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Genetic Diversity of Plant Species in Hilly Areas Adjacent to Sylhet Agricultural University

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Abstract

The study was carried out to investigate the status of genetic diversity of plant species in hilly areas and plain lands of Sylhet Agricultural University (SAU) and in hilly areas adjacent to SAU during January, 2015 to June, 2015. Four study areas were selected to investigate the status of genetic diversity of plant species. It also explored relationships between the characteristics, types, habits, total number of plants and the relationships between hilly area plants and plain land area plants. Many plant species including trees, shrubs and herbs were recorded from the studied hilly areas. Several medicinal plants found in hilly areas were also recorded. Among these plant species the most prevalent tree species were horitoki, bohera, mehgoni, arjun, neem etc, and the most prevalent herb species were chanci, shaknotey, katanotey, malancha shak, salvia etc. The highest numbers of natural tree species were found in hilly areas of M.C. College adjacent to SAU whereas the lowest numbers of tree species were found in the area of Vice-chancellor's bungalow of SAU. The highest number of shrubs and herbs were found in Vice-chancellor's bungalow and plain land of SAU, respectively. Both naturally grown and planted trees, shrubs and herbs along with a good number of medicinal plants were found in the studied areas which exhibited the wide diversity in plant genetic resources in studied areas.

Keywords: Genetic diversity; Medicinal plants; Genetic resources; Hilly areas; Trees

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Introduction

Genetic diversity is of fundamental importance in the continuity of a species as it provides the necessary adaptation to the prevailing biotic and abiotic environmental conditions, and enables change in the genetic composition to cope with changes in the environment. Bangladesh is known as an evergreen country with the huge number of plant genetic resources. The majority of the country's land was formed by river alluvium from the Ganges and the Brahmaputra and their tributaries, which consists mostly of flood plains (80%) with some hilly areas (12%). Although a small country, Bangladesh is exceptionally endowed with a vast variety of flora and fauna due to its unique geophysical location [1,2]. An estimated 5,700 species of angiosperms alone, including 68 woody legumes, 130 fiber yielding plants, 500 medicinal plants, 29 orchids, 3 species of gymnosperms and 1,700 pteridophytes has been recorded from the country [3]. Bangladesh National Herbarium reported 106 vascular plant species under risk of various degrees of extinction in the country [4].

Sylhet is the northeastern divisional city of Bangladesh. The Greater Sylhet has only one agricultural university named Sylhet Agricultural University which is located in near Tilaghor reserve forest.

However, the drawback is the lack of proper documentation of the several components of the natural history on the campus. There have been innumerable newspaper reports on the occurrence of several tree plants, herbs, shrubs, medicinal plants and ornamental plants species, the findings have never been a part of any scientific research report. To understand the significance of the existing biodiversity of plant species, it is necessary to understand what is valued of the place and what the benefits it provides are and its relevance for the future. Biodiversity does influence the rates or nature of ecosystem processes, and a majority of studies have found that a reduction in biodiversity does have a negative effect on ecosystem function. Biodiversity provides a useful measure of the

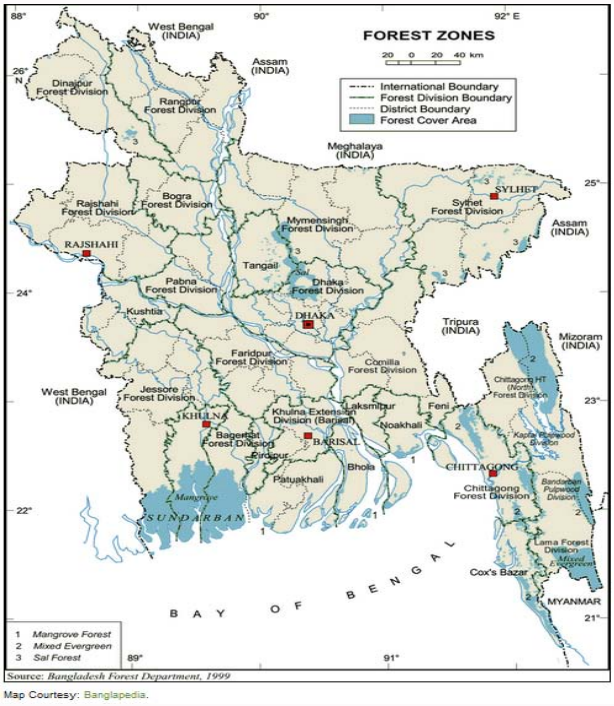

Figure 1: Map showing the distribution of forest cover areas (hilly areas) of Bangladesh [5].

