78)	88.51%
T5	45.20	51.00	55.60	62.40	66.00	73.20	84.80	

3.3 Population buildup of aphids against leaf extracts of tobacco before and after spray

The data in (Table-3) showed that pre-treatment count of aphids 54.80, 60.00, 48.00, 55.00 and 34.20 nymph /five leaf of okra were determined for T1, T2, T3, T4 and T5. After spray, average mortality of aphids were recorded as 54.71%, 69.15%, 78.16%, 86.99%, 84.53% and 78.69% on T1, 53.86%, 69.20%, 77.61%, 85.89%, 84.46% and 79.55% on T2, 53.60%, 69.15%, 79.30%, 87.75%, 85.55% and 78.88% on T3, 63.55%, 76.17%, 87.07%, 92.22%, 89.77% and 84.69% on T4 after 24 hrs, 48 hrs, 72 hrs, 96 hrs, 120 hrs and one week, respectively. On average mortality of aphids on spray was 54.71%, 53.86%, 53.60%, and 63.55%, for T1, T2, T3 and T4, respectively.

The results indicated that maximum efficacy of tobacco leaf extracts against aphids on spray were examined for T4 (92.22%) followed by T3 (87.75%), T1 (86.99%) and T2 (85.89%). Analysis of variance showed significant difference between time intervals (P<0.05) and treatments (P<0.05). Application of tobacco extracts resulted in the decline of pest population up to 96 hours.

Table 3: Population buildup of aphids against leaf extracts of tobacco before and after spray

Treatment	Pre-treatment	Post-treatment						Maximum efficacy (%)
		24 hrs	48 hrs	72 hrs	96 hrs	120hrs	1 week	
T1	54.80	31.20 (54.71)	25.80 (69.15)	21.20 (78.16)	16.00 (86.99)	22.00 (84.53)	39.40 (78.69)	86.99%
T2	60.00	34.80 (53.86)	28.20 (69.20)	23.80 (77.61)	19.00 (85.89)	24.20 (84.46)	41.40 (79.55)	85.89%
T3	48.00	28.00 (53.60)	22.60 (69.15)	17.60 (79.30)	13.20 (87.75)	18.00 (85.55)	34.20 (78.88)	87.75%
T4	55.00	25.20 (63.55)	20.00 (76.17)	12.60 (87.07)	9.60 (92.22)	14.60 (89.77)	28.40 (84.69)	92.22%
T5	34.20	43.00	52.20	60.60	76.80	88.80	115.40	

4. Discussion

Sucking insect pests like white fly, jassids and aphids are most serious insect pests of vegetables and ornamental crops. They cause serious damage by sucking cell sap from underside of the leaves and also transmit the viruses. The Extensive loss of cell sap results not only in low vigor but also inhibits plant growth. Moreover, all these sucking insect pests cause a great damage by sucking the plant sap. Insect pests cause 35-40% crop yield losses and ultimately increase the level of damage up to 60-70% in optimal conditions [9]. In current findings average efficacy of tobacco leaf extracts were examined against white fly after spray T1 (58.02-55.56%), T2 (65.23-54.22%), T3 (68.74-57.50%) and T4 (71.46-52.53%), respectively. And maximum efficacy of tobacco leaf extracts against white fly were examined after spray T4 Gurakhu (86.58-82.13%), T3 Balkhi (85.95-84.26%), T2 Desi (83.71-80.98%), and T1 Hazaropattar (79.83-79.31%), respectively. Average efficacy of tobacco leaf extracts spray against jassids was T1 (47.31-43.02%), T2 (37.22-42.40%), T3 (34.76-38.97%) and T4 (54.81-59.60%), respectively. And the maximum efficacy of tobacco leaf extract against jassids were examined for spray T4 Gurakhu (88.51-90.42%), T1 Hazaropattar (83.99-81.99%), T2 Desi (76.14-77.43%), and T3 Balkhi (74.28-72.95%), respectively. Average efficacy of tobacco leaf extracts spray against aphids was T1 (54.71-42.06%), T2 (53.86-52.24%), T3 (53.60-51.97%), and T4 (63.55-63.80%), respectively. And the maximum efficacy of tobacco leaf extracts against aphids were examined for T4

Gurakhu (92.22-89.32%), T3 Balkhi (87.75-81.55%), T1 Hazaropattar (86.99-73.15%) and T2 Desi (85.89-69.52%), respectively.

Furthermore, results are suggested with [17] that synthetic insecticides have toxicity which harms the farmers, consumers and the environment. Bio-pesticides effect only on targeted pests and these are less effective to bio-control agents. [18] Evaluated that *N. tabacum* was very effective as *A.vera*, but more effective than other treatments in managing aphid upto 96.73 per plant. [19] Determined the plant extracts like neem, tobacco, onion and dhatura were tested against aphid which showed that mortality of all instars of aphid were caused by tobacco, neem, dhatura and onion, respectively. [20] Examined the efficacy of different plant extracts such as Neem, Dhatura, Tooh, Tobacco, one chemical pesticide (Confidor SL200 @250 ml/acre) and untreated (check). Three pests of tomato *viz;* white fly, thrips and aphids were treated and data showed that among bio-pesticides chemical insecticide showed highest mortality followed by neem, tooh, dhatura and tobacco.

