

Medicinal and Aromatic Plants (MAPs): Diversity and Vegetative Propagation-I



Written by
Dr. D. K. Patel

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Preface

The current book is focused on the Diversity of Medicinal and Aromatic Plants (MAPs) and their mode for rapid and easily vegetative propagation for further Ex-Situ conservation in Herbal Garden developed under the Startup Grant UGC - New Delhi, India. A collection of vegetative parts/plant of MAPs from varied sites of the Chhattisgarh State was made for their introduction in the Herbal Garden. As the plants showing variation in their presence, diversity and mode of regeneration. A total of 100 MAPs which propagated efficiently using their vegetative parts were selected, collected and prepared for their vegetative propagation.

Various plant parts except seeds were taken in the experiment like stem cutting, leaf, root or their modified forms such as bulb, tuber, rhizome, corm etc. A bud initiation was also applied for fast propagation of the underground plant propagules. A young, disease free, mature stems cuttings were applied for vegetative propagation. As per need of the plant/plant parts requirements were managed. Better water supply and drainage facility also required for better growth of the plant. Weed removal, diseases, insect and pest etc. were also managed. 100 MAPs are arranged in alphabets order followed by their Common/Hindi Name, English Name, Sanskrit Name, Chhattisgarhi Name, Botanical Name, Family, Habit, Propagation, Brief Description, Propagation Mode and Vegetative Propagation success rate individually.

MAPS registered as great components for primary health care over the world. These are utilized as a source of folk medicine since a long ago. Due to efficient potential of MAPs its utilization over the world is increasing day by day similarly with the high demand of MAPs their existence in nature is coming under the boundary of extinction. Many natural and manmade reasons are responsible for loss of specific MAPs from a certain ecological areas which urgently need for conservation as well as propagation for their long term utilization and existence in nature. Traditional medicinal plants are important sources for treatment of varied disorders.

The propagated MAPs are documented individually following their related information and images related to the individuals of the 100 MAPs. The book will better explore the diversity of MAPs following their information's with propagation. It will also increase understanding and interest of the knowledge on MAPs useful for further conservation.

The book is beneficial for the researchers, students and other related persons not only for to identify the plant but also for the knowledge about its vegetative propagation. It can also support the peoples engaged in MAPs conservation programme/projects in multifold directions. I am hoping that the readers can find knowledge about the diversity and vegetative propagation of various MAPs and it will be helpful for further conservation of valuable and endangered MAPS.

A handwritten signature in blue ink, appearing to read "Dr. D. K. Patel", is written over a light blue rectangular background.

Thank you,
Dr. D. K. Patel

About Author



- Dr. Devendra Kumar Patel has done Ph.D. in Botany/Life Sciences and had the fellowship in Chhattisgarh Council of Science and Technology (C.G.) India sponsored Research project for 2003 - 2005. He has around Eight year of teaching/research experience. Currently He is working as an Assistant Professor in Rural Technology Department in Guru Ghasidas Vishwavidyalaya (A Central University) Bilaspur, Chhattisgarh, India.
- He is the Life member of many Indian societies like (MAPAI) Medicinal and Aromatic Plants Association of India, (IAAT) Indian Association for Angiosperm Taxonomy, (ISCA) Indian Science Congress Association, (SPTB) Society for Promotion of Tropical Biodiversity and (IBS) and Indian Botanical Society. His Research papers are presented at National and International levels. He presented his Research papers on many National, State and International Conferences/Symposia.
- He is performing as an Editor in Chief in International Journal of Biodiversity and Endangered Species and also a member of Editorial board in many reputed International Research Journals Like Int. Journal of Agrotechnology, Journal of Medicinal and Aromatic Plants, Journal of Bioremediation and Biodegradation (IF - 3.5), Journal of Plant Sciences (JPS), American Journal of Life Sciences (AJLS), Universal Journal of Plant Science, International Journal of Herbal Medicine etc.
- The Author' Research of Interest are -
 1. Plant Ecology, Diversity/Conservation/Ethno- botany/ Multiplication / Plant Propagation /Conservation of endangered/Important Medicinal Plants,
 2. Diversity assessment of the Plants, Phyto-remediation.

He is a Principal Investigator of a Research Project (Startup Grant) sanctioned from UGC New Delhi, India. Titled "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.

Acknowledgement

My sincere thanks to UGC, New Delhi for financial support to carry out the current propagation of 100MAPs for their ex-situ conservation in herbal garden under a Startup Grant Research Project. I am also thankful to all the persons who participated their role in successful development of the Herbal Garden and supporting in propagation and conservation of the Medicinal and Aromatic plants.

My best wishes to the readers...



To My Grand Mother with respect ...

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Medicinal and Aromatic Plants (MAPs): Diversity and Vegetative Propagation-I

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General Introduction

Medicinal and Aromatic plants participating remarkable role in primary health care of the peoples over the world. Forest is a main source for collection of the traditional medicinal plants. Presence of plant species in certain ecological areas is related to several ecological factors like water, temperature, light, pH etc. and also by various biotic factors. Uses of Medicinal and Aromatic Plants as a traditional medicine are followed by around 80% peoples in the world. India is marked as mega biodiversity regions over the world. Rich plant diversity present in variable ecological sites regulated by certain ecological/ environmental condition. The presence of the plants also affected by its adaptation capacity in local climates. Plants having wide capability for reproduction and for adaption capacity in changeable environmental condition.

Plant diversity also playing a significant role in the presence of rest of the species diversity in certain habitats which are remarkable segment for formation of the rich biodiversity. On the basis of utility of the plants these are categorized as food, fodder, fuel plants etc. Out of the rich plant diversity many plant species showing capability for treatment of many disorders known as MAPs. Variations can be also seen in terms of useful plant parts as well as their preparation methods for certain disorders. A complete life cycle of the plants is affected by various biotic, abiotic factors and also by the genetics of the plants. Plants are important source for global biodiversity. Adaptation capacity and utilization of the MAPs are changeable among varied MAPs in nature. Plants are showing variation in their diversity, presence, mode of utilization and propagation methods etc. These are leads by the variable climatic conditions, available facilities needed for their successful growth and development. On the basis of various habits plants are classified in herbs, shrubs and trees.

Herbs are of soft body, less branched, less height in compare of the shrubs and tree species of the plants. Herbs showing mostly annual life cycle. Under their life period it produces new individuals as their parental ones by vegetative mode as well as by seeds. Some plants also performing their propagation by their vegetative parts and seeds both. A certain type and concentration of aroma is present in few MAPs known as Aromatic

Plants. Aroma concentration in the various parts of the specific plants also affected by plant age, local environmental conditions etc. and are regulated by their own genetic makeup. Aromatic plants are not only a source of aroma but also marked for treatment of many disorders. A therapy used for treatment of specific disorder by utilizing these aromatic plants is Aromatherapy and is as old as the human civilization.

India marked for rich biodiversity with presence of rich plant diversity. Out of them many of the plants are registered as MAPs valuable among the peoples of different localities. Increasing population pressure, over exploitation, introduction of the new species, fire etc. are leading factors for endangerment of the MAPs which required for proper protection and conservation. Conservation not only provides protection of the species in certain ecological areas but it is also significant for providing chances to reproduces their own individuals as their parental ones. Plants efficiently performing as a major component for their role in primary health care in rural areas of the country. For long term existence of the plants these are producing numerous seeds with wide variation in their dispersal. Many of them significantly reproduce new individuals by their vegetative mode which cannot produce seeds. Out of the rich plant diversity some plants performs propagation by seeds and vegetative modes both.

Amujoyegbe et al., 2012 [1] noticed on cultivation supporting on medicinal plants conservation. Patel et al., 2013 [2] recorded the Climbers in urban set up - Ahmedabad and Gandhinagar. *Gloriosa superba* Linn, an important endangered medicinal plant and their conservation strategies studied by Singh et al., 2013 [3] and Suthari et al., 2014 [4] studied on the climbing plants of northern telangana in India and their ethno medicinal and economic uses. Ethnobotanical study on various medicinal plants was made by Abhyankar and Upadhyay 2011[5], Ajaib et al., 2012 [6]. Ethnomedicinal record/Utilization of medicinal plants was made by Samyurai et al., 2012 [7] Sharma and Samant 2014 [8], Sharma et al., 2003 [9], Swarnakar and Katewa 2008 [10] and Zingare 2012 [11]. Production status of varied MAPs are changeable in different ecological areas based on the climatic condition, plant adaptability as well as their market demand in local, national and international levels.

Plant/Floristic Diversity studies were done by many researchers like Harney 2013 [12] Singh and Singh 2002 [13], Adhikari et al., 2010 [14]. Diversity of Climbing Plants in Koch Bihar District of West Bengal, India was recorded by Bandopadhyya and Mukherjee 2010 [15] Barbhuiya et al., 2009 [16] noticed on Diversity and conservation of medicinal plants in Barak Valley, Northeast India. Medicinal and Aromatic plants diversity of Asteraceae in Utrakhand focused by Bisht VK and Purohit V 2010 [17] Choudhary and Kumar 2011 [18] studied on some important medicinal trees of district Bijnor. Books /flora referred for preparation of current books were Hooker JD 1875 [19] The flora of British India. Vol: I-VII, Vyas and Purohit 2007 [20] Medicinal plants Cultivation: A scientific approach, Balkrishna 2014 [21]. Ayurvedic jadi buti rahasya, Sharma PV 2013 [22] Dravyaguna Vijnana and Sastry JLN 2014 [23] Dravyaguna Vijnana. Eswani et al., 2010 [24] recorded Medicinal plant diversity and vegetation analysis of logged over hill forest of tekai tembeling forest reserve. Fordjour et al., 2008 [25] studied on Diversity and conservation of medicinal plants in the Bomma community of the Brong Ahafo region Ghana. Diversity and status of ethnomedicinal plants of Almoda district in Utrakhand, India made by Kumari et al., 2011 [26] Pandey and Tripathi 2010 [27] focussed on Diversity and distribution of aromatic plants in forests of Gorakhpur division UP India. Samant and Pant 2007 [28] observed assessment of plant diversity and prioritization of communities for conservation in Mornaula Reserve Forest.

Conservation: Why Need for...

Due to significant and multifold valuation of plant diversity in current scenario there is an urgent need for their conservation and rapid propagation. *Ex-situ* conservation is a type of conservation in outside of the natural habitat of the plants/animals. Herbal garden made over the world is for above purpose. Study on Biodiversity and conservation of medicinal and aromatic plants in Africa made by Okigbo et al., 2008 [29] Oladele et al., 2011 [30] studied on Medicinal plants conservation and cultivation by Traditional Medicine Preparation (TMPs) in Aiyedaade local Government area of Osun state, Nigeria. *Ex-situ* conservation studies on ethnomedicinal plants were made by Biswas 2010 [31], Hassan et al., 2010 [32], Patil 2012 [33], Phartyal et al., 2002 [34] Rajkumar and Rajanna 2011 [35].

Bhat et al., 2013 [36] studied on Need and importance of conservation of *Tinospora cordifolia* - a threatened medicinal plant. Hamilton, 2004 [37], focussed on Medicinal plants, conservation and livelihoods. Shankar and Rawat 2013 [38] observed on Conservation and cultivation of threatened and high valued medicinal plants in north East India. Sharma et al., 2011 [39] observed on Conservation status and diversity of some important plants in the Shiwalik Himalaya of Utrakhand, India. Biodiversity and conservation of medicinal and aromatic plants was made by Kasagana and Karumuri 2011 [40].

Objective

The current study based on following objectives:

1. Identification and collection of the valuable and endangered Medicinal and Aromatic plants.
2. To carry the plant materials/propagules for further their propagation and also for *ex-situ* conservation in Herbal Garden.
3. To document the MAPs following their related information with images.
4. Application of the plant materials for further propagation especially by their vegetative parts.
5. Re-plantation of prepared new individuals of the varied 100 MAPs.

Methodology/Experimental Set Up

For the current study varied vegetative plant parts used as a propagates to develop a new individuals of MAPs as similar to their parental ones. These parts of the plants were selected on the basis of their maturity, diseases free etc. Older/matured stem cuttings were collected/ separated carefully from mother plants and further used for vegetative propagation in Herbal Garden in poly bags than transferred further in the field.

For above purpose six poly bags for each species of the MAPs with depth 15cm, width 10cm and weight around 730gm (After filling of a mixture of sand, manure and soil equally) were taken for vegetative propagation of each individual species of varied 100 MAPs. Six poly bags were prepared for individual Medicinal and Aromatic Plants by filling manure, sand and soil in equal amount. Vegetative plant parts were grown in each poly bags in a group of six individuals of each MAPs. Continuous monitoring/observations were made for all the experimented MAPs to record the changes of the plants and also for fulfillment of

the plants requirement and to protected them against varied adverse conditions in time to time. Images of each MAPs arranged for their identification and for vegetative propagation.

Vegetative Propagation: What is and Why Need ...

Plants are efficiently regenerating by using their vegetative parts or modified plant parts such as their root, stem and leaves which produces similar individuals under the favorable environmental conditions is Vegetative Propagation. The plants which does not producing seeds are well adapted to multiply their individuals using vegetative parts and is useful for maintaining their existence in nature. To protect the plant diversity the modes of the plant propagation is a remarkable step needed for further plants conservation.

Numerous seeds production and their dispersal support the plant for their survival in nature and to maintain their existence in nature is helpful for its much spreading in different ecological areas. This process is affected by their seed number, quality, weight, dispersal mechanism followed by the environmental conditions. Vegetative parts modifications are unique for the individual species of the plants which directly support the process of their vegetative propagation.

Modified plant parts are important sources for regeneration of the new plants. These parts like bulb, tuber, rhizome, corm etc. are going dormant/resting phase in adverse environmental conditions. When these structures come under high moisture and low temperature range (Suitable environmental condition) it starts to form new buds that further develop into the same new plants like their parents. Propagation of the Medicinal and Aromatic plants is not only important for their multiplication in number but also provide better facilities to the plants for their long term presence in nature. Due to various natural and manmade reasons plant population facing problem day by day and many of them going to extinct if proper protection strategy is not applied in certain time of their life.

Day by day due to climatic changes, increasing population load, over exploitation, introduction of new species etc. are becoming key reasons for loss of the species in different habitat. Plant diversity assessment, valuation, propagation and conservation need for further application in multifold directions. Valuable plant parts which located inside of the soil are referred as underground plants regenerating by their modified structures like Bulb, Tuber, Rhizome, Corm etc. in favorable environmental condition. These plant parts used for propagation are main sources of alternative of the seeds gifted by the nature in case of the plant is not capable to reproduce seeds.

Different plant parts like roots, stem, leaves etc. are efficiently used for treatment of certain disorder. Their modified forms are also valuable for above purpose. Among rich plant diversity many of the MAPs are registered for propagation using by the methods such as by seeds and by vegetative parts with its modification like *Asparagus racemosus*, Based on above valuation in current scenario there is an urgent need for their assessment, regeneration and conservation for future generation. Vegetative propagation on different Medicinal and Aromatic plants were done by Butola and HK 007 [41] Hartmann and Kester 1983 [42], Kumar et al., 2009 [43] and Hamide 2011 [44].

Management/Care

Grown plant parts for the above purpose were well managed for successful growth and development of MAPs separately. Water supply as well as removal of excess water was managed. As per need of the plants nutrients/manure were also supplied. Controlling of

diseases/pest/insects was also followed by suitable techniques without damage of the Plants. Properly weeds were removed and other strategy needed for better growth of the MAPs were applied to support them for *ex-situ* conservation in Herbal Garden.

Conclusion

Present research deals with the Diversity and vegetative propagation of the 100 MAPs including important and endangered in their condition. It is an effort for their rapid propagation as well as for their *ex-situ* conservation in Herbal Garden. Current study aimed for the collection/Propagation of the diverse Medicinal and Aromatic plants including underground Medicinal and Aromatic plants. Among the introduced Medicinal and Aromatic plants some are endangered need for urgent protection and conservation. Not only in India but also over the world MAPs are useful for treatment of various disorders and are a prime source of traditional medicine. Demands of MAPs are increasing day by day due to rich capacity for treatment of certain disorders and also their less or no side effect.

