HONEYDEW PRODUCING INSECTS IN TEHRAN PROVINCE, IRAN,

Heydari Alizadeh, B. and M.S. Mossadegh

A survey was conducted from 1993 to 1994 for the presence of honeydew producing insects on various trees in Tehran province. A total of 56 species from HOMOPTERA order were recorded. Among the collected insects, two aphids species, Cinaria palaestinensis (H.R.I.) and Cavariella archagelicae (Scoopoli), and one coccid species Planococcus vovae (L.) are new record for Iran.

INTRODUCTION

Honeydew has its origin in the sap of plants and is a sweet liquid excreted by Hemipterous insects, principally aphids and coccids. Droplet of honeydew fall on the plant surface, and collected and stored by bees and is generally considered inferior to honey in flavour and quality. Honeydew can be a good source of supplementary food for bees when nectar is not available (Crane, 1990) Honeydew contains 72% sugars, 16% water, 12% other materials, and its pH 5.1-7.9. Honeydew contains sucrose fructose, glucose, and appreciable amounts of trisaccharide sugars

1 - Department of plant protection, College of Agriculture, Shahid Chamran University, Ahwaz, Iran.
(melezitose, raffinose, and fructomaltose), some higher saccharide, and also dextrin, and certain enzymes and amino acids not normally found in honey from nectar (Stroyan, 1977; Barbattitini & Creatti, 1989; Malsen, 1989). In general honeydew quality and quantity depends on insect and the host plants (Carter & Malsen, 1989; Powel et al., 1990). The characteristic composition of honeydew is somewhat different from that of nectar, because honeydew contains enzymes derived from the gut and saliva of the plant sucking insect (Carter & Maslen, 1989; Crane, 1990). Honeybees collect honeydew from the leaves of oak (Quercus sp.), beech (Fagus sp.), popular (Populus sp.), willow (Salix sp.), linden (Tilia sp.), cedar (Juniperus sp.), spruce (Picea sp.), and Acer spp.

Honeydew flows are the main source of honey in some parts of the world, for instance in Greece where they provide some 65% of the honey produced (Santas, 1988; Crane, 1990; Ricciardelli & Albore, 1992). They are especially important in parts of European countries such as Germany, France, Yugoslavia and England (Santas, 1988; Oberpfalz, 1988; Muzaffer and Ahmad, 1989; Crane, 1990; Ricciardelli & Albore, 1992); and also used by beekeepers in New Zealand and North America, Pakistan, Turkey and Australia (Muzaffer & Ahmad, 1989; Crane, 1990). The most important sources of honeydew are trees (willow, oak, ... etc.) of these, conifers give the highest yields (Carter & Maslen, 1989; Crane, 1990). In parts of Turkey, and Greece, beekeepers extend the range of the honeydew flow by introducing Marchalina hellenica (Gennadius) into areas of Pinus halepensis Miller without it (Crane, 1990). Carter & Maslen (1989) recorded annual honeydew production on
different trees. The average yield of honeydew was 75kg for *Pinus*, 30kg for *Populus* and 25-30Kg for *Phyllaphis*.

Aphids were the main insects which were producing honeydew in Tehran province. The scientific names of aphids were checked by Lampel list(1993). Although honeydew flows are the main source of honey in some parts of the world, but in Iran, the beekeepers have no experience of them. This is the first survey on honeydew producing insects in Iran.

**MATERIALS AND METHODS**

A survey was conducted from 1993 to 1994 for the presence of honeydew producing insects mainly on various trees in Tehran province. Four regions of Tehran, Shamiranat, Damavand and karaj were selected for this study. Infested branches were cut off from the main tree, placed in a polyethylene bag and transported to laboratory, where the insects picked up with a fine cammal brush and kept in separate containers in 80% methanol. In the case of annual plants, whole plant was collected. In the absence of adult insects, a section of a branch or annual plant was placed in a vial and kept at laboratory conditions. The plant was replaced every two days. Permenent microscopic slids of insects were prepared according to Bodenheimer & Swirski (1957), Eastop & Blackman (1984).

