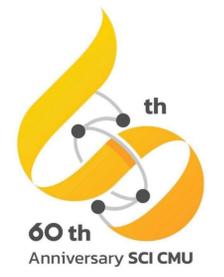




# Effect of Seed Soaking with Various Solution on Growth and Some Biochemical changes in Chinese White Radish Seedlings



Supitchar Sameochai<sup>1</sup> and Jarunee Jungklang<sup>1</sup>

<sup>1</sup> Department of Biology, Faculty of Science, Chiang Mai University, Supitchar\_s@cmu.ac.th (640510300) and Jarunee.j@cmu.ac.th

## Abstract

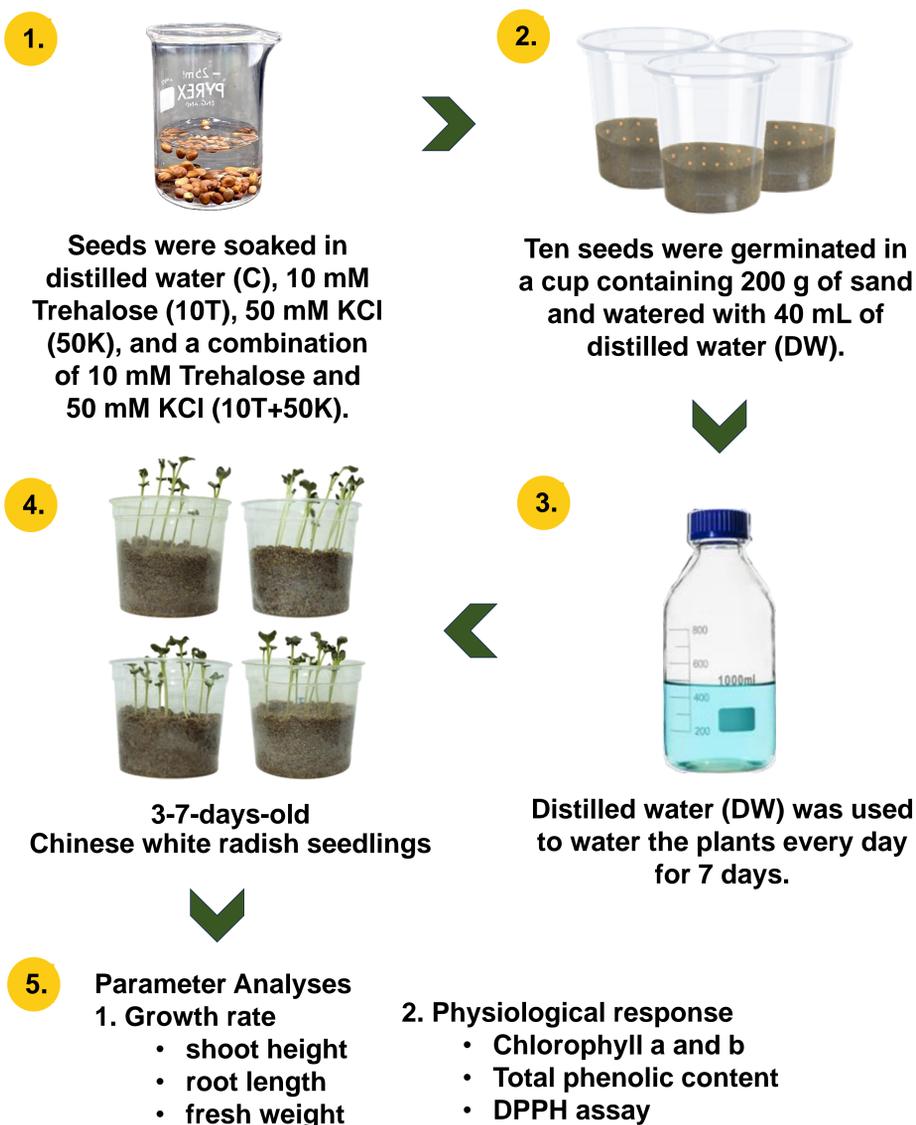
The effects of seed soaking with different solutions on growth and changes in some biochemical compounds in Chinese white radish seedlings were examined. Seeds were soaked in 10 mM trehalose, 50 mM KCl a combination of 10 mM trehalose and 50 mM KCl and distilled water as the control before being sown in find sand. The seedlings were watered daily with distilled water for 7 days. Growth parameters, including growth rates of shoot height, root length, and fresh weight, were recorded from days 3 to 7. Additionally, chlorophyll contents, total phenolic content, and antioxidant activity were measured on days 4 and 5. The results revealed that seedling height was greater on day 4 than on day 5, although not higher than the control. However, some physiological compounds tended to increase in seedlings from seeds soaking in 10 mM trehalose. This study indicates that seed soaking in a 10 mM trehalose solution before planting is a method to increase the accumulation of some biochemical compounds in the Chinese white radish seedlings.

