East African Scholars Journal of Agriculture and Life Sciences
Abbreviated Key Title: East African Scholars J Agri Life Sci
ISSN 2617-4472 (Print) | ISSN 2617-7277 (Online)
Published By East African Scholars Publisher, Kenya

Volume-9 | Issue-1 | Jan-2026 | DOI: https://doi.org/10.36349/easjals.2026.v09i01.001

OPEN ACCESS

Original Research Article

Effect of Some Botanical Oils on the Control of the Cotton Jassid, *Jacobiasca lybica* (De Berg) (Hemiptera: Cicadellidae) on Eggplant at Gezira and Khartoum States, Sudan

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Article History
Received: 19.10.2025
Accepted: 22.12.2025
Published: 21.01.2026

Journal homepage:
http://www.easpublisher.com

Quick Response Code

Abstract: Eggplant, *Solanum melongena* L., is one of the major vegetable crops in the Sudan. Eggplant is infested by some species of insect pests. However, the cotton jassid (*Jacobiasca lybica*) is the major one. This study was conducted to investigate the effects of botanical oils, castor bean seed oil, cotton seed oil and sunflower seed oil on population of the cotton jassid on eggplant, cultivar Wizzo. Two field experiments were executed during season 2015/16 at two sites, the experimental farm in the Faculty of Agricultural Sciences, University of Gezira and Elalafoon at the eastern Bank of the Blue Nile, in Khartoum state. The experiments in both sites were arranged in Randomized Complete Block Design (RCBD) with four replications. The botanical seed oils at a concentration of 5% were applied at 7 days interval with four sprays. Post-treatment observations on number of jassid were taken after 2 days from the application. The results indicated that all oil treatments were apparently effective against the cotton Jassid compared to the untreated control. The study found that the cotton seed oil was more effective in reducing the number of Jassid on eggplant (64 insects/100 leaves) followed by sunflower seed oil (132 insects/100 leaves), castor bean seed oil (140 insects/100 leaves) and the untreated control (312 insects/ 100 leaves) at Wad Medani site while, at Khartoum Site the cotton seed oil recorded high reduction of jassid population (92 insects/100 leaves) followed by castor bean seed oil (140 insects/100 leaves), sunflower oil (208 insects/100 leaves) and the untreated control (608 insects/ 100 leaves). This study recommended that, cotton seed oil can be used to reduce the number of cottons jassid on the eggplant crop.

Keywords: Eggplant, *Solanum melongena, Jacobiasca lybica*, Botanical oils, Cottonseed oil, Sudan.

INTRODUCTION

Vegetable production in the Sudan is rapidly increasing in order to meet the needs of the growing population. Tomato, onion, eggplant and okra are the major vegetable crops grown in the country. They are rich in vitamins, minerals and very efficient in the utilization of land area. The total production of vegetable crops is not high enough to meet the people's consumption throughout the year. Insect pests, diseases and weeds are among the key factors causing this shortage. Estimated losses due to them can reach 25% (Mohamed *et al.,*1984). Eggplant, *Solanum melongena*n L, is one of the major vegetable crops in the country, mainly in the Central Region. It can be cooked and eaten, prepared in variety of different ways. It is very rich in vitamins, minerals and very efficient in the utilizations of land area. One cooked cup contains; calories 27.7 grams, protein 0.82 gram, carbohydrates 6.57 grams, dietary fiber 2.47 grams, phosphorus 21.78 mg, potassium 245.52mg and foliate 14.26 mg. (Abdelmagid, 2003). Eggplant suffers from different types of insect pests, diseases, nematodes and weeds. The major insect pests of eggplant reported include Jassid *Jacobiasca lybica* (*J. lybica*) De Berg, Aphid (*Aphis gossypii* Lev.), and whitefly *Bemisia tabaci* Genn. The major diseases of eggplant reported include powdery mildew, *Leveillula taurica* lev., leaf spot, *Alternaria solani* Ell, and Damping-off *Pythium debaryanum* Hesse. However, the jassid*, J. lybica, is* considered as a major pest of the foliage causing considerable damage to the leaves (hopper burn) and results in shedding of flowers and small fruits (Schmutterer,1969).

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The Objective of this study was to evaluate the efficacy of some botanical oils for the management of the cotton jassid on eggplant crop.

