Subcellular localization of PAL genes in Citrus limon

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Plant defense against pathogens involves mechanisms that include the expression of several genes, which could be located in any of the three compartments that contain genomes in plant cells: nuclei, mitochondria and chloroplasts. To transfer defense genes against pathogen attack from resistant to sensitive plants, it is desirable to know in which genomic context these defense genes are located before they are introduced in the appropriate compartment within the recipient cell. Previous work has suggested that the Citrus limon defense response against Alternaria alternata requires functional chloroplasts. Phenylalanine ammonia-lyase (PAL, E.C.4.3.1.5.) is one of the enzymes involved in early events of this defense. To determine whether the involvement of organelles was due to the presence of PAL genes in more than one genome or to the participation of other cellular signals, the subcellular localization of PAL genes in C.limon was examined. Chloroplasts and mitochondria were purified in