

SL 205

Molecular Cloning of Two Plant 2 Cys-Peroxiredoxins and Their *in vivo* Localization

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Two cDNAs (*C2C-Prx1* and 2) corresponding to 2Cys-peroxiredoxins (2Cys-Prx) were isolated from a leaf cDNA library of Chinese cabbage. They have 2 conserved cysteines and several peptide domains present in most of the 2Cys-Prx subfamily members. Southern analysis of *C2C-Prx* genes revealed that they consist of a small multigene family in chinese cabbage genome. RNA blot analysis showed that the genes were predominantly expressed in the leaf tissue of chinese cabbage seedlings, but the mRNAs were generally expressed in most tissues of mature plant, except roots. The two C2C-Prx proteins are encoded as preprotein containing putative targeting signals of 65 and 55 amino acids at their N-termini. The N-terminally truncated recombinant proteins (Δ C2C-Prx) prevent the inactivation of glutamine synthetase and the DNA-cleavage in the metal catalyzed oxidation system. In the yeast thioredoxin system containing thioredoxin reductase, thioredoxin, and NADPH, the Δ C2C-Prx proteins exhibit peroxidase activity on H₂O₂. It was found that the C2C-Prx1 is exclusively targeted to plant mitochondria and C2C-Prx2 migrates to chloroplasts by electron microscope and GFP targeting analyses.