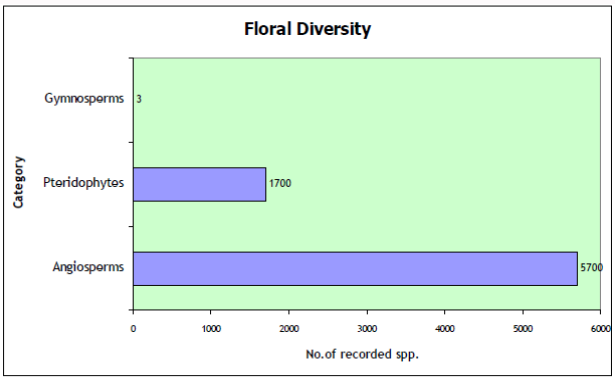

Figure 2: Floral diversity of Bangladesh.

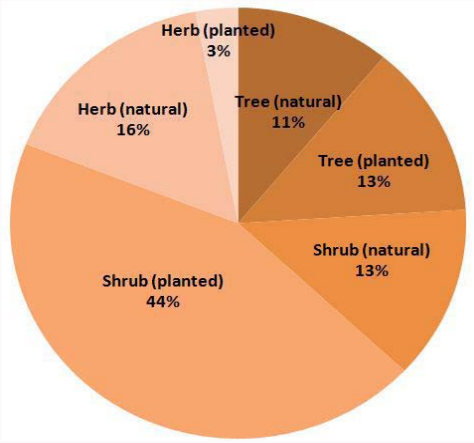

Figure 3: Genetic diversity of plant species found in area of Vice-chancellor's bungalow.

quality of the environment and of the probability of sustainability on which man depends (Figure 1) [5].

Geographically, Bangladesh falls near the Indo-Burma region which is one of the ten global prime spot areas and supposed to have 7000 endemic plant species [6]. Due to its unique geo-physical location Bangladesh is exceptionally characterized by a rich biological diversity [1,2,7,8]. An estimated 5,700 species of angiosperms alone, including 68 woody legumes, 130 fibre yielding plants, 500 medicinal plants, 29 orchids, three species of gymnosperms and 1700 pteridophytes have been recorded from Bangladesh (Figure 2) [9-11].

Materials and Methods

The study "Genetic diversity of plant species in hilly areas adjacent to Sylhet Agricultural University" has been undertaken by several field visits during (January 2015 to June 2015) by several. The study involved seasonal documentation of the flora for its abundance and distribution. To minimize errors, several repeated visits were made to collect the data properly. The steps followed in the present study were the selection of the area, specific records of the relevant factors, sampling technique, period of investigation, preparation of the interview schedule, rapport building with respondents, collection of data, processing and analysis of data.

Study area

The study was conducted in following areas of SAU and adjacent to Sylhet Agricultural University campus- Vice-chancellor's bungalow of SAU, Dairy Farm Area adjacent to SAU, M.C. College Area and Plain land of SAU.

Soil and climatic condition of selected study sites

The soil of the study site was grey, sandy loam in texture and belongs to the "non-calcareous Grey" soils under Eastern Surma-Kusiyara Flood Plain [12,13]. Soil ranges from clay loams to pale brown (acidic) clay loams on the hills. Red sandy clay contains granules of magniferous iron ore [14]. Soil pH ranges from 5 to 7.5. The tropical monsoon climate prevails in the area with average maximum temperature of 31.6˚C and average minimum temperature of 19.9˚C. The average annual rainfall is 3937 mm, most of which falls between June-September [15].

