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The Mites and Insect Fauna of Squash (*Cucurbita pepo* var. *pepo* L.) Area in Gülağaç Town of Aksaray Province' Turkey

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ABSRACT

In Turkey, *Cucurbitaceae* species constitute 23% of the vegetable production. The squash, (Cucurbita pepo var. Pepo L.), has considerable economic value and usually has been producing in the eastern part of Central Anatolia; Kayseri, Aksaray, Nevşehir provinces etc. The present study was carried out in Gülağaç Town of Aksaray where squash is nearly monoculture. In 2010 growing season, to determine the harmful and beneficial acar and insect fauna on the squash areas; surveys were started in June 13 and continued by six-eight day intervals for collecting; sweeping net and checking directly plant material were used as methods. As a result; 8 harmful insect species from 6 families of four order and 8 beneficial insect species from 5 families of 3 order were determined. From the pest species, *Empoasca decipiens* Paoli , *Tetranychus urticae* Koch., *Thrips tabaci* Lind., *Myzus (*Nectarosiphon*) persicae* Sulzer, *Aphis gosspypii* Glover, *Aphis nasturtii* Kaltenbach and between the beneficial species *Coccinella septempunctata* L. *Adonia variegata* Goeze ve *Chrysoperla carnea* Step. were the common insect and acar species. *Empoasca decipiens* Paoli was the most important and dominant pest of squash in the area. Consequently It can be advised that the future work should be done on this species together vector aphids.

1. Introduction

In Turkey, Cucurbitaceae species constitute 23% of the vegetable production. The squash, (*Cucurbita pepo* var. p*epo* L.), has considerable economic value and usually has been producing in the eastern part of Central Anatolia; Kayseri, Aksaray, Nevşehir provinces etc.

Squash has many different species and grown for many different purposes. It is producing on 1,5 million hectare area, as approximately 21 million tones on the world. Turkey has 2% of this production (FAO, 2010).

Nevertheless, while the squash production in Turkey is 18.500 tones, 3.655 tones of them are supplying from Aksaray province (TUIK, 2010). Where it is completely grown for seeds.

The squash materials which cultivating in Turkey, are usually *Cucurbita pepo* L., however *C. moschata* is also growing in a little amount for the same aim.

In Turkey, while there are many researches published about squash cultivation, the researches about pests are not enough. In this project, the acar and insect fauna of squash area were determined in Gülağaç District of Aksaray Province which is one of the most important growing centers of squash in Turkey.

2. Materials and Methods

The main materials of the research were the squash (*Cucurbita pepo* var. *pepo* L.) sown area and acar and insect fauna collected from that area. In 2010, four different localities were surveyed in Gülağaç district; Center, Gülpınar and Demirci town and Kızılkaya village. In every locality, two field no chemical were applied were chosen.

Surveys were begun in 13 June and weekly continued till the end of August. At a random on a diagonal

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transect across each field, 20 plants checked and the acar and insect pests were recorded. In addition to collect adults of insects, sweeping-net was used (50 times for each field).

3. Results and Discussion

3.1. Mites and Insect Fauna of Squash Area in Gülağaç Dictrict of Aksaray Province' Turkey

As a result of this research conducted in 2010 in squash areas, 1 tetranychid and 8 insect species from 7 families belong to 4 order were determined (Table 1).

3.2. The Population Developments of some Important Mite and Insects harmful on Squash

3.2.1. *Gülağaç Center*

E. decipiens, cotton leafhopper, was determined as the most important pest species on squash in Gülağaç canter location in 2010. The population was begun in 13 June with 5 number/leaf, then gradually increased till 20 number/leaf peak point (Fig. 1). However, the population was slowly decreased; it stayed on 15 number/leaf levels until to the last observation date, 29 August.

