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Effect of Different Culture Media on the Micropropagation of GF677 (Prunusamygdalus ×P. persica)

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Introduction: The GF677(*Prunusamygdalus*×*P. persica*) is a peach rootstock tolerant to Fe deficiency. Nowadays, it is mainly propagated through micro propagation. Widening and undesirable growth of leaves as well as poor rooting are major problems during its *in vitro* culture. GF-677 is one of the most suitable rootstocks for almond and peach used in calcareous soils to overcome lime-induced chlorosis. Therefore, *in vitro* micro propagation is important for commercial purposes. Using liquid medium, it may be possible to reduce costs to a level lower than solid medium and liquid medium is better than solid medium in growth. Both the brand and concentration of agar also affect the chemical and physical characteristics of a culture medium. One of the main factors on micropropagation is hormone specially BAP. Furthermore, shoot branching depends on the initiation and activity of axillary meristems, which usually controlled by cytokinin. The rooting stage, the induction of roots on explants from *in vitro* culture is crucial part in any micropropagation process. The ability of plant tissue to form adventitious roots depends on interaction of many exogenous and endogenous factors, including hormone. Most reports of adventitious root induction of woody species have involved treatments with exogenous auxins such as IBA, NAA or IAA. Dimassi-Theriou (1995) for rooting of GF-677 compared different culture media and results on the rooting of these rootstocks depend on the type of medium culture.

Materials and Methods: Axillary shoot of GF677 was cultured on both liquid and solid media. In proliferation step both liquid and solid media (MS, DKW and WPM) were used in primary stages of the experiment. Medium containing BAP 1mg.land^{-1} NAA 0.1mg.l^{-1}. Under growth chamber conditions, light intensity was maintained at 2500-3000 lux with an 8-hour dark period. For rooting, 3-4 cm-long shoots from previous culture were transferred to 1/2 MS medium containing IBA (0, 0.5, 1 and 1/5mg.l^{-1}) and 6 , 0 g l^{-1} agar. Darkness during the last week of the rooting phase has been shown to be necessary in stimulating rooting in some woody species. Note that the room temperature was maintained at 25°C during this experimental stage. The experiment was carried out based on factorial adopted completely randomized design with 5 replications per treatment. Explants shoot lengths, shoot numbers, root lengths and root numbers were recorded after 4 weeks which propagated plants via tissue culture were transferred to soil medium using 50% peat and 50% perlit mixture.

Results and Discussion:

Shoot proliferation: The observation indicates that there were significant differences between solid and liquid media. Best results were achieved for proliferation by liquid medium and among which MS obtained the highest frequency. The highest number of shoot was observed in MS medium and the lowest number of shoot was observed in WPM medium. Increasing mineral concentration resulted in increased multiplication, growth rate and total mineral uptake by GF677 explants.

Root initiation of *in vitro:* Various concentrations of IBA showed significant differences. The maximum number of roots and root length were observed in the medium containing 0.5 mg.l^{-1} IBA. The best results were obtained for rooting in liquid 1/2 MS supplemented with 0.5 mg.l^{-1} IBA. The mean survival of the plants were transferred to liquid medium (75%) and mean survival of the plants were transferred from the solid culture medium (50%).

Conclusion: In conclusion, a micropropagation system for *GF677* has been worked out utilizing nodal explants. Our investigation showed that the liquid MS medium with 1 mg.lit^{-1} BAP was the best for proliferation of GF677 and micropropagated plants were rooted and established in soil successfully. WPM medium is higher in chloride level which has been reported to result in growth depression in plants due to inhibited nutrient uptake, transport and utilization of nutrients variation in multiplication and growth of explants can be explained on the basis of water potential and mineral availability to the explants in the liquid medium. Many investigators have reported that IBA has a better effect on promoting adventitious root formation in comparison to IAA. The

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best results were obtained for rooting in 1/2 MS supplemented with 0.5 mg. l/1 IBA.

Keywords: IBA, Liquid Medium, Proliferation and Rooting