The book is based on vegetative propagation of 100 Medicinal and Aromatic plants aimed for their further *ex-situ* conservation in Herbal Garden. Finally on the basis of present experimentation in the Herbal Garden there are 100 Diverse Maps were propagated using their vegetative mode and also by their modified parts. The current study focused not only on the diversity of 100 variable maps but also it is a better collection for supporting of the vegetative propagation of the MAPs to achieve the aim of study as for the *Ex-situ* conservation in Herbal Garden.







S. No.	Botanical name of the MAPs.	Table No.
1	<i>Acorus calamus</i> L.	1.1
2	<i>Adhatoda vasica</i> L.	1.2
3	<i>Allium sativum</i> L.	1.3
4	<i>Aloe vera</i> (L.) Burm. F. Mill.	1.4
5	<i>Alpinia galanga</i> (L.) Willd.	1.5
6	<i>Alstonia scholaris</i> L.R.Br.	1.6
7	<i>Amorphophallus paeoniifolius</i> (Dennst.) Nicolson	1.7
8	<i>Andrographis paniculata</i> Nees	1.8
9	<i>Angelonia angustifolia</i> Humb & Bonpl.	1.9
10	<i>Anisomeles indica</i> L.	2.0
11	<i>Argyreia nervosa</i> (Burm.f.) Bojer	2.1
12	<i>Asparagus racemosus</i> Willd.	2.2
13	<i>Baccopa monerri</i> L.	2.3
14	<i>Barleria prionitis</i> L.	2.4
15	<i>Basella alba</i> L.	2.5
16	<i>Boerhaavia diffusa</i> L.	2.6
17	<i>Canna indica</i> L.	2.7
18	<i>Catharanthus roseus</i> (L.) G. Don.	2.8
19	<i>Centella asiatica</i> (L.) Urban.	2.9
20	<i>Centratherum punctatum</i> Cassini.	3.0
21	<i>Chlorophytum borivilianum</i> San. & Fer.	3.1
22	<i>Chromolaena odorata</i> (L.) King & H.E.	3.2
23	<i>Cissus quadrangularis</i> L.	3.3
24	<i>Clerodendrum inerme</i> (L.) Gaertn.	3.4
25	<i>Coleus scutellarioides</i> (L.) R. Br.	3.5
26	<i>Coleus forskohlii</i> (Willd.) Briq.	3.6
27	<i>Colocasia esculenta</i> (L.) Schott	3.7
28	<i>Commiphora wightii</i> (Arn.) Bhandari	3.8

29	<i>Costus speciosus</i> (J. Konig) Sm.	3.9
30	<i>Crinum latifolium</i> L.	4.0
31	<i>Curculigo orchiooides</i> Gaerth.	4.1
32	<i>Curcuma amada</i> Roxb.	4.2
33	<i>Curcuma angustifolia</i> Roxb.	4.3
34	<i>Curcuma aromatica</i> L.	4.4
35	<i>Curcuma caesia</i> Roxb.	4.5
36	<i>Curcuma longa</i> L.	4.6
37	<i>Cymbopogon flexuosus</i> (Nees ex Steu) Wat.	4.7
38	<i>Cyperus rotundus</i> L.	4.8
39	<i>Dioscoria bulbifera</i> L.	4.9
40	<i>Eclipta prostrata</i> L.	5.0
41	<i>Eryngium foetidum</i> L.	5.1
42	<i>Euphorbia nerifolia</i> L.	5.2
43	<i>Euphorbia trigona</i> Mill.	5.3
44	<i>Grewia asiatica</i> L.	5.4
45	<i>Gymnema sylvestris</i> (Retz) R. Br.	5.5
46	<i>Hedychium coronarium</i> J. Koenig	5.6
47	<i>Helicteris isora</i> L.	5.7
48	<i>Hibiscus rosa sinenses</i> L.	5.8
49	<i>Ipomoea batatas</i> L.	5.9
50	<i>Jasminum grandiflorum</i> L.	6.0
51	<i>Justicia gendarussa</i> Burm.f.	6.1
52	<i>Kalanchoe blossfeldiana</i> Poelln.	6.2
53	<i>Kalanchoe pinnata</i> (Lam.) Pers.	6.3
54	<i>Lippa javanica</i> (Burm.f.) Spreng.	6.4
55	<i>Mentha arvensis</i> L.	6.5
56	<i>Mentha piperata</i> L.	6.6
57	<i>Mimosa pudica</i> L.	6.7
58	<i>Mirabilis jalapa</i> L.	6.8
59	<i>Moringa oelifera</i> Lam.	6.9
60	<i>Morus alba</i> L.	7.0
61	<i>Murraya paniculata</i> (L.) Jack	7.1
62	<i>Musa paradistica</i> L.	7.2
63	<i>Nerium indicum</i> F. Le. Makino	7.3
64	<i>Nyctanthus arbortristis</i> L.	7.4
65	<i>Ocimum gratissimum</i> L.	7.5
66	<i>Ocimum kilimandscharicum</i> L.	7.6
67	<i>Paederia foetida</i> L.	7.7
68	<i>Pandanus tectorius</i> Soland. Ex.	7.8
69	<i>Passiflora edulis</i> Sims..	7.9
70	<i>Petalium murex</i> L.	8.0
71	<i>Pedilanthus tithymaloides</i> (L.) Poit.	8.1
72	<i>Piper betle</i> L.	8.2
73	<i>Piper longum</i> L.	8.3
74	<i>Plectranthus amboinicus</i> (Lour.) Spreng.	8.4
75	<i>Plumbago zeylanica</i> L.	8.5
76	<i>Plumeria rubra</i> L.	8.6
77	<i>Polyanthus tuberosa</i> L.	8.7
78	<i>Quisqualis indica</i> L.	8.8
79	<i>Rauvolfia serpentina</i> Benth.ex Kurz	8.9
80	<i>Rauvolfia tetraphylla</i> L.	9.0
81	<i>Sansevieria roxburghiana</i> Schult. & Schult. F.	9.1

82	<i>Smilax zeylanica</i> (L.).	9.2
83	<i>Solanum nigrum</i> L.	9.3
84	<i>Stevia rebaudiana</i> (Bert.) Bertoni.	9.4
85	<i>Synadenium grantii</i> Hook. F.	9.5
86	<i>Tabernaemontana coronaria</i> (L.) Willd.	9.6
87	<i>Tagetes patula</i> L.	9.7
88	<i>Thevetia peruviana</i> (Pers.) Schum.	9.8
89	<i>Tinospora cordifolia</i> (Willd.) Miers.	9.9
90	<i>Urginea indica</i> Roxb.	10.0
91	<i>Vetiveria zizanioides</i> (L.) Nash	10.1
92	<i>Vitex negundo</i> L.	10.2
93	<i>Vitis vinifera</i> L.	10.3
94	<i>Woodfordia fruticosa</i> (L.) Lurz.	10.4
95	<i>Zephyranthes rosea</i> Lindl.	10.5
96	<i>Zingiber zerumbet</i> (L.).	10.6
97	<i>Zinziber officinale</i> Rose.	10.7
98	<i>Achyranthus bidentata</i> Blume	10.8
99	<i>Gloriosa superba</i> L	10.9
100	<i>Homalocladium platycladum</i> (F. J. Muell. exHook)L. H. Bailey	11.0

Table 1: List of the Medicinal and Aromatic Plants (Maps) Propagated through their Vegetative Modes in Herbal Garden for their Ex-Situ Conservation.

Diversity of The Medicinal and Aromatic Plants (Maps) Propagated through their Vegetative Modes in Herbal Garden for their Ex-Situ Conservation

Table - 1.1		
Common/Hindi Name - Vacha, Ghodvach English Name - Sweet flag Sanskrit Name -Uragandha, Vacha		
Chhattisgarhi Name - Bhutnasan, Vach Botanical Name - <i>Acorus calamus</i> Linn		
Family - Araceae Habit - Herb Propagation - Rhizome		
Brief Description - It is moist loving, herbaceous in nature with presence of rhizome inside of the soil. Leaves are long, isobilateral, smooth and apex pointed. The plant includes aroma in rhizome and also in their aerial parts.		

Propagation Mode -The plant is propagated by their underground rhizomes with adventitious buds which are capable to reproduces the new individuals of *Acorus calamus* Linn. For this purpose healthy, diseases free rhizomes should be selected for their propagation. Buds should be initiated before growing for fast propagation. The rhizomes with buds should be grown around 3 - 6 inches deep in soil followed by proper water facility.

Vegetative Propagation success rate -100%

Table - 1.2









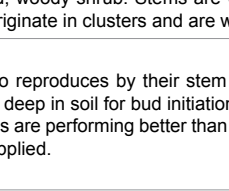
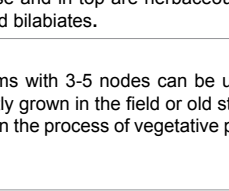








<p>Common/Hindi Name - Adusa, Adus</p>		
<p>English Name - Malabar nut Sanskrit Name - Vasa, Vasika, Vasaka</p>		
<p>Chhattisgarhi Name - Vasa, Vasaka</p>		
<p>Botanical Name - <i>Adhatoda vasica</i> Linn</p>		
<p>Family - Acanthaceae</p>		
<p>Habit - Shrub</p>		
<p>Propagation - Stem cutting</p>		
<p>Brief Description - It is a medium heighted, woody shrub. Stems are woody at the base and in top are herbaceous in nature. Leaves are simple, long, smooth. Flowers originate in clusters and are white in colour and bilabiate.</p>		
<p>Propagation Mod - This plant is capable to reproduces by their stem cutting, Old stems with 3-5 nodes can be used for this purpose. 4 – 7 inches of the stem should be deep in soil for bud initiation. It can be directly grown in the field or old stems should deep in water for fast bud initiation. Old stems are performing better than the young ones in the process of vegetative propagation. As per need of the plant water should be supplied.</p>		
<p>Vegetative Propagation success rate -100%</p>		

Table - 1.3

<p>Common/Hindi Name - Lahsun</p>		
<p>English Name - Garlic Sanskrit Name - Rason</p>		




Chhattisgarhi Name - Lesun, Lehsun		
Botanical Name - <i>Allium sativum</i> Linn		
Family - Liliaceae		
Habit – Herb		
Propagation - Bulb		
Brief Description - The plant is small herb and bulbous in nature, Leaves are long, smooth, green with aroma. Bulbs are small and underground, white in colour and originate in clusters.		
Propagation Mode – Adventitious buds are produced by the plants around main grown bulb. These bulbs with new buds are performing to develop in to new individuals under favorable environmental condition. Buds grown in poly bags and field both. It can be propagated directly in the field with better field preparation. Excess water should be removed to protect the developing new plants. Spacing between plant to plant and row to row should be carefully done to provide better chances for generation of many bulbs.		
Vegetative Propagation success rate -100%		

Table - 1.4







Common/ Hindi Name - Gwarpatah, Aloe		
English Name - Indian aloe		
Sanskrit Name - Ghritkumari		
Chhattisgarhi Name - Ghritkumari		
Botanical Name - <i>Aloe vera</i> (Linn). Burm.f		
Family - Liliaceae		
Habit - Herb		
Propagation - Bud		
Brief Description - This is a succulent plant with flashy, long, broad at the base and gradually narrow at the top leaves and are filled with jelly like component. Flowers are originating in a long spike.		
Propagation Mode – The plant is regenerating by the mode of adventitious buds produced by the older mother plants nearby its body. Separation of buds from mother plant should be done carefully without damage of other plant parts. Separated buds can be grown in suitable places in the field by maintaining proper distance of the plants as well as row to row. As water logging is a harmful event for growth of the plant so excess water should be removed from beds/fields where it is cultivated.		
Vegetative Propagation success rate -100%		

Table - 1. 5












<p>Common/Hindi Name - Blue ginger, Kulanjan</p>		
<p>English Name - Java Galangal Sanskrit Name - Sugandha Vacha, Kulinjana</p>		
<p>Chhattisgarhi Name- Neela Adrak</p>		
<p>Botanical Name - <i>Alpinia galanga</i> (L.) Willd.</p>		
<p>Family - Zingiberaceae</p>		
<p>Habit - Herb</p>		
<p>Propagation - Rhizome</p>		
<p>Brief Description - It is an aromatic, medium heighted, herbaceous aromatic as well as medicinal plant. Stem cylindrical, smooth. Leaves are simple, green and apex acute. Flowers in clusters.</p>		
<p>Propagation Mode - This plant is regenerating by their underground rhizomes which are sources of production of the new plants. It bears new adventitious buds. Rhizome cut with new buds are selected and deep in field/poly bags in around 4 – 6 inches depth and supplied water by avoiding water storage in the grown sites.</p>		
<p>Vegetative Propagation success rate -83.33%</p>		

Table - 1.6

<p>Common/Hindi Name - Satona, Saptaparni</p>		
<p>English Name - Devil Tree, Indian Pulai, Sanskrit Name - Saptaparni</p>		
<p>Chhattisgarhi Name - Satwan Botanical Name - <i>Alstonia scholaris</i> L.R.Br</p>		
<p>Family - Apocynaceae</p>		
<p>Habit - Shrub</p>		
<p>Propagation - Stem cutting</p>		

<p>Brief Description - It is medium heighted dense leafy, woody plant in tree form. Stem cylindrical, branched and rough. Leaves are simple, glabrous and shiny.</p>
<p>Propagation Mode - It is capable to reproduce new plants by the mode of their stem cutting. Young woody stems are used for its propagation directly in selected part of the fields. It can be also developed in poly bags than transplanted to the fields. Deep around 5 - 8 inches of cut part of the stem in soil. Following proper water maintenance new leaves/buds develop. Water storage should be avoided.</p>
<p>Vegetative Propagation success rate - 100 %</p>

Table - 1.7







<p>Common/Hindi Name - Zimikand, Van Suran</p>		
<p>English Name - Amorphophallus, Elephant yam</p> <p>Sanskrit Name -Vanasoorana, Surana, Kanana kanda</p>		
<p>Chhattisgarhi Name - Zimikand, Zimikanda</p>		
<p>Botanical Name - <i>Amorphophallus paeoniifolius</i> (Dennst.) Nicolson</p>		
<p>Family - Araceae</p>		
<p>Habit - Herb</p>		
<p>Propagation - Corm</p>		
<p>Brief Description - The plant is herbaceous with presence of hemispherical corm inside of the soil and upper part includes leaves are compound, green, shiny, smooth and petiole long and rough.</p>		
<p>Propagation Mode - Corm of this plants which located underground are used to develop new individuals. Corms producing new buds and which is further developing into new plant like their mother plant. An older corm producing many buds than can be separated by cutting of corms. Each part of the corm with new buds are used to propagate the plant. These parts should deep in soil and water logging should be avoided.</p>		
<p>Vegetative Propagation success rate -100%</p>		

Table - 1.8

<p>Common/Hindi Name - Bhuneem, Kalmegh, Kirayat</p>		
<p>English Name - The creat, Green Chireta, King of bitters</p> <p>Sanskrit Name - Kalamegha ,Bhunimba</p>		

Chhattisgarhi Name- Bhuineem		
Botanical Name - <i>Andrographis paniculata</i> Nees		
Family - Acanthaceae		
Habit- Herb		
Propagation - Seed/Stem cutting		
Brief Description - The plant is medium heighted, herbaceous plant with branched stem (Angular), and simple, smooth, shiny leaves. The plant includes bitter compound and also called "King of Bitter".		
Propagation Mode - Stem cutting, Seeds both are the mode of developing new individuals of this plant. In moist condition 6 - 8 inches long, old stem cutting with 4-6 nodes are taken and grown either in poly bags or in the beds directly. Water supply should be done as per need of the plant and always avoid water logging near the new developing plants/stem cutting.		
Vegetative Propagation success rate -100%		

