

Chapter 5

5.0 CONCLUSION

This thesis demonstrates several aspects of developing protocols for ornamental plants specifically on tissue culture and mutagenesis treatments. Micropropagation of *Sansevieria* explants showed the production of multiple shoots per explants. From seven combinations of BAP and NAA chosen, the results indicated that maximum number of shoots was developed on MS shoot induction medium supplemented with higher concentration of BAP in variety *Hahnii* but this was not consistent in variety *Laurentii*, where highest BAP used i.e. 5.0 mg/l BAP: 2.00 mg/l NAA produced similar number of shoots as 2.00 mg/l BAP: 0.50 mg/l NAA. While the highest shoot formation for variety *Hahnii*, was observed when explants were incubated on medium supplemented with 4.00 mg/l BAP and 5.00 mg/l BAP. For variety *Laurentii*, MS media containing 4.00 mg/l BAP with 1.00mg/l NAA and 5.00 mg/l BAP with 2.00 mg/l NAA were the best media tried (significant level $p<0.05$). From this study, it showed that *Sansevieria* obtained maximum length by using explants incubated in higher BAP concentration in the presence of NAA.

Culture of shoots on rooting medium were best rooted in MS medium containing 1.00mg/l IAA in light condition (3.00 for *Hahnii* and 2.83 for *Laurentii*) for both varieties producing more roots compared to cultures in dark pretreatment condition with MS medium containing 2.00mg/l IAA concentration (2.33 for *Hahnii* and 2.17 for *Laurentii*). The two varieties of *Sansevieria* showed that there is significant difference between longest roots produced by variety *Hahnii* (3.73 ± 0.31) and variety *Laurentii* (7.08 ± 0.55) on media containing 2.00mg/l IAA in light condition compared with other treatments used. It can be concluded that the longest root were produced when high concentration of IAA was used in the media in addition with adequate light availability.

The explants which were irradiated with low Gamma irradiation (0 to 25 Gy for variety *Hahnii* and 0 to 30 Gy for variety *Laurentii*) grew better than those irradiated with a high dose. Variety *Laurentii* ($LD_{50} = 44$ Gy) was found to be less sensitive to gamma radiation as compared to variety *Hahnii* ($LD_{50} = 38$ Gy). All explants exposed to Gamma rays above 100Gy dose did not survive.

After acclimatization, comparison between two *Sansevieria* varieties showed that variety *Hahnii* exhibited better growth than variety *Laurentii*. In conclusion, adapted plantlets grew very slowly.

Future Studies

In the present study, many factors are known to influence and determine the growth performance of plants in tissue culture. Important factors being plant growth regulators whether endogenous or exogenous, light availability and other localized environmental as well as management factors. These factors will be studied to achieve better micropropagation protocol. The application of culture techniques were difficult to establish because of high contamination in cultures. Many improvements will be done to ensure better performance of growth of in vitro *Sansevieria* explants.

For the development of mutant plants from mutagenesis, the LD₅₀ determined in this study will be applied to leaf explants (at least 1000 explants used) so as to obtain a mutant. The stability of the mutants will be established through repeated subculture. Usually a four subculture regime is used (MV₄) and morphological observations are made on the newly established mutants.

In conclusion, the results of the present study, even though fundamental; nevertheless is a step forward that provides the baseline data that are useful to advance future research strategies in specific and commercial industry with the hope that *Sansevieria* plants in Malaysia will be an additional income earner in the near future.