COMPARISON OF METABOLITE LEVELS IN CALLUS OF *TECOMA STANS* (L.) JUSS. EX KUNTH. CULTURED IN PHOTOPERIOD AND DARKNESS.

ABSTRACT

Tecoma stans is a tropical plant from the Americas. Antioxidant activity and both phenolic compound and flavonoid total content were determined for callus tissue of *T. stans* cultured in either a set photoperiod or in darkness. Callus lines from three explant types (hypocotyls, stem, and leaf) were established on B5 culture medium supplemented with 0.5 μM 2,4-D and 5.0 μM kinetin. While leaf-derived callus grew slower under a 16-h photoperiod (specific growth rate, $\mu = 0.179$ d^{-1}, $t_D = 3.9$ d) than in darkness ($\mu = 0.236$ d^{-1}, $t_D = 2.9$ d), it accumulated the highest amount ($p < 0.05$) of both phenolics (86.6 ± 0.01 mg gallic acid equivalents/g) and flavonoids (339.6 ± 0.06 mg catechin equivalents/g). Similarly, antioxidant activity was significantly higher ($p < 0.05$) when callus was cultured in period light than when grown in extended darkness. Antioxidant activity measured with a 2,20-azinobis (3-ethylbenzothiazoline-6-sulphonic acid) diammonium salt (ABTS)-based assay was 350.5 ± 15.8 mmol Trolox/g extract for callus cultured under a defined photoperiod compared to 129.1 ± 7.5 mmol Trolox/g extract from callus cultured in darkness. Content of phenolic compounds and flavonoids was in agreement with a better antioxidant power ($EC_{50} = 450$ μg extract/mg 1,1-diphenyl-2-picrylhydrazyl) and antiradical efficiency. Results of the present study show that calli of *T. stans* are a source of compounds with antioxidant activity that is favored by culture under a set photoperiod.

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Autores: Alma R. López-Laredo, Fanny D. Ramírez-Flores, Gabriela Sepúlveda-Jiménez, Gabriela Trejo-Tapia*

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