Table - 1.9





Common/Hindi Name - Angelonia, Summer Snapdragon		
English Name - Narrow leaf angelon		
Sanskrit Name - Hayahapuchhi, kalyani		
Botanical Name - <i>Angelonia angustifolia</i> Humb & Bonpl		
Family - Scrophulariaceae		
Habit - Herb		
Propagation - Stem cutting		
Brief Description - The plant is marked for its medicinal value as well as for their ornamental/flower importance. Stems are unbranched, angular, and herbaceous. Leaves are dark green, simple, dentile and apex pointed. Flowers originate in clusters. The plant is rich in their glandular secretion.		
Propagation Mode - It does not forming seeds and well adapted to regenerate by using their stem cutting. 6 - 9 inches long stems are selected and deep in soil around 2 - 3 inches depth in field. /poly bags. A moderate level of water is needed for better growth of this plant.		
Vegetative Propagation success rate -100%		










Table - 2.0		
<p>Common/Hindi Name - Godhara, Gopoti, Kalpanath</p> <p>English Name -Malabar catmint</p> <p>Sanskrit Name - Vaikunthah, Mahadronah</p>		
<p>Chhattisgarhi Name - Bada van talsa</p> <p>Botanical Name - <i>Anisomeles indica</i> Linn</p>		
<p>Family - Lamiaceae</p> <p>Habit - Herb</p> <p>Propagation - Seed/Stem cutting</p>		
<p>Brief Description - The plant s medium heighted herbaceous in nature. Stem angular, branched, and smooth. Leaves are simple, dentile margin and apex acute. Inflorescence racemose type.</p>		
<p>Propagation Mode - It produces seeds and also registered their capability for regeneration by the mode of stem cutting. An old stem around 8 - 10 inches are selected and cut from mother plant. These should be grown in the fields or in poly bags. Water should be managed with proper its removal facility.</p>		
<p>Vegetative Propagation success rate -100%</p>		

Table - 2.1		
<p>Common/Hindi Name -Vidhara</p> <p>English Name - Elephant creeper, Wooly morning glory</p> <p>Sanskrit Name - Aavegi</p>		
<p>Chhattisgarhi Name - Vidhara</p> <p>Botanical Name -<i>Argyreia nervosa</i> (Burm.f.) Bojer</p>		



Family - Convolvulaceae		
Habit - Herb/ climber		
Propagation -Stem cutting		
Brief Description - This is a climbing nature plant which basal parts are woody and upper part herbaceous in nature. Stems are cylindrical, smooth and leaves are broad, heart shaped, wooly and green.		
Propagation Mode - It is mostly regenerating by their stem cutting, Woody stem having rich capacity to develop in to new plants as compare to new ones. Oblique cut should be made on the stem and further it should be deep in poly bags or fields directly around 5 – 8 inches depth. As the plant is spreading so there is a need of proper spacing between the propagating stem. Moisture level should be maintained by providing water and always avoid the storage of water.		
Vegetative Propagation success rate -83.33%		

Table - 2.2







Common/Hindi Name - Satavar, Satmuli		
English Name - Asparagus Sanskrit Name - Satavari, Narayani		
Chhattisgarhi Name - Satavar, Chhatavar		
Botanical Name - <i>Asparagus racemosus</i> Willd		
Family - Liliaceae		
Habit - Shrub/Climber		
Propagation - Seed/Tuber		
Brief Description - It is a spiny, xerophytic, climber plant of medicinal as well as ornamental value.		
Propagation Mode - Seed/Tubers are used to regenerate this plant. In summer season it produces numerous seeds which are round, green in colour and changed in to red-brown than black after their maturation. The plant is also producing clusters of tubers inside of the soil and is carefully separated to develop new individuals. Deep this structures in soil by around 3 - 6 inches depth. Moderate water provided to the plants. Excess water may be harmful to this xerophytic plant. After development of new plants a support also required because it is of climbing in nature.		
Vegetative Propagation success rate -83.33%		













Table - 2.3		
Common/Hindi Name - Brahmi		
English Name - Baby tears		
Sanskrit Name - Somvalli, Saraswati		
Chhattisgarhi Name - Chhota brahmi		
Botanical Name - <i>Baccopa monerri</i> Linn.		
Family - Scrophulariaceae		
Habit - Herb		
Propagation - Stem cutting		
Brief Description - The plant is water/shade loving, herbaceous in nature. It includes small, fleshy, ovate leaves and white flowers.		
Propagation Mode - Stem cutting mode of propagation is used for this herbaceous, creeper plant. Small pieces of the old stems with presence of 6—8 nodes are used for development of new individuals of this plant. The plant is capable to grow in almost all type of soil with mixing of compost, sand etc. Water should be provided as per need of the plant. Beds/fields should not be dry but filled with water.		
Vegetative Propagation success rate -100%		

Table - 2.4		
Common/Hindi Name - Piyabonsa Katseria,		
English Name - Porcupine flower, Sanskrit Name - Sanchar, Jhinti,		
Chhattisgarhi Name - Malti, Piyabasa		
Botanical Name - <i>Barleria prionitis</i> Linn.		
Family - Acanthaceae		
Habit - Herb		
Propagation - Seed/ Stem cutting		
Brief Description - This is a medium heighted, Stem cylindrical, smooth, and green with spines. Leaves are simple, glabrous and flowers are yellow in colour.		

Propagation Mode - Seed/ Stem cutting both are the plant parts used for regenerating the new plants. Seeds are produced by the plant single time in a year can be used to develop new plants. This plant is also propagated by their stem cutting. Stem cutting with 6-8 nodes should be selected for vegetative propagation of this plant. 3-6 nodular parts of the selected stem cutting are deep in soil with better supply of water. After few days new buds, leaves are developing and forming a new plant as their parental ones.
Vegetative Propagation success rate -100%

Table - 2.5










Common/Hind Name - Poi		
English Name - Red wine pinch		
Sanskrit Name - Potki		
Chhattisgarhi Name - Poi		
Botanical Name - <i>Basella alba</i> Linn.		
Family - Chenopodiaceae		
Habit - Herb/Climber		
Propagation - Seed/Stem cutting		
Brief Description - The plant is herbaceous, climber with soft stem and ovate, smooth, shiny leaves.		
Propagation Mode - Seed/Stem cutting, both the methods are used for their propagation. Numerous small seeds are produced by the plant in ending of their life. The plant also capable to reproduces new individuals by their stem cutting. Fast regeneration takes place by this mode. Small pieces around 5 – 8 inches length with 6-8 nodes can be used to grow the plant directly at the field may be develop in poly bags also. After maturation it can be transferred to the selected places with proper water management.		
Vegetative Propagation success rate -100%		

Table - 2.6

Common/Hindi Name - Gadapurna, Punarnava, Thikri		
English Name - Pigweed, Hogweed		
Sanskrit Name - Punarnava, Sothaghni,		
Chhattisgarhi Name - Punarnava		
Botanical Name - <i>Boerhaavia diffusa</i> Linn.		



Family - Nyctaginaceae		
Habit - Herb/ Creeper		
Propagation - Stem cutting		
<p>Brief Description - This Plant is herbaceous, creeper in nature, Nodes, internodes are clear. It is moist loving plant with ovate, simple leaves and small flowers.</p> <p>Propagation Mode - Stem cutting mode of vegetative propagation is used for multiplication of this plant. Stem cutting with 4-6 nodes are used for its propagation. Around 3 - 5 inches part of the stem deep in soil and maintain the level of moisture. Avoid water logging for successful growth of the plant.</p> <p>Vegetative Propagation success rate -100%</p>		








Table - 2.7		
Common/Hindi Name - Canna, Indian shot English Name -Canna lily , African arrowroot Sanskrit Name - Sarvajayaa, VankeLii		
Chhattisgarhi Name - Baijanti Botanical Name - <i>Canna indica</i> Linn.		
Family - Zingiberaceae Habit - Herb Propagation - Rhizome		
<p>Brief Description - This is a rhizomatous, herbaceous plant with water loving tendency and includes unbranched, cylindrical and smooth stem bearing long, fan like green, glabrous leaves.</p> <p>Propagation Model - The plant regenerates by using their Rhizomes. The parts of rhizome with adventitious buds can be used for further propagation of this plant. Small parts of rhizomes with buds are selected, removed and deep in soil by following around 4 – 6 inches depth. Supply water in proper way. It requires much water so fill water near the plants.</p> <p>Vegetative Propagation success rate -100%</p>		

Table - 2.8		
Common/Hindi Name -Sadabahar, English Name -Rose periwinkle Sanskrit Name - Sadapushpa,		









Chhattisgarhi Name - Sadasuhagin		
Botanical Name <i>Catharanthus roseus</i> (L.) G. Don		
Family - Apocynaceae		
Habit - Herb		
Propagation - Seeds/Stem cutting		
Brief Description - The plant is herbaceous in nature with cylindrical, smooth and branched stem. Leaves are simple, ovate, shiny and glabrous. Dense canopy develop after growth of this plant. Flowers originates in clusters are pink, white in colours.		
Propagation Mode - Seeds/Stem cutting both modes are found to be suitable for multiplication of the plant. Seeds are small, black develop in pods. It is a source of generation of the new plants. Stem cutting with 6-10 nodes can also be used for regeneration of this plant by deeping in soil by around 1/3 part of the stem. Proper water availability is required for successful development of new plants.		
Vegetative Propagation success rate -83.33%		

Table - 2.9		
Common/Hindi Name - Mandukparni,		
English Name -Sheep root - Indian pennwort		
Sanskrit Name - Manduki, Supriya, Sarda		
Chhattisgarhi Name - Brahmi		
Botanical Name - <i>Centella asiatica</i> (L.) Urban		
Habit - Herb		
Family - Apiaceae		
Propagation - Stem cutting/Runner		
Brief Description - This is a creeper, Water/shade loving, herbaceous plant, Petiole long, Leaves are simple, ovate. Plant commonly grown near the water bodies.		

Propagation Mode - Runner of this plant used for fast propagation of this plant. It should not deep much in soil. After growing of this plant parts beds/fields should be filled with water to generate new roots and leaves. After few days naturally it is spreading in the grown sites and converts into dense grouped plants.

Vegetative Propagation success rate -100%

Table - 3.0

<p>Common/Hindi Name - Brazilian Bachelor's Button</p>		
<p>English Name - Lark daisy</p>		
<p>Sanskrit Name - Somaraji</p>		
<p>Chhattisgarhi Name - Supari phul</p>		
<p>Botanical Name -<i>Centratherum punctatum</i> Cassini</p>		
<p>Family - Asteraceae</p>		
<p>Habit - Herb</p>		
<p>Propagation - Seed/ Stem cutting</p>		

Brief Description - The plant is an herbaceous with creeping tendency. Stems are branched, cylindrical. Leaves are dentile, simple and glabrous.

Propagation Model - It is producing many seeds and also well adapted to grow by the mean of their stem cutting. An old stem part of 3 – 6 inches is found to be suitable for this plants propagation. Each stem should be deep in soil around 3 inches depth in the beds or it can be also propagated in poly bags which need for transfer to the suitable places after its maturation. As per requirement of the plant water should be supplied.

Vegetative Propagation success rate -100%

Table - 3.1

<p>Common/Hind Name - White musli,</p>		
<p>English Name - Indian Spidar Plant Sanskrit Name - Dhavalmusli, Balyakanda</p>		





Chhattisgarhi Name- Safed musli		
Botanical Name - <i>Chlorophytum borivillianum</i> San. & Fer		
Family - Liliaceae		
Habit - Herb		
Propagation - Bulb		
Brief Description - The plant is an herbaceous, bulbous nature plant with long shiny and smooth leaves.		
Propagation Mode – The plant includes underground bulb which can be used for regeneration of the new individuals of the plants. Adventitious bulbs produced by older bulbs. Each adventitious bulbs are capable to convert into a new plant as their parental plant. These are used to develop new plants. Bulbs are carefully separated from mother plant and deep in soil around 4 inches depth and cover with soil. Proper water facility should be done and avoid water logging.		
Vegetative Propagation success rate -100%		

Table - 3.2





Common/Hindi Name - Devil Weed, Tivra Gandha		
English Name - Christmas Bush Sanskrit Name -Ropani, Seekhrasarpī		
Chhattisgarhi Name- Vilayati Mehandi		
Botanical Name – <i>Chromolaena odorata</i> (L.) King & H.E. Robins		
Family - Asteraceae		
Habit - Herb		
Propagation - Stem cutting,		
Brief Description - This plant includes aroma and is a medium heighted, dense, cylindrical branched stem and green, dentile, glabrous leaves. Flowers are in clusters.		
Propagation Mode - It is performing better to regenerate vegetatively by their stem cutting. Older stems are found to be more suitable for this purpose than the others. A stem with 6 - 9 inches length should be cut carefully from mother plant and deep in soil by around 3-5inches depth. To maintain the moisture level need for proper water that should be supplied properly and also it need for removal facility of excess water from the beds/poly bags.		
Vegetative Propagation success rate -100%		












Table - 3.3		
Common/Hindi Name - Hathzode		
English Name - Bone setter, Veld grape Sanskrit Name - Asthisanhar, Vajradi		
Chhattisgarhi Name- Hathzodi, Hadsanghar		
Botanical Name - <i>Cissus quadrangularis</i> Linn Family - Vitaceae		
Habit - Herb/Climber		
Propagation - Stem cutting		
Brief Description - It is an herbaceous, climber plant with quadrangular, smooth stem, Leaf simple, small and glabrous. Tendrils also present and helpful to climb the plant in any support.		
Propagation Mode - Stem cutting is registered as a main part for vegetative propagation of this plant. The plant is succulent type and nodes are clear capable to develop new roots. Stem with presence of 4-6 nodes is used for propagation by deeping 2-3 node part in soil. As per need of the plant water should be supplied for better growth and development of the plant.		
Vegetative Propagation success rate -100%		

Table - 3.4		
Common/Hindi Name - Chhoti ari, Glory Bower, Smooth Volkameria		
English Name - Garden Quinine, Sanskrit Name - Kundali, Sangam Kuppi		
Botanical Name - <i>Clerodendrum inerme</i> (L.) Gaertn.		
Family - Verbenaceae		
Habit - Shrub		
Propagation - Stem cutting		

Brief Description - The plant is medium height shrub with much branched, cylindrical and dense stems. Leaves are simple, oval shaped, glabrous, green. Flowers are white and in clusters.

Propagation Mode - It is well adapted to regenerate by their stem cutting mode. Old stems performing better than new ones. In this purpose stem around 10 inches are selected and cut from their mother plant and deep in soil (Around 3 inches) direct in the field or in poly bags. Manage the water level as per need of the plant.

Vegetative Propagation success rate -100%

Table - 3.5

<p>Common/Hindi Name -Coleus</p>		
<p>English Name - Painted nettle Sanskrit Name - Karpuravalli</p>		
<p>Chhattisgarhi Name - Chitkabripan</p>		
<p>Botanical Name - <i>Coleus scutellarioides</i> (L.) R. Br.</p>		
<p>Family - Lamiaceae</p>		
<p>Habit - Herb</p>		
<p>Propagation - Stem cutting</p>		

Brief Description - The plant is soft, herbaceous in nature. Stems are soft, angular, and smooth. Leaves are multicoloured with dentile margins. Flowers are in clusters.

Propagation Model - It is not producing seeds but successfully propagated by using their stem cutting. Although old stems showing fast growth than new stem can be also used for this purpose. Carefully cutting of the stem should be applied for their vegetative propagation. Deep the cut stem in around 3-4 inches depth in the field directly or in poly bags and supply water as per need of the plant. Avoid water storage in field/poly bags.

