ISSN 1814 – 5868

Available online at http://bjas.bajas.edu.iq
https://doi.org/10.37077/25200860.2023.36.2.17
College of Agriculture, University of Basrah

Basrah J. Agric. Sci., 36(2), 226-234, 2023

Basrah Journal of Agricultural Sciences

E-ISSN: 2520-0860

Chemical Control of the Leaf Miner *Scaptomyza flava* Fallen (Diptera: Drosophilidae) and Determination of Acetamipride and Abamectin Residues on Radish Plant

Amjed A. Fadhil[1*] & Nadia K. Thamer[2]

[1]Department of Plant Protection, College of Agriculture, University of Basrah, Iraq
[2]Department of Microbiology, College of Veterinary, University of Basrah, Iraq

[*]**Correspondence author email: A.A.F.**: amjed.fadhil@uobasrah.edu.iq; **N.K.T.**: nadia.thamer@uobasrah.edu.iq

Received 8th.March 2023; Accepted 10th October 2023Available online 30th December 2023.

Abstract: *Scaptomyza flava* (Diptera: Drosophilidae) is a serious pest that attacks Brassicaceae, causing significant production losses. The current study was carried out to evaluate the relative efficiency of deltamethrin 2.5 EC, abamectin 1.8 EC, and acetamiprid 20 SP insecticides. In addition to determining the acetamiprid 20 SP and abamectin1.8 EC residues in the leaves and roots of radish. The mortality score revealed that acetamiprid 20 SP, and abamectin 1.8 EC achieved 87.3% and 72.8% respectively after 72 hours compared to deltamethrin 2.5 EC, which scored 54.42%. The chromatogram outcomes of acetamiprid 20 SP and Abamectin1.8EC demonstrated that the acetamiprid 20 SP residues sharply decreased. They reduced from 1856.8 and 25.9 to 0 mg.L^{-1} in both leaves and roots respectively after ten days of application. While the Abamectin1.8 EC residue was decreasing from 954.12 to 0 mg.L^{-1} after ten days. Furthermore, abamectin 1.8 EC residues have not been detected in the radish roots. The overall consequence proposed that both acetamiprid 20 SP and abamectin1.8 EC are highly efficient in the controlling of *Scaptomyza flava* larva and there are no harmful impacts for both on the edible vegetable.

Keywords: Abamectin 1.8 EC, Acetamiprid 2.5 SP, HPLC, Radish, *Scaptomyza flava*.

Introduction

Raphanus sativus is one of the Brassicaceae family that is also called the mustard family. They are an economic vegetable, involving cabbage, cauliflower, grown in Iraq and the world. The Cruciferae family includes an estimated 380 genera and 3000-3709 species cultivated around the world (Al-Masoudi, 2019).

Radish plants are infested by different insects belonging to the different orders, such as the Diptera, where this order involves a wide range of small flies (*Drosophila*). Their larvae attack a wide range of plants, but a few of them make tumors. In the field, Seraj (2000) and Mehdi *et al.* (2019) reported that *Scaptomyza flava* caused great losses in the seedling stage in Khuzestan. The European leafminer *Scaptomyza flava* (Fallen 1823) were found the first time in New Zealand (Martin, 2004). However, it was recorded for the first time in Basrah, Iraq by (Mahdi *et al.,* 2020). Furthermore, insect damage involves its feeds on the mesophyll layer. This results in spots and translucent white lines (Seraj, 1994). It has previously been observed that many insecticides have been used to control the leaf miner makers, for example, abamectin was used to control *Liriomyza trifolii* larvae on cabbage plants (Trumble, 1985). Super Saqr (dimethoate), Dragon (lambda-cyhalothrin +thiamethoxam), and Sakhuy (alphacypermethrin) insecticides also applied to control *Scaptomyza flava* on the radish plants. Data from Super Saqr used has achieved a high mortality of 92% (Mehdi *et al.,* 2019).

Due to the economic importance of radish plants, the objectives of this research can be divided into two main aims. Firstly, evaluation of three different insecticides, acetamiprid 20 SP, abamectin 1.8 EC, and deltamethrin 2.5 EC against *S. flava*. Secondly, determination of acetamiprid 20 SP and abamectin 1.8 EC residues in leaves and roots radishes using the high-performance liquid chromatography technique (HPLC).

