Title : Antioxidants activity of local Thai rice under salt stress

Author(s) : Thaksapawn Aueaphiriyakul **Student ID :** 650510230

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Advisor(s) : Lecturer Dr. Chutarat Punchkhon

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ABSTRACT

Rice (Oryza sativa L.) exhibits various salt tolerance abilities among varieties/cultivars such as tolerant, intermediate-tolerant, and sensitive. Previous research on the salinity stress response in rice has been studied during the seedling stage. Therefore, this study shows the effects of sodium chloride (NaCl) on reactive oxygen species (ROS) scavenging activity in Gamfuang and Laimak compared to IR29 (standard salt-sensitive cultivar) and Pokkali (standard salt-tolerant cultivar). Rice were grown in a hydroponic system and treated with 120 mM NaCl for salt stress at 28 days after germination. Samples were collected 3 timings which are 0 (T1), 5 (T2) and 10 (T3) days after salt stress. T1 show trend of the increase in enzymatic antioxidants activities, including superoxide dismutase (SOD) and catalase (CAT). There were no significantly differences under salt stress compared to control in each cultivar, while Laimak show significantly increase in glutathione peroxidase (GPX) activity. At T2, all cultivars show trend of reduction of SOD, CAT and GPX activities. Laimak and Pokkali have a higher ascorbate peroxidase (APX) activity under salt stress condition. And T3 show the reduction of APX and GPX activity of all cultivars under salt stress, while SOD activity of Gamfuang is increase. Laimak and Pokkali also have a higher CAT activity under salt stress in this timing. Proline content of T1 shows similar in all cultivars. When subjected to salt stress at T2 and T3, Pokkali has the highest proline content in both timings. Laimak show the increase of proline content at the T2 and then decrease at the T3. For Gamfueng, proline content reduce at T2 and T3 after salt stress treatment. All the results show trend of similarity enzymatic antioxidants activities and proline content in Laimak and Pokkali. It can be concluded that Laimak might have a tolerance ability similar to Pokkali.

Keywords: Salt stress, Rice, Antioxidant activitivity, Proline content, Oryza sativa L.

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