

Study on multiplication of some important medicinal plants in G.G.V. Bilaspur, C.G., India.

D. K. Patel

Department of Rural Technology, Guru Ghasidas Vishwavidyalaya, (A Central University), Bilaspur, 495009, Chhattisgarh, India.

Abstract

A medicinal plant includes specific chemical compounds in their body system that may be varying between plants. Genetic constitution and related environmental condition affect the presence of the Medicinal plants in certain area. Destructions of natural habitat is a leading factor responsible for loss of the species in any ecological area. Over exploitation, Diseases etc. are also supporting the extinction of the species. To maintain the existence in nature plants are producing a remarkable number of seeds once or twice in a year. Among a large group of the plants many of the plants are not capable to produce seeds but such a condition nature has provided them the capacity to regenerate themselves by vegetative mode. Stem cutting, Bud, Leaf, Root are the vegetative parts of the plants are widely used for vegetative propagation. Amount of Seed production and their dispersal mechanism is specific and unique for variable plant species. Seed germination percentage is also changeable from plant to plant. Under vegetative propagation in the plants stem cutting experiment success depends upon the initiation of roots and origination of new buds/leaf. The current study focuses on the multiplication of various Medicinal plants which are regenerating by both the methods Seeds as well as by their vegetative parts. The experiment was carried out in planting the Medicinal plants in poly bags. The findings of the experiment are listed in Table -01 and discussed furthermore.

Keywords: Medicinal plants, Multiplication, Vegetative parts.

INTRODUCTION

India a rich center of biological diversity with a wide spectrum of natural habitats (Bapat et al., 2008). Among around 45000 plant species in India near 1500 Plant species are listed as rare and threatened in India (Myers, 1988). High demand of Medicinal plants leads over exploitation, loss of natural habitats, Environmental pollution etc. are responsible for disappearing the species from a natural habitat (Yadav and Mayur, 2008).

Many modes have been applied for regeneration/multiplication of the Medicinal plants. Micro-propagation focuses on development of various Medicinal plants by tissue culture techniques. Hormonal treatment for propagation of the plants leads fast multiplication of the plant species. Plant growth hormones play a significant role not only in production of new buds but also for generation of new roots which support them to their further growth. Plants are remarkable source of medicines and play a key role in world health problem (Constabel, 1990).

Micropropagation of an Endangered Medicinal Plant: *Curculigo orchoides* Gaertn. Was studied by Bhavisha et al., (2003). Medicinal plants have been utilized for a long period in the country. Herbal medicines are main source to treat many disorders or playing remarkable role for primary health care among the peoples. Plant

species are showing complex behavior in their multiplication process. Stem cuttings is the most popular and sole method to multiply the plants (Nanda and Kochhar, 1987).

Medicinal plants are not only an important resource like traditional medicine but also useful for many diseases. For human beings Medicinal plants are of great significance. These plants have been utilized by human beings from past to current time. Around 80 - 85% of traditional medicines are prepared by using plants (Vieira and Skorupa, 1993). Effect of stem cuttings and hormonal pre-treatment on propagation of *Embelia tsjeriam* and *Caesalpinia bonduca*, two important medicinal plant species was studied by Tiwari and Das, 2010.

Vegetative propagation of *Berberis aristata* DC. An endangered Himalayan shrub was noticed by Majid Ali, A. R. Malik and K. Rai Sharma. 2008. In vitro propagation of some important Chinese medicinal plants and their sustainable usage was recorded by Satish Manohar Nalawade and Hsin-sheng Tsay 2004 and Vegetative propagation of *Warburgia ugandensis* Sprague: An important medicinal tree species in eastern Africa was observed by Akwatulira et al., 2011.

Influence of indole acetic acid and indole butyric acid on root development and status of *Andrographis elongata* (Vahl) T. and – an endemic medicinal plant of India was recorded by Chinnappan Alagesabooopathi, 2012.

In vitro propagation of *Ceropegia thwaitesii* Hook- an endemic species of Western Ghats of Tamil Nadu, India was observed by Muthukrishnan et al., 2012.

Present study conducted with low cost, eco-friendly and safe technique to multiply the Medicinal plants in natural condition as by collecting seeds or by vegetative propagation with stem cutting of mature plants. Growth rate of the stem cutting depends upon many

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*Corresponding Author

D. K. Patel

Department of Rural Technology, Guru Ghasidas Vishwavidyalaya, (A Central University), Bilaspur, 495009, Chhattisgarh, India.

Tel: +91-9993660173

Email: dplantscience@yahoo.co.in

factors, such as Plant age, stem variation, media, moisture, environmental temperature etc.

