



Effect of drought stress on pea nutritional quality

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INTRODUCTION

Principal Challenges



Climate Change

- Global warming
- More frequent floods and droughts



Legumes

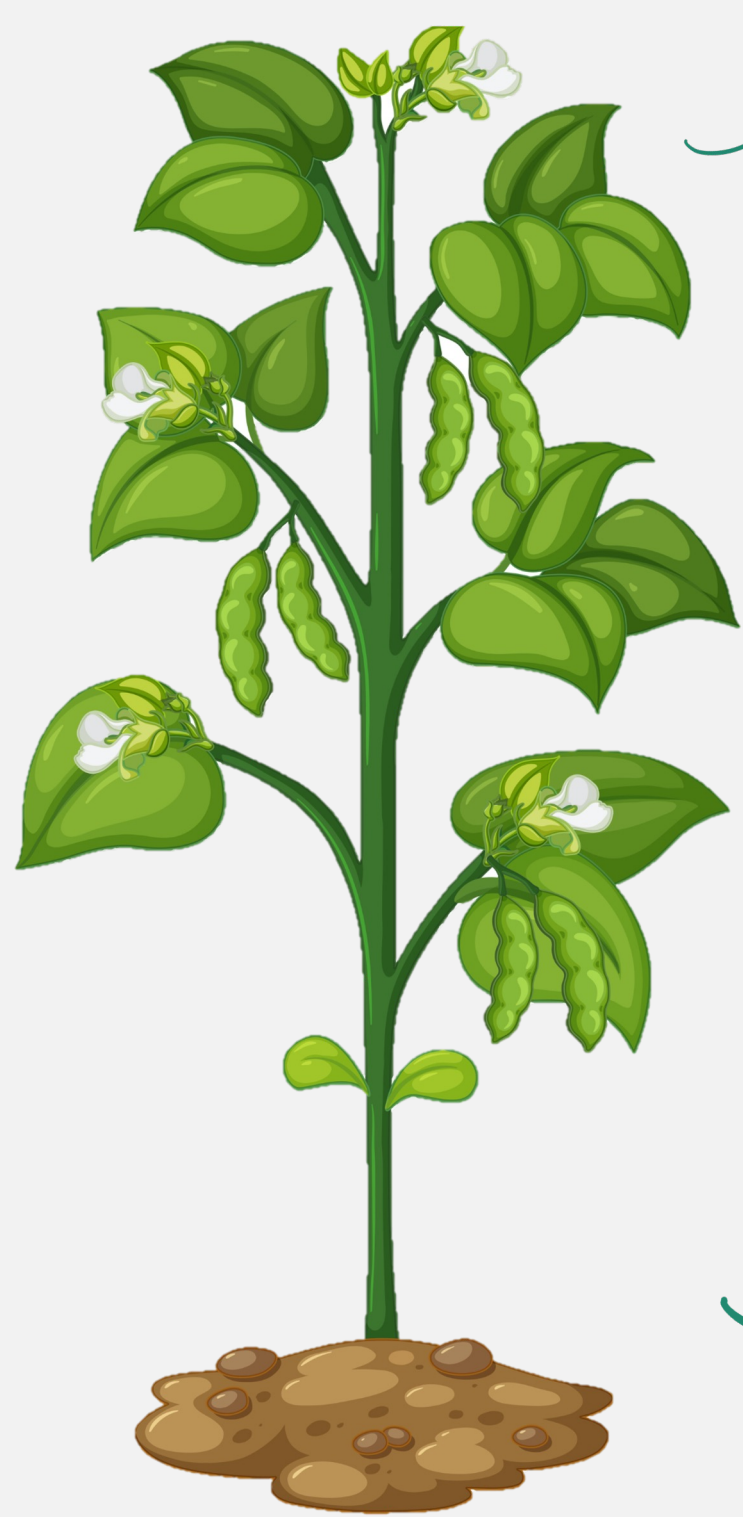
- Often grown in regions that are prone to drought



Nutritional Quality

- Drought stress can reduce the protein content and increase the antinutrient levels in legumes

Pea (*Pisum sativum* L.)