MATERIALS AND METHODS

The study was carried out in two sites during season (2015/2016) to evaluate the effects of some botanical oils against jassid on the eggplant crop: the first site at the Experimental Farm, University of Gezira experimental farm (lat. 14° 24` N, long. 33° 29′ E) in the Gezira State and the second site at the eastern Bank of the Blue Nile (Elalafoon) in Khartoum State. The seeds of cotton and sunflower were obtained from the Agricultural Research Corporation, Gezira Research Station. The seeds of castor bean were obtained from Wad Medani local market.

The seeds were pressed for oil extraction in the National Oil seeds Processing Research Institute (NOPRI), University of Gezira, Wad Medani, Sudan. The obtained oils were diluted with water and applied as aqueous solutions mixed with few drops of liquid soap. The mixture was shaken well in tightly closed plastic containers.

Eggplant cultivar used, Wizzo, was obtained from a known source at the vegetables central market, Wad Medani, Sudan.

Treatments and experimental design

In both sites each experiment was arranged in a Randomized Complete Block Design (RCBD) with four replications. The replications in both sites consisted of 4 treatments. Botanical oils were evaluated at 5% concentration (ml/lit). The treatments were as follows.

1- Castor bean seed oil.
2- Cotton seed oil.
3- Sunflower seed oil.
4- Untreated control.

How many replications/ how many blocks?

Cultural practices such as weeding, irrigation and fertilization were performed according to the recommendations of the Agriculture Research Corporation (ARC) for eggplant production.

Eggplant seeds (Wizzo) were sown in the nursery on October 2015. After six weeks, the seedlings were transplanted. Regular watering was performed 2-3 days at the seedling stage, and 6-8 days afterwards as needed. Nitrogen fertilizer was used at the rate of 80 Kg urea 46%/feddan splited into two doses for each experimental site. Hand weeding was done to minimize competition of weeds with the crop and then to remove jassid alternative hosts as well. On each site, the experimental area was prepared and divided into four blocks and then each block was divided into four subplots (3.0m × 3.5m). The subplot contained 5 ridges and each ridge was 3.5 m long with 0.80 m spacing between ridges. A distance of two meters was left between plots within the replicates to avoid plot to plot effects. Each ridge was planted with 7 plants with spacing 50cm between plants.

Sampling technique

The crop was sprayed at the interval of 7 days at each replication with a knapsack sprayer. The first application of oil was done one month after transplanting of the seedlings. Post-count observations were taken after two days throughout the study. To assess the population of jassid (adult and nymph), data were recorded visually during early morning hours by counting the number of jassids from five leaves on lower sides at top, mid and bottom parts of the 5 randomly selected plants from each treatment or subplot.

Efficacy of the tested products was evaluated against jassid at post –spray counts. Evaluation of the biological efficacy of the product was based on the reduction in population of jassid at each spray relative to the control throughout the seasons (4 readings).

Data Analysis

The data was subjected to statistical manipulation through the application of the Analysis of variance (ANOVA) after appropriate transformation. Mean separation was performed based on Duncan's Multiple Range Test (DMRT). The computer package Statistical Analysis System (SAS) was used for all data analysis.

RESULTS

Effect of different treatments on number of the cotton jassid on eggplant, Wad Medani site

Data presented in (Table 1 and Figure 1) show the reduction of jassid number by the tested products in the first site throughout season 2015/2016. It is apparent from these results that reduction was significantly higher in all treatments compared with the control. No significant differences were found between oil treatments in first, second and third spray. In the fourth spray the reduction was significantly higher in case of cotton seed oils (12 insects) than sunflower oil (40 insects) and castor bean oil(66 insects), respectively. In the first spray, the cotton seed oil scored the highest reduction (6insects), followed by sunflower oil (13 insects) and castor bean oil (16 insects), respectively In the second spray the cotton seed oil recorded highest reduction (27 insects), followed by castor bean seed oil (30 insects) and sunflower seed oil (41 insects). In the third spray, the cotton seed oil recorded the highest reduction (17 insects), followed by castor bean seed oil (29 insects) and sunflower seed oil (37 insects). The overall mean of the four sprays showed that the reduction in number of jassid was significantly higher in case of Cotton seed oil (16 insects) compared with sunflower seed oil (33 insects) and castor bean seed oil (35 insects), respectively (Fig.2).

