



Diversity of floral insect visitors of mango during blooming period at Pantnagar

USHA¹, POONAM SRIVASTAVA² and VIMLA GOSWAMI³

College of Agriculture, G B Pant University of Agriculture and Technology, Pantnagar U S Nagar,
Uttarakhan 263 145

Received: 3 April 2013; Revised accepted: 23 January 2014

ABSTRACT

A total of 20 insect species were observed visiting on mango flowers belonging to eight species of the order Diptera, seven species of Hymenoptera, three species of Lepidoptera, one species of Hemiptera and one species of Coleoptera. The Dipterans constituted major group of insects visiting on mango flowers. Among the dipterans, syrphids (Family: Syrphidae; subfamilies: Syrphinae and Eristalinae) were observed the most frequent visitors, constituted (44.67%) the major group of visitors. The syrphids species included *Episyrphus balteatus* DeGeer, *Melanostoma orientale* Weid, *Syrphus corollae* Fab. and *Eristalis tenax* L. Of these, *E. balteatus* exhibited marked higher incidence on mango and as compared to other syrphids. Besides syrphids, other dipterans, viz. *Musca domestica* belonging to the family Muscidae and subfamily Muscinae, were also observed as the occasional visitors (0.50 per cent) on mango flowers. The Hymenopterans were monitored as second major group of insects found visiting on mango flowers. Of these, the family Apidae and subfamily Apinae contributed 40.95% and represented by three main species of the genus *Apis*, viz. *A. dorsata* Fab., *A. mellifera* L., and *A. cerana indica* Fab. Among the non apis bees of family Melliponae: Melliponinae (*Tetragonula laeviceps*) and Xylocopidae: Xylocopinae (*Xylocopa aestuans* L.) were observed to constituted 9.10 per cent and 2.07 per cent respectively. In addition to this some Hemipterans, Lepidopterans and Coleopterans were also found on mango inflorescence that contributed 0.17, 0.20 and 0.42 per cent, respectively.

Key words: *Apis*, Insect pollinators, Mango, Non apis bees, Syrphids

The mango has been grown in tropical climates, consisting of numerous species of tropical fruiting trees in the plant family Anacardiaceae, of which *Mangifera indica*, or the common mango, is rightly called the “King of Fruits” grown all over the country. Its native to southern Asia, especially eastern India, Burma, and the Andaman Islands, as this is the only fruit that the poor as well as the rich equally enjoy. The mango inflorescence is visited by a number of insects like flies, wasps, bees, butterflies, moths, beetles, ants and various bugs sucking the nectar and some of them transfer the pollen but a certain amount of self-pollination also occurs, during the period of flowering.

Among the various insect pollinators of mango syrphids are one of the most important group of pollinators that help in producing crops of significant value. The adult syrphid-flies spend a great deal of time in visiting on the flowers and are effective pollinators. Singh (1960) stated that syrphid flies and *M. domestica*, as well as stingless bees of *Trigona* spp., are main pollinators of mango in India.

The honey bees (*Apis* species) also have major role and considered widely as pollinating agents. Deodikar and Suryanarayana (1977) reported that insect pollination has been recognized as a key input in improving crop productivity. Among pollinating insects honey bees occupy a prime position as they can be employed in large numbers whenever and wherever required. It is estimated that about 90 per cent of the pollination in various cross pollinated crops is done by honey bees alone. Popenoe (1917) also observed that honey bees were the most important hymenopterous insect visitor on the mango flowers. However there are many other insects especially non apis bee called as native bees or pollen bees also play significant role in pollination.

MATERIALS AND METHODS

Regular observations were recorded to explore the diversity of various insect visitors during flowering stage (March - April) in 36 years old mango (cv. Dashehari) orchard at HRC, Patharchatta during the year 2011 and 2012. The visiting insects were collected throughout the blooming period from 0800 h to 1700 h till the 90% flowering were over. All the specimen were arranged systematically and identified by comparing with maintained reference collection.

¹ Ph D Scholar (e mail: ushamauryaento@yahoo.com),

² Assistant Professor (e mail: poonamento@rediffmail.com),

³ Ph D Scholar (e mail: vimlagoswami87@yahoo.co.in),
Department of Entomology

RESULTS AND DISCUSSION

A total of 20 insect species were observed visiting on mango flowers belonging to eight species of the order Diptera, seven species of Hymenoptera, three species of Lepidoptera, one species of Hemiptera and one species of Coleoptera. The Dipterans constituted major group of insects visiting on mango flowers. Among the dipterans, syrphids (Family: Syrphidae; subfamilies: Syrphinae and Eristalinae) were observed the first and most frequent visitors, constituted (44.67%) the major group of visitors. The syrphids species included *Episyrphus balteatus* DeGeer, *Melanostoma orientale* Weid, *Syrphus corollae* Fab., *Eristalis tenax* L. and *Eupeodes* sp. Of these, *E. balteatus* exhibited marked higher incidence on mango as compared to other syrphids. Besides syrphids, other dipterans, viz. *Musca domestica* (Muscidae: Muscinae), *Calliphora* sp. and *Chrysomya* sp. (Calliphoridae: Calliphorinae and Chrysomyinae) were also

found as occasional visitors on mango and contributed 0.50, 1.30 and 0.42% respectively. Dag and Gazit (2001) observed that effective insect pollination is essential for increasing fruit set and yield in mango (*M. indica*). The blow flies, *Musca domestica* and several species of syrphid fly, of which *Episyrphus balteatus* were the predominant visitors of mango flowers. They concluded that the Dipterans are most important pollinators for mango.

