A Study on *in vitro* propagation of *Plumbago indica* (Ratnetol) and its medicinal properties

W. D. T. Maduwanthi and S. M. K. Hirimburegama

Department of Plant Sciences, University of Colombo, Colombo 03.

Abstract

Plumbago indica is a perennial herbaceous plant with long succulent roots. It is an exotic plant, in the family Plumbaginaceae and is probably native to Southeast Asia. In Sri Lanka, it is found in anthropogenic localities and only under cultivations.

The roots of *P. indica* are commonly used in indigenous medicine of Ayurveda. It contains an orange yellow pigment named Plumbagin (2-methyl-5-hydroxy-1,4-naphthoquinone) which is the active compound in *P. indica.*

Although it can be easily grown under local conditions, the domestic production is at a minimum level due to lack of organized cultivation. It was revealed that more than 90 % of the industrial requirement is imported from India.

The main objective of this study was to develop a technology for mass production of *Plumbago indica* plants through *in vitro* propagation and a preliminary analysis of the plant for plumbagin. *In vitro* propagation is rather difficult as *P. indica* contains many endophytic microorganisms. But washing in soapy water for 15 minutes, keeping under running tap water for 45 minutes, dipping the nodal cuttings in carbendazim™ at concentration of 10.0 g/L for overnight and washing with 70 % Clorox™ for 10 minutes provide a successful method for surface disinfestation of nodal cuttings of *P. indica.*

Murashige and Skoog basic medium (Murashige *et al.*, 1962) supplemented with BAP (6-Benzylaminopurine) at 3.0 mg/L and IAA (Indole-3-acetic acid) at 0.5 mg/L medium provides the most suitable out of the tested, for proliferation of shoots (100 %). BAP : IAA (3.0 : 1.0 mg/L), BAP : IAA (5.0 : 3.0 mg/L), BAP : AS (Adenine sulfate) (3.0 : 15.0 mg/L) and BAP : AS (3.0 : 10.0 mg/L) media showed 80 %, 46 %, 40% and 40 % shoot proliferation respectively within three weeks in *in vitro.* Plantlets were acclimatized in the potting mixture of coir : sand : garden soil in 1 : 1 : 1 proportions.

Thin Layer Chromatography analysis showed the presence of plumbagin in roots and leaves of *in vitro* propagated plants.