7 : SUMMARY

1. The floristic study of terrestrial ferns of Darjeeling plain and its associated entomofauna indicated that only some of the fern species harboured more of insects.

2. Of the five fern species studied , D. esculentum and C. crinipes were mostly subjected to insect herbivory. This might depend on increased frequency (71.95% and 57.92%) of these fern species (apparency) & also their suitable dietary values as hosts.

3. Excepting some haustillate (sucking) and specialized forms most of the fern-attacking insects occurred during warmer months (summer + monsoon).

4. Insect orders recorded on ferns from other parts of the world were also represented in the fern entomofauna collected from this region.However notable exception was the order Collembola.

5. Atleast nine insect species were known to commonly use ferns as well as angiosperm crops and were ,therefore, of economic and bioecological importance.

6. Richness of fern entomofauna studied seemed to be due to switch over from angiosperms.

7. Biochemical analysis of the nutritional and some non-nutritional host-plant factors (including a few allelochemicals) had been done for the five common fern species and two angiosperm species.

8. Based on the dietary factors analysed in the study, the fern D. esculentum and C. crinipes appeared to be nutritionally superior to the rest of the three fern species. Of the angiosperm , C. capsularis appears to be a nutritionally better host than M. indica .

9. The host preference and palatability tests were performed with three of the common polyphagous insect herbivores, Spilarctia obliqua, and S. casigneta belonging to the lepidopteran family Arctiidae, and Atractomorpha crenulata belonging to the Orthopteran family Acrididae.

10. Amongst fern species, S. obliqua and S. casigneta showed a preference for D. esculentum; and A. crenulata

consumed both D. esculentum and C. crinipes but showed a greater inclination for the latter. Between fern and angiosperm species the preference of S. obliqua was always for the latter(C. capsularis) whereas S. casignata showed a clear choice for the former (D. esculentum), and A. crenulata for the fern (C. crinipes)

11. The higher nutritional quality of the D. esculentum was reflected through the better performance i.e. fecundity, hatchability, development period, survival pupal and adult weights etc of S. casignata when compared to its performance on M. indica. In a similar performance on a nutritionally richer C. crinipes, the acridid species, A. crenulata , showed greater efficiency as compared to its activity on C. capsularis. In a departure from the above findings S. obliqua was found to perform better on C. capsularis than on D. esculentum, despite the appearance of the latter host as nutritionally better (as revealed by the short gun chemical analysis of the dietary factors of the host). This exception may presumably be due to factors; (i) a better adaptation of S. obliqua to the conventional host, C. capsularis. (ii) C. capsularis

being richer in its carbohydrate (specially mono- and oligosaccharides)and high quality (albumin and globulin) protein (despite a lower level of total dietary protein) content. (iii) some unanalysed and unknown nutritional factors.

12. The higher RCR and RGR values, atleast in the earlier instars of S. casignata on D. esculentum resulted in a higher total production, but this was not so in case of S. obliqua on D. esculentum and A. crenulata on C. crinipes.

13. The respiratory value & maintenance cost was found to be higher on D. esculentum for the lepidopteran larvae as compared to a higher respiratory value recorded on C. capsularis for the orthopteran nymphs. The higher maintenance cost might be due to many factors that also included the consumption rate and detoxification of some plant defence chemicals of an unusual or phenologically unrelated host by gearing up the enzyme system.

14. Additional instars (VII) of S. obliqua on D. esculentum and S. casignatum on M. indica must to be a mechanism

to attain minimal larval weight to enter pupation.

15. Occurrence of supernumerary (VI) nymphal instars of A. crenulata on both the hosts, resulting into females, possibly is a compensatory mechanism by prolonging the feeding period and thereby making up for the additional requirements of female system.