

Chehasan Cheubong 2010: Leaf Protein Differentially Expressed During Salt-Stress Response in Stock Planted of Mulberry (*Morus* spp.). Master of Science (Biochemistry), Major Field: Biochemistry, Department of Biochemistry. Thesis Advisor: Assistant Professor Amornrat Promboon, Ph.D. 99 pages.

Salt stress is one of the major abiotic stresses affecting plant growth and productivity in Thailand, especially in the northeast. Most of the sericulture taken place in mulberry planting area is facing the saline soil problem. Mulberry is the sole source of food for domesticated silkworm (*Bombyx mori*). The quality of mulberry leaves (*Morus* spp.) directly determines both the yield and quality of the silkworm cocoon.

Screening of salt tolerant and salt susceptible mulberries was performed by adding 200 mM NaCl for 1 month into 44 varieties of 2 month-old mulberry stocks. The results showed that two local varieties, Som and Plong, were tolerant to salt soil (still survive) and the  $EC_{1.5}$  values of the soil were 4.80 and 4.07  $dSm^{-1}$ , respectively. However, BR51 (hybrid variety) and S61 (exotic variety) were salt sensitive and died before the end of the test period at the soil  $EC_{1.5}$  values of 2.18 and 1.87  $dSm^{-1}$ , respectively. Similar physiological changes and  $EC_{1.5}$  values were observed in all the 4 varieties when the screening tests were repeated during the dry winter and summer. Protein expression profile of Som and S61 varieties after treated with 200 mM NaCl for 7 days were determined by 2-dimensional electrophoresis. The result was analyzed with an imagemaster 2D Elite 5.0 program. Approximately 100 protein spots were reproducibly detected on each gel. Of these, 13 protein spots were differentially expressed under salt treatment in leaves of Som and S61 varieties. After protein spots were excised, the gels were subjected to in-gel digestion and the tryptic peptides were analyzed by LC-MS/MS. The main functions of these proteins were photosynthesis and stress defense including RuBisCO, OEC, OEE1, OEE2, Rieske Fe/S protein of cytochrome b6/f complex and WAP (smHSP) protein. While the three new proteins are markedly up-regulated in tolerant variety could not be identified.

The novel proteins should be further identified and may play an important role in salt tolerance of mulberry. These proteins might be useful for marker-assisted selection in salt tolerant mulberry in the future.

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Thesis Advisor's signature

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