MATERIALS AND METHODS

The present study was carried out during July 2011- December 2012 in the nursery of Rural Technology Department, G. G. V. (A Central University) - Bilaspur (C. G.). Many poly bags diameter 10 cm and 20 cm height was taken in the experiment. Each poly bag was filled with black soil, sand and compost. Plant parts like Seed or Stem, Leaf etc. of the Medicinal plants are shown/grown in poly bags individually.

Proper water, weed, nutrient and disease were managed over the tenure of the experiment. There are eight plants of each studied Medicinal plants were multiplied. Pant materials (Seeds and Vegetative parts) which are used for further multiplication were collected from different parts of the Chhattisgarh state. Most of the plants are multiplied by using stem cutting whereas for some Medicinal plants seeds were used for the purpose in nursery by developing poly bags.

RESULTS AND DISCUSSION

Outcome of the current study is shown in the Table -01. Table - 02 is for Habit variation of different Medicinal plants. Table - 03 indicating family wise distribution of the studied Medicinal plants.

Total 52 Medicinal plants of varied habits were multiplied during the study period. Out of them Herbs includes 32 members, 08 - 08 members belonging to Herb/Climber and Tree habit respectively whereas 04 members of shrub habit were taken in the experiment. Maximum 61.53 % Herbaceous Medicinal plants are multiplied. Tree species and Herb/Climber of the Medicinal plants were equally 15.39 % were multiplied. Minimum multiplication done for shrub nature of Medicinal plants that was 7.69 %.

Maximum 05 - 05 members belonging to the family Lamiaceae and Solanaceae individually. 04 - 04 members of family Fabaceae,

Liliaceae, 03 members of family Asclepiadaceae and rest of the families includes one or two members which were multiplied.

Over the 52 studied Medicinal plants ten are of Aromatic in nature like *Aegle marmelos* (L.) Corr., *Cymbopogon flexuosus* (Nees ex Steu) Wat., *Eryngium foetidum* L., *Mentha piperata* Linn., *Mentha arvensis* Linn., *Ocimum basilicum* Linn., *Ocimum snactum* Linn., *Vitex negundo* Linn etc. Nine Medicinal plants viz *Acorus calamus* Linn., *Andrographis paniculata* Nees, *Costus speciosus* (J. Konig) Sm., *Eryngium foetidum* L., *Gymnema sylvestris* (Retz) R. Br., *Plumbago zeylanica* Linn., *Rouvolfia tetrafolia*, *Termenalia arjuna* Roxb., *Vitex negundo* Linn were found endangered in the C. G. State.

Eight Medicinal plants like *Aegle marmelos* (L.) Corr., *Andrographis paniculata* Nees, *Azadirachta inaica* A. Juss., *Catharanthus roseus* (L.) G. Don., *Gymnema sylvestris* (Retz) R. Br., *Ocimum snactum* Linn., *Stevia rebaudiana* (Bert.) Bertoni., *Termenalia arjuna* Roxb etc are utilizing as anti-diabetic medicine in the state. Five plants (*Adhatoda vasica* Linn., *Datura innoxia* Mill., *Datura stramonium* Linn., *Ocimum basilicum* Linn., *Ocimum snactum* Linn.etc.) are registered as useful in respiratory problems.

Rest of the Medicinal plants are valuable for Boil and Burn (*Aloe barbadensis* Mill.), Brain tonic (*Baccopa monneri* Linn.), Anti-cancerous property (*Catharanthus roseus* (L.) G. Don.), Bone fracture (*Cissus quadrangularis* Linn) Kidney stone (*Kalanchoe pinnata* (Lam.) Pers.), Digestive (*Aegle marmelos* (L.) Corr., *Mentha arvensis* Linn., *Piper longum* Linn etc.), Skin problem (*Azadirachta inaica* A. Juss., *Ocimum snactum* Linn., *Sensaveria cylindrica* Bojer. etc), Dental problem (*Azadirachta inaica* A. Juss., *Vitex negundo* Linn etc).

Finally on the basis of present findings it is concluded that among the wide diversity of the plant species experimented 52 Medicinal plants having specific potential of medicinal value useful for human beings. This was a little step to protect the Medicinal plants by multiplying them in the nursery and for further spreading them. In future there is an urgent need for multiplication of the Medicinal plants in a large scale not only to maintain their existence in nature but also for their protection for future generation.

Table 1.Multiplication of Some Important Medicinal Plants in G.G.V. Bilaspur, C.G.

