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PROPAGATION OF PAULOWNIA FELT(*PAULOWNIATOMENTOSA*) USINGBIOTECHNOLOGICAL METHODS

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Abstract. *As a result of the experiments, the peculiarities of germination of Paulownia felt seeds under sterile and non-sterile conditions and germination of explants on Murasige-Skug (MS) and Andersen nutrient media were revealed.*

Keywords*: paulownia, sterilization, seeds, shoots, in vitro, seed germination, explants.*

Introduction. One of the urgent problems of today's rapidly developing world is the use of natural wood, environmentally friendly materials. Now many countries in the world are looking for a way to improve environmental conditions and find new sources of energy. One solution to this global problem is the cultivation of a unique tree, which is already known throughout the world as Paulownia. In many countries such as China, Japan, Bulgaria, etc. for landscaping urban areas and the territory of industrial enterprises began to widely use seedlings of fast-growing Paulownia trees, which is a new innovation that allows you to get a tall deciduous tree (6-meter trees maximum for 3 years), providing improvement of ecological conditions in cities and industrial enterprises.

And in Uzbekistan a special role is given to Pavlovnia. In the republic Pavlovnia is planted around factories, industrial enterprises, squares, boulevards, along highways, etc. On the initiative of President of the Republic of Uzbekistan Sh. Mirziyoyev the state project "Yashil makon" was launched where till 2030 yearly 200 million tree saplings will be planted in the territory of the republic. And this project has been elevated to the rank of state policy.

Paulownia felted is characterized by high economic and biological potential, and is of interest as an ornamental and valuable tree species.

Until recently, the main method of obtaining planting material was vegetative propagation, which allows to preserve the genotype of the mother plant and reduce the duration of the juvenile period. Cell and tissue culture methods are a vegetative method of plant propagation *in vivo*. Thanks to clonal micropropagation it is possible to obtain a population of genetically equalized trees, which will allow to accurately predict the dynamics of plantation development

Material and methodology of the study. The purpose of this work was to carry out a comparative analysis of plant yield from sterile and non-sterile seeds and sterile shoots of Paulownia felicata.

Studies were carried out in the laboratory of "De Nova Agro" LLC at Tashent State University.

Externally identical sterile and non-sterile Paulownia felt seeds were used as an object of research. In all experiments, 11 complete seeds in triplicate were used in each experiment variant. Non-sterile seeds were germinated in Petri dishes on wet filter paper according to the conventional method. Fungicide solutions and a 7.5% calcium hypochlorite solution sterilizing agent were used to introduce sterile seeds into the *in vitro* culture. After sterilization and washing, seeds were germinated in jars and explants were planted on Murasige-Skug (MS) and Andersen nutrient media with 6-benzylaminopurine (BAP).

Also, the object of the study were nonwoody, apical stem fragments 15 mm long with 1-2 buds in an amount of 20 pieces. Sterilization was performed by the above method. The washed explants were placed in jars on MS medium with addition of BAP.

The shoots obtained by sterile germination were divided into explants and then placed again on the same nutrient medium. Jars with seeds and shoots were placed on racks of the light unit of the culture room of biotechnology laboratory at temperature +25°C, day/night photoperiod of 16/8 h, illumination of 4000 lux, and relative humidity of 70%.

The number of germinated seeds and explants was counted every 10 days for four months.

Results. Seed germination is a complex process that depends on many conditions: temperature, characteristics of the substrate, physiological characteristics of the seeds themselves. The processes occurring at the beginning of development, which determine the preparation and transition to the generative period, play an important role in plant productivity.

Seed sterilization is an effective and environmentally friendly measure to protect plants from infection. Obtaining aseptic seedlings for *in vitro* experiments is quite challenging due to the possibility of high bacterial and fungal contamination of the material.

For each plant, the optimal sterilization regime is determined experimentally. Despite the fact that the surface of Paulownia felt seeds is pubescent with short hairs, which can make its release from infection difficult, we managed to provide sufficient disinfection of the material, thus increasing the number of germinated sterile seeds compared with non-sterile ones. The laboratory germination rate refers to the number (in %) of normally germinated seeds within a certain period of time (mostly 7-10 days) to the total number of seeds in the sample.

On the 10th day, the germination rate among sterile seeds was 76 %, among non-sterile seeds - 33 %. The use of sterile seeds at the stage of plant introduction into *in*

vitro culture allows to obtain a large number of explants and thereby increase the probability of success of further stages of microclonal multiplication.

It should be noted that non-sterile seeds began to germinate on the second day from the beginning of the experiment, and the sterile ones - on the sixth day. It is likely that such a delay in seedling development may be related to the negative effect of sterilizing agents on the seed germ.

Explants cultured on nutrient agarized Anderson medium were characterized by slow growth and low proliferation activity.

Further micropropagation of the main and additional shoots *in vitro* provided multiplication ratios in the first cycle on MS medium up to 1:8, on Andersen medium up to 1:4.

The yield of viable explants after sterilization of shoots with buds was 50%, reproduction rate was 1:3.

Conclusions. As a result of the experiments, the peculiarities of germination of Pavlovnia felt seeds in sterile and non-sterile conditions were revealed.

When using sterilizing agents to introduce seeds as primary explants in *in vitro* culture, the effect of disinfectants on the seed germ should be considered. Sterilization significantly reduces the seed germination rate and seedling development, but at the same time contributes to the elimination of pathogens from the seed surface.

MS medium with the addition of BAP is optimal for culturing explants.

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