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The effect of Vermicompost extract on the White Fly population on Green House Cucumber (*Cucumis sativus* L.) in 2 varieties

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ABSTRACT: Cucumber plant with the scientific name of (*Cucumis sativus* L.) is from Cucurbitacea family. Vermicompost organic fertelizers, which are made of effects and mutual reactions between earth worms and micro-organizm, are produced from the breakdown of the organic residues. This organic fertilizer, containing high density of nutrient matters like Nitrogen, Calcium, Phosphorus and Liguid Potassium, is absorbed quickly by the plant. Farthermore, it contains phenolic and Tannin matters, reducing the population of insects after absorbtion. This study was implemented in a period of 70 days in from of Randomized Complete Block Design(CRBD), Factorial test, in 4 treatments on two varieties(Majed and Yaren) with four repetitions and 4 plants in each plot. Treatments was Control , 5% , 15% and 20% of vermicompost extract. The results showed that the use of vermicompost fertilizer extract reduced significantly the population of Green house White fly. And 20% treatment of this extract showed the least population of White fly in Majed Cv.

***Keywords*:** Vermicompost , Cucumber , White Fly.

INTRODUCTION

Cucumis sativus is an important vegetable that its green house production has increased recently. It has a significant role in Human's feeding and is the top four vegetable in consumption and production(Rigi and Seedi, 2007). White fly and plant aphids, that are the main transmitter of viral diseases, are one of the farmers main problems. The length of white fly is almost 2 mm with 4 small wings. Its body is covered by a white powder like matter. This insect shakes the leaves of the plant and then sticks to the back of the plant leaves. This insects feed with the sap and they cause the oozing of a dense essence on the leaves and fruits. The economical loss of this pest is so high on the cucumber. So farmers have to use pesticides and other non-organic methods. White flies are mostly seen on the back of young leaves. They transmit viral diseases to the plants besides their losses(Shokouhian, 2001 & Nosouhi, 2000). Their life cycle is 4 to 5 weeks and dependes in the environment temperature(Ghaderi, 2010). Vermicompost is a technology that uses the specific types of the earth-worms. Due to their highe growth and reproduction popential, the earth-worms can be turned into an unique organic fertilizer. Slowly and steady pass of this matter from the digestive system of the earth-worm and mixing with the varius oozing of the digestive system, produces matters that are different from the other matters. These matters, called vermicompost, contain full of humic matter, absorbable nutrient e;ements, various vitamins, growth-stimulant hormones, and various enzymes. Vermicompost is in from of black granular odourless and is produced commercially in most countries(Samavat, 2009). The research showed that after producing the liguid of vermicompost extract and spraying in various percents on the potato that population of tobacco hornworm (*Manduca sexta*) reduced from 8 worms in each block of the first day to 5.5 of the fourteenth day of the Experiment. Furthermore, the number of cucumber beetles (*Acalymna vittatum*) reduces from 8 in each block of the first day to 4.6 of the fourteenth day, after foliar spraying on the cucumber. The results of these studies showed that the liquid phenols, which are produced from the vermicompost, are absorbable by plants and have a bitter taste for insects. So this is a mechanism that vermicompost extracts can prevent from the

pests (Edwards, 2009). In the other study showed that the foliar spraying of the vermicompost on the potato reduced the *Phytophthora infestans*. This study also showed that the use of this extract can control pests to a great extent and it can have a high potential like an environmental control agent in the organic planting (Zaller, 2006). In the other study by Pandey and Kalra(2010), vermicompost reduced significantly the phytophtora spp. And reduced the population of *Meloidogyne incognita* in potato. In the other study about *Tetramychus urtica* pest on the tomato and cucumber showed that foliar spraying of vermicompost extract with various density makes that pest either leave the plant or die, reducing their reproduction capacity and decreasing their population. This is because of the vermicompost phenolic liguid absorbed by the plant tissue(Edwards, 2009).

Regarding the irregular use of chemical pesticides against greenhouse, the main purpose of this study was to investigate the effect of vermicompost extract, as an organic fertilizer on the population of white fly in 2 varieties of green house cucumber to provide an opportunity for reducing te use of chemical pesticides.