S. No.	Botanical Name	Common name	Family	Habit	Propagation	Mode of Multiplication
1	<i>Abrus precatorius</i> Linn.	Ratti, Gunja	Fabaceae	Herb/Climber	Seed	Seed Collection
2	<i>Abutilon indicum</i> (L.) Sw.	Kanghi	Malvaceae	Herb	Seed	Seed Collection
3	<i>Acacia catechu</i> (L.F.) Willd.	Khair	Fabaceae	Tree	Seed	Seed Collection
4	<i>Acorus calamus</i> Linn.	Sweet flag	Araceae	Herb	Rhizome	Poly Bags
5	<i>Adhatoda vasica</i> Linn.	Vasaka	Acanthaceae	Shrub	Stem cutting	Poly Bags
6	<i>Aegle marmelos</i> (L.) Corr.	Bael	Rutaceae	Tree	Seed	Seed Collection
7	<i>Aloe barbadensis</i> Mill.	Ghritkumari	Liliaceae	Herb	Bud	Poly Bags
8	<i>Allium validum</i> S. Wats.	Van Lahsun	Liliaceae	Herb	Bulb	Poly Bags
9	<i>Andrographis paniculata</i> Nees	Bhuineem	Acanthaceae	Herb	Seed	Seed Collection
10	<i>Annona squamosa</i> Linn.	Sitaphal	Annonaceae	Tree	Seed	Seed Collection
11	<i>Asparagus racemosus</i> Willd.	Satavar	Liliaceae	Herb/Climber	Seed/Tuber	Poly Bags
12	<i>Azadirachta inaica</i> A. Juss.	Neem	Meliaceae	Tree	Seed	Seed Collection
13	<i>Baccopa monneri</i> Linn.	Brahmi	Scrophulariaceae	Herb	Stem cutting	Poly Bags
14	<i>Basella alba</i> Linn.	Poi	Chenopodiaceae	Herb/Climber	Seed/Stem cutting	Poly Bags
15	<i>Bixa orellana</i> Linn.	Sinduri	Bixaceae	Shrub	Seed	Seed Collection
16	<i>Boerhaavia diffusa</i> Linn.	Punamava	Nyctaginaceae	Herb	Seed/Stem cutting	Poly Bags
17	<i>Caesalpinia crista</i> Linn.	Gataran	Fabaceae	Tree	Seed	Seed Collection
18	<i>Calotropia gigantea</i> (L.) Ait.F.	Ak	Asclepiadaceae	Shrub	Seed	Seed Collection
19	<i>Calotropis procera</i> Aiton.	Ak	Asclepiadaceae	Shrub	Seed	Seed Collection
20	<i>Catharanthus roseus</i> (L.) G. Don.	Sadabahar	Apocynaceae	Herb	Seed	Poly Bags
21	<i>Centella asiatica</i> (L.) Urban.	Mandukparni	Apiaceae	Herb	Seed	Poly Bags
22	<i>Cissus quadrangularis</i>	Hathzode	Vitaceae	Herb	Stem cutting	Poly Bags
23	<i>Clitoria ternatea</i> Linn.	Aprajita	Fabaceae	Herb/Climber	Seed	Seed Collection
24	<i>Coleus forskohlii</i> (Willd.) Briq.	Pattharchur	Lamiaceae	Herb	Stem cutting,	Poly Bags
25	<i>Costus speciosus</i> (J. Konig) Sm.	Keukand	Zingiberaceae	Herb	Rhizome	Poly Bags

