Regulation of Microclonal Reproduction according to the Nutrient Medium Components of in vitro Culture of Senecio Phlathiphiloides

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Abstract:

In vitro growth of Senecio Phlathiphiloides, changes in mineral composition of the medium and in the different parts of the explants (callus, stem and leaves) for the regulation of bud formation and development the explants were moved into Murasige-Skoog nutrient medium. The desirable effect was conditioned by the change of nitrogen food source and vitamins. Micro-reproduction coefficient was directly proportional to the growth of cultivation number. The supply of explants with mineral food elements in the presence of cytokinin causes the production of well-developed conglomerate system of buds and sprouts and induction of axillary buds proliferation on apical sprouts.

Key Terms: nutrient medium, callus, morphogenesis, hormone, propagation.

Micro-reproduction

Introduction:

Any cultivated plant possesses a number of abilities, the realization of which in selection can be carried out utilizing in vitro techniques. The researchers distinguish some spectra among which the most essential is the expansion of genetic basis by producing new initial material. The criterion of carrying out this process is the factor of nutrient medium and modification of its constituent components.

Materials and Methods:

The object of research was Senecio Phlathiphiloide. In order achieve massive microreproduction of aseptic material we used nutrient mediums of different composition, namely: of Gamborg, Murassige-Skoog, Nitsch and Nitsch. From growth regulators benzylaminopurine with 10µM concentration was added to the nutrient.

Results and Discussion:

We put apical and axillary buds in nutrient mediums of different composition, and obtained different effect. Weak buds the average height of which didn’t exceed 2-5 mm developed in the medium with B5 and NN mineral salts. The leaves developed weakly and at the end of the passage turned yellow and fell down. In every case the morphogenic callus was developed in the basal end of the initial explant, but their buds weren’t characterized by stem morphogenesis. That’s why we totally ignored NN nutrition and the composition of Gamborg nutrient medium was different according to the mineral salts and vitamins. The phase of bud development reduced, normal buds developed out of meristem buds diffused on the callus surface, which number was 12.4 units; leaf-formation was increased, apical dominance also occurred. This process took place during two passages. At the end of the III passage the leaves again turned yellow and fell down.

For the regulation of bud formation and development the explants were moved into Murasige-Skoog nutrient medium. The desirable effect was conditioned by the change of nitrogen food source and vitamins. In the II passage the buds with thick stem and dark green leaves were developed through the reproduction, the callus was well-developed in the basal part. The period of sprout-formation was reduced and consisted of 8-10 days. The height reached 17.9 mm. The induction of proliferation of the buds already conceived in callus, as well as the development of new accelerated meristem out of the axillary of microsprout leaves were also noticed. This was reflected on the growth of the axillarion of micro-reproduction coefficient. Micro-reproduction coefficient
was directly proportional to the growth of cultivation number. This process was certainly promoted by cytokininic hormone, the concentration of which was the same in all variants because their different amount in nutrient medium together with its basic components would give different effects. As a result of our research, the supply of explants with mineral food elements in the presence of cytokinin causes the production of well-developed conglomerate system of buds and sprouts and induction of axillary buds proliferation on apical sprouts. Hence, in order to provide high efficiency of Senecio Phlathiphiloides microreproduction, it’s essential to use nutrient medium with cytokinins.

References


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