**RESULTS**

A total of 56 species from HOMOPTERA order were recorded. Among the collected insects, two aphids and one coccid species that are marked with asterisk are new record for Iran. The scientific name
of the insects, their host plants, locations, and production of honeydew are as follows:

- low +
- medium ++
- large amount +++

<table>
<thead>
<tr>
<th>Order</th>
<th>Sub. Order</th>
<th>Super Fam.</th>
<th>Fam.</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOMOPTERA</td>
<td>STERNORRHYNCHA</td>
<td>APHIDOIDEA</td>
<td>APHIDIDAE</td>
</tr>
</tbody>
</table>

### I- Aphidinae-Aphidini

<table>
<thead>
<tr>
<th>Scientific name</th>
<th>Host plant</th>
<th>Location</th>
<th>Production of honeydew</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - <em>Aphis craccivora</em> Koch</td>
<td>False acacia</td>
<td>T, Sh, K1</td>
<td>+++</td>
</tr>
<tr>
<td>2 - <em>A. nasturtii</em> Kaltenbach</td>
<td>Common buckhtorn</td>
<td>D, Ds, Sh</td>
<td>++</td>
</tr>
<tr>
<td>3 - <em>A. poni</em> de Geer</td>
<td>Apple, Pear</td>
<td>T, D, K, Sh, Shl, Ta</td>
<td>++</td>
</tr>
<tr>
<td>4 - <em>A. punicae</em> Passerini</td>
<td>Pomegranate</td>
<td>K, Sh</td>
<td>++</td>
</tr>
<tr>
<td>5 - <em>A. ruborum</em> (Börner)</td>
<td>Black berry</td>
<td>A, D, Ta, Shl</td>
<td>+</td>
</tr>
<tr>
<td>6 - <em>A. umberlla</em> (Börner)</td>
<td>Black berry, Dog-rose</td>
<td>D, K, L</td>
<td>++</td>
</tr>
<tr>
<td>7 - <em>Hyalopterus pruni</em> (Geoffroy)</td>
<td>Plum tree</td>
<td>D, K, Shl, A, Ta, Shm, Of</td>
<td>++</td>
</tr>
<tr>
<td>8 - <em>Rhopalosiphum maidis</em> (Fitch)</td>
<td>Sorgum</td>
<td>T</td>
<td>++</td>
</tr>
</tbody>
</table>

---

1 - T=Tehran  Ta=Taleghan  L=Lavasanat  Ds=Darbanasar  
K=Karaj  Sh=Shahriyar  G=Chitgar  Dr=Darband  
D=Damavand  Of=Oshan fesham  A=Arengh  Shm=Shamshekar
<table>
<thead>
<tr>
<th>No.</th>
<th>Species</th>
<th>Hosts</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>R. nymphae(L.)</td>
<td>Plum tree, Wild cherry</td>
<td>K,A,Sht,Shm,Ta +</td>
</tr>
<tr>
<td>10</td>
<td>Schizaphis graminum(Randani)</td>
<td>T</td>
<td>++</td>
</tr>
<tr>
<td></td>
<td><strong>MACROSIPHINI</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Acyrthosiphon pelargonii(Kalt)</td>
<td>T,K</td>
<td>++</td>
</tr>
<tr>
<td>12</td>
<td>A. rosae(L.)</td>
<td>Rose</td>
<td>T,K,D,Of</td>
</tr>
<tr>
<td>13</td>
<td>Brachycadus (Thuleaphis) amygdalinus (Schot)</td>
<td>Almond</td>
<td>D,A</td>
</tr>
<tr>
<td>14</td>
<td>B. (Acaudus) divaricatae(Shap)</td>
<td>Plum tree</td>
<td>T,A,Ta</td>
</tr>
<tr>
<td>15</td>
<td>B. helichrysi (Kaltenbach)</td>
<td>Plum</td>
<td>T,A</td>
</tr>
<tr>
<td>16</td>
<td>B. pericca (Passerini)</td>
<td>Plum</td>
<td>Sh</td>
</tr>
<tr>
<td>17</td>
<td>B. (Appelia) prunicola (Kaltenbach)</td>
<td>Plum</td>
<td>T,Sh,Sh,Sht,Shm</td>
</tr>
<tr>
<td></td>
<td>Chaitophorus leucomelas Koch</td>
<td>Popular pine</td>
<td>T,D,A,Ta,Sht,</td>
</tr>
<tr>
<td>19</td>
<td>C. niger Mordv.</td>
<td>White &amp; Wepin willow</td>
<td>T</td>
</tr>
<tr>
<td>20</td>
<td>C. populet (Panz.)</td>
<td>White popular</td>
<td>T,A,D,Sht,K,Ta</td>
</tr>
<tr>
<td>21</td>
<td>C. populialbae (B. d. F.)</td>
<td>White popular</td>
<td>T,A,D,Sht,Ta</td>
</tr>
<tr>
<td>22</td>
<td>C. salicti (Schrk)</td>
<td>Wilhelms willow</td>
<td>K,A,Sht,Ar</td>
</tr>
<tr>
<td>23</td>
<td>Cavariella aegopodii (Scopoli)</td>
<td>White &amp; Weping</td>
<td>T,Sht,K,Ar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>willow</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>C. archangellicae (Scopoli)</td>
<td>White willow</td>
<td>K,Ar</td>
</tr>
<tr>
<td>25</td>
<td>Dysaphis crataegi (Kalt)</td>
<td>Azarole</td>
<td>T,Shm</td>
</tr>
<tr>
<td>26</td>
<td>D. devecta (Walker)</td>
<td>Apple,Plum Tree</td>
<td>T,A</td>
</tr>
<tr>
<td>27</td>
<td>D.(Pomaphis) plantaginea (Pass).Pear</td>
<td>T,A,Sht</td>
<td>+</td>
</tr>
<tr>
<td>28</td>
<td>D.(Popamphis) pyri (B. d. F.)</td>
<td>Pear</td>
<td>T,Ta,A</td>
</tr>
<tr>
<td>29</td>
<td>Macrosiphum rosae (L.)</td>
<td>dog - rose</td>
<td>T,D,Ta,Sht,Shm</td>
</tr>
</tbody>
</table>
30 - *Myzus cerasi* (Fab.) Wild cherry T,D ++
31 - *M. (Nectarosiphon) persicae* Plum tree, T,A,of,D,Ta ++
     (Sulzer) Almond