Table (1): Effect of spraying of some plant seeds oils on number of the cotton jassid on eggplant, Wad Medani, Season 2015/16

Treatments		Mean number of jassids / 25 leaves				Grand mean
	Pre spray	First spray	Second spray	Third spray	Fourth spray	
Cotton seed oil	15	6 b (2.60)	27 b (5.24)	17 b (4.21)	12 c (3.54)	16 c (4.02)
Sunflower oil	23.25	13 ab (3.71)	41 b (6.46)	37 b (6.12)	40 b (6.36)	33 b (5.78)
Castor bean oil	40	16 ab (4.09)	30 b (5.55)	29 b (5.43)	66 b (8.14)	35 b (5.98)
Control	18.5	25 a (5.07)	94 a (9.71)	88 a (9.38)	108 a (10.39)	79 a (8.89)
SE±		0.72	0.70	0.78	0.68	0.51
CV%		40.22	21.12	25.27	19.48	16.98

* Data between two brackets are transformed $\sqrt{x + 0.5}$

* Means in the same column followed by the same letter(s) are not significantly different according to Duncan's Multiple Range Test ($P \leq 0.05$).

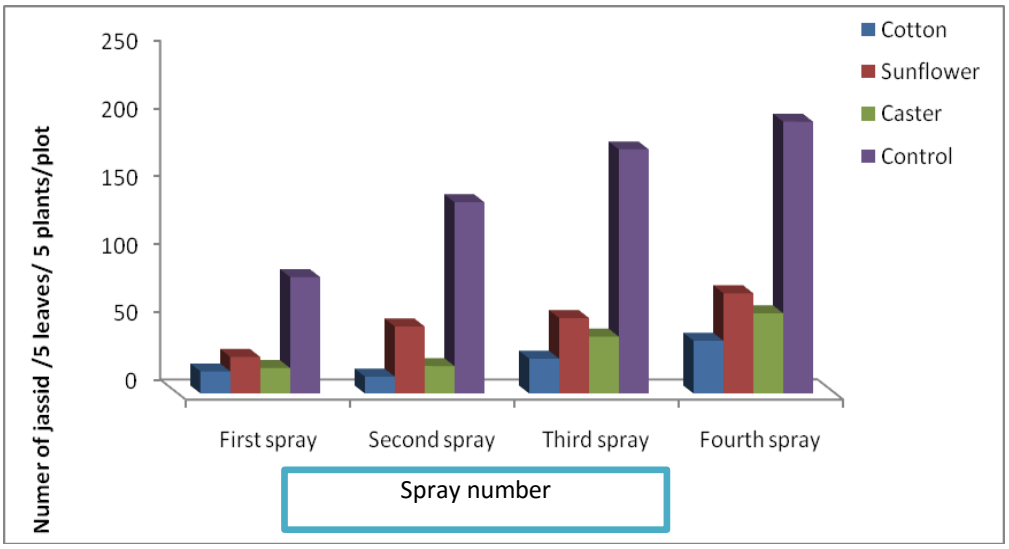

Fig. 1: Effect of spraying of some plant seeds oils on number of the cotton jassid on eggplant, Wad Medani, Season 2015/16