One of the most widely consumed legume vegetables

Significant portion of the daily protein intake in many parts of the world

Important source of protein, fibre, and other essential nutrients

Requires relatively less water and fertilizers compared to several other crops

IMPACT OF DROUGHT STRESS?

While several studies have focused on the effect of drought on pea agronomic traits, understanding the shifts in the nutritional quality (beyond protein content) is yet to be unravelled.

MATERIAL AND METHODS

TREATMENTS

80% FC	40% FC
CONTROL	DROUGHT STRESS
<ul style="list-style-type: none"> •START: Filled with water until reaching the field capacity (FC) •No further irrigation until 80% of FC and then kept at that level 	<ul style="list-style-type: none"> •START: Filled with water until reaching the FC •No further irrigation until 40% FC and then kept at that level

AT HARVEST:

Morphophysiological Traits:

- Dry and fresh weight (shoot, pods, seeds and total)
- Plant Height
- Chlorophyll Content (SPAD)
- Water Consumption

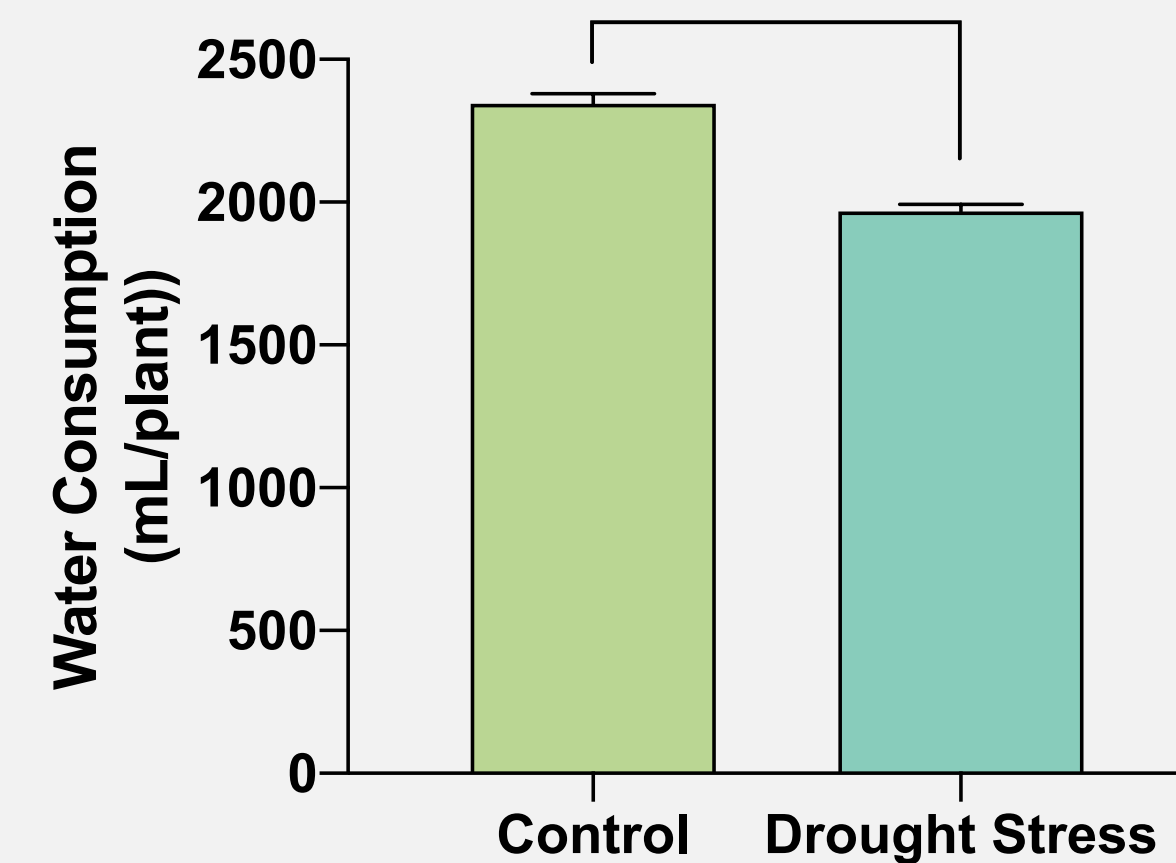
Nutritional Traits:

