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Adhatoda vasica Linn: Performance of stem cutting in rapid vegetative propagation in herbal garden

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Abstract
Plant diversity includes a variety of species of the plants with variation in their habit, growth pattern and mode of reproducing new individuals like their parental ones. In connection to above point's plants are capable to producing numerous seeds as a new source of plant development.
All plant cannot perform the same procedure for seed development. In this condition a major group of plant species are widely grown/propagated using their vegetative modes for same purpose. Except the vegetative parts like root, stem, leaf etc the modified structures of the plants are also found to be efficient to regenerate new plants such as bulb, tuber, rhizome corm etc. in the presence of suitable environmental condition.
Present study made in Herbal garden to develop new plants of *Adhatoda vasica* Linnby using its mature stem cuttings in poly bags filled with soil, sand and manure mixture equally followed by supply of required materials to the developing new plants fron stem cuttings.

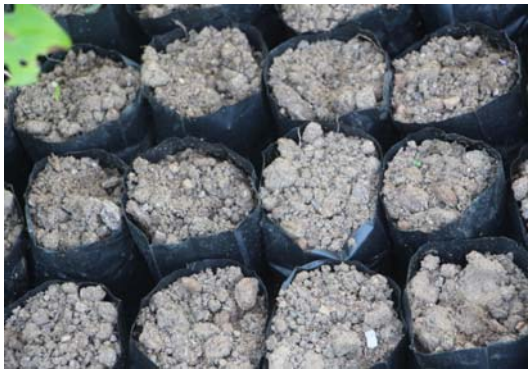
Keywords: *Adhatoda vasica* Linn, Stem cutting, Vegetative propagation, Herbal garden.

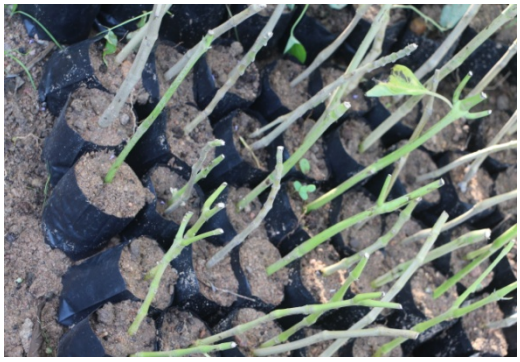
Introduction
Plant diversity is a complex association of varied plant species and is an important component for formation of biodiversity in certain ecological areas. Plant growth and development is effected by many factors like environmental variables and the plant parts utilized for developing the new plants. Plant resources are variable in nature for their occurrence, morphology and also different in types and capability to reproduce themselves.
Seeds are participating a major role in their propagation tendency to develop new plants like their parental plants with proper support of the favourable environmental conditions. Dispersal of seeds is also unique and variable pattern among the plant population. All the plants are not equally successful to produce seeds but are efficiently adapted to regenerate using their vegetative plant parts and also by the potential application by their modified plant parts like bulb, tuber, rhizome, and corm etc. In current study new plant development (After growing of each stem cuttings in all used poly bags)in fifty poly bags were made and are shifted in suitable beds in Herbal garden followed by proper management.
Such type of vegetative propagation support the rapid plant propagation in limited time and space in almost all the season of the year which further support the ex-situ conservation of the certain plant species. It is also helpful to transfer the new plants from one place to another as per demand/need.
Gangwar and Ghosh 2014 found medicinal uses and Pharmacological activity of *Adhatoda vasica.* Gupta *et al* 1977 [5] studied on pharmacological investigations of vasicine and vasicinone - the alkaloids of *Adhatoda vasica.* Bhatt *et al* 2011 [1] studied on phytochemical investigation and antidiabetic activity of *Adhatoda zeylanica.* Plant regeneration from nodal explants of *Adhatoda vasica* Nees was done by Bimal and Shahnawaz 2012. [2]
Antimicrobial activity of *Adhatoda vasica* against clinical pathogens was noticed by Josephin and Selva 2012 [7]. Anthelmintic activity of *Adhatoda vasica* roots was recorded by Lateef *et al* 2003 [9]. Patel and Venkatakrishna 1984 found in vitro study of antimicrobial activity of *Adhatoda vasica* Linn. (Leaf extract) on gingival inflammation - a preliminary report. Claeson *et al* 2000 [3] studied on *Adhatoda vasica*: a critical review of ethnopharmacological and toxicological data.
Phytochemical investigation of roots of *Adhatoda vasica* was done by Jain and Sharma 1982 [6]. Investigations on the Phytochemical activities and wound healing properties of *Adhatoda vasica* leave in Swiss albino mice was done by Subhashini and Kantha 2011 [14]. Anti-ulcer activity of *Adhatoda vasica Nees* studied by Shrivastava *et al* 2006. Kumar *et al* 2010 [8] found Indian traditional herbs *Adhatoda vasica a*nd its Medicinal application.
Srivastava *et al* 1965 [13] found *Adhatoda vasica*, a promising insecticide against pests of storage. Yadav and Tangpu 2008 [15] studied by anticestodal activity of *Adhatoda vasica* extract against *Hymenolepis diminuta* infections in rats. Chronic toxicity studies with vasicine from *Adhatoda vasica* Nees. in rats and monkeys made by Pahwa *et al* 1987 [10].

