YUSTINUS ULUNG ANGGRAITO. Genetic Transformation of *Nicotiana benthamiana* L. and Soybean with *MaMt2* Gene Encoding Metallothionein Type II from *Melastoma malabathricum* L. Supervised by SUHARSONO, SAPTOWO J. PARDAL, and DIDY SOPANDIE.

The low pH and high concentration of aluminum (Al) are major limiting factors for crops production. The capability of crops to cope those stresses can be improved by expressing genes controlling adaptation to low pH and high concentration of Al. One of these genes was *MaMt2* encoding for metallothionein type II which isolated from *Melastoma malabathricum*. The objectives of the research were 1) to construct overexpression vector of *MaMt2* gene with pIG6 plasmid, 2) to transform *Nicotiana benthamiana* and soybean with *MaMt2* gene, and to analyze the transgenic plants. The *MaMt2* gene were successfully fused with the strong promoter pUbiquitin in the pIG6 plasmid, and the recombinant plasmid was introduced into *Escherichia coli* DH5α by electroporation method. The pIG6-*MaMt2* recombinant vector was successfully introduced into *A. tumefaciens* LBA4404 by triparental mating method (TPM). Genetic transformation was performed by co-cultivating *A. tumefaciens* LBA4404-pIG6-*MaMt2* with *N. benthamiana* leaf explants and half seed explants of soybean cv. Lumut. The T0 and T1 generations of transgenic plants were already obtained. The integration of *MaMt2* transgene into the genom of T0 transgenic plants was confirmed by PCR. Segregation analysis in the T1 generation of *N. benthamiana* showed that *hpt* gene was inherited to the offspring in Mendelian pattern and all samples of transgenic plants were heterozygote containing one functional *hpt* gene. Transformation of cv. Lumut half seed explants with *MaMt2* gene was successful, based on PCR by UbiF and NosTR primer combination. PCR analysis of T1 generation of transgenic soybean showed that *MaMt2* gene was transmitted into the offspring indicating that this transgene is integrated in the genome of transgenic soybean plants. Keywords: transformation, *MaMt2* gene, metallothionein, *Nicotiana benthamiana*, soybean