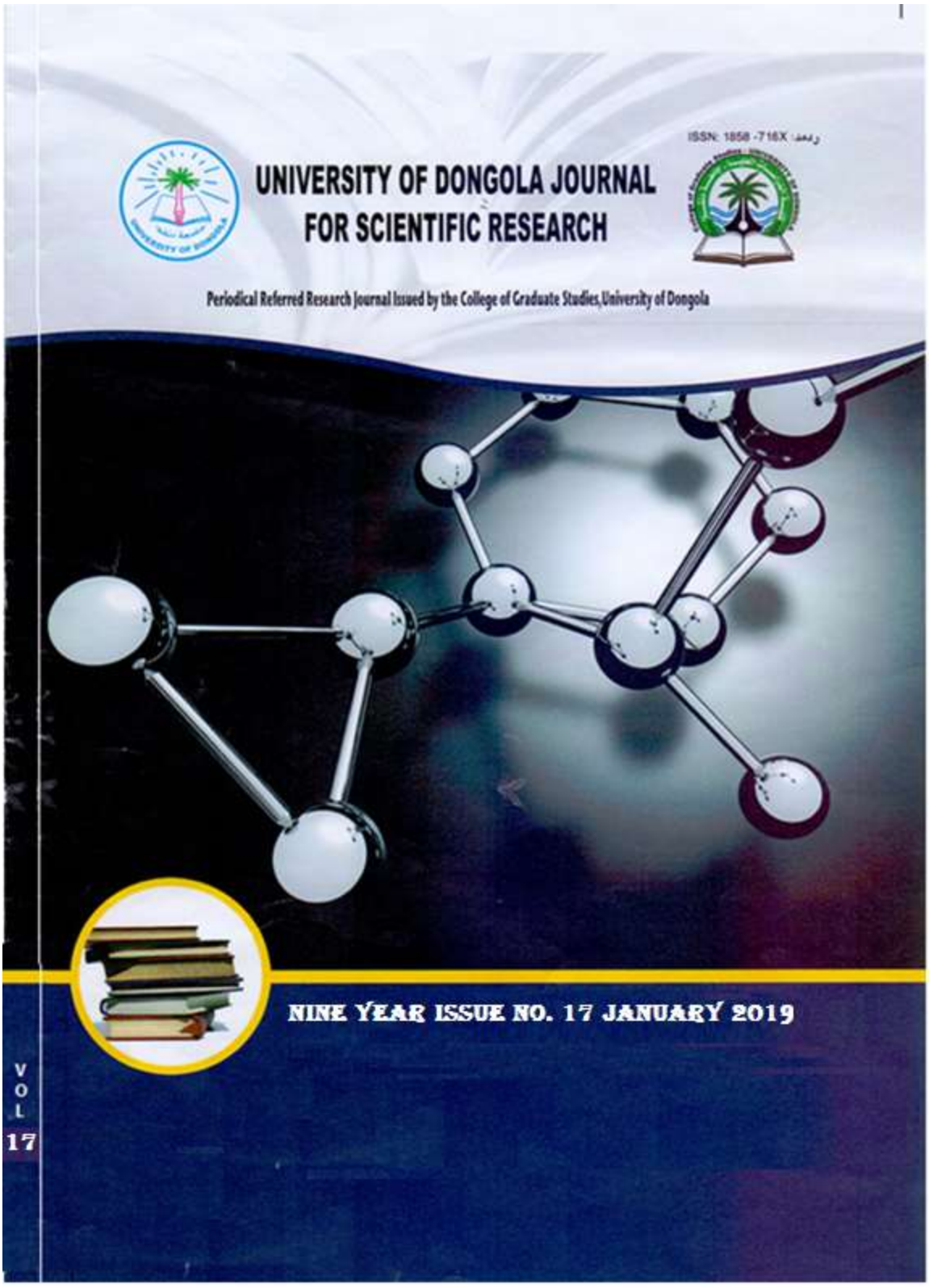
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تصدر عن كلية الدراسات العليا – جامعة دنقلا

مجلة جامعة دنقلا للبحث العلمي

مجلة نصف سنوية علمية محكمة

تصدر عن كلية الدراسات العليا – جامعة دنقلا

دنقلا – السودان

مقدمـة:

مجلة جامعة دنقلا للبحث العلمي مجلة تصدر عن كلية الدراسات العليا بجامعة دنقلا، وهي مجلة نصف سنوية علمية محكمة، تسهم في توسيع دائرة العلم والمعرفة، وذلك من خلال نشر البحوث والأوراق العلمية، التي تتوافر فيها الأصالة والمنهجية والفائدة العلمية ووفق هذه الرؤية ترحب المجلة بإسهامات الأساتذة الباحثين من داخل وخارج الجامعة والتي تتوفر فيها كل أساسيات البحث العلمي، شريطة أن لا تكون الإسهامات قد نشرت من قبل أو تحت إجراء النشر في أي مجلة أخرى.