Vegetative Propagation success rate -100%

Table - 3.6

<p>Common/Hindi Name - -Patharchur, Karpuravali</p>		
<p>English Name- Indian Coleus Sanskrit Name - Makandi</p>		
<p>Chhattisgarhi Name- Patharchur</p> <p>Botanical Name - <i>Coleus forskohlii</i> (Willd.) Briq</p>		



Family - Lamiaceae		
Habit - Herb		
Propagation - Seed/ Stem cutting		
<p>Brief Description - The plant includes aroma and is herbaceous in nature, leaves are hairy, simple and thick. Stems are Cylindrical, branched and hairy. Flowers are violet in colour and in clusters.</p> <p>Propagation Model - Numerous seeds are produced by the plant but for rapid propagation its stem cutting is used. Stem which includes 4-8 nodes are used to develop the new plants. 2-4 nodular parts of stem should be deep in soil by maintaining moisture level. After some days new buds originates on nodular parts of the stem and further it develop as their parental plants. If plants develop in poly bags it requires transferring them in the fields. Excess water should be removed from the fields.</p> <p>Vegetative Propagation success rate -100%</p>		






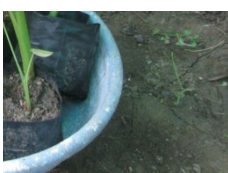
Table - 3.7		
Common/Hindi Name - Arvi, Kachalu		
English Name - Taro Sanskrit Name - Aaluki, Alupam		
Chhattisgarhi Name - Kuchai		
Botanical Name - <i>Colocasia esculenta</i> (L) Schott Family - Araceae		
Habit - Herb		
Propagation - Corm		
<p>Brief Description - The plant is herbaceous which includes corm inside of the soil. Stem not clear and petiole long, smooth with ovate, large, glabrous and green leaves in which waxy coat present.</p> <p>Propagation Mode - Corm with new adventitious buds are performing to develop the new plant. Before growing of this plant new buds should be initiated from corm by putting large amount of corms in jute bags with proper moisture level. Deeping of the corms with buds in the beds should be around 3 - 5 inches depth and also need for care in distance between plant - to plant and row to row. Excess water should be removed from beds/fields in proper way.</p> <p>Vegetative Propagation success rate -100%</p>		

Table - 3.8		
Common/Hindi Name - Guggul		
English Name - Mukul myrrh tree		




<p>Chhattisgarhi Name- Guggul, Gugal</p>		
<p>Botanical Name - <i>Commiphora wightii</i> (Arn.) Bhandari</p>		
<p>Family - Burseraceae</p>		
<p>Habit - Shtub</p>		
<p>Propagation - Stem cutting</p>		
<p>Brief Description - This plant is xerophytic, shrub in nature. Stem woody, cylindrical, branched bearing small leaves. These leaves are simple, glabrous and of dentile margin. The plant marked as slow growth plant. It is an endangered, red listed important medicinal plant so, need for much propagation to protect the plant species.</p>		
<p>Propagation Model - Its stem cuttings are performing suitable for its rapid propagation. Stem with 6 - 9 inches length are selected and cut obliquely from mother plant carefully. These stems are deep in soil of the beds/poly begs by 1/3 part deep. Moderate range of water needed for proper growth of the new individuals. Better water removal facilities are also required.</p>		
<p>Vegetative Propagation success rate -83.33%</p>		

Table - 3.9







<p>Common/Hindi Name - Keu</p>		
<p>English Name - Spiral flag Sanskrit Name - Pushkara, Kashmeera</p>		
<p>Chhattisgarhi Name - Keu kanda</p>		
<p>Botanical Name - <i>Costus speciosus</i> (J. Konig) Sm.</p>		
<p>Family - Zingiberaceae</p>		
<p>Habit - Herb</p>		
<p>Propagation - Rhizome/ Stem cutting</p>		
<p>Brief Description - The plant is medium heighted, herbaceous plant with long, simple leaves spirally arranged on the stem. Rhizomes are underground. Flowers white in colour.</p>		
<p>Propagation Mode - Seed/Rhizome/Stem cutting all these plant parts are used for propagation of this plant. The plant includes rhizome inside of the soil. Numerous seeds also produced by the plant. Vegetatively the plant reproduces in new plants by rhizomes and stem cutting. A rhizome with buds produces new individuals plants whereas 5 - 8 inches long older stem also capable to develop into new plants after deeping in soil around 3 - 4 inches depth. Excess water removal facility required for better growth of the plant.</p>		
<p>Vegetative Propagation success rate -83.33%</p>		

Table - 4.0









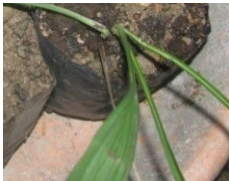

<p>Common/ Hindi Name - Sukhdarshan</p>		
<p>English Name - Wild leaved crinum Sanskrit Name - Sudarshan</p>		
<p>Chhattisgarhi Name - Sudarshan</p>		
<p>Botanical Name - <i>Crinum latifolium</i> Linn.</p>		
<p>Family - Liliaceae</p>		
<p>Habit - Herb</p>		
<p>Propagation - Bulb</p>		
<p>Brief Description - This is a bulbous, herbaceous plant with long, simple, smooth and shiny leaves.</p>		
<p>Propagation Mode - Bulb of this plant are capable to develop in to the new individuals like their parental ones. Adventitious bulbs are produced by an older bulb, after separation of these bulbs each can develop in to a new plant. The plant requires moderate range of water/moisture. Bulbs may be decay in excess water level in the field/soil so plants should be protected against water logging.</p>		
<p>Vegetative Propagation success rate -100%</p>		

Table - 4.1

<p>Common/Hindi Name - Kali musli, Musli kand</p>		
<p>English Name - Black musli Sanskrit Name - Tal musli, Hemapushpi</p>		
<p>Chhattisgarhi Name - Kali musli</p>		
<p>Botanical Name - <i>Curculigo orchioides</i> Gaerth.</p>		

Family - Amaryllidaceae		
Habit - Herb		
Propagation - Seed/Rhizome		

Brief Description - The plant is herbaceous in nature with sessile, lanceolate leaves with presence of elongated rhizome in soil. Flowers are yellow in colour also known as a golden eye grass.

Propagation Mode - Seed/Rhizomes are mode for their propagation. Numerous seeds produced by the plant for their further multiplication. Rhizomes are originates in clusters and by separation of these parts it is grown in the fields. As per need of the plant water should be supplied and always avoid the condition of the water logging.

Vegetative Propagation success rate -100%

Table - 4.2









Common/Hindi Name - Ama haladi, Karpura haridra		
English Name - Mango ginger Sanskrit Name - Amragandhi Haridra		
Chhattisgarhi Name - Ama Hardi, Aami Hardi		
Botanical Name - <i>Curcuma amada</i> Roxb.		
Family - Zinziberaceae		
Habit - Herb		
Propagation - Rhizome		
Brief Description - The plant is medium heighted, herbaceous in nature which includes underground rhizome. Each rhizome marked by the presence of node, internodes and grows horizontally inside of soil.		
Propagation Mode - Rhizome is its important plant part for further generation of this plant. New buds develop from nodular part of the rhizome. Its pieces with the presence of buds can be used for further propagation of the plant. Rhizomes are deep in soil approximately 3-5 inches depth. Light water required in initial stage of growth but after development of the plant water supplied as per their need. Water logging is harmful for growth of rhizome so it should be always avoid.		
Vegetative Propagation success rate -83.33%		

Table - 4.3

Common/Hindi Name - Tikhur		
English Name - Indian arrowort Narrow leaved Turmeric Sanskrit Name - Talkshir		





Chhattisgarhi Name - Tikhur		
Botanical Name - <i>Curcuma angustifolia</i> Roxb.		
Family - Zinziberaceae		
Habit - Herb		
Propagation - Rhizome		
Brief Description - The plant is herbaceous in nature which includes rhizome inside of soil. Each rhizome marked by the presence of node, internodes. Buds/roots originate from their node.		
Propagation Mode - Rhizome is its important plant part for further generation of this plant. New buds develop from nodular part of the rhizome. Its pieces with the presence of buds can be used for further propagation of the plant. Rhizomes are deep in soil approximately 3 - 5 inches depth. Light water required in initial stage of growth but after development of the plant water supplied as per need of the plant. Water logging is harmful for growth of rhizome so it should be always avoid.		
Vegetative Propagation success rate -83.33%		

Table - 4.4







Common/Hindi Name - Van Haldi, Jangali Haldi		
English Name - Wild Turmeric Sanskrit Name - Aranya, Haridra, Van Haridra		
Chhattisgarhi Name - Ban Hardi		
Botanical Name - <i>Curcuma aromatica</i> Linn		
Family - Zinziberaceae		
Habit - Herb		
Propagation - Rhizome		
Brief Description - The plant is an herb with underground rhizome which includes nodes and internodes and producing buds. Leaves are smooth, long, fan shaped.		
Propagation Mode - Almost similar method can be followed as for <i>Curcuma angustifolia</i> Roxb.		
Vegetative Propagation success rate -100%		

Table - 4.5







<p>Common/Hindi Name - Kali Haldi, Krishna Kedar</p> <p>English Name - Black Turmeric</p> <p>Sanskrit Name - Nishaa, Raatri</p>		
<p>Chhattisgarhi Name - Kari Hardi</p> <p>Botanical Name <i>Curcuma caesia</i> Roxb</p>		
<p>Family -Zinziberaceae</p> <p>Habit - Herb</p> <p>Propagation - Rhizome</p>		
<p>Brief Description - Like <i>Curcuma aromatica</i> Linn. But different in presence of black line at middle part of the Leaf.</p>		
<p>Propagation Mode - Almost similar method can be followed as for <i>Curcuma angustifolia</i> Roxb.</p>		
<p>Vegetative Propagation success rate -100%</p>		

Table - 4.6







<p>Common/Hindi Name - Haldi</p> <p>English Name - Turmeric</p> <p>Sanskrit Name - Haridra, Rajani</p>		
<p>Chhattisgarhi Name - Hardi</p> <p>Botanical Name - <i>Curcuma longa</i> Linn.</p>		
<p>Family - Zinziberaceae</p> <p>Habit - Herb</p> <p>Propagation - Rhizome</p>		
<p>Brief Description - It is large than <i>Curcuma aromatica</i> Linn and rest are almost similar with <i>Curcuma aromatica</i> Linn.</p>		
<p>Propagation Mode - Almost similar method can be followed as other <i>zingiber</i> sps.</p>		
<p>Vegetative Propagation success rate -100%</p>		


















Table - 4.7		
Common/Hindi Name - Green tea English Name - Lemon grass Sanskrit Name - Bhutik, Sugandha		
Chhattisgarhi Name - Lemongrass Botanical Name - <i>Cymbopogon flexuosus</i> (Nees ex Steu) Wat. Family - Poaceae		
Habit - Herb Propagation - Seed/ Root bud		
Brief Description - The plant is herbaceous in nature with cylindrical and smooth stem. Adventitious roots and long, rough surface, pointed leaves. Flowers in clusters. Propagation Mode - Seed/ Root. As the plant is monocot and developing roots in clusters. An adventitious root originates in clusters out of them new buds with roots are carefully separated and can be planted in poly bags or direct in the fields. Moderate level of water is required for growth of this plant. Field should avoid the water logging. Vegetative Propagation success rate -100%		

Table - 4.8		
Common/Hindi Name - Motha, Mustak, English Name - Cocograss, Nut grass Sanskrit Name - Musta, Varid		
Chhattisgarhi Name - Gengarva Band Botanical Name - <i>Cyperus rotundus</i> Linn. Family - Cyperaceae		
Habit - Herb Propagation -Rhizome		
Brief Description - The plant is perennial, monocot which includes underground rhizome. Leaves are pointed shiny and smooth around 10 cm long.		

Propagation Mode - The rhizome is a source for propagation of the plant. Rhizome goes to resting phase during summer season and when get favorable environmental condition it starts to grow in to new buds. Rhizomes with new adventitious buds are separated and used to grow in beds. Moderate water should be provided the newly growing plants.

Vegetative Propagation success rate - 100 %

Table - 4.9

<p>Common/Hindi Name - Gaithi, Vardhi kand</p>		
<p>English Name - Potato yam, Bulb bearing yam, Sanskrit Name - Varahikand,</p>		
<p>Chhattisgarhi Name - Dang kanda Botanical Name - <i>Dioscoria bulbifera</i> Linn.</p>		
<p>Family - <i>Dioscoriaceae</i></p>		
<p>Habit - Herb/Climber</p>		
<p>Propagation - Tuber/ Stem cutting</p>		

Brief Description - The plant is herbaceous and climbing in nature producing tuber in aerial parts. It is also called "Air potato". Stem long, less branched, angular and green. Leaves cardiac shaped, glabrous, green and apex pointed.

Propagation Mode - Tuber/Stem cutting both are found to be suitable for its propagation. Tuber structure is marked as useful for its vegetative propagation. Adventitious buds are developing from mature tubers in better climatic condition which are capable to regenerate it in to new individuals. The plants stem cutting including of 4-8 nodes are also performing as a mode of vegetative propagation and are developing in to new plants like their parental ones. Proper water supply needed for growth of new developing plants.

Vegetative Propagation success rate -100%

Table - 5.0

<p>Common/Hindi Name - Bhangra, English Name - False daisy Sanskrit Name - Bhingraj</p>		
<p>Chhattisgarhi Name - Bhingraj</p>		
<p>Botanical Name - <i>Eclipta prostrata</i> Linn.</p>		



Family - Asteraceae		
Habit - Herb		
Propagation - Seed/Stem cutting		
<p>Brief Description - The plant is herbaceous in nature including soft, cylindrical and smooth stem, clear nodes and bearing small and simple leaves. Flowers are small and white in colour.</p> <p>Propagation Mode - Seed/Stem cutting these both modes of propagation are found to be a best source to develop the new plants. Numerous seeds produced by this plant. Cut part of the stem is also performing better in its vegetative propagation. Stem part selected for its further propagation should be including 5-10 nodes and around 2- 3 inches stem deep in soil. It should be followed by supply of water as per need of the plant.</p> <p>Vegetative Propagation success rate -100%</p>		

Table - 5.1









Common/Hindi Name - Jangali dhaniya		
English Name - Wild coriander		
Chhattisgarhi Name - Ban dhaniya		
Botanical Name - <i>Eryngium foetidum</i> Linn.		
Family - Apiaceae		
Habit - Herb		
Propagation - Seed/ Stem cutting		
<p>Brief Description - The plant is short and of creeping tendency. It is moist loving plant with aroma like of coriander. Stem branched, smooth and cylindrical. Leaves with dentile margins, simple and smooth.</p> <p>Propagation Mode - Seeds are small and a source of its development in to new plants where as stem cutting also marked for their propagation under favorable environmental condition. Stem cut around 5 inches length and approx. four inches should deep in direct field or in poly bags. Water providing as per need of the plant.</p> <p>Vegetative Propagation success rate -100%</p>		

Table - 5.2

Common/Hindi Name - Thuhar		
English Name - Common Milky hedge, Indian spurge tree		
Sanskrit Name - Snuhi, Vajri,		




Chhattisgarhi Name - Sehur, Thuhar		
Botanical Name - <i>Euphorbia nerifolia</i> Linn.		
Family - Euphorbiaceae		
Habit - Herb		
Propagation - Stem cutting		
Brief Description - The plant is xerophytic in nature which includes angular, spiny, branched and green stem. Leaves are green, oblong and smooth. The plant parts having milky latex.		
Propagation Mode - It is not producing seeds but capable to regenerate frequently by their stem cutting mode. Cut of stem part are deep in soil around 4 - 6 inches depth in soil following moderate water supply. Stems are spiny so carefully cut should be made during propagation. It also can be grown in poly bags and are transferred to suitable sites after maturation. Water storage near the plant should be avoided.		
Vegetative Propagation success rate -100%		

Table - 5.3







Common/Hindi Name - African milk tree, Cathedral Cactus		
English Name - Sanskrit Name - Tridhara, Nanda, Vajra,		
Chhattisgarhi Name - Aakashballi		
Botanical Name - <i>Euphorbia trigona</i> Mill		
Family - Euphorbiaceae		
Habit - Herb		
Propagation - Stem cutting		
Brief Description - It is xerophytic in nature and a succulent plant. Stem modified in to thick structure and includes chlorophyll. Leaves are small, smooth and ovate. Milky latex present in aerial part of the plant.		
Propagation Mode - The plant does not producing seeds but adapted for vegetative propagation by their stem cutting mode. Older stem with length 6 -9inches are selected and deep in beds/poly bags. Water supply made as per need of the plant and remove excess water from beds/poly bags.		
Vegetative Propagation success rate -100%		

Table - 5.4














<p>Common/Hindi Name - Phalsa, Phalsao</p>		
<p>English Name - Phassa Sanskrit Name - Parushaka, Alpasthi, Parapara</p>		
<p>Chhattisgarhi Name - Phalsa</p>		
<p>Botanical Name - <i>Grewia asiatica</i> L</p>	 	
<p>Family - Tiliaceae</p>		
<p>Habit - Shrub</p>		
<p>Propagation - Stem cutting</p>		
<p>Brief Description - It is a medium heighted shrub. Stem cylindrical, woody, branched. Leaves are simple, alternate and of rough surface.</p>		
<p>Propagation Mode - The plant is adapted to multiply by their stem cutting. Old, woody stems are selected and cut oblique to regenerate the plants. Stem cut around 10 inches should deep in the field or can be also developed in poly bags followed by proper water facility.</p>		
<p>Vegetative Propagation success rate -83.33%</p>		

Table - 5.5

<p>Common/Hindi Name - Gudmar, Merasingi</p>		
<p>English Name - Gymnema Sanskrit Name - Madhunashini, Meshshringi</p>	 	
<p>Chhattisgarhi Name - Gurmar</p>		
<p>Botanical Name - <i>Gymnema sylvestris</i> (Retz) R. Br.</p>	 	
<p>Family - Asclepiadaceae</p>		
<p>Habit - Herb/Climber</p>	 	
<p>Propagation - Seed/Stem cutting</p>		
<p>Brief Description - The plant is of woody stem at the base and comparatively soft at the top. Climbing nature plant, Leaves are ovate, simple, apex pointed. Flowers minute yellow-white in colour and originates in clusters.</p>		

Propagation Mode - The plant is producing seeds. Propagation by stem cutting is most popular method for this plant. Small pieces of the older stems which include 8-10 nodes are selected to grow the plant. Stem cutting deep in soil around 3 – 4 inches depth and supply water. A facility of excess water removal is needed for the plant growth. After development of the plant a support is needed to climb the plant.

