CONCLUSIONS

1 In *Sesamum* germination begins with imbibition of water and this increase in moisture content activates enzymic systems involved in the breakdown of complex reserves into simpler substances which are then utilised for the growth of embryo-axis. Increasing activities of lipase, protease and RNase with progress in germination help in the degradation of various reserves and consequently contents of nucleic acids and proteins also decrease. Higher utilisation of AA suggests its important role during germination. AA-FR-peroxidase activity also increases accelerating the formation of free-radicals of AA. The consequent electron-flow helps the synthetic processes associated with seedling growth.

2 Growth, flowering and metabolic activities are intimately correlated and co-ordinated with each other and also with the environmental complex.

3 Synthesis of AA, its utilisation and complexing with macromolecules increase during the reproductive phase as compared to vegetative or senescence phase,
whereas ASG content decreases releasing more AA for rapid development. Activities of general peroxidase, AA-FR-peroxidase, protease and RNase also increase, synchronizing with accelerated synthesis of proteins, histones and nucleic acids at the time of floral induction and subsequently during the differentiation of reproductive organs. These enzymic and metabolic activities are accelerated to a greater degree under SD, compared with that in ND. This greater acceleration in the metabolism leads to earlier flowering under SD.

All these metabolic and enzymic activities mentioned above are generally at a lower level under LD compared with that in SD and ND.

With increase in number of inductive cycles, vegetative growth is reduced and development is accelerated as evidenced by earlier and better development under 12-SD compared with that in 8- and 4-SD treatment respectively.

Inductive treatment received by the plant, accelerates the synthesis of AA, nucleic acids and proteins and enzymic activities such as general peroxidase, AA-FR-peroxidase, protease and RNase which are generally maximum under 12-SD in which floral
initiation takes place earlier and differentiation of reproductive organs is also faster.

7 Synthesis of metabolites and enzymic activities are lower in the terminal apex of plants kept under continuous illumination (LD) compared with those in plants receiving photoinductive treatments.

8 Importance of ascorbic acid and nucleic acids in the regulation of cell-processes is further confirmed by exogenous application of AA, RNA and DNA to Sesamum seeds during juvenile differentiation. These treatments not only activate synthesis of AA, nucleic acids and proteins but also enzymic activities like lipase, protease, peroxidase and AA-FR-peroxidase.

9 Addition of $\text{H}_2\text{O}_2$ in very low concentration to these media helps in more rapid imbibition of water during germination, causing greater hydration of protoplasm. Significant increase in AA-FR-peroxidase activity coupled with faster synthesis of AA, creates the reductive atmosphere by faster formation of AA free-radicals which ultimately trigger the whole metabolism and seedling growth.
Thus these studies on *Sesamum indicum* L. cv. *Limbdi* a qualitative short-day plant, confirms the ascorbic acid-nucleic acid-protein-metabolism concept of growth and development which was advanced earlier from this laboratory in the case of wheat, barley and other thermophobes.