## Introduction

Radish (*Raphanus sativus* L. var. *longipinnatus* Bailey), known as “Kaiware” in Japanese, are a nutritious health food. Soaking seeds in various solutions may promote seed germination and seedling growth. Trehalose plays an important role in protecting against osmotic pressure and enhance salt stress tolerance [1] by increasing the activity of antioxidant enzymes, while potassium chloride is important in promoting growth [2]. Therefore, the aims of this study was to study the effects of seed soaking in various solutions on growth and some biochemical changes in Chinese white radish seedlings.

## Materials & Methods

### Effect of seed soaking in various solutions on growth and some biological changes in Chinese white radish seedlings.



## Acknowledgment

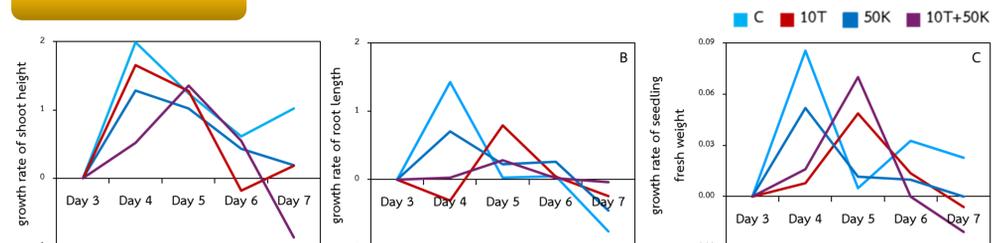
I would like to express my sincere gratitude to the Stress Physiology, Postharvest Physiology and Plant Physiology Laboratories, Department of Biology, Faculty of Science, Chiang Mai University, for providing the necessary facilities and support during the course of this research. The assistance and guidance from the faculty and staff were invaluable in completing this work.

## Results & Discussion

### Effect of seed soaking in several solutions on growth and some biological changes in Chinese white radish seedlings.

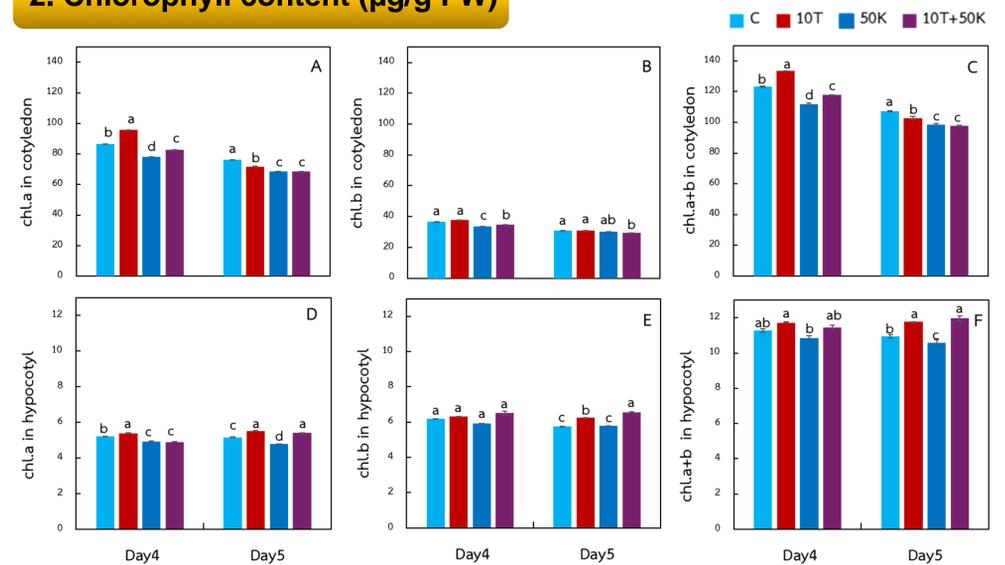
Soaking seeds in a 10 mM trehalose solution had no effect on the growth but some physiological compounds tended to increase such as chlorophyll content and antioxidant activity in Chinese white radish seedlings. (Figure 1-2). Therefore, this concentration of trehalose for soaking seeds before germination might be an option to improve seedling efficiency.

