

Dissertation Abstract

Report no.	(Course-based) No.1079	Name	SHIN JI MIN
Dissertation title	Functional analysis of transcription factors that respond to nitrogen starvation in plants (植物の窒素飢餓に応答する転写因子の機能解析)		
<p>Abstract</p> <p>※ The abstract should be in keeping with the structure of the dissertation (objective, statement of problem, investigation, conclusion) and should convey the substance of the dissertation.</p> <p>This study aims to identify novel molecular mechanisms responsible for nitrogen deficiency in plants. We hope that this study helps to create tolerant crops to nitrogen starvation and understand how to utilize nutrient efficiently in plants. Finally, it will enable to solve the problems with excessive fertilizer use and increasing foods demand. Even though the nitrogen stress-responsive genes have been intensively studied, nitrogen sensing and signaling as well as function and mechanisms of nitrogen involved in plant physiology and development are very complicated, and the transcriptional regulatory mechanisms for responses to nutrient stress are still largely unknown. In this study, nitrogen (N) deficiency-responsive transcription factors (TFs) were screened using CRES-T (Chimeric Repressor gene-Silencing Technology) mutant library. Two transcription factors, <i>GATA4</i> and <i>MYB116</i>, involved in tolerance to N deficiency, were isolated and functionally analyzed. <i>GATA4</i> may be related to N assimilation and development of primary and lateral root and root hair, but further study of the correlation between N response and root development which could be simultaneously controlled by <i>GATA4</i> is required. <i>MYB116</i> might be involved in lateral root development and act as a repressor of reactive oxygen species (ROS)-responsive genes induced by N starvation in roots. The unknown parts of molecular mechanisms responsible for nitrogen deficiency would be identified via this study and we could more effectively approach the way how to manipulate for plant to utilize nitrogen efficiently.</p>			