Abstract

Buttercup "*Ranunculus asiaticus* L." is a perennial and herbaceous plant belongs to the family of Ranunculaceae. It is used as cut flower, potted plant and bedding plant in landscapes. The buttercup is an allogamus plant and its characters will be preserved through vegetative propagation. Sexual propagation is the common method of multiplication of buttercup. This is usually done with the use of F_1 hybrid seeds in Iran. Using micropropagation and tissue culture techniques can be the efficient methods for rapid multiplication and mass production of the buttercup plants. Therefore, in this research the effects of different explants including leaf, axillary bud, cotyledonary leaf and thalamus besides various levels of auxin and cytokinins on *in vitro* cultivation of buttercup plant (*Ranunculus asiaticus* 'magic') were investigated. For regenrating all explants, MS medium supplemented with different concentrations of 2,4-D, BAP and kinetin were used. The concentrations of plant growth regulators used in the experimants were as follows: BAP (0,9,13,17 µm) and 2,4-D (0, 2.2, 4.4, 8.8 µm) for cotyledonary leaf, BAP(0, 1.1, 2.2, 3.3, 4.4, 5.5 µm) and Kin (7.3, 9.3, 11.3 µm) for axillary bud, BAP (0, 2.2, 4.4, 8.8 µm) and 2,4-D (0, 2.2 µm) for leaf, BAP (0, 2.2, 4.4, 6.6 µm) and 2,4-D (0.45, 0.95, 1.45 µm) for thalamus. All treatments were arranged in the factorial experiments in a completely randomized design with three replications. Statistical analysis was performed with SAS software and the Least Significant difference (LSD) method used for comparing treatment group means. All explants other than thalamus, could produce plantlets in cultures. Results concerning the culture of explants *in vitro* indicated that the cotyledonary leaf explants cultured in MS medium supplemented with 2.2 µm 2,4-D and 13 µm BAP was proliferated more and produced the highest number of shoots. The leaf explant had the highest regenerations and plantlet formation in MS medium containg 2.2 µm BAP. The best medium for producing maximum axillary buds from apical buds was MS medium supplemented with 11.3 µm kin and 4.4 µm BAP. The recommended medium for induction, establishment, growth and direct organogenesis in thalamus was MS medium supplemented with 6.6 µm BAP and 1.45 µm 2,4-D. In conclusion, the result of the statistical analysis and the comparison of treatments group means indicated that the most efficient explant was axillary bud and the best culture medium was MS+11.3 µm kin + 4.4 µm BAP. The shoots were produced from all kinds of explants were rooted easily at 95% in hormone free MS medium.

Key words:

Ranunculus asiaticus, Micropropagation, Cotyledonary leaf, Thalamus, Axillary bud.