



Journal of Pesticide Science
Pesticide Science Society of Japan

[Available Issues](#) | [Japanese](#) >> [Publisher Site](#)

Author: Keyword: [ADVANCED](#)



[TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

ONLINE ISSN : 1349-0923

PRINT ISSN : 1348-589X

Journal of Pesticide Science

Vol. 28 (2003) , No. 3 pp.287-292

[\[Image PDF \(763K\)\]](#) [\[References\]](#)

The Expression Level of a Specific Catalase Isozyme of Maize Mutants Alters Catalase and Superoxide Dismutase during Norflurazon-Induced Oxidative Stress in Scutella

Sunyo JUNG¹⁾ and Yong In KUK²⁾

1) Scigen Harvest Research Center, Business Incubator, Seoul National University

2) Biotechnology Research Institute, Chonnam National University

(Received: December 19, 2002)

(Accepted for publication: April 4, 2003)

The effect of catalase (CAT) levels on antioxidant responses to norflurazon (NF)-induced photooxidative stress was examined in 5-day postimbibition (dpi) scutella of a standard maize (*Zea mays*) CAT line (W64A) and various CAT mutants. In W64A and CAT-3 null (WI10D), CAT activities decreased at 1 μ M NF and increased at 10 μ M NF. The CAT activities of CAT-2 null (WA10C) and CAT-2/CAT-3 double null (WDN10) were very low throughout all treatments. The high CAT-2 activity mutant (R6-67) had decreased CAT activity but maintained the highest level among the various CAT lines upon NF treatment, and also had the highest level of SOD activity. Total SOD activity and SOD isozyme patterns were relatively consistent at NF concentrations of 1-10 μ M in scutella of all maize CAT lines examined. The mutants lacking the CAT isozyme were capable of maintaining a high level of SOD in response to NF, demonstrating that SOD is the base-level scavenger of NF-mediated photooxidative stress. An increase in *Cat1*, *Cat2*, and *Cat3* transcript levels occurred in scutella of R6-67, but not W64A following treatment with NF. All *Sod* transcript levels except the level of *Sod1* responded differentially between NF-treated scutella of W64A and R6-67. W64A and maize mutant line expressing strong CAT-2 activity exhibited a different response to NF at the protein and mRNA levels of CAT and SOD. These results indicate that the level of a specific CAT isozyme in the maize mutants affects the levels of CAT and SOD.

Keywords:

catalase, *Zea mays*, norflurazon, oxidative stress, scutella, superoxide dismutase

To cite this article:

Sunyo JUNG and Yong In KUK, "The Expression Level of a Specific Catalase Isozyme of Maize Mutants Alters Catalase and Superoxide Dismutase during Norflurazon-Induced Oxidative Stress in Scutella". *J. Pestic. Sci.* Vol. **28**, pp.287-292 (2003) .

doi:10.1584/jpestics.28.287

JOI JST.JSTAGE/jpestics/28.287

Copyright (c) 2004 Pesticide Science Society of Japan

