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Study on multiplication of *Plumbago zeylanica* L. using stem cutting in herbal garden

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Abstract

This plant is valuable for its medicinal purpose and also for ornamental purpose. The plant showing its capability for regeneration following their seeds as well as by the potential application of its mature stem cuttings. Selected stem cuttings were grown in prepared fields and in poly bags (including equally by soil, sand and manure) also. Stem cutting from mother plant was made by selections of the older ones and oblique cut on stem made. For this purpose around 10 – 15 cm long stem cuttings were used for the same purpose.

These cutting parts of the stem were further applied for its regeneration in prepared beds and poly bags in large scale to its propagation, protection and for dissemination in different needed sites. Development of new individuals of this plant in each one of the poly bags were monitored and as per need of the plants facilities were provided to support their successful growth and development. Finding for the same was discussed further more in this paper.

Keywords: *Plumbago zeylanica* L., Stem cutting, Plant multiplication, Herbal Garden.

Introduction

Presence of different plant species in certain ecological areas is leading by several environmental factors and also by the genetic makeup of the plant species. Favourable environmental condition and better plant adaptability etc are major responsible factor for successful growth and development of the different plant species. Plants are variable to each other species based on their habit, habitat, production rate, propagation mode etc.

These variables are due to genes and surroundings of the plants individually and are important for development of the healthy ecosystem. These are also performing role in formation of biological diversity of any ecological sites. Each plant species in nature are of a great significance due to presence of certain valuable compounds or for their unique production beneficial for human beings. These are also remarkable for environmental management, Supporting natural cycles etc.

In propagation aspects of the plants are showing variable tendency like some are producing seeds and propagating by seeds. Among the large plant diversity some plants not producing seeds and are efficiently propagating through vegetative modes like root, stem, leaf etc. These are propagating by the modified plant parts like bulb, tuber, rhizome and corm etc. Some plants are potentially propagated using their seeds and by vegetative modes also like *Plumbago zeylanica* etc. Plant propagation supporting rapid dissemination of plant species in nature leading to formation of biodiversity.

Due to rich valuation of the plants and over exploitation, introduction of the new species etc are leading factor for loss of the certain plant species from their natural habitat. So sustainable use of the plants should be done for maintaining its existence in nature. Focusing on above points it is urgent need for plant conservation which support their protection as well as for multiplication like their mother plants.

Pharmaceutical Studies and Therapeutic Uses of *Plumbago Zeylanica* L. Root were done by Chetty *et al.*, 2006 [5]. Arunachalam *et al.*, 2010 [1] studied on anti-inflammatory and cytotoxic effects of extract from *Plumbago zeylanica*. Azi and Chiamaka 2012 [2] studied on anti-ulcer activity of *Plumbago Zeylanica* Linn root extract. Borhade *et al.*, 2014 [3] recorded pharmacognostic and phytochemical investigations of *Plumbago zeylanica* Linn. Root. *Plumbago zeylanica* Linn. (Chitrak) - Review as Rasayan (Rejuvenator / Antiaging) was carried out by Datta and Mishra 2012 [6].

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Kumar and Sudha 2011 ^[10] find out phytochemical and antimicrobial studies on *Plumbago zeylanica* Linn. (Plumbaginaceae). Rapid clonal propagation of an endangered medicinal plant *Plumbago zeylanica* Linn was experimented by Dohare *et al.*, 2012 ^[7]. Jain *et al.*, 2014 ^[8] noticed on pharmacological profiles of ethno-medicinal Plant: *Plumbago zeylanica* L.- A Review. Jeyachandran *et al.*, 2009 ^[9] recorded antibacterial activity of plumbagin and root extracts of *Plumbago zeylanica* L. Chauhan 2014 ^[4] reviewed on Morphology, Phytochemistry and Pharmacological activities of medicinal herb *Plumbago zeylanica* Linn.

