

Aromatic Plants Vegetative Propagation and *ex-situ* Conservation in Herbal Garden

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ABSTRACT

Plants are major components in structure of biodiversity over the world. These are also unique for their growth and population structure in certain area. Due to presence of a specific chemical compounds each plants are marked as valuable for human beings. Amount and type of chemical constituents are varying among the plant species. It may be also different based on plant type, health, age and related environmental condition. Present study focused on diversity of 45 aromatic plants found in Chhattisgarh and their propagation for further *ex-situ* conservation in Herbal Garden. Various plant parts are registered as plant propagules showing their efficient capability in the development of new individuals of the plants as similar to their parental ones.

Key words: Aromatic plants, Propagation, Conservation, Herbal Garden

INTRODUCTION

Medicinal plants are better sources for treatment of certain disorders. These are traditionally used by the rural peoples not only in Indian states but also in over the world. Efficient capability for treatment these are of great demand. Aromatic plants are also valuable for above purpose which required for collection, propagation and for conservation.

India is known as a rich center for biodiversity including a variety of plant species. Out of them some having remarkable for the presence of certain aromatic plants. Aromatic plants are variable between their species due to differ in chemical compounds. Day by day due to excess population pressure on ecosystem these are coming near of endangerment which urgently required for conservation. Conservation not only provide protection of the species but also important for giving chances to regenerate their own species as their parental ones.

Abhay *et al.* (2010) studied on Diversity and distribution of aromatic plants in forests of Gorakhpur division U. P. India, Kosalge *et al.* (2009) studied Investigation on ethno-medicinal claims of some plants used by the tribals of Satpuda hills in India.

Uniyal *et al.* (2002) focused on current status and distribution of commonly exploited medicinal and Aromatic plants in upper Gori valley, Kumaon Himalaya, Uttaranchal. Ethno-medicinal plants in sacred groves of Manipur made by Khumbmayung *et al.* (2005). Cano *et al.* (2004) marked on Herbal mixtures in the traditional medicine of Eastern Cuba.

Ethnomedicinal study on the plants made by the researchers like Pei (2001), Sharma and Lal (2005), Sharma *et al.* (2003). Kraisintu (1997) recorded Industrial exploitation of indigenous medicinal and aromatic plants.

Vegetative propagation on Medicinal and Aromatic plants were done by Butola (2007), Hartmann and Kester (1983). Kumar *et al.* (2009). Schopp and Fremuth (2001) recorded the Sustainable use of medicinal plants and nature conservation in the Prespa National Park area, Albania. Hamilton (2004) studied on the Medicinal plants, conservation and livelihoods. Biodiversity and Conservation Survey of wild aromatic ethnomedicinal plants of Velliangiri hills in the southern Western Ghats of Tamil Nadu, India was done by Samyudurai *et al.* (2012). Present study is based on vegetative propagation of 45 Aromatic plants aimed for their further *ex-situ* conservation in Herbal Garden.

MATERIALS AND METHODS

Different plant parts were collected and introduced to develop the new adventitious buds than grown in poly bags or prepared beds of the Herbal Garden. This is done by shade storage of the vegetative, modified plant parts like Bulb, Tuber, Rhizome, Corm etc. (Figure 1). Under favorable environmental condition these are producing new Buds/Roots and are after separation from mother plant parts applied to grow in the field/poly bags following medium depth in soil.