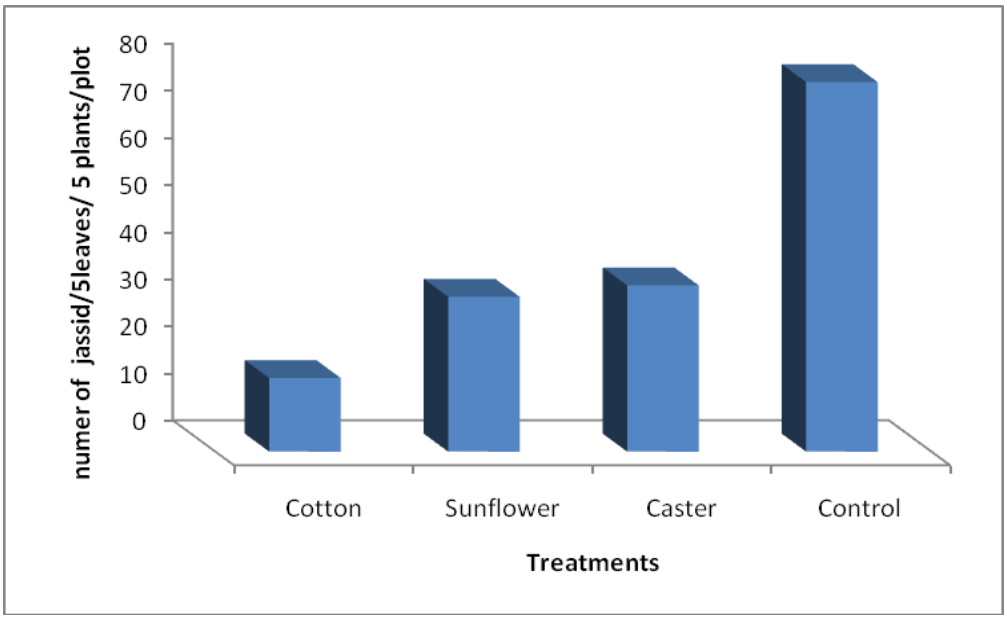

Fig. 2: Over all mean number of cottons jassid on eggplant sprayed with some botanical oils, Wad Medani, Season 2015/16

Effect of different treatments on number of the cotton jassid on eggplant, Khartoum site

The data regarding the number of Jassid at Khartoum site recorded at 7 days interval after application of plant oil on eggplant (4 readings) are described in (Table 2 and Fig 3). It is apparent from these results that reduction was significantly higher in all treatments compared with the control. In the first spray, the cotton seed oil hasrecorded the highest reduction (16 insects), followed by castor bean seed oil (18 insects) and sunflower seed oil (27 insects), respectively. In the second spray the cotton seed oil (13 insects) and castor bean seed oil (20 insects) were significantly higher than sunflower seed oil (50 insects). In the third spray, the cotton seed oil (26 insects) was significantly higher than castor bean seed oil (42 insects) and sunflower seed oil (56 insects). In the fourth spray the reduction was significantly higher in the case of cotton seed oil (39 insects) than castor bean seed oil (59 insects) and sunflower seed oil (74 insects), respectively. The overall mean of the four sprays showed that reduction was significantly higher in case of cotton seed oil (23insects) and castor bean seed oil (35 insects), respectively compared with sunflower seed oil (52 insects) (Fig.4). Generally, the cotton seed oil performed the best control of jassid followed by castor bean seed oil and sunflower seed oil, respectively.

Table (2): Effect of spraying of some plant seed oils on number of the cotton jassid on eggplant, Khartoum, Season 2015/16

Treatments		Mean number of jassids / 25 leaves				Grand mean
	Pre spray	First spray	Second spray	Third spray	Fourth spray	
Cotton seed oil	69.5	16 b (4.09)	13 c (3.61)	26 c (5.12)	39 c (6.28)	23 c (4.78)
Sunflower oil	73.25	27 b (5.24)	50 b (7.07)	56 b (7.50)	74 b (8.63)	52 b (7.11)
Castor bean oil	89.5	18 b (4.39)	20 c (4.56)	42 bc (6.52)	59 b (7.73)	35 c (5.80)
Control	69.75	86 a (9.30)	141 a (11.91)	180 a (13.44)	201 a (14.19)	152 a (12.21)
SE±		0.85	0.65	0.68	0.44	0.35
CV%		30.41	19.60	16.88	9.67	9.36

* Data between two brackets are transformed $\sqrt{x + 0.5}$

* Means in the same column followed by the same letter(s) are not significantly different according to Duncan's Multiple Range Test ($P \leq 0.05$).\'+