قواعد النشر:

- ترحب المجلة بالبحوث في ثلاث نسخ مطبوعة علي وجه واحد على ورق A4 بفراغات مزدوجة وهوامش 2.5 سم، على أن لا يزيد حجم البحث عن أربعين صفحة شاملة الملخصين والموضوع والمراجع والملاحق. ويكون حجم الحرف (14) وترقم الصفحات في الأسفل على الجانب الأيسر بشكل متسلسل.
- يجب أن يحتوي البحث على ملخص بحدود (10) أسطر باللغة الأصلية للبحث (عربي، الإنجليزية). بالإضافة إلى ملخصٍ وافٍ باللغة الإنجليزية إذا كان البحث مكتوباً باللغة العربية، وملخصٍ وافٍ باللغة العربية إذا كان البحث مكتوباً باللغة الإنجليزية.
- يكتب في بداية البحث: عنوان البحث، واسم الباحث، القسم، الكلية، الجامعة، المدينة، البلد، والكلمات المفتاحية Keywords باللغتين العربية والإنجليزية.
- يجب أن تتبع الطريقة العلمية المثلى لعرض البحث أو الورقة من حيث الخلاصة ومناهج ووسائل البحث، وعرض الموضوع وتحليله، والنتائج التي تم التوصل إليها، والتوصيات المقدمة، وقائمة المراجع وفق المنهج المتبع.
- يجب أن يراعى ترقيم الجداول والأشكال والرسومات والصور المرسومة بالحبر الأسود، مع الإيضاح المقابل لكلٍ، على أن تكون واضحة عند إعادة إنتاجها.
- تخضع البحوث المقدّمة للنشر، للتقويم من قبل مختصين في موضوع البحث.
- في حالة البحوث والأوراق المستلة، يجب توضيح الدرجة التي منحت للرسالة وزمانها، والجامعة التي قدمت لها، واللجنة التي قومتها.

- بعد التحكيم يطلب من الباحث تسليم البحث في قرص مدمج (CD).
- يحق لهيئة التحرير إجراء التغيرات التي تراها ضرورية لأغراض الصياغة أو تصويب الأخطاء النحوية، أو الترقيم.
- يرجي من الباحثين إرفاق سيرتهم الذاتية.
- يحق لمن ينشر له بحث في المجلة نسختين من العدد المعني.
- المجلة غير ملزمة برد الأوراق التي لم يتم اعتمادها للنشر، وترسل إفادة بعدم النشر للكاتب.
- ترسل الأوراق إلى المجلة على العنوان التالي:

مجلة جامعة دنقلا للبحث العلمي

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كلمة العدد

بسم الله الرحمن الرحيم

يطيب لي أن أضع بين أيديكم العدد السابع عشر لمجلة جامعة دنقلا والتي تصدرها كلية الدراسات وهى حبلى بعدد من المواضيع ذات الطابع العصري ومزيج من التنوع العلمي والثقافي للكُتاب السودانيين من مختلفة الجامعات السودانية والمؤسسات العلمية الرائدة وبعض المشاركات من الباحثين العرب الذين درجوا على إيصال مشاركاتهم عبر مجلة جامعة دنقلا وذلك نسبة لسهولة التواصل والاتصال معهم وهيئة التحرير والتي تعمل بروح الفريق الواحد .

نلتمس العزر للذين لم تحظ أبحاثهم بالنشر حتى الآن لظروف خارجة عن إرادة إدارة هيئة التحرير وحتماً سوف ترى النور قريباً وتؤكد حرصنا التام والإصرار في المضي قدماً لتحقيق أفضل وأجود خدمات النشر العلمي لتلبية رغبات الباحثين فهي غايةٌ نسعى لها دوماً .

من هنا أحب أن أزجي الشكر والتقدير لكل قُراء مجلة جامعة دنقلا والتحية موصولة للزملاء في هيئة التحرير والسادة مستشاري التحرير وكل من أسهم في صدور هذا العدد .

رئيس هيئة التحرير

الفـهرس

Study on the effect of Sesame, groundnut and sunflower oils for the control of onion thrips (*Thrips tabaci* Lind.; Thysanoptera: Thripidae).

