International Journal of Advanced Research and Development
ISSN: 2455-4030
Impact Factor: RJIF 5.24
www.advancedjournal.com
Volume 2; Issue 5; September 2017; Page No. 96-99

Stem cutting propagation of *Helicteres isora* Linn. in herbal garden

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Abstract
Plants diversity in nature is a major segment of biodiversity. It is determined by surrounding of the plants. Every one plant species in nature always trying to maintain their population as well as existence in nature for long time. For such aim these are producing seeds and also adapted to multiply by vegetative modes using root, stem, leaf etc. These modes are variable among the different plant species. The plant *Helicteres isora* Linn is well adapted to regenerate using its mature stem cutting. Stem cutting 25 - 30 cm length were selected and oblique cut made than grown in the prepared beds till 8 cm depth and in prepared sixty poly bags individually for further development in Herbal garden. Above practice is supporting its better dissemination in the required sites.

Keywords: stem cutting, vegetative propagation, *Helicteres isora* Linn, herbal garden

Introduction

Plant diversity in particular ecological areas is determined by a several types of the environmental factors. Genetics of the plant species is also a regulatory factors which supporting the presence of the plant diversity. In natural system a variety of the plant species are found and by association that forms a complex structure of plant diversity which plays a remarkable role in the development of biodiversity of the certain ecological areas.

Growth pattern, Plant multiplication capacity and their modes for the same are recorded in variable trends. It is due to their unique behavior of the different plant species in nature as well as their adaption capacity in changeable environmental conditions. Seeds formation, dispersal and germination process of the different plant species are variable and it is a best method for their dissemination and development of new individuals followed by the similarities between developed plant and to their parental plant.

For the purpose Vegetative propagation, vegetative parts of the different plants actively involved and support for the same purpose. Such plant can be propagated by above parts and these are also characterized for the vegetative using their modified forms of the vegetative structures like bulb, tuber, rhizome etc. It is also noticed that some plants like *Helicteres isora* Linn etc are performing their propagation by seeds as well as by mature stem cuttings. For current study the plant *Helicteres isora* Linn vegetative propagation was done using its mature stem cuttings in simple ways.

These plant parts are utilized for development of its new plants in Herbal Garden aimed for preparations of its new individuals as their parent plants in poly bags filled with soil, manure and sand mixture equally. This combination found best for the its root and shoot initiation from grown stem cuttings after supply of the moderate range of water as per need of the developing stem cuttings. Above study was done in Herbal Garden for their rapid propagation by application of the mature stem cutting.

Bean *et al.* 1985 [3] recorded on cucurbitacin B and isocucurbitacin B cytotoxic components of *Helecteres isora*. Kumar *et al.* 2006 [4] found effect of *Helicteres isora* bark extract on blood glucose and hepatic enzymes in experimental diabetes. Kumar *et al.* 2006 [5] noticed hypoglycaemic effect of *Helicteres isora* bark extract in rats.

Kumar *et al.* 2013 [6] recorded validation of tribal claims through pharmacological studies of *Helicteres isora* L. leaf extracts. Badgujarh and Patel 2009 [2] studied anti-inflammatory activity of *Helicteres isora* linn. Stem bark extracts in rats. Badgujar *et al.* 2006[1] studied antimicrobial activity of stem bark of *Helicteres isora.*

Pohocha and Grampurohit 2001[8] focused on antispasmodic activity of the fruits of *Helicteres isora* Linn. Patel *et al.* 2012 [7] noticed antidiabetic herbal drugs a review.

Shrirama *et al.* 2010 [10] found antibacterial and antiplasmid activities of *Helicteres isora* L. Prajapati *et al.* 2003 [9] noticed about Medicinal plants-*Helicteres isora*, in: A handbook of medicinal plants. Venkatesh *et al.* 2003 [14] studied on antihyperglycemic activity of *Helicteres isora* roots in alloxan-induced diabetic rats. Varghese *et al.* 2012 [12] recorded on isolation and evaluation of Antimicrobial Properties of Isolated Phytoconstituents of Fruits of *Helicteres isora* Linn.

Singh *et al.* 1985 [11] Ethnobotany of *Helicteres isora* Linn. In Kheri district, Uttar Pradesh. Venkatesh *et al.* 2004 [15] focused on effect of *Helicteres isora* root extracts on glucose tolerance in glucose-induced hyperglycemic rats. Venkatesh *et al.* 2007 [13] found antinociceptive activity of *Helicteres isora*.

Material and Methods

The plant is woody, Shrub found in open land as well as in forest areas. It is marked for its dense leafy cover around the plant and quailed fruits with beautiful flowers. It is capable to regenerate itself by following their mature stem cuttings in favourable environmental condition. The study was conducted in the year 2016 in Herbal Garden developed in Guru

Ghasidas Vishwavidyalaya (A Central University), Bilaspur (C. G.).

Stem cutting found useful to propagate it vegetatively. 25 – 30 cm mature stem cutting are cut oblique and deep in soil around 10 cm supply water as per need of the plant.

Vegetative propagation also followed by developing new individuals of this plant in poly bags filled with soil. For this purpose 50 poly bags were prepared and each one is used to develop a new plant of the *Helicteres isora* Linn by growing one mature stem cutting individually. Shade, water etc managed to generate new shoot and root system finally that convert in to new plant like their parents. Again these plants were shifted in different selected fields/sites.

Images of Different Stages of Plant Development

Fig 1: Poly bags with stem cutting propagation

Fig 2: Plant development

Fig 3: Plant development

Fig 4: View of Mature plants in poly bags

Result and Discussions

The plant is shrubby in nature becoming dense after maturation due to much branching from mother plant. It is capable to grow in almost all type of soil and also much tolerance capacity in changing climatic condition.

Roots are tap root system, Branched and deep in soil. Stem are Cylindrical, Branched, Smooth, Woody in nature. Leaves are Petiolate, Simple, Green, Dentate margin, Unicosted reticulate venation. The flowers are beautiful and red-orange in colour, Arranged on stem where as fruits are green, Long, Quailed, after maturation colour changes from green to brown.

Fruits are of a unique shape (Quailed). The plant is widely grown in different areas of the state. It has efficient potential to develop new plants using its stem cutting as well as by their seeds in favourable environmental condition.

Due to rich valuation the plants are harvested rapidly leading gradually loss of their existence in natural sites. In this scenario the current simple method can be applied to support

their rapid vegetative propagation followed by transfer of developed plants through stem cuttings as per required and selected fields.

Acknowledgements
I am very much thankful to UGC New Delhi for providing me a research project - Start up Grant on the Topic "Ex – situ Conservation of important Medicinal and Aromatic Plants (MAPs) Resources from Chhattisgarh in Guru Ghasidas Vishwavidyalaya (A Central University) Campus, Bilaspur (C.G.)" No. F. 20 – 17 (3)/2012 (BSR) - Dated 8 March 2013.

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