MATERIALS AND METHODS

In order to investigate the effect of vermicompost extract on the population of white fly in two varieties of cucumber(Yaren and Majed), This study was implemented in a period of 70 days in from of Randomized complete block design(CRBD), factorial test, in 4 treatments with fuor repetitions and four plants in each plot. Then we mixed together one unit of vermicompost and four units of water(20 kg vermicompost + 80 liters water) for 72 hours in the 25°c condition so that the extract dissolve completely in the water. Then, we filtered the extract to get the solution for foliar spraying. The solution was diluted with water in 0(just water as control treatment), 5, 15 and 20 percent densities. After that the plant reached to the 4 leaves stage, we started the foliar spraying from the beginning of each week during the implementation of the study. The number of white flies on the leaves was counted separately in each treatment a day after each foliar spraying. Data analysis was don by Spss software and we compared averages using Duncan's multiple range test in 5 % level.

RESULTS AND DISCUSSION

Majed variety

The comparison of the averages, using Dunca n's test at the 5% level of Majed kind, showed that the most number of white fly was seen in the control an 5 percent treatments with the averages of 12.5 and 10.75 , in order. And the least number of white fly was seen in 15 and 20 percent treatments with the averages of 5 and 4.75, in order. According to the table 1 there was not any significant difference between control and 5 % treatments, and neither did in 15 and 20 percent treatments.

Table 1. The average population of white flies in various treatments of Majed var

Treatments	Control	5 %	15 %	20 %
The averges of white fly population in Majed var.	12.5 ^{a}	10.75 ^{a}	5.00 ^{b}	4.75 ^{b}

*The means with atleast common letter, have not significant difference (P ≤ 0.05) Duncan's test

Yaren variete: The comparison of the averages, using Duncan's test at the 5 % level of Yaren kind, showed that the most of with fly population were in the control and 5 percent treatments with the averages of 8.87 and 8.75, in order. And the least number was not any significant difference between applied treatments. Nevertheless, the control treatment showed the most number of white fly and 20 percent treatment showed the least(Table 2).

Table 2. The average population of white flies in various treatments of Yaren var

Treatments	Control	5 %	15 %	20 %
The averges of white fly population in Yaren var.	8.87 ^{a}	8.85 ^{a}	7.93 ^{a}	6.50 ^{a}

*The means with atleast common letter, have not significant difference (P ≤ 0.05) Duncan's test

The comparison of the various treatment between Majed and yaren: According to the table 3, the mutual effect of various treatments on the number of white fly has been significantly between two varieties. The most of white fly population was in the control treatment of Majed var with the average of 12.5 and the least was in the 20 % treatment of Majed var with the average of 4.75, showing a significant difference with the control treatment. As you can see from the comparison of the averages in each treatment between two varities, again control treatment shows the most of white fly population and 20 % treatment shows the least(Table 3).

Table 3. The comparison of the effect of various treatments on the number of white fly in tow var

Treatments	Control	5 %	15 %	20 %	Average
Majed	12.5 ^{a}	10.75 ^{ab}	5.00 ^{d}	4.75 ^{d}	8.25 ^{A}
Yaren	8.87 ^{bc}	8.75 ^{bc}	7.93 ^{bcd}	6.50 ^{cd}	8.01 ^{A}
	10.68 ^{A}	9.75 ^{A}	6.64 ^{B}	5.62 ^{B}	

The average with at least a common letter are not significant at the level of 5 percent Duncan's test. Uper case letters are related to the comparison between treatments and two varities, and lower case are related to the mutual effect of treatments

The results of data analysis of variance(ANOVA) showed that the treatments had s significant difference at 5 % level. The most of white fly was seen in control treatment and the least in 20 % treatment. Fourthermore, the increase in density from 0 to 20 % leads to the reduction of white flies(Table 1,2,3). It can be because of the phenolic matters in the vermicompost extract that are absorbed by the plant tissue after foliar sprying. The most number of White fly was seen in the control treatment of Majed var with the average of 12.50 and the least was in the 20 5 treatment of Majed variety with the average of 4.75. The results of this study are compatible with the results from Pandey and Kalra(2010), Edwards, et al(2009), and Zaller(2006).

CONCLUSION

It can be concluded that the use of vermicompost organic fertilizer reduces the population of white flies in two varieties of cucumber(Yaren and Majed). Since one of the main problems of from is the white fly and aphids plants, that are the main transmitter of viral diseases, the use of vermicompost extraxt can be useful in the reduction of white fly population. It can also provide an opportunity for the reduction of the use of chemical pesticides.

Suggestion

- The use of vermicompost fertilizer for the reduction of white flies population.
- Doing complementary studies by researchers in various densities.

Doing complementary studies about the effect of vermicompost extract on the other pests.

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