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ABSTRACT

The field experiments were carried out in two successive seasons in Gezira State. The experiments aimed at studying the efficacy of some botanical oils including Sesame, groundnut and sunflower oils on thrips, *Thrips tabaci* (Lind.) population compared to the standard commercial insecticide Karate 5% EC (lambda–cyhalothrin). The results indicated that all oil treatments were apparently very effective against the onion thrips compared to the untreated control. Significant differences in the number of insects were encountered on onion plant in season 2006/07. However, during season 2007/08 highly significant differences were found in the onion thrips population. Sesame oil was found to be more effective in controlling the pest followed by groundnut oil, and sunflower oil, respectively. The oil treatments decreased thrips population within 2-7days.The data revealed that the best performance of the tested oils was obtained when the higher concentrations were administered in all treated plots. Karate treatment gave the best control of onion thrips and this was reflected in the high percentage mortality.

INTRODUCTION

Onion (*Allium cepa* L.) is one of the most important vegetable crops worldwide, used by all people for its nutritional and medicinal values. The plant originated in southeast Asia, and introduced in Sudan long time ago (Hala, 2001).The main producing areas for onion in Sudan are : Kassala in the Eastern State, Dongola and Shendi in the Northern State, Zalengi in Darfur State, Gezira and Rahad Schemes (Elhassan, 1994). Onion is the main vegetable crop in the Gezira State, which represents about 42% of the total vegetables area grown in the Gezira Scheme and 28% of the whole area grown in the Scheme. The crop suffers from the attack of many insect pests and diseases, which significantly affect the yield quantitatively and qualitatively. In the field, the crop is attacked by various insect pests but onion thrips (*Thrips tabaci*) is considered as one of the most important limiting factors affecting both productivity and quality of onion and caused tremendous losses to the crop if not well managed (Bakheit, 1993). Onion is normally transplanted during October when the thrips population is negligible under Gezira conditions. Transplanting afterwards renders the crop under severe thrips attack. Early transplanted onion can produce higher yields because they are usually well established, before the onset of infestation which later becomes severe. However, late transplanted onion attracts thrips

which rapidly multiplies, increase the extent of damage and produces lower yield.

Chemical insecticide application is the most commonly used control measure and intensively adopted by farmers. Large-scale usage of pesticides has become a source of great concern because of its possible effects on human health and on non target components of the environment (Elzorgani and Abbadi, 1978).

Integrated pest management (IPM) strategies were directed towards implementation of various control practices, such as cultural, biological, chemical measures and resistant cultivars inorder to judiciously managing the pests and diseases without disturbance to the biological equilibrium and intoxication to the environment. Thus minimizing the number of sprays and reducing the cost of crop production (Abdelrahman *et al.,* 1992). Obviously, the research needed is to find alternative methods of control, complementary and not antagonistic to chemical control. This paper reported on the efficacy of some edible oils in comparison to the conventional standard insecticide application for the control of onion thrips.

MATERIALS AND METHODS

The study was carried out in two seasons (2006/2007 and 2007/2008), at the Gezira state; in the Gezira Scheme, Massalamia Group, Nidiana block. In each season the experimental area was prepared according to the standard recommended land preparation procedures adopted by farmers for successful onion production (Kannan and Mohmed 2004).

The efficacy of some botanical oils; including sesame oil, sunflower oil and groundnut oil for the control of onion thrips in onion were tested in comparison to the standard commercial insecticide Karate 5% EC (lambda – cyhalothrin)/ during two production seasons (2006/07 and 2007/08). The oils were obtained from Wad Medani local market i.e. refined oils, for ease of being obtained by vegetable growers later on. Oils were diluted with water and applied as aqueous solutions mixed with few drops of liquid soap and Molass (as an anti UV light). The onion variety used was Saggai obtained from a known source at the vegetables central market, Wad Medani , Sudan . During both seasons each experiment was arranged in a Randomized Complete Block design (RCBD) with three replications. The experimental fields consisted of 11 treatments. Botanical oils were evaluated at 3 different rates. The treatments and their dosage rates were as follows:

Sesame oil at the rate of 1.5% concentration (Ses. 1.5%),Sesame oil at the rate of 2.5% concentration (Ses.2.5%),Sesame oil at the rate of 5% concentration(Ses.5.0 %),Groundnut oil at the rate of 1.5% concentration (G/N. 1.5%),Groundnut oil at the rate of 2.5% concentration (G/N. 2.5%),Groundnut oil at the rate of 5% concentration (G/N. 5.0%),Sunflower oil at the rate of 1.5% concentration (S/F. 1.5%) ,Sunflower oil at the rate of

