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Thrips (Thysanoptera) species occurring in cherry orchards in Isparta province of western Turkey

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A b s t r a c t : This study was carried out to determine the species of Thysanoptera existing at important cherry orchards in Isparta province of western Turkey during the month of April-June of 2013. At the end of this study, nineteen species belonging to three families of Thysanoptera were determined. The most abundant species in this study were *Taeniothrips inconsequens* (UZEL 1895), *Thrips meridionalis* (PRIESNER 1926), *T. tabaci* (LINDEMAN 1889), *Haplothrips reuteri* (AMYOT & SERVILLE 1843) and *Frankliniella occidentalis* (PERGANDE 1895).

K e y w o r d s : Thysanoptera, Cherry, *Prunus avium*, Isparta, Turkey.

Introduction

Cherry is a fruit which has an important place in the Turkish economy. There are 17.922.171 cherry trees in Turkey and annual production is 494.325 tons (ANONYMOUS 2013). Cherries are widely grown in the Mediterranean, Marmara and Aegean regions of Turkey. 6.42 % of the Turkish cherry production is realized in Isparta, Mediterranean region of Turkey (ANONYMOUS 2013).

In the field of cherry production of Turkey, it is seen that there is no detailed information about the species related to Thysanoptera. LODOS (1993) and ULUSOY et al. (1999) reported *Taeniothrips inconsequens* (UZEL) from cherry orchards, ÖZBEK ET AL. (1996) recorded *Haplothrips reuteri* (KARNY) and *Thrips meridionalis*.

The most comprehensive study on this area was conducted by ŞAHİN & TEZCAN (2014) in 2010 and 2011 and 21 species belonging to Thysanoptera was determined in cherry orchards from Kemalpaşa (Izmir) province of western Turkey. In this study *Thrips tabaci* (LINDEMAN 1889), *T. major* UZEL 1895, *T. inconsequens* (UZEL 1895) and *T. angusticeps* UZEL 1895 were reported as the most common species. No other study was found which went as far down as the species belonging to Thysanoptera in Turkey.

For the purpose of overcoming this absence, conducting a study in the cherry orchards in Isparta which is the most prominent cherry producing area of Mediterranean region of Turkey was deemed necessary. The scope of the study was to determine thrips species during the flowering and fruiting period.

Material and Methods

The main material of this study is consisted of various laboratory equipments and also Thysanoptera species that were collected from the cherry orchards in the districts of Isparta during the months of April-June 2013.

This study was conducted in Central district, Uluborlu, Senirkent, Atabey, Keçiborlu and Gönen and these districts are among the important areas in cherry production in Isparta with their 76% of total production.

The examples of this study were collected from 155 cherry orchards of six districts mentioned above. The size of these orchards ranges from 1 to 10 decares. The number of orchards was determined thanks to their production potential.

These districts and the number of orchards which were sampled were as follows: Uluborlu (63), Senirkent (24), Atabey (22), Central district (21), Keçiborlu (16), Gönen (9). - 155 Orchards in total.

In the course of the study, 25 trees were chosen randomly by walking along the diagonals of each orchard. One flower was picked up from the four directions of each tree, totalling 100 flower, fruit and leaf samples.

Flower samples that were put into falcon tubes having 70% ethyl alcohol were brought to the laboratory after writing their label information on falcon tubes. Thrips specimens that found on flowers were separated according to their morphology and they were made ready for preparation (FUNDERBURK et al. 2011). The fruit and leaf samples brought to the laboratory were brushed separately into white dishes by using sable brushes. Those thrips which had fallen into dishes were taken eppendorf tubes having 70% of alcohol, they were labelled, then prepared and finally identified.

Preliminary diagnosis of the samples were done by Assist. Prof. Dr. Ozan Demirözer. The confirmation and identification of the samples were done by Prof. Dr. Irfan Tunç (Akdeniz University, Faculty of Agriculture, Department of Plant Protection, Antalya, Turkey).

Results and Discussion

As a result of this study, a total of 19 species belonging to three families were identified and they were indicated in Table 1.

According to this study, the most common species was *T. meridionalis* in cherry orchards and this species was collected from the 48.38% of the orchards. It was followed by *T. tabaci* (47.74%), *Taeniothrips inconsequens* (47.09%), *Haplothrips reuteri* (40.64%), *A. intermedius* (14.19%) and *F. occidentalis* (13.54%).

During the study, thrips in a total of 15.500 flowers, leaves and fruits from 155 orchards were evaluated. Accordingly, in Isparta, while the percentage of flowers with thrips was 12.80%, it was found to be 0.21% in fruits and it was 0.00% on leaves.

When the numerical and percentage status of the collected samples within the total sample was observed *Taeniothrips inconsequens* was the most prominent one with 805 samples (5.19%). It was followed by *Tenothrips frici* with 12 samples (0.077%), *Haplothrips*

tritici with 11 samples (0.070%), *Aeolothrips collaris* with 10 samples (0.060%), *Melanthrips fuscus* with 6 samples (0.038%), *T. italicus* with 3 samples (0.019%), *Frankliniella intonsa*, *Mycterothrips salicis* and *Thrips angusticeps* with 2 samples (0.012%), *M. pallidior*, *Orothrips priesneri* and *T. minutissimus* with 1 sample (0.006%) were only found in flowers while *M. albidicornis* with 1 sample (0.006%) on fruits. The species of *Aeolothrips intermedius*, *Chirothrips manicatus*, *Frankliniella occidentalis*, *Thrips meridionalis*, *T. tabaci* and *Haplothrips reuteri* were sampled both in flower and fruit samples.

In this study, the species reported from Isparta for the first time were *Mycterothrips salicis*, *Thrips italicus* and *Orothrips priesneri*.

