Identification of differentially expressed genes during somatic embryogenesis of Axonopus compressus by restriction fragment differential display-coupled FSD

ABSTRACT

We present an approach to profile the expression of gene family members during somatic embryogenesis of Axonopus compressus through the modification of a recently developed RNA fingerprinting method. The protocol combines restriction fragment differential display technology with primers directed to a gene family specific domain signature on mRNA and hence is termed ôRFDD-coupled FSDô. By using this method, two differentially expressed mRNAs, AC1 and AC2, containing the chromo-like domain and the serine/threonine protein kinase signatures, respectively, were isolated. Sequence analysis revealed that AC1encoded a MIP (plasma membrane protein) meanwhile AC2 shared low homology to other serine/threonine protein kinases. The abundance of these two transcripts appeared to be down-regulated in the embryogenic and non-viable embryogenic tissues when examined on Northern and semi-quantitative RT-PCR analyses, suggesting possible developmental arrest. This preliminary differential expression examination has somewhat provided a first insight into the molecular events underlying A. compressus somatic embryo development. Thus, RFDD-coupled FSD has been shown to be an efficient procedure for identifying differential regulated transcripts that correspond to their defined gene family domain signature sequences.

Keyword: Axonopus compressus; Somatic embryogenesis; Restriction fragment differential display-coupled FSD; Serine/threonine protein kinase; MIP protein; Chromo domain