CPSF subunit gene expression in non-induced and fungus-induced tomato

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Tomato, Solanum lycopersicum, is an important member of the Solanaceae family and being grown worldwide. Being model plant, tomato has been extensively subjected to molecular studies, however, regulation of gene expression, especially at polyadenylation level has not been reported yet. Multiple Poly(A) factors, organized into complexes, bring about the cleavage and polyadenylation process. In plants the poly(A) factors are best studied in Arabidopsis that include CPSF, CstF, PAP, CFI-25m, PA8N1 (polyadenylate binding protein) and FiP1 (Factor Interacting with Poly(A) polymerase). Among these factors CPSF (cleavage and polyadenylation specificity factor) multisubunit complexes are the key players in the polyadenylation process. The subunits are classified on the basis of molecular masses which are CPSF30, 73, 100 and 160. We investigated CPSF gene expression pattern in different tomato tissues through reverse transcription polymerase chain reaction (RT-PCR) using automated gel electrophoresis system. Among the five subunits studied, highest expression was found for the subunit CPSF 73II followed by CPSF73I. The gene expression level of the CPSF subunits was highest in the shoot as compared to root. Effect of fungal stress on CPSF was also studied with the help of gene specific primers. Time course under fungal stress showed highest expression of CPSF 73II followed by CPSF73I gene after 4 and 6 hours post inoculation respectively. Fungal stress reduced the expression of all these genes. The results of this study shed light on differential expression of CPSF subunit across different tissues and growth conditions in tomato and provide foundation to explore the in vivo composition and interaction patterns among tomato CPSF components. The studies have practical implications as CPSF subunit expression has been found to be linked to various biological process such as flowering time, genetic transmission of female gametes etc.

Keywords: CPSF, Tomato, Polyadenylation