

表現過氧化氫生成酵素Glucose Oxidase可增加菸草乾旱與鹽害逆境耐受性

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摘要

因自然環境常變動不定，植物於是處於非生物性逆境中。非生物性逆境 (abiotic stress) 常刺激細胞產生並累積大量有害細胞之毒性分子過氧化氫 (hydrogen peroxide, H₂O₂)，而傷害細胞膜、DNA、蛋白質等細胞重要組成物質。進一步近年研究的證實，過氧化氫除了是細胞毒性分子外，也扮演逆境訊號分子的角色，可以提高植物對各式逆境的耐受能力。本研究為了釐清於不同逆境下過氧化氫之訊號傳遞，因此育成以CaMV 35S啟動子驅動持續性表現葡萄糖氧化酶 (Aspergillus niger glucose oxidase, GO) 之轉基因菸草 (Nicotiana tabacum L. cv. SR1)；葡萄糖氧化酶是以葡萄糖為受質，可催化產生過氧化氫之酵素。經分子檢測證實，葡萄糖氧化酶於各轉殖株系之蛋白質層面，的確有較高程度表現與累積。轉基因植株細胞內過氧化氫含量也與葡萄糖氧化酶表現量有正相關。進一步高鹽逆境試驗顯示，相較於野生型菸草，GO 轉基因菸草對於高鹽逆境確實具有較高耐乾旱逆境研究，也發現GO 轉基因菸草對於乾旱逆境也具有較高耐受能力。

關鍵詞：乾旱逆境、葡萄糖氧化酶、過氧化氫、鹽害逆境、菸草

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