RECORDS OF SOME LEAF MINERS OF ANTHOMYIIDAE, (DIPTERA) AND THEIR HOST PLANTS IN IRAQ

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ABSTRACT

The leaf miners Pegomya terbrans (Rondani) and P. bicolor (Wiedemann) (Diptera; Anthomyiidae) were newly recorded in Iraq. Host plants of these leaf miners and P. cunicularia (Rondani) were identified: P. bicolor was found to be monophagous, whereas P. terbrans and P. cunicularia were oligophagous. It was found that Cirsium syriaca and Silybum marianum were more susceptible to P. terbrans than the other ones. Infectivity and severity of infestation were estimated for most susceptible weeds against P. terbrans and P. bicolor. These leaf miners have two generations a year.

INTRODUCTION

Pegomya Robineau Desvoidy 1830 is the commonest genus of the Anthomyiidae (Suwa, 1984). Suwa (1974) and Cameron (1917) have reported that Pegomya includes all the anthomyiids with naked or at least pubescent antennary bristle. They have also concluded that anal vein reaches the wing margin as well as partly yellowish coloration of the legs and abdomen.

P. terbrans has been known as a leaf miner on plants of Cirsium (=Notobasis), Carduus and Cynara (personal communication with Dr. Suwa). Hennig (1973) has indicated that P. terbrans distributes in Palestine and Europe.

Griffiths (1982) reared P. bicolor from Rumex acetosa. However, other researchers reared this species from most Rumex spp.: acetosella (Suwa, 1917), acutus (Seguy, 1937), Obrusifolius (Cameron, 1917; Suwa, 1971), Patentia (Tiensu, 1935). According to Hennig (1973), the larvae of P. bicolor in Europe devoured on Elymus australis, Fagopyrum asculentum, Oxyria digyna, Peganum semperflorens and Polygonum and spread in Europe, North Africa, North America and Asia. P. cunicularia and its allied species are notorious pests injurious to beet and spinach (Michelsen, 1980; Suwa, 1984). In Iraq it was found that P. cunicularia mine Beta vulgaris van cicla (Makhlif, 1992). This leaf miner spread in Holarctic regions.

According to the literature available, only P. hyoscyma is reported as an anthomyiid leaf miner from Iraq (Hariri, 1976).

The aim of the present study is to study is to survey anthomyiid leaf miners and their host plants. Besides, the beneficial significance of the two species that attack weeds have been
Leaf miners and their host plants

investigated The dates of the leaf-miners appearance as well as their presence in the field are likewise determined.

MATERIALS AND METHODS

The infested leaves of the host plants were collected from the fields. Later, pupae of anthomyiid leaf miners were confined in the laboratory, until the adults emerged. The adults were preserved in 70% alcohol and some drops of glycerin, added to the preservative solution.

Host plants of P. cunicularia were collected from AL-Qaim in AL-Anbar province, whereas, the hosts of P. terbrans and P. bicolor were collected from the parks of the university campus and the woodland in Mosul. Host plants were identified in the herbarium of College of Sciences, University of Mosul.

To evaluate the efficiency of leaf miners against their hosts, the infectivity and severity of infestation were determined: by infectivity is meant the percentage of infested plants to the total examined plants. Severity of infestation was undertaken by counting the mined leaves of each infested plant in relation to its total leaves.

RESULTS AND DISCUSSION

Host plants

P. terbrans

Larvae of this fly cause blotch mines in the leaf blade. The hosts belong to four genera of the family compositae (Table 1). Therefore, P. terbrans is an oligophagous leaf miner. Onopordum acanthium and Silybum marianum are initially recorded as genera and species infested with this leaf miner. C. achenoides and C. syriaca are newly recorded as hosts for P. terbrans.

P. bicolor

Larvae of this species mine two closely related hosts within Rumex only (Table 1). Accordingly, this leaf miner is monophagous. R. sanguineus is a new host for P. bicolor. Hennig (1973) has indicated that P. bicolor bred from Einaux, Festuca, Polygonum, Oxyria and Begonia. However, Hennig does not examine the bred specimens by himself; it is, therefore, most likely that these records might have been based on some wrong information.

P. cunicularia

(Table 1) shows that P. cunicularia is an oligophagous leaf miner. Suwa (1974) and Mekhilif (1992) have found this leaf miner infesting plants from the genera Beta, Atriplex and Chenopodium.

Susceptibility of hosts
Cultivated plants

Larvae of *P. cunicularia* attack *B. vulgaris* var. *cicla* and spanich. Several damages cause death to seedlings and wilt of mined leaves.

