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An Efficient and Low Cost Protocol for Rapid and Mass in vitro Propagation of Hyssopus officinalis L.

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Abstract : The study describes a highly efficient and low-cost protocol for rapid and mass in vitro propagation of medicinal and aromatic plant species (Hyssopus officinalis L., Lamiaceae). Hyssop is an important aromatic herb used for its medicinal values because of its antioxidant, anti-inflammatory and antimicrobial properties. The protocol for large-scale multiplication of this aromatic plant was developed using young stem tips explants. The explants were sterilized with 0.04% mercuric chloride ($HgCl_2$) solution for 20 minutes and washing three times with sterile distilled water in 15 minutes. The cultural media was full and half strength Murashige and Skoog medium containing indole-3-butyric acid. Full and ½ Murashige and Skoog media without auxin were used as controls. For each variant 20 glass tubes with two plants were used. In each tube two tip and nodal explants were inoculated. Maximum shoot and root number were obtained on ½ Murashige and Skoog medium supplemented with 0.1 mg L-1 indole-3-butyric acid at the same time after four weeks of culture. The number of shoots per explant and shoot height were considered. The data on rooting percentage, the number of roots per plant and root length were collected after the same cultural period. The highest percentage of survival 85% for this medicinal plant was recorded in mixture of soil, sand and perlite (2:1:1 v/v/v). This mixture was most suitable for acclimatization of all propagated plants. Ex vitro acclimatization was carried out at 24±1 °C and 70% relative humidity under 16 h illuminations (50 µmol $m^{-2}s^{-1}$). After adaptation period, the all plants were transferred to the field. The plants flowered within three months after transplantation. Phenotypic variations in the acclimatized plants were not observed. An average of 90% of the acclimatized plants survived after transferring into the field. All the in vitro propagated plants displayed normal development under the field conditions. Developed in vitro techniques could provide a promising alternative tool for large-scale propagation that increases the number of homologous plants for field cultivation. Acknowledgments: This study was conducted with financial support from National Science Fund at the Bulgarian Ministry of Education and Science, Project DN06/7 17.12.16.

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