Table 1
Mite and Insect species determined on squash areas in Gülağaç District of Aksaray Province' Turkey, 2010

Order/Family	Species	Location			
		Gülağaç Central	Gülpınar	Demirci	Kızılkaya
Acarina/Tetranychidae	*Tetranychus urticae* Koch	X	X	X	X
Thysanoptera/Thripidae	*Thrips tabaci* Lind.	X	X	X	X
	Aphis gossypii Glover	X	X	X	X
Hemiptera/Aphidide	*Aphis nasturtii* Kaltenbach	X	X	X	X
	Myzus persicae Sulzer	X	X	X	X
Hemiptera/Cicadellidae	*Empoasca decipiens* Paoli	X	X	X	X
Coleoptera/Elateridae	*Adratus anatolicus* Platia and Schimmel		X	X	X
Coleoptera/Scarabaeidae	*Phyllophogo* sp.			X	X
Coleoptera/Tenebrionidae	*Opartum sobulasum* L.			X	X

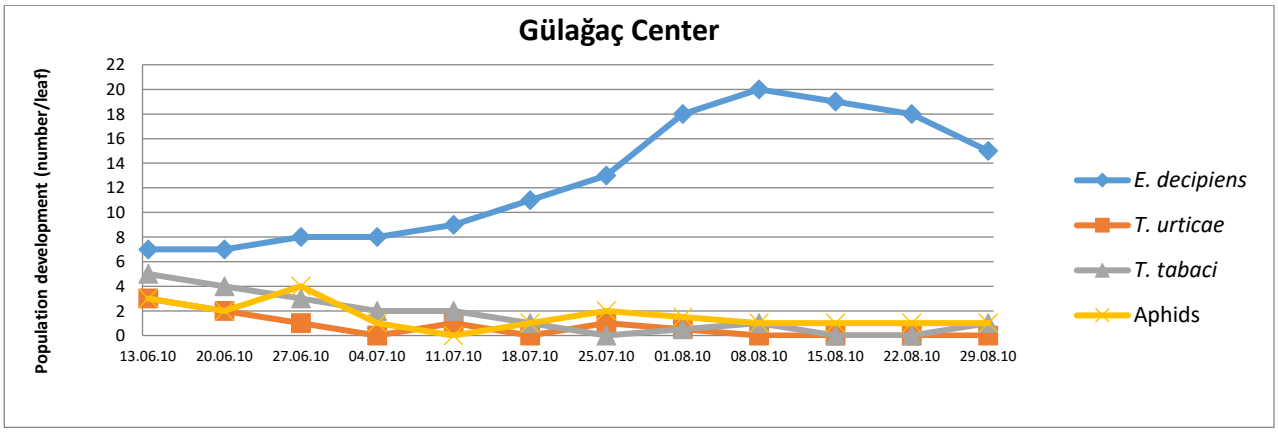

Figure 1
Population Development of some Mite and Insect Harmful on Squash in Gülağaç Center of Aksaray Province' Turkey, 2010

