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Conservation and management practices of medicinal plants of Vindhya Basin, M.P. India

Abhishekh Srivastava[1], A. P. Singh[2], Naveen Gaurav[3], Asha Singh[4] and Anil Kumar Singh[5]

[1]Assistant Professor, Department of Botany Govt. S.V. College Teonthar, M.P. India

[2]Department of Botany Govt. P.G. Science College, Rewa, M.P. India

[3]Assistant Professor Department of Biotechnology, S G R R P G College Dehradun, U.K. India

[4]M. Pharmacology, PHC, Madwal, Sidhi, M.P. India

[5]Research Scholar, A.P.S. University, Rewa, M.P. India

Abstract

Indian great epics were full of many instances of biological importance and its origin and use from very remote age with the advent of agriculture system from the Vedic period (2000 B.C.- 800 B.C.) for cultivation of various types wild food crops. Several old vocabularies were used to named these plants and also for the use of various part of the plants. Some instances related with morphology involve the facts about the possible internal greater bio-molecules of various plants were studied and given importance to select and cultivate and practicize for the improvement of production through agriculture. Ancient man gathered various experiences through agricultural practices specially through rotation of crop consequently, improve the productivity of the selected wild crops. Including amendment of leaf residue into the soil extend the overall properties consequently growth of the plants increase. Subsequently, increases the over all production of selected crops. Men has classified the important plants for various uses and given proper recognition to production & protection of various useable plants. The medicinal & food important crops plants were collected and studied properly as well as carefully.

Keywords: Biological Importance, Agriculture System, Wild Food Crops, Vocabularies, Morphology, Productivity, Medicinal etc.

Introduction

Ishopanishad great mahamantra state all creation belong to lord nature let no one can encroach the right and privilege of one another. This clearly verify the honour & respect of our natural resource. There is urgent need to conserve all genetic resources for maintenance of ecological balance of nature, Swaminathan given statement that our national food security depend on our ability to conserve all our biological wealth. Conservation needs to benefit of all types of life exist upon earth. Various conservation strategies have been adopted at National & International level. But no systematic and pinpointed results have been achieved till now *(Dhar, 1993).* Variation in the results of conservation might varied from local to national level. The basic root problems have been varied from place to place. There is urgent need to areas by assessment of basic cause of failure of conservation strategies at various levels.

Conservation strategies normally follow ex-situ an in-situ for preservation & restoration of resources of the habitat. There has been complete negligence on ecological importance of plants for maintenance of microclimate of the region. Microclimatic suitability for synthesis of greater bio-molecules have been earlier studied and verified by different workers *(Tiwari, 2009).* Fast depletion of the forest resources from the tropical region and the area of wild phytoresources & quantity of the great molecules exist on the various phyto parts have been shrinken day by day *(Mali & Ved 1999).* The loss will be many times and burse if the situation exist in similar fashion *(Pimm & Raven 2000).*

Drastic increase in population normally destroy the resource of nature. Modern civilisation boost the process of loss consequently, decline the quality and quality of these resources day by day *(Hamilton & Smith 1989; Allen & Barnes 1985).* Owing to fast depletion of phytomedicnal diversity from the various regions. This is utmost importance to conserve all phytoresources at different level of the region. These phytoresouces are indeed valuable from their greater bio-molecules and unique synthesis of secondary metabolites. The important ecological steps require to conserve all phytoresouces is urgently required *(Verma, et. al. 2007; Qazi & Qazi 2007).* The judicious conservation & management strategies required to save all genetic diversity present on different habitat *(Chandra Prakash 1999).* The modern principal governing the conservation of any species is the inclusion and maintenance of overall genetic diversity present on the habitat *(Anant Krishnan 2001).*

Foundation for revitalisation local health traditions (FRLHT) has given emphasis on effective population size (Ne) in the range of 50-500 individual require to conserve any species of area. The population size of 800 would be required for long term survival of the species *(Mali & Ved 1999). Kannaiyan, 2008)* noted new ways of analysing population dynamics of natural population the diversity sustainable use and conservation of medicinal plants are quite important to stabilise the ecological balance of any region. Soil is precious non renewal natural resources available on earth. According to one recent estimates about 12 million tonnes of soil erodes every year in the country and 1 billion of top soil in equivalent to loosing loss of many of nutrient from the top soil of the habitat.