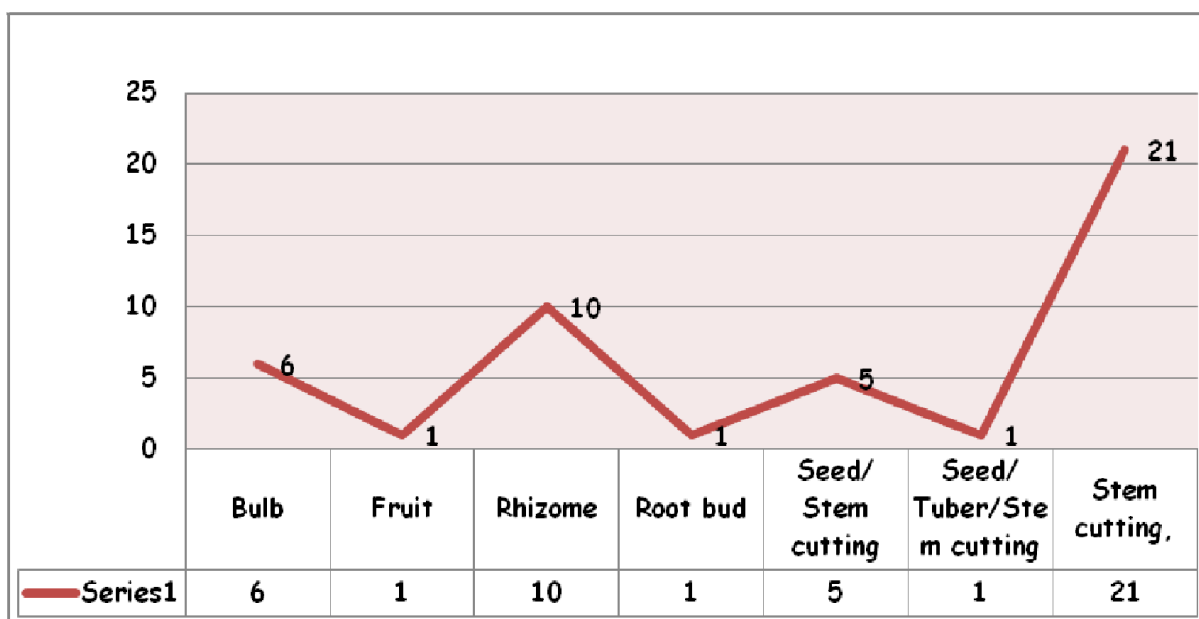


Figure 1. Vegetative Propagation methods of Aromatic plants.

Water supplied as per need of the developing Medicinal and Aromatic Plants. Excess water removed from the grown sites of these plants. After maturation these are shifted to the prepared fields with proper monitoring of the newly developing Aromatic Plants. Diseases, pest, insect etc were managed with proper weeding and pruning practices to support the plants for better growth.

RESULTS AND DISCUSSION

Vegetatively Propagated Aromatic plants are listed in Table 1 including their information like Botanical name, Common name, Family, Habit, propagation and propagation mode separately for all 45 collected and propagated MAPs.

Table 2 showing scattered number of the plants due to variation in their belonging families. Maximum number 8 plant species belonging to the family Zingiberaceae, 5 members of family Liliaceae were propagated using their vegetative parts and conserved in Herbal Garden. Rest of the Plant families includes 1- 4 plant species individually.

Table 3 is for vegetative propagation methods of Aromatic plants. Thick, old stem were shown their much efficiency in multiplication in comparison of the new ones. Aromatic plants registered for a variety of modes for their propagation like a maximum 21 species shown their propagation by stem cutting. 10 by using rhizomes. 5 by seeds/stem cutting. 6 by bulb and rest by another modes.

Habit variation of the Aromatic plants given in Table 4 and Figure 2. Out of 45 there are 26 species of the Aromatic plants herbaceous in nature. 11 Shrubs, 6 Herb/climber and rest 1-1 Tree and Shrub/climber were introduced in Herbal Garden.

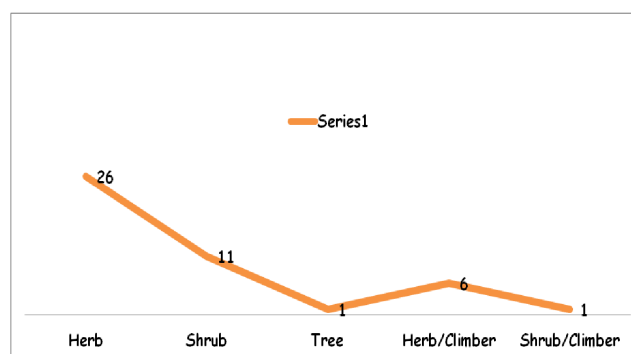


Figure 2. Habit Variation of Aromatic Plants.

CONCLUSION

Finally it is concluded that in current scenario there is an urgent need for conservation of the Medicinal and Aromatic Plants. As many of the species are due to various manmade and natural reasons has been extinct or going to loss their species population. Focusing on the above point collection, propagation and conservation of the Medicinal and Aromatic Plants will be a better step towards their conservation.

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Photographs of Aromatic plants

A. *Acorus calamus* Linn.B. *Allium canadense* Linn.C. *Allium cepa*D. *Alpinia galena* RoxbE. *Cestrum nocturnum* Linn.F. *Chromolaena odorata* (L) King & H.E. Robins.



G. *Cocos nucifera* L.



H. *Crinum latifolium* Linn.



I. *Jasminum sambac* (L.) Aiton



J. *Mentha piperata* Linn



K. *Nerium indicum* F. Le. Makino



L. *Nyctanthus arbortristis* Linn.



M. *Pandanus tectorius* So-land. Ex.



N. *Passiflora edulis* Sims



O. *Plectranthus amboinicus* (Lour.) Spreng.



P. *Plumeria rubra* Linn.



Q. *Polyanthus tuberosa* Linn.



R. *Quisqualis indica* Linn



S. *Tagetes patula* Linn.



T. *Thevetia peruviana* (Pers.) Schum.



U. *Vitex negundo* Linn.

Table 1. Diversity of the Aromatic Plants introduced in Herbal Garden.

