

Diversity of medicinal plants and their utilization in two villages of Mymensingh

S.M. Harun-Or-Rashid, M. S. Haque and M. M. Rahman

Department of Crop Botany, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh

Abstract: The study recorded the medicinal plant diversity and their uses in two selected villages of Mymensingh district using a random stratified homestead survey. A total of 2067 medicinal plants have been recorded under 95 species, 78 genera and 49 families comprising 29.27% of the total plant populations in the Bhabkhali village. The plants contained 176 of herbs, 983 of shrubs, 655 of trees and 253 of climbers. In Dori Bhabkhali village, a total of 2375 plants were listed under 77 species, 65 genera and 44 families comprising 26.63% of the total plant populations. The plants contained 176 plants of herbs, 1117 of shrubs, 822 of trees and 260 of climbers. The highest Prevalence Value (PV) found in *Aphanimixis polystachya* in both the villages (95% and 87%). The highest species diversity (H) was observed in *Aphanimixis polystachya* (0.1475) in Bhabkhali village and in Dori Bhabkhali village, the greater species diversity (H) was found in *Operculina turpethum* (0.1194). Plant parts such as leaf, root, stem, flower, bark, seed, fruit, tuber, kernel or even whole plants were used for medicinal purposes by the rural peoples.

Keywords: Diversity, Prevalence value, medicinal uses.

Introduction

The medicinal plant genetic resources with enormous genetic diversity are global assets of incalculable value to the present and future generations. They also help in maintaining environmental balance and stability of ecosystem. But, tragically many of these important plant genetic resources are now in greatest threat to extinction than ever before due to over exploitation and loss of habitats. A large number of medicinal plant species are reported to be disappearing rapidly (FAO, 1997). The trend of using medicinal plants does not exist only in developing countries but also in developed countries as well. In recent years, there has been a growing interest in traditional medicine due to increase in interest in complementary medicine in industrial countries and modern pharmaceuticals

companies still contains at least 25% drugs derived from medicinal plants (Silva, 1997). In Bangladesh, the importance of medicinal plants need not to mention. Considering the importance of plant genetic resources (PGR), out most importance has been given on the conservation of rare and endangered plant genetic resources both *in-situ* and *ex-situ*, particularly with changing concept after the proclamation adopted in the conservation on biological diversity (CBD) in 1992. In recent years, homesteads have been considered as one of the most important centers for conservation of threatened plant species as planting of trees in homesteads is a traditional land use system in Bangladesh. The home gardens are of different types and they vary widely not only in form, structure and composition, but also vary among themselves

in their purposes and the produce they provide. But unfortunately, the information on the composition of trees in homesteads and their uses, dominance and diversity were not well documented. The documentation of the flora of Bangladesh, particularly the homestead flora has not yet been completed. Alam *et. al.* (1996) prepared a list of the village trees of Bangladesh. So the present piece of research work was under taken to compare distribution, abundance and diversity of medicinal plant genetic resources in two selected villages and to provide an inventory of homestead medicinal plant species with particular emphasis on its medicinal uses.

Materials and Methods

The Mymensingh district lies between 24⁰15' and 25⁰12' north latitudes and between 90⁰13' and 90⁰49' east longitudes. The study was carried out in two villages of Bhabkhali union of Sadar Upazila under Mymensingh district. The villages are Bhabkhali and Dori Bhabkhali. Initially 20 days were spent to select the village and households by observing the status of medicinal plants (tree, shrub, herb and climber) and indigenous knowledge of using these species. Structured questionnaire was used to study the socio economic and biological parameters of the home garden. Then questionnaire was pre-tested (before starting the actual survey) with 100 households in order to make necessary modifications. The sample responded for the study consisted of 80 households, 40 from each village. Most of the information was obtained through interviews of household

members. Identification of the existing medicinal plants was done by the help of rural people, local traditional doctors and with the help of taxonomic books. The data collected from the study area were entered in the computer to prepare a database through Microsoft Excel database programme. Then the data were quantitatively analyzed for relative frequency, relative density and abundance following Curtis and McIntosh (1950). The relative values for frequency and density were determined as per Phillips (1959). Percent of area containing a particular species is one of the indicators of the prevalence of species of that particular species in the area. Population of species per unit area is divided by farm with the species and then multiplies with 100 to get the prevalence value (PV). The species diversity (H) was determined by using Shannon-Wiener (1963) information index as $H = -\sum (N_i/N) \log n (N_i/N)$, where N_i is the total density value for species, i and N is the total density value of all the species in a village.