Materials and Methods

The areas considered for present study were taken for soil conservation value. Similar plots were selected for study. The precautions were taken for common plants and similar erosive factors. The formula were used to determine the conservation value is as follows :-

$$\text{Conservation on Value (\%)} \quad \frac{CP - CV}{CV} \times 100$$

CP = Protected

CV = Barren

$$\text{Density of Plant} = \frac{\text{number of individuals of species in all quadrats}}{\text{number of quadrat sampled}}$$

Results

Table-4.1

S. No.	Botanical Name	Family	Conservation Value of Wild medicinal plant			
			Site-I	Site-II	Site-III	Site-IV
			Cons. Value (%)	Cons. Value (%)	Cons. Value (%)	Cons. Value (%)
1	Abelmoschus moschatus	Malvaceae	–	–	–	22.30 ± 0.37
2	Abroma augusta	Sterculiaceae	–	–	20.30 ± 0.50	22.10 ± 0.34
3	Abrus precatorius	Fabaceae	26.70 ± 0.69	30.40 ± 0.72	–	–
4	Abutilon indicum	Malvaceae	24.00 ± 0.21	25.10 ± 0.92	–	–
5	Acacia catechu	Mimosaceae	–	–	18.40 ± 0.38	20.60 ± 0.32

6	Acacia nilotica	Mimosaceae		–		24.60	±	0.91		–			–		
7	Achyranthes aspera	Amaranthaceae	28.20	±	0.75	30.40	±	0.17	35.20	±	0.42	38.60	±	0.21	
8	Acorus calamus	Araceae		–			–		30.50	±	0.38	32.40	±	0.20	
9	Adhatoda vasica	Acanthaceae	25.20	±	0.64	27.20	±	0.26	32.10	±	0.40	30.40	±	0.18	
10	Aegle marmelos	Rutaceae	16.40	±	0.83	18.30	±	0.27		–			–		
11	Allium sativum	Liliaceae	3.80	±	0.15	4.20	±	0.16		–		5.30	±	0.18	
12	Allium wallichii	Liliaceae	10.50	±	0.36	8.90	±	0.18	9.20	±	0.21	8.40	±	0.20	
13	Aloe vera	Liliaceae	20.10	±	0.52	22.30	±	0.67	23.10	±	0.73	25.20	±	0.61	
14	Alstonia scholaris	Apocynaceae	18.20	±	0.36	19.20	±	0.34		–			–		
15	Amaranthus spinosus	Amaranthaceae	23.40	±	0.15	22.10	±	0.65	25.10	±	0.95	26.20	±	0.76	
16	Amomum subulatum	Zingiberaceae	24.80	±	0.23	25.20	±	0.16	26.20	±	0.26	29.30	±	0.17	
17	Amorphophallus campanulatus (Re check)	Araceae	30.20	±	0.35	28.10	±	0.17	27.30	±	0.33	25.40	±	0.69	
18	Amorphophallus paeoniifolius	Araceae		–			–			–		26.10	±	0.74	
19	Andrographis paniculata	Acanthaseae	27.50	±	0.71	28.20	±	0.72	30.50	±	0.37	32.40	±	0.19	
20	Anisomeles indica	Lamiaceae		–			–		17.20	±	0.22	20.40	±	0.31	
21	Annona squamosa Linn.	Annonaceae	22.80	±	0.88	23.40	±	0.84	24.50	±	0.88	25.40	±	0.67	
22	Argemone mexicana	Papaveraceae	18.20	±	0.37	19.20	±	0.36	21.30	±	0.51	24.10	±	0.50	
23	Argyreia nervosa	Convolvulaceae		–			–		25.30	±	0.18	28.30	±	0.94	
24	Arisaema amurense	Araceae		–			–		26.10	±	0.24	27.80	±	0.91	
25	Asparagus racemosus	Liliaceae	20.10	±	0.54	22.30	±	0.68	25.10	±	0.96	24.85	±	0.58	
26	Azadirachta Indica	Meliaceae	18.10	±	0.23	20.10	±	0.43	22.50	±	0.66	23.20	±	0.45	
27	Bacopa monnieri	Scrophulariaceae	20.40	±	0.76	21.40	±	0.57	21.80	±	0.54	22.10	±	0.36	
28	Bambusa vulgaris	Gramineae		–			–		10.80	±	0.31	12.15	±	0.31	
29	Barleria prionitis	Acanthaceae		–		23.40	±	0.86	24.10	±	0.82	25.80	±	0.72	
30	Bauhinia vahlii	Caesalpiniaceae		–			–		27.10	±	0.31	28.30	±	0.96	
31	Bauhinia variegata L.	Caesalpiniaceae	20.10	±	0.57	22.30	±	0.69	24.10	±	0.78	26.20	±	0.75	
32	Bixa orellana	Bixaceae		–			–		16.20	±	0.76	16.40	±	0.69	
33	Boerhaavia diffusa	Nyctaginaceae	20.40	±	0.77	21.65	±	0.64	22.30	±	0.63	22.80	±	0.41	
34	Bombax ceiba	Bombacaceae		–			–		18.10	±	0.31	19.10	±	0.21	
35	Bryonia alba	Cucurbitaceae		–			–		10.60	±	0.29	11.30	±	0.28	
36	Bryonopsis laciniosa	Cucurbitaceae		–			–		11.20	±	0.35	12.40	±	0.32	
37	Buchanania lanzan	Anacardiaceae		–		16.40	±	0.79	18.20	±	0.33	19.10	±	0.22	