Vegetative Propagation success rate -83.33%

Table - 5.6






<p>Common/ Hindi Name - <i>Gulbakawali</i></p>		
<p>EnglishName - white ginger lily Sanskrit Name</p>		
<p>Chhattisgarhi Name - Gulablauli</p> <p>Botanical Name -<i>Hedychium coronarum</i> J. Koenig</p>		
<p>Family - Zingiberaceae</p>		
<p>Habit - Herb</p>		
<p>Propagation</p>		
<p>Brief Description - The plant is herbaceous including rhizome. Stem long, cylindrical, and smooth. Leaves are long, glabrous and apex acute. Flowers are in clusters.</p>		
<p>Propagation Mode - It is not producing seeds but capable to regenerates by their rhizomes. Rhizomes are producing new buds and are also main source to form the new plants. Each rhizome cut should include bud and are deep in soil around 4 - 6 inches deep. Management of water required as per need of the plant.</p>		
<p>Vegetative Propagation success rate -100%</p>		

Table - 5.7

<p>Common/Hindi Name - Bhendu</p> <p>English Name - East Indian Screw Tree</p> <p>Sanskrit Name - Avarttani</p>		
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Chhattisgarhi Name - Aithi		
Botanical Name - <i>Helicteres isora</i> Linn.		
Family - Sterculiaceae		
Habit - Shrub		
Propagation - Stem cutting		
Brief Description - This is an important medicinal plant with woody, shrub in nature, Stem woody, cylindrical, rough and branched. Leaves ovate, simple, dentile, Flowers are orange-red in colour, fruits long, quailed, spirally twisted, green in initial stage but is changes after maturation in to black – brown in colour.		
Propagation Mode -The plant is well adapted to reproduces new individuals by their Stem cutting. In this purpose older stems performing better than the new ones. Stem cutting of 6 - 9 inchesm length are used for regeneration of new plants. Stem cutting should be oblique in cut and deep in soil around 3 inches. Supply water as per need of the plant and protect the new plants against water logging.		
Vegetative Propagation success rate -100%		

Table - 5.8






Common/Hindi Name - Gudahal,		
English Name - Rose of China, Sanskrit Name - Japa, Arkpriya, Rudrapushpa		
Chhattisgarhi Name - Gudahal, Madar		
Botanical Name - <i>Hibiscus rosa-sinenses</i> Linn		
Family - Malvaceae		
Habit - Shrub		
Propagation - Stem cutting		
Brief Description - This plant is important for its medicinal as well as ornamental values. The plant is medium heighted shrub. Stem woody, cylindrical and branched. Leaves are simple, smooth, shiny, dentile margins and apex pointed. Flowers are large and in many colours.		
Propagation Mode - It is not producing seeds but can be successfully multiplied by their stem cutting mode. Oblique cutting of the stem around 8 – 10 inches length are deep in soil (of beds or in poly bags) till of around 4 inches depth. Proper water management is required for initial origination of the new buds from nodes and also for their further growth. Excess water should be removed from the beds/poly bags.		
Vegetative Propagation success rate -83.33%		

Table - 5.9















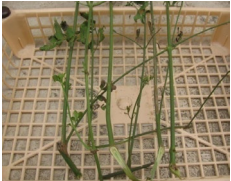


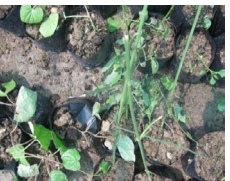
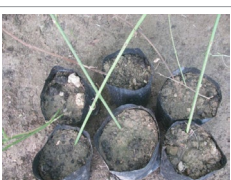

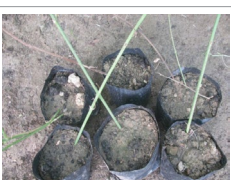

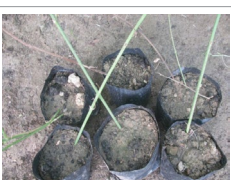

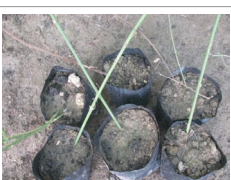

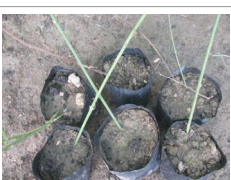

Common/Hindi Name -Shakarkand		
English Name - Sweet potato Sanskrit Name Sitaluk		
Chhattisgarhi Name - Kanda		
Botanical Name - <i>Ipomoea batatas</i> Linn.		
Family - Convolvulaceae		
Habit - Herb		
Propagation - Stem cutting/ Tuber		
Brief Description - This is a Herb with creeper and tuberous plant. Stems are smooth, cylindrical, less branched with creeping tendency. Leaves are simple, glabrous and apex pointed.		
Propagation Mode - It is vegetatively propagated by using their stem cutting and also by tubers. Small tubers with adventitious buds are useful for generation of the new individuals. Stem cutting around 9 inches are selected and deep one third in selected field or in poly bags. As per need of the plant water supplied and avoid water logging.		
Vegetative Propagation success rate -100%		

Table - 6.0

Common/Hindi Name - Chameli		
English Name - Spanish jasmine Sanskrit Name - Jati		
Chhattisgarhi Name - Chameli		
Botanical Name - <i>Jasminum grandiflorum</i> Linn		
Family - Oleaceae		
Habit - Herb		
Propagation - Stem cutting		
Brief Description - This plant is valuable for their medicinal as well as aromatic value. Basal part of the plant is woody and upper part soft in nature. Stem cylindrical, smooth and branched. Leaves are ovate, green, shiny and smooth.		

Propagation Mode - Stem cutting is widely used method for its regeneration. It does not producing seeds. Stem cutting around 4 - 6 inches long should be selected for regenerating the plants. 6 - 8 nodes should be above of soil after Deeping its stem cutting in beds/poly begs Better water management should be done as required by the plants.

Vegetative Propagation success rate -66.66%

Table - 6.1







Common/Hindi Name - Kala adulasa		
English Name - Willow-leaved justicia Sanskrit Name - Vaidyasinha		
Chhattisgarhi Name - Kariyabasa		
Botanical Name - <i>Justicia gendarussa</i> Burm. F.		
Family - Acanthaceae		
Habit - Herb		
Propagation - Stem cutting		
Brief Description - It is a medium heighted, herbaceous nature plant. Stem smooth, branched. Leaves are simple, glabrous, acute, and alternate.		
Propagation Mode - This plant is not producing seeds but well performing in their multiplication by stem cutting mode. 10 inches old stems are selected and cut obliquely to deep in soil around 4 inches in poly bags or in the fields. Moderate range of water needed for successful growth of the newly developing plants.		
Vegetative Propagation success rate -100%		

Table - 6.2

Common/Hindi Name - Kalanchoe		
English Name - Christmas Kalanchoe Sanskrit Name - Parna bija		
Chhattisgarhi Name - Chhote Bhasampatri		
Botanical Name - <i>Kalanchoe blossfeldiana</i> Poelln		



Family - Crassulaceae		
Habit - Herb		
Propagation - Leaf/Stem cutting		
Brief Description - The plant is succulent, medium heighted, round leaves, branched cylindrical, smooth stem. Flowers in clusters and dark red in colour .		
Propagation Mode - It does not producing seeds. The plant is successfully adapted to regenerate by the mode of their stem cutting as well as adventitious buds develop from the apex of the leaf. 5-10 new adventitious buds produced at the apex of leaves and each having capability to convert into a new parental plant. Artificially or naturally (by water) these structures are transferred from one place to another and develop its new individuals.		
Vegetative Propagation success rate -100%		

Table - 6.3









Common/Hindi Name - Pattharchatta, Mothers of Hundreds		
English Name - Air plant, Life plant Sanskrit Name - Parnabija, Astibhaksha,		
Chhattisgarhi Name - Bhasampatri		
Botanical Name - <i>Kalanchoe pinnata</i> (Lam.) Pers.		
Family - Crassulaceae		
Habit - Herb		
Propagation - Leaf/Stem cutting		
Brief Description - The plant is succulent and xerophytic in nature not require much water for their growth and development. Stem long, cylindrical, smooth with thick, simple, ovate and dentile leaves.		
Propagation Mode - It is showing difference among other ones in terms of their mode of propagation. Mostly this plant is propagating by their leaves. Each notch on margins of the leaves having growing point which are developing in to new plants in moist situation. New individuals of this plant develop either older leaves attached to the stem or after separation of the leaves upper surface are put towards soil covering with soil/sand. After development of new individuals leaf margins with new plants are separated and are planted in selected/prepared beds/poly bags. Stem cutting of this plant with buds are also used for above purpose. Water should supply as per need of the plant.		
Vegetative Propagation success rate -100%		

Table - 6.4

Common/Hindi Name - Lemon Bush, Bukkan		
English Name - Fever tea, Wild tea, Sanskrit Name -Vasir, Vasuka		





Chhattisgarhi Name-		
Botanical Name - <i>Lippia javanica</i> (Burm.f.) Spreng		
Family - Verbenaceae		
Habit - Shrub		
Propagation - Stem cutting		
<p>Brief Description - This plant is woody, xerophytic, medium heighted plant with presence of aroma in leaves. Stems are long, cylindrical, less branched and angular. Leaves are simple, rough surface and dentate margins. Flowers originate in clusters.</p> <p>Propagation Mode - It does not form seeds but stem cutting playing role in regeneration of this plant. Old stems are preferred for their further propagation. Stem should be of around 8 - 10 inches long and deep in soil it by 3 - 5 inches dept directly in the fields or in poly bags. The plant does not require much water so excess amount of the water should be removed from the grown area. Plants in poly bags are transferred after its maturation in selected places.</p> <p>Vegetative Propagation success rate -100%</p>		

Table - 6.5






Common/Hindi Name - Podina		
English Name - Spear mint, Garden mint Sanskrit Name - Rochini,		
Chhattisgarhi Name - Pudina		
Botanica Name - <i>Mentha arvensis</i> Linn.		
Family - Lamiaceae		
Habit - Herb		
Propagation - Stem cutting		
<p>Brief Description - This plant is also marked as aromatic as well as medicinal valuable plant like <i>Mentha piperata</i> Linn. Stems are soft, angular, green leaves with dentate margins, rough surface and comparatively small than <i>Mentha piperata</i> Linn.</p> <p>Propagation Mode - It is well propagated through their stem cutting. Stem included by 8-10 nodes should be cut from mother plant and planted in to the prepared beds/poly bags. Following deep around 2-3 inches. Moisture level should be maintained. In initial stage the field should be filled with water. After some days a dense structure forms.</p> <p>Vegetative Propagation success rate -100%</p>		

Table - 6.6











<p>Common/Hindi Name - Peepermint</p>		
<p>English Name - Brandi mint Sanskrit Name - Sugandhi patra</p>		
<p>Chhattisgarhi Name- Peepermint</p>		
<p>Botanical Name - <i>Mentha piperata</i> Linn</p>		
<p>Family - Lamiaceae</p>		
<p>Habit - Herb</p>		
<p>Propagation - Stem cutting</p>		
<p>Brief Description - This is marked as aromatic as well as medicinal valuable herbaceous plant. Stems are soft, angular and less branched. Leaves dark green, simple, smooth, with dentile margin.</p>		
<p>Propagation Mode - Similar methods can be adopted for its regeneration like of <i>Mentha arvensis</i> Linn.</p>		
<p>Vegetative Propagation success rate -100%</p>		

Table - 6.7

<p>Common/Hindi Name - Lajvanti</p>		
<p>English Name - Touch me not, Shame plant Sanskrit Name - Lajjalu</p>		
<p>Chhattisgarhi Name - Chui-mui</p>		
<p>Botanical Name - <i>Mimosa pudica</i> Linn.</p>		
<p>Family -Fabaceae</p>		
<p>Habit - Shrub</p>		
<p>Propagation- Seed/Stem cutting</p>		
<p>Brief Description - The plant is a shrub with woody, cylindrical, branched and spiny stems. Leaves are compound, sleeping in nature. Flowers are pink or white in colour.</p>		

Propagation Mode - It is producing numerous seeds and also capable to regenerates new plants by their stem cutting. Small pieces of the stem with 5 - 8 nodes/buds are selected for further development of the plants. 4-6 nodes should be upper side of the soil and the same should deep in soil. Grown stem cutting should be supplied water and excess storage of water should be removed.

Vegetative Propagation success rate - 83.33%

Table - 6.8


<p>Common/Hindi Name - Beauty of the night, Gulabas, Gulbakshi</p> <p>English Name - Four o' clock plant</p> <p>Sanskrit Name - Krishnakeli, Sandhyakuli</p>		
<p>Chhattisgarhi Name - Lal Gulal</p> <p>Botanical Name - <i>Mirabilis jalapa</i> Linn.</p>		
<p>Family - Nyctaginaceae</p> <p>Habit - Herb</p> <p>Propagation - Seed/Tuber/Stem cutting</p>		

Brief Description - The plant is important for its medicinal as well as ornamental values for colourful flowers. It is medium heighted herbaceous plant. Stems are smooth, cylindrical, green and weak. Leaves are simple, heart shaped, smooth and apex acute. Flowers are multicolored. Seeds are round, black in colour with rough surface.

Propagation Mode - It is successfully regenerating using their Seed/Tuber/Stem cutting. Seeds performing as a source of development of new individuals of this plant. Tubers with presence of buds and stem cutting of 5-8 nodes are selected and deep in soil by moderate depth and are supplied water properly. Avoid water logging from the beds/poly bags. Plants develop in poly bags are shifted in selected beds after their maturation.