Pant *et al.*, 2012 ^[12] studied on *Plumbago zeylanica* L.: a mini review. Ravikumar and Sudha 2011 ^[14] noticed Phytochemical and antimicrobial studies on *Plumbago zeylanica* (L) (Plumbaginaceae). Sharma and Singh 2015 ^[16] studied a multifarious potent herb: *Plumbago zeylanica* – A mini review. Selvakumar 2001 ^[15] studied on in vitro propagation of the medicinal plant *Plumbago zeylanica* L. through nodal explants.

Lemma *et al.*, 2002 recorded on anti-bacterial activity of *Plumbago zeylanica* L. roots on some pneumonia causing pathogens. Rao *et al.*, 2011 ^[13] Evaluated wound healing activity of methanolic root extract of *Plumbago zeylanica* L. in wistar albino rats. Subhash 2013 ^[17] analyzed phytochemical Screening and Antimicrobial Studies on *Plumbago zeylanica* L. Yedapo 1996 ^[19] Studied on bioactivity of the root extract of *Plumbago zeylanica*.

Tilak 2004 ^[18] studied on antioxidant properties of *Plumbago zeylanica*, an Indian medicinal plant and its active ingredient, plumbagin. Zarmouh *et al.*, 2010 ^[21] recorded cause and effect of *Plumbago zeylanica* root extract on blood glucose and hepatic enzymes in experimental diabetic rats. Yuvaraj *et al.*, 2011 ^[20]. Noticed on a comprehensive review on *Plumbago zeylanica* Linn.

Material and Methods

The plant is herbaceous with beautiful flowers. It is well adapted to make their own copies by using their seeds as well as by the stem cuttings for the same purpose. In this purpose older stem cuttings 10 – 15 cm long were carefully removed from mother plant and oblique cut made than deep in soil up to 5-8 cm depth following proper water management to develop new plants of *Plumbago zeylanica* L. aimed for ex-situ conservation in Herbal garden.

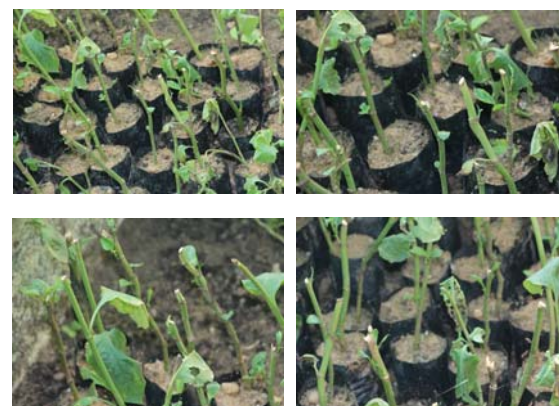
There are fifty poly bags were used for developing new plants of the *Plumbago zeylanica* L. separately. Poly bags were filled with soil, sand and manure equally. After development of the new plants in poly bags were transferred in to the prepared beds of Herbal garden for further their Growth and development.

Development of the new plants in poly bags are helpful in their easy dissemination in required sites.

Images



18 July 2015



28 July 2015



8 August 2015



18 August 2015



20 August 2015

Result and Discussions

The plant *Plumbago zeylanica* L is marked for its medicinal as well as for ornamental values (Flowers). It is an herbaceous plant belonging to family Plumbaginaceae. The plant is producing beautiful white flowers in racemosa inflorescence. The plant is capable to regenerate by sexual and asexual methods. A moderate level of water need for its better development.

Roots are tap root deep in soil. Stems are long, green, cylindrical, smooth, green, branched, woody at the base and herbaceous at top portion of the plant. Leaves are simple,

green, shiny, alternate, unicasted reticulate venation, apex pointed.

Flowers are pediculate, pentamerous, white, racemosa inflorescence. Fruits are small cylindrical, hairy with glandular segregation. Large at the base of the inflorescence and gradually small at the top. Seeds are small. Due to rapid exploitation of the plants is going towards loss of their existence need for much propagation and dispersal from different parts of its presence. The above practices are helpful for further their conservation.

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