

Abstract

Petunia is one of the most important bedding plant in the world and is usually propagated by seed. Tissue culture is a technique which allows the rapid production of many genetically identical plants using relatively small amounts of space, supplies and time. The aims of this research were to study MS media with various hormones to establish a rapid protocol for propagation of *Petunia hybrida*. For this purpose different explants of cultivars including Postillion lilac, Lambada pink, Postillion white, Tango ros were compared. The results showed that the regeneration in media without any hormones take place only in node explants. Study of auxin hormones (IAA, NAA, 2,4-D) in MS media mainly lead to callus and root production and among different cytokinin hormones (BAP, Zea, Kin), BAP was a suitable hormone for propagation. Among different studied explants, leaf explant produced somatic embryo in media which contained BAP hormone. The combination of auxin hormones (IAA, NAA, 2,4-D) with BAP also lead to produce callus and organogenesis. This results showed two compounds containing NAA+BAP and 2,4-D+BAP produce callus and root and also production of callus and stem in the media containing IAA+BAP hormones without any subculture was obtained. It appears that for mass propagation in large scale of combinatory media IAA+BAP and the media containing BAP are suitable. Genetic stability of shoot derived from node and leaf explants in this suitable media was studied with ISSR markers. The stability in regenerated plants that derived from two explants in BAP media was more than the media which contains IAA+BAP hormones. Among different explants although the genetic stability of node explant was greater than leaf explant, but the stability of leaf explant was relatively more suitable. Although the node explant has a suitable genetic stability but due to its limitation in parental plant, it is not a suitable source for *Petunia* propagation in large scale. In general the results revealed that the use of leaf explant in media containing BAP hormone with concentration of 0.42 mg/lit is suitable for *Petunia* propagation in large scale.