Results and Discussion

A total of 2067 medicinal plant species belonged to 95 species, 78 genera and 49 families comprising 29.27% of the total plant populations were recorded in the Bhabkhali village (Table 1) containing 176 of herbs, 983 of shrubs, 655 of trees and 253 of climber in habit having 8.51%, 47.56%, 31.69% and 12.42%, respectively (Table 2). Again, a total of 2375 medicinal plants were listed under 77 species, 65 genera and 44 families comprising 26.63% of the total plant populations in the

Dori Bhabkhali village (Table 1). Of all the species 176 were of herbs, 1117 of shrubs, 822 of trees and 260 of climber plant species in habit and their percentage were 7.41%, 47.03%, 34.61% and 10.95%, respectively (Table 2). From the above results, it revealed that maximum medicinal plants were shrubs in life forms. Mostafa *et al* (1999) observed 71 medicinal plant species representing 41 families from 143 homegardens of Dhamrai,

Bangladesh. Dori Bhabkhali village contained more medicinal plants than the Bhabkhali village. The villager's do not have enough knowledge about the use of medicinal plants due to lack of literacy and awareness. Caniago *et al.* (1999) observed that the villagers of Ransa Dayak village, West Kalimantan, Indonesia utilize over 200 medicinal plant species from 165 genera and 75 families.

Table 1: Species, genus and family composition of medicinal plants recorded in Bhabkhali and Dori Bhabkhali villages

	Bhabkhali	Dori Bhabkhali
Total no. of species	95	77
Total no. of genus	78	65
Total no. of family	49	44
Total no. of plants	2067	2375
Percent of total	29.27	26.63

Table 2: Total number of species and their percentage under different category of plants in two villages

Category of Plant species	Bhabkhali		Dori Bhabkhali	
	Total no. of species	Percent of total	Total no. of species	Percent of total
Herbs	32 (176)	8.51	35 (176)	7.41
Shrubs	39 (983)	47.56	24 (1117)	47.03
Trees	15 (655)	31.69	12 (822)	34.61
Climbers	9 (253)	12.24	6 (260)	10.95
Total	95 (2067)	100	77 (2375)	100

Table 3: Prevalence Value (PV), abundance (AB), relative density (RD), relative frequency (RF) and species diversity (H) of the 15 most common medicinal plant species in Bhabkhali village

Sl. #	Species	Part used	Total no. of plants	PV%	AB	RD	RF	H
1	<i>Aphanamixis polystachya</i>	Seed	345	95	9.1	4.885	0.538	0.1475
2	<i>Ficus indica</i>	Fruit	301	80	9.4	4.262	0.453	0.1345
3	<i>Sterblus asper</i>	Leaf	80	55	3.6	1.113	0.312	0.0508
4	<i>Coccinia indica</i>	Leaf	189	50	9.5	2.676	0.283	0.0969
5	<i>Melia sempervirens</i>	Seed	202	50	10.1	2.860	0.283	0.1017
6	<i>Phyllanthus reticulatus</i>	Fruit	154	42.5	9.1	2.181	0.241	0.0834
7	<i>Bombax ceiba</i>	Root	37	42.5	2.2	0.524	0.241	0.0275
8	<i>Litsea monopetala</i>	Leaf	36	30	3.0	0.510	0.170	0.0269
9	<i>Clematis gpuriana</i>	Fruit	40	27.5	3.6	0.566	0.156	0.0293
10	<i>Hibiscus schizopetalus</i>	Flower	88	22.2	9.8	1.246	0.127	0.0546
11	<i>Averrhoa carambola</i>	Fruit	11	20	1.4	0.156	0.113	0.0101
12	<i>Azadirachta indica</i>	Leaf	13	20	1.6	0.184	0.113	0.0116
13	<i>Clerodendrum inerme</i>	Leaf	50	17.5	7.1	0.708	0.099	0.0350
14	<i>Terminalia arjuna</i>	Bark	8	15	1.3	0.113	0.085	0.0077
15	<i>Oroxylum indicum</i>	Fruit	11	15	1.8	0.156	0.085	0.0101