S. No.	Botanical Names	Common Name	Family	Habit	Propagation	Regeneration Mode
1	<i>Acorus calamus</i> Linn.	Sweet flag	Araceae	Herb	Rhizome	Poly Bags/Field
2	<i>Allium canadense</i> Linn.	Wild Onion	Liliaceae	Herb	Bulb	Poly Bags
3	<i>Allium cepa</i>	Piyaz	Liliaceae	Herb	Bulb	Field
4	<i>Allium sativum</i> Linn.	Lahsun	Liliaceae	Herb	Bulb	Field
5	<i>Allium vineale</i> Linn.	Wild garlic	Liliaceae	Herb	Bulb	Poly Bags
6	<i>Alpinia galena</i> Roxb	Kulanjan	Zingiberaceae	Herb	Rhizome	Field
7	<i>Angelonia angustifolia</i> Humb & Bonpl.	Snapdragon	Scrophulariaceae	Herb	Stem cutting	Field
8	<i>Anisomeles indica</i> Linn.	Kalpnath	Lamiaceae	Herb	Stem cutting	Poly Bags/Field
9	<i>Bignonia venusta</i> Ker-Gawler	Flame vine	Bignoniaceae	Herb/ Climber	Stem cutting	Field
10	<i>Cestrum nocturnum</i> Linn.	Night jasmine	Solanaceae	Shrub	Stem cutting	Poly Bags/Field
11	<i>Chromolaena odorata</i> (L) King & H.E. Robins.	Devil weed	Asteraceae	Herb	Seed/ stem cutting	Field
12	<i>Cocos nucifera</i> L.	Coconut	Araceae	Tree	Fruit	Field
13	<i>Crinum latifolium</i> Linn.	Sudarshan	Liliaceae	Herb	Bulb	Poly Bags/Field
14	<i>Curcuma amada</i> Roxb.	Amai haldi	Zinziberaceae	Herb	Rhizome	Field
15	<i>Curcuma angustifolia</i> Roxb.	Tikhur	Zinziberaceae	Herb	Rhizome	Field
16	<i>Curcuma aromtica</i> Linn.	Jangali Haldi	Zinziberaceae	Herb	Rhizome	Field
17	<i>Curcuma caesia</i> Roxb.	Kali Haldi	Zinziberaceae	Herb	Rhizome	Field
18	<i>Curcuma longa</i> Linn.	Haldi	Zinziberaceae	Herb	Rhizome	Field
19	<i>Cyperus rotundus</i> Linn.	Nagarmotha	Cyperaceae	Herb	Rhizome	Field
20	<i>Gardeniojesmr'noides</i> Ellis	Gandhraj, Cape-Jessamine	Rubiaceae	Shrub	Stem cutting	Field
21	<i>Hedychium coronarium</i> J. Koenig	Gulbaucauli	Zingiberaceae	Herb	Rhizome	Field
22	<i>Jasminum sambac</i> (L.) Aiton	Mogra	Oleaceae	Herb	Stem cutting,	Poly Bags/Field
23	<i>Jasminum auriculatum</i>	Juhi	Oleaceae	Herb/ Climber	Stem cutting,	Field
24	<i>Jasminum gratiflorum</i> Linn.	Chameli	Oleaceae	Herb/ Climber	Stem cutting,	Poly Bags
25	<i>Lippa javanica</i> (Burm.f.) Spreng.	Lemon bush	Verbenaceae	Shrub	Stem cutting	Poly Bags/Field
26	<i>Mentha piperata</i> Linn.	Peeperment	Lamiaceae	Herb	Stem cutting	Poly Bags/Field
27	<i>Mirabilis jalapa</i> Linn	Four o clock plant	Nyctaginaceae	Herb	Seed/ Tuber/ Stem cutting	Poly Bags/Field
28	<i>Murraya paniculata</i> (L.) Jack	Madhukamani	Rutaceae	Shrub	Stem cutting	Poly Bags/Field
29	<i>Nerium indicum</i> F. Le. Makino	Kaner	Apocynaceae	Shrub	Seed/Stem cutting	Field
30	<i>Nyctanthus arbortristis</i> Linn.	Parijat, Har-shrigar	Nyctaginaceae	Shrub	Seed, Stem cutting	Field
31	<i>Ocimum gratissimum</i> Linn.	African Basil	Oxalidaceae	Herb	Stem cutting	Field
32	<i>Ocimum kilimand-scharicum</i> Linn.	Devna	Lamiaceae	Herb	Stem cutting	Field
33	<i>Paederia foetida</i> Linn.	Gandh prasarni	Rubiaceae	Herb/ climber	Stem cutting	Field

