Melittophily and Aphidophagy Found on Sunflower (*Helianthus annuus* Linnaeus) (Compositae) Genotypes

Muhammad Aslam and Naheed Akhtar Awan
Department of Entomology, University of Arid Agriculture, Rawalpindi, Pakistan

**Abstract:** Sunflower plants also attract tremendous number of insects of beneficial nature (predators, parasites and pollinators including honey bees). To see which beneficial insects are attracted to which genotypes and to what extent, observations were made on different genotypes of sunflower and the bee pollinators (melittophily) and aphid feeders, *Coccinella* spp. (aphidophagy) found on different genotypes were recorded. The highest number of honey bees (*Apis* spp.) was attracted to Suncross-24 and the lowest to SF-187. On SMH-9706, SMH-9707, Parasun-1, SF-187 and Hysun-33, the number of honey bees attracted was the lowest. It was concluded that SMH-9707 attracted the highest number of lady bird beetles (*Coccinella* spp.). The genotypes SMH-9706, Parasun-1, SF-187, Hysun-33 and Suncross-24 attracted statistically equal number of lady bird beetles. Hysun-33 had the highest number of *Aphids* (*Aphis gossypii*) and on all other genotypes except SMH 9707, the number of apids was intermediate. SMH 9707 had significantly lower number of aphids than Hysun-33. The lady bird beetles were found feeding on aphids on different genotypes of sunflower. These beneficial insects helped regulate the population of insect pests and also helped in the pollination of sunflower plants.

**Key words:** Beneficial insects, *Apis* spp., *Coccinella* spp., sunflower genotypes, pollination, melittophily, aphidophagy

**Introduction**
The sunflower is a good bee plant as it furnishes hive bees with large quantities of wax and nectar. Based on Patrick (1998), pollination is vital in producing many seed crops. Sunflower hybrids are self-fertile and depend less on insect pollination than earlier, self-incompatible varieties requiring insect pollination (primarily bees). Studies indicate that even current self-compatible hybrids benefit from insect pollination. Seed set, seed oil percentage, seed yields and oil yields increase when pollinators are present. *Apis* spp. are very important pollinators (melittophily) (Richard, 1978). Based on Skoric (1988), sunflower is very attractive to honey bees. Bees play an important role in pollinating sunflower plants because they are much visited by them. Based on Gaud and Giriraj (1999), pollination in a sunflower plant does not depend on its own pollen but on foreign pollen. According to Weiss (2000) older sunflower cultivars are basically insect pollinated and vary greatly in the degree of cross fertilization, or self-pollination, with quoted figures ranging from 5 to 95%, most commercial hybrids are virtually self-fertile. He further reported that sunflower is generally insect pollinated, principally by bees. *Coccinella* spp. feed on aphids (aphidophagy) and other soft bodied insects (Thalji, 1994). They reduce the number of aphids from sunflower agroecosystems (Arora et al., 1998). The members of Coccinellidae are predacious feeding on other insects during their larval and adult stages, (Imms et al., 1977). Lady Bird Beetles feed on aphids attacking agricultural crops (Bujaki and Szalay-Marzso, 1995). Based on Aslam (1994) the agroecosystem of sunflower should be least contaminated when pollinators are present. Bees are very important pollinators (Richard, 1978). These insects help pollinate our crop plants and on the other hand produce honey of medicinal value (Aslam, 1983, 1984, 1993). In search of one drop of honey, honey bee visits about 500-1000 flowers. Based on Aslam (1994) the activities of honey bees and other pollinating insects may not be disrupted as these insects help a lot in the pollination process of sunflower plants. According to Sharma and Sharma (1997) there was variation in the extent of pollination by insects especially bees in different sunflower genotypes.