Materials & Methods

Laboratory experiment

This experiment was conducted to examine the efficacy of Deltamethrin 2.5 EC, Acetamiprid 20 SP, and Abamectin 1.8 EC in the laboratory. The infested leaves were collected from Shatt Al-Arab field. The petiole leaf's stem is placed in the small nutrient solution container, containing sugar dissolved with water to avoid the dryness. After that each leaf was treated by five larvae of the fourth-stage larvae. A small sprayer five litres was used to treat the leaf miner by the insecticides using a 0.5 mL solution per leaf. The control treatment was sprayed by distilled water only. Each two leaves were placed in the plastic container using three replications. All containers incubated after removing its lid at a temperature of 28± 2ºC, a relative humidity of 60 + 5%, and a photoperiod of 6-10 hours / day (Lacey, 1997). The larvae mortality was calculated after 24, 48, and 72 hours. After that the mortality% was estimated and corrected according to the Abbott equation.

$$Mortality\% = \frac{Mortality\ in\ the\ treatment - Mortality\ in\ the\ control}{100 - mortality\ in\ the\ control} \times 100$$

Field experiment

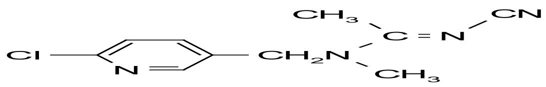
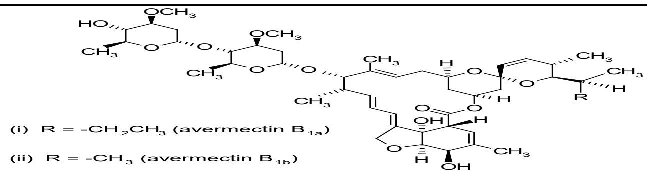
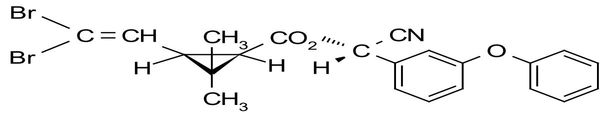
This trial was performed at the Shatt Al-Arab district, Basra Province for the growing season 2021-2022. The experiment unite was divided into 2×2 m^2, the distance between them 0.5 m. This trail was performed using the complete random block design (RCBD). The radish seeds were planted on 03/01/2002. The insecticides (Table 1) were applied at field using recommended concentration when the leaf miner populations reached the economic threshold level, while the control was treated by water only. The knapsack sprayer capacity 10 litres were used to spray the rows by two litres in 01/03/2022. This experiment was carried out using three different treatments, plus the control with three replications (Mehdi *et al*., 2019).

To study the insecticides efficacy, 30 leaves of *S. flava* were collected from each replicate after 1, 3, 7, and 14 days of application. The larvae numbers were estimated by the direct counting, and the data was processed by the Henderson-Tilton's formula (Henderson & Tilton, 1955) using the below equation. The average was compared according to the least significant difference test.

$$Relative\ efficiency = \left(1 - \frac{n\ in\ Co\ before\ treatment - n\ in\ T after\ treatment}{n\ in\ Co\ after\ treatment - n\ in\ T\ before\ treatment}\right) \times 100$$

Where: n = Insect population, T = treated, Co = control.

Table (1): Common insecticides used in the study.

Active ingredient name and the used its chemical group	Concentration used gm/mL L^{-1}	Chemical structure	Company
Acetamiprid 20 SP neonicotinoid	0.5		Nippon soda
Abamectin 1.8EC avermectin	0.5		Vapco
Deltamethrin 2.5 EC pyrethroid	0.5		Medmac

Determination of insecticide residues

The extraction of acetamiprid

A 10 g sample was blended for the homogeneity. The solvent mixture of acetic acid, dichloromethane, and acetone 2:8:10 ratio was used in acetamiprid 20 SP extraction. Then, the extract was cleaned up using the activated carbon and the flurossiel. After that the sample displayed on the ultrasonic waves for 5 minutes with centrifuges on 4000 rounds per minute (rpm) for 10 minutes. The supernatant was taken and filtered through o.45 microliter filters, and concentrated using the rotary evaporator on 50 ^{O}C until the dryness. A 20 mL of methanol was added into the dryness sample and stored in the refrigerator until HPLC analysis (Nawaz *et al*., 2015) (Ail *et al*., 2018).

