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Growth pattern study on *Centella asiatica* (L.) Urban in herbal garden

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Abstract

Plants are remarkable as a major component for the composition of biological diversity. Each one plant in nature is capable to increase in their number for maintaining their existence in nature. Several modes for this purpose found to be useful in this chain. Most of the Medicinal and Aromatic plants are reproducing by using their seeds. The Medicinal plant *Centella asiatica* (L.) Urban is an herbaceous, prostrate nature plant which found near water bodies or it is referred as moisture loving plant. Wide range of this plants propagation is done by their stem/runner cutting. Each one part of the stem which includes node is capable to reproduce new individuals like their parental ones.

Growth behavior of *Centella asiatica* (L.) Urban was studied in order to monitor the changes during of their life phase and also to support their vegetative mode of propagation. Different soil types affecting its growth, Sandy, humus soil is more suitable for its rapid propagation.

Keywords: *Centella asiatica* (L.) Urban, Stem cutting, Vegetative Propagation, Herbal Garden.

Introduction

Plant diversity is a key segment in formation of biodiversity in specified ecological areas. It also includes variation and variability among different plant species. Plant association is a leading factor for complex vegetational growth of the plant in natural habitat. Life phases of the plants are variable among the different species. It is also affected by their genes as well as by the modifications in their environmental variations.

Rich potential of the plants to adjust in variety of the climatic conditions leading for their existence in nature. Plants are also marked as a variable in their habit and habitat. Growth pattern, Reproductive mode etc. Growth pattern includes changes in different phases of the plant life. It is also unique for all the species of the plants of different habitats. Growth pattern focused on events which are changeable from starting to ending of plant life.

Plants are showing variable tendency and capability to grow in different soil types. Plants are regenerating their new copies by varied plant parts and are differ to each one species of the plants. Growth of the plants regulated by several biotic or abiotic factors.

An optimum level of the factors leading for successful growth of the plants in their natural habitats. As per nature of the plants requirements are also changeable like the climbing nature plants needs to a suitable substratum for proper climbing purpose. In another hand creeper plants development weed removal and water supply needed as per need of the plants in their different stages of life etc.

New plants development using vegetative modes need proper care and management over its growing to maturation periods. For proper growth of the plants diseases, nutrients etc management is an urgent need to support them in grown sites. Above practices are important for the study of growth pattern as well as for their rapid propagation by all possible means.

Castillo *et al.* 1980^[3] recorded phytochemical study of *Centella asiatica* (L.) Urban L. (fam. Umbelliferae). Devkota and Jha 2009^[4] noticed on variation in Growth of *Centella asiatica* (L.) Urban along Different Soil Composition. *Centella asiatica* (L.) Urban - A review of its medicinal uses and pharmacological effects done by Arora *et al.* 2002^[1]. Bhavna and Jyoti 2012^[2] studied on *Centella asiatica* (L.) Urban: The elixir of life.

Centella asiatica (L.) Urban in food and beverage applications and its potential antioxidant and neuroprotective effect was done by Hashim 2011^[5]. Jagtap *et al.* 2009^[6] recorded antimicrobial and Antifungal Activity of *Centella asiatica* (L.) Urban (L.), Umbelliferae.

Centella asiatica (L.) Urban – A review was done by Jamil *et al.* 2007^[7]. Jaziri 2007^[8] has been made comparative analysis of active constituents in *Centella asiatica* (L.) Urban samples from Madagascar: application for ex situ conservation and clonal propagation. Antioxidant Activity of *Centella asiatica* (L.) Urban: Impact of Extraction Solvent Polarity was studied

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by Rahman *et al.* 2013^[9]. Antidepressant activity of ethanolic extract of leaves of *Centella asiatica* (L.) Urban by In vivo methods recorded by Selvi *et al.* 2012^[11].

Variation in the chemical composition of Indian samples of *Centella asiatica* (L.) Urban. Was done by Rao and Seshadri 1969^[10]. Chemical examination of *Centella asiatica* (L.) Urban. III. Constitution of bhramic acid was done by Singh and Rastogi 1968^[12]. Singh *et al.* 2010^[13] recorded *Centella asiatica* (L.) Urban: a plant with immense medicinal potential but threatened. Antinociceptive and antiinflammatory effects of *Centella asiatica* (L.) Urban was made by Somchit *et al.* 2004^[14]. Tiwari *et al.* 2011^[15] studied *Centella asiatica* (L.) Urban: a concise drug review with probable clinical uses.

