



Germinated Thi Rice

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The objective of this study was to investigate the possibility of enhancing the antioxidant properties of germinated rice seeds cv. KumDoi Saket, a pigmented rice variety cultivated in northern Thailand, using salinity. Rice seeds were soaked in 0, 25, 75, 150, and 300 mM vNaCl for 12 hours, sown on 0.7% agar supplemented with the same NaCl concentrations for soaking at $28 \pm 2^\circ\text{C}$ in the dark for 5 days. Germination percentage, growth of seedlings, antioxidant capacities, total phenolic content, and activities of Ascorbate Peroxidase (APX) and Catalase (CAT) were examined. The results showed that germination was not affected by 25 and 75 mM NaCl, but was significantly reduced by 17% and 100% under 150 and 300 mM NaCl, respectively. Fresh weight was not affected by 25 mm NaCl, whereas all NaCl concentrations significantly reduced the shoot length of germinated seeds. Root length was significantly reduced by 150 and 300 mM NaCl. Antioxidant capacities, quantified by DPPH and ABTS radical scavenging assays, and total phenolic content significantly increased in germinated seeds treated with 150 mM NaCl. A high positive correlation between antioxidant capacities and total phenolic content was found. APX activities increased with germination time, reached the highest peak on day 2 for the control, and on day 4 for salt treatments with 150 mM NaCl showing the highest activity. CAT activities of the control reached the maximum on day 2, whereas it showed different highest peaks for salt treatments; salinity reduced the activity of CAT during germination. These results suggest that antioxidant properties of KumDoi Saket germinated rice seeds are

enhanced by salinity stress of 150 mM NaCl. This is an alternative way to elevate antioxidant properties for consumption and for further pharmaceutical application of germinated Thai rice. Tobacco farming is increasing gradually with last 15 years in the study area and results from almost all tobacco plots showed that farming of tobacco in a same land frequently reduces its fertility; therefore the farmers do not get productivity neither from tobacco nor from other food latter. Therefore, tobacco cultivation leads to soil fertility depletion. Now the experiment need to be repeated to trace heavy metal contamination such as Pb, Cr, Ni, Cu, Cd etc. at tobacco cultivated plots to ascertain its impact on soil quality and environment. However, Agriculture Extension Department as well as Government should provide easy accessibility of seeds, fertilizers and other inputs to the farmers of the study area to ensure alternatives as profitable as tobacco farming from food producing crops so that farmers will leave tobacco cultivation. Minimum dry weight was recorded in control treatment. This might be due to the application of zinc and silicon to aromatic rice increase the chlorophyll content and maximum production of photosynthates. The present findings were quite similar with those of rice. On the basis of experimental findings, it can be concluded that NPK150:80:40 + Two Zn spray @0.5% at 30 and 45 DAT proved to be better when the yield attributes had improved significantly with increasing fertility level from control to NPK 150:80:40 + Two Zn spray 0.5% resulting in higher grain yield of Rice.

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