The extraction of abamectin

The leaves and roots collected samples were left at 25 ^{O} C room temperature. A 5 gm was taken after its well homogenizing. The sample was weighed and placed in the plastic tube. After that all samples were treated by 10 mL (volume) of 1% acetic acid in acetonitrile solution, with conducting a centrifuge at 10,000 rpm for 10 min. The sample mixed using the vortex mixer. A 5 mL of the homogenized extract was transferred via the micropipette to be ready in HPLC injection (Algethami *et al*., 2023).

Analysis conditions

The High-Performance Liquid Chromatography (HPLC) model SYKAMN (German origin) was used to analyze and estimate the studied insecticide residues. The flow rate of the water-methanol mixture was 90:10 (vol: vol) was 1.2 ml.min^{-1} for acetamiprid 20 EC at pH 7.0 (Badawy *et al*., 2019). Whilst the flow rate of the water: acetonitrile 60:40 (vol: vol) was 1 mL min^{-1} at pH 7.0 for Abamectin (Ali *et al*., 2022). The separation column used is a C18 column containing Octadecyl Chains (ODS) which are hydrophobic and adsorbent non-polar materials. The shaft is 25 cm long and 4.6 mm in diameter). Acetamiprid 20 EC was detected by a UV detector with a wavelength of 254 nm (Nawaz *et al*., 2015; Ail *et al*., 2018), while in the case of abamectin, the wavelength was 210 nm (Algethami *et al*., 2023).

Statistical analysis

The laboratory experiment was analyzed by the randomized complete block design (RCBD) at $P<0.01$. The field experiment was analyzed according to the RCBD at $P<0.05$. The insecticide residue kineticity was evaluated using the first-order reaction mentioned in (Al-Farttoosy & AlSadoon, 2022). All these data were analyzed by using the SPSS Software.

Results & Discussion

Table (2) shows the chemical control of leafminer larvae of *S. flava* in the laboratory. The statistical analysis indicated that the acetamiprid 20 SP was superior in the mortality to abamectin and deltamethrin 2.5 EC at $p<0.01$. The acetamiprid, abamectin, and deltamethrin 2.5 EC achieved 87.3, 72.8, and 57.8% respectively after 72 hours of application. It might be that acetamiprid 20 sp has a stomach action, and works as a stimulant for the acetylcholine receptors in the central nerve system (CNS) (Cordova *et al*., 2006). In addition, acetamiprid 20 sp contains the N-Cyano Acetamidine substance that is effectively characterized to the sucking pests (European Food Safety Authority, 2010). Considering that the abamectin effectiveness can be attributed to its physical characteristics like a relatively high stability, as well as its translaminar or local systemic transmission. Where it is a rapid ability to penetrate leaf tissues inside the treated plant tissues (Tollerup & Higbee, 2020). Besides that, abamectin is considered a non-systemic pesticide that affects through contact and stomach. Hence the reason for its less effect is probably due to its lack of access to the larvae within the tissue. In this field, Harris & Maclean (1999) mentioned that the non-systemic or non-translaminar insecticides will remain on the leaf surface and can kill the larvae after they leave the plant leaf.

Table (2): Efficacy of insecticides against larvae of *S. flava* under laboratory condition.

Insecticides	Mortality mean (%) after different periods of treatment (hour)			Mortality mean (%)
	24	48	72	
Acetamiprid 20 SP	76.70	85.20	100	87.3 a
Abamectin 1.8% EC	48.10	70.40	100	72.8 b
Deltamethrin 2.5 SP	36.70	56.70	80.00	57.8 c
Time effect mean	53.83 c	70.76 b	93.33 a	

Table (3) revealed a significant difference between the insecticides. The acetamiprid 20 EC was superior in causing the highest mortality rate by 70.58%. Mortality was recorded by deltamethrin 2.5 EC which scored 54.42%. This is due to the fact that acetamiprid 20 SP is a systemic insecticide, as indicated by (Prijono *et al*., 2004). They mentioned also that the Acetamiprid 20 SP possesses systemic (translaminar) properties, to be useful against *Liriomyza* spp., however the leaf tunnels can provide the larvae protection from the exposure to chemical insecticides (Parrella & Keil, 1984,). As well, the insects' mortality decreased at the field in comparison to the laboratory experiment. It might be due to insecticide being influenced by different environmental conditions. For instance, temperatures, light and its density and rainfall during those times. Moreover, the mortality was influenced by time. The highest mortality rate was recorded at 74.22%, and the lowest was 46.56% after seven days. This is probably might to sensitivity varies. Also, the insects are more sensitive to poisonous substances in particular when insects are more exposed to these compounds in the environment.

