Enhancement of callus induction in potato (Solanum tuberosum L.) cultivar Desiree

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Potato is one of the most important food crops worldwide, because of its various merits, starting from its carbohydrate, vitamins, and protein content, to its increasingly high productivity, which reached more than 385 million tonnes in 2014 worldwide (FAOSTAT data). Accordingly, research on improvement of quality and quantity of potato cultivars is significantly increasing. Callus is used in many aspects in plant improvement, such as transformation methods, initiation of cell culture, somaclonal variation, ect.
In this study, a protocol for increasing callus induction in potato (Solanum tuberosum L.) c.v Desiree was established. This was done by modification of a protoplast culture protocol.
Callus derived from potato cultivar Desiree was used. The study examined fresh and dry weight, colour, and texture of callus induced from six types of media with different combination of hormones, and an added complex of vitamins, organic materials and sugars (VOS). Callus induction medium was MS (Murashige and Skoog) medium with 20 g l^{-1} sugar, 0.5 mg l^{-1} Kinetin, 1 mg l^{-1} $AgNO_3$ supplemented with 3 mg l^{-1} NAA or 2,4-D, with and without VOS. In addition to MS medium with and without VOS used as controls.
Results showed that callus induced from media containing VOS had significant results when compared with the same media without VOS. Fresh and dry weight of callus induced from media containing VOS significantly increased. Results also showed that MS medium supplemented with 2,4-D and VOS had superior results above all examined media.

Abbreviations: VOS – vitamins, organic materials and sugars; MS – Murashige and Skoog ; $AgNO_3$ – Silver nitrate; NAA – α-naphthalene acetic acid; 2.4 D –2,4-dichlorophenoxyacetate.