Results and Discussion

The plant species found in the studied area can be categorized into three groups: i) Trees, ii) Shrubs and iii) Herbs. Each group again can be categorized into two: i) natural and ii) planted plant species. The result showed that naturally grown and planted shrubs were in highest portion of total plant species (44%) in the area of Vice-chancellor's Bungalow of SAU (Figure 3). Plant genetic diversity found in that area are given in Table 2. The largest portion (42%) of plant species were planted trees in the area of Dairy Farm adjacent to SAU (Figure 4). A fourth quarter percent is naturally grown trees and the least minority around 4% was artificially planted herb. Therefore, it is concerned that the natural tree is being transferred to planted tree and it leads to biodiversity changes in hilly areas. Plant species are grown in that area is shown in Table 3. Natural trees were the highest portion (38%) of total plant genetic diversity in the hilly areas of M.C. College adjacent to SAU, whereas shrubs (planted) ranked the second highest in plant population (Figure 5 and Figure 6). The list of plant species of some selected plant species are shown in the Table 4. The list of plants grown in plain land of SAU is shown in Table 5.

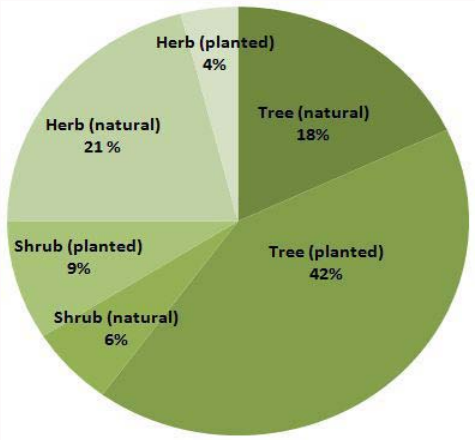

Figure 4: Genetic diversity of plant species found in area of dairy farm adjacent to SAU.

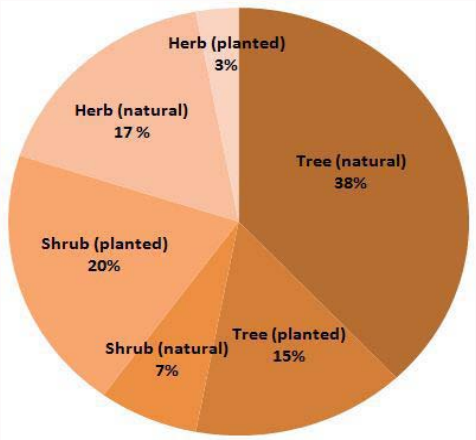

Figure 5: Genetic diversity of plant species in hilly areas of M.C. College adjacent to SAU.

Several medicinal plant species were found in hilly areas (Table 7). Most interestingly, a number of plant species were found which were grown in site-specific areas (Table 8).

Medicinal plants

Bangladesh is very rich in medicinal plants and it has more than 500 medicinal plant species [16]. An alarmingly populous, but size wise a very small country is rather unique in having diversified genetic resources in a wide range of habitats. Increasing population pressure and multifarious anthropogenic activities on the natural ecosystems are posing severe and serious threats to once dense and rich genetically diversified plant communities of this country. Loss of habitats from the wild forests as well as from the village groves, cultivated plains and wild lands is quite common in this country. A broad genetic base has been replaced by a narrow one, and the indigenous old genetic diversity is disappearing both inside and outside of the ancient gene centers. This trend is inevitable with the need for highly efficient and uniform cultivars in advanced and sophisticated farming systems. At present, we have no real protected area for natural genetic resources and also have no specific practical policy on conservation of biodiversity. Although there are several gene banks having limited facilities to preserve some economic crops like rice, jute, wheat, pulses etc in Bangladesh, but there is no centralized organization to maintain germplasms of the wild relatives for agriculture, horticulture, medicinal and economically less important forest species. In Bangladesh there are about 297 unani,

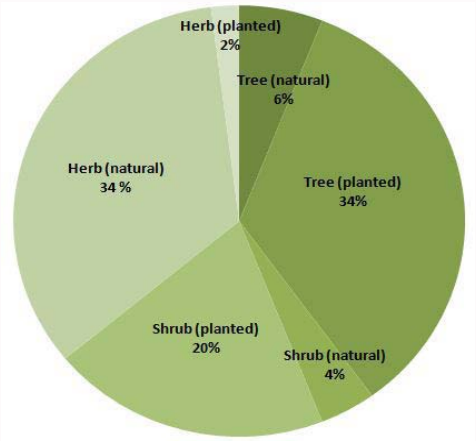

Figure 6: Genetic diversity of plant species in plain land of SAU campus.