2.5% concentration (S/F. 2.5%) ,Sunflower oil at the rate of 5% concentration (S/F. 5.0%),Karate 5% EC (lambda–cyhalothrin) at the rate of 150 ml /fed.(7 .5% g a.i / fed.)and Untreated Control (UTC)

The experimental data had been attained through regular periodical surveys, usually, effected early in the morning. Five plants were randomly sampled from the inner rows for assessing thrips population of both adults and nymphs per subplot for the various treatments. Each plant was thoroughly examined for insect population using hand lens. Application of oils or insecticide was done when spray able level of 5-7 insects/ plant was attained. Spraying was performed through knapsack sprayer emitting spray volume of 20 gallons / feddan. Efficacy of the tested products was evaluated against thrips at pre and post- spray counts at regular intervals of 2,4,7,10,14 and 21 days after spraying. Evaluation of the biological efficacy of the product was based on the percentage mortality and product performance at each spray and the performance throughout the seasons were determined. The percentage mortality was calculated as follows:

% mortality = (per spray count- post spray count) / per spray count X 100.

The data were subjected to the Analysis of Variance (ANOVA) after transformation, if needed, and the values of the grand mean, standard error and coefficient of variation were calculated. Duncan's Multiple Range Test (DMRT) was used to separate means among treatments.

RESULTS AND DISCUSSION

Data presented in Table 1 showed the mean number of onion thrips population as affected by different oil treatments recorded during season 2006/ 07. It is apparent from this result that the different treatments harboured almost variable populations of onion thrips and highly significant differences between the treatments were observed. It was noticed that Karate treatment hosted significantly less number of thrips (1.9) compared to the untreated control (10.4) and all treatments during the first spray count followed by groundnut oil 1.5% (8.9) , sunflower oil 5% (9.5), sesame oil 5% (9.8) and groundnut oil 5% (11.0). During the subsequent post spray counts, Karate treatment had less number of thrips population followed by sesame oil 5% (7.9) , sesame oil 1.5% (8.1), groundnut oil 1.5% (8.9) , sesame oil 2.5% (9.3), sunflower oil 2.5% (9.6) compared to the untreated control treatment which harboured the highest number of thrips population (16.7). The same results were obtained from the third and the fourth count of the first spray. Generally, it was observed that Karate hosted significantly less number of thrips population compared to all treatments. Moreover, the post- spray count of the second spray showed that

Karate, sesame oil, groundnut oil and sunflower oil at the highest rates gave a significant reduction in the pest population.

Table 2 shows the percentage mortality of thrips and general performance of different oil treatments throughout season 2006/ 2007. The data indicated that percentage mortality was significantly higher in all treatments after spray counts in comparison to the untreated control. The different oil treatments displayed variable performance at the different concentration as to the pest incidence. It was clearly shown that the higher concentration (5%) of the different tested oils exerted a significant higher lethal effect on the pest as its population was rapidly declined. Generally, Karate gave the best control of the pest and this resulted in the highest percentage mortality compared to other treatments and the untreated control.

Regardless of the different times of spray, the data in Table 3 clearly indicated that the Karate treatment always hosted significantly less number of thrips compared to all treatments. The level of thrips population decreased significantly after application of the tested products compared to the untreated control.

The post- spray counts of the first spray showed that Karate (3.3) and all oil treatments at the higher rates gave a significant reduction in the pest population .Again and during the second count of the first spray lowest number of thrips was obtained from the Karate (6.3) treatment .Similarly, the post – spray counts of the third spray showed that Karate (9.7) gave a significant reduction in the pest population. There were no significant differences between the botanical oil treatments. The post- spray counts of the fourth spray showed significant differences between all treatments. The sesame oil treatment at the highest rate harboured the lowest number of onion thrips (7.0) followed by sunflower oil 5% (9.3) and groundnut oil 5% (11.0) treatments, while Karate harboured the highest number (13.0) followed by the untreated control (47.7). It is apparent from the results presented in Table 4 that the percentage mortality was significantly higher in all treatments at post spray counts. This insures that the products tested were very effective in controlling the pest .However, the same pattern of control was again repeatedly observed with the higher concentrations of the tested oils, which significantly suppressed the onion
thrips build up. The percentage mortality was significantly higher in Karate treatment. Similarly, Karate had the best performance against the pest .The different oil treatments displayed variable performance at the different concentration as to the pest incidence .It was clearly shown that the higher concentration(5%) of the different oil treatments had a
clearly higher lethal effect on the pest as its population declined rapidly declined. The
consistent results in the general performance (G. P) of the tested botanical oils recorded in this study throughout the two seasons confirmed beyond doubt the effectiveness of 5% sesame, and groundnut oils, respectively in controlling thrips However, these tested oils were refined ones for the sake of

