CHAPTER VI

SUMMARY

AND

CONCLUSION
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1. The effects of auxins (Naphthalene acetic acid - NAA and Indole acetic acid – IAA), gibberellins (Gibberellic acid - GA₃) and Bio-rooting powder (Rootex-3) of Agri-Horti product of India on germination, growth, flower-initiation, flower-formation, seed production, test-weight (1000-seed weight) and alkaloid “Punarnavine” production in the form of root-extract of Gadahpurna (Boerhaavia diffusa Linn.) have been studied in the present investigation.

2. The seeds of Boerhaavia diffusa were collected from the plants grown on waste land, bank of the ponds, ditches and other uncultivated lands.

3. Five treatments using naphthalene acetic acid (NAA), indole acetic acid (IAA), gibberellic acid (GA₃) and Bio-rooting powder (Rootex-3) with distilled water treated control were maintained.

4. Stock solution of 50 ppm each of NAA and IAA, 300 ppm of GA₃ and 500 ppm of Rootex-3 were prepared in glass redistilled water.
The solution of 20 and 30 ppm each of NAA and IAA, 100 and 200 ppm of GA₃ and 200 and 300 ppm of Rootex-3 were prepared by dilution technique just before use.

5. For germination, 20 ml. solution of each concentration of different growth regulating substances were taken in each petri-dish separately. After 12 hrs. of soaking, the soaked seeds were washed with distilled water and then transferred to another petri-dishes (50 seeds / petri-dish) having wet blotting paper for proper moisture. The seeds were treated with an equivalent amount of distilled water as control.

6. Daily observations for germination were taken upto 7 days for 3 successive years and observations were taken in terms of germination % in normal light as well as in red light.

7. The seeds of Boerhaavia duffusa were soaked in different solutions of NAA, IAA, GA₃ and Rootex-3 for about 12 hrs. and then transferred to the cimented pots (5 seeds / pot) containing two parts of garden soil and one of compost thoroughly mixed for vegetative growth, flower-initiation,
flowering, seed production for cultivation and alkaloid (punarnavine) synthesis in the form of root-extract.

8. Replicated of 10 plants / treatment were randomly distributed and maintained under natural conditions of growth in the Botanical Garden of the college for observations.

9. For vegetative growth, the observations were taken each year for 3 successive years. The growth was measured in terms of mainstalk height at flower initiation, mainstalk nodes at flower-initiation, internodal-length at flower-initiation, fresh-weight of shoot and root at complete bloom, mainstalk height at harvest, mainstalk nodes at harvest, vegetative branches 10 cm. and longer, fresh-weight of shoot and root at harvest respectively.

10. The observations on flowering were taken in terms of days to flower-initiation, flowers / plant at complete bloom, flowers formed / plant upto harvest, seed production, and test-weight (1000-seed weight) respectively.

11. The production of alkaloid “Punarnavine” was measured in terms of volume of root-extract / plant. For this purpose, the intact plants were uprooted by a
gradual process of loosening and inverting the pot with no damage to the root system. The roots were then washed, blotted and weighed. Then a homogenate is prepared by crushing and grinding the roots. The homogenate is filtered with the help of cheese cloth and root-extract was measured by placing it in the measuring cylinder and represented in term of root-extract (root-juice) / plant.

12. The data on germination, growth, flowering, and seed production have been subjected to statistical analysis using “Fisher’s Analysis of Variance” method. The Critical Difference (C.D.), whenever necessary, has been also calculated.

13. Also, the data on germination, growth, flowering, seed production and alkaloid synthesis (root-extract) have been presented in the form of tables, graphs and histograms whenever necessary.

14. The seeds of Boerhaavia diffusa can be obtained throughout the year but the most suitable time for seed collection for cultivation is October-November and March-April.
15. The treatments of NAA, IAA and GA<sub>3</sub> were found to have positive effect on seed germination. The combined effect of growth, regulating substances and red light were found more beneficial in promotion of seed germination.

16. The growth of the plant was invigorated with treatments each of NAA, IAA, GA<sub>3</sub> and Rootex-3. Such plants were generally taller, had more vegetative branches and were heavier in weight than the controls.

17. As for as flower-initiation is concerned, treatments each of NAA, IAA and GA<sub>3</sub> caused earliness significantly whereas those of Rootex-3, slight earliness in flower-initiation was also recorded but this earliness was not significant.

18. Flowering was also promoted significantly with treatments of NAA, IAA, GA<sub>3</sub> and Rootex-3.

19. Treatments each of NAA, IAA, GA<sub>3</sub> and Rootex-3 resulted in promotion of seed production in comparison to control.
20. The test-weight (1000 seed-weight) was also increased with the application of above mentioned substances.

21. The fresh-weight of shoot was also increased significantly over control with the treatment of NAA, IAA and GA$_3$ but the increase in fresh-weight by Rootex-3 application was not significant.

22. The plants treated with NAA, IAA, GA$_3$ and Rootex-3 were also found to promote the development of root and root-extract containing alkaloid punarnavine.

As it is well known from the findings that the leaves, seeds and roots of Gadahpurna or Punarnava (Boerhaavia duffusa Linn.) have an extra importance in the field of medicine, this experiment was performed and found that for the availability of this plant throughout the year for medicinal purpose, it can be easily cultivated with the application of NAA, IAA, GA$_3$ and Rootex-3, but it needs special attention for further work on extraction, purification, storage facility of root-extract (root-juice) containing an alkaloid “Punarnavine” having an extra ordinary medicinal value in the field of medicine.

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