#### 1. Growth rate

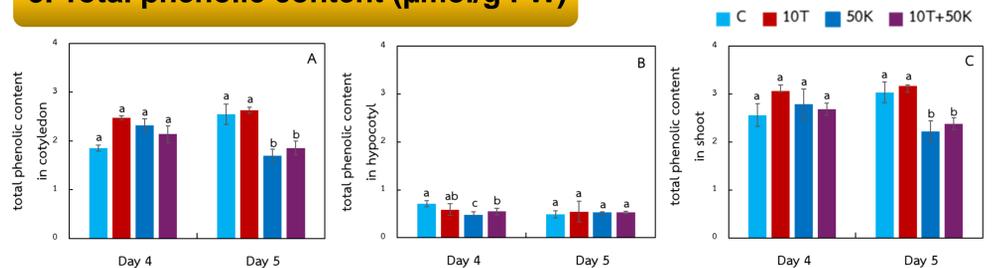


**Figure 1** Effect of soaking seeds in various solution on growth rate of shoot height (A), root length (B) and plant fresh weight (C) after sowing for 7 days of Chinese white radish seedlings. The treatments are as follows: C (control), 10T (10 mM trehalose), 50K (50 mM KCl), 10T+50K (10 mM trehalose + 50 mM KCl).

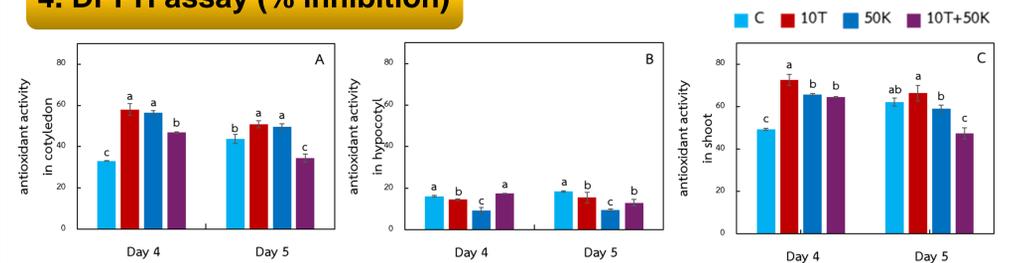
#### 2. Chlorophyll content (µg/g FW)



#### 3. Total phenolic content (µmol/g FW)



#### 4. DPPH assay (% inhibition)



**Figure 2** Effect of soaking seeds in various solution on chlorophyll contents(1), total phenolic content (2) and free radical scavenging activity by DPPH assay (3) in 4-day-old and 5-day-old Chinese white radish seedlings. The results are the means of three replications with standard deviation (SD) indicating as vertical bar. Different letters (a-d) of the same parameter are considered differently different at p<0.05 by Duncan's new multiple rang test.

## Conclusion

- The seedling height was greater on day 4 than on day 5, although not higher than the control.
- Some physiological compounds tended to increase in seedlings from seeds soaking in 10 mM trehalose.

## References

- Hassan, M., Nawaz, M., Shah, A., Raza, A., Barbanti, L., Skalicky, M., Hashem, M., Brestic, M., Pandey, S., Alamri, S., Mostafa, Y., El Sabagh, A. and Qari, S. 2022. Trehalose : A key player in plant growth regulation and tolerance to abiotic. *Journal of Plant Growth Regulation* 42(6) : 4935-4957
- El-Tayeb, M.A. 2005. Effect of NaCl stress on *Pisum sativum* germination and seedling growth with the influence of seed priming with potassium (KCl and KOH). *American Eurasian Journal of Agricultural, and Environmental Sciences* 14(11) : 1304-1311.