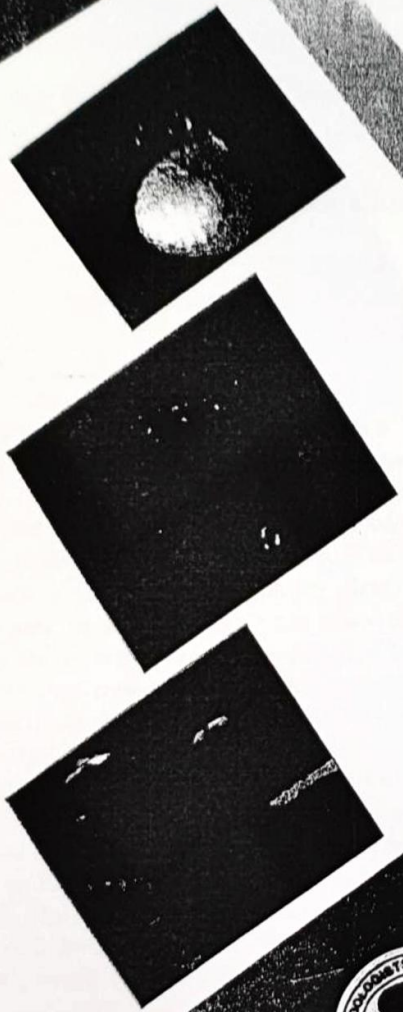
COMPENDIUM OF ABSTRACTS

XVII AZRA INTERNATIONAL CONFERENCE ON

FRONTIER RESEARCH IN APPLIED ZOOLOGY AND INSECT PEST MANAGEMENT STRATEGIES : A WAY FORWARD FOR FOOD AND NUTRITIONAL SECURITY



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PP 1

Foraging behaviour of species of Honey bees in Safflower (*Carthamus tincorius* .L)

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The peak foraging activity of all pollinators was found at 10:00 to 12:00 hrs and 7th day after 10 percent flowering was observed. The maximum time spent for pollen foraging (8.70 hrs) was recorded by *Apis indica* and minimum (6.45 hrs) by *Trigona Spp.* The number of flower visited per minute and time of pollen and nectar foraging were minimum in case of *Apis mrllifera* .It means that honey bee spent less time for foraging nectar than pollen. Number of honey bees in bee hive per minute was found to be highest in *Apis indica* followed by *Apis forea* and *Apis mellifera.*

Key words: Honey bee, *Apis spp*, Foraging behavior, Time and *Carthamus tinctorius.* L.

PP-2

Bee visits play a key role in pollination of Cashew

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Cashew (*Anacardiumoccidentale* L.) is an insect pollinated tree crop having staminate and hermaphrodite flowers in same inflorescence. Honey bees as well as native wild bees play a major role in pollination of cashew. In cashew, anthesis occurs between 9.00 am and 2.00 pm, but peak anthesis occurs during 10.00 and 11.30 am, and peak anther dehiscence occurs between 10 am and 12.00 N. A trial conducted at DCR, Puttur revealed that around 42 % of the fresh hermaphrodite flowers are devoid of any pollen grains even at the end of the day. This indicates that there is definite pollination deficit in cashew. The mean number of pollen grains per stigma was 0.2 during 10-10.30 and, and 2.65 during the evening, which may be due to multiple bee visits during the day. Besides, an experiment was conducted to understand the importance of time period of bee visits on nut set of cashew. The inflorescences with buds ready to open were tagged and the fine mesh nylon net cages were used to restrict bee visits. Results indicated that controlled exposure of bees during different time periods have differences in nut set percentage. Nut set was more when flowers were exposed to bees during 11.30 am -1.30 pm followed by 9.30 am - 11.30 am. This indicates that bee visits during 11.30 and 1.30 is very efficient in effecting pollination of cashew followed by visits during 9.30 am - 11.30 am. There was no nut set in flowers exposed for insect visits after 4.00 pm till 9.00 am, which indicates that nocturnal and crepuscular insects have no role in pollination of cashew. No nut set was recorded in caged inflorescences also, which ensures that insect visits are necessary for pollination. While maximum nut set was recorded under combined hand and open pollination confirming that increased pollination results in higher nut set. Further, freshly opened hermaphrodite flowers were confined with a small tissue paper cover after single

visit of bees to understand the pollination efficiency by single bee visits. Preliminary observations revealed that single successful visits of bees like *Braunsapis picitarsus* Smith, *Apis cerana indica* F., *Pseudapis oxybeloides* Smith and *Ceratinahiero glyphica* Smith could result in 10-35 % nut set, which needs to be studied further. However, pollen load on the bees and body parts of bee touching the stigma are the major influencing factors.

Keywords: Cashew, *Apis cerana indica*, anthesis, Bee visits

PP-3

Impact of Climate change on Honeybees

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Ecosystem services are defined as the benefits people obtain from ecosystem provided by organism interacting in ecosystem. Pollination is valuable ecosystem service providing variety of benefits such as food, fibre etc. by pollinators. Pollination serves as the backbones of complex ecological systems and is essential to agricultural production. Pollinators are a key component of global biodiversity, providing vital ecosystem services to crops and wild plants. One third of the food is derived from the plants that are dependent on insect pollination, especially honey bees. Honey bees are considered as keystone species because of significant role in supporting various ecosystems through their massive pollination services. However, rapid climate change caused the decline in honey bee population which begs the question, where are all of the honeybees going, and why?. Several impact due to climate change on honey bees observed *viz.*, sudden loss or mass disappearance of honey bees in a colony termed Colony Collapse Disorder (CCD). Extended periods of cold, rainy, and hot weather have been reported on severe, often unexplained, honey bee mortality in the past. Change in rainfall patterns is now causing droughts that are wiping out tree and flower species which supply pollen and nectar to bees. Thus, they die due to starvation. Honey bees being ectothermic, temperature of their surroundings determines the activity of bees and hence climate change, characterized by elevated temperature could drastically impact their biology, behaviour, distribution and foraging activity. It has been reported in several regions of the world that changing climate is causing decline in abundance and diversity of honey bee. Contributions of honey bees to ecological and economic are invaluable, which makes decline in honey bees a serious issue. Continued honeybee loss could drastically affect food supply and agricultural, economic and environmental systems.

Keywords: Pollinators, Honeybee, Climate change, Ectothermic.