



# Non-destructive postharvest monitoring of artificial illumination induced potato greening phenomenon

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## Introduction

The quality of potatoes is significantly affected by the storage conditions applied. Direct exposure to natural or artificial light influences the formation of chlorophyll in potatoes, which becomes visible as green surface coloration of the crop. The process of chlorophyll formation is accompanied by the natural synthesis of  $\alpha$ -chaconine and  $\alpha$ -solanine, which are toxic glycoalkaloids with natural origin.

## Aims

The objective of this study was to examine the effect of varying degrees of illumination on the process of greening in relation to the synthesis of potato solanine. For the purpose of this study, table potatoes (*Solanum tuberosum L.* cv. ,Anuschka', Euro Sol Kft., Hungary) were stored under three different conditions: in the dark (0 Lux), under artificial illumination by LED lamps (~400-450 Lux) and high light intensity providing photo lamps (~4500-5000 Lux).



## Materials & Methods



## Results



#### Conclusions

According to our results,

- Konica Minolta CR-400 and Vis/NIR DA-meter<sup>®</sup> devices proved to be suitable tools for monitoring the greening of potatoes caused by artificial illumination,
- the DA-index<sup>®</sup> characterizes more clearly the different illumination induced chlorophyll production accompanied by glycoalkaloid development compared to the frequently used a\* color parameter provided by the well-known surface color measurement,
- significant difference was found between the illuminated (sunny) and shaded sides of the potatoes,
- significant difference was determined between samples illuminated with a photo lamp and LED, and those stored in the dark (control),
- artificial illumination by a photo lamp resulted in the greatest degree of greening phenomenon,
- in general, in case of a yellow skinned cultivar the light stress induced greening is more easily detectable even by human eye compared to red skinned cultivars.