their availability to the vegetable grower from the local market. Crude oils could have been more potent as reported by Jacobson (1953) for groundnut and cotton seed oils. However, the use of sesame oil to control whitefly on tomato in Sudan was recommended by Yassin *et.al. (*1982). Again, Elamin (1995) reported that sesame oil (refined) at 2 – 3 % as oil water emulsion + Agaral (or liquid soap) led to significant decrease in TYLCV and significant increase in yield. It should be mentioned that the type of oil, as reported by Cranshaw (1999) can greatly affect its activity. This could possibly be explained in terms of botanical origin. i.e. plant sp. as well as the treatment the oil receives. Accordingly, further experimentation with crude botanical oils for the control of thrips on onion could lead to more positive results.

Table (1): Effect of Sesame oil , groundnut oil , sunflower oil and Karate on thrips population (season 2006/07). Mean No. of thrips / 5 plants (actual figures in parenthesis).

Treatments	Pre1st spray	1st Post1st spray √ x	2nd Post1st spray √ x+1	3rd Post1st spray √ x	4th Post1st spray	5th Post1st spray	Pre-2nd spray	1st Post 2nd spray √ x	2nd Post 2nd spray	3rd Post 2nd spray
1.Ses.1.5%	(22.8) a	(14.0) 3.7 b	(8.1) 3.0 b	(17.3) 4.2 d	(23.2) cd	(23.2) cd	(23.2) a	(11.1) 3.3 a	(18.3) b	(22.9) cd
2.Ses.2.5%	(21.7) a	(11.5) 3.3 b	(9.3) 3.2 bc	(17.5) 4.2 d	(20.8) bc	(20.8) abc	(20.8) a	(8.8) 2.9 a	(19.5) b	(23.2) cd
3.Ses. 5%	(21.2) a	(9.8) 3.1 b	(7.9) 2.9 b	(14.4) 3.8 cd	(18.7) bc	(18.7) a	(18.7) a	(6.6) 2.7 a	(18.6) b	(19.4) bcd
4.G/N 1.5%	(19.1) a	(8.9) 2.9 b	(10.2) 3.3 bc	(17.7) 4.2 d	(22.6) cd	(22.6) bc	(22.6) a	(8.0) 2.8 a	(22.8) b	(25.1) d
5. G/N2.5%	(19.1) a	(7.1) 2.6 a	(15.6) 4.1 bc	(17.3) 4.2 d	(21.3) bc	(21.3) abc	(21.3) a	(6.6) 2.5 a	(20.9) b	(19.2) bcd
6. G/N 5%	(22.5) a	(11.0) 3.2 b	(8.9) 3.1 bc	(9.3) 3.1 b	(19.3) bc	(19.3) ab	(19.1) a	(6.4) 2.5 a	(18.4) b	(20.8) bcd
7.S/F.1.5%	(19.6) a	(11.8) 3.4 b	(9.6) 3.2 bc	(17.0) 4.1 d	(26.4) d	(26.4) d	(26.4) a	(8.3) 2.9 a	(20.9) b	(23.6) d
8.S/F.2.5%	(20.5) a	(7.9) 2.7 ab	(9.6) 3.2 bc	(12.0) 3.3 bc	(19.9) bc	(19.9) abc	(19.9) a	(6.7) 2.6 a	(20.1) b	(19.5) bcd
9.S/F. 5%	(21.2) a	(9.5) 3.1 b	(13.5) 3.8 bc	(9.4) 3.0 b	(22.0) bcd	(22.0) abc	(22.0) a	(7.5) 2.7 a	(19.1) b	(20.3) bcd
10.Karate 5%EC	(20.0) a	(1.9) 1.4 a	(1.3) 1.4 a	(4.5) 2.3 a	(12.6) a	(18.7) a	(20.3) a	(13.5) 3.5 a	(11.8) a	(6.4) a
11. UTC	(20.3) a	(10.4) 3.2 b	(16.7) 4.2 c	(24.8) 4.2 e	(32.3) e	(32.3) d	(32.3) b	(9.3) 3.0 a	(39.4) c	(33.0) e
SE±	0.4	0.2	0.2	0.2	1.5	1.2	1.2	0.1	2.0	1.9
CV%	6.1	20.4	23.2	17.9	22.5	18.0	17.5	11.1	32.2	29.7

- **Data transformed to** $\sqrt{x}$

Table (1) Cont.

