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

Asiye UZUN, Serdar TEZCAN & Ozan DEMİRÖZER

Abstract: 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 (PHEINER 1926), T. tabaci (LINDEMAN 1889), Haplothrips reuteri (AMYOT & SERVILLE 1843) and Frankliniella occidentalis (PERGANDE 1895).

Keywords: 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 UŁUSOY 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 (İzmir) 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, Keciborlu and Gonen 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), Keciborlu (16), Gonen (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*
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; ŞAHÎN & TEZCAN 2014). In addition, in Isparta, A. intermedius, Melanthrips fuscus, Frankliniella occidentalis, Thrips angusticeps is known to be determined by ŞAHÎN & 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 albicorneus, 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 intona, Mycterothrips albicorneus, 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 Lamiaceae. 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. intona, Melanthrips fuscus, M. pallidior, Chirothrips manicatus, Orothrips priesner, Tenothrips frici, Mycterothrips albicorneus, 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.
Acknowledgement

We sincerely would like to thank Prof. Dr. Irfan Tunç (Akdeniz University, Faculty of Agriculture, Department of Plant Protection, Antalya, Turkey) for his great support regarding the identification and confirmation of the collected samples.

Zusammenfassung


References


Authors' addresses:

Asiye UZUN
Süleyman Demirel University,
Faculty of Agriculture,
Department of Plant Protection
TR-Isparta, Turkey
E-mail: asiyee_uu@hotmail.com

Prof. Dr. Serdar TEZCAN
Ege University, Faculty of Agriculture,
Department of Plant Protection
TR-Bomova-Izmir, Turkey
E-mail: sendar.tezcan@gmail.com

Assis. Prof. Dr. Ozan DEMIRÖZER
Süleyman Demirel University,
Faculty of Agriculture,
Department of Plant Protection
TR-Isparta, Turkey
E-mail: ozandemirozer@sdu.edu.tr
Table 1. List of species according to the families

<table>
<thead>
<tr>
<th>Species</th>
<th>Number of orchards occurring thrips specimens</th>
<th>Rate of orchards occurring thrips specimens (%)</th>
<th>Number of collected specimens</th>
<th>Rate of collected specimens (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aeolothripidae</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aeolothrips collaris (Priesner 1919)</td>
<td>8</td>
<td>5.16</td>
<td>10</td>
<td>0.495</td>
</tr>
<tr>
<td>Aeolothrips intermedius (Bagnall 1934)</td>
<td>22</td>
<td>14.19</td>
<td>33</td>
<td>1.634</td>
</tr>
<tr>
<td>Melanothrips fuscus (Sulzer 1776)</td>
<td>2</td>
<td>1.29</td>
<td>6</td>
<td>0.297</td>
</tr>
<tr>
<td>Melanothrips pallidus (Priesner 1919)</td>
<td>1</td>
<td>0.64</td>
<td>1</td>
<td>0.050</td>
</tr>
<tr>
<td>Oreothrips priesneri (Moulton 1907)</td>
<td>1</td>
<td>0.64</td>
<td>1</td>
<td>0.050</td>
</tr>
<tr>
<td><strong>Thripidae</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chirothrips manicatus (Haliday 1836)</td>
<td>2</td>
<td>1.29</td>
<td>2</td>
<td>0.099</td>
</tr>
<tr>
<td>Frankliniella intonsa (Trybom 1895)</td>
<td>1</td>
<td>0.64</td>
<td>2</td>
<td>0.099</td>
</tr>
<tr>
<td>Frankliniella occidentalis (Pergande 1895)</td>
<td>21</td>
<td>13.54</td>
<td>93</td>
<td>4.606</td>
</tr>
<tr>
<td>Mycterothrips altidscecent (Knuttila 1923)</td>
<td>1</td>
<td>0.64</td>
<td>1</td>
<td>0.050</td>
</tr>
<tr>
<td>Mycterothrips salsicus (Reuter 1879)</td>
<td>1</td>
<td>0.64</td>
<td>2</td>
<td>0.099</td>
</tr>
<tr>
<td>Thrips inaequalis (Uzel 1895)</td>
<td>73</td>
<td>47.09</td>
<td>805</td>
<td>39.871</td>
</tr>
<tr>
<td>Taeniothrips fasciatus (Uzel 1895)</td>
<td>8</td>
<td>5.16</td>
<td>12</td>
<td>0.594</td>
</tr>
<tr>
<td>Theriothrips angusticeps (Uzel 1895)</td>
<td>1</td>
<td>0.64</td>
<td>2</td>
<td>0.099</td>
</tr>
<tr>
<td>Theriothrips italicus (Bagnall 1926)</td>
<td>2</td>
<td>1.29</td>
<td>3</td>
<td>0.148</td>
</tr>
<tr>
<td>Theriothrips meridionalis (Priesner 1926)</td>
<td>75</td>
<td>48.38</td>
<td>483</td>
<td>23.922</td>
</tr>
<tr>
<td>Theriothrips minutissimus (Linnaeus 1758)</td>
<td>1</td>
<td>0.64</td>
<td>1</td>
<td>0.050</td>
</tr>
<tr>
<td>Theriothrips tabaci (Lindeman 1899)</td>
<td>74</td>
<td>47.74</td>
<td>294</td>
<td>14.562</td>
</tr>
<tr>
<td><strong>Phlaeothripidae</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haplothrips reuteri (Karny 1907)</td>
<td>63</td>
<td>40.64</td>
<td>257</td>
<td>12.729</td>
</tr>
<tr>
<td>Macrothorax nitidus (Krishmaraj 1912)</td>
<td>5</td>
<td>3.22</td>
<td>11</td>
<td>0.545</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>155</td>
<td>2019</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>