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Piper longum Linn. : Application of Stem cutting for rapid vegetative propagation in herbal garden

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Abstract
Plants growth pattern and behavior are variable and specific among the different plant species of different habitat. This variation participates their role in formation of plant diversity and further it is marked as a component of biodiversity.
For maintaining of existence of life by the plants there are several adoptions are found in the variety of plants. They are multiplying using many methods like by seeds and vegetative parts. This tendency of the plants in nature supporting their continuous occurrence in nature.
Present study is a purpose of to know about the vegetative propagation using stem cutting of the *Piper longum* Linn. The study made in herbal garden where stem cuttings of the plants were grown in selected and prepared poly bags by supporting their requirements to develop new individuals.

Keywords: *Piper longum* Linn. Stem cutting, Vegetative propagation, Herbal Garden.

1. Introduction

Richness of species diversity in certain ecological areas are key factors for the composition of the biodiversity. Plant diversity performing their efficient role in structure of biodiversity. Occurrence of the plants and their types associated with many factors such as biotic and abiotic components.
Alteration of the above factors affecting plant diversity/growth and development etc. Natural regeneration of the varied plant species is supporting the diversity of the plants. For the same purpose to prevent their existence in nature plants are adapted to grow and multiply by several methods like by seeds and also by the vegetative plant parts or their modified forms such as bulb, tuber, rhizome corm etc. With the application of the above methods plants are regenerating itself in their natural habitat.
Current study focus on the vegetative propagation of *Piper longum* Linn. In poly bags at herbal garden in university campus aimed for their rapid propagation as well as for conservation purpose. Continuous cultivation, protection against adverse condition, control on over exploitation etc are leading factors for plant conservation in certain ecological areas.
Bisht 1963 observed pharmacognosy of piplamul- the root & stem of *Piper longum*. Abbasi *et al.* 2010 [1] observed conventional and modern propagation techniques in *Piper nigrum.* Agrawal *et al.* 2000 [2] noticed effect of *Piper longum*, *Zingiber officinale* Linn and ferula species on gastric ulceration and secretion in rats. Atal *et al.* 1984 [3] analyzed biochemical basis of enhanced drug bio-availability by Piperine. Bhat *et al.* 1995 [4] studied plant regeneration from various explants of cultivated *Piper* species.
Das *et al.* 1996 [7] analyzed alkamides and other constituents of *Piper longum.* De Souza *et al.* 2009 [8] studied on vegetative propagation in Piperaceae Species. Cikricki *et al.* 2008 [6] studied on antimicrobial activity of white pepper on fungi. Dhanukar *et al.* 1984 [9] socused ob efficacy of *Piper longum i*n childhood asthma. Etampawalat *et al.* 2002 [10] studied on propagation, optimal growth conditions and fruit formation of the medicinal plant *Piper longum* L.
Chemistry and pharmacology of *Piper longum* L was studied by Zaveri 2010 [21]. Greig 1993 [12] noticed on regeneration mode in neotropical *Piper*: habitat and species comparisons. Kanta 1962 [13] recorded on morphology and embryology of *Piper. Nigrum* L. Gartner 1989 [11] studied on breakage and regrowth of Piper species in rain forest understory. Lee *et al.* 2001 [14] studied on fungicidal activity of Pipernonaline, a Piperidine alkaloid derived from fruits of long pepper, *Piper longum*, against phytopathogenic fungi. Nahak and Sahu 2011 [15] analyzed on phytochemical evaluation and antioxidant activity of *Piper cubeba* and *Piper nigrum.*
The Piperaceae - a family profile made by Yuncker 1958 [20]. Padhan 2015 [16] observed on regeneration of plantlets of *Piper longum* L. through in vitro culture from nodal segments. Parmar *et al.* 1998 found on polyphenols and alkaloids from Piper species. Sarasan *et al.* 1993 [18] studied on plant regeneration in *Piper longum* L. (Piperaceae) through direct and indirect shoot development. Sunila and Kuttan 2004 [19] studied on immunomodulatory and antitumor activity of *Piper longum* Linn and Piperine.

