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## Relative abundance of insect pollinators on two cultivars of sunflower in Islamabad

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### Abstract

An Experiment was conducted during the year 2012 to evaluate the Relative abundance of insect pollinators on two cultivars of sunflower at Honey bee Research Institute, National Agriculture Research Center, Islamabad i.e., Hysun-33 and SMH-0942. Honey bees were the dominant group of pollinators that constituted about 79.96 and 78.49% on cultivars Hysun-33 and SMH-0942 respectively. Among honey bees *Apis mellifera* dominant on both cultivars. Other insect pollinator shows low activity on sunflower.

**Keywords:** Sunflower, insect, Pollinators, cultivars

### 1. Introduction

Pollinators are the most important insects playing vital role in the process of sunflower pollination. Bees visit a greater number of flowers to fulfill the needs of their colony, instead of other insects that visit flowers only for their own food<sup>[3]</sup>. Honey bees (*Apis mellifera*), due to higher numbers, vigorous daily activity, as well as their body structure conduct pollen transportation from one sunflower inflorescence to another. This provides an excellent pollination of the tube shaped sunflower florets<sup>[2]</sup>. The main issue in studies of sunflower pollination is foraging pattern of bees. Rearing of bees is an important requirement for good pollination, for excellent production providing a greater understanding of plant biology<sup>[6]</sup>. Bumble bees prove to be efficient pollinators due to their enhanced fluffy body, their long tongues, and the fact that they can carry out under low temperature and dark conditions. Bumble bees have an economical significance in most wide and cultured plants<sup>[4]</sup>. Other insect pollinators such as flies, butterflies and wasps also visit flowers and conduct pollination; however their activities are not considerable. The flowers visited by honeybees per minute were more in open pollination compared to other insect pollinators. Hence sufficient number of bee colonies in the surrounding area of the crops during flowering period was envisaging<sup>[5]</sup>.

### 2. Materials and Methods

The present field investigations were carried out at Honey Bee Research Institute, National Agriculture Research Center Islamabad-Pakistan. The field experiment was conducted during March to June 2012. Two cultivars of sunflower Hysun-33 and SMH-0942 were sown in 70 m<sup>2</sup>. Plant to plant and row to row distance was kept as 30 and 60 cm respectively. A 30-cm path between the plots was maintained. All recommended cultural practices were done with no spray during flowering period. All types of pollinators were collected using hand net from sub plot and main plot. Pollinators visiting sunflower were counted twice a day throughout the blooming period of the crop.

Relative abundance of each species was determined by using the following formula:

$$\text{Relative abundance of species} = \frac{\text{Number of individuals visiting flower}}{\text{Total number of pollinators counted}} \times 100$$

