

Watsamon Imprasittichai 2014: Identification and Functional Analysis of Genes Involving in Storage Root Formation in Cassava. Master of Science (Genetics), Major Field: Genetics, Department of Genetics. Thesis Advisor: Associate Professor Somsak Apisitwanich, Dr.Agr.Sci. 92 pages.

This study, the differential display reverse transcription-PCR (DDRT-PCR) technique was employed to investigate cassava genes involving in storage root development. Genes encoding a homeodomain-leucine zipper (*HD-Zip*) protein; *MeHD-ZipIII*, and an integral membrane protein; *MeTM*, were selected as being up-regulated during the storage root induction stage. Reverse transcription-PCR (RT-PCR) results confirmed that both genes are highly expressed in the swelling fibrous root by radial growing for starch granule storage. These two identified genes showed participation in increasing of starch accumulation on storage root formation. Consequently, overexpression cassettes of both genes under the control of 35S CaMV promoter and storage organ-specific, papatin promoter, were constructed and introduced into potato, a model organism. Two independent transgenic lines of 35S:*MeTM* were found with a single and double copies of the transgene. This *MeTM* gene could induced *in vitro* tuberlization of the transgenic potatoes.

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