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Salicilic Acid Effect on Carotenoid Production and Carotenogenic Gene Expression of in vitro Culture of Marigold

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Abstract: Carotenoids are of interest for natural food colorants uses and have been relevant against protection from a range of diseases. *In vitro* culture of Marigold (*Tagetes erecta*) shows potential for commercial production of carotenoid pigments this has led to the application of elicitation of vegetal culture for improved production of pigments. In these context, elicitation with salicylic acid (AS) have also been shown to induce the carotenoid biosynthetic pathway, and can be applicate to the *in vitro* culture of *T. erecta* for improved production of carotenoid. In our study carotenoid pigment accumulation was significantly increased when elicited with SA in comparison to the control. Transmission electron microscopy showed cellular alterations in elicited cultures and highest electro density plastoglobules in comparison to the control. Transcriptional expression patterns of carotenoid genes indicated that elicitor change transcriptional expression of four carotenoid gene, these genes exhibited different expression profiles, carotenoids biosynthesis under SA was up-regulated mainly by *psy*, *pds* and *lcyb* and down-regulate by *lcye* at transcriptiona level. Summarily, these results suggest that SA constitute molecular signals in the network of carotenoids biosynthesis. Induction of total carotenoids accumulation by AS without any other stimuli presents an attractive application potential in suspension culture of *T. erecta*.

Keywords: Marigold, Elicitation, Carotenoids, Carotenogenic gene.

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