**Results and Discussion**
**Melittophily:** Table 1 and 2 reveal that the highest number of honey bees was found on Suncross-24 and the lowest on SF-187. On all other genotypes, the number of the honey bees attracted was intermediate. The honey bees were found pollinating different flowers (Fig. 1). Honey bees (*Apis* spp.) are very important pollinators (Richard, 1978). These insects on the one hand pollinate our crop plants and on the other produce honey of medicinal value (Aslam, 1983, 1984, 1993). In search of one drop of honey, honey bee visits about 500–1000 flowers. Based on Aslam (1994) the activities of honey bees and other pollinating insects may not be disrupted as these insects help a lot, in the pollination process of sunflower plants. According to Sharma and Sharma (1997) there was variation in the extent of pollination by insects especially bees in different sunflower genotypes.

**Aphidophagy:** The analysis of variance for *Coccinella* spp. is presented in Table 3. Table 4 reveals that the genotype SMH-9707 had maximum number of *Coccinella* spp. (Lady Bird Beetles) which was significantly different from all other genotypes. All other genotypes did not differ from one another in attracting the number of beneficial insects, the Lady Bird Beetles. Hysun-33 had the highest number of aphids (*Aphis gossypii*) and on all other lines except SMH9707, the number of aphids was intermediate. SMH-9707 had significantly lower number of aphids than Hysun-33.

---

2251
Aslam and Awan: Melittophily and aphidophagy found on sunflower genotypes

Fig. 1: Honey Bee pollinating Sunflower (Melittophily)

Fig. 2: Lady Bird Beetles Feeding on Aphids (Aphidophagy)

Table 1: Analysis of variance for honey bees

<table>
<thead>
<tr>
<th>K Value</th>
<th>Source</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Value</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Replication</td>
<td>3</td>
<td>0.097</td>
<td>0.032</td>
<td>0.203</td>
<td>0.0024</td>
</tr>
<tr>
<td>2</td>
<td>Factor A</td>
<td>5</td>
<td>1.216</td>
<td>0.243</td>
<td>2.462</td>
<td>0.0338</td>
</tr>
<tr>
<td>4</td>
<td>Factor B</td>
<td>7</td>
<td>19.715</td>
<td>2.816</td>
<td>28.502</td>
<td>0.003</td>
</tr>
<tr>
<td>6</td>
<td>AB</td>
<td>35</td>
<td>3.486</td>
<td>0.100</td>
<td>1.008</td>
<td>0.4667</td>
</tr>
<tr>
<td>7</td>
<td>Error</td>
<td>141</td>
<td>22.563</td>
<td>0.160</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Mean number of *Apis* spp. attracted to different sunflower genotypes under field conditions

<table>
<thead>
<tr>
<th>Sunflower Genotypes</th>
<th>Mean number of <em>Apis</em> spp.</th>
<th>Mean number of Aphids</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMH-9707</td>
<td>1.131 ab</td>
<td>2.062 b</td>
</tr>
<tr>
<td>SMH-9706</td>
<td>1.188 ab</td>
<td>2.375 ab</td>
</tr>
<tr>
<td>Parasun-1</td>
<td>1.044 ab</td>
<td>2.225 ab</td>
</tr>
<tr>
<td>SF-187</td>
<td>1.006 b</td>
<td>2.331 ab</td>
</tr>
<tr>
<td>Hysun-33</td>
<td>1.156 ab</td>
<td>2.394 ab</td>
</tr>
<tr>
<td>Suncross-24</td>
<td>1.212 a</td>
<td>2.467 ab</td>
</tr>
</tbody>
</table>

Means followed by the same letters are not significantly different from one another at p = 0.05

Rogers and Thompson (1978) also reported variations in the degree of resistance of different sunflower genotypes against aphid, *Masonaphis masoni*. The lady bird beetles were found feeding on aphids (Fig. 2). Thus the phenomena of aphidophagy were observed on almost all the genotypes of sunflower. Aslam et al. (2000) indicated that aphids damaged sunflower plants in ‘barani’ tracts of our country. Based on Aslam (1994) the agroecosystem of sunflower should be least disrupted as natural enemies like *Coccinella* spp. are always busy in the sunflower fields to reduce the number of aphids.

References