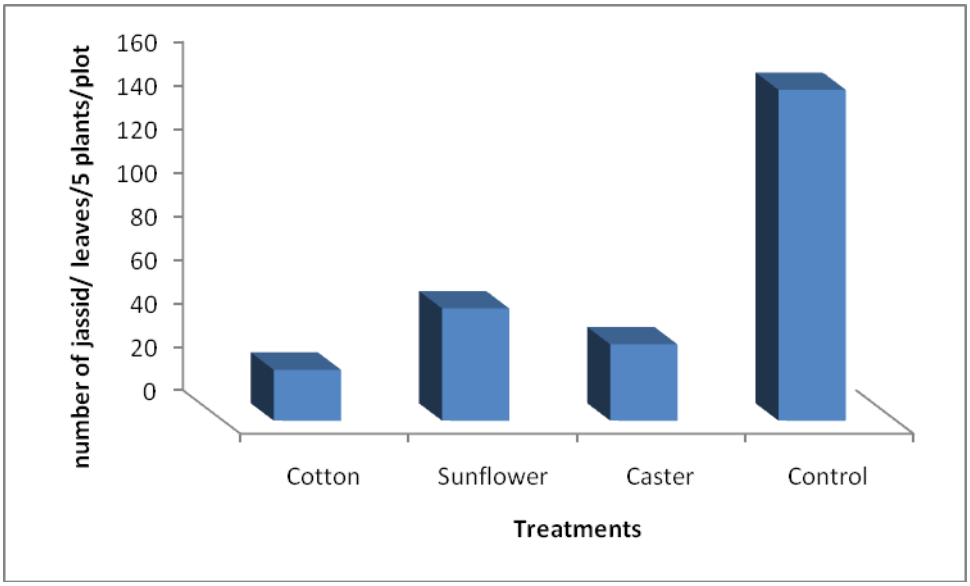

Fig.3. Effect of spraying of some plant seed oils on number of cottons jassid on eggplant, Khartoum, Season 2015/16

DISCUSSION

In Sudan, the use of insecticides was the main adopted method to control jassid. These insecticides represent a wide diversity of chemicals, which has led to substantial concerns over health and environmental impacts to human, animals, birds, invertebrates and soil micro-organisms in addition to the development of resistance (Inglis *et al.,* 2001). Due to the over use of

chemicals, botanicals are used as alternative technique for the control of sucking insect pests (Santos and Cost, 2004).

The present study on the effect of different plant seed oils on eggplant against jassid was carried out during season 2015/16. Four sprays were applied at two sites. The products evaluated included cotton seed oil, sunflower seed oil and castor bean seed oil. The study found that the cotton seed oil was more effective in controlling Jassid on eggplant followed by sunflower seed oil and castor bean seed oil at Wad Medani site while, at Khartoum Site the cotton seed oil also recorded high reduction followed by castor bean seed oil and sunflower seed oil.

Generally, all oils showed effective drop in the management of jassid compared to the control but the cotton seed oil gave the best result in controlling jassid population at the two sites. This result agrees with the findings of lubna *et al*. (2017) who reported that the cotton seed oil was found to be more effective in reducing the population of sucking insect complex specially jassid compared to other oils (neem oil, cooking oil, linseed oil). The findings are also consistent with the results of Wessal (2010) who reported that the cotton seed oil gave better results than the sunflower on onion thrips.

It could be concluded that the botanical oils such as cotton seeds oil, castor bean seed oil and sunflower seed oil are effective against jassids on eggplant.

It was noticed that the cotton seeds oil was more effective for controlling jassids compared with castor bean seed oil and sunflower seed oil.

REFERENCES

- Abdelmagid, M. (2003). An integrated pest management approach for the Jassid *Jacobiasca lybica* De Berg, on eggplant. M.Sc. Thesis, University of Gezira, Sudan.
- Inglis, G.D.; Goettel, M.S.; Butt, T.M. and Strasser, H. (2001). Use of hyphomycetous fungi for managing insect pests. In: Butt TM, Jackson C, Magan, N. (eds.): Fungi as bio-control agents' progress, problems and potential. Wallingford, UK: CABI.
- Lubna, B.R.; Arfan, A., Aslam, B. and Niaz, A.W. (2017). Impact of Different Oils as Bio-pesticide against Sucking Insect Pests in Cotton. Journal of Basic & Applied Sciences, 2017, 13, 34-40
- Mohamed, E.G.; Fadual, G.M. and Heinz, B. (1984). A survey of insect pest disease and weed on vegetables in Khartoum province. Acta, Horticulture 18th African Symposium on Horticultural Crops. No .143: 359-367.
- Santos, T.M.D. and Costa, N.P., 2004 Effect of neem extract on the cotton aphid. pesq. agro pec. Bras., 39: 1071-1076.
- Schmutterer, H. (1969). Pests of crops in north east and central Africa. Stuttgart and Portland. Gustav Fischer Verlag.
- Wessal, Y.H.A. (2010). Studies on the use of some botanical oils and petroleum oil for the control of onion *Thrips tabaci* (Thysanoptera: Tripixidae) and onion yield. Ph.D. Thesis University of Gezira, 2010.

Cite This Article: Mohamed B. M. Hassan, Faiza E. E. Salah, Adil Khider Balla (2026). Effect of Some Botanical Oils on the Control of the Cotton Jassid, *Jacobiasca lybica* (De Berg) (Hemiptera: Cicadellidae) on Eggplant at Gezira and Khartoum States, Sudan. *East African Scholars J Agri Life Sci, 9*(1), 1-5.