- Nutrients (ICP-OES and DUMAS)
- Protein (DUMAS)
- Total Phenolic Content

From harvest until the grain-filling stage
≈ 8 weeks, cv. Tom Thumb (short cycle cv.)

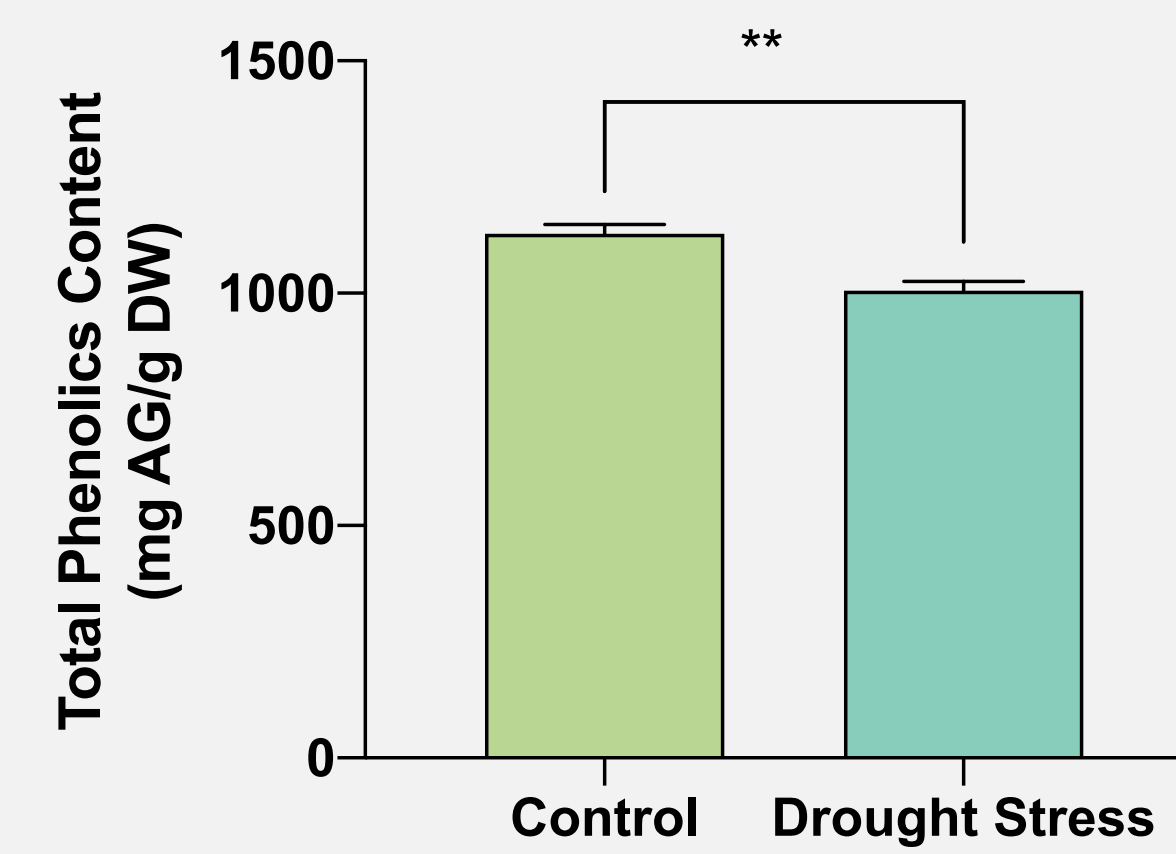