38	Butea monosperma	Fabaceae	23.40	±	0.17	25.80	±	0.20	26.40	±	0.28	27.90	±	0.93
39	Calotropis procera	Asclepiadaceae	19.20	±	0.47	20.10	±	0.46	22.30	±	0.59	22.80	±	0.40
40	Carica papaya	Caricaceae	8.30	±	0.17	9.20	±	0.20	9.80	±	0.24	–		
41	Carissa carandas L.	Apocynaceae	12.30	±	0.54	13.10	±	0.48	14.20	±	0.54	15.30	±	0.54
42	Carum copticum	Apiaceae	9.80	±	0.24	10.20	±	0.30	10.30	±	0.28	10.10	±	0.24
43	Cassia angustifolia	Caesalpinaceae	11.20	±	0.43	12.40	±	0.44	13.14	±	0.44	13.85	±	0.40
44	Cassia fistula	Caesalpiniaceae	14.10	±	0.66	15.30	±	0.57	14.30	±	0.55	14.80	±	0.50
45	Cassia occidentalis	Caesalpiniaceae	13.80	±	0.64	12.80	±	0.46	13.10	±	0.43	14.25	±	0.45
46	Cassia tora	Caesalpiniaceae	11.30	±	0.47	12.10	±	0.39	12.75	±	0.42	13.15	±	0.36
47	Catharanthus roseus	Apocynaceae	9.80	±	0.27	10.50	±	0.31	12.20	±	0.40	14.80	±	0.49
48	Centella asiatica	Apiaceae		–			–		16.50	±	0.88	17.10	±	0.85
49	Chlorophytum arundinaceum	Liliaceae	11.50	±	0.49	13.10	±	0.47	15.10	±	0.59	16.70	±	0.76
50	Christella dentata	Thelypteridaceae		–			–		13.20	±	0.48	14.50	±	0.46
51	Cissampelos pareira	Menispermaceae	23.10	±	0.89	24.50	±	0.87	26.20	±	0.25	–		
52	Cleome viscosa	Capparaceae	30.25	±	0.36	28.10	±	0.21	29.30	±	0.34	25.70	±	0.71
53	Clitoria ternatea	Fabaceae	28.20	±	0.76	27.10	±	0.25	25.82	±	0.21	26.20	±	0.78
54	Coleus aromaticus	Lamiaceae		–			–		18.20	±	0.35	19.50	±	0.27
55	Coleus barbatus	Lamiaceae		–			–		17.50	±	0.26	18.10	±	0.19
56	Commiphora wightii	Burseraceae	19.20	±	0.48	20.40	±	0.50	22.40	±	0.64	–		
57	Convolvulus pluricaulis	Convolvulaceae	20.30	±	0.71	21.50	±	0.59	24.40	±	0.87	24.80	±	0.55
58	Cordia dichotoma	Boraginaceae		–			–		25.30	±	0.19	26.25	±	0.79
59	Cordia obliqua	Boraginaceae		–			–		20.10	±	0.48	20.20	±	0.29
60	Coriandrum sativum	Apiaceae	18.10	±	0.24	20.10	±	0.44		–			–	
61	Costus speciosa	Zingiberaceae		–			–		24.10	±	0.83	25.20	±	0.62
62	Crinum deflexum	Amaryllidaceae		–			–		22.20	±	0.58	23.10	±	0.43
63	Curculigo orchioides	Amaryllideae	11.80	±	0.52		–			–		14.20	±	0.43
64	Curcuma angustifolia	Zingiberaceae		–			–		12.10	±	0.38	16.50	±	0.71
65	Curcuma aromatica	Zingiberaceae		–			–		13.20	±	0.50	14.60	±	0.47
66	Curcuma caesia	Zingiberaceae		–			–		15.40	±	0.63	16.20	±	0.62
67	Curcuma longa	Zingiberaceae		–		17.50	±	0.20	16.80	±	0.96	17.10	±	0.86
68	Cuscuta reflexa	Convolvulaceae		–			–			–			–	
69	Cynodon dactylon	Gramineae	45.20	±	0.47	47.10	±	0.72	48.10	±	0.46	47.40	±	0.23
70	Cyperus rotundus	Cyperaceae	30.62	±	0.39	29.60	±	0.93	29.40	±	0.35	28.60	±	0.98
71	Datura alba	Solanaceae	25.20	±	0.65	26.30	±	0.22	25.70	±	0.20	24.80	±	0.57