5. Conclusions

All the extracts of the tobacco varieties were performed well in the population reduction of white fly, jassids and aphids. Spray against white fly Gurakhu and Balkhi varieties leaf extracts was reduced maximum population. Against jassids Gurakhu and Hazaropattar varieties leaf extracts was also shown maximum reduction. The maximum reduction in the population of aphids was recorded by using Gurakhu and Balkhi varieties leaf extracts. This study proved that insect pests can be managed in field with some bio-pesticides. Even though, some tobacco varieties have shown noticeable efficacy against white fly, jassid and aphid on okra crop. Furthermore, understanding the phenomena of tobacco extracts perspective precise of controlling such harm full insect pests and taking advantage of their implementation by farmers.

6. Acknowledgment

We are thankful to teachers of our department who helped us on each and every step of this research.

7. References

1. Dubey VK, Bhagat KP, Yadu YK. Insect Pest succession studies on okra. J. of Applied Zoological researches. 1999; 10(2):144-145.
2. Atwal SN. Agricultural pests of India and South-East Asia. Kalyani Publishers, New Delhi, India, 1994, 529.
3. Lohar MK. Biological control. In Applied entomology Published by Dr. Kashif Raza under Kashif Publication, Hyderabad, 2001, 147-167.
4. Lanjar AG, Sahito HA. Effect of some spring hosts on the life cycle of White fly, *Bemisia tabaci* (Genn). Pakistan j. Entomol Karachi. 2005; 20(1,2):17-23.
5. Dhandapani N, Shelkar UR, Murugan M. Biointensive pest management (BIPM) in major vegetable crops: an Indian perspective. Food Agric. Envir. 2003; 1(2):333-339.
6. Singh S, Choudhary DP, Sharma HC, Mahla RS, Mathur YS, Ahuja DB. Effect of nsecticidal modules against jassid and shoot and fruit borer in okra, Indian J Entomol. 2008; 70(3):197-199.
7. Bindra OS, Mahal MS. Varietal resistance in egg plant (brinjal) (Solanum melongena) to the cotton jassid (*Amrasca biguttula biguttula*). Phytoparasitica. 1981; 9(2):119-131.
8. Matthews GA. Cotton Insect Pests and Their Management. Longman Scientific & Technical, Harlow, Essex, UK, and John Wiley & Sons, New York. 1989, 199.
9. Salim M. Diversity: role in integrated pest management. Sci. Tech. Dev. 1999; 18(4):26-31.
10. Malik MU, Javeed H, Ayyaz M. Evaluation of Different Groundnut *Arachis hypogeal* L. Cultivars Against Termit, *Odontotermes obesus* (Rambur) in Rawalpindi, Pakistan. Turkish Journal of Agriculture-Food Science and Technology. 2015; 1-3(6):448-452.
11. Hassan S, YA Jesse, Gabdo HB. Pesticide utilization in *Mubiarea* and associated hazards, Surv. J Sustainable Dev. Agric. Environ. 2007; 3:89-95.
12. Food and Agricultural Organization (FAO). FAO/WHO global forum of food safety regulators. Marrakech, Morocco, 2002.
13. Economic Survey of Pakistan. Finance Division, Government of Pakistan, Islamabad, 2010.
14. Masud SZ, Hassan N. Pesticide residues in foodstuffs in Pakistan organochlorine, organophosphorous and pyrethroid insecticides in fruits and vegetables. Pak. J. Sci. Ind. Res. 1992; 35:499-499.
15. Patel PS, Patel GM, Shukla NP. Evaluation of different modules for the management of pest complex of okra. Pestology. 2009; 33(2):31-37.
16. Fleming R, Retnakaran A. Evaluating single treatment data using Abbot's formula with modification. J Econ. Entomol. 1985; 87(6):1179-1181.
17. Khater HF. Prospectus of botanical bio-pesticides in insect pest management. Pharmacologia. 2012; 3(12):641-656.
18. Sarwar M. The inhibitory properties of organic pest control agents against Aphid (Aphididae: Homoptera) on Canola *Brassica napus* L. (Brassicaceae) under field environment. IJSRES. 2103; 1(8):195-201.
19. Abid B. Toxicity of selected plant extracts against wheat aphid and its predators. Appl. Sci. Bus. Econ. 2014; 2(2):33-39.
20. Solangi BK, Suthar V, Sultana R, Abassi AR, Nadeem M, Solangi MN. Screening of bio-pesticides against insect pests of tomato. European Academic Research. 2014; 2(5):6999-7018.