SUMMARY

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This investigation was conducted in the Tissue Culture Laboratory, Horticulture Department, Faculty of Agriculture, Moshtohor during the period from 1995-1997 to study the possibility to use tissue culture techniques to produce colonal propagation for Magnolia and Mulberry plants. New growing shoots were taken at the beginning of the growing season, washed with running water, divided into small parts and immersed in an antioxidant solution containing (150 mg/L. ascorbic acid and 100 mg/L. citric acid) for 20 minutes. The treated parts were sterilized for 15 minutes using 10% Clorox (commercial bleach) plus two drops of Tween-20, then transferred into sterilized water 3-times for 5 minutes each. Shoot-tips (0.5 mm thick) were excised from the terminal parts, while the rest of these parts were divided into one-node cuttings as explants under aseptic conditions. The prepared explants were cultured on different media i.e., Murashige and Skoog, Lepoivre and Woody plant media. The used basal medium was supplemented with 0.1 mg/L. IBA (Indole 3-butric acid), 1.0 mg/L. BAP (6-benzyl amino purine), 30 g/L. sucrose and 7 g/L. Difico Bacto agar for the establishment stage. However, during the proliferation stage the same aforementioned supplementations were added also to the used basal medium except BAP which varied according to the treatment. In the rooting stage IBA was only increased, but other constituents of the established medium were

used. Generally, pH of the used medium was adjusted to be 5.7, and autoclaved at 121°C and 15 lb/in^2 for 15 minutes. The cultured explants were incubated under 16 hours of artificial light (fluorescent light at 30 M/m^2/sec) and 8 hours of darkness at temperature of 28 – 30°C. Subculturing was done regularly at 4 weeks for all stages.

Anyhow, the obtained results can be summarized as follow:

I- Establishment stage:

1- Solid Murashige and Skoog medium was superior in all measured parameters for explant establishment and development for Mulberry plant, while, woody plant medium exerted an adverse effect on explant development parameters of Magnolia plants.

2- The highest explant development parameters occurred when the explant was collected either during January to March or April to June periods. However, the third period was the worst in explant development and greening in Mulberry plants.

3- Magnolia explants collected during the second period during July to September is the best for explant development, greening and bud efficiency.

4- Antioxidant solution pretreatment succeeded in reducing the accumulation of phenolic compounds as reflected in decreasing necrosis of Magnolia plants. Moreover, the combination of antioxidant solution as pretreatment and 300 mg/L. activated charcoal to the cultured medium took the second rank in this respect.

5- The establishment peak was reached after 30 days from culturing time for Magnolia plants.

II- Proliferation stage.

1- Proliferation was enhanced when BAP was added to Murashige and Skoog medium in relation to kinetin, zeatin and thidizuron.

2- The lower concentration of BAP (0.5 mg/L. and 1.0 mg/L.) encouraged growth and chlorophyll and caused less necrosis. However, using of 3 mg/L. BAP increased proliferation of Mulberry plants.

III- Rooting stage.

III.A. Shoot elongation:-

1- Shoot elongation was increased when 2.0 mg/L. GA_3 was used instead of lower concentrations (0.5 and 1.0 mg/L.), where these lower concentrations improved chlorophyll in Mulberry plants.

2- Indole 3-butyric acid was the most effective auxin in inducing the best root formation for Mulberry plants.

III.B. Root formation:-

1- Liquid medium of Murashige and Skoog medium on other medium states in shoot development, greening and rooting.

2- Indole 3-butyric acid was the most effective auxin in inducing the best root formation.

IV- Acclimatization stage.

1- The combination treatment of 33% sand + 33% peatmoss + 33% loam induced the highest percentage of Mulberry plantlets survivals.

2- Combination treatment (33% sand + 33% peatmoss + 33% loam) induced the highest percentages of Mulberry survival and reached up to 93%.

3- Different growth parameters (plant length, number of shoots, average shoot length, number of green leaves and growth index) were slowly increased during the first three weeks. While, fast increased was noticed during the latest three weeks of gradual adaptation either laboratory, greenhouse or filed phases.