

Plant Science 2019: In vitro propagation of Aloe vera and Aloe littoralis plants: Gamma radiation, biochemical and genetic changes- Zahra Nourmohammadi- Islamic Azad University**Zahra Nourmohammadi**

Islamic Azad University, Iran

Aloe is an important commercial crop available in a wide range of species and varieties in international markets. The applications of this plant have been recorded in the ancient cultures of India, Egypt, Greece, Rome and China. Aloe has been used for centuries and is currently being actively studied for medicinal purposes. Aloe is propagated through lateral buds which is slow, very expensive and low income practice. Nowadays, it has been cultured by in vitro propagation for rapid multiplication of plants, genetic improvement of crops, obtaining disease-free clones and for progressive valuable germ plasm. The present study focused on the influence of different phytohormones on rapid in vitro propagation of Aloe plants. We also investigated the effect of gamma radiation on biochemical characters as well as genetic changes. Shoot tip of 2-3 cm were collected from offshoot of Aloe barbadensis and Aloe littoralis and were inoculated with MS medium containing various concentrations of BA (0.5, 1, 2 mg/l), IAA (0.5, 1 mg/l). The best treatment for a highest shoot number and bud proliferation was MS medium containing 2 mg/l BAP and 0.5 mg/l IAA in A. barbadensis and A. littoralis. Maximum percentage of proliferated shoot buds (90% and 95%) from a single explant were obtained in MS medium after 4-5 weeks of the second and the first subcultures, respectively. Different genome sizes were also indicated among treatments and subcultures. The mixoploids identified in flow cytometry histograms in different treatments. The effect of gamma radiation

on A. littoralis showed that by increasing the dose of gamma radiation, amounts of chlorophyll A, B, carotenoids, total protein content and superoxide dismutase were significantly increased compared to control plants. Genetic variation analysis also revealed significant genetic differences between control and gamma radiation treated regenerated plants by AMOVA test. Higher genetic heterozygosity was observed in radiation treated plants. Our findings may provide useful method for improving of Aloe plant proliferation with increasing of useful material such as antioxidant enzymes. Aloe genus plants, distributed in Old World, are widely known and have been used for centuries as topical and oral therapeutic agents due to their health, beauty, medicinal, and skin care properties. Among the well-investigated Aloespecies are A. arborescens, A. barbadensis, A. ferox, and A. vera. Today, they account among the most economically important medicinal plants and are commonly used in primary health treatment, where they play a pivotal role in the treatment of various types of diseases via the modulation of biochemical and molecular pathways, besides being a rich source of valuable phytochemicals. In the present review, we summarized the recent advances in botany, phytochemical composition, ethnobotanical uses, food preservation, and the preclinical and clinical efficacy of Aloe plants. These data will be helpful to provide future directions for the industrial and medicinal use of Aloe plants.