



Expression of an alfalfa (*Medicago sativa* L.) peroxidase gene in transgenic *Arabidopsis thaliana* enhances resistance to NaCl and H₂O₂

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ABSTRACT. Peroxidases (PODs) are enzymes that play important roles in catalyzing the reduction of H₂O₂ and the oxidation of various substrates. They function in many different and important biological processes, such as defense mechanisms, immune responses, and pathogeny. The POD genes have been cloned and identified in many plants, but their function in alfalfa (*Medicago sativa* L.) is not known, to date. Based on the POD gene sequence (GenBank accession No. L36157.1), we cloned the POD gene in alfalfa, which was named *MsPOD*. *MsPOD* expression increased with increasing H₂O₂. The gene was expressed in all of the tissues, including the roots, stems, leaves, and flowers, particularly in stems and leaves under light/dark conditions. A subcellular analysis showed that *MsPOD* was localized outside the cells. Transgenic *Arabidopsis* with *MsPOD* exhibited increased resistance to H₂O₂ and NaCl. Moreover, POD activity in the transgenic plants was significantly higher than that in wild-type

Arabidopsis. These results show that *MsPOD* plays an important role in resistance to H₂O₂ and NaCl.

Key words: *Medicago sativa* L.; Transgenic *Arabidopsis thaliana*; Peroxidase; Abiotic stress