Cold acclimation of *A. thaliana* grown in different nitrogen concentrations

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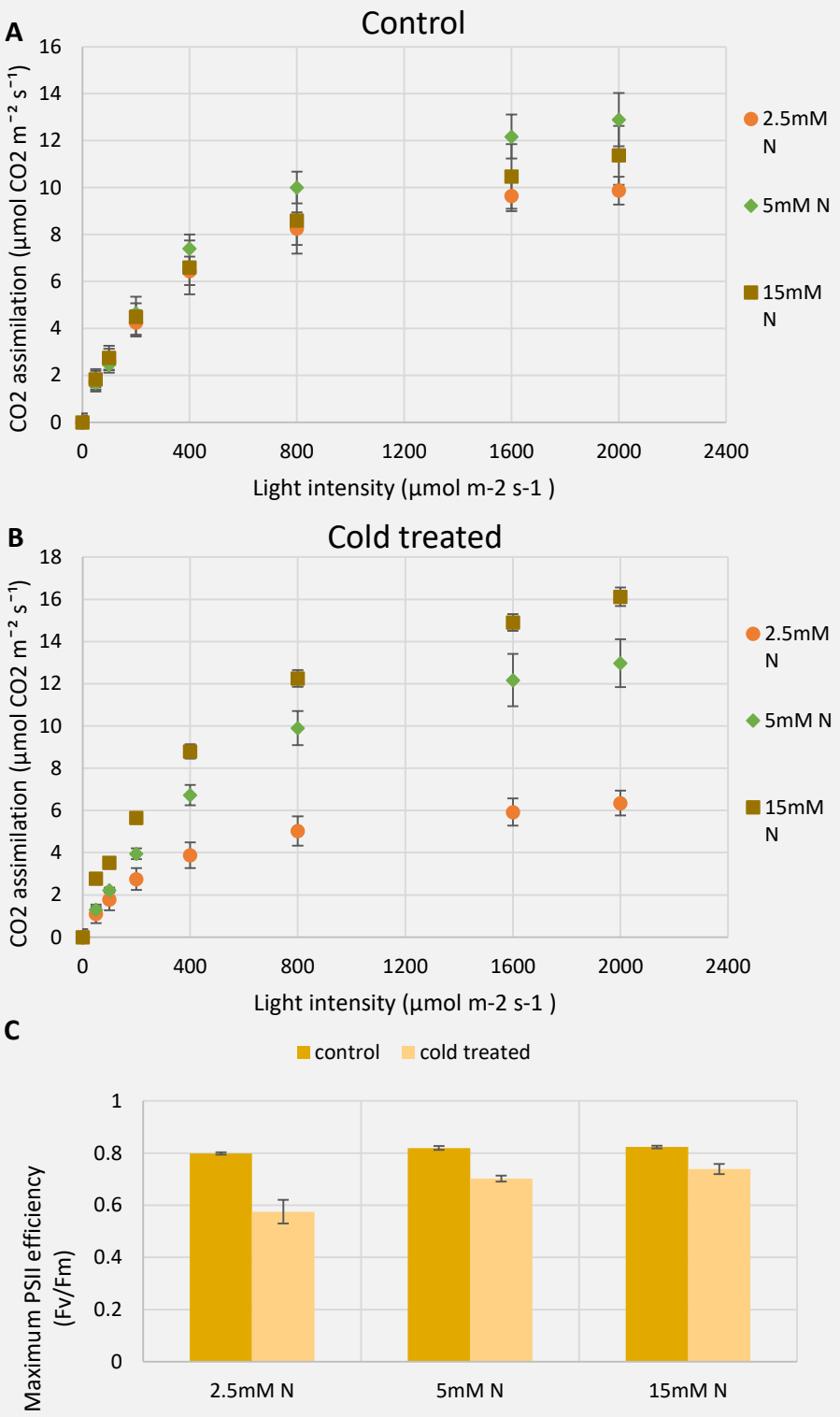
INTRODUCTION

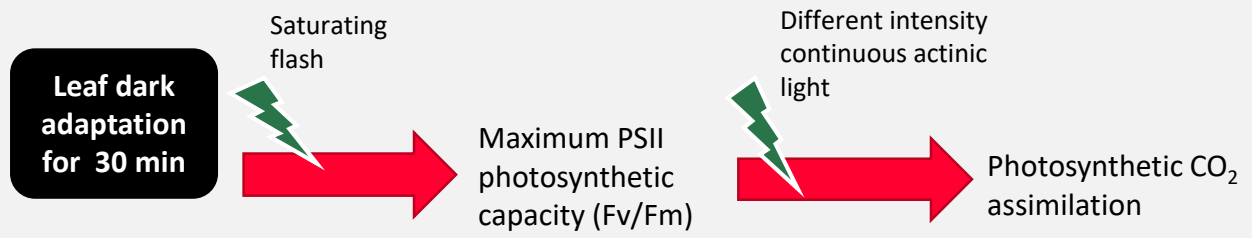
Upon a sustained drop of temperature plants reorganise their gene expression and upregulate protein synthesis, particularly for the Benson-Calvin cycle enzymes, a process known as cold acclimation. Cold acclimated plants establish a new steady state with a higher photosynthetic rate compared to non stressed plants [1]. Dynamic acclimation is completed within days in fully developed leaves and requires energy and nutrient allocation to acclimating leaves from other plant tissues.

In this study we examined the effect of nitrogen limitation on the ability of wild type *Arabidopsis thaliana* plants for cold acclimation.

RESULTS



METHODS



A. thaliana wild type Columbia 0 ecotype plants were grown in sand and fertilized to the following total nitrogen concentrations: 15 mM, 5 mM and 2.5 mM. Plants were grown in 20 °C day/18 °C night for eight weeks and were then transferred to 5 °C for a week.

Acclimation was determined in fully developed leaves via photosynthetic carbon assimilation measurements under different light intensities and chlorophyll a fluorescence measurements.

CONCLUSIONS

- Nitrogen limitation hinders plant ability to acclimate to cold conditions while cold exposure causes sustained damage on Photosystem II.

Photosynthetic carbon assimilation under different light intensities and saturating CO_2 conditions without (A) and with cold treatment (B) and maximum Photosystem II (PSII) efficiency (C) of *A. thaliana* plants grown in 15mM, 5mM and 2.5mM nitrogen concentration.

REFERENCES

[1] Dyson, B. C. *et al.* (2016) 'FUM2, a Cytosolic Fumarase, Is Essential for Acclimation to Low Temperature in *Arabidopsis thaliana*;, *Plant Physiology*, 172(1), p. 118 LP-127. Available at: http://www.plantphysiol.org/content/172/1/118.abstract.