**BEE VISITORS (APOIDEA) ON ALLIUM CEP A L. IN WESTERN RA JASTHAN**

Imran, *Abhishek Rajpurohit, Damayantipatel, Habib Pathan and Rajiv K. Gupta
Department of Zoology, Jai Narain Vyas University, Jodhpur-342001, Rajasthan, India.
*Department of Zoology and Environmental Sciences,
Lachoo Memorial College of Science and Technology (Autonomous), Jodhpur, Rajasthan, India.
(Corresponding author e-mail: Imrankhan7114@gmail.com)

**MATERIALS AND METHODS**

Present observations were recorded on onion flower planted in a farm at Chokha village of Jodhpur. The crop was planted in the month of November and December 2016. It started flowering in the month of February. The collection of bees was made during month of March and April 2016. Bees were collected by direct-sweeping method. Collections were made every 3 day in flowering period until the end. Collected bees were instantly killed with the help of Benzene fumes in a killing bottle. They were brought to the laboratory and properly spread for the identification. Confirmation of identification was based upon microscopic observations involving vital body parts such as mouth parts, wings, head, thorax, abdomen and genitalia etc.

**FIELD OBSERVATIONS**

A total of 321 bees were collected on *A. cepa* from Chokha village of Jodhpur. These were identified 16 species grouped into 11 genera incoming from 3 families of Apoidea (Halictidae, Megachilidae, Apidae) (Table 1). No bee has been recorded on this crop from Andrenidae, Colletidae and Melittidae family. On a normal sunny day most of the bees started their foraging activities around 8:00 A.M. i.e. when sufficient amount of sunshine was spread all over the fields. Their population and activity reached to its peak at round 12:00 to 1:00 P.M. and most of the bees began to return their nests around 3:00 to 5:00 P.M. onwards. Table 1 illustrates the bee species identified, their activity periodicity, population density and the floral resource recorded on the flowerings in the field.
Table 1: Apoidean Bee visitors observed on Allium cepa L.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Family</th>
<th>Species</th>
<th>Activity Periodicity</th>
<th>Population Density</th>
<th>Attracting Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Nectar / Pollen</td>
</tr>
<tr>
<td>1</td>
<td>Halictidae</td>
<td>Nomiaelliotii Smith, 1875</td>
<td>8:00AM-3PM</td>
<td>+++</td>
<td>N</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Pseudapistagulata Smith, 1875</td>
<td>8:00AM-3PM</td>
<td>++</td>
<td>N</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Lasioglossum sp.</td>
<td>8:00AM-3PM</td>
<td>+</td>
<td>N</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Halictus sp.</td>
<td>8:00AM-3PM</td>
<td>+</td>
<td>N</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Ceylalictus sp.</td>
<td>8:00AM-3PM</td>
<td>++</td>
<td>N</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Nomioides sp.</td>
<td>8:00AM-3PM</td>
<td>+++</td>
<td>N</td>
</tr>
<tr>
<td>7</td>
<td>Megachilidae</td>
<td>Megachilestriostom Cameron, 1913</td>
<td>8:00AM-3PM</td>
<td>++</td>
<td>N</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Megachileargentata Spinola, 1806</td>
<td>8:00AM-3PM</td>
<td>+++</td>
<td>N</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Megachilecreusa Bingham, 1898</td>
<td>8:00AM-3PM</td>
<td>++</td>
<td>N</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Megachilestudiosa Bingham, 1897</td>
<td>8:00AM-3PM</td>
<td>+</td>
<td>N</td>
</tr>
<tr>
<td>11</td>
<td>Apidae</td>
<td>Crocisa ramose Lepeletier, 1841</td>
<td>8:00AM-3PM</td>
<td>++</td>
<td>N</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>Ceratinapropinqua Cameron, 1897</td>
<td>8:00AM-3PM</td>
<td>+++</td>
<td>N</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>Ceratinasexmaculata Cameron, 1897</td>
<td>8:00AM-3PM</td>
<td>++</td>
<td>N</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>Amegilaquadrifaciata de Villers, 1789</td>
<td>8:00AM-3PM</td>
<td>+</td>
<td>N</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>Amegilaniveocincta Smith, 1854</td>
<td>8:00AM-3PM</td>
<td>++</td>
<td>N</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>Epeolus sp.</td>
<td>8:00AM-3PM</td>
<td>+++</td>
<td>N</td>
</tr>
</tbody>
</table>