Treatments	Pre 3rd spray	1st Post 3rd spray	2nd Post 3rd spray	Pre 4th spray	1st Post 4th spray	2nd Post 4th spray √ x	3rd Post 4th spray	4th Post 4th spray	5th Post 4th Spray √ x+1
1.Ses1.5	(22.9) a	(16.7) cd	(24.8) e	(24.8) b	(7.0) abcd	(12.2) 3.5 defg	(4.6) a	(3.7) ab	(2.3) 1.7 ab
2.Ses.2.5	(23.2) a	(14.0) cd	(22.9) de	(22.9) b	(4.5) abc	(10.0) 3.2 bcde	(3.6) a	(3.1) ab	(2.3) 1.8 abc
3.Ses.5%	(19.4) a	(9.6) ab	(15.3) bcde	(20.7) b	(3.2) a	(7.5) 4.2 b	(3.5) a	(3.4) ab	(1.8) 1.7 ab
4.G/N1.%	(25.0) a	(17.9) d	(21.3) cde	(21.3) b	(5.2) abc	(14.7) 3.8 fg	(4.7) a	(4.0) abc	(2.8) 2.0 bc
5.G/N2.%	(19.2) a	(17.1) d	(21.2) bcde	(21.2) b	(5.7) abc	(10.5) 3.2 bcdef	(4.0) a	(4.7) bc	(2.0)1.7 ab
6. G/N %	(20.8) a	(14.7) cd	(20.5) bcde	(20.5) b	(4.3) ab	(9.4) 3.1 bcde	(4.9) a	(3.0) ab	(2.0) 1.7 ab
7.S/F. %	(23.6) a	(17.5) d	(20.7) de	(20.7) b	(7.3) bcd	(11.4) 3.4 cdef	(4.4) a	(2.9) ab	(2.7) 1.9 bc
8.S/F. %	(19.5) a	(14.4) cd	(23.4) bcd	(23.4) b	(6.6) abcd	(13.3) 3.6 efg	(4.7) a	(3.8) ab	(1.8) 1.7 ab
9.S/F%	(20.3) a	(14.6) cd	(18.4) de	(24.5) b	(6.0) abc	(7.2) 2.7 b	(3.6) a	(3.5) ab	(2.0) 1.7 ab
10Karate 5%EC	(21.9) a	(6.5) a	(8.5) bcd	(14.5) a	(3.1) a	(4.3) 2.1 a	(3.5) a	(2.4) a	(1.0) 1.4 a
11. UTC	(33.0) b	(46.8) e	(33.2) a	(33.2) c	(10.6)	(16.1) g	(7.3) b	(6.0) c	(4.3) 2.3 c
SE±	1.2	3.1	1.8	1.4	0.6	1.8	0.3	0.3	0.1
CV%	17.5	60.2	29.0	120.1	37.1	386.6	24.6	26.7	12.8

- **Data transformed to** $\sqrt{x}$

Table (2): Percentage mortality (%M) and general performance (G.P), season 2006/07

