ABSTRACT

The present research work was carried out to optimize the conditions for seed germination, callus formation and to analyze secondary metabolites in *in vitro* cultures of *Citrullus colocynthis* (L.) Schard.

Conditions were optimized for the seed germination in growth room. It was found that soaked seeds of *C. colocynthis* produced highest germination percentage in petriplates containing 10ml of distilled water at 28°C when surface sterilized with 2.5% NaOCl for 15 minutes followed by rinsing three times in sterile distilled water.

Leaf and internode explant of *C. colocynthis* produced best callus in medium MBN2,3 (Appendix 2) and MBN3,2 (Appendix 2), from leaf and internode with callus index (CI) of 300 and callus initiation duration was 3 days whereas in medium MBN0,5 (Appendix 2) callus was formed from leaf and internode explants with CI of 33. Leaf explant on medium MDK1,1 (Appendix 2) produced callus with CI of 66. In MDK2,1 (Appendix 2) and MDK2,2 (Appendix 2) leaf produced callus with CI of 200 and callus initiation duration was 15 days. Internode explant on medium MDK1,1 (Appendix 2) and MDK2,1 (Appendix 2) produced callus with CI of 66 and on medium MDK2,2 (Appendix 2) internode produced callus with CI of 133 and callus initiation duration was 10 to 15 days from internode. Calli emerged from leaf and internode explants were subjected to GC-MS for the analysis of secondary metabolites.

Secondary metabolites from seedling leaf and internode tissue and leaf and internode callus were analyzed by GC-MS. Total forty-four secondary metabolites were determined. Nineteen compounds were detected from seedling leaf tissue and internode tissue. The common secondary metabolites present in leaf and internode tissue were Toluene, α-sphinosterol, Quercetin, Tetradecane, Pentadecane, Hexadecane, Octadecane, Hentriactone, 9,12-Octadecadienoicacid[7,7] and n-Hexadecanoic acid. Quercetin a flavonoid found from seedling tissue and callus can prove to be an important secondary

Hentriactone, 9,12-Octadecadienoicacid[7,7] and n-Hexadecanoic acid. Quercetin a flavonoid found from seedling tissue and callus can prove to be an important secondary metabolite of *C. colocynthis*. From the comparative analysis of secondary metabolites, it is concluded that most of the secondary metabolites from seedling tissue were present in their respective callus. From the present study, it was also observed that some metabolites from seedling tissue and its respective callus were different.