RESULTS AND DISCUSSION

Morphophysiological Traits

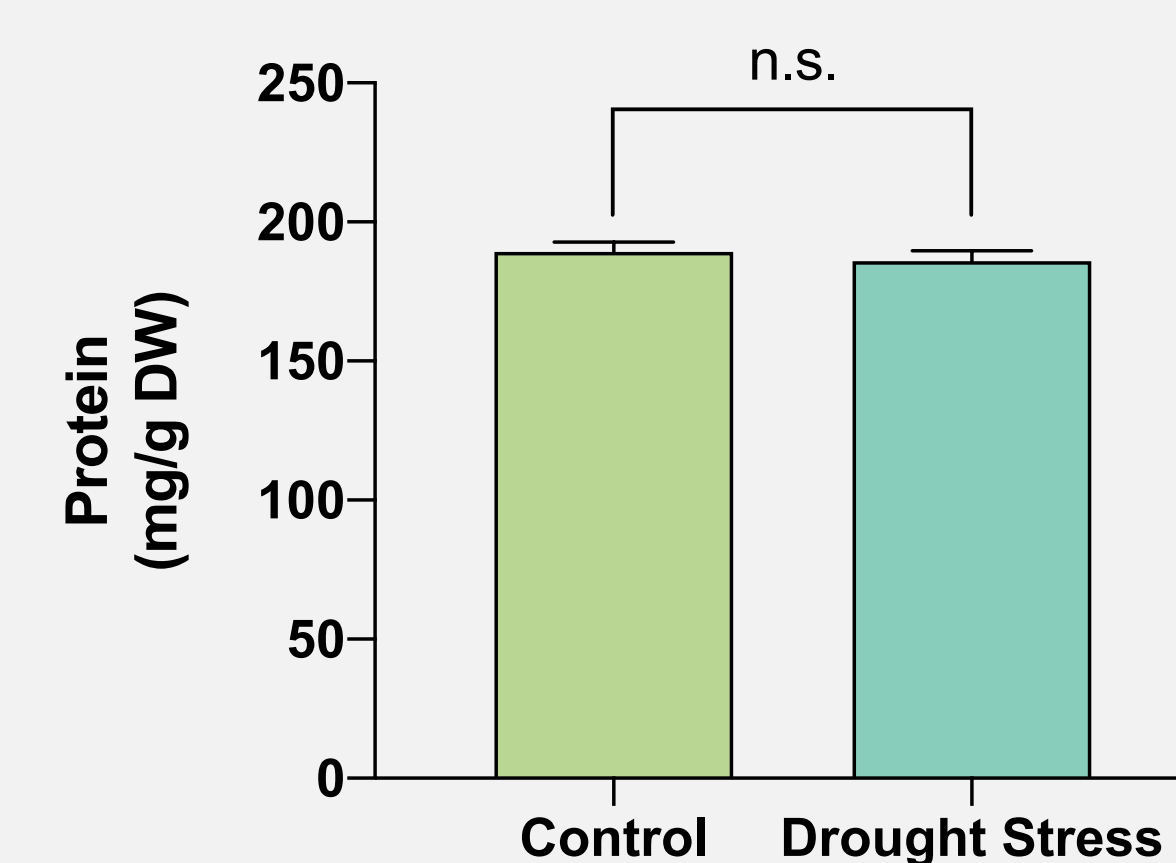


Drought stress did not significantly impact morphophysiological traits **but allowed to save 16 % of water**

