CHAPTER VI

CONCLUSIONS

The role of insects in general and bees in particular in pollination of the crop plants is of paramount importance for better crop yield. On the other hand role of wild vegetation providing sustenance to the pollinators to live in absence of the crop plants is an important vital link between plants and flower visitors.

During the present investigations observations on different aspects of pollination and the flower visitors were undertaken for three consecutive years i.e. 2005, 2006 and 2007. The observations on flowering phenology of the crop, duration of flowering, time of anthesis, anther dehiscence, pollen production, insect / pollinator census, period of pollinator activity, behavior of the pollinator, floral rewards, pollen load carried out by pollinator, fruit-sets under ‘SP’, ‘BP’ and ‘OP’, percentage of fruit / seed set and natural vegetation and weed flowering at the time of experiments were undertaken during the investigations at different study sites and seasons.

Better understanding of mutualistics relations between flower visitors in general and the pollinators in particular which indepth and keen observations leads to following conclusions.

Flowering phenological events including timing, duration, sequence, intensity and frequency of flowering are found to be determined by the physical environment and several other ecological factors. The observations on all these aspects during consecutive years of study confirmed that phenological events are governed by certain physical and ecological factors. Moreover, they are also found to be very helpful for establishment of mutual relationships between the flowers and insects (flower visitors) in different crop plants.

For the successful pollination pollen production and availability of matured pollen grains is an essential requirement for fruit and seed-set. Pollen production is also found to be influenced by number of environmental factors. The pollen production varies from species to species, however, during the present investigations pollen production in studied crop plants varies against their cultivation site and season also.
Pollen viability test provides a mean to assess the potential of pollen germination on the stigma. During the present work pollen viability percentage by triphenyl tetrazolium chloride (TTC) method was found to be reliable as it has been observed with very minor variations in percentage of pollen viability during the study period at different study sites and seasons. Maximum pollen viability was observed in all the studied crop plants.

There is a strong correlation between pollen:ovule ratio and breeding system. In all selected crop plant species pollen:ovule ratio more or less reflects the breeding system. The crop plants which are predominantly self-pollinated have low pollen:ovule ratio, where as those which are cross-pollinated have high pollen: ovule ratio.

For sufficient pollination good population of flower vectors along with their activity during flowering period is essential. Pollen and nectar is found to be chief source of reward offered by the flowers to pollinators in order to have their services as pollinating agents. It is observed that the process of pollination is an outcome of synchronization of male and female functions influenced by the interactions between flower and flower-visitors. From the observations it reported that amongst the bees A. florae, A. dorsata, A.cerana indica, Trigona spp., Ceratina spp. and Xylocopa spp. are the faithful and dominant visitors of the major crop plants cultivated in this region.

During the present investigations it is noted that the pollen collecting insects harvest the pollen grains from several flowering species. Pollen pick-up and pollen load carried out by forager is an indication of mutual relationship amongst crop plants and flower visitors from this area.

Breeding experiments during the present investigations showed that fruit-set in open or natural and insect-pollination is always higher in all investigated crop plant species, which is an indication of successful pollination.

It is observed that there are several wild plant species providing sustenance to the flower visitors when crops are not in blooming. The flower visitors thus can sustain their life even in absence of crops, however, it is very important that it makes them to remain available though out the year to play their role in crop yield enhancement. Thus special attention is needed to conserve all those insects (flower visitors/pollinators) for better crop yield and the other hand to conserve with biodiversity with respect to available flora and fauna of particular region.