RESULTS AND DISCUSSION

It is a well-known fact that number of flowering plants use insect as pollen vectors and they actually depend on the visits of insect for their pollination. Present study was done to explore the pollination bees on a very short duration of plant Allium cepa L. Its flowering attracted a total of 16 species of bee which have been identified belong to 11 genera incoming from 3 families of Apoidea. So far around 650 species of bees have been recorded from India which are identified to 65 genera grouped under 6 families (Gupta, 2003). It was fascinating to record more than 50 species in the Thar Desert of Western Rajasthan on a single crop. Following account details the family-wise data with regard to various genera and species found on this crop. Bees of family Colletidae, Andrenidae and Melittidae were not collected from A. cepa. A total of 4 species of family Megachilidae were collected on its flowering. All 4 species have been recorded on this crop during all time in a day little after sunshine until 3 PM to 4 PM. Member of this family can collected huge amount of pollen grains on their scopae which is prominently located at
the ventral surface of the abdomen and bears quite long dense bristles. Megachilidae bees can be seen sitting on flowers of *A. cepa*, staying on it for a good time and slowly returning in reverse pattern loaded with pollens.

A total of 6 species were identified under 4 genera of family Apidae. They had enough affection for the nectar and pollen of *A. cepa* and therefore a good number of bees were seen working on its flower. They belong to genera *Thyreus* Panzer, *Ceratina* Latreille, *Amegilla* Friese and *Epeolus* Latreille.

A total of 6 species identified under 6 genera of family Halictidae, may be referred as the top pollinators for this crop. They belong to genera *Nomia* Latreille, *Pesudapis* Kirby, *Halictus* Latreille, *Ceytalictus* Strand, *Nomioides* Schenck and *Lasioglossum* Curtis.

*Apis floria* Fabricius were collected in huge numbers on this crop. Their working span was quite longer too, in comparison to the bees of family Halictidae and Megachilidae. Apidae constitutes second largest group of bees which have been recorded with 4 genera including 6 species on referred crop. Genus *Thyreus* Panzer includes cleptoparasitic bees. They lack pollen collecting apparatus therefore, they are incapable of collecting pollen grains. They were often seen tracking behind *Amegilla* species to their nests and lay their eggs on the provisioning deposits collected by the *Amegilla* females.

One can conclude from Table 1 that which of the species may be considered quite effective pollinator on *A. cepa*. Further studies are definitely required to make comparison in efficiencies for the referred act in between non- *Apis* & *Apis* species as well as among both groups themselves. This has been established that the principal factors which determine the effectiveness of pollinators can be briefed as they should be found in abundance, their flight periodicities should be the maximum on flowering and their visiting rate (the number of flowers visited per minute by a bee) should be considerably enough also (Free, 1970; Ozbek, 1976; Richards, 1993).

Bee pollination is necessary for many cross pollinated crops especially in the case of seed production e.g. onion (*Allium cepa* L.) (Mayer and Lunden, 2001; Tolon and Duman, 2003), but managed bee pollination is not always possible in all environments.

Authors suggest that identical studies should be made by pollination and bee biologists to explore further possibilities of pollinator bees towards intensive and more effective pollination on wild and cultivated crops (Rajpurohit and Gupta, 2006).

**ACKNOWLEDGEMENTS**

The authors are grateful to the Dr. L.S. Rajpurohit, Head, Department of Zoology, Jai Narayan Vyas University, Jodhpur for providing necessary research and laboratory facilities and to all senior colleagues of wild bee laboratory, J.N.V. University, Jodhpur.

**REFERENCES**