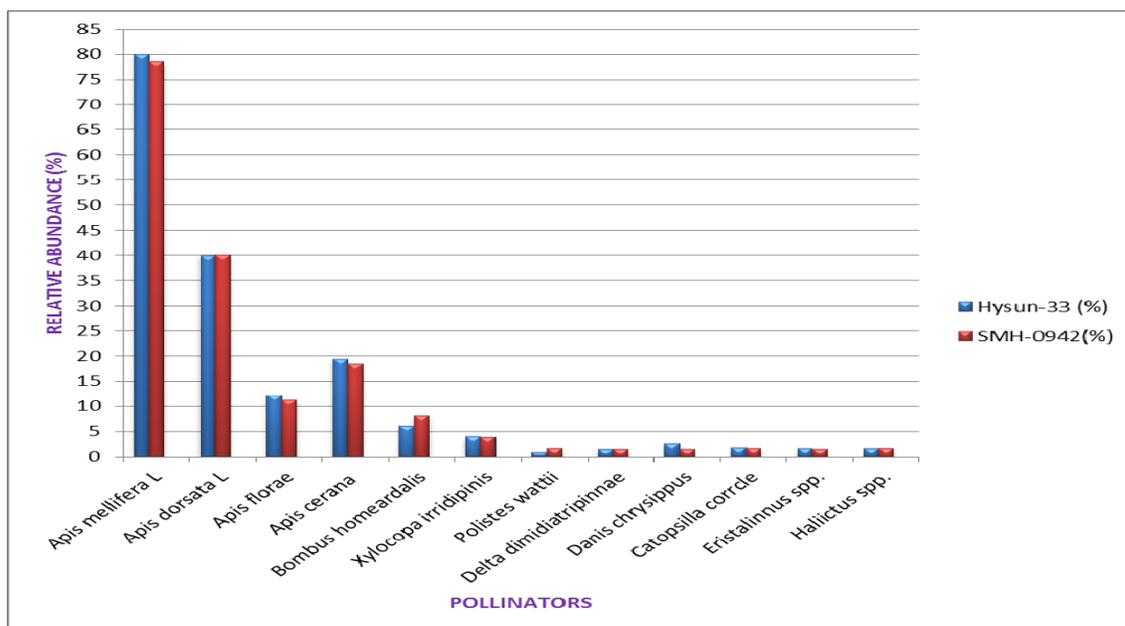
### 3. Results and Discussion

Table-1 shows data on relative abundance of pollinator's fauna of sunflower. Among the 12 species, honey bees were dominant group of pollinators on cultivars Hysun-33 and SMH-0942

respectively. Among honey bees, *Apis mellifera* proved to be most dominant group of pollinator on both cultivars that was 40 and 39.9% of total insect pollinators visiting cultivars Hysun-33 and SMH-0942 respectively. This was followed by *Apis cerana* (19.32%) on Hysun-33 and 18.49% on SMH-0942. The reason behind this difference is that *Apis mellifera* reared by commercial beekeepers and their population high in the surrounding area. *Apis dorsata* 8.6% on Hysun-33 and 8.74 on SMH-0942. Other seven pollinators constituted about 13.9% on Hysun-33 and 13.49% on SMH-0942. *Halictus* spp. was less abundant contributing only 1.6 and 1.7 percent of the total pollinators. Low population of other pollinators could be due to the low population of these in surrounding. These findings are very close to those of (Arya, D. R., R. C. Sihag and P. R. Yadav. 1994) [1] who also observed Non *Apis* bees lower in number. (Viraktamath, S., B. S. Patil, S. Murasing and G. S. Guruprasad. 2001) [7] also reported similar results. In their findings honey bees constituted 97.87% of total pollinators.

**Table 1:** Relative abundance of pollinators on SMH- 0942 and Hysun-33

Name of pollinators	Hysun-33 (%)	SMH-0942 (%)
Honey bees	79.96	78.49
<i>Apis mellifera</i> L	39.9	40
<i>Apis dorsata</i> L	8.6	8.74
<i>Apis florae</i>	12.14	11.26
<i>Apis cerana</i>	19.32	18.49
<i>Bombus homeardalis</i>	6.07	8.06
<i>Xylocopa iridipennis</i>	3.99	3.86
<i>Polistes wattii</i>	.96	1.7
<i>Delta dimidiatiripinnae</i>	1.44	1.51
<i>Danis chrysippus</i>	2.55	1.51
<i>Catopsilia circe</i>	1.76	1.7
<i>Eristalinus</i> spp.	1.6	1.51
<i>Halictus</i> spp.	1.6	1.7



**Graph 1:** Relative abundance of pollinators on SMH- 0942 and Hysun-33.

It is clear from the graph that among honey bees, *Apis mellifera* proved to be most dominant group of pollinator on both cultivars that was 40 and 39.9% of total insect pollinators visiting cultivars Hysun-33 and SMH-0942 respectively. This was followed by *Apis cerana* (19.32%) on Hysun-33 and 18.49% on SMH-0942. *Apis dorsata* 8.6% on Hysun-33 and 8.74 on SMH-0942. Other seven pollinators constituted about 13.9% on Hysun-33 and 13.49% on SMH-0942. *Halictus* spp. was less abundant contributing only 1.6 and 1.7 percent of the total pollinators.

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