Continued

Table 1 Continued

34	<i>Pandanus tectorius</i> So-land. Ex.	Kewda	Pandanaceae	Shrub	Root bud	Field
35	<i>Passiflora edulis</i> Sims	Passion Flower, Kaurav- pandav	Passifloraceae	Herb/ Climber	Stem cutting	Poly Bags
36	<i>Piper betle</i> Linn.	Pan	Piperaceae	Herb/ Climber	Stem cutting	Poly bags/Field
37	<i>Plectranthus amboinicus</i> (Lour.) Spreng.	Pan /Wild ajwine, Maxican mint	Lamiaceae	Herb	Stem cutting	Poly Bags
38	<i>Plumeria rubra</i> Linn.	Plumeria, Tample Tree	Apocynaceae	Shrub	Stem cutting	Poly bags/Field
39	<i>Polyanthus tuberosa</i> Linn.	Tuberose	Amaryllidaceae	Herb	Bulb	Poly bags/Field
40	<i>Quisqualis indica</i> Linn.	Rangoon ki bel	Combrataceae	Shrub/ Climber	Stem Cutting	Poly bags/Field
41	<i>Rosa indica</i> Linn.	Gulab	Rosaceae	Shrub	Stem cutting	Poly bags/Field
42	<i>Tagetes patula</i> Linn.	Marigold	Asteraceae	Herb	Seed/Stem cutting	Field
43	<i>Thevetia peruviana</i> (Pers.) Schum.	Pili Kaner	Apocynaceae	Shrub	Seed/Stem cutting	Poly bags/Field
44	<i>Vitex negundo</i> Linn.	Nirgundi	Verbenaceae	Shrub	Stem cutting	Poly bags/Field
45	<i>Zinziber officinale</i> Rose.	Adarak	Zingiberaceae	Herb	Rhizome	Field

Table 2. Variation of Aromatic Plants in their Family.

S. No.	Family	Herb	Herb/ Climber	Shrub	Shrub/ Climber	Tree	Total
1	Amaryllidaceae	Herb	1	-	-	-	1
2	Apocynaceae	Shrub	3	-	-	-	3
3	Araceae	Herb	1	-	-	-	1
4	Araceae	Tree	-	-	-	1	1
5	Asteraceae	Herb	2	-	-	-	2
6	Bignoniaceae	Herb/Climber	-	1	-	-	1
7	Combrataceae	Shrub/Climber	-	-	1	-	1
8	Cyperaceae	Herb	1	-	-	-	1
9	Lamiaceae	Herb	4	-	-	-	4
10	Liliaceae	Herb	5	-	-	-	5
11	Nyctaginaceae	Herb	1	-	-	-	1
12	Nyctaginaceae	Shrub	-	1	-	-	1
13	Oleaceae	Herb	1	-	-	-	1
14	Oleaceae	Herb/Climber	2	-	-	-	2
15	Oxalidaceae	Herb	1	-	-	-	1
16	Pandanaceae	Shrub	-	1	-	-	1
17	Passifloraceae	Herb/Climber	1	-	-	-	1
18	Piperaceae	Herb/Climber	1	-	-	-	1
19	Rosaceae	Shrub	-	1	-	-	1
20	Rubiaceae	Shrub	-	1	-	-	1
21	Rubiaceae	Herb/climber	-	1	-	-	1
22	Rutaceae	Shrub	-	1	-	-	1
23	Scrophulariaceae	Herb	1	-	-	-	1
24	Solanaceae	Shrub	-	1	-	-	1
25	Verbenaceae	Shrub	-	2	-	-	2
26	Zingiberaceae	Herb	8	-	-	-	8
TOTAL							45

Table 3. Vegetative Propagation methods of Aromatic Plants.

S. No.	Parts used for Propagation	Number of the Aromatic plants
1	Bulb	6
2	Fruit	1
3	Rhizome	10
4	Root bud	1
5	Seed/ Stem cutting	5
6	Seed/ Tuber/Stem cutting	1
7	Stem cutting,	21
TOTAL		45

Table 4. Habit Variation of Aromatic Plants.

S. No.	Habit Type	Number of the Aromatic Plants
1	Herb	26
2	Shrub	11
3	Tree	01
4	Herb/Climber	06
5	Shrub/Climber	01
Total		45