Vegetative Propagation success rate -100%

Table - 6.9

<p>Common/Hindi Name Sahinjan -</p> <p>English Name - Indian Horse Radish, Drume stick Tree</p> <p>Sanskrit Name - Mochak, Sobhanjana</p>	
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Chhattisgarhi Name - Munga		
Botanical Name - <i>Moringa oelifera</i> Lann.		
Family - Moraceae		
Habit - Herb		
Propagation - Stem cutting		
Brief Description - The plant is important for its medicinal values and different parts like fruit and leaves are also used in vegetables. Stem rough, cylindrical, branched. Leaves are compound. Flowers are in a group. Fruits long, angular, green with pointed end.		
Propagation Mode - The plant is forming seeds and also capable to multiply by using their old stem cutting. These are cut carefully from mother plant and are deep in soil around of 8-10 inches depth. Upper part protected by covering dung. Water supply made as per need of the plant.		
Vegetative Propagation success rate -83.33%		

Table - 7.0

Common/Hindi Name - Sahatoot		
English Name - Mulberry Sanskrit Name - Brahmataru, Tooda		
Chhattisgarhi Name - Shahtoot, Toot		
Botanical Name - <i>Morus alba</i> Linn.		
Family - Moraceae		
Habit - Shrub		
Propagation - Stem cutting		
Brief Description - This is medium heighted shrub with woody, branched, cylindrical rough stem. Leaves are simple, smooth, dentile margins. Flowers in clusters.		

Propagation Mode - Stem cutting of this plant is widely used for its regeneration. It does not producing seeds. Old stem cutting performed better for above purpose. Oblique stem cutting with 6-9 inches length are selected and deep in soil following 1/3 parts of the stem. After deeping of stem cutting regular water supply needed for successful growth of the new plants. As per need of the plant water should be supplied. The plant can be propagated directly in the field or in poly bags also. After development of the plant in poly bags are transferred to the suitable fields.

Vegetative Propagation success rate -83.33%

Table - 7.1









<p>Common/Hindi Name - Madhukamni, Kamini</p>		
<p>English Name - Orange jasmine</p>		
<p>Chhattisgarhi Name - Madhukamani</p>		
<p>Botanical Name - <i>Murraya paniculata</i> (L.) Jack</p>		
<p>Family - Rutaceae</p>		
<p>Habit - Shrub</p>		
<p>Propagation - Seed/Stem cutting</p>		
<p>Brief Description - The plant is medium heighted, woody, shrub in nature. It is a valuable plant for its flower as well as medicinal values. Stems are smooth, cylindrical and branched. Leaves are compound, shiny, and glabrous. Flowers are in clusters with aroma.</p>		
<p>Propagation Mode - It produces seeds and also regenerating by their stem cutting. Stem around 6 - 9 inches long are obliquely cut and are deep in soil (Directly in selected place or in poly bags) by its 1/3 part. In the presence of proper moisture level its growth of buds/leaves starts. Excess water should be removed from beds/poly bags. If it is propagated in poly bags plants after maturation transferred in the fields.</p>		
<p>Vegetative Propagation success rate -83.33%</p>		

Table - 7.2

<p>Common/Hindi Name - Kela</p>		
<p>English Name - Banana Sanskrit Name - Vana Laxmi, Rambha, Bhanuphala, Kadali phal</p>		








Chhattisgarhi Name - Kera		
Botanical Name - <i>Musa paradisiaca</i> Linn.		
Family - Musaceae		
Habit - Herb		
Propagation - Rhizome		
<p>Brief Description - The plant is important for its medicinal as well as fruit value. It is also grown for religious purpose and is herbaceous in nature with cylindrical, long unbranched, smooth stem. Leaves are broad smooth and marked by the parallel venation. Many fruits develop in a spike.</p> <p>Propagation Mode - Plant does not forming seeds and well adapted to grow in to new individuals by the mode of their rhizomes. Rhizomes with adventitious buds are found to be suitable part for vegetative propagation and are carefully separated from mother plant. Rhizomes are deep in soil around 5-7 inches depth. As the plant is water loving nature so required more water in comparison of another ones.</p> <p>Vegetative Propagation success rate -100 %</p>		

Table - 7.3










Common/Hindi Name - Kaner		
EnglishName - Sweet scented oleander, Roseberry spurge		
Sanskrit Name - Karavira		
Chhattisgarhi Name - Kaner		
Botanical Name - <i>Nerium indicum</i> F. Le. Makino		
Family - Apocynaceae		
Habit - Herb		
Propagation - Seed /Stem cutting		
		

Brief Description - The plant is less branched, medium heighted, xerophytic in nature. Stems are cylindrical and smooth soft at top and woody at the base. Leaves thick, smooth, long and whorls on the stem.

Propagation Mode - It produces seeds that can develop in to new plant but stems are more used to propagate the plants. Old stems performing better for this purpose. Oblique stem cutting with presence of 5-10 nodes are selected and deep in soil by 4 - 6 inches depth. Water supply should be made as per need of the plant. Excess water may be harmful so, always avoid supply much water to the plants.

Vegetative Propagation success rate -83.33%

Table - 7.4




<p>Common/Hindi Name - Harshingar</p>		
<p>English Name - Night jasmine, Sanskrit Name - Parijat, Ragpushpi,</p>		
<p>Chhattisgarhi Name- Parijat</p>		
<p>Botanical Name - <i>Nyctanthus arboristis</i> Linn</p>		
<p>Family - Nyctaginaceae</p>		
<p>Habit - Shrub</p>		
<p>Propagation - Stem cutting</p>		

Brief Description - This is a medium heighted woody shrub plant important for its medicinal and aromatic value. Stem woody at the base and is herbaceous at the top, angular and branched. Leaves are simple, glabrous, dentile margin, apex pointed.

Propagation Mode - It is producing seeds and well performed to multiply by their stem cutting. This practice is widely used to regenerate the plant. Cut part of the old stem should include 5-8 nodes/buds and deep in soil around 4-6 inches depths in selected field/poly bags. Maintenance of the moisture level is urgent need for growth of the stem cutting.

Vegetative Propagation success rate -83.33%

Table - 7.5

<p>Common/Hindi Name - Ben</p>		
<p>English Name - Shrubby Basil Sanskrit Name - Vindra</p>		







Chhattisgarhi Name - Devna	
Botanical Name - <i>Ocimum gratissimum</i> Linn.	
Family - Lamiaceae	
Habit - Herb Propagation - Seed/Stem cutting	
Brief Description - The plant is famous for its religious as well as medicinal values. It is herbaceous plant, Stems are angular, branched. Leaves are simple, glabrous and of dentile margins. It also includes aroma.	
Propagation Mode - This plant is producing seeds and also capable to develop in to new plants by using their stem cutting. Each cut part of the stem should include 4 - 6 nodes and deep it in the depth of around 2-3 inches directly or may be also propagated in poly bags than transferred to selected beds of the fields.	
Vegetative Propagation success rate -100%	

Table - 7.6






Common/Hindi Name - Kapuri Tulsi, Kilimanjaro Basil English Name - African blue basil Camphor Basil Sanskrit Name - Kapura Tulasi		
Chhattisgarhi Name - Kariya Devana Botanical Name - <i>Ocimum kilimandscharicum</i>		
Family - Lamiaceae		
Habit - Herb		
Propagation - Seed/ Stem cutting		

Brief Description - This is aromatic as well as medicinally valuable herbaceous, branched plant. Stem angular, hard at the basal part and are soft at the top. Leaves are smooth, simple. Apex pointed including aroma.

Propagation Mode - It produces numerous seeds and also capable to regenerate by their stem cutting. Mature stem which having 5-10 nodes are suitable for its multiplication. By deeping in soil followed by 2 3 inches depth. Proper water supply is required and removes excess water from the fields/poly bags to control on water logging.

Vegetative Propagation success rate-100%

Table - 7.7

<p>Common/Hindi Name - Gandha Prasarinini</p> <p>English Name - Chinese moon Creeper</p> <p>Sanskrit Name - Prasarni, andhpatra</p>		
<p>Chhattisgarhi Name - Gandhi pan</p> <p>Botanical Name - <i>Paederia foetida</i> Linn</p>		
<p>Family - Rubiaceae</p>		
<p>Habit - Herb/climber</p>		
<p>Propagation - Stem cutting</p>		

Brief Description - It is an herbaceous, climber nature plant with presence of an odour. Stem cylindrical, branched and weak. Leaves are simple, glabrous, entire and basal part broad and acute at apex.

Propagation Mode - The plant is well adapted to regenerate by using their stem cutting mode. Older stems performing better than a new one. Old stem cutting made by following around 9 inches long deeping it by 3 inches in the field or can be also regenerates in poly bags. Provide water as per need of the plant and manage water removal facility in grown sites.







Vegetative Propagation success rate -100%

Table - 7.8

<p>Common/Hindi Name - Kewda, Jambul, Umbrella tree</p>		
<p>English Name - Screw pine</p>		
<p>Sanskrit Name - Sucikapuspa, Ketaki</p>		

Chhattisgarhi Name - Kevara		
Botanical Name - <i>Pandanus tectorius</i> Soland. Ex.		
Family - Pandanaceae		
Habit - Shrub		
Propagation - adventitious bud		
Brief Description - The plant is tall with long, dentile, shiny green leaves. Apex acute		
Propagation Mode - The plant regenerates by their adventitious buds. These should be carefully removed from their mother plant without damage of the plant. New buds are grown in poly bags or can be planted directly in the selected fields. To maintain the moisture level and avoid water logging both are urgent need for their propagation		
Vegetative Propagation success rate -100%		

Table - 7.9

Common/Hindi Name - Wild maracuja, Passion fruit, Marya-marya		
English Name - Purple granadilla		
Sanskrit Name - Mamataphala, Amlaphala		
Chhattisgarhi Name - Kaurav-Pandav		
Botanical Name - <i>Passiflora edulis</i> Sims		
Family - Passifloraceae		
Habit - Herb		
Propagation - Stem cutting		
Brief Description - It is climber flowering as well as medicinal plants. Stem smooth, cylindrical, branched. Leaves are simple, green and glabrous, Shiny. Flowers are attractive with aroma.		

Propagation Mode - The plant is not producing seeds but well propagated by its stem cutting. Older stem found to be more efficient in generation of the new plants. Water supply needed as per need of the plant.

Vegetative Propagation success rate -83.33%

Table - 8.0










<p>Common/Hindi Name - Bada Gokharu</p>		
<p>English Name - Land Caltrops Sanskrit Name - Gajadauns tree, Gokshur, Tiktagokshura</p>		
<p>Chhattisgarhi Name- Gukharu</p>		
<p>Botanical Name - <i>Pedaliium murex</i> Linn.</p>		
<p>Family - Pedaliaceae</p>		
<p>Habit - Herb</p>		
<p>Propagation - Buds</p>		
<p>Brief Description - It is a short, herbaceous plant. Stem smooth, cylindrical and branched. Leaves are ovate; Flower yellow and fruits are spiny.</p>		
<p>Propagation Mode - The plant is producing seeds and can be also propagated by using their stem cutting. Stems are cut from mother plant around 9 inches and deep in soil of the field or in poly bags. Water should be supplied as per need of the plant.</p>		
<p>Vegetative Propagation success rate -66.66%</p>		

Table - 8.1

<p>Common/Hindi Name - Naga daman</p>		
<p>English Name - Jew's Slipper. Sanskrit Name</p>		
<p>Chhattisgarhi Name - Naga damna</p>		
<p>Botanical Name - <i>Pedilanthus tithymaloides</i> (Linn.) Poit.</p>		



Family - Euphorbiaceae	 
Habit - Herb	
Propagation - Stem cutting	
<p>Brief Description - The plant is herbaceous in nature at upper portion but woody at the base. Stems are cylindrical, smooth, and green. Leaves are simple, alternate, sessile, glabrous with wavy margins. Milky latex present in stem and leaves both.</p> <p>Propagation Mode - It does not producing seeds and capable to reproduces by their stem cuttings. Old stem with 4-8 nodes are selected and cut from mother plant. It can grow in the field/beds directly or also can be propagated in poly bags than transferred to required sites. Water supply made as per need of the plant.</p> <p>Vegetative Propagation success rate -100%</p>	

Table - 8.2







Common/Hindi Name - Pan		
English Name - Betel Leaf, Betel creeper Sanskrit Name - Tambul, Nagavalli		
Chhattisgarhi Name - Beera Pan,		
Botanical Name - <i>Piper betle</i> Linn.		
Family - Piperaceae		
Habit - Herb/ Climber		
Propagation - Stem cutting		
<p>Brief Description - This plant is moist/shade loving, climbing nature, herbaceous, medicinally important plant. Stems are cylindrical, smooth, less branched. Leaves are heart shaped, broad, simple, glabrous and of shiny surface.</p> <p>Propagation Mode - It is showing capability to regenerate by their stem cutting mode. Each stem used for this purpose should includes 8 -10 nodes and is deep in beds/poly bags following 3 inches depth. Site for its regeneration should be maintaining water level with proper facility of removal of the excess water.</p> <p>Vegetative Propagation success rate -100%</p>		

Table - 8.3

Common/Hindi Name - Pimpli, pipli		
English Name - Long pepper, Dried Catkin Sanskrit Name - Pipli, Chapla,		





Chhattisgarhi Name - Peeperadi, Peepra		
Botanical Name - <i>Piper longum</i> Linn.		
Family - Piperaceae		
Habit - Herb		
Propagation - Stem cutting		
Brief Description - The plant is creeper, herbaceous with cylindrical, branched and green stem. Leaves are heart shaped, green, and smooth with apex pointed.		
Propagation Mode - New individuals of this plant can be developed by their stem cutting. A stem around 6 – 8 inches long with 6 – 8 nodes are enough for development of the new plants. Stem should be deep in soil around 8 cm depth in the field directly or in poly bags. If plant developed in poly bags it can be transplanted in to selected beds. Water supply should be maintained without storage in the fields.		
Vegetative Propagation success rate -100%		

Table - 8.4





















Common/Hindi Name - Patta Ajwine		
English Name - <i>Mexican mint</i> , Country Borage Sanskrit Name - Parnayvani,		
Chhattisgarhi Name - Ajwine Pan		
Botanical Name - <i>Plectranthus</i> <i>amboinicus</i> (Lour.) Spreng.		
Family - Lamiaceae		
Habit - Herb		
Propagation - Stem cutting		
Brief Description - It is herbaceous plant with the presence of aroma in stem and leaves with medicinal values. Stem cylindrical, smooth and branched. Leaf thick, green, rough, ovate and hairy.		
Propagation Mode - It does not producing seeds but stem cutting having potential to regenerate the new plants like their mother plant. Stem cutting used for this purpose should includes 4 - 6 inches length and are deep in soil by 1/3 parts. Water should be applied as per need of the plant and excess water need for proper removal.		
Vegetative Propagation success rate -100%		

Table - 8.5



<p>Common/Hindi Name - Chitra, Chiti, Chitrak</p>		
<p>English Name - White leadwort, Ceylon leadwort, Sanskrit Name - Chitraka, Agni, Shikha</p>		
<p>Chhattisgarhi Name - Chitra</p>		
<p>Botanical Name - <i>Plumbago zeylanica</i> Linn.</p>		
<p>Family - Plumbaginaceae</p>		
<p>Habit - Herb</p>		
<p>Propagation - Seed/ Stem cutting</p>		

Brief Description - This is a medium heighted, herbaceous, less branched medicinal plant. Stems are long, less branched, cylindrical and smooth, and green. Leaves are simple, alternate, glabrous and shiny. Flowers in clusters on spike.

Propagation Mode - It is producing many seeds which are capable to develop in to the new plants under favorable environmental condition. New individuals of this plant can be also developed by using their stem cutting. Old stem should be selected for fast regeneration of this medicinal plant. Each cut part of the stem should be of 5 – 8 inches length and around 3 - 5 inches should be deep in soil of the beds or in poly bags. Plant develops in poly bags need for further transfer in the field. During water supply the storage of water should be avoid.