26	<i>Crinum latifolium</i> Linn.	Sudarshan	Liliaceae	Herb	Bulb	Poly Bags
27	<i>Cymbopogon flexuosus</i> (Nees ex Steu) Wat.	Lemongrass	Poaceae	Herb	Root	Poly Bags
28	<i>Datura innoxia</i> Mill.	Datura	Solanaceae	Herb	Seed	Poly Bags
29	<i>Datura stramonium</i> Linn.	Datura	Solanaceae	Herb	Seed	Poly Bags
30	<i>Dioscoria bulbifera</i> Linn.	Air potato	Dioscoriaceae	Herb/Climber	Tuber	Poly Bags
31	<i>Eryngium foetidum</i> L.	Jangali Dhania	Apiaceae	Herb	Seed	Seed Collection
32	<i>Eugenia jambolina</i> Lam.	Jamun	Myrtaceae	Tree	Seed	Poly Bags
33	<i>Gymnema sylvestris</i> (Retz) R. Br.	Gudmar	Asclepiadaceae	Herb/Climber	Seed/Stem cutting,	Poly Bags
34	<i>Kalanchoe pinnata</i> (Lam.) Pers.	Life plant	Crassulaceae	Herb	Leaf	Poly Bags
35	<i>Mentha piperata</i> Linn.	Pipperment	Lamiaceae	Herb	Seed	Poly Bags
36	<i>Mentha arvensis</i> Linn.	Podina	Lamiaceae	Herb	Seed	Poly Bags
37	<i>Ocimum basilicum</i> Linn.	Tulsi	Lamiaceae	Herb	Seed	Poly Bags
38	<i>Ocimum sanctum</i> Linn.	Tulsi	Lamiaceae	Herb	Seed	Poly Bags
39	<i>Oxalis corniculata</i> Linn.	Khatti buti	Oxalidaceae	Herb	Seed	Poly Bags
40	<i>Oxalis reticulata</i> Linn.	Khatti buti	Oxalidaceae	Herb	Seed	Poly Bags
41	<i>Piper longum</i> Linn	Pipali	Piperaceae	Herb/Climber	Stem cutting	Poly Bags
42	<i>Plumbago zeylanica</i> Linn.	Chitrak	Plumbaginaceae	Herb	Stem cutting	Poly Bags
43	<i>Rouvolfia tetrafolia</i>	Sarggandha	Apocynaceae	Herb	Seed	Seed Collection
44	<i>Sensaveria cylindrica</i> Bojer.	Jangali munga	Agavaceae	Herb	Rhizome	Poly Bags
45	<i>Solanum indicum</i> Linn.	Wild brinjal	Solanaceae	Herb	Seed	Poly Bags
46	<i>Solanum nigrum</i> Linn.	Makoye	Solanaceae	Herb	Seed	Poly Bags
47	<i>Spilanthes acmella</i> Linn.	Akarkara	Asteraceae	Herb	Seed	Seed Collection
48	<i>Stevia rebaudiana</i> (Bert.) Bertoni.	Sweet Tulsi	Asteraceae	Herb	Seed	Poly Bags
49	<i>Termenalia arjuna</i> Roxb.	Arjun	Combrataceae	Tree	Seed	Seed Collection
50	<i>Tinospora cordifolia</i> (Willd.) Miers.	Giloye	Menispermaceae	Herb/Climber	Seed/Stem cutting	Poly Bags
51	<i>Vitex negundo</i> Linn.	Nirgundi	Verbenaceae	Tree	Stem cutting	Poly Bags
52	<i>Withania somnifera</i> Dunal.	Ashwagandha	Solanaceae	Herb	Seed	Poly Bags

Table – 2. Habit wise Classification of the Multiplied Medicinal Plants.

S. No.	Habit	Number	Percentage
1	Herb	32	61.53
2	Herb/Climber	8	15.39
3	Shrub	4	7.69
4	Tree	8	15.39
Total		52	100.00

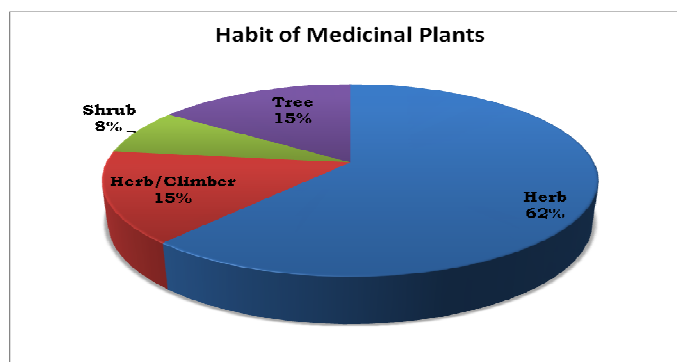


Table 3. Classification of the Multiplied Medicinal plants on the basis of their Family.

S. No.	Family	Number
1.	Acanthaceae	2
2.	Agavaceae	1
3.	Annonaceae	1
4.	Apiaceae	2
5.	Apocynaceae	2
6.	Araceae	1
7.	Asclepiadaceae	3
8.	Asteraceae	2
9.	Bixaceae	1
10.	Chenopodiaceae	1
11.	Combrataceae	1
12.	Crassulaceae	1
13.	Dioscoriaceae	1
14.	Fabaceae	4

15.	Lamiaceae	5
16.	Liliaceae	4
17.	Malvaceae	1
18.	Meliaceae	1
19.	Menispermaceae	1
20.	Myrtaceae	2
21.	Nyctaginaceae	1
22.	Oxalidaceae	2
23.	Piperaceae	1
24.	Plumbaginaceae	1
25.	Poaceae	1
26.	Scrophulariaceae	1
27.	Solanaceae	5
28.	Verbenaceae	1
29.	Vitaceae	1
30.	Zingiberaceae	1
Total		52

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