Wankar and Tripathi 1993^[16] studied population dynamics of *Centella asiatica* (L.) Urban, a clonal herbaceous perennial, in 'jhum' fallows of two different ages. Zainol *et al.* 2003^[17] find out antioxidative activity and total phenolic compounds of leaf, root and petiole of four accessions of *Centella asiatica* (L.) Urban.

Material and Methods

Stem cuttings/runners were found to be useful in term of its rapid propagation in selected fields. It is mostly grown near the aquatic sites. So as per its behaviour/life pattern much moisture level needed for its growth and development.

Stem cuttings selected from healthy, diseases free plants were slightly deep in soil and sand mixture with manure and sand spread which support its root/shoot initiation and for spreading of the plants. Plants propagated in prepared fields as well as in 50 poly bags of 13 cm deep and 8 cm broad which were filled with fertile soil, manure and sand mixture equally.

Water supply made as per need of the plants stem cuttings. Proper spacing required between the lines of the plants and also between plants stem cuttings grown in the field. After around three weeks it spread around its main root system forming new Stem/runner and covers the areas.

Growth pattern in varied stages



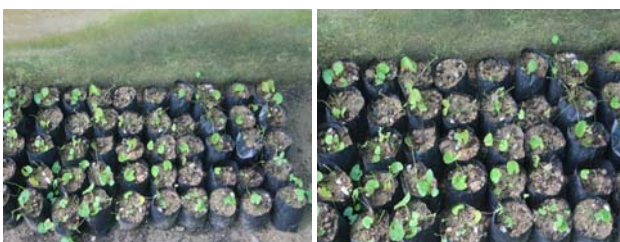
On 0 Day – (18 July 2015)

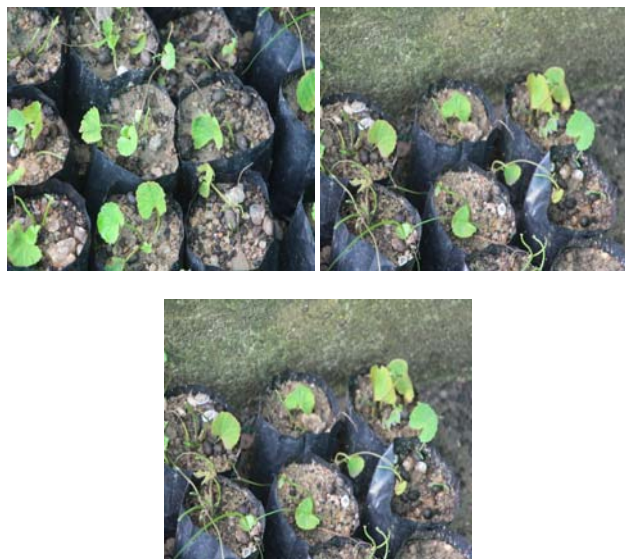


After 10 Days



After 20 Days





After 30 Days



Transplantation of Developed plants in prepared Beds in Herbal Garden

Changes in Morphology



Result and Discussions

The plant is prostrate, creeper, herbaceous and moisture loving plant. It is naturally found near the water channel/water bodies. Roots are around 5-10 cm deep in soil, Branched. Root length 12 – 15 cm, Root diameter 1.5 – 2.5 cm, Roots originating from nodular part of the stem. Stem- Cylindrical, Smooth, Less branched, Prostrate, Runner. Internodes 3 – 4 cm, Stem diameter 1 – 2 cm,

Each one nodular part of the runner develop root inside of soil whereas long petiole arise at the top of nodes which bear leaf at the apex. Leaf – These are simple, Green, Smooth, Oval shaped, Reticulate leaf venation. Leaf length 1.5 – 2.0 cm, Leaf broad 0.5 – 1.0 cm, Weavy margin, Petiole long and fistular. Flower – In clusters near the basal part of petiole.

The plant registered as potent to propagate itself in to new individuals like their parental ones using stem/runner cutting. These stem cuttings are applied for further development of the plants in specific prepared sites. Nodular part of the stem/runner is capable for developing new shoot and root system in presence of favourable environmental condition. Spreading tendency and capability of the grown stem cutting depends on the soil quality, water availability, shade etc.

Development of new individuals of this plant was done in direct beds of Herbal garden and is also applied for proper development in poly bags in protective sites at Herbal garden. Light, water supply etc were managed as per need of the plant to support them for fast multiplication. This process of plants regeneration also leads to its conservation. Prepared new individuals of these plants were further carefully shifted in to new prepared beds of Herbal garden followed by providing facilities to the developing plants.

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