2. Material and Methods

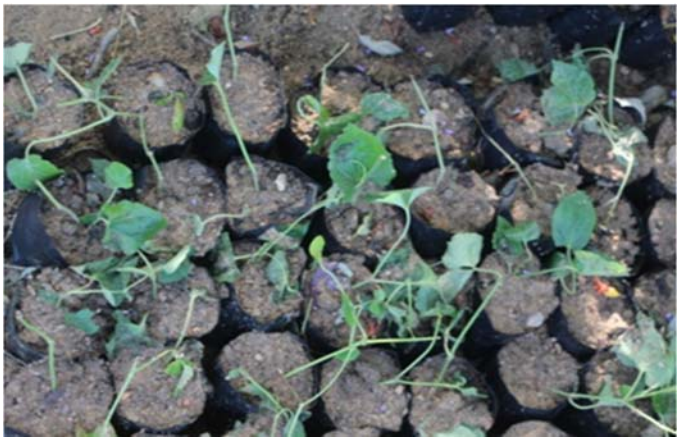
It is Weak, herbaceous plant of a rich medicinal values and is efficiently propagating by the vegetative modes using the stem cuttings with proper supply of water. Present study carried out in herbal garden where fifty poly bags were used for its vegetative propagation purpose including fertile soil, sand and manure mixture equally.
Each one poly bags were further used as a media to grow one-one stem cuttings of 20 cm long these were deep in five cm depth followed by proper water supply. In favourable environmental condition the stem cuttings further developing new root, shoot to convert in to new individuals like their parental ones.

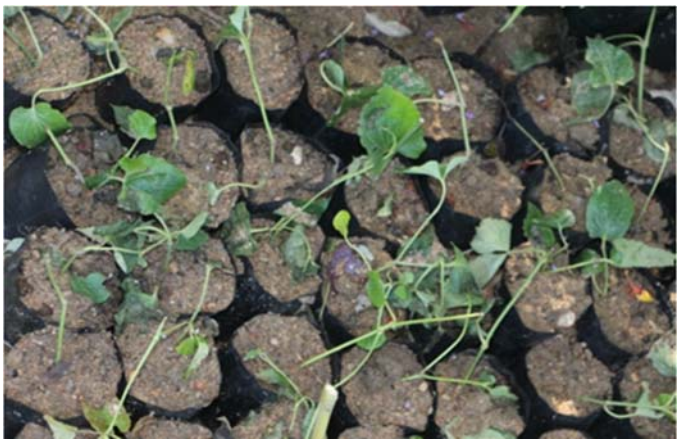
Continuous observations made on the experiment to assessed the need of the developing plant stems. Ten days interval images were taken to observe the changes in grown stem cuttings.
After successful development of *Piper longum* Linn. in poly bags were shifted in the selected and prepared beds in herbal garden followed by supply of facilities needed for developing new buds, leaves and roots.

Views on the current experiment

18 July 2015







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3. Result and Discussions

The plant *Piper longum* Linn is a creeper, herbaceous in nature belonging to family Piperaceae. It is well adapted to regenerate its new individuals by their stem cuttings. Roots are tap, small, branched and less deep in soil. Stems are long, smooth, cylindrical, branched and weak with clear node and internodes producing new root and buds for further development of new individuals of this plant. Leaves are petiolate, green, ovate, smooth, shiny, unicosted, reticulate venation. Flowers are small white – milky in colour. Fruits are long, cylindrical, rough surface. Fruits develop from reproductive branches where rootlets are absent. The plant requires moderate range of water.

Each one of the plant species is marked for the presence of certain and unique medicinal properities. On the basis of presence of in plants are registeded for their action in treatment of varied disorders. Such tendency of the plant species leading in their rich valuation as well as importance among the human beings. Continuous cultivation of the Medicinal and aromatic plants for their utility as well as for economic benefits etc are playing role in their regular appearance in natural systems.

Vegetative propagation of the plant *Piper longum* Linn is influenced and supported by the level of moisture and shade in initial stage of plants growth in poly bags separately by using their stem cuttings.

Present paper is a record to explain its rapid propagation using its vegetative plant parts like mature stem cuttings.

For the above purpose stem cuttings were applied for bag nursery development of this plant which further leads its spreading and for transfer of the plant species in varied selected sites. As per need facilities provided not only to protect the plants but also to support the initiation of new root and shoot system from grown stem cuttings.

The plant having rich efficiency to develop new drugs for application in varied diseases. A fruit of this plant includes volatile oil, alkaloids, saponins, starch etc. Important chemical compounds are Piperine and Piplatin found to be useful in many purpose like for antimicrobial, anti-inflammatory, antibacterial, anti-asthmatic etc. Images were taken on different events of the experiment for proper vegetative changes in each one of the plants. Undoubtedly the current study not only promotes its rapid vegetative propagation as well as supports its conservation for further utilization in study on different aspects.

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5. References

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