

**Title :** The physiological response of local Thai rice under salt stress

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**Major :** Biology

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## ABSTRACT

Rice (*Oryza sativa* L.) is important to Thailand's economy and food security, serving as both a major source of income and the staple food for people. About 60% of rice-growing area of Thailand is in the Northeastern region, which increasingly affected by soil and water salinity, resulting in yield and quality reduction. This research aims to investigate the physiological responses of local Thai rice cultivars (Laimak and Gamjuang) under salt stress condition and evaluate the effects of salt stress on photosynthetic performance of local Thai rice cultivars. Rice cultivars including Pokkali (PK), IR29, Laimak (LM) and Gamjuang (GF) were grown in modified WP No.2 hydroponic solution. 120 mM NaCl was added for salt stress condition. The rice seedlings were treated for 10 days and collected the data at 0, 7, and 10 days after stress. The results show the stomatal conductance of the LM is similar between control and salt stress conditions, while the other rice cultivars exhibited significantly reduction of stomatal conductance under salt stress conditions. The percent changes of chlorophyll *a*, chlorophyll *b*, carotenoids, and total chlorophyll contents show significantly reduction in the PK and GF compared to LM and IR29 when subjected to salt stress. In contrast, IR29 showed an increase in these parameters, which is different from the trends observed in the other rice cultivars. Plant height and root length in all rice cultivars significantly decreased under salt stress condition. The leaf number parameter under salt stress show trends of reduction in the GF. The PK can maintain leaf rolling score and leaf drying score until 7 days after stress. From the results can conclude that LM and PK may have different salt tolerance mechanism, which helps

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LM to maintain stomatal conductance, chlorophyll *a*, chlorophyll *b*, carotenoids, and total chlorophyll contents under salt stress condition.

Keyword: the physiological, photosynthetic performance, salt stress

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