**II - DREPANOSIPHIINAE**

32 - *Drepanosiphum latanoidis* (Senr. & Kun.) False plane, syca-
     more maple tree Ta

33 - *Eulachnus agilis* (Kaltenbach) Black & Scot T,D,Sht,Sh,K, ++
     pine L,Sr
34 - *E. releyi* (Williams) Black & Scot T,D,Sht,L,Sr ++
     pine
35 - *Protolachnus tuberculostimata* Aleppo & Persian T,G,Sr ++
     (Theob) Pine
36 - *Tuberolachnus salignus* (Gamel.) White willow, T,D,Sht,Ta,Ds,Ar ++
     Weping willow Ar

**CINARINI**

37 - *Cinara cedri* Mimeur Lebanon cedar T ++
38 - *C. juniperina* Mordv. Savin, Juniper D,of,Dr ++
39 - *C. palaestinensis* (H.R.I.) Aleppo & Persian T ++
     pine
40 - *C. pilicornis* (Hart) Colorado spruce, T,G,K ++
     Spruce
41 - *C. tujafilina* (del Guercio) Savin, Persian D,sht,of,Ds ++
     juniper, Common
juniper tree

**LACHNINI**

42 - *Pterochloroides persicae* (Chol) Prunus T,Ta,D,K,Sh ++

**IV - PHYLLAPHIDINAE**

43 - *Betulaphis quadriiuberculata* (Kalt.) Birch K,Sh + +

44 - *Myzocallis coryli* (Goeze) Hazelnut-tree D,Shm,Ta +

45 - *M. picta* (Ferreri) Oak tree T,K ++

46 - *Panaphis (Callaphis) juglandis* Walnut tree T,Sh,Ta,A,Ds ++

(Goeze)

