

عنوان مقاله:

Expression Profile of Hyoscyamine Biosynthesis-related Genes in Response to UV-C Radiation in Datura metel Plant

محل انتشار:

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خلاصه مقاله:

Introduction: Tropane alkaloids as secondary metabolites are one of the most useful plant elements that are widely applied in medicinal approaches. Studies have shown that UV light led secondary metabolites to be increased. Thus, we investigated the effect of UV-C light on the expression of the main genes involved in the biosynthesis of tropane alkaloids, namely hyoscyamine β -hydroxylase (H β H), Putrescine N-methyltransferase (PMT), and Tropinone reductase I (TR-I). Materials and Methods: Datura metel seeds cultured on MS media at 25 °C less than 12 h-12 h light-dark photoperiod. Then, they were transferred into vases and kept in the greenhouse. Three-month-old plants received 196 μ Wcm⁻² UV-C light for 30 min. Afterward, the expression levels of different genes encoding H β H, PMT, and, TR-I enzymes, were measured at different post-exposure times. Results: Our results demonstrated that UV-C increased the expression of PMT and TR-I genes after 48 h. Moreover, the rise of H β H expression was found after 24 h but its level was downregulated again after 48 h. Conclusions: These findings indicated that UV-C light as abiotic stress could boost the formation of tropane alkaloids through upregulation of genes of enzymes catalyzing the main steps in their biosynthesis and, also, these genes are differentially affected.

کلمات کلیدی:

Datura metel, UV-C, H β H, PMT, TR-I, Hyoscyamine

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