



# Agricultural Journals

*Czech Journal of*

**GENETICS AND  
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[home](#) [page](#) [about us](#) [contact](#)

[us](#)

## Table of Contents

### **IN PRESS**

**CJGPB 2014**

**CJGPB 2013**

**CJGPB 2012**

**CJGPB 2011**

**CJGPB 2010**

**CJGPB 2009**

**CJGPB 2008**

**CJGPB 2007**

**CJGPB 2006**

**CJGPB 2005**

**CJGPB 2004**

**CJGPB 2003**

**CJGPB 2002**

**CJGPB**

**Home**

---

## **Editorial Board**

### **For Authors**

- **Authors  
Declaration**
- **Instruction  
to Authors**
- **Guide for  
Authors**
- **Copyright  
Statement**
- **Submission**

### **For Reviewers**

- **Guide for  
Reviewers**
- **Reviewers  
Login**

---

## **Subscription**

# **Czech J. Genet. Plant Breed.**

**X.:**

**Enhanced ascorbic acid accumulation through overexpression of dehydroascorbate reductase confers tolerance to methyl viologen and salt stresses in tomato**

Czech J. Genet. Plant Breed., 48 (2012): 74-86

As an important antioxidant for plants and humans, L-ascorbic acid (AsA, vitamin C) can scavenge reactive oxygen species (ROS) and can be regenerated from its oxidized form in a reaction catalyzed by dehydroascorbate reductase (DHAR). To analyse the effect of overexpressing *DHAR* on tomato (*Solanum lycopersicum*), an expression vector

containing potato cytosolic *DHAR1* (*DHAR1*) or chloroplastic *DHAR* (*DHAR2*) cDNA driven by a cauliflower mosaic virus 35S promoter was transferred into tomato plants. Compared with the wild type (WT), *DHAR1* overexpression increased *DHAR* activity and AsA content in both leaves and fruits while *DHAR2* overexpression increased *DHAR* activity and AsA content mainly in leaves. *DHAR1* and *DHAR2* overexpression increased the chlorophyll content and photosynthetic rate of transgenic lines, but had no effect on plant height and stem diameter. Furthermore, the germination rate, plant fresh weight, seedling length and chlorophyll content of transgenic *DHAR1* and *DHAR2* plants under salt stress were higher than those of WT plants. In addition, the transgenic plants also exhibited considerable tolerance to