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ITEMS FROM SPAIN

UNIVERSIDAD POLITÉCNICA DE MADRID

Departamento de Biotecnología, E.T.S.I. Agrónomos.- C. Universitaria, 28040, Madrid, Spain.

A. Delibes, I. López-Braña, and E. Simonetti.

UNIVERSIDAD DE LLEIDA

Departamento de Producción Vegetal y Ciencia Forestal, Institut de Recerca i Tecnologia Agroalimentaries (UdL-IRTA), Rovira Roure, 191-25198 Lleida, Spain.

J.A. Martín-Sánchez and E. Sin.

CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS

Departamento de Protección Vegetal, Centro de Ciencias Medioambientales, Serrano, 115, 28006, Madrid, Spain.

M.F. Andrés.

Localization of two class-III peroxidase genes expressed in the roots of a *Heterodera avenae*-resistant wheat line.

The cereal cyst nematode is a pest that seriously affects cereal crops in many of the world's wheat-growing areas. The *H. avenae* resistance gene *Cre2* from *Ae. ventricosa* present in the *Ae. ventricosa*/wheat introgression line H-93-8, was shown to confer a high level of resistance to the Spanish pathotype Ha71 (Delibes et al. 1993). The infection of H-93-8 line with *H. avenae* resulted in a hypersensitive reaction, with syncytial cells deteriorating in a few days. Following nematode infection, peroxidase, esterase, and superoxide dismutase activities increased in H-93-8 roots compared with the parental, susceptible cultivar Almatense, H-10-15 (Andrés et al. 2001). Twenty peroxidase genes were characterized from 211 ESTs and 259 genomic DNA clones of this resistant line. The alignment of deduced amino-acid sequences and phylogenetic clustering with peroxidases from other plant species showed that these enzymes fall into seven different groups (designated TaPrx108 to TaPrx114) that represent peroxidases secreted into the apoplast by a putative N-terminal peptide signal. The expression levels of groups TaPrx112 and TaPrx113 in roots of the H-93-8 resistant line increase in response to nematode infection. The maximum peroxidase levels were reached four days post-inoculation. Moreover, the expression of groups TaPrx112 and TaPrx113 always was much higher in H-93-8 line (4- and 100-fold, respectively) than in their susceptible parental. This fact may be related to a constitutive mechanism of defense in this resistant line. The chromosomal assignment of peroxidases of both groups was done using Sears' aneuploid wheat lines (Sears 1954; Kimber and Sears 1968) and PCR-specific primers from peroxidases. Two PCR fragments obtained from peroxidases TaPrx112-F and TaPrx113-F were absent in nulli-tetrasomic and ditelosomic lines N2BT2D and Dt2BL, respectively. Therefore, both peroxidase genes would be located in 2B short arm chromosome of wheat.

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Cooperation with other institutions.

We are cooperating with 'Agrosa Semillas Selectas SA'.

Personnel.

Dra. Fanny Alvaro Sánchez joined the Institut de Recerca i Tecnologia Agroalimentaries-IRTA (Centre of Lleida) as a bread-wheat breeder in May 2008. She received her PhD from the University of Lleida in 2007 on wheat breeding and adaptation for Mediterranean environments.

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