



# Down-regulation of NTR Genes by RNAi in the *cad2* mutant impairs plant development of *Arabidopsis thaliana*.

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## Abstract:

The NADPH-Thioredoxin System (NTS) and NADPH Glutathione System (NGS) are the two major thiol reduction systems that play a key role in the maintenance of cellular redox homeostasis and several plant developmental processes. Crosstalk between these two thiol reduction systems has been studied by associating TRX reductase (*ntra ntrb*) and glutathione biosynthesis (*cad2*) mutations. Triple *ntra ntrb cad2* mutant revealed a new phenotype related to flower meristem development. Unfortunately, this mutant is infertile and therefore it cannot be maintained at a homozygous stage. In this study, we used the RNAi technique to obtain close similar phenotype to this mutant, but that are fertile. RNAi strategy is performed by down-regulating the expression of both NTR genes by introducing RNAi construct harbouring two head-to-tail copies of the NTRA gene in the genetic back-ground of the *cad2* mutant. The transformed plants obtained exhibit attenuated phenotypes compared to the *ntra ntrb cad2* mutant. Remarkably, no plants exhibit the characteristic pin-like phenotype of the *ntra ntrb cad2* mutant were obtained. However, some plants looks fertile but show a decrease of the apical dominance. Others are more affected and show infertile flowers. Our data show that the RNAi strategy is an efficient strategy to generate fertile plants with down-regulated NTS and NGS reduction systems and to investigate the crosstalk between these two thiol systems.

## Keywords:

KEY WORDS: *Arabidopsis*, NTS pathway, NGS pathway, RNA interference.

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