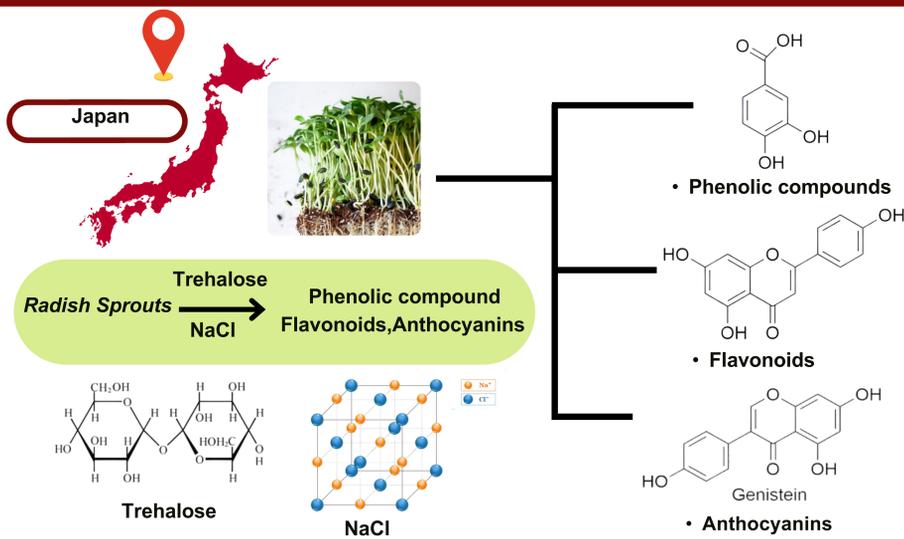


## Abstract

This study examined the effects of trehalose (Tre) and sodium chloride (NaCl) on the growth and biosynthesis of phenolic compounds, flavonoids, and anthocyanins in radish sprouts (*Raphanus sativus* var. longipinnatus) these compounds have antioxidant properties that help protect plants from oxidative damage. Previous studies show that Tre and NaCl can stimulate antioxidant production in plants effects on growth The results showed that treatment with 10 mM Tre, 50 mM NaCl, and their combination (10 mM Tre + 50 mM NaCl) significantly enhanced radish sprout growth This was evidenced by increased fresh weight, dry weight, relative water content, and improved water status in the stems and leaves of the sprouts effects on biosynthesis of antioxidants the study also measured changes in the levels of phenolic compounds, flavonoids, and anthocyanins, as well as the activities of three key enzymes phenylalanine ammonia-lyase (PAL), polyphenol oxidase (PPO), and peroxidase (POD) The results indicated that the combination of 10 mM Tre and 50 mM NaCl resulted in the highest accumulation of phenolic compounds, flavonoids, and anthocyanins, which corresponded with increased activities of PAL, PPO, and POD enzymes.

## Introduction



## Objectives

- To study the effects of trehalose sugar and sodium chloride on the growth of radish seedlings.
- To study the effects of trehalose sugar and sodium chloride on the levels of phenolic compounds, flavonoids, anthocyanins, and related enzymes in radish seedlings.

## Results

Experiment 2 The effects of trehalose and sodium chloride on the levels of phenolic compounds, flavonoids, anthocyanins, and related enzymes in radish seedlings.