Weeds

As it is known, significant weeds infestation with insects is useful. Among the hosts investigated in this study, it has been found that *C. syriaca* and *S. marianum* are more susceptible to *P. terbrans*. (Table 2) shows that the females prefer *C. syriaca* during oviposition. It has been concluded from (Table 2) that F ratio of infectivity and severity of infestation between *C. syriaca* and *S. marianum* is 1.38 and 1.26 respectively.

There is no significant susceptibility between *R. obtusifolius* and *R. sanguineus* against *P. bicolor*. (Table 2) shows that about four-fifths of the examined plants are severely infested. Weeds control by anthomyiid leaf miner is more effective when seedlings and young plants are infested.

Presence date of leaf miners

Growth of weeds which are infested by *P. terbrans* and *P. bicolor* begins after rainfall; the planting season of *B. vulgaris* var. *cicla* and spanich begins at the same time. The infestation with the first generation starts from November till the first week of February but immature stages are not observed for about 45 days. This may be attributed to low temperature; therefore, the pupae are overwintered. Larvae of second generation are seen from late March until the end of season.

<table>
<thead>
<tr>
<th>Host plant</th>
<th>Leaf miner</th>
<th>Collecting date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chenopodiaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Chenopodium album</em></td>
<td><em>P. cunicularis</em></td>
<td>15. April, 1989</td>
</tr>
<tr>
<td><em>C. murale</em></td>
<td><em>P. cunicularis</em></td>
<td>23. March, 1989</td>
</tr>
<tr>
<td><em>C. vulgaris</em></td>
<td><em>P. cunicularia</em></td>
<td>28. March, 1989</td>
</tr>
<tr>
<td><em>Spinacia oleracea</em></td>
<td><em>P. cunicularia</em></td>
<td>4. January, 1989</td>
</tr>
<tr>
<td>Compositae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Carduus nutans</em></td>
<td><em>P. terbrans</em></td>
<td>15. January, 1989</td>
</tr>
<tr>
<td><em>C. acanthoides</em></td>
<td><em>P. terbrans</em></td>
<td>22. December, 1989</td>
</tr>
<tr>
<td><em>Cirsium</em> (= Notobasis)</td>
<td><em>P. terbrans</em></td>
<td></td>
</tr>
<tr>
<td><em>Syriaca</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Onopordum acanthium</em></td>
<td><em>P. terbrans</em></td>
<td>19. March, 1989</td>
</tr>
<tr>
<td><em>Silphium marianum</em></td>
<td><em>P. terbrans</em></td>
<td>2. February, 1989</td>
</tr>
<tr>
<td>Polygonaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Rumex Obtusifolius</em></td>
<td><em>P. bicolor</em></td>
<td>17. November, 1989</td>
</tr>
<tr>
<td><em>R. sanguineus</em></td>
<td><em>P. bicolor</em></td>
<td>20. April, 1989</td>
</tr>
</tbody>
</table>
Leaf miners and their host plants

Table (2) Infestation of weeds which are mainly susceptible to leaf miners

<table>
<thead>
<tr>
<th>Host plant</th>
<th>Leaf-miner</th>
<th>Infectivity</th>
<th>Severity of infestation</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. syriaca</td>
<td>P. terbrans</td>
<td>81</td>
<td>76(+) 10.8</td>
</tr>
<tr>
<td>S. marianum</td>
<td>P. terbrans</td>
<td>58</td>
<td>63(+) 12.8</td>
</tr>
<tr>
<td>Rumex spp.</td>
<td>P. bicolor</td>
<td>78</td>
<td>78(+) 15.5</td>
</tr>
</tbody>
</table>

ACKNOWLEDGMENT

Iem indebted to Dr Massaki Suwa of the Institute of Entomology, Faculty of AGRICULTURE, Hokkido University, Japan for identifying the leaf miners.

LITERATURE CITED


Hariri, G. 1976. The economic insects of Syria and neighbouring countries. Faculty of Agriculture, University of Aleppo, Aleppo, Syria.


تسجيلات لبعض حفارات الأوراق من العائلة Anthomyiidae и عوائلها النباتية في العراق

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الخلاصة

تم تسجيل الحفارات من P. bicolor (Wiedemann) و Pegomya terbrans (Rondani) لأول مرة في العراق. وقد شُخصت عوائلهما وعوائل حفارات الأوراق P. bicolor من العائلة Anthomyiidae وعوائل حفارات الأوراق P. bicolor (Wiedemann) P. bicolor (Rondani) P. cunicularia (Rondani) P. terbrans بالحوار من الخفارات P. terbrans و P. cunicularia. فيما قدّرت نسبة الأضافة وشدها للإبلاغ الأكثر في الحفارات P. bicolor. و P. terbrans في السنة ...

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