CONCLUSIONS

Some of the conclusions emerging out from the present investigations are:

- Immature seeds / embryos of orchids can be successfully utilized for mass propagation purposes; their culture reduces the time lapse between pollination and sowing.
- The harvest time of capsule for most optimal germination varies with the species and the local conditions, and it should be determined for all taxa in order to avoid wastage of seeds during green pod culture.
- Very young or fully mature embryos do not form good explants.
- Intermediary top- or cone-shaped structure, the protocorm, is typical of orchid seed germination and it has a high multiplication potential that is markedly influenced by the chemical stimulus in the nutrient mix.
- Darkness is not a significant factor in initiation of seed germination. However, the later stages of development may get affected.
- The nutritional requirements of orchid embryos during the initial stages of development are quite simple; DW could initiate germination in *Bletilla striata* and *Dendrobium chrysotoxum*.
- Immature embryos of most orchid species have a wide nutritional amplitude.
- The efficacy of M medium in supporting high germination response is further confirmed.
- PDA, a chemically undefined medium, supports high germination response and early organogenesis of the germinating entities.
- Sugar is an essential component of the medium for orchid seeds to reach seedling stage, being most optimum at 1-3%. However, the ability of older cultures to develop leaves and roots in media bereft of sucrose seems to suggest their autotrophic nature.
- The use of PGR(s) and/or organic growth supplements for raising in vitro seed cultures has to be judiciously planned since their efficacy varies with the species. Incidentally, the suppressed development of rhizoidal hairs in BAP enriched combinations is noteworthy.
Conclusions

• Isabgol, individually or in combination with agar, can be profitably used as a gelling agent.

• Shoot meristem, leaf, stem disc, pseudobulb, tuber, rhizome, inflorescence axis explants can be effectively utilized for orchid micropropagation. Manifestation of their inherent regeneration potential, in vitro, is a function of their source, genetic constitution, physiological age and the chemical treatment they are subjected to.

• In vitro sourced explants are more responsive than those sourced from greenhouse grown mature plants.

• The effect of exogenous supply of growth adjuncts in different explants is species specific and it varies during initiation, multiplication and differentiation of cultures.

• Explants from seed cultures, though useful for mass propagation, have a limited utility in cloning desired genotypes in outbreeding taxa like orchids where a lot of heterozygosity is generated in the progenies and it is difficult to select a true-to-type seedling when young. Thus, a two-step technique, of raising regenerants (Plbs/shoot buds) from in vivo sourced explants and utilizing their embryogenic potential, can be effectively used for the cloning of the desired genotypes.

• The inherent proliferative potential of intact plant organs (still attached to plants) can be successfully employed for multiplying cultures. The formation of a large number of regenerants from different organs, on basal medium, is significant.

• Slow growth technique can be effectively used for in vitro germplasm storage.

• Synthetic ‘seeds’ as means of efficient delivery system for tissue culture raised genotypes can be effectively used in orchids.