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Differential Proteomic Profile and Terpenoid Production in Somatic Embryos of Jatropha curcas

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Abstract : Somatic embryos reproduce original seed characteristics and could be implemented in biotechnological studies. Jatropha curcas L. is an important plant for biodiesel production, but also is used in traditional medicine. Seeds from J. curcas are toxic because contain diterpenoids called phorbol esters, but in Mexico exist a non-toxic variety. Therefore, somatic embryos suspension cultures from non-toxic J. curcas variety were induced. In order to investigate the characteristics of somatic embryos, a differential proteomic analysis was made between pre-globular and globular stages by 2-D gel electrophoresis. 108 spots were differentially expressed (p<0.02), and 20 spots from globular somatic embryos were sequenced by MALDI-TOF-TOF mass spectrometry. A comparative analysis of terpenoids production between the two stages was made by RP-18 TLC plates. The sequenced proteins were related to energy production (68%), protein destination and storage (9%), secondary metabolism (9%), signal transduction (5%), cell structure (5%) and aminoacid metabolism (4%). Regarding terpenoid production, in pre-globular and globular somatic embryos were identified sterols and triterpenes of pharmacological interest (alpha-amyrin and betulinic acid) but also it was found compounds that were unique to each stage. The results of this work are the basis to characterize at different levels the J. curcas somatic embryos so that this system can be used efficiently in biotechnological processes.

Keywords: Jatropha curcas, proteomics, somatic embryo, terpenoids

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