The Hymenopterans were found as second major group of insects visiting on mango flowers. Of these, the family Apidae and subfamily Apinae contributed 40.95. The Apinae was represented by three main species of the genus *Apis*, viz. *A. dorsata* Fab., *A. mellifera* L., and *A. cerana indica* Fab. Among the non apis bees, *Tetragonula laeviceps* (Melliponae: Melliponinae) and *Xylocopa aestuans* L. (Xylocopidae: Xylocopinae) were observed to constituted 9.10% and 2.07% respectively. Ants and wasp (*Vespula orientalis*) were also found visiting on mango inflorescence which contributed 0.20 per cent. Farjado *et al.* (2008) confined that the primary pollinators on the mango flowers were stingless bees (*Trigona biroi*), calliphorids (*Chrysomya* spp.), syrphids (*Eristalis* spp.) and honeybees (*Apis cerana* and *A. mellifera*). In addition to above mentioned insect pollinators some Hemipterans (*Plectica nearctica*), Lepidopterans (*Danaus plexippus*, *Pieris rapae* and *Macroglossum* sp.) and Coleopterans (*Coccinella septempunctata*) were also found to visit on mango inflorescence that contributed 0.17, 0.20 and 0.42%, respectively. These findings were also supported by Degani *et al.* (1996) who reported the major pollinators associated with mango were *Mellipona* sp., *Syrphus* sp. and blue bottle flies; housefly *Musca domestica*. Besides these *Coccinella septempunctata* was another important pollinator.

On the basis of the above observations, it can be concluded that the mango flowers are visited by a number of insects which play a important role for enhancing the productivity of the crop. Among the various group of insect floral visitors dipterans constituted major group followed by Hymenopterans visiting on mango flowers.

REFERENCES

- Dag A and Gazit S. 2001. Mango pollinators in Israel. *Journal of Applied Horticulture* 2(1): 39–43.
- Deodikar G B and Suryanarayana M C. 1977. Pollination in the service of increasing farm production in India. *Advances in Pollen-Spore Research* II: 1–23.
- Degani C, Yulko O, Batsri R E and Gazit S. 1996. Out crossing rate in adjacent Maya and Tommy Atkins mango blocks. Abstracts 5th International mango Symposium, Tel Aviv, Israel, Sep. pp 1–6.
- Farjado A C, Medina J R, Opina O S and Cervancia C R. 2008. Insect pollinators and floral visitors of mango. *Philippine Agricultural Scientist* 91: 372–82.
- Popenoe W. 1917. The Pollination of the mango. U S Department of Agriculture Bulletin 542, 20 pp.
- Singh L B. 1960. *The Mango: Botany, Cultivation and Utilization*, p 438. Leonard Hill Press, London.

Table 1 Diversity of the various insect visitors on mango flowers at HRC, Patharchatta during 2011 and 12

Insect Pollinators	Order (Family :Subfamily)	Status
<i>Apis dorsata</i> Fab.	Hymenoptera (Apidae: Apinae)	11.5%
<i>Apis mellifera</i> L.	Hymenoptera (Apidae Apinae)	28.03%
<i>Apis cerana indica</i> Fab.	Hymenoptera (Apidae Apinae)	1.42%
<i>Tetragonula laeviceps</i>	Hymenoptera (Apidae: Melliponinae)	9.10%
<i>Xylocopa aestuans</i> L.	Hymenoptera (Xylocopidae: Xylocopinae)	2.07%
Ant	Hymenoptera (Formicidae)	0.20%
<i>Vespula orientalis</i>	Hymenoptera (Vespidae: Vespinae)	-do-
<i>Melanostoma orientale</i> Weid	Diptera (Syrphidae: Syrphinae)	44.67%
<i>Syrphus corollae</i> Fab.	Diptera (Syrphidae: Syrphinae)	(All syrphids)
<i>Episyrphus balteatus</i> DeGeer	Diptera (Syrphidae: Eristalinae)	-do-
<i>Eristalis tenax</i> L.	Diptera (Syrphidae: Eristalinae)	-do-
<i>Eupeodes</i> sp.	Diptera (Syrphidae: Syrphinae)	-do-
<i>Calliphora</i> sp.	Diptera (Calliphoridae: Calliphorinae)	1.30%
<i>Chrysomya</i> sp.	Diptera (Calliphoridae: Chrysomyinae)	0.42%
<i>Musca domestica</i>	Diptera (Muscidae: Muscinae)	0.50%
<i>Plectica nearctica</i>	Hemiptera (Bibionidae: Bibioninae)	0.17%
<i>Danaus plexippus</i>	Lepidoptera (Nymphalidae: Danainae)	0.20%
<i>Pieris rapae</i>	Lepidoptera (Pieridae: Pierinae)	-do-
<i>Macroglossum</i> sp.	Lepidoptera (Sphingidae: Sphinginae)	-do-
<i>Coccinella septempunctata</i>	Coleptera (Coccinellidae: Coccinellinae)	0.42%