Changes in Redox State and Fruit Yield in Red Pepper Plant *Capsicum baccatum* Chronically Exposed to Elevated Ozone Concentration

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**INTRODUCTION:** Due to its strong oxidizing potential, ozone (O\(_3\)) is a powerful oxidizing agent capable of reacting with several biomacromolecules, including lipids, proteins, nucleic acids and carbohydrates. Tropospheric O\(_3\) is the most damaging air pollutants to crops, leading to huge losses on crop yield. Tropospheric ozone background concentrations have increased since pre-industrial times reaching phytotoxic concentrations in many world regions during the growing season of important cultivars. Thus, the aim of this work was to evaluate the effects of chronic elevated ozone concentration in red pepper plant *Capsicum baccatum* L. var. *pendulum* mainly regarding the redox state and yield. **MATERIAL AND METHODS:** Plants were exposed to O\(_3\) in an open-top chambers during fruit ripening (62 days) at concentrations above the AOT\(_{40}\) (hourly accumulative O\(_3\) concentration over the 40 ppbv threshold) from 10:00 to 16:00. **RESULTS AND DISCUSSION:** Plants treated with O\(_3\) showed a significant decrease on fruits total weight and the number of fruits, but not regarding to the mean weight of the fruits. In O\(_3\) treated plants the increase of reactive oxygen species levels on the leaves may be due to the decreasement of antioxidant enzymatic defense activity, the diminished polyphenol levels and also the decreased of reduced thiol groups. The increase in anthocyanins levels in treated plant leaves was not sufficient to prevent the increase of ROS. Both ROS production and the direct ozone reaction lead to damages in biomacromolecules as seen in the diminished chlorophyll content and elevation in lipid peroxidation and protein carbonilation. We observed trough the correlation analysis that polyphenols levels were more correlated with protection against oxidative damages to lipids than to proteins. **CONCLUSION:** The pepper plants were sensitive to the concentration of ozone used. We data showed that ozone adversely affects the leaf redox state, chlorophyll content and crop yield.

Word Keys: *Capsicum baccatum*, oxidative stress, phenolic compounds, chlorophyll, crop yield.

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