CaProDH2 imparts resistance against *Ascochyta rabiei* infection in chickpea through fine modulation of the proline-P5C cycle under drought stress

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ABSTRACT

Loss of drought-induced resistance against *A. rabiei* infection in chickpea *CaProDH2* silenced plants involved in proline-P5C regulation.

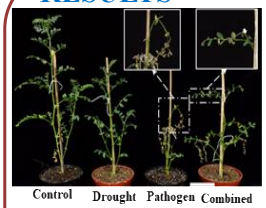
INTRODUCTION

Chickpea plants are affected by drought and *A. rabiei* infection, and are known to co-occur. However their effect on plant defense pathway is unknown.

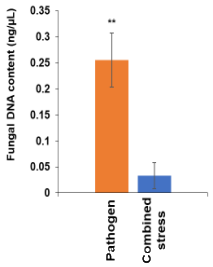
METHODS

Through meta-analysis *CaProDH2* candidate gene was identified and silenced using miRNA induced gene silencing approach. Plants were tested for their stress tolerance by exposing to individual and combined stress treatments.

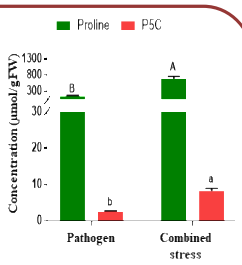
RESULTS



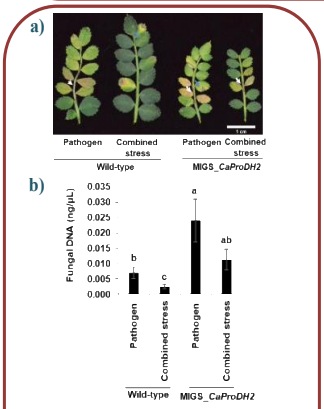
Wild-type plants with less disease incidence under drought stress



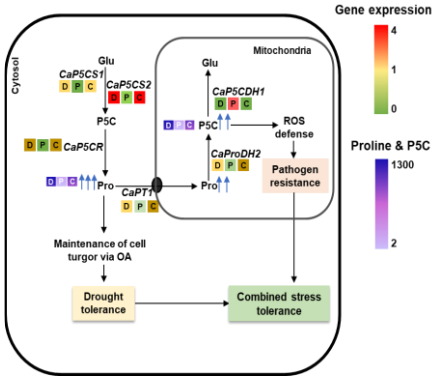
Reduced fungal load under combined stress



More proline & P5C content under combined stress



CaProDH2 silenced plants showing higher disease incidence (a) and fungal load (b) under combined stress



Model shows the regulation of proline-P5C cycle in chickpea plants subjected to combined drought and *A. rabiei* infection

DISCUSSION & CONCLUSIONS

The drought-induced proline production in the cytosol helps maintain cell turgor and enhanced mitochondrial P5C production by *CaProDH2*, generates ROS molecules that mounts defense response and provides resistance against *A. rabiei* infection

REFERENCE

Patil et al. (2021) *CaProDH2*-mediated fine modulation of proline and P5C metabolic pathway confers tolerance to *Ascochyta rabiei* in chickpea under drought stress. *Unpublished*

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