Table (3): Efficacy of insecticides against larvae of *S. flava* under field condition.

Insecticides	Mortality mean (%) after different periods of treatment (day)				Mortality mean (%)
	1	3	7	14	
Acetamiprid 20 SP	54.67	70.33	83.67	73.67	70.58 a
Abamectin 1.8% EC	45.33	63.00	75.00	65.33	62.16 b
Deltamethrin 2.5 EC	39.67	53.33	65.67	59.00	54.41 c
Time effect mean	46.55 d	62.22 c	74.78 a	66.00 b	

Determination of Acetamiprid 20 SP residues

Fig. (1) illustrated that Acetamiprid 20 SP residues decreased from the radish leaves. At the first day of the treatment, the residues were high 1856.8 mg. K^{-1}, then started to sharply reduce after five days until it reached 11.2 mg. k^{-1}. Further analysis showed that residues disappeared after seven and ten days, reaching 0 mg. K^{-1} in both leaves and roots. The results of this study probably resulted from many reasons, like the climate condition during the insecticides application, including temperature which was reached 23.5^{O}C.

It is possible that Acetamiprid 20 SP enters the soil, suffering different processes, for example the adsorption via vacancy soil sites. This process also can lead to loss of its availability in the soil solution (Al-Farttoosy & AlSadoon, 2022). Another important reason is the insecticide-microbes interaction (Hameed & Al-Farttoosy, 2022). Moreover, the physicochemical characteristic, for example the pH. It is considered the most important factor in the acceleration of insecticides degradation.

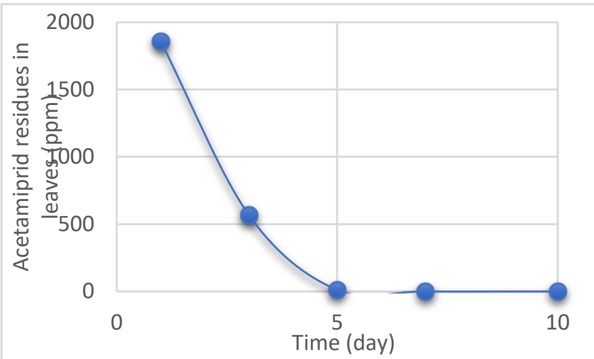


Fig. (1): Acetamiprid 20 SP residues dissipation in the radish leaves (mg.kg^{-1}).

The results of fig. (2) showed that acetamiprid 20 SP residues were dissipated from radish roots. As the gained outcomes, acetamiprid 20 SP residues were 25.9 mg. kg^{-1} and quickly disappeared into 0 after five days.

In order to evaluate the residues decreasing whether in the soil or in leaves or roots, the kinetic reaction model was applied due to it being a valued model to explain like these experiments. This model illustrates that the insecticide residues decrease over a time. Therefore, the residue decreasing undergoes the first-order reaction. The residue degradation rate was 2.14 and 0.65 mg.kg^{-1} a day in both leaves and roots respectively. This implies that the residue dissipation on leaves and roots was very fast, and this is answering why the residues disappeared during a few days as shown in table (4).

Consequently, the time required to break down 50% of initial concentration is going to be little. Based on that, the DT_{50} of acetamiprid 20 SP on leaves and roots were 0.32 and 1.06 mg kg^{-1} day respectively. In accordance with the present results, previous studies have demonstrated that the acetamiprid 20 EC DT_{50} ranged between 3.12-3.92 mg.kg^{-1} days and 1.18-1.46 mg kg^{-1} days in watermelon and soil, and 1.18-1.46 mg.kg^{-1} days in two different locations Beijing and Shandong provinces, respectively (Wu *et al*., 2012).

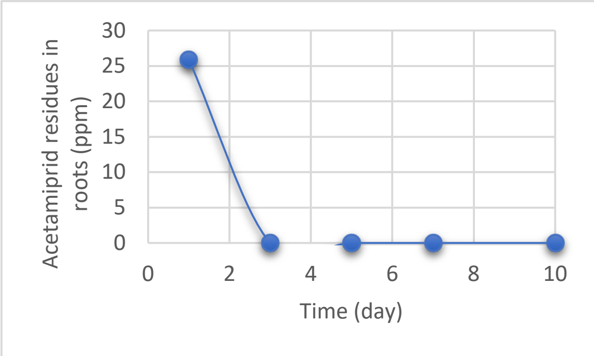


Fig. (2): Acetamiprid 20 SP residues dissipation in the radish roots (mg.kg^{-1}).

