

菸草轉殖表現黑麴菌葡萄糖氧化?可提高對熱逆境之抗性

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摘要

植物處於熱逆境下細胞內將產生並累積大量過氧化氫。過氧化氫是有害細胞之毒性分子，可氧化細胞膜、DNA、蛋白質等細胞重要組成物質。然而，近年研究也指出，過氧化氫可能扮演逆境訊號分子，用以提高植物對各式逆境的耐受能力。本研究為了釐清在熱逆境下過氧化氫訊號傳遞的角色，因此育成於CaMV 35S啟動子驅動下持續表現葡萄糖氧化?(*Aspergillus niger* glucose oxidase, GO)之轉基因菸草(*Nicotiana tabaccum* L. cv. SR1)；葡萄糖氧化?主要以葡萄糖為受質，催化產生過氧化氫。分子檢測證實，葡萄糖氧化?於各轉植株系無論於RNA與蛋白質層面確皆有較高度表現與累積，轉基因植株內過氧化氫含量也高於野生型菸草。進一步熱逆境試驗顯示，相較於野生型菸草，GO轉基因菸草對於熱逆境確實具有較高耐受能力，而此熱耐受能力應與GO轉基因植物體內總抗氧化能力提升有關。同時研究也發現，GO轉基因菸草植株中熱休克蛋白HSP70與HSP101基因表現量並無提高，反而有輕微的抑制現象，因此誘導GO轉基因植物熱逆境抗性之現象，應與熱休克蛋白無關。

關鍵詞：葡萄糖氧化?、熱休克蛋白、熱逆境、過氧化氫、菸草、熱耐受性

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