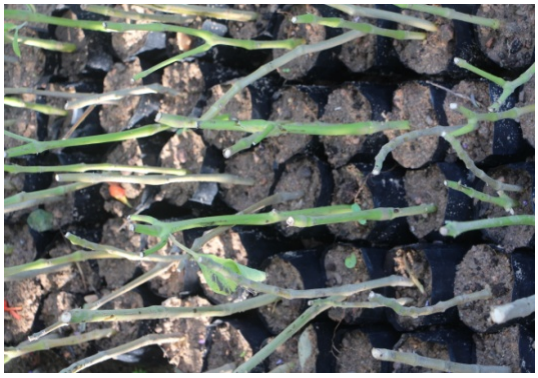
Material and Methods
The plant is woody, shrub nature and is not producing seeds but including efficient capability to regenerate by using their stem cuttings. Around 15 - 20 cm long mature stem cuttings were selected and removed from mother plant. These stem cuttings were further utilized as a source of the plant propagules to regenerate them as their parental plants.
There are fifty poly bags used to develop (by vegetative mode) new individuals of the plant *Adhatoda vasica* Linn. One –one stem cuttings of the plant were applied in each one poly bags separately filled with soil, sand and manure in equal amount.

In experiment as per need of the developing new plants necessary facilities were provided.
Such method is important for rapid reproducing the plants and helpful to disseminate them from one place to another in easy way. The experiment was carriedout in Herbal garden for same objectives to prepare new plants of *Adhatoda vasica* Linn.

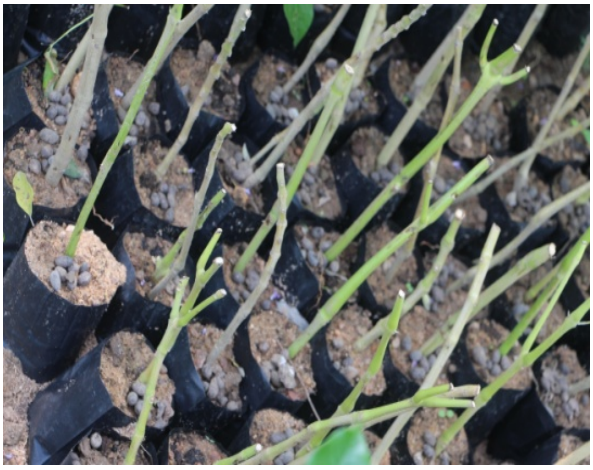
Views on the current study








18 July 2015



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Result and Discussions

The plant is shrub in nature with dense structure after maturation. It is capable to grow in all type of soil with moderate water facilities. Tap root system present in this plant. Stems are woody at the base and are herbaceous at top. Smooth, Clear node and internodes, Less branched. Leaves are petiolate, simple, lanceolate, wavy margins, shiny, green, unicosted reticulated venation. Flowers are white in colour, medium in size and are bilabiate.

The plant does not producing seeds and is well performing its vegetative propagation using its stem cuttings. It is a rich source of medicine and are also utilized as a fencing purpose in rural areas.

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References

1. Bhatt M, Gahlot M, Juyal V, Singh A. Phytochemical investigation and antidiabetic activity of *Adhatoda zeylanica*, Asian Journal of Pharmaceutical and Clinical Research. 2011; 4(2):27-30.
2. Bimal R, Shahnawaz MD. Plant regeneration from nodal explants of *Adhatoda vasica* Nees. Journal of Medicinal Plants Research. 2012; 6(7):1229-1233.

3. Claeson UP, Malmfors T, Wikman G, Bruhn JG. *Adhatoda vasica*: a critical review of ethnopharmacological and toxicological data. Journal of Ethnopharmacology. 2000; 72(1-2):1-20.
4. Gangwar AK, Ghosh AK. Medicinal uses and Pharmacological activity of *Adhatoda vasica* International Journal of Herbal Medicine. 2014; 2(1):88-91.
5. Gupta OP, Sharma ML, Ghatak BJ, Atal CK. Pharmacological investigations of vasicine and vasicinone - the alkaloids of *Adhatoda vasica.* Indian J Med Res. 1977; 66(4):680-691.
6. Jain MP, Sharma VK. Phytochemical investigation of roots of Adhatoda vasica. Planta Med. 1982; 46(4):250.
7. Josephin SB, Selva MT. Antimicrobial activity of *Adhatoda vasica* against clinical pathogens, Asian Journal of Plant Science and Research. 2012; 2(2):83-88.
8. Kumar KPS, Debjit B, Chiranjib PT, Rakesh K. Indian traditional herbs *Adhatoda vasica* and its Medicinal application. J Chem Pharm Res. 2010; 2(1):240-245.
9. Lateef M, Iqbal Z, Khan MN, Akhter MS, Jabber A. Anthel mintic activity of *Adhatoda vasica* roots. Int. J Agri. Biol. 2003; 5(1):86-90.
10. Pahwa GS, Zutshi U, Atal CK. Chronic toxicity studies with vasicine from *Adhatoda vasica* Nees. in rats and monkeys. Indian J Exp Biol. 1987; 25(7):467-470.
11. Patel VK, Venkatakrishna BH. In vitro study of antimicrobial activity of *Adhatoda vasika* Linn. (Leaf extract) on gingival inflammation - A preliminary report. Indian J Med Sci., 1984; 38(4):70-72.
12. Shrivastava N, Shrivastava A, Banerjee A, Nivsakar M. Anti-ulcer activity of *Adhatoda vasica Nees*. J Herb Pharmacother. 2006; 6(2):43-9.
13. Srivastava AS, Saxena HP, Singh DR. *Adhatoda vasica*, a promising insecticide against pests of storage. Lab Dev. 1965; 3(2):138.
14. Subhashini S, Kantha DA. Investigations on the Phytochemical activities and wound healing properties of *Adhatoda vasica* leave in Swiss albino mice, African Journal of Plant Science. 2011; 5(2):133-145.
15. Yadav AK, Tangpu V. Anticestodal activities of *Adhatoda vasica* extract against *Hymenolepis diminuta* infections in rats. J Ethnopharmacol. 2008; 119(2):322-324.