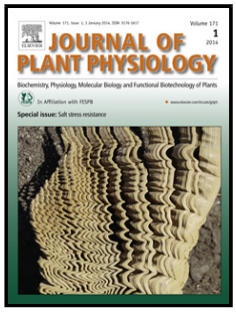

Title: Chrysanthemum morphology, photosynthetic efficiency and antioxidant capacity are differentially modified by light quality

Authors: Liang Zheng, Marie-Christine Van Labeke

PII: S0176-1617(17)30070-6
DOI: http://dx.doi.org/doi:10.1016/j.jplph.2017.03.005
Reference: JPLPH 52539

To appear in:

Received date: 6-1-2017
Revised date: 7-3-2017
Accepted date: 9-3-2017

Please cite this article as: Zheng Liang, Van Labeke Marie-Christine.Chrysanthemum morphology, photosynthetic efficiency and antioxidant capacity are differentially modified by light quality.*Journal of Plant Physiology* http://dx.doi.org/10.1016/j.jplph.2017.03.005

Chrysanthemum morphology, photosynthetic efficiency and antioxidant capacity are differentially modified by light quality

Liang Zheng

Department of Plant Production, Ghent University

Coupure links 653, 9000 Gent, Belgium

Email: liang.zheng@ugent.be

Marie-Christine Van Labeke

Department of Plant Production, Ghent University

Coupure links 653, 9000 Gent, Belgium

Email: mariechristine.vanlabeke@ugent.be

Corresponding author:

Marie-Christine Van Labeke

Department of Plant Production, Ghent University

Coupure links 653, 9000 Gent, Belgium

Email: mariechristine.vanlabeke@ugent.be

Phone: +32 9 264 60 71

Abstract

The effect of light quality on leaf morphology, photosynthetic efficiency and antioxidant capacity of leaves that fully developed under a specific spectrum was investigated in *Chrysanthemum* cv. Four light treatments were applied at 100 µmol m^{-2} s^{-1} and a photoperiod of 14 hours using light-emitting diodes, which were 100% red (R), 100% blue (B), 75% red with 25% blue (RB) and white (W), respectively. Intraspecific variation was investigated by studying the response of eight cultivars. Overall, red light significantly decreased the leaf area while the thinnest leaves were observed for W. Chlorophyll content and Chl a/b ratio was highest for W and lowest under R. B and RB resulted in the highest maximum quantum yield (F_v/F_m) and quantum efficiency (Φ_{PSII}). A negative correlation between heat dissipation (NPQ) and Φ_{PSII} was found. Blue light induced the highest hydrogen peroxide content, which is a proxy for total ROS generation, followed by W and RB while low contents were found under R. The antioxidative response was not always correlated with hydrogen content and differed depending on the light quality treatment. Blue light enhanced the proline levels, while carotenoids, total flavonoid and phenolic compounds were higher under W. Intraspecific variation in the responses were observed for