



## Phenols Content and Phenolic Peroxidase Activity in Cucumber Plants Under Led Lighting

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27

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Cucumber plants (variety “Kurazh”) had been growing under Philips TL-D 36W/765 fluorescent lamps at 4000 lx with 14 h photoperiod until the beginning of first leaf formation. Then until the appearance of the second leaf (usually 10 d) the plants had been growing under blue (459 nm) or red (635 nm) light-emitting diodes (LEDs) or under blue and red LEDs with red to blue ratio 2:1. Plants grown under white fluorescent lamps were used as a control. All lamps had the same light intensity. Water-soluble phenols content was determined spectrophotometrically and  $\alpha$ - and  $\gamma$ -tocopherols contents were determined with HPLC with fluorescent detector. Phenolic peroxidase activity was assayed by guaiacol consumption kinetics at 436 nm.

We found that water-soluble phenols and tocopherols levels increase by 80% and 30% under blue LEDs while under red LEDs these levels, conversely, decrease by 30% and 13% compared to control plants. During combined action of red and blue light water-soluble phenols content increased by 55% compared to control. On the other hand tocopherols contents under such lighting were at the level of control. Under red LEDs  $\alpha$ - to  $\gamma$ -tocopherol ratio was lower than that under blue light. Previously we showed that monochromatic narrow-band light sources, especially with red light, are considered by plant organism as a stress factor. Low  $\alpha$ -tocopherol level detected under red light may be caused by its intensive consumption as an effective quencher of reactive oxygen species and free radicals interceptor. It is not impossible that narrow-band lighting has the inhibiting effect on  $\gamma$ -tocopherol methyltransferase – an enzyme that catalyses  $\gamma$ - to  $\alpha$ -tocopherol conversion.

Phenolic peroxidase activity changed adversely compared to phenols content – it had the highest value under red LEDs and the lower value under blue LEDs. This is consistent with the fact that it uses phenols as the substrate.

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