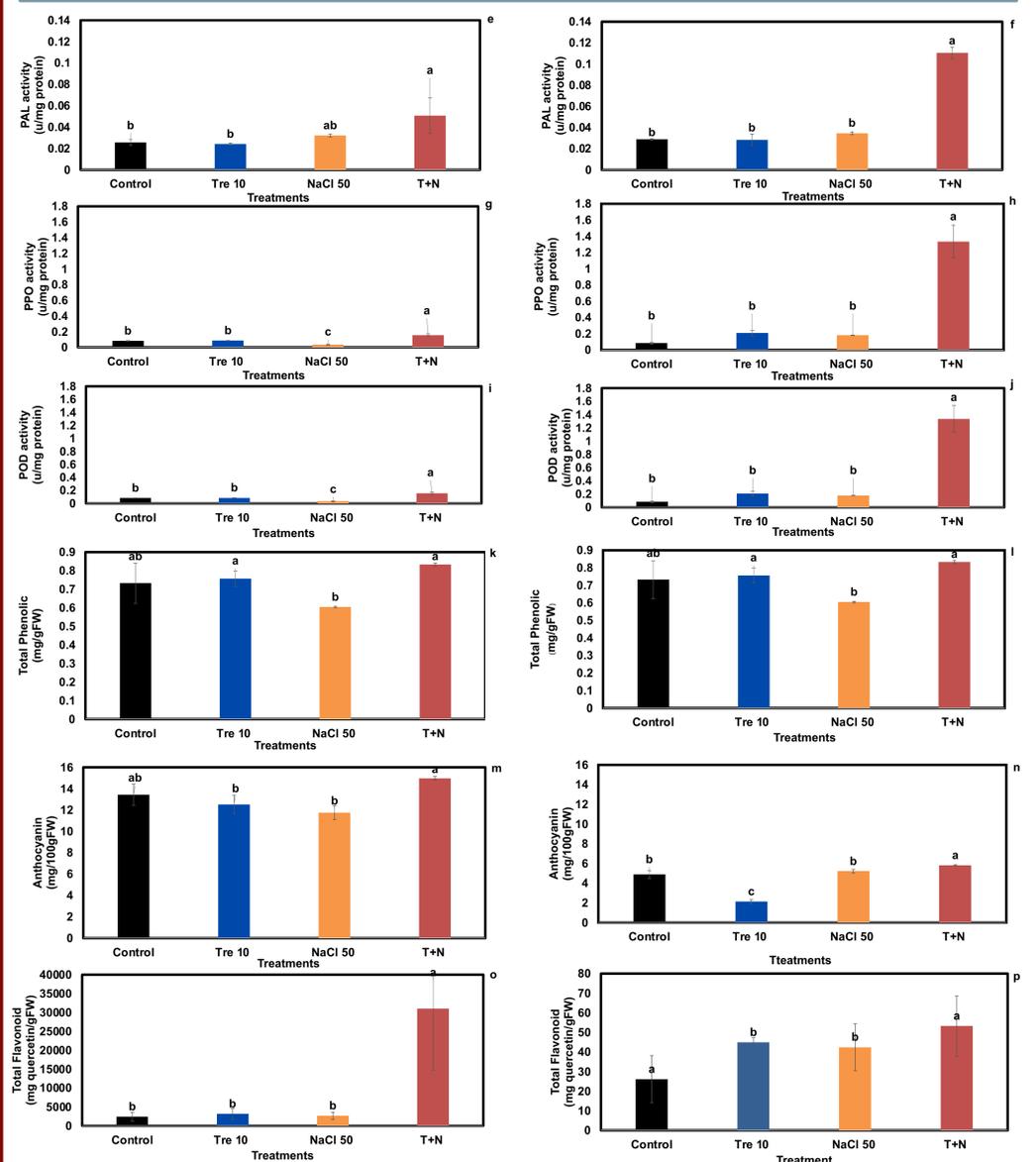
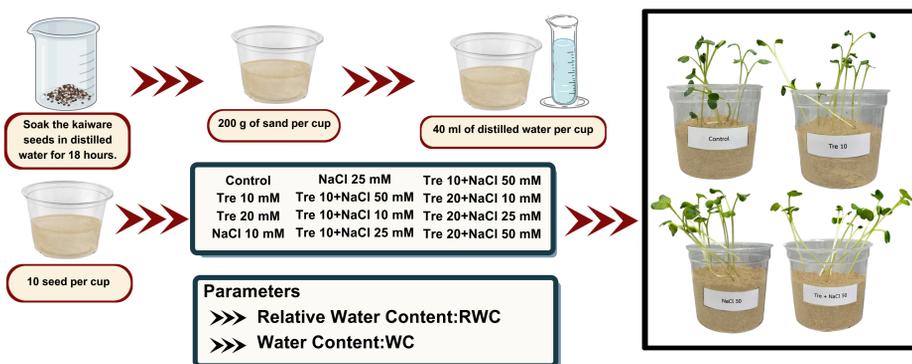


