

Pawin Panichponpun 2011: Molecular Cloning, Sequencing and Expression of the *SoNHX1* Gene Responding to Salt Stress of Sugarcane. Master of Science (Genetic Engineering), Major Field: Genetic Engineering , Interdisciplinary Graduate Program. Thesis Advisor: Associate Professor Siripatr Prammanee, Ph.D. 93 pages.

Sugarcane is the raw material of sugar mill which is an important for the economic system in Thailand ,but some of the planting area in northeast and central Thailand are saline soil. Salinity is a major stress factor limiting crop production. The aim of this study, is to investigate the vacuolar Na^+/H^+ antiporter gene (*SoNHX1* gene) respond to salinity in sugarcane cultivars. Four cultivar of sugarcane K 84-200, KPS 94-13, Suphanburi 80 and LK 92-11 were studied. The result showed that all of the leaves of sugarcane varieties were yellow and necrosis from the margins inward at NaCl concentration 1.0-2.0% (w/v) .The cultivars LK 92-11 was found to be more sensitive to NaCl than the others. The leaves of cultivars LK 92-11 presented greatly yellow and necrosis after treated with NaCl at 1.5-2.0 % (w/v) concentration in a week and the NaCl accumulation in their tissue was more than the others. While the cultivars K- 84-200 was the lowest and which can be indicated as less NaCl sensitivity. The leaves of cultivars K 84-200 showed yellow symptom after treated with 2.0 % (w/v) concentration of NaCl within two weeks. At NaCl concentration of 2.0 % (w/v) all the cultivars showed yellow leaves symptom and died. The expression of the vacuolar Na^+/H^+ antiporter gene (*SoNHX1*)in cultivars K 84-200 and KPS 94-13 were found when the concentration of NaCl increased to 2.0% (w/v) but the expression of cultivars LK 92-11 and Suphanburi 80 were absented at this concentration level, according to the sugarcane leaves symptom and the NaCl accumulation in their tissue was higher than other cultivars. The *SoNHX1* gene in cultivars K 84-200 and KPS 94-13 express in high salinity which is the mechanism of plant to defense themselves from the high salt. The cultivars K- 84-200 and KPS 94-13 can tolerate under high concentration of NaCl more than cultivars LK92-11 and Suphanburi 80. Under salt stress, the high accumulation Na^+ in leaves cause the toxic effect to the plant . The level of *SoNHX1* gene expression can be used to indicate the salt tolerant ability of sugarcane. In this experiment, the sugarcane cultivars K 84-200 and KPS94-13 have higher salt tolerance.

Student's signature

Thesis Advisor's signature