Netnapa Chingkitti 2008: Salt-Stress Response of Mulberry, *Morus Rotunbiloba*. Master of Science (Biochemistry), Major Field: Biochemistry, Department of Biochemistry. Thesis Advisor: Assistant Professor Amornrat Promboon, Ph.D. 172 pages.

Investigation of biochemical mechanisms against salt stress in a local mulberry, *Morus rotunbiloba* Koidz, namely mon noi, was performed by tissue culture techniques. The plants were grown for 3 weeks under 16 h photoperiod of 150 $\mu molm^{-2}s^{-1}$ at 25°C with relative humidity of 70-80 %. After treated the plant cultures with various concentrations of sodium chloride for 1 week, leaf and root samples were collected at various time for determining of some enzyme activities, sugar and selected genes at transcriptional level.

After treated plant's cultures with NaCl at 300 and 500 mM, the enzymes including, ATPases, glucosidase, glutathione-S-transferase and peroxidases gave higher activities than the control sample. However, the cultures treated with NaCl at 100 and 600 mM showed the same level of enzyme activities. ATPase showed activity in leaf and root 3.5 and 5.5. times respectively, higher than in the control sample at 500 mM NaCl. Glucosidase gave 3 times higher than in leaf at 300 and 500 mM NaCl. Glutathione-S-transferase demonstrated the same activities of 3-4 times of the control sample at 300 and 500 mM NaCl. The neutal peroxidase in leaf gave 3.5 times higher than the control sample at 300 and 500 mM NaCl and higher than in the acidic and basidic peroxidase enzymes.

Determination of some selected sugars in both leaf and root samples were performed by HPLC. At least four kinds of sugars, namely fructose, glucose, mannitol and sucrose were greatly observed in leaf but not found in root tissue.

Some selected responsive genes were determined by RT-PCR. Mulberry leaf lectin gene gave higher and lower transcripts than control sample at 50 and 100 mM NaCl, respectively. Whereas responsive genes for sugar synthesis namely, fructose 1,6-bisphosphatase gene (FBP) and responsive gene for praline synthesis namely pyrroline-5-carboxylase synthetase gene (P5CS) gave higher activities, and pyrroline-5-carboxylase reductase gene (P5CR) gave lower activity than in the control sample.

These data suggested that mulberry plant has mechanisms for antioxidation, detoxification, and osmoprotection in leaf whereas ion pump may be used to maintain osmotic pressure in root tissue.

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