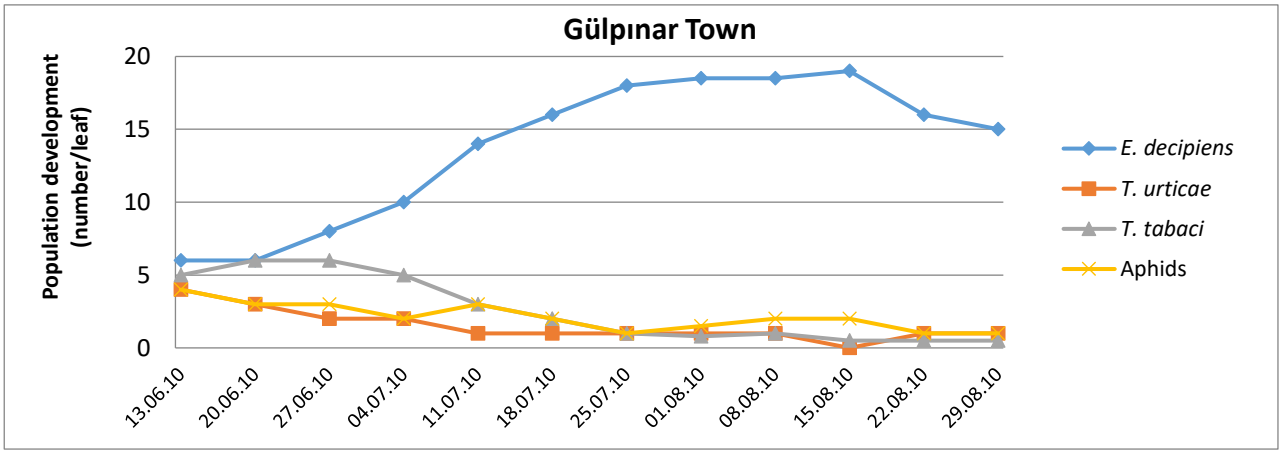

Figure 1

Population Development of some Mite and Insect Harmful on Squash in Gülpınar Town of Gülağaç District of Aksaray Province' Turkey, 2010

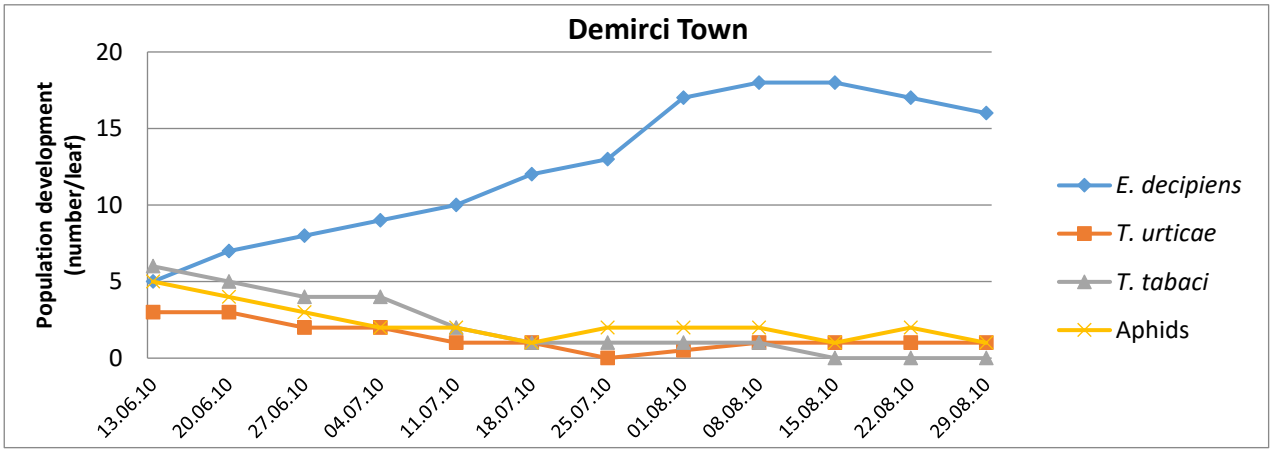

Figure 3

Population Development of some Mite and Insect Harmful on Squash in Demirci Town of Gülağaç District of Aksaray Province' Turkey, 2010

