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TISSUE CULTURE STUDIES ON VALUABLE PLANTS

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With teachers and student groups at the scientific-manufacturing center of Biotechnology and genetics scientific works are performed on micropropagation of plants. Our purpose is micropropagation of rarely encountered medicinal herbs in Turkmenistan (*Glycyrrhiza glabra*, *Mandragora turcomanica*), agriculturally valuable, high yielding plant breeds (tomato, potato, cucumber), decorative plants (*Paulownia sp.*), rarely encountered plants (*Pistachio badhyziensis*) by obtaining their callus or cell biomass [1].

Recent years one of the main methods of agricultural biotechnology, tissue culture took the main role to grow plants in agriculture. Plant tissue culture is a cultivation of plant fragments obtained from any parts of plant in vitro pure medium, for economical or scientific purposes. Thus, by realization of new plant regeneration, whole, complete plant can be obtained [2, 3].

Nowadays, in many countries of the world, to solve the problems such as development of agricultural field, eradication of nutrient deficiency, protection of plants from diseases, prevention of loss of high-yield quality, obtaining pure plant biomass for pharmaceutical industry, maintaining plant types which are rarely encountered and under extinct depend on usage of in vitro plant growth method, that is plant tissue culture [4, 5].

Projects consist of several stages and each stage has been repeated many times: preparation of culture medium; preparation of required equipment; obtaining of samples and purification; planting explants on the culture media; growth controlling.

Based to the experiments have done during research have been developed general protocol and optimal ratio of growth stimulants for each plant species (*Figure 1-3*).

For tomato plant it constitutes taking explants from apical buds and stem nodes, sterilizing them sequentially by hypochlorite (1 *min*), ethanol (30 *sec*) and peroxide (4 *min*), then cultivating into MS growth medium by adding growth stimulants (16/8 light/dark regime, 25^0C, 60-65% humidity). Obtained calluses stimulated by phytohormones for taking seedlings (*figure 4-6*). Phytohormone ratio was 1,664 *mg/L* IBA and 3,68 *mg/L* kinetine respectively [6] (*Table 1*).

Figure 1. The callus of *Glycyrrhiza glabra*

Figure 2. Seedling of Pavlovnia grown from callus

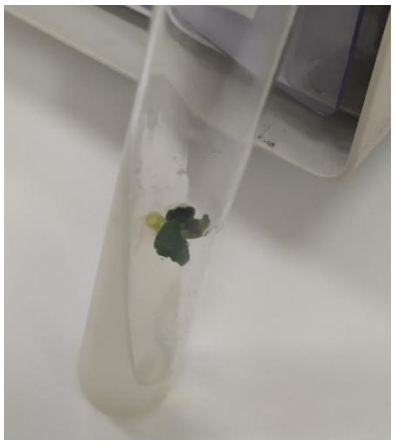

Figure 3. *In vitro* grown seedling of raddish

Figure 4. The callus of *Lycopersicon esculentum*

Figure 5. Root growth from tomato callus

Figure 6. *In vitro* grown seedling of tomato from callus

Table 1. Auxin/Cytokinine ratio for tomato explant cultivated in MS medium

Kinetin conc. (*mg/L*) \ IBA concentration (*mg/L*)	0	1	1,664	2,0
0	no growth	root formation	root formation	root formation
1	shoot formation	medium callus formation	highly callus formation	highly callus formation
3,68	shoot formation	shoot formation	highly callus formation	highly callus formation
4,344	shoot formation	shoot formation	medium callus formation	medium callus formation

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