Table (4): The dissipation rate of acetamiprid 20 SP residues in the leaves and roots.

The dissipation rate of Acetamiprid 20 SP in the leaves mg.kg^{-1}.day^{-1}	Time requires to degrade 50% of initial concentration of Acetamiprid 20 SP in the leaves (day)	The dissipation rate of Acetamiprid 20 EC in the roots mg.kg^{-1}.day^{-1}	Time requires to degrade 50% of initial concentration of Acetamiprid 20 SP in roots (day)
2.1433	0.32	0.6508	1.06

Table (5): The dissipation rate of abamectin residues in the leaves and roots.

The dissipation rate of Abamectin in the leaves mg. kg^{-1}.day^{-1}	Time requires to degrade 50% of initial concentration of Abamectin in the leaves (day)
0.7489	0.92

Determination of abamectin residues

Fig (3) demonstrated a high amount of Abamectin residues after the direct application. It was estimated to be 954.12 mg.kg^{-1}. The residues then dropped dramatically into 522.48, 188.54, and 51.2 mg. kg^{-1} after three, five, and seven days of the application. On day 10, the residues completely disappeared from the radish leaves. Further analysis using kinetic evaluation in table (5) confirmed that the rate of abamectin dissipation, scored 0.74 mg.kg^{-1} a day. Therefore, the DT50 is a 0.92 mg.kg^{-1} .day^{-1}.

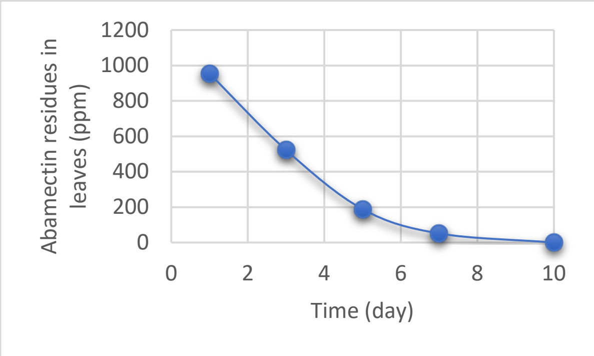


Fig. (3): Abamectin residues dissipation in the radish leaves (ppm).

Eventually, the residues of both acetamiprid 20 SP and abamectin 1.8 EC remain for less than 10 days. Except, the abamectin has not been detected in the radish roots in this study, which means that the use of those insecticides based on our results can be safe and not cause harm. The current study is in agreement with the study of Malhat *et al.* (2012), which revealed that abamectin residues half-life in tomato was 2.4 days and the waiting period does not exceed 8 days after the application. Moreover the abamectin residues do not cause any health problems as long as their residue levels are almost 0.5 mg.kg as maximum residue limit (MRL).

Conclusions

The aim of the current study was to compare the effects of three different insecticides, and to determine acetamiprid 20 SP and abamectin residues in the leaves and roots of radish by using HPLC technique. The experimental findings, acetamiprid 20 SP outperformed abamectin and deltamethrin 2.5 EC in the leaf miner mortality. The results of the field experiment illustrate that deltamethrin 2.5 EC caused the lowest mortality%, while acetamiprid 20 SP was the greatest. In the present study, however, the residues of both acetamiprid 20 SP and abamectin quickly disappeared from the radish leaves and roots. Furthermore, due to their fast dissipation, their remains had no negative effects on public health.

Acknowledgements

The authors would like to thank Mr Ahmed Adam Hussein the owner of radish field for allowing us to work.

Conflict of interest

There is no conflict of interest among the authors for publishing this manuscript.

ORCID

A.A.F., https://orcid.org/0000-0003-0659-0630

N.K.T., https://orcid.org/0000-0001-5410-1665

Contributions of Authors

N.K.T.: Idea, and checking the entire paper for scientific discussion, its conclusions, and text revision.

A.A.F.: The preparing, conducting of experiments, the writing and statistically analysis.

