1. The haemocytes of Leptocorisa varicornis, Nepa cineria, Adesmia cancellata and Dermestes vulpinus are invariably polymorphic cells. The variations in morphology and histology of the haemocytes have been taken as criteria to classify them into distinct categories.

2. Generally, six major types of haemocytes viz, prohaemocytes (PRs), plasmatocytes (PLs), granular haemocytes (GRs), cystocytes (CYs), oenocytoids (OEs) and adipohaemocytes (ADs) were concurrently observed in different stages of the L. varicornis, N. cineria, A. cancellata and D. vulpinus.

3. By using histological methods alone, only three types of haemocytes, PRs, PLs and GRs are seen more prevalent and these cells may be regarded as important sessile forms of haemocytes.

4. By using electron microscopy, in A. cancellata four types, PRs, PLs, GRs and CYs are identified and electron micrographs also show the possible phagocytic nature of PLs.

5. The changes in total haemocytes (THC) during growth generally follow instant increase in L. varicornis and N. cineria due to
regular production of haemocytes.

6. In the nymphal stages of *L. varicornis* generally the mean THC ranged from $13203.6 \pm 1005.6$/$\text{mm}$ to $14958.4 \pm 196.26$/$\text{mm}$. But in the corresponding stages of *N. cineria* the mean THC varied from $6557 \pm 341.15$/$\text{mm}$ to $11252 \pm 158.87$/$\text{mm}$.

7. The adult stages of *L. varicornis* had THC from $15569.8 \pm 436.65$/$\text{mm}$ to $21188.8$/$\text{mm}$ whereas, in adults of *N. cineria* THC ranged from $11668 \pm 105.38$/$\text{mm}$ to $14096 \pm 137.92$/$\text{mm}$.

8. Individually early age group of a stage have lower THC than that of late age individuals. Early nymphs have lower THC than late nymphs and adults have higher THC than nymphs in both the species, *L. varicornis* and *N. cineria*.

9. In both *L. varicornis* and *N. cineria* females have higher THC than that of the males.

10. The THC in corresponding age, stage and sex of *L. varicornis* is higher than those of the *N. cineria*.

11. In the nymphal stages of *L. varicornis* the mean percentages of PRs, PLs, GRs, CYs, OEs and ADs varied from 16.24 to 51.70, 28.19 to 78.59, 0.8 to 5.61, 0.20 to 9.91, 0.19 to 10.61, 0.0 to
10.38 whereas, in the corresponding stages of *N. cineria* the mean percentages of PRs, PLs, GRs, CYs, OEs and ADs varied from 10.91 to 12.51, 32.43 to 40.86, 2.67 to 7.49, 1.33 to 3.45, 23.93 to 30.40 and 9.56 to 17.95 respectively.

12. In the adult stages of *L. varicornis* the DHC of PRs, PLs, GRs, CYs, OEs and ADs varied from 8.25% to 12.52%, 54.67% to 78.05%, 2.08% to 5.71%, 0.73% to 3.50%, 2.61% to 4.35%, 4.36% to 23.35% respectively whilst in the adults of *N. cineria* the variation in the mean percentages of PRs, PLs, GRs, CYs and OEs was 2.29 to 25.71, 60.86 to 79.17, 0.36 to 9.21, 0.21 to 0.81, 0 to 4.05 respectively and ADs were absent.

13. Further, in both the species mentioned above generally, PLs form the bulk of the population of haemocytes and PRs follow it. Types of haemocytes, GRs, CYs, OEs and ADs are comparatively in smaller percentages.

14. In *L. varicornis* and *N. cineria* through the age and growth, the changes in the percentages of PRs and PLs show inverse relationship due to direct transformation of PRs into PLs.

15. The changes in the percentages of PLs obviously affect the relative percentage of GRs, CYs, OEs and ADs due to its transformation into GRs, CYs and ADs.
16. The occurrence of increase in the percentage of PRs, whenever recorded, may be due to their instant and regular production. But the reduction in the percentages of PLs may be due to either low rate of interconversion of PRs into PLs or transformation of PLs into GRs, CYs, OEs and ADs.

17. In the haemocytes of the nymphal stages of both *L. varicornis* and *N. cineria* glycogen is qualitatively seen as minute PAS positive granules particularly in a few plasmatocytes. On the other hand, the haemocytes of the adults of both the species have more PAS positive granules than those of their nymphs. Further, the haemocytes of the females of both the species have higher concentration of glycogen than that of the respective males. But in both sexes glycogen granules enhance with age.

18. Lipid deposits in the form of globules are abundantly found in nymphs of the nymphal stages of both *L. varicornis* and *N. cineria*. But in the haemocytes of the newly emerged adults the lipid globules are meagre. Further in older adults i.e. after three days such deposits are completely lacking.

19. Following the inoculation of spores of different fungal species in *A. cancellata* (four weeks old adults) THC and DHC were determined. It induced increase and highest THC was recorded following the inoculation of *A. citri*. It was followed by *R.*
oryzae, P. digitatum, A. niger, A. chlamydospora and Trichoderma sp. in descending order.

20. Corresponding DHC was also observed following the inoculation of spores of each fungal species. The percentage of PRs enhanced whereas those of PLs and GRs was decreased. Maximum changes occurred by the inoculation of the spores of A. citri, which was successively followed by that of R. oryzae, A. niger, Trichoderma sp., A. chlamydospora, P. digitatum.

21. The PLs and GRs of A. cancellata showed phagocytic activity following the inoculation of the spores of the above mentioned fungi. This activity commenced after 20 minutes and continues up to 60 minutes later it declines. The GRs were faster as compared to PLs in this activity. Further, spores of A. citri induced phagocytosis most rapidly and effectively as compared to spores of other fungi, which followed in descending order viz., A. oryzae, P. digitatum, A. niger, A. chlamydospora and Trichoderma sp..

22. The response of the haemocytes both in vivo and in vitro was also studied by injecting an eugregarine. Consequently THC was enhanced particularly by the increase in GRs and PLs. Further the haemocytes encircled the protozoan parasite and made a capsule consisting of three layers. But in vitro inoculation caused slow encapsulation and it was only one layer thick.
23. Injection of the sperms in *A. cancellata* from the specimens of the similar species apparently do not show either phagocytosis or nodule formation or encapsulation thus, characterising the ability of the self recognition.

24. Histopathological effects of deoxyphylotoxin, an anti tumor drug currently know as insecticide are dose and period of exposure based and the most susceptible haemocytes are CYs, followed by ADs, PRs, GRs and PLs whereas, the oenocytoid are most resistant cells to the toxicity of the compound in either of the two species.