CHAPTER - V

SUMMARY

The present investigation has been carried out in the eco-climatic condition of Kamrup district located between the latitudes 91°E to 91° 55' E and longitudes 25°45'N to 26°30'N covering an area of 1959.25 sq.km. Mesothermal muggy climate with high rainfall moderate temperature and luxuriant growth of the vegetation are the characteristics of the region. The study area includes:

i) Eastern hill Sal forests - Khasi Hills Sal.
ii) Moist plains Sal forests - Kamrup Sal.
iii) Moist mixed deciduous forests.
iv) Evergreen patches.
v) Monotypic Teak forests.
vi) Secondary moist Bamboo breaks.
vii) Secondary Euphorbiaceous Scrub.
viii) Moist Sissoo forests.

In these forests the dominant plants are S. robusta, T. grandis, G. arborea and D. sissoo. Most of the Sal forests are of natural origin. The investigation has been carried out to know the entomofauna which are responsible to cause damage to these valuable plants with respect to their biology and ecology.

1. As many as 74 insects have been identified which causes extensive damage to the economically important forest plants of which 56-species belongs to Coleoptera and 18 to Lepidoptera. The insects that out break in the form of epidemic are E. undata and C. leayana on G. arborea, Aeolesthes sp, Lymantria groeti and H. puera on T. grandis and P. reflexa on D. sissoo. The skeletonizer, window feeder, leaf netter, bark feeder and stem borer are the prominent feeder and caused extensive damage to the forest plants.
2. After a continuous outbreak for a period of 4 years the *P. damastesalis* population disappeared and re-appeared again after 1-2 years. The epidemic outbreak of *Dasychira groeti* and *Lymantria* sp. observed after 6-9 years.

3. The population builtup of *P. damastesalis* alternates with the *H. puera*.

4. Short range migration of the larvae of *P. damastesalis* and *E. undata* were observed after complete defoliation of the host plants.

5. Repeated defoliation reduced the volume and growth of the host plants.

6. On the basis of the following criteria the three insects *P. damastesalis, E. undata* and *C. leayana* were selected for ecological study:

   i) Higher population density.
   ii) Epidemic and continuous outbreak.
   iii) Uni or multivoltine and
   iv) Higher consumption potential and capacity to cause heavy damage to the host plants.

7. The population density of *P. damastesalis* was highest in Pre-monsoon, lowest in the Monsoon and either scanty or totally absent in the Retreating monsoon. Monsoon is the period of peak population builtup of *C. leayana* followed by Pre-monsoon and reduced to a minimum in the Retreating monsoon. The population of *E. undata* reduced gradually from first instar to eighth instar. Almost all the host plants are infested by these insects in the study area. The caterpillars of *E. undata* often covered the whole stem of the host plants.

8. Combined feeding of the larvae of *E. undata* and *C. leayana* denudad the host plants.

9. The aggregation of *P. damastesalis* was higher in the Monsoon. The aggregation of *C. leayana* either gradually decreased from Pre-monsoon to Retreating monsoon or was higher in the Retreating monsoon. The aggregation greater than the unity indicates higher concentration of the insects towards a particular place or on a particular plant.
10. The climatic factors like temperature, relative humidity and rainfall have significant positive or negative correlations with the population density of the three selected insects.

11. There are 4-larval instars of *P. damastesalis* and *C. leayana* but *E. undata* has 8-larval instars. The duration of life cycle from egg laying to adult emergence of *P. damastesalis* is 29.5-32.5 days in Pre-monsoon and 21.0-24.0 days in Monsoon; that of *C. leayana* is 26.5 - 33.75, 19.5-25.5 and 34.5-41.75 days in Pre-monsoon, Monsoon and Retreating monsoon respectively but *E. undata* has a duration of 118-116.4 days.

12. The three selected insects lay eggs at night but *C. leayana* also lay eggs during the day. The fecundity of *P. damastesalis*, *C. leayana* and *E. undata* is 116-226, 75-120 and 300-380 eggs respectively. The larvae feeds diurnally. The developmental period of the larvae varies with the leaf maturity stages.

13. The consumption potential of the larvae of the three selected insects varies with the leaf maturity stages of their host plants.

14. There are 5-6 overlapping generations of *P. damastesalis*. The duration of the generation was maximum in Monsoon and minimum in Pre-monsoon. This insect undergoes diapause in the form of pupa in the winter. *C. leayana* has 8-overlapping generations. The generation duration was shortest in the Monsoon and longest in the Retreating monsoon. *E. undata* is an univoltine insect but often built a partial second generation. This insect undergoes diapause in the form of pupa under the soil or leaf litter in the winter season.

15. About 46-species of predators, parasites and pathogens were identified from the field which may be used as the potential biological agent to control the insects damaging economically important forest plants.

16. The damage caused to the economically important forest plants specially the *S. robusta*, *T. grandis*, *G. arborea* and *D. sissoo* in the ecobiotic condition of Kamrup district found to be the cumulative effects of the larvae and adult population of the insects. The proper management of these insects will help in the propagation and luxuriant growth of these important plants and will fetch a good amount of revenues for the state.