Treatments	%M.	G.P 1st spray counts	%M.	G.P 2nd spray counts	%M.	G.P 3rd spray counts	%M.	G.P.T.
(71.7) 57.9	(36.3) 32.3 b	(18.3) cd	(52.0) 46.3	(18.3) def	(26.3) 30.8 bcd	(19.0) de	(71.7) 57.9 ab	(15.7) fg
2.Ses. 2.5%	(48.3) 43.8 ab	(17.0) bcd	(58.3) 50.0	(18.0) cdef	(39.7) 39.0 abcd	(18.0) cde	(80.3) 63.8 ab	(14.3) cdefg
3.Ses. 5%	(54.0) 47.3 ab	(15.3) bc	(64.3) 53.4	(15.7) bcd	(51.0) 45.6 ab	(15.3) b	(85.0) 67.4 a	(12.0) b
4. G/N.1.5%	(51.0) 46.1 ab	(17.7) bcd	(62.7) 52.8	(18.7) ef	(28.3) 32.1 bcd	(18.7) de	(75.3) 60.6 ab	(15.3) efg
5. G/N.2.5%	(63.3) 53.1 ab	(17.3) bcd	(69.0) 56.4	(17.0) bcdef	(15.0) 22.2 cd	(17.7) cde	(71.7) 58.0 ab	(14.3) cdefg
6. G/N. 5%	(55.3) 48.4 ab	(14.7) ab	(67.7) 55.5	(15.0) b	(27.0) 27.1 bcd	(16.0) bc	(79.7) 63.1 ab	(13.0) bc
7.S/F.1.5%	(40.3) 39.2 b	(19.7) d	(67.0) 55.3	(19.3) f	(24.3) 29.0 bcd	(19.0) de	(65.0) 53.8 b	(15.0) defg
8.S/F.2.5%	(60.3) 52.2 ab	(15.0) ab	(66.3) 54.6	(15.3) bc	(22.3) 26.2 bcd	(16.3) bc	(70.3) 57.9 ab	(14.0) cdef
9. S/F. 5%	(54.3) 47.6 ab	(16.3) bc	(65.7) 54.3	(16.7) bcdef	(27.0) 30.0 bcd	(17.3) bcd	(75.7) 60.5 ab	(13.7) bcde
10. Karate5% EC	(90.7) 72.6 a	(10.3) a	(36.3) 32.5	(11.7) a	(69.7) 57.0 a	(11.3) a	(77.0) 62.2 ab	(9.0) a
11 . UTC	(50.0) 45.1 ab	(25.0) e	(44.3) 41.7	(26.3) g	(0.0) 1.8	(28.7) f	(67.7) 55.4 ab	(23.3) h
SE±	3.0	1.1	2.2	1.1	4.2	1.3	1.2	1.0
CV%	20.9	21.3	14.7	20.8	44.8	23.4	6.6	23.8

- **Actual figures in parenthesis**

Table (3): Effect of Sesame oil , groundnut oil , sunflower oil and Karate on thrips population (season 2007/08). Mean No. of thrips / 5 plants (actual figures in parenthesis).

Treatments	Pre1st spray	1st Post1st spray √ x	Pre-2nd spray	1st Post 2nd spray √x	Pre-3rd spray	1st Post 3rd spray	Pre-4th spray	1st Post 4th spray √ x
1. Ses.1.5%	(20.3) a	(11.0) 3.3 bc	(19.7) abc	(11.7) 3.4 ab	(21.3) ab	(17.0) b	(21.3) b	(11.3) 3.4 bcd
2. Ses.2.5%	(21.3) a	(9.3) 3.1 b	(21.7) bc	(8.0) 2.8 ab	(21.0) ab	(18.0) b	(20.3) ab	(11.3) 3.4 bcd
3. Ses. 5%	(22.3) a	(11.3) 3.4 bc	(19.7) abc	(9.7) 3.1 ab	(21.0) ab	(17.7) b	(20.3) ab	(7.0) 2.6 a
4. G/N1.5%	(21.3) a	(10.3) 3.1 b	(21.3) abc	(14.3) 3.8 b	(21.3) ab	(17.0) b	(20.7) ab	(12.7) 3.6 cd
5. G/N2.5%	(23.3) a	(9.7) 3.1 b	(21.7) bc	(13.3) 3.6 ab	(20.7) ab	(17.0) b	(20.7) ab	(14.0) 3.7 d
6. G/N 5%	(21.7) a	(12.3) 3.4 bc	(20.7) abc	(13.0) 3.6 ab	(23.3) b	(15.7) b	(21.0) ab	(11.0) 3.3 bcd
7.S/F.1.5%	(22.3) a	(11.0) 3.3 bc	(21.3) abc	(15.0) 3.9 b	(21.7) ab	(18.3) b	(21.0) ab	(12.0) 3.5 bcd
8.S/F.2.5%	(20.3) a	(12.3) 3.5 bc	(19.3) abc	(16.0) 4.0 b	(21.7) ab	(17.7) b	(22.3) b	(12.7) 3.6 cd
9.S/F.5%	(19.0) a	(15.3) 3.9 bc	(20.0) abc	(9.7) 3.1 ab	(21.0) ab	(18.0) b	(21.3) b	(9.3) 3.0 abc
10. Karate5%EC	(22.7) a	(3.3) 1.8 a	(19.0) a	(6.3) 2.5 a	(20.3) ab	(9.7) a	(20.3) b	(13.0) 3.6 cd
11 . UTC	(22.0) a	(19.7) 4.4 c	(24.7) d	(32.3) 4.4 c	(35.7) c	(52.0) c	(60.0) c	(47.7) 6.9 e
SE±	0.4	0.2	0.5	0.2	1.3	3.3	3.6	0.3
CV%	5.8	19.2	7.7	16.1	19.4	55.2	48.2	30.1

- **Data transformed to** $\sqrt{x}$

Table (4): Percentage mortality (%M) and general performance (G.P), season 2007/08.