Vegetative Propagation success rate -83.33%

Table - 8.6

<p>Common/Hindi Name - Plumaria, Temple tree</p>		
<p>English Name - Pagoda Tree, Temple Tree</p>		





Chhattisgarhi Name - Champa		
Botanical Name - <i>Plumeria rubra</i> Linn.		
Family - Apocynaceae		
Habit - Shrub		
Propagation - Stem cutting		
Brief Description - The plant is medium heighted, multi-branched tree with attractive, aromatic flowers. Stem smooth, cylindrical, branched, woody at the base and herbaceous at the top. Leaf simple, glabrous and shiny.		
Propagation Mode - It does not producing seeds but showing capability to regenerates by its stem cutting mode. Stem should be cut by 9 – 12 inches length and are deeping in soil by 1/3 parts direct in the field or in poly bags and moisture level should be maintained by providing proper water.		
Vegetative Propagation success rate - 100 %		

Table - 8.7







Common/Hindi Name - Rajanigandha, Gulcheri		
English Name - <i>Tuberose</i> Sanskrit Name - Rajanigandha		
Chhattisgarhi Name - Rajanigandha		
Botanical Name - <i>Polyanthus tuberosa</i> Linn.		
Family - Amaryllidaceae		
Habit - Herb		
Propagation - Bulb		
Brief Description - The plant is registered as aromatic, medicinal plant as well as important for its beauty used in many occasion. It is herbaceous, bulbous plant which includes small bulb inside of the soil and leaves are long and smooth.		
Propagation Model - It reproduces by the means of their new adventitious bulbs. These are separated to each other carefully from mother bulb without damages. Adventitious bulbs are further transplanted to the selected beds/poly bags. It required moderate range of water so, excess or less water supply can be adversely affect the plant growth. Water supply should be in managed manner.		
Vegetative Propagation success rate -100%		

Table - 8.8






<p>Common/ Hindi Name - Madhumalti</p>		
<p>English Name - Rangoor creeper Sanskrit Name - Rangoon malti,</p>		
<p>Chhattisgarhi Name - Lata,</p>		
<p>Botanical Name - <i>Quisqualis indica</i> Linn.</p>		
<p>Family - Combrataceae</p>		
<p>Habit - Herb/ limber</p>		
<p>Propagation - Stem cutting</p>		
<p>Brief Description - The plant is woody, climber and important for its medicinal and also for flowering value. Upper portion of the plant is herbaceous whereas basal part is woody in nature. As it is a climbing plant so there is a need of suitable substratum where it can climb. Stem cylindrical, woody, rough surface, less branched. Leaves are simple, smooth. Flowers are in clusters with aroma.</p>		
<p>Propagation Mode - It is not producing seeds and well adapted to regenerate by their stem cutting. Stem cutting part should be around 6 - 8 inches long and deep 1/3 of the stem inside of the soil. Proper level of moisture is required for successful growth of the plant. It can be also developed in poly bags following above mode. After its maturation it can be transferred to selected sites.</p>		
<p>Vegetative Propagation success rate -100%</p>		

Table - 8.9

<p>Common/ Hindi Name -Sargandha, Dhawal barua, Chandramar</p>		
<p>English Name - Serpentine Root, Sanskrit Name - Chandramar, Sargandha</p>		
<p>Chhattisgarhi Name - Sargandha</p>		
<p>Botanical Name - <i>Rauvolfia serpentina</i> Benth. ex Kurz</p>		

Family - Apocynaceae		
Habit - Herb		
Propagation - Seed/Stem cutting		

Brief Description - The plant is branched, woody at the base and herbaceous in top. Stem cylindrical, smooth, branched. Leaves long, simple, apex pointed and shiny. Flowers in clusters. Fruits are round in shape and green-red-black in different stages of their maturation.

Propagation Mode - It bears numerous seeds. It can be propagated by seeds as well as their stem cuttings also. Stem cutting should be done at just below of nodular part with presence of 5-10 nodes around 5 - 8 inches length. Oblique cut stem should be deep in soil in 3 – 4 inches depth. As per need of the plant water should be supplied.

Vegetative Propagation success rate -66.66%

Table - 9.0

Common/Hindi Name - Sarpagandha		
English Name - Wild snake root, Serpentine root Sanskrit Name - Sarpanasini		
Chhattisgarhi Name - Sarpagandha		
Botanical Name - <i>Rauvolfia tetraphylla</i> Linn.		
Family - Apocynaceae		
Habit - Herb		
Propagation - Seed/Stem cutting		

Brief Description - It is a medium heighted, herbaceous plant. Stem branched, cylindrical, smooth. Leaves are oval shaped, four in a group, simple and hairy. Flowers are white in colour and in clusters.

Propagation Mode - The plant is producing seeds for their further propagation. Stem cutting also found suitable for this purpose. A stem with 6 - 9 inches are selected and grow in soil of the field or in poly bags followed by moderate water supply. Excess water should be removed.

Vegetative Propagation success rate -83.33%

Table - 9.1






Common/Hindi Name - Murva		
English Name - Indian bowstring hemp, Bowstring Hemp Sanskrit Name - Nagdaman		
Chhattisgarhi Name - Sappan		
Botanical Name - <i>Sansevieria roxburghiana</i> Schult. & Schult. F.		
Family - Agavaceae		
Habit - Herb		
Propagation - Rhizome		
Brief Description - The plant is xerophytic in nature with presence of rhizome inside of soil and stem short. Leaves long, smooth, and fleshy.		
Propagation Mode - Rhizomes with adventitious buds are used for its propagation by vegetative mode. It should be deep in soil around 3- 5 inches depth. Water supply should be made as per the requirement of the plant. The plant is also capable to reproduce by their leaf cutting under favorable environmental condition.		
Vegetative Propagation success rate -100%		

Table - 9.2

Common/Hindi Name - Ram Dataun, Kumarika		
English Name - Indian sarsaparilla Sanskrit Name - Vanamadhusnahi		
Chhattisgarhi Name - Ram Dataun		
Botanical Name - <i>Smilax zeylanica</i> (L.)		



Family - Smilacaceae		
Habit - Shrub/Climber		
Propagation - Rhizome/Seed		
Brief Description - The plant is of shrub and climbing in nature. It is monocot plant with medicinal values. Leaves are ovate, simple, and green with parallel venation. Stem includes small spines and helping the plant to climb on any substratum. Flowers producing in clusters.		
Propagation Mode - The plant is producing seeds and also propagating using its rhizomes. Selected rhizome should include 1. 2 adventitious buds and are deep in soil around 3 – 6 inches depth in field. /poly bags. A moderate level of water is required for better initiation of new buds and for development of this plant.		
Vegetative Propagation success rate -100%		

Table - 9.3












Common/Hindi Name - Makoi		
English Name - Black night shade Sanskrit Name - Kakamachi		
Chhattisgarhi Name - Makiya, Chhote Chirpoti		
Botanical Name - Solanum nigrum Linn.		
Family - Solanaceae		
Habit - Herb		
Propagation - Seed/ Stem cutting		
Brief Description - The plant is short, herbaceous in nature. Stem soft, smooth and cylindrical. Leaves are entire, simple, glabrous and shiny. Flowers in clusters.		
Propagation Mode - Seed/ Stem cutting both mode of regeneration can be applied for this plant. Each round fruit included by many seeds. Stem cutting is also used for further propagation of the plant. Cut stems are deep in soil with proper water facility. Removal of excess water should be done to protect the plant from water logging.		
Vegetative Propagation success rate -100%		

Table - 9.4





<p>Common/ Hindi Name - Madhuparni</p>		
<p>Chhattisgarhi Name - Meetha tulsi</p>		
<p>Botanical Name - <i>Stevia rebaudiana</i> (Bert.) Bertoni</p>		
<p>Family - Asteraceae</p>		
<p>Habit - Herb</p>		
<p>Propagation -Stem cutting</p>		

Brief Description - This plant is also known as sweet tulsi. It is an herbaceous, creeper plant with sweet taste of the leaves. Stem cylindrical, hairy. Leaves are simple, soft and dentile margin. Flowers are small and in clusters.

Propagation Mode - As the plant is not producing the seeds so naturally it is well adapted to grow by their Stem cutting. Basal semi solid stems are selected for their multiplication. Each stem cut used for this purpose should be of around 4 inches long. It should be deep in soil of the beds/poly begs maintaining better water facility. As the plant is soft and sensitive against water and temperature also so need to protect the plant against above factors.

Vegetative Propagation success rate -100%

Table - 9.5

<p>Common/Hindi Name - Coat of many colours,</p>		
<p>English Name - African milk bush Sanskrit Name - Bahukshira, Vajradrooma</p>		
		
<p>Botanical Name - <i>Synadenium grantii</i> Hook. F.</p>		



Family - Euphorbiaceae		
Habit - Shrub		
Propagation - Stem cutting		
<p>Brief Description - It is a semi succulent, evergreen shrub plant. Stem smooth, cylindrical, branched, green, with presence of milky latex. Leaves are simple, smooth, ovate, alternate, and fleshy including milky latex.</p> <p>Propagation Mode - It is well propagated by their stem cutting mode. Each stem used for this purpose should be selected by 9 inches long which further deep in the soil approx 3 inches deep in the fields directly or can be also propagated in poly bags with proper water management.</p> <p>Vegetative Propagation success rate -100%</p>		

Table - 9.6







Common/Hindi Name -Tagar		
English Name - East Indian Rosebay Sanskrit Name - Nandi Pushpa		
Chhattisgarhi Name- Bada Chandani		
Botanical Name -<i>Tabernaemontana coronaria</i> (L.) Willd		
Family - Apocynaceae		
Habit - Shrub		
Propagation - Stem cutting		
<p>Brief Description - The plant is medium heighted shrub. Stem woody, branched, smooth. Leaf simple, glabrous, and shiny. Flowers in clusters and white in colour.</p> <p>Propagation Mode – It is not producing seeds but well regenerates by using their stem cutting. Old stem should be preferred for this purpose than new ones. Stem around 10 inches long are selected followed by oblique cut and deep in soil by 4 inches deep. Supply water as per need of the plant and avoid water logging.</p> <p>Vegetative Propagation success rate -100%</p>		

Table - 9.7

Common/Hindi Name -Genda		
English Name - Marigod Sanskrit Name - Jhandu		




Chhattisgarhi Name - Chandeni Gonda		
Botanical Name - <i>Tagetes patula</i> Linn.		
Family - Asteraceae		
Habit - Herb		
Propagation - Seed/Stem cutting		
Brief Description - This is a medium heighted, herbaceous nature plant with the presence of compound leaves that includes aroma. Stem angular, branched and flower in apex.		
Propagation Mode - The plant is producing seeds in a group and also performing capability to regenerate by their stem cutting mode. A stem cutting around 6 inches should be selected and deep in soil by 1/3 part. This requires a better water facility. Proper water should be given and avoid storage of water.		
Vegetative Propagation success rate -100%		

Table - 9.8







Common/Hindi Name - Yellow Kaner		
English Name - Oleander Sanskrit Name - Ashwamarak,		
Chhattisgarhi Name - Piwari Kaner		
Botanical Name - <i>Thevetia peruviana</i> (Pers.) Schum.		
Family - Apocynaceae		
Habit - Shrub		
Propagation - Seed/ Stem cutting		
Brief Description - The plant is medium heighted shrub, xerophytic in nature. Stems are long, cylindrical, smooth, branched. Leaves are long, green, glabrous, shiny and acute. Flowers pentamerous white, yellow in colour.		
Propagation Mode - It produces seeds in summer and also registered to propagate by their stem cutting. Old stem performed better than the new ones to develop new individuals. Stem cutting should include 8-12 nodes and deep in the field or in poly bags by around 3 - 4 inches depth. Water arrangement should be maintained and always remove the excess water from the fields/ poly bags.		
Vegetative Propagation success rate -83.33%		

Table - 9.9







<p>Common/Hindi Name - Giloye, Gudich, Gurach</p>		
<p>English Name - Bitter grape Sanskrit Name - Guduchi, Amrita</p>		
<p>Chhattisgarhi Name - Giloye</p>		
<p>Botanical Name - <i>Tinospora cordifolia</i> (Willd.) Miers</p>		
<p>Family - Menispermaceae</p>		
<p>Habit - Herb/climber</p>		
<p>Propagation - Stem cutting</p>		
<p>Brief Description - The plant is solid, climbing in nature with large, green, heart shaped leaves. Stem cylindrical, smooth, woody at the base and herbaceous at top.</p>		
<p>Propagation Mode - The plant is reproducing widely by their stem cutting. Each cut part of the stem should include node/buds and are capable to develop in to new individuals of this plant. Cutting of stem should be done carefully in length of 3 - 6 inches with 5 -7 nodes. 1/3 part of the stem cut should be deep in soil of the field directly or can be also develop in poly bags. Supply of the water should be made as per need of the plant. A strong substratum is required because it is a climber plant.</p>		
<p>Vegetative Propagation success rate -100%</p>		

Table - 10.0

<p>Common/Hindi Name - Jangali piyaz</p>		
<p>English Name - Indian squill, Sanskrit Name - Van palandam, Kol kand</p>		
<p>Chhattisgarhi Name - Ban Gondli</p>		
<p>Botanical Name - <i>Urginea indica</i> Roxb.</p>		
<p>Family - Liliaceae</p>		
<p>Habit - Herb</p>		
<p>Propagation - Bulb</p>		

Brief Description - The plant is herbaceous in nature. Underground bulbs present inside of soil. Leaves are long, smooth, and green with aroma.

Propagation Model - It is a small plant with the presence of short bulbs in side of the soil. New adventitious bulbs are produces by the plant which are a source to regenerate new individuals of the same plant. Small, new bulbs should be separated carefully and planted directly in the prepared beds or in poly bags also. As the plant having small bulbs so it should not be deep in much depth. Water managements required as per need of the plant with proper removal of excess water from grown sites.