204 ayurvedic and 77 homeopatheic drug manufacturing industries where the medicinal plants are extensively used in both raw and semi-processed forms of medicine in various pharmaceutical dose formulations. These plants also serve as important raw materials for many modern medicinal preparations. The market value of drugs produced by these industries from medicinal plants is about Tk. 300 cores [17]. Besides, village Kobiraj, street Vendors and Tribal people also use a large number of medicinal plants for the treatment of

Table 1: Forest types (ecosystem diversity) and areas in Bangladesh.

Forest type	Location	Area (million ha)	Remarks
Hill forest Managed reserved forest (evergreen to semievergreen)	Eastern part of the country (Chittagong, Chittagong Hill Tracts and Sylhet)	0.67	Highly degraded and managed by the Forest Department.
	Chittagong Hill Tracts	0.73	Unclassed State Forest (USF) Under the control of district administration and denuded mainly due to faulty management and shifting cultivation. Mainly scrub forest.
Plain land forest Tropical moist deciduous Forest	Central and north-western region (Dhaka, Mymensingh, Tangail etc.)	0.12	Mainly Sal forest but now converting to exotic short rotation plantations. Managed by the Forest Department.
Mangrove Sundarbans	Southwest (Khulna, Satkhira)	0.57	World's largest continuous mangrove forestand including 0.17 million ha of water.
Coastal forest	Along the shoreline of twelve districts	0.10	Mangrove plantations along the shoreline of 12districts. Managed by Forest Department.
Village forest	Homestead Forests all over the country	0.27	Diversified productive system. Fulfil majority of country's domestic timber, fuel wood and bamboo requirements.
Plantation in tea and Rubber gardens	Chittagong Hill Tracts and Sylhet	0.07	Plantations of various short rotation species (mainly exotics).
Total forest		2.53	17.49% of country's total landmass

Source: [12,13].

Table 2: List of plant species found in Vice-chancellor's bungalow of SAU.