Treatments	%M.	G.P 1st spray counts	%M.	G.P 2nd spra counts	%M.	G.P 3rd spray counts	%M.	G.P.T.
1.Ses. 1.5%	(70.3) 58.1 ab	(14.0) bcd	(42.0) 40.3 abc	(14.3) bcde	(10.7) 16.0 d	(15.3) bcd	(54.3) 47.6 abc	(15.0) cde
2.Ses. 2.5%	(41.0) 39.6 b	(13.3) bcd	(65.3) 48.7 ab	(13.7) bc	(29.7) 33.0 abc	(15.0) bcd	(55.0) 47.9 abc	(14.0) bc
3.Ses. 5%	(53.7) 47.2 abcd	(12.3) b	(47.0) 43.3 abc	(12.7) b	(29.7) 33.0 abc	(14.0) b	(60.0) 50.8 ab	(13.0) ab
4. G/N.1.5%	(46.7) 43.0 ab	(14.0) bcd	(30.3) 32.6 cd	(14.7) cde	(31.0) 33.6 ab	(15.7) bcd	(53.3) 47.0 abc	(15.0) cde
5. G/N.2.5%	(60.0) 50.8 ab	(15.3) cd	(34.7) 36.0 abc	(15.3) cde	(20.3) 26.7 bcd	(16.0) bcd	(43.7) 41.3 abcd	(16.0) e
6. G/N. 5%	(46.7) 43.1 bcd	(13.7) bcd	(42.3) 40.4 abc	(14.7) cde	(23.7) 28.8 abcd	(15.3) bcd	(58.0) 49.6 ab	(14.3) bcd
7.S/F.1.5%	(37.0) 37.4 cde	(14.7) bcd	(31.3) 34.1 bcd	(15.7) de	(34.0) 35.2 ab	(16.7) cd	(42.7) 40.8 bcd	(15.7) de
8.S/F.2.5%	(44.0) 41.5 bcde	(14.7) bcd	(17.3) 20.2 d	(16.0) e	(27.7) 31.7 abc	(17.0) d	(46.7) 43.6 abc	(16.0) e
9. S/F. 5%	(24.3) 29.2 e	(14.7) bcd	(32.3) 34.5 abcd	(14.7) cde	(32.7) 34.8 ab	(15.7) bcd	(61.3) 51.6 ab	(14.7) cde
10. Karate5% EC	(77.3) 62.4 a	(8.0) a	(59.3) 50.4 a	(9.3) a	(43.3) 41.8 a	(10.3) a	(39.3) 38.7 cd	(11.7) a
11 . UTC	(0.0) 1.8 f	(22.7) e	(0.0) 1.8 e	(26.7) f	(0.0) 1.8 e	(34.7) e	(39.0) 38.6 cd	(38.3) f
SE±	4.9	1.0	4.2	1.3	3.3	1.9	1.5	2.2
CV%	38.9	23.9	39.4	27.7	38.2	36.6	10.6	43.6

- **Actual figures in parenthesis**

CONCLUSION

The results of this study demonstrated the effectiveness of the botanical oils such as sesame oil, groundnut oil and sunflower oil for the control of onion thrips. From the results obtained it can be concluded that :

1- There was a considerable variation between the insecticide Karate and oils treatments as to thrips control.
2- Karate exhibited an outstanding performance in the pest suppression.
3- Oil treatments potential of efficacy was only expressed at the higher concentration rates (5.0 %) followed by the second dose (2.5%) and the first dose (1.5%) respectively.
4- During this study, it was noticed that sesame oil was more effective in controlling onion thrips.
5- It was important to note that the Karate treatment could be regarded as the best of the treatments tested followed by sesame oil 5%, groundnut oil 5%, groundnut oil 2.5%, , and sunflower oil 5% respectively.

These results demonstrated that the oil sprays decreased the onion thrips population density for two weeks after spray. So, it is suggested that this protection period could be increased if the oils spray is supplemented by chemical such as Karate used with low dosage rate. The emulsion oil / water / insecticide such as Karate with low dose must be applied when weather conditions are suitable

It is well known that pesticides in general are extremely hazardous and very expensive particularly in developing countries. It is therefore, possible to mitigate the pest menace and reduce damage through disseminating the culture and adoption of the use of non – chemical measures to combat these pests, particularly in food crops.

This study laid a base line information of using such oils and other products of plant origin to control insect pests on other vegetable and edible crops.

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