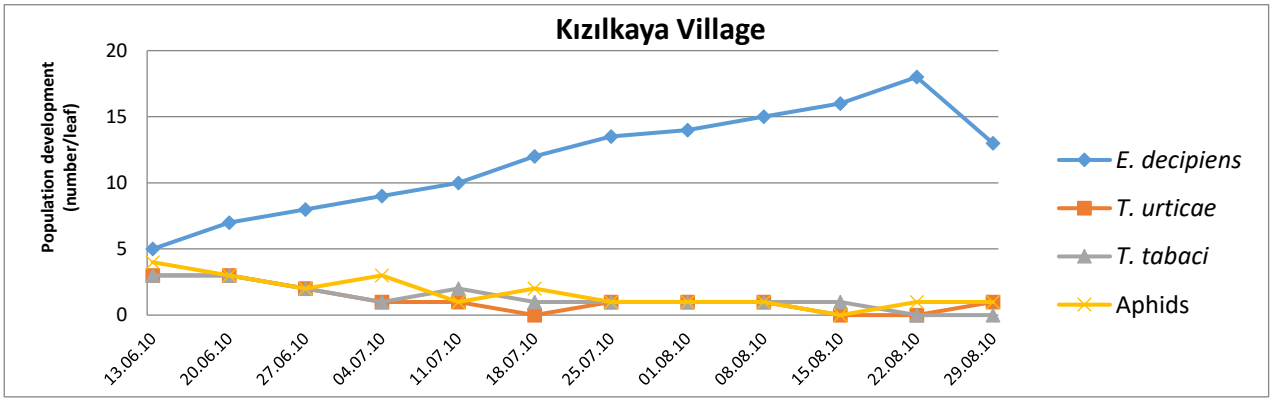

Figure 4

Population Development of some Mite and Insect Harmful on Squash in Kızılkaya Village of Gülağaç District of Aksaray Province' Turkey, 2010

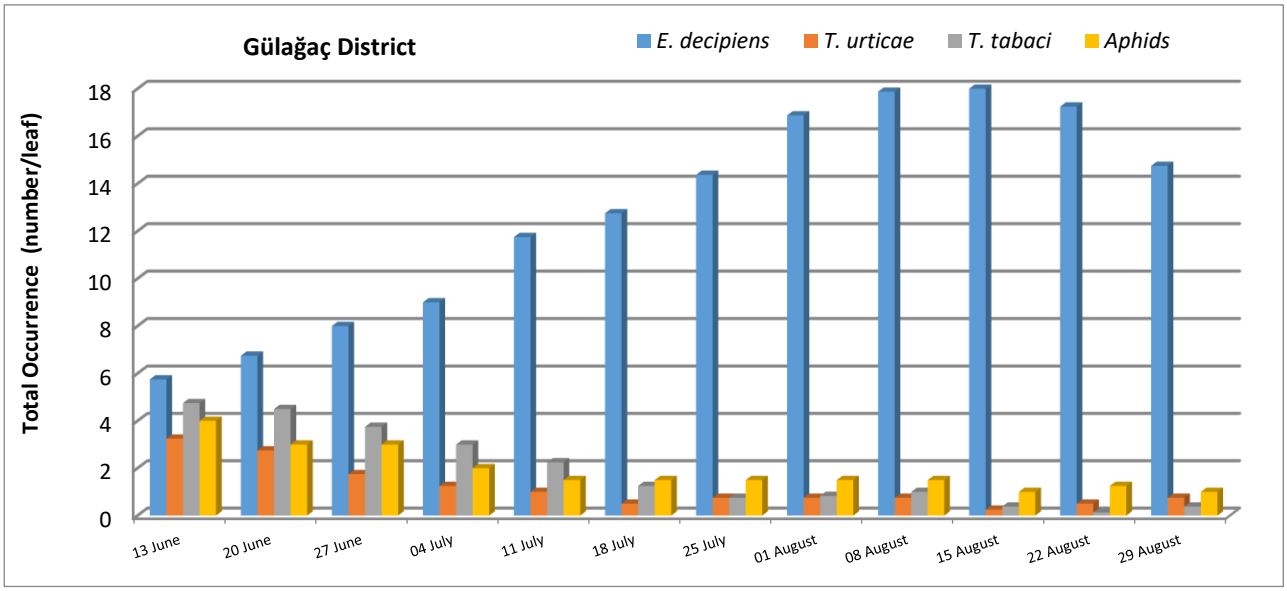

Figure 2
Total Occurrence of some Mite and Insect Pests on Squash Area in Gülağaç District of Aksaray Province' Turkey, 2010

T. urticae population on the research area was relatively low compare to the other insect pests. In 13 June, it was determined as 3 number/leaf. Then it suddenly decreased until beginning of July and it fully collapsed in early August.

