INFERENCe
The study “Ecological modelling, biodiversity studies, geographical mapping of mango leafhopper populations in mango ecosystems of South India” was conducted to understand the herbivore ecology of Cicadellids in relation to mango ecosystem, and it led to the following inferences from the results obtained.

1. The distribution maps developed from 31 sites of six zones of Peninsular India showed six species of mango leafhoppers viz., *Idioscopus nitidulus*, *I. nagpurensis*, *I. clypealis*, *Amritodus brevistylus*, *A. atkinsoni* and *A. splendens* to be common in the mango orchards. In 18 sites *I. nitidulus* dominated, followed by *A. brevistylus* (12 sites), *I. nagpurensis* (11 sites) and *A. atkinsoni* (6 sites). *Idioscopus clypealis* and *A. splendens* were the least common, occurring only in two places. While the map serves to give region-specific management interventions, it would also be indicative of future spread and establishment of species as a consequence of area increases in mango or climatic change.

2. Diversity indices revealed that most of the studied sites had homogeneous leafhopper community as in each place only one or two species occurred, except for few places (Bangalore, Silvepura, Shimoga Periyakulam and Kanya Kumari) where it had heterogeneous leafhopper community with more than two common mango leafhopper species. All the species have never occurred in a single site. Interspecific processes and adaptive capability of species seemed to allow dominance of a species *viz-a-viz* the geographical areas.

3. In rank analysis of abundance of pest occurrence, a horizontal curve was not obtained. Horizontal curve indicated evenness and was obtained only when all the species were ranked the same. A single species was never ranked first in all the places for e.g. *I. nitidulus* ranked first in Shimoga and Kanya Kumari, whereas in Bangalore it ranked second. These ranks reflect variation in leafhopper community influenced by shoots and flowers and help a pest manager to facilitate interventions based on dominance.
4. Seasonal and off-seasonal incidence of mango leafhopper by visual and sticky trap methods revealed that *I. nitidulus* and *I. nagpurensis* were found maximum during the months of January to March, which was mainly due to the availability of the feeding and breeding niches and the effects of abiotic variables viz., temperature, relative humidity, wind speed and rainfall. *Amrasca splendens* was found during the months of June to July and September to November, corresponding to the flushing of fresh shoots.

5. In sticky trap method, yellow colour was significant in attracting *I. nitidulus* (14.28%) and *A. splendens* (25.71%), whereas blue was significant in attracting *I. nagpurensis*. A combination of yellow and blue is ideal for surveillance. The trap catches seemed as early indicators of population and will be useful for farmers to anticipate infestation or resort to need-based sprays rather than prophylactic.

6. Diversity of leafhoppers attracted to the sticky trap in the mango ecosystem revealed 48 species representing 7 subfamilies. It included mango leafhoppers, vectors and major and minor pests of economically important horticultural crops. Incidentally 48 species were detected in the traps of mango ecosystem. Except for the six common mango leafhoppers mentioned less common mango leafhoppers *Idioscopus dworakowskae* and *Petalocephala granulosa*, others were not detected in mango can potentially infest in future.

7. A taxonomic key exclusive to mango ecosystem for six hoppers was prepared in order to enhance the efficiency of identification of pests by tutor/entomologists and practioners of IPM. This will also go a long way in helping entomologists to identify *I. nitidulus*, *I. nagpurensis*, *I. clypealis*, *A. atkinsoni*, *A. brevistylus* and *A. splendens* and give appropriate IPM interventions. The basis of the keys was the morphological characters those explain the uniqueness of the species like the clypellus, dark spots on the vertex/scutulum and style and aedeagus of genital region.

8. The alternate method for identification of mango leafhoppers as explained in the present study by DNA isolation and blasting was useful to supplement morphological
identification or detect species when only single sex was found. This will facilitate academic/research interest in the field.

9. Study revealed that there is a positive influence of temperature and negative influence of relative humidity on the mango leafhoppers population. Though as a general trend during the study period there was no significant correlation between hopper population and inflorescence length as well with hopper population and damage rating, but in 2011 there was a positive correlation due to high population where in the rate of breeding of hoppers matched with the rate of inflorescence growth. Suitable models for IPM decisions were developed.

10. The biotic factors and crop phenology revealed significant positive or negative correlation between vegetative/reproductive phase of the crop and the hopper species. Inflorescence length and damage rating can not be used as an index for IPM decisions.

11. The nutritional loss caused by the feeding damage of mango leafhoppers is one of the probable causes for withering of mango inflorescence or fruits. From the study, it was found that there was a decrease in the amino acid and total sugars and an increase in the reducing sugars. Mango leafhoppers formed a drain on the nutrient sink in inflorescence and much of this was excreted as honeydew, especially the total sugars on which the sooty mould was formed.

From the study, the following lacunae were identified in the field investigations-

a) Quality of the fruits as a result of mango leafhoppers infested inflorescences is not yet understood.

b) Distribution maps on the North West and east of India would be useful, as done for Peninsular India in this study.

c) Mass rearing of leafhoppers for several generation is a challenge

d) Commercializing mycosis as a future viable project.

These lacunae could be addressed in future studies.