Table 4: Species prevalence (PV), abundance (AB), relative density (RD), relative frequency (RF) and species diversity (H) of the 15 most common medicinal plant species in Dori Bhabkhali village

Sl. #	Species	Part used	Total no. of plants	PV (%)	AB	RD	RF	H
1	<i>Aphanamixis polystachya</i>	Seed	204	87.5	5.83	2.287	0.392	0.0864
2	<i>Sterblus asper</i>	Leaf	169	77.5	5.45	1.895	0.348	0.0751
3	<i>Ficus indica</i>	Fruit	313	65	12.04	3.509	0.291	0.1175
4	<i>Litsea monopetala</i>	Leaf	107	52.5	5.10	1.200	0.235	0.0531
5	<i>Phyllanthus reticulatus</i>	Stem	259	50	12.95	2.904	0.224	0.1028
6	<i>Azadirachta indica</i>	Leaf	47	42.5	2.76	0.527	0.191	0.0276
7	<i>Bombax malabaricum</i>	Root	44	40	2.75	0.493	0.179	0.0262
8	<i>Operculina turpethum</i>	Leaf	320	32.5	24.62	3.587	0.146	0.1194
9	<i>Calotropis gigantea</i>	Leaf	21	25	2.10	0.235	0.112	0.0142
10	<i>Coccinia indica</i>	Leaf	179	25	17.90	2.007	0.112	0.0784
11	<i>Zanthoosylum rhetsa</i>	Seed	29	22.5	3.22	0.325	0.101	0.0186
12	<i>Solanum carolinense</i>	Fruit	29	17.5	4.14	0.325	0.078	0.0186
13	<i>Lawsonia inermis</i>	Leaf	9	17.5	1.29	0.101	0.078	0.0070
14	<i>Melia sempervirens</i>	Seed	27	17.5	3.86	0.303	0.078	0.0176
15	<i>Tinospora cordifolia</i>	Leaf	25	15	4.17	0.280	0.067	0.0165

The prevalence values (PV) of homestead flora ranged from 15% to 95% in Bhabkhali and from 15% to 87.5% in Dori Bhabkhali village (Table 3, 4). *Aphanamixis polystachya* showed the highest PV values in both the village (95% in Bhabkhali and 87% in Dori Bhabkhali village). Akhter *et al.* (1997) found *Magnifera indica* as highest in number in the sampled villages of Chittagong, Bangladesh. In Bhabkhali village highest abundance, relative density and relative frequency were observed in *Melia sempervirens* (10.1), *Aphanamixis polystachya* (4.885) and in *Aphanamixis polystachya* (0.538), respectively (Table 3). The maximum abundance, relative density and relative frequency of Dori Bhabkhali village were observed in *Operculina turpethum* (24.62), *Ficus indica* (3.509) and in *Aphanamixis polystachya* (0.392), respectively (Table 4).

The species diversity (H) varied between 0.0077 to 0.1475 in Bhabkhali village and from 0.0070 to 0.1194 in Dori Bhabkhali village (Table 3, 4). Bhandari (2003) observed the range of species diversity from 0.73 to 1.60 in Garhwal Himalaya of India. In Bhabkhali village, the greater species diversity (H) was observed in *Aphanamixis polystachya* (0.1475) while in Dori Bhabkhali village *Operculina turpethum* (0.1194) showed the greater species diversity (H). Miah and Hossain (2002) reported that *Artocarpus heterophyllus* and *Swietenia mahagoni* were the dominant species in homesteads, institutions and waste marginal lands of Norsingdi district. Different plant parts such as leaf, seed, flower, tuber, stem, root, bark, bud, stalk, rhizome, corm, latex, bulb, leaf juice, resin, nut, sap, gum, twig and even whole plants are used for medicinal purposes by the rural peoples. They used these

parts for astringent, spleen, liver diseases, tumors, abdominal complaints, rheumatism, cough and cold, vomiting, burning urination, hair tonic, diarrhoea, dysentery, anaemia, skin problems, cardiac tonic, asthma, hypertension, ulcers, eczema, epistaxis, leucoderma, piles etc.

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