The population of *T. tabaci* was 5 number/leaf in 13 June; this beginning level is the same with *E. decipiens*. But the numbers of *T. tabaci* were decreased to till the last week of July. It was thought that as if thrips leave the plants after flowering stage.

Aphid's population was also relatively quite low. There were three species; *Myzus persicae*, *Aphis nasturtii*, *Aphis gossypii*, however, the last one was dominant in aphid population. These three, especially polyfag species, *Myzus persicae* and *Aphis gossypii* are very effective vectors (Tresh, 1985).

3.2.2. Gülpınar Town

In Gülpınar district, *E. decipiens* population was begun in 13 June as 6 number/leaf. Then gradually increased till mid-August and peaked in 15 August as 19 number/leaf. After this date, the growing season already finished and population was suddenly collapsed (Fig.2). Gülağaç Center and Gülpınar town are quite close and the results also nearly the same for each other. The population of *T. tabaci* was begun with 5 number/leaf in 13 June, peaked with 6 number/leaf in 27 June and then gradually decreased. Both at the beginning and peaked date was 13 June with 4 number/leaf level (Fig. 2). Dominating aphid species was *M. persicae* in this location.

3.2.3. Demirci Town

E. decipiens population was begun with 5 number/leaf level and the highest population level (18 number/leaf) was recorded in 8 August (Fig.3). It was continued nearly the same level at the ending of growing season. *T. urticae*, *T. tabaci* and aphid population progresses were very similar to former locations.

3.2.4. Kızılkaya Village

The first observation date was 13 June and all the species population was begun at that time (Fig. 4). *E. decipiens*'s population beginning level was 5 number/leaf. Differently, it peaked in Kızılkaya with the level of 18 number/leaf in 22 August, at least 10-15 day later then the former location. While thrips population was quite low. *T. urticae* and aphid population values were much closed to the former location.

3.3. The Total Occurrence of Mite and Insect Pests on Squash Area in Gülağaç District of Aksaray Province

Fig. 5. Shows that *E. decipiens* was intensively found in all localities and dates in 2010. It was dominant pest species. At the beginning, both *E. decipiens* and the other pests (*T. urticae*, *T. tabaci* and aphids) show nearly the same population level in all localities with small differences. But form the beginning of July; *E. decipiens* population was drastically increased. Consequently, these leafhoppers can be found from the May to the end of November. But it is mostly very common in July-August. It can be found in overwintering sides in October-November. In Turkey, it gives 4-5 generations in Mediterranean region and 3-4 generations in Aegean region (Lodos, 1982). In the district, none of *M. persicae*, *A. gossypii* and *T. tabaci* was founded. This was probably related to the strong spring rainfall situation in the district in that year.

In the present research, carried out in 2010 in Gülağaç District of Aksaray Province' Turkey, 8 insect species belonging to 7 families from 4 order and 1 acar species were determined. Between them, *Empoasca decipiens* Paoli, *Tetranychus urticae* Koch, *Thrips*

tabaci Lind., *Aphis gossypii* Glover, *Myzus percicae* Sulz. and *Aphis nasturtii* Kaltenbach were evaluated as dangerous pests for squash. However *E. decipiens* is clearly dominant pest, vector aphids are also important even their population were usually the lowest.

It was advised that producers should definitely be careful against these early sucking pests from the beginning of June. Additionally, they should be informed about the side effects of chemicals and advantages of organic farming, etc.

As a result, in this study, the squash pest fauna, which there are nearly no detailed research on it in Turkey, were determined. Furthermore basic knowledge were tried to collect about some species which can be problem in future and their control strategies.

4. Acknowledgements

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