72	Dioscorea bulbifera	Dioscoreaceae	18.10	±	0.27	17.50	±	0.93	16.20	±	0.75	15.65	±	0.57
73	Dioscorea hispida	Dioscoreaceae	16.70	±	0.88	15.80	±	0.64	14.70	±	0.56		–	
74	Dioscorea pentaphylla	Dioscoreaceae	15.20	±	0.69	14.80	±	0.54		–			–	
75	Eclipta alba	Asteraceae	10.30	±	0.35	12.10	±	0.38	13.50	±	0.52	13.40	±	0.37
76	Embelia ribes	Myrsinaceae	8.90	±	0.22	9.20	±	0.22	9.40	±	0.22	9.85	±	0.23
77	Emblica officinalis	Euphorbiaceae	10.10	±	0.30	9.80	±	0.26	10.25	±	0.26	12.10	±	0.29
78	Enicostema littorale	Gentianaceae	20.10	±	0.59	25.80	±	0.18	24.60	±	0.93	25.20	±	0.66
79	Eragrostis cynosuroides	Gramineae	40.25	±	0.43	42.40	±	0.72	43.10	±	0.43	44.50	±	0.22
80	Eulophia nuda	Orchidaceae	10.70	±	0.40	11.20	±	0.36	13.20	±	0.46	14.10	±	0.41

Discussion

This is evident from Table-4.1 that the phytomedicinal plant of Rewa region plays ecological significant role for betterise the environment of the region. The maximum plant shown better conservation value of soil consequently betterise the aggregation potential of soil particles subsequently increase the water holding capacity and transmission of water (Horizontal & Vertical) and increase the over all water permeability and hydraulic conductivity of soil. The some wild member of Gramineae shown best performance for conservation of soil of the habitat. *Vetiveria, Cynodon, Eragrostis, Cyperus* shown highest value of conservation for soil i.e. 68.20±0.24%, 48.10±0.46%, 44.50±0.22% & 30.62±0.39%. This is evident form the earlier data that grasses play important role to stabilise the soil of the region. Thus improve the quality & quantity of microorganism and improve the elemental cycle of nutrients. The work results are in agreement with the work of so many earlier workers *(Dhar 1993; Chandra Prakash 1999; Verma et. al. 2007).*

These species shown drastic increase of soil conservation value of soil when these were associated with other neighbour wild species. *Vetiveria* shown 85.20±0.45%, 90.20±0.21%, 85.40±0.42% & 88.10±0.27% of conservation value with wild associated species where as the species shown 60.80±0.49%, 65.70±0.65%, 67.80±0.48% & 68.20±0.24% of conservation value when recorded alone. This is quite evident that all other associated species enable to from complex aggregation for restoring the edaphic habitat while lonely condition of plant species enable to stabilise the soil from the habitats. Some important species which proves better potential are *Cynodon, Vitex, Eragrostis, Peristrophe, Cyperus, Cleome, Amorphophallus, Withania, Clitoria, Abrus, Achyranthes, Andrographis, Adhatoda,*

Acorus, Amomum & Bauhinia vahlii. This is evident from the data recorded in Table 4.1 shown highest & lowest conservation value of soil of region. The ecological importance of these plants for betterise the habitat potential has already been recorded by many workers.

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