

THE EFFECT OF CONCENTRATIONS OF PHYTOHORMONES ON THE MORPHOGENESIS OF THE OMSK PLANT VARIETY POTATO «ERMAK» IN VITRO

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Currently, the problem of improvement of potato seed material for the Omsk region is the most relevant and promising. The potato is an important staple consumption of the population of Siberia. Great consumer demand Omsk potato «Ermak», which has a number of positive qualities. This early-maturing breed is heat resistance, high yield up to 450 tons per hectare, tuber weight is 115 grams, the content krakhmal-12%, but has a high degree of resistance to fungal, bacterial and viral diseases. According to scientific data Omsk scientists, almost 100% potatoes Omsk varieties «Ermak», are damaged by three particularly dangerous viruses X, Y, and S for this culture, as well as by potatoes ureterovaginal viroids, which lead to a 30-40% loss of yield and deterioration of quality indicators [1, 2].

Due to high consumer demand among the population of Omsk region the potato varieties «Ermak» was used as a research object for recovery from mosaic viruses X, M, Y, S, L.

The of method apical meristem and micropropagation in vitro were used for this research. The selection of apical meristems and micropropagation of potato was conducted in the conditions of the kelp-box (Lamsystems) in combination with the method of thermotherapy for inhibition of phytopathogenic infection within 5-7 days. In the next step, treated potatoes were grown in a closed, and then open ground in the scientific and industrial laboratory «Applied biotechnology» of Omsk state technical University.

As a nutrient medium for the cultivation of apical meristems were used our modified solutions of nutrient medium Murashige-Skoog (MS). As growth regulators were used kinetin, 6-benzylaminopurine (BAP) and indelicato acid (IAA).

In the course of our research were investigated the impact of the following combinations of different phytohormones and vitamins on morphogenetic processes of plant varieties potato «Ermak » in vitro with constant macro - and microelements MS (mg/l):

1) MS with the addition of pyridoxine (0,5), ascorbic acid (1,0), folic acid (0,05), nicotinic acid (0,5), gibberellinovoy acid (2,0), ISB (0,5), kinetin (1,0), 6-BAP (0.5 in), mesoinositol (100);

2) MS + the same components, but without 6-BAP and with the addition of zeatin (0,2);

3) MS + same components, but without 6-BAP, SC, IMC of zeatin and mesoinositol, with the addition of IAA (1,0);

4) MS as in option 3, with the addition of adenine (0,5), IAA (0.05) and of kinetin (0,1);

5) MS 3 variant, but without folate, nicotinic acid, ISB, 6-BAP, and zeatin with the addition of mesoinositol, ferulic acid (0,02) and adenine (1.);

6) MS as in option 4, but without adenine, with the addition of mesoinositol;

7) MS as in option 4, but without mesoinositol, kinetin, IAA, with the addition of 2,4-D (0,01);

8) MS as in option 4, but without kinetin, IBA, with the addition of zeatin (0,3), 2,4-D (0,01), IAA (0,3), 6-BAP (1.0 in).

When the height of the plants in vitro has reached 10-15 cm, these plants were tested for the presence of viral infection by the specific immunochromatography method of rapid tests Bioreba (PVM AgriStip, PLRV AgriStip-magnetic, PYY AgriStip, PLRX AgriStip-magnetic, PVS AgriStip), and polymerase chain reaction using fluorescent PCR detector «gene» company «DNA-technology».

In summary, our experimental data show that for the cultivation of apical meristem in order to obtain the plant varieties «Ermak» in vitro the optimal nutrient medium is MS + adenine (0,5mg/l) + phytohormones auxin IAA (0.05 %) + cytokinin kinetin (0.1 per cent), and this medium has marked the exit shoots 95-100%.

Our experimental data show the great potential of virus-free seed production biotechnology in Western Siberia and their real using prospects in practice of potato industry in Omsk region.

References

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