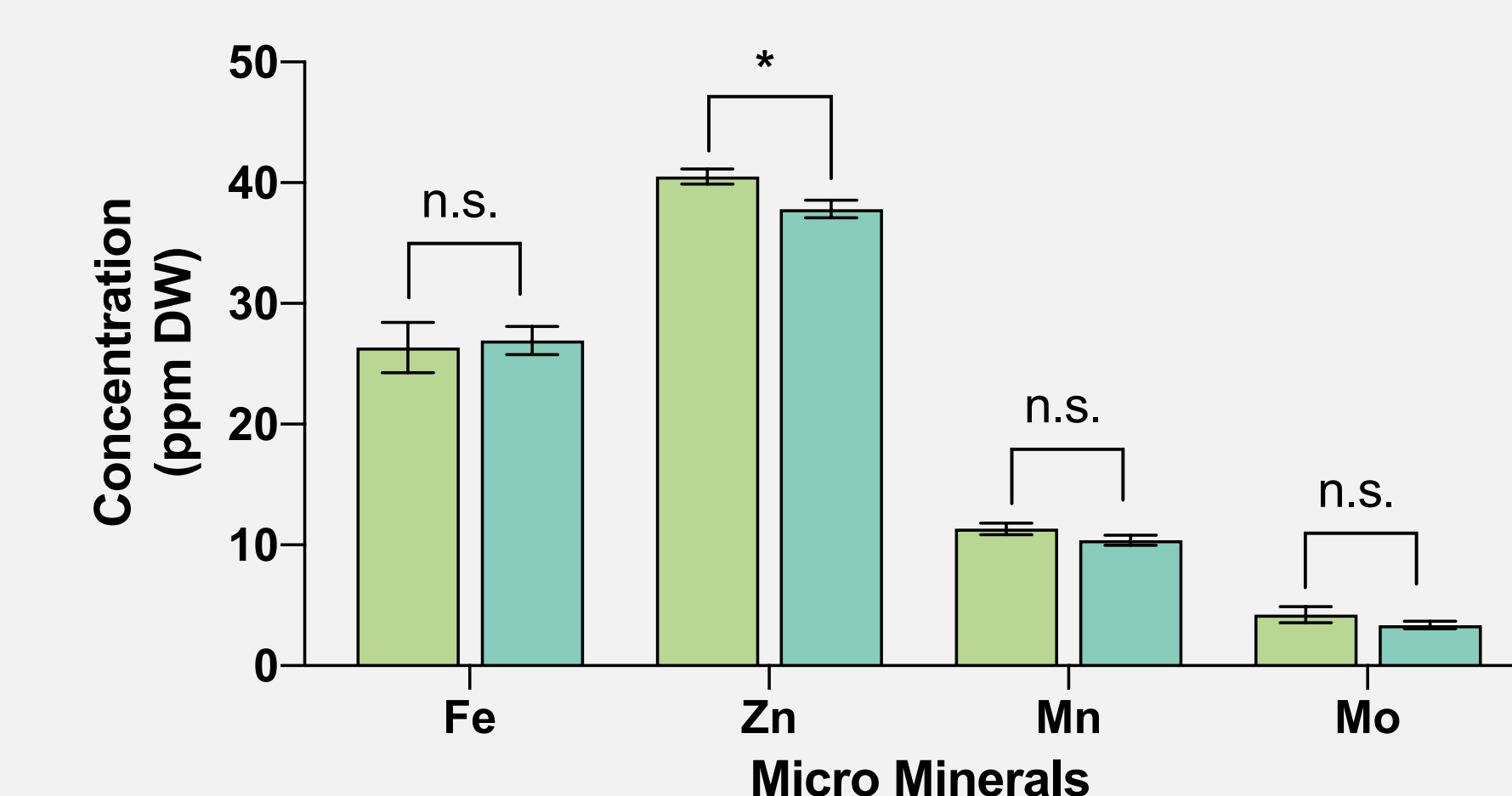
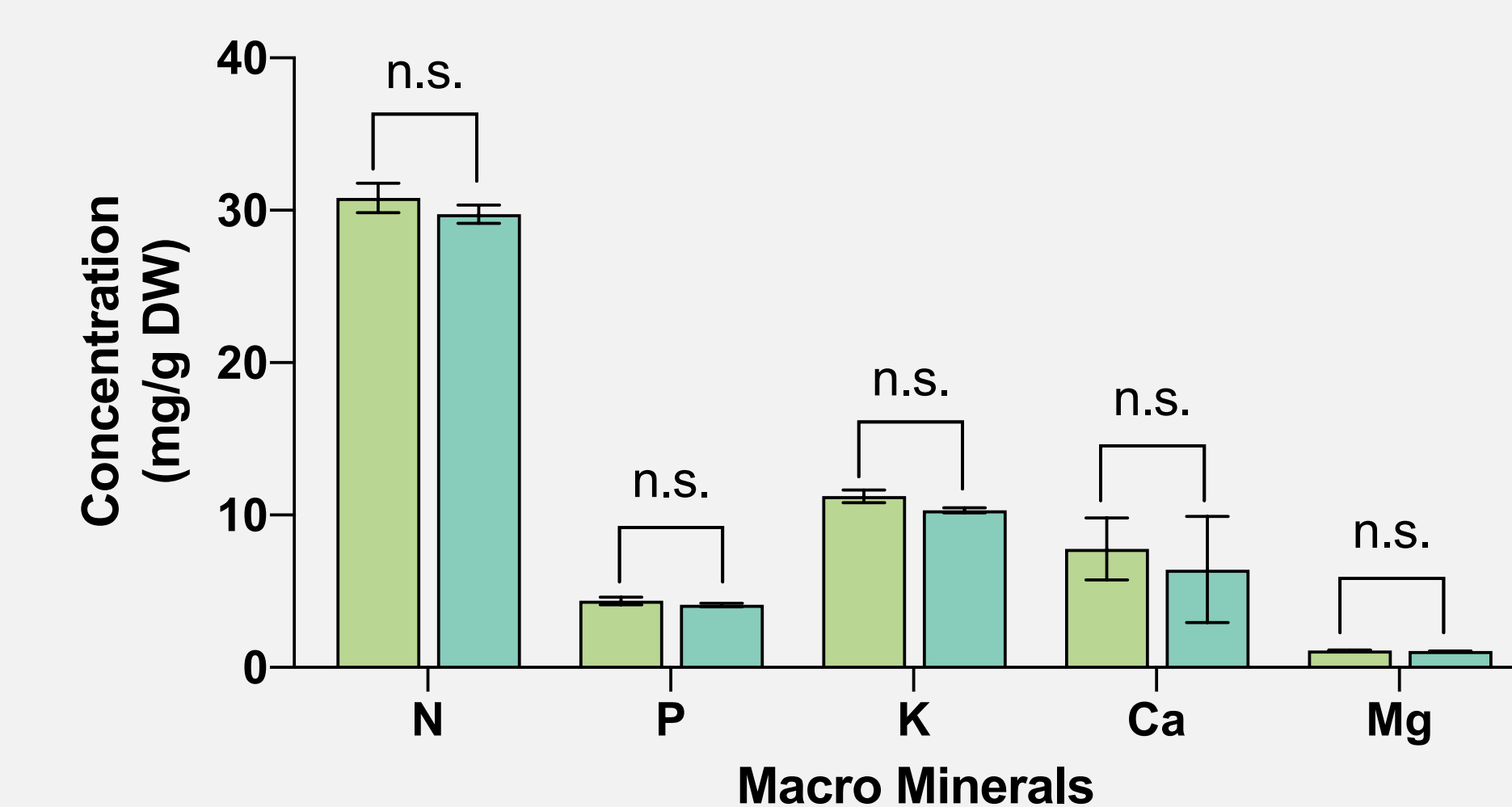
Nutritional Traits



Drought stress significantly impacted antioxidant traits **decreasing total phenolics content by 11%**



No significant impact on nutritional traits such as protein content or macro and micro minerals, only slightly decreasing Zn (3%)



CONCLUSIONS

- Priming Tom Thumb cultivar with mild drought stress might allow water savings during growth, without severely compromising its nutritional properties or yield
- Additional data is currently under analysis to determine drought impacts on other pea nutritional traits and bioactive value

ACKNOWLEDGEMENTS

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