References

Algethami, J. S., Alhamami, M. A. M., Ramadan, M. F., & Abdallah, O. I. (2023). Residues of the Acaricides Abamectin, Hexythiazox, and Spiromesifen in eggplant (*Solanum melongena* L.) fruits grown under field conditions in Najran, Saudi Arabia. *Agriculture 13*, 116. https://doi.org/10.3390/agriculture13010116

Ali, H. M., Gamal, M., Ghoneim, M. M., & Mohammed Abd Elhalim, L. (2022). Quantitative analysis of abamectin, albendazole, levamisole HCl and closantel in q-drench oral suspension using a stability-indicating HPLC-DAD method. *Molecules*, *27*(3). https://doi.org/10.3390/molecules27030764

Al-Farttoosy, A. H., & Al Sadoon, J. N. (2022) Comparison of different coefficients to know the kinetic behaviour of glyphosate in soil column', *Basrah Journal of Agricultural Sciences, 35*(2), 110-118. https://doi.org/10.37077/25200860.2022.35.2.08

Al-Masoudi, R. K. H. (2019). Morphological, anatomical and geographical distribution studies of species *Horwoodia dicksoniae* (Turrill) in Iraq. *Iraqi Journal of Agricultural Sciences*, *50*(6), 1613-1620. https://doi.org/10.36103/ijas.v50i6.851

Badawy, M. E. I., Ismail, A. M. E., & Ibrahim, A. I. H. (2019). Quantitative analysis of acetamiprid and imidacloprid residues in tomato fruits under greenhouse conditions. *Journal of Environmental Science and Health, Part B*, *54*(11), 898–905. https://doi.org/10.1080/03601234.2019.1641389

Cordova, D.; Benner, E. A.; Sacher, M. D.; Rauh, J. J.; Sopa, J. S.; Lahm, G. P.; Selby, T. P.; Stevenson, T. M.; Flexner, L.; Gutteridge, S., & Tao, Y. (2006). Anthranilic diamides: A new class of insecticides with a novel mode of action, ryanodine receptor activation. *Pesticide Biochemistry and Physiology*, *84*(3), 196-214. https://doi.org/10.1016/j.pestbp.2005.07.005

European Food Safety Authority (EFSA). (2010). Annual report on pesticide residues according to article 32 of regulation (EC) No 396/2005*. EFSA Journal*, *8*(7), 1646-1807. https://efsa.onlinelibrary.wiley.com/doi/abs/10.2903/j.efsa.2010.1646

Hameed, S. N., & Al-Farttoosy, A. H. (2022) Biodegradation of Carbendazim using four bacterial Strains. *Misan Journal for Academic Studies*, *21*(44), 346-358. http://www.misan-jas.com/index.php/ojs/article/view/395

Harris, B. M., & Maclean, B. (1999). Spinosad: control of lepidopterous pests in vegetable brassicas. In *Proceedings of the New Zealand Plant Protection Conference, 52*, 65-69. https://doi.org/10.30843/nzpp.1999.52.11588

Henderson, C. F., & Tilton, E. W. (1955). Tests with acaricides against the brow wheat mite. *Journal of Economic Entomology 48*, 157-161. https://doi.org/10.1093/jee/48.2.157

Lacey, L. A. (Ed.). (1997). *Manual of techniques in insect pathology.* Academic Press, 404pp. https://doi.org/10.1016/B978-0-12-432555-5.X5000-3

Mahdi, H. A., Najim, S. A., & Fadhil, A. A. (2020). Identification of European leafminer Insect *Scaptomyza flava* FALLEN (Diptera: Drosophilidae) from Brassicaceae plants in Basrah Province Fields Southern Iraq. *Zagazig Journal of Agricultural Research*, *47*(5), 1183-1188. https://doi.org/10.21608/zjar.2020.247955

Malhat, F., Almaz, M., Arief, M., El-Din, K., & Fathy, M. (2012). Residue and dissipation dynamics of lufenuron in tomato fruit using QuEChERS methodology. *Bulletin of Environmental Contamination and Toxicology*, *89*(5), 1037–1039. https://doi.org/10.1007/s00128-012-0823-4

Martin, N.A. (2004). History of an invader, *Scaptomyza flava* (Fallen, 1823) (Diptera: Drosophiidae). *New Zealand Journal of Zoology*, *31*, 27-32. https://doi.org/10.1080/03014223.2004.9518356

Mehdi, H. A., Najim, S. A., & Aufi, B. G. (2019). Chemical and biological control of radish leave miner insect *Scaptomyza flava* Fallen (Diptera: Drosophilidae) under the Conditions of Basrah Province. *Syrian Journal of Agricultural Research–SJAR*, *6*(4), 549-556. http://agri-research-journal.net/SjarEn/?p=2065