No.	Local Name	English Name	Scientific Name	No. of Plants	Types
1.	Bot	Banyan Tree	*Ficus bengalensis*	8	Tree (natural)
2.	Bash	Bamboo	*Bambuseae*	6	Tree (natural)
3.	Kola	Banana	*Musa sapientum*	9	Tree (natural)
4.	Tula	cotton	*Bombax ceiba*	3	Tree (natural)
5.	Randy	Rain tree	*Albizia saman*	7	Tree (natural)
6.	Pichli	not found	not found	7	Tree (natural)
7.	Tetul	Tamarind	*Tamarindus indica*	11	Tree (natural)
8.	Kantal	Jackfruit	*Artocarpus heterophyllus*	15	Tree (planted)
9.	Krishnochura	Flamboyant	*Delonix regia*	4	Tree (planted)
10.	Amra	Hong plum	*Spondias pinnata*	1	Tree (planted)
11.	Am	Mango	*Mangifera indica*	19	Tree (planted)
12.	Boroi	Jujube fruit tree	*Zyzyphus mauritiana*	13	Tree (planted)
13.	Jam	Black plum	*Syzygium cumini*	9	Tree (planted)
14.	Neem	Indian Lilac	*Azadirachchta indica*	7	Tree (planted)
15.	Pepe	Papaya	Carica papaya	1	Tree (planted)
16.	Fodar	not found	not found	25	Shrub (natural)
17.	Kewa	not found	not found	19	Shrub (natural)
18.	Bet	not found	not found	Unlimited	Shrub (natural)
19.	Telakucha	not found	not found	1	Shrub (natural)
20.	Dainer Hathpao	not found	not found	1	Shrub (natural)
21.	Krishnochura	Flamboyant	*Delonix regia*	1	Shrub (natural)
22.	Lojjaboti	Memosa	*Mimosa pudica*	Unlimited	Shrub (natural)
23.	Kata Mehedi	Golden Dewdrops	*Duranta repens*	3	Shrub (natural)
24.	Rongon	Scarlet Jungleflame	*Ixora coccinea*	11	Shrub (planted)
25.	Gada	Marigold	*Tagetes erecta Linn*	About 200	Shrub (planted)
26.	Bakul	Indian medlar	*Mimosops elengi*	2	Shrub (planted)
27.	Debdaru	Ashoka	*Polythia longifolia*	19	Shrub (planted)
28.	Morog ful	Texas plant	*Celosia argntea*	About 100	Shrub (planted)
29.	Christmas tree	Christmas tree	*Picea abies*	9	Shrub (planted)
30.	Thuja	Arborvitae	*Thuja occidentalis*	13	Shrub (planted)
31.	Noyon tara	Periwinkle	*Vinea rosea*	9	Shrub (planted)
32.	Joba	China rose	*Hibiscus rosa-sinensis*	5	Shrub (planted)
33.	Radha chura	Dwarf Poinciana	*Caesalpinia pulcherrima*	1	Shrub (planted)
34.	Gondhoraj	Gardenia	*Gardenia jasminoides*	8	Shrub (planted)
35.	Hasnahena	Night-blooming jasmine	*Cestrum octurnum*	2	Shrub (planted)
36.	Kamini	Orange Jasmine	*Murraya exotiea*	1	Shrub (planted)
37.	Korobi	Oleander	*Nerium oleander*	4	Shrub (planted)
38.	Lebu	Citrus/Lemon	*Citrus limon*	33	Shrub (planted)
39.	Dahlia	Dahlia	*Dahlia hybrida*	23	Shrub (planted)
40.	Bottle brush	Bottle brush	*Callislemon lanecolatus*	11	Shrub (planted)
41.	Botam ful	Common Globe Amaranth	*Gomphrena globosa*	6	Shrub (planted)
42.	Surjo mukhi	Sun flower	*Helianthus annus*	5	Shrub (planted)
43.	Beliful	Arabian jasmine	*Jasminum sambac*	7	Shrub (planted)
44.	Bagan bilash	Gardenia	*Bougainvillea spectabilis*	15	Shrub (planted)
45.	Golap	Rose	*Rosa chinensis*	8	Shrub (planted)
46.	Nageshar chapa	Ceylon Ironwood	*Messua ferrea*	1	Shrub (planted)

No.	Local Name	English Name	Scientific Name	No. of Plants	Types
47.	Sylvia	Sylvia	*Saluia pratennis*	About 50	Shrub (planted)
48.	Ada	Ginger plant	*Zingiber Officinalis*	19	Shrub (planted)
49	Petunia	Petunia	Petunia Inflorescence	3	Shrub (planted)
50	Pine	Pine tree	*Pinus sylvestris*	5	Shrub (planted)
51	Dhekishak	Fern	*Dryopteris serratodentala*	Unlimited	Herb (natural)
52	Kashordam	Water primsose	*Ludwigia adseendens*	Unlimited	Herb (natural)
53	Amrul shak	Indian sorree	*Oxalin europaea*	Unlimited	Herb (natural)
54	Kanduli	Nudiflora	*Murdannia nudiflora*	Unlimited	Herb (natural)
55	Ket para	not found	*Hedyotis corymbosa*	Unlimited	Herb (natural)
56	Halud Nakful	not found	*Whlenbergia marginata*	Unlimited	Herb (natural)
57	Bon sharisha	Wild mustard	*Brassica kaber*	Unlimited	Herb (natural)
58	Kanai bashi	Spider wort	*Commelina bengalensis*	Unlimited	Herb (natural)
59	Mikania lata	not found	*Mikania scandens*	Unlimited	Herb (natural)
60	Helencha	Ocepin water primrose	*Jessica repens*	Unlimited	Herb (natural)
61	Carpet Grass	Carpet grass	*Axonopus compressus*	Unlimited	Herb (planted)
62	Kata Notey	Spiny pig weed	*Amaranthus spinosus*	Unlimited	Herb (planted)

Table 3: List of plant species found in dairy farm area adjacent to SAU campus.

