## Abstract

In the present study, the possibility of using cell suspensions and root cultures for extracting medicinally important compound Plumbagin from plant *Plumbago indica* was studied. *Plumbago indica* is a perennial herb, with climbing stems and consists of simple leaves. Secondary metabolites with medicinal value are secreted by leaves of *P. indica* and are stored in succulent roots. The main objective of this research work was to study the possibility of extracting Plumbagin from *in vitro* cultures where it can be used for medicinal purposes.

Leaf and root explants from mother plants of different maturity were cultured on solid MS medium supplemented with varying concentrations of hormones; 2,4-D and BAP for callus initiation and development. Callus was developed from leaf explants within 2 weeks. Callus of *Plumbago indica* was established from leaf explants of conventionally propagated plants of 2 years and 8 months aged and 3 months tissue cultured plants on solid MS medium supplemented with the combination of 6.0 mg/L 2,4-D and 3.0 mg/L BAP. However, callus could not be obtained from root explants. At the end of 4 weeks, callus was sub cultured onto solid MS medium with the same hormone combination. Callus tissues were transferred into liquid MS medium with the same hormonal combination and maintained in a rotatory shaker at a speed of 100 rpm. Samples of cell suspension cultures stained with Aceto-carmine and observed under a light microscope showed the presence of dividing cells until $12^{th}$ day in the liquid culture. The production of Plumbagin, in cell suspension cultures obtained from liquid MS medium with the combination of 6.0 mg/L 2,4-D and 3.0 mg/L BAP, was determined by TLC method. Using extraction of roots of mature conventionally propagated *P. indica* plants as the marker, several TLC were run with samples of cell suspension cultures and leaves and roots of conventionally propagated plants as well as tissue cultured plants. According to the $R_f$ values obtained, Plumbagin was present in conventional plant leaves and tissue cultured plant roots as well as cell suspension cultures obtained from callus developed from 2 years, 8 months aged conventional plants and 3 months tissue cultured plant leaves.

Since there is no callus formation from *Plumbago indica* roots, attempts were made to obtain root cultures from leaf explants of mature conventionally propagated plants, on solid Gamborg's B5 medium supplemented with the combination of 1.0 mg/l NAA and 0.1 mg/l Kinetin. Out of 24 leaf explant cultures, only 2 were developed into callus followed by root organogenesis at 6 weeks from callus initiation.