A. collaris, *T. meridionalis*, *T. tabaci*, *Taeniothrips inconsequens*, *H. reuteri* reported in cherry orchard of Isparta are known to be found in fruit production areas in different regions of Turkey (TUNÇ 1989a, 1989b; ŞAHİN & TEZCAN 2014). In addition, *Aeolothrips intermedius*, *Melanthrips fuscus*, *Frankliniella occidentalis*, *Thrips angusticeps* is known to be determined by ŞAHİN & TEZCAN (2014) in cherry orchards in Kemalpaşa, Izmir. However, there is no record regarding the other 10 species including *M. pallidior*, *Orothrips priesneri*, *Chirothrips manicatus*, *Frankliniella intonsa*, *Mycterothrips albidicornis*, *M. salicis*, *Tenothrips frici*, *T. italicus*, *T. minutissimus*, *H. tritici* in cherry orchards.

From species were known to be found in Isparta in study of conducted by Tunç et. al (2012) *Aeolothrips intermedius*, *Melanthrips fuscus*, *M. pallidior*, *Chirothrips manicatus*, *Frankliniella intonsa*, *Mycterothrips albidicornis*, *Taeniothrips inconsequens*, *Tenothrips frici*, *Thrips angusticeps*, *T. meridionalis*, *T. minutissimus*, *T. tabaci*, *H. reuteri* and *H. tritici* were observed in this study. In addition, species that were obtained in the study mentioned above were reported to be seen on different fruit orchards and weed species related various families including Brassicaceae, Chenopodiaceae, Fabaceae, Asteraceae and Lamiceae. In addition, *O. priesneri* and *H. reuteri* were known to be determined in cherry trees.

At the end of the study, 11 species was found in Uluborlu, 10 species in Atabey, 9 species in Central district, Senirkent and Gönen, 7 species in Keçiborlu.

A. intermedius, *A. collaris* found at the end of this study are predators while *T. tabaci*, *T. meridionalis*, *Taeniothrips inconsequens*, *F. occidentalis*, *F. intonsa*, *Melanthrips fuscus*, *M. pallidior*, *Chirothrips manicatus*, *Orothrips priesneri*, *Tenothrips frici*, *Mycterothrips albidicornis*, *M. salicis*, *Thrips angusticeps*, *T. italicus*, *T. minutissimus*, *Haplothrips reuteri* and *H. tritici* are phytophagous. LEWIS (2006) indicated that *A. intermedius*, *F. occidentalis* and *T. tabaci* showed phytophagous and predator nutrition property and also *A. intermedius* and *F. occidentalis* that are both phytophagous and predator showed cannibalism. It is known that *Melanthrips* species feeds on pollen and nectar in the meanwhile, *Mycterothrips* species feeds on leaves.

It is being considered that it is useful to follow this subject in the future and to pay attention to possible population growth of phytophagous species.

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Zusammenfassung

Vorliegende Arbeit behandelt die Thysanopterenfauna an Kirschbaumkulturen in der westtürkischen Provinz Isparta, erfasst im Zeitraum April bis Juni 2013. Es gelang der Nachweis von 19 Arten aus drei Familien. Als häufigste Arten stellten sich *Taeniothrips inconsequens* (UZEL, 1895), *Thrips meridionalis* (PRIESNER, 1926), *T. tabaci* (LINDEMAN, 1889), *Haplothrips reuteri* (AMYOT & SERVILLE, 1843) und *Frankliniella occidentalis* (PERGANDE, 1895) heraus.

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Table 1. List of species according to the families

Species	Number of orchards occurring thrips specimens	Rate of orchards occurring thrips specimens (%)	Number of collected specimens	Rate of collected specimens (%)
Aeolothripidae				
<i>Aeolothrips collaris</i> (PRIESNER 1919)	8	5.16	10	0.495
<i>Aeolothrips intermedius</i> (BAGNALL 1934)	22	14.19	33	1.634
<i>Melanthrips fuscus</i> (SULZER 1776)	2	1.29	6	0.297
<i>Melanthrips pallidior</i> (PRIESNER 1919)	1	0.64	1	0.050
<i>Orothrips priesneri</i> (MOULTON 1907)	1	0.64	1	0.050
Thripidae				
<i>Chirothrips manicatus</i> (HALIDAY 1836)	2	1.29	2	0.099
<i>Frankliniella intonsa</i> (TRYBOM 1895)	1	0.64	2	0.099
<i>Frankliniella occidentalis</i> (PERGANDE 1895)	21	13.54	93	4.606
<i>Mycterothrips albicornis</i> (KNECHTEL 1923)	1	0.64	1	0.050
<i>Mycterothrips salicis</i> (REUTER 1879)	1	0.64	2	0.099
<i>Taeniothrips inconsequens</i> (UZEL 1895)	73	47.09	805	39.871
<i>Tenothrips frici</i> (UZEL 1895)	8	5.16	12	0.594
<i>Thrips angusticeps</i> (UZEL 1895)	1	0.64	2	0.099
<i>Thrips italicus</i> (BAGNALL 1926)	2	1.29	3	0.148
<i>Thrips meridionalis</i> (PRIESNER 1926)	75	48.38	483	23.922
<i>Thrips minutissimus</i> (LINNAEUS 1758)	1	0.64	1	0.050
<i>Thrips tabaci</i> (LINDEMAN 1889)	74	47.74	294	14.562
Phlaeothripidae				
<i>Haplothrips reuteri</i> (KARNY 1907)	63	40.64	257	12.729
<i>Haplothrips tritici</i> (KURDJUMOV 1912)	5	3.22	11	0.545
Total	155		2019	

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