47 - *Tinocallis saltans* (Nevs.) Common elm T,D,Sh,Ta,A ++

48 - *T. zelkovae* (Dshibladze) Siberian elm Sh ++

49 - *Pterocynma pilosum* Buckt. White willow, T,A,D,Sh,Ta + + +

Popular pine COCCOIDEA

**I - ASTEROLECANIIDAE**

50 - *Asteroleticum phoenice* (Green) Plum tree K,Sh ++

**II - COCCIDAE**

51 - *Pulvinaria betulae* (L.) Birch Sh ++

52 - *Coccus hesperidum* (L.) Plum tree K,Sh ++

**III - PSEUDOCOCCIDAE**

53 - *Planococcus citri* (Risso) Pomegranate T,Sh,K ++

54 - *P. voavae* (L.) Persian juniper T,D,K,G,Sr ++
ALEYRODOIDEA

I - ALEYRODIDAE

55 - Aleurodes rosae (M.)
Dog-rose T,Sh,Ta ++

PSYLOIDEA

II - PSYLLIDAE

59 - Psylla pyricola (Foerster)
Pear K,Sh ++

DISCUSSION:

Honeydew can be a good source of supplementary food for bees when nectar is not available as well as a honey flow. Although there are many good honeydew sources in Iran, but our beekeepers have no information or experience of them. This survey can be a start for further study in this field.

The important honeydew producing insects are Cinara spp. on Cedrus spp., Juniperus spp. and Pinus that produce large amount of honeydew for a long period especially in autumn. Other aphids such as Caitophorous spp. and Tuberosculus salignus on Salix alba, S. babylonica and S. elbursensis trees also produc large amount of honeydew from early spring to late summer. The bees can collect a good surplus from early to late summer. The coxid (Planococcus spp.) also produce abundant of honeydew on Juniperous as well as fruit trees.

In many parts of Iran, honeydew is produced by different honeydew producing insects on different forest, none forest and fruit trees, however, the pest insects are the target of pesticides applications, and they no longer give honeydew flows where pest
management is effective. But the forest and none forest trees with no pesticides application provide good sources of honeydew flow from early spring to late autumn.

ACKNOWLEDGMENT

The authors would like to thank Dr. A. Rezwani, Gh. Farahbakhsh, H. Mirzayans and Mrs Z. Davoudi for their help for insect identification.

REFERENCES:


7 - MUZAFFAR, N., & R. AHMAD, 1989. Insect and plant sources


بررسی حشرات مولدهسلک (Honeydew) در استان تهران

بابک حیدری علیزاده و محمدسعید مصدق

در سالهای ۱۳۷۲–۷۳ حشرات مولدهسلک درختان سمند و غیرسمند در استان تهران جمع آوری و شناسایی شد. در بیش از ۵۰ جونه از حشراتی که عسلک زیادی تولید می‌نمایند بشرح زیر شناسایی گردیدند:

۱- شنها - ۴۳ جونه. مربوط به ۷ حسن و ۵ زیرخانواده.
۲- شیشکفا - ۴۷ جونه. مربوط به ۴ حسن و ۳ خانواده.
۳- مگنهای سفید - یک جونه.

Cinara palaestinesis از حشرات جمع آوری شده در کوهه شهید و یک جونه Cavariella archangelicae (Scopoli) و (I.R.I) شیشکفا (۱) که و در به اولین بار از ایران گزارش می‌گردد.

عملک (Honeydew) ماده شیرینی است که منشأ آن شیره گیاهی است و توسط حشرات راسته جوربالان مانند شنها و شیشکفا که از شیره‌گاهان تحت‌الزمان ترشح می‌شود. قطرات عملک در روی تمام‌پوشی متفاوت گیاه پیچیده برگ‌ها ریزش و غالباً توسط زنبوران عسل جمع‌آوری و ذخیره می‌شود، که فیت آن از نظر عطر و طعم از عمل پایین‌تر است. عملک را اغلب ریز برگ درختانی مانند بلوط، راش، انواع صنوبر، نارون افرا، اردبیل، کاج و سایر سوفی فوق‌العاده برگ‌ها می‌توان مشاهده نمود. مقدار جمع‌آوری آن برگ‌ها به وفور شده‌اند و غذا گیاه‌شناسی خویی برای زنبوران در عمل وجود شده در طبیعت است.

اصول مقاله به زبان انگلیسی تهیه شده است.

۱- کارشناس ارشد - مرکز تحقیقات آفات و بیماری‌های گیاهی - وزارت کشاورزی - اولین، تهران
۲- استاد گروه گیاه‌پزشکی دانشکده کشاورزی، دانشگاه شهید چمران، اهواز
تاریخ دریافت: ۱۳۷۶/۱۱/۲۵