РЕЗЮМЕТА
НА НАУЧНИТЕ ПУБЛИКАЦИИ
на гл.ас. д-р Лиляна Руменова Начева

във връзка с участието й в конкурс за заемане на академичната длъжност „Доцент" по професионално направление 4.3 Биологични науки, научна специалност: Физиология и биохимия на растителни тъканни култури, обявен от Институт по овощарство – гр. Пловдив в ДВ бр. 56 от 28.06.2013 г.

1. **Nacheva, L.**, Z. Zlatev, K. Ivanova, P. Manolov. **2002**. Possibilities for Application of Photoautotrophy in Micropropagation of Dzhanka 4 Rootstock, *Acta Horticulturae* 577: 199-207.

Abstract

In vitro cultured plantlets have heterotrophic development, relying on the use of exogenous sugars as a carbon source for growth. During the acclimatization stage, plantlets are constrained to grow photoautotrophically, i.e. to synthesize carbohydrates through their own photosynthesis. Many researchers suggested that the photosynthetic competence of plants, when transferred to soil, might be an important factor in determining transplant survival. The aim of the present investigation was to study photosynthetic ability and possibilities for application of photoautotrophy during micropropagation of *Dzhanka 4 (Prunus cerasifera Ehrt)* rootstock. Observations were made on net photosynthesis of plantlets at three stages of micropropagation (multiplication, elongation and rooting), cultured under conventional conditions and conditions favouring photosynthesis (light, gas-permeable closure and decreased sucrose concentration). In addition, the same photosynthetic characteristics were analyzed in photoautotrophically-rooted (in peat) plantlets. The improved environmental conditions led to an increase of quantum yield and Rubisco activity. In result, the net photosynthetic rate increased by 63% (in multiplication) to 91% (in rooting). The results from this research and the recent experiments showed that improved environmental conditions enhanced photosynthesis and enabled the application of photoautotrophy in micropropagation of *Prunus cerasifera* Ehrt.

2. **Nacheva, L.**, K. Ivanova and S. Milusheva . **2002**. Elimination of PPV in plum cvs Kyustendilska sinya and Valjevka through in vitro Techniques *Acta Horticulturae* 577: 289-291.

Abstract

The aim of the present research was to obtain PPV-free plants of *Prunus domestica* cv. Kyustendilska Sinya (KS) and cv. Valjevka (Val) via in vitro techniques. Mother trees of *Kyustendilska Sinya* and *Valjevka* were tested through DAS ELISA for PPV as well as other important viruses: Apple chlorotic leaf spot virus (ACLSV), Apple mosaic virus (ApMV), Prune dwarf virus (PDV) and Prunus necrotic ringspot virus (PNRSV). The test results showed that plants have high concentration only of PPV and free of another tested viruses. Young shoots were collected in May 2000 and surface-sterilized. Explants were cultured on Murashige and Skoog medium, supplemented with 0.56 mg/l BAP, 0.001 mg/l IBA, 30 g/l saccharose and 5.8 g/l agar, pH 5.6. After initiation, small apex buds with 2-3 unfolded leaves were subcultured at 3-weeks intervals on the same medium. DAS ELISA was used to determine the virus content in the plants at each 3th subculture. To the fourth subculturing 35.3 % of obtained subclones of *KS* and 33.3 % of *Val* were free of PPV. After 8 passages 88 % of established subclones of *KS* and 100 % of Val were PPV-free. After acclimatization the virus-free plants will be retested.

3. **Nacheva, L.** and Gercheva, P. **2009.** Micropropagation of Gisela 5 (Cherry Dwarf Rootstock): The effect of the type and the concentration of the carbohydrates in the nutrient medium. *Acta Hort.* (ISHS) 825:261-268.

Abstract

Gisela 5 Cherry Dwarf Rootstock has a moderate to poor growth and it is very perspective for the development of modern intensive cherry plantations. There are single announcements in scientific literature about micropropagation of Gisela 5. The aim of the present study was to investigate the effect of the type and the concentration of carbohydrates (sucrose and sorbitol) added to the nutrient medium with auxins (IBA, NAA and IAA) on the multiplication coefficient and the length of the newly formed shootlets in Gisela 5 Cherry Dwarf Rootstock. The study was carried out on 15 different nutrient media suitable for multiplication, based on MS (1962). The effect of the varying concentrations of auxins (IBA, NAA and IAA) and carbohydrates (sucrose and sorbitol used separately and in a combination) at a constant concentration of the cytokinin BAP (2.5 μM), was followed out. The results of the investigations showed that the basic effect on both studied characteristics was exerted by the type and the concentration of the carbohydrates. The highest multiplication coefficient (number of shootlets per plant) was achieved when combining sucrose and sorbitol in a 2:1 ratio, followed by the variants of sucrose to sorbitol in a 1:2 ratio. The most distinct differences were reported in the variants on the nutrient medium with IBA and IAA when the coefficient of multiplication was 3-4 times higher compared to the classical variants with sucrose. The best results (multiplication coefficient of 3.72 – 4.31 at 1.9 cm mean length of the shootlets) were achieved in the variants containing 0.005 μM IBA, 20 g/L of sucrose and 10 g/L of sorbitol.

4. Gercheva, P., **Nacheva, L.** and Dineva, V. **2009**. The rate of shoot regeneration from apple (*Malus domestca* BORKH.) leaves depending on the in vitro culture conditions of the source plants. *Acta Hort.* (ISHS) 825:71-76.

Abstract

Efficiency of somatic organogenesis depends to a great degree on the physiological status of the in vitro source plants. Important factors are the cultivation conditions – nutrient media, cultivation plates, gas-exchange possibilities, temperature and light regime. The aim of the present study was to investigate the effect of conditions for cultivating the source plants (cultivation plates and nutrient media) on the regeneration capacity of the apple (*Malus domestica*) leaf explants. Studies were carried out with in vitro propagated plants of the apple cultivar 'Chadel'. The source microplants were cultivated on MS nutrient media with the addition of sucrose 10 g/L and modified MS with added BAP 2.5 μM, IAA 0.0571 μM and sucrose 30 g/L. Two types of cultivation plates were used in the experiment - glass jars and plastic vessels with a gas-permeating cover. Leaf segments of the source plants that had been cultivated in each of the four combinations of nutrient media/cultivation plates were set for regeneration. The nutrient media for regeneration were based on MS with added TDZ (7.5 μM), sucrose 10 g/L, sorbitol 30 g/L and different IAA content – 5, 10, 15 and 20 μM. The explants were cultivated in darkness for 15 days, after which – at a photoperiod of 16/8 hours (40 μmol m^{-2} s^{-1} PAR) at a temperature of 22±2°C for 25 days. The best results (over 80% regeneration) were achieved when using explants of plants grown in plastic vessels with a gas-permeating cover in modified MS nutrient medium.