Vegetative Propagation success rate -100%

Table - 10.1


<p>Common/Hindi Name - Khas</p>		
<p>English Name - Khaskhas grass Sanskrit Name - <i>Reshira, Urisa, Sugandhimula</i></p>		
<p>Chhattisgarhi Name - Uraizeri</p>		
<p>Botanical Name - <i>Vetiveria zizanioides</i> (Linn.) Nash</p>		
<p>Famil - Poaceae</p>		
<p>Habit - Herb</p>		
<p>Propagation - Seed/Root buds,</p>		
<p>Brief Description - The plant is monocot with unbranc hed, long stem. Leaves are long and are originates in a group. Roots are in a bunch having capability to bind the soil and also a source of aroma so it is useful for medicinal as well as for control on soil erosion.</p>		
<p>Propagation Mode - It is producing seeds. But new adventitious buds are also used for their wide range of regeneration. These are separated carefully and planted in the beds or in poly bags. As per need of the plant water should be supplied in the grown sites and avoid water storage in the field/poly bags.</p>		
<p>Vegetative Propagation success rate -100%</p>		

Table - 10.2

<p>Common/Hindi Name - Sambhalu, Nirgandi</p>		
<p>English Name - Five leaved chaste tree, Horse shoe vitex, Sanskrit Name - Nirgundhi, Nilika, Sephalika</p>		




Chhattisgarhi Name - Nengur		
Botanical Name - <i>Vitex negundo</i> Linn.		
Family - Verbenaceae		
Habit - Shrub		
Propagation - Stem cutting		
Brief Description - It is a woody, medium heighted, shrub with long, smooth, cylindrical and branched stem that is woody at the base and herbaceous at top. Leaves are compound with aroma. Flowers in clusters.		
Propagation Mode - The plant is rapidly propagated by using their stem cutting. Stem length around 15 cm should be cut obliquely from the mother plant and deep 1/3 part in soil. Maintain the water level for easily and also for fast initiation of the new buds/leaves. It can be also developed in poly bags than need for transfer to the suitable places.		
Vegetative Propagation success rate -100%		

Table - 10.3






Common/Hindi Name - Angur, Munnaka		
English Name - Grape Sanskrit Name - Draksha, Mridwika, Gostani		
Chhattisgarhi Name - Angur		
Botanical Name - <i>Vitis vinifera</i> Linn.		
Family - Vitaceae		
Habit - Herb/Climber		
Propagation - Stem cutting		
Brief Description - This plant is woody, climber in nature requires a substratum for climbing of the plant. Stem woody, smooth. Leaves are simple, multicosted reticulate venation.		
Propagation Mode - The plant does not producing seeds but successfully performing their regeneration by the mode of their stem cutting. Each cutting of the stem (should be of an oblique cut with presence of 4-6 nodes and length around 10-15 cm) deep in soil of the field or in poly bags. Water arrangement should be made as per need of the plant.		
Vegetative Propagation success rate -83.33%		

Table - 10.4











<p>Common/Hindi Name - Davi, Dhauta</p>		
<p>English Name - Fire-flame Bush Sanskrit Name - Dhauri, Dhaataki</p>		
<p>Chhattisgarhi Name - Dhawai</p>		
<p>Botanical Name - <i>Woodfordia fruticosa</i> (L.) Kurz</p>		
<p>Family -Lytharaceae</p>		
<p>Habit - Shrub</p>		
<p>Propagation - Seed/ Stem cutting</p>		
<p>Brief Description - This is a woody shrub. Stem cylindrical, smooth, branched. Leaves are simple, glabrous and shiny. Flowers in clusters and of red in colour.</p>		
<p>Propagation Mode - It is better producing new plants by their stem cutting mode. Select around 10 inch stem, cut obliquely from mother plant. It should be deep in field/poly bags with proper water management. If develop in poly bags after plants development need for to transfer in the field.</p>		
<p>Vegetative Propagation success rate -100%</p>		

Table - 10.5

<p>Common/Hindi Name - West wind flower</p>		
<p>English Name - Pink Rain lily, Sanskrit Name - Sinhakeshara, Anangaka,</p>		
<p>Chhattisgarhi Name - Chhotelily</p>		
<p>Botanical Name - <i>Zephyranthes rosea</i> Lindl.</p>		







Family - Amaryllidaceae	
Habit - Herb	
Propagation - Stem cutting	

Brief Description - The plant is herbaceous, bulbous in nature. Bulbs are small, underground. Leaves are long, smooth, and shiny. Flowers pink -white in colour.

Propagation Mode - The plant can be propagated by using their adventitious small bulbs around its main bulb. These are separated carefully without damage of the plant and are deeping in soil of the field or in poly bags for development of the new individuals. Proper water supply needed and avoid water logging.

Vegetative Propagation success rate -100%

Table - 10.6

Common/Hindi Name - Van Adrak		
English Name - Bitter Ginger, Sanskrit Name - Avanti, Kumbhika		
Chhattisgarhi Name - Van Adrak		
Botanical Name - <i>Zingiber zerumbet</i> (L.)		
Family - Zingiberaceae		
Habit - Herb		
Propagation - Rhizome		

Brief Description - It is herbaceous plant with underground rhizomes capable for further production of the new individuals. Stem herbaceous, smooth and cylindrical, long and unbranched. Leaves are simple, smooth with parallel leaf venation.

Propagation Mode - It does not producing seeds. Rhizome is important plant part used for its vegetative propagation. Node part of the rhizome producing new buds and are further develop in to new individuals as their parental plant. Rhizomes should deep in soil by around 10 cm depth followed by required water supply of the plant. It should be protected against water logging.

Vegetative Propagation success rate -100%

Table - 10.7

Common/Hindi Name - Adrak, Soth		
English Name - Ginger Sanskrit Name - Adrak , Adrika		










Chhattisgarhi Name - Aada		
Botanical Name - <i>Zinziber officinale</i> Rose		
Family - Zinziberaceae		
Habit - Herb		
Propagation - Rhizome		
<p>Brief Description - The plant is herbaceous in nature with unbranched stem. Rhizomes underground marked by presence of node and internodes, showing horizontal growth. Stem herbaceous, smooth and cylindrical. Leaves are simple, glabrous parallel leaf venation. The plant also includes aroma.</p> <p>Propagation Mode - Rhizome at the base of soil is registered as a main part of their vegetative propagation. It includes nodes/ internodes. Nodular part of the rhizome originates adventitious buds capable to develop into a new parental plant. Seeds are not produced by the plant. Rhizomes used for propagation should deep in soil by around 10 cm depth. Proper water supply should be made with better water removal facility to manage the water storage in the fields.</p> <p>Vegetative Propagation success rate - 100 %</p>		

Table - 10. 8







Common/Hindi Name - Apamarga, Putkan , Latjira		
English Name - Twotooth Achyranthes, Pig's knee, Devils horse Whip Sanskrit Name - Apamarga		
Chhattisgarhi Name - Chirchita Botanical Name - <i>Achyranthus</i> <i>bidentata</i> Blume		
Family - Amaranthaceae		
Habit - Herb		
Propagation - Seed/ Stem cutting		

Brief Description - The plant is medium height herb. Stem angular, smooth. Leaves are simple, apex acute, alternate. Flowers and fruits are in a spike.

Propagation Mode - This plant is producing seeds and also performing to regenerate by their stem cutting mode. Around 9 inches old stems are selected and deep in soil directly or in poly bags (about 3-5 inches) for development of new individuals. Water facility required with proper removal of the excess water.

Vegetative Propagation success rate -100 %

Table - 10.9


Common/Hindi Name - Kalihari		
English Name - Glory Lily, Flame Lily, Climber Lily, Sanskrit Name - Kalihari, Agnishikha,		
Chhattisgarhi Name - Jhagdal kanda		
Botanical Name - <i>Gloriosa superba</i> Linn.		
Family - Liliaceae,		
Habit - Herb/Climber		
Propagation - Sees/ Tuber		




Brief Description - This is an endangered plant with medicinal as well as their flowering value. It is also marked as a beautiful ornamental plant with climbing, herbaceous in nature. Long, branched tuber present inside of the soil. Stem, erect, cylindrical and smooth. Leaves are simple, apex modified into tendril known as leaf tendril is important for providing support to the plant. Flowers are yellow-orange-red in colour.

Propagation Model - It is forming seeds and also well adapted to regenerate by their underground tuber. Tubers are long, smooth with the presence of new adventitious buds. Selected tubers with buds are used for further propagation of this plant by deeping in soil around 3 - 5 inches depth in the field or in poly bags. Proper water supply made with management of removal of excess water from the field/poly bags.

Vegetative Propagation success rate -100%

Table - 10.10

Common/Hindi Name - Tapeworm Plant		
EnglishName - Ribbon Bush		

Chhattisgarhi Name-		
Botanical Name - <i>Homalocladium platycladum</i> (F. J. Muell. ex Hook.) L. H. Bailey		
Family - Polygonaceae		
Habit - Herb		
Propagation - Stem cutting		
<p>Brief Description - It is a xerophytic nature plant with leaf like flats, green, smooth and branched stem, Leaves are small, glabrous and simple type.</p> <p>Propagation Mode - It is better reproducing in to its new individuals using stem cutting. Old stem performing better to regenerates as a new plant in compare to new ones. Cutting of the stem should deep in soil by 3 inches depth and providing water as per need of the plant. Avoid the storage of water inside the beds/poly bags.</p> <p>Vegetative Propagation success rate -100%</p>		

Appendix: Medicinal and Aromatic Plants with their Vegetative Propagation Mode

S. No.	Botanical name	Propagation
1	<i>Acorus calamus</i> Linn.	Rhizome
2	<i>Adhatoda vasica</i> Linn.	Stem cutting
3	<i>Allium sativum</i> Linn.	Bulb
4	<i>Aloe vera</i> (L.) Burm. F. Mill.	Bud
5	<i>Alpinia galanga</i> (L.) Willd.	Rhizome
6	<i>Alstonia scholaris</i> L.R.Br.	Seed/Stem cutting
7	<i>Amorphophallus paeoniifolius</i> (Dennst.) Nicolson	Corm
8	<i>Andrographis paniculata</i> Nees	Seed/Stem cutting
9	<i>Angelonia angustifolia</i> Humb & Bonpl.	Stem cutting
10	<i>Anisomeles indica</i> Linn.	Seed/Stem cutting
11	<i>Argyreia nervosa</i> (Burm.f.) Bojer	Stem cutting
12	<i>Asparagus racemosus</i> Willd.	Seed/Tuber
13	<i>Baccopa monerri</i> Linn.	Stem cutting
14	<i>Barleria prionitis</i> Linn.	Seed/Stem cutting
15	<i>Basella alba</i> Linn.	Stem cutting
16	<i>Boerhaavia diffusa</i> Linn.	Stem cutting
17	<i>Canna indica</i> Linn.	Rhizome
18	<i>Catharanthus roseus</i> (L.) G. Don.	Seeds/Stem cutting
19	<i>Centella asiatica</i> (L.) Urban.	Stem cutting
20	<i>Centratherum punctatum</i> Cassini.	Seed/Stem cutting.
21	<i>Chlorophytum borivilianum</i> San. & Fer.	Bulb

22	<i>Chromolaena odorata</i> (L.) King & H.E.	Seed/stem cutting
23	<i>Cissus quadrangularis</i> Linn.	Stem cutting
24	<i>Clerodendrum inerme</i> (L.) Gaertn.	Stem cutting
25	<i>Coleus scutellarioides</i> (L.) R. Br.	Stem cutting
26	<i>Coleus forskohlii</i> (Willd.) Briq.	Seed /Stem cutting,
27	<i>Colocasia esculenta</i> (L) Schott	Corm
28	<i>Commiphora wightii</i> (Arn.) Bhandari	Stem cutting
29	<i>Costus speciosus</i> (J. Konig) Sm.	Rhizome/ Stem cutting
30	<i>Crinum latifolium</i> Linn.	Bulb
31	<i>Curculigo orchioides</i> Gaerth.	Seed/ Stem cutting
32	<i>Curcuma amada</i> Roxb.	Rhizome
33	<i>Curcuma angustifolia</i> Roxb.	Rhizome
34	<i>Curcuma aromtica</i> Linn.	Rhizome
35	<i>Curcuma caesia</i> Roxb.	Rhizome
36	<i>Curcuma longa</i> Linn.	Rhizome
37	<i>Cymbopogon flexuosus</i> (Nees ex Steu) Wat.	Seed/Buds
38	<i>Cyperus rotundus</i> Linn.	Rhizome
39	<i>Dioscoria bulbifera</i> Linn.	Tuber/ Stem cutting
40	<i>Eclipta prostrata</i> Linn.	Seed/Stem cutting
41	<i>Eryngium foetidum</i> Linn.	Seed/Stem cutting,
42	<i>Euphorbia nerifolia</i> Linn.	Stem cutting
43	<i>Euphorbia trigona</i> Mill.	Stem cutting
44	<i>Grewia asiatica</i> L.	Stem cutting,
45	<i>Gymnema sylvestris</i> (Retz) R. Br.	Seed/Stem cutting,
46	<i>Hedychium coronarium</i> J. Koenig	Rhizome
47	<i>Helicterus isora</i> Linn.	Seed/Stem cutting
48	<i>Hibiscus rosa sinenses</i> Linn.	Stem cutting
49	<i>Ipomoea batatas</i> Linn.	Tuber/Stem cutting
50	<i>Jasminum grandiflorum</i> Linn.	Stem cutting,
51	<i>Justicia gendarussa</i> Burm.f.	Stem cutting
52	<i>Kalanchoe blossfeldiana</i> Poelln.	Leaf/Stem cutting
53	<i>Kalanchoe pinnata</i> (Lam.) Pers.	Leaf/Stem cutting
54	<i>Lippia javanica</i> (Burm.f.) Spreng.	Stem cutting
55	<i>Mentha arvensis</i> Linn.	Stem cutting
56	<i>Mentha piperata</i> Linn.	Stem cutting
57	<i>Mimosa pudica</i> Linn.	Seed
58	<i>Mirabilis jalapa</i> Linn.	Seed
59	<i>Moringa oelifera</i> Lam.	Seed/stem cutting
60	<i>Morus alba</i> Linn.	Seed
61	<i>Murraya paniculata</i> (L.) Jack	Stem cutting
62	<i>Musa paradisiaca</i> Linn.	Rhizome
63	<i>Nerium indicum</i> F. Le. Makino	Seed/Stem cutting
64	<i>Nyctanthus arbortristis</i> Linn.	Stem cutting
65	<i>Ocimum gratissimum</i> Linn.	Stem cutting
66	<i>Ocimum kilimandscharicum</i> Linn.	Stem cutting
67	<i>Paederia foetida</i> Linn.	Stem cutting
68	<i>Pandanus tectorius</i> Soland. Ex.	Root bud
69	<i>Passiflora edulis</i> Sims,	Stem cutting
70	<i>Petalium murex</i> Linn.	Buds
71	<i>Pedilanthus tithymaloides</i> (Linn.) Poit.	Stem cutting
72	<i>Piper betle</i> Linn.	Stem cutting
73	<i>Piper longum</i> Linn.	Stem cutting

74	<i>Plectranthus amboinicus</i> (Lour.) Spreng.	Stem cutting
75	<i>Plumbago zeylanica</i> Linn.	Seed/ Stem cutting
76	<i>Plumeria rubra</i> Linn.	Stem cutting
77	<i>Polyanthes tuberosa</i> Linn.	Bulb
78	<i>Quisqualis indica</i> Linn.	Stem Cutting
79	<i>Rauvolfia serpentina</i> Benth.ex Kurz	Seed/Stem cutting
80	<i>Rauvolfia tetraphylla</i> Linn.	Seed/Stem cutting
81	<i>Sansevieria roxburghiana</i> Schult. & Schult. F.	Rhizome
82	<i>Smilax zeylanica</i> (L.).	Rhizome
83	<i>Solanum nigrum</i> Linn.	Seed/Stem cutting
84	<i>Stevia rebaudiana</i> (Bert.) Bertoni.	Seed
85	<i>Synadenium grantii</i> Hook. F.	Stem cutting
86	<i>Tabernaemontana coronaria</i> (L.) Willd.	Stem cutting
87	<i>Tagetes patula</i> Linn.	Seed/Stem cutting
88	<i>Thevetia peruviana</i> (Pers.) Schum.	Seed/Stem cutting
89	<i>Tinospora cordifolia</i> (Willd.) Miers.	Seed
90	<i>Urginea indica</i> Roxb.	Bulb
91	<i>Vetiveria zizanioides</i> (Linn.) Nash	Seed/Root bud
92	<i>Vitex negundo</i> Linn.	Stem cutting
93	<i>Vitis vinifera</i> Linn.	Stem cutting
94	<i>Woodfordia fruticosa</i> (L.) Lurz.	Stem cutting
95	<i>Zephyranthes rosea</i> Lindl.	Bulb
96	<i>Zingiber officinale</i> Rose.	Rhizome
97	<i>Zingiber zerumbet</i> (L.).	Rhizome
98	<i>Achyranthus bidentata</i> Blume	Seed/Stem cutting
99	<i>Gloriosa superba</i> Linn.	Seed/Rhizome
100	<i>Homalocladium platycladum</i> (F. J. Muell. ex Hook.) L. H. Bailey	Stem cutting

Table 2: Medicinal and Aromatic Plants with their Vegetative Propagation Mode.

Images Related to Current Study



Front view of the Herbal Garden.



Shade for Propagation of the MAPS.



Soil.



Sand.



Manure.



Sand, Soil and Manure.



Mixing of Sand, Soil and Manure Equally.



Polythene Bags.



Filling of Mixture (Sand, Soil And Manure Equally) in Poly Bags.



Filling of mixture (Sand, Soil and Manure equally) in Poly Bags.



Six Poly bags ready for each MAPs.



Ready Poly Bags for Propagation of the MAPs.



Arranged Poly Bags in Protected Shade.



Stem and Other Vegetative Modes for Propagation of Maps.





Stem and Other Vegetative Modes for Propagation of Maps.



Developed Maps in Each Poly Bags Needs to Transfer in the Selected Fields.

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