

# Canonical variate analysis of chlorophyll $a$ , $b$ and $a + b$ content in tropospheric ozone-sensitive and resistant tobacco cultivars exposed in ambient air conditions

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## Abstract

Tropospheric ozone effects negatively crop plants causing the biomass and yield losses, which might be connected with plant photosynthesis activity decrease. Chlorophyll content has been discovered as one of the parameters, which responses for higher ozone concentrations. However, these results were usually obtained during fully controlled conditions. Hence, it is necessary to conduct investigations in ambient air conditions to confirm these findings.

Ozone-sensitive and -resistant tobacco cultivars were employed in presented investigations. Plants were exposed in 6 sites for 7 two-week series in growing season of 2006. Simultaneously, one site was located in control conditions with no ozone. Chlorophyll  $a$ ,  $b$  and  $a + b$  in fresh and dry weight content were measured after every exposure series with using the extraction by DMSO method.

The aim of presented study was to examined if ozone affects chlorophyll content in these two cultivars exposed in various sites in several series. As well as, the determination differences in leaf response for further choice the best leaf to physiological plant investigations. For these purposes canonical variate analyses was employed. Graphical presentation of obtain results is presented here. Experimental objects were placed in space of canonical variates, while points described the chlorophyll content were located in dual space of canonical variates.

The results revealed differences between chlorophyll content measured in different exposed series, although there was no differences between sites, except control and site located in the city centre. Probably, sites of exposure did not differ the ozone effect due to small differences in tropospheric ozone concentrations. While higher differences were noted between certain series, which might be connected with favorable meteorological conditions for ozone creation as well as for plant photosynthesis activity and chlorophyll creation. Moreover, both tobacco cultivars responded similarly for ozone occurrence in the ambient air, which might be a very good indicator of ozone effect without visible symptoms. Additionally, the obtained results pointed out the best leaf for further investigations.