ABSTRACT

The purpose of this research study was to propose a set of conditions of *Agrobacterium*-mediated transformation system for Chickpea (*Cicer arietinum* L. cv. PB-2008) which will ensure optimal transient *gus* gene expression. Three different types of explants (cotyledonary node, cotyledon and node) obtained from 7-day-old *in vitro* germinated seedlings and one month-old callus cultures derived from these explant types were treated for 20 or 30 min with bacterial inoculum (*A. tumefaciens* strain EHA101) with optical density (OD_{600}) of 0.8, 1.0 or 1.2. Potentially infected plant tissue was co-cultivated for 2, 3, 4 or 5 days in dark at 26±2°C. After antibiotic treatment with cefotaxime, plant tissue devoid of bacterial presence was subjected to GUS histochemical analysis for detection of transient expression of *gus* gene. Statistically analyzed data revealed that the combination of 1.0 OD_{600} with 5 days of co-cultivation and 20 min of infection caused cotyledonary node and cotyledon to respond optimally. For node explant, transient gene expression was optimized at 1.0 OD_{600} with 4 days of co-cultivation and 30 min of infection. Wounding of cotyledon was found to be effective in increasing histochemically stained surface area. Optimization of transient gene expression by callus revealed that set of conditions required for optimal gene expression in callus cultures didn't correspond to those required for optimal gene expression in their respective explant type. Further optimization of this transient transformation system by evaluating the effects of other factors on GUS response was recommended.