Parrella, M. P., & Keil, C. B. (1984). Insect pest management: the lesson of *Liriomyza*. *Bulletin of the ESA, 30*(2), 22-25. https://doi.org/10.1093/besa/30.2.22

Prijono, D., Robinson, M., Rauf, A., Bjorksten, T., & Hoffmann, A. A. (2004). Toxicity of chemicals commonly used in Indonesian vegetable crops to *Liriomyza huidobrensis* populations and the Indonesian parasitoids *Hemiptarsenus varicornis*, *Opius* sp., and *Gronotoma micromorpha*, as well as the Australian parasitoids *Hemiptarsenus varicornis* and *Diglyphus isaea*. *Journal of Economic Entomology*, *97*(4), 1191-1197. https://doi.org/10.1093/jee/97.4.1191

Seraj, A.A. (1994). Biology and host plant relationships of *Scaptomyza flava* leaf miner. Ph. D. Thesis, Massey University, New Zealand. https://mro.massey.ac.nz/handle/10179/3013

Tollerup, K., & Higbee, B. (2020). Evaluation of a preventative strategy to manage spider mites on almond. *Insects*, *11*(11), 772. https://doi.org/10.3390/insects11110772

Trumble J. T. (1985). Integrated pest management of Liriomyza trifolii: influence of avermectin, cyromazine and methomyl on leafminer ecology in celery. *Agriculture, Ecosystems and Environment 12*(3), 181-188. https://doi.org/10.1016/0167-8809(85)90109-4

Wu, J., Wang, K., & Zhang, H. (2012). Dissipation and residue of acetamiprid 20 ECin watermelon and soil in the open field. *Bulletin Environmental Contamental contmintion and Toxicology, 89*(3), 644-648. https://doi.org/10.1007/s00128-012-0733-5

المكافحة الكيميائية لحشرة حفار الاوراق *Scaptomyza flava* Fallen (*Diptera: Drosophilidae*) وتقدير متبقيات مبيدي الاسيتامبرايد والابامكتين على نبات الفجل

أمجد عباس فاضل*[1] و نادية كاظم ثامر[2]

[1]قسم وقاية النبات، كلية الزراعة، جامعة البصرة، العراق

[2]قسم الاحياء المجهرية والطفليات البيطرية، كلية الطب البيطري، جامعة البصرة، العراق

المستخلص: تعد الحشرة *Scaptomyza flava* (Diptera: Drosophilidae) واحدة من الآفات المهمة التي تهاجم نباتات العائلة الصليبية. اهتم بحثنا في ايجاد أفضل المبيدات الحشرية في مكافحة الافة مع تقدير لبقايا المبيدات المستخدمة Acetamiprid 20 SPو Abamectin 1.8 EC في أوراق نباتات الفجل وجذورها .ففي المختبر، اظهرت النتائج المختبرية تفوق مبيد Acetamiprid 20 SPعلى Abamectin 1.8 EC و Deltamethrin 2.5 EC في احداث اعلى معدلات القتل محققا 87.3 و 72.8 و 57.8 على التوالي بعد 72 ساعة على التوالي .أظهرت نتائج الدراسة الحقلية تفوق Acetamiprid 20 SPفي التسبب في تحقيق اعلى معدل قتل بلغ 70.58٪، مقارنة بمبيد Deltamethrin 2.5 ES الذي سجل اقل معدل قتل بلغ 54.42٪ . انخفضت بقايا Acetamiprid 20 SP بشكل حاد من 1856.8 25.9 إلى 0، و 0 جزء في المليون في كل من الأوراق والجذور على التوالي، بينما انخفض بقايا Abamectin1.8 EC من 954.12 إلى 0 جزء في المليون. بينما لا يمكن الكشف عن بقاياها في الجذور بعد الاستخدام .بينت هذه الدراسة أن القدرة على استخدام Acetamiprid 20 SP وabamectin 1.8 EC في السيطرة على *S. flava* وليس هناك أي تأثير ضار لكليهما على الخضروات الصالحة للأكل.

الكلمات المفتاحية: ابامكتين. 1.8 EC، اسيتامبرايد 2.5 SP ، جهاز الكروماتوغرافي الغازي عالي الأداء، الفجل، *Scaptomyza flava*.