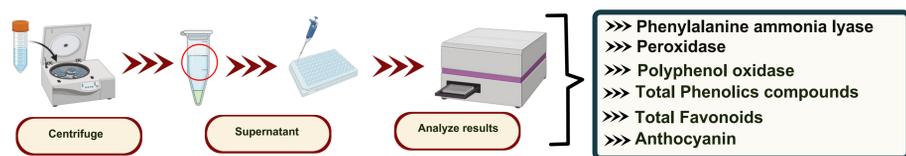
Figure 2 The effects of trehalose sugar and sodium chloride on PAL activity in leaves (e) PAL activity in stems (f) PPO activity in leaves (g) PPO activity in stems (h) POD activity in leaves (i) POD activity in stems (j) Total phenolic in leaves (k) Total phenolic in stems (l) Anthocyanin in leaves (m) Anthocyanin in stems (n) Total flavonoid in leaves (o) Total flavonoid in stems (p).

## Methods

Experiment 1 Study the effects of trehalose sugar and sodium chloride on the growth of radish seedlings.



Experiment 2 study the effects of trehalose and sodium chloride on the levels of phenolic compounds, flavonoids, anthocyanins, and related enzymes in radish seedlings.



## Results

Experiment 1 The effects of trehalose and sodium chloride on the growth of radish seedlings.

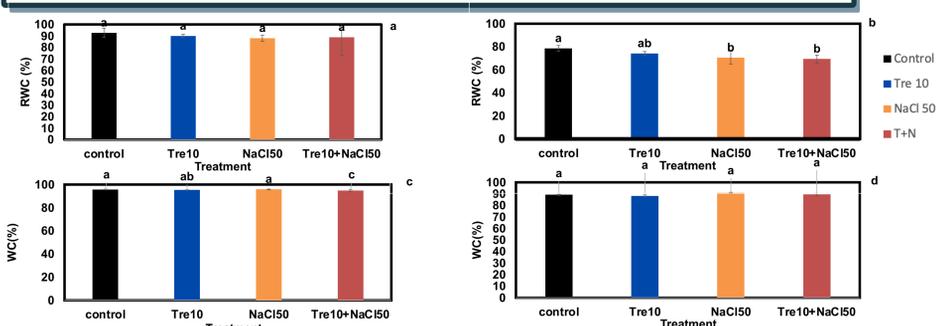


Figure 1 The effects of trehalose sugar and sodium chloride on %RWC in leaves (a) %RWC in stems (b) WC% in leaves (c) WC% in stems(d).

## Discussion & Conclusion

The effects of trehalose and sodium chloride play a role in protecting plant cells from damage caused by stress, while also stimulating the synthesis of secondary metabolites when triggered at appropriate levels This leads to an increase in the activities of PAL, PPO, and POD enzymes and positively influences plant growth rates This is evident as there were no significant statistical differences in relative water content and water levels in plant cell tissues. Therefore, it demonstrates that the plants were not stressed by water deficit or salinity resulting from the treatments applied.

## Selected References

- Saengnil, K., Lueangprasert, K. and Uthabutra, J., 2011. Sunlight-stimulated phenylalanine ammonia-lyase (PAL) activity and anthocyanin accumulation in exocarp of Mahajanaka mango. *Maejo International Journal of Science and Technology*, 5(3), p.365.
- Saengnil, K., Chumyarn, A., Faiyue, B. and Uthabutra, J., 2014. Use of chlorine dioxide fumigation to alleviate enzymatic browning of harvested 'Daw' longan pericarp during storage under ambient conditions. *Postharvest Biology and Technology*, 91, pp.49-56.
- Shraim, A.M., Ahmed, T.A., Rahman, M.M. and Hijji, Y.M., 2021. Determination of total flavonoid content by aluminum chloride assay: A critical evaluation. *Lwt*, 150, p.111932.
- Doy, P.K., Goswami, A. and Mitra, A., 2023. A new targeted approach of postharvest accumulation of anthocyanin in fragrant leaves of *Melissa officinalis* L. *Industrial Crops and Products*, 196, p.116479.