No.	Species	English Name	Scientific Name	No. of Plants	Types
1.	Randy	Rain tree	*Albizia saman*	13	Tree (natural)
2.	Tetul	Tamarind	*Tamarindus indica*	1	Tree (natural)
3.	Neem	Indian Lilac	*Azadirachchta indica*	150	Tree (natural)
4.	Jam	Black plum	*Syzygium cumini*	6	Tree (natural)
5.	Pahari raintree	Raintree	*Albizia saman*	15	Tree (natural)
6.	Mon	Indian pennywort	*Centella asiatica*	7	Tree (natural)
7.	kola	Banana	*Musa sapientum*	18	Tree (natural)
8.	Pichli	not found	not found	250	Tree (natural)
9.	Fodar	not found	not found	60	Tree (natural)
10.	Booti Jam	not found	not found	200	Tree (natural)
11.	Bot	Banyan Tree	*Ficus bengalensis*	8	Tree (natural)
12.	Awaal	not found	not found	150	Tree (natural)
13.	Kadom	Wild cinchona	*Anthocephalus chinensis*	5	Tree (planted)
14.	Chalta	Indian dellenia	*Dillenia indica*	1	Tree (planted)
15.	Mandar	Indian Coral Tree	*Erythrina variegata*	1	Tree (planted)
16.	Arjun	White Marudah	*Terminalia arjuna*	100	Tree (planted)
17.	Matang	White Meranti	*Shorea assamica*	15	Tree (planted)
18.	Jarul	Giant Crape Myrtle	*Lagerstroemia flosreginae*	60	Tree (planted)
19.	Geol	not found	not found	6	Tree (planted)
20.	Albizia	Frywood	*Albizia lebbeck*	3	Tree (planted)
21.	Shegun	Teak	*Tectona grandis*	6	Tree (planted)
22.	Borishali Amra	Hog plum	*Spondias mangifera*	1	Tree (planted)
23.	Shishoo	Indian Rosewood	*Dalbergia sissoo*	12	Tree (planted)
24.	Agar	Agarwood	*Aquilaria sinensis*	10	Tree (planted)
25.	Am	Mango	*Mangifera indica*	15	Tree (planted)
26.	Koroi	White Siris	*Albizia procera*	150	Tree (planted)
27.	Akashi	*Dillenia*	*Dilleniascabrella roxb*	60	Tree (planted)
28.	Mehgoni	Honduras Mahogany	*Swietenia macrophylla*	150	Tree (planted)
29.	Kantal	Jackfruit	*Artocarpus heterophyllus*	8	Tree (planted)

No.	Species	English Name	Scientific Name	No. of Plants	Types
30.	Simul	Red Silk-Cotton	*Bombax ceiba*	4	Tree (planted)
31.	Betelnut	Areca Palm	*Areca catechu*	21	Tree (planted)
32.	Coconut	Coconut Tree	*Cocos nucifera*	11	Tree (planted)
33.	Jalpai	*Indian Olive*	*Elaeocarpus floribundus*	5	Tree (planted)
34.	Karpur	Camphor	*Cinnamomum camphora*	8	Tree (planted)
35.	Jarul	Giant Crape-myrtle	*Lagerstroemia speciosa*	6	Tree (planted)
36.	Bakul	Spanish cherry	*Mimusops elengi*	9	Tree (planted)
37.	Bash	Bamboo	*Bambuseae bamboo*	19	Tree (natural)
38.	Litchu	Litchi	*Litchi chinensis*	9	Tree (planted)
39.	Guava	Guava	*Psidium guajava*	9	Tree (planted)
40.	Pepe	Papaya	*Carica papaya*	27	Tree (planted)
41.	Citrus	Citrus	*Citrus limon*	19	Tree (planted)
42.	Tula	cotton	*Bombax ceiba*	7	Tree (planted)
43.	Nageshar chapa	Ceylon Ironwood	*Messua ferrea*	1	Shrub (natural)
44.	Lojjaboti	Memosa	*Mimosa pudica*	many	Shrub (natural)
45.	Kata Mehedi	Golden Dewdrops	*Duranta repens*	3	Shrub (natural)
46	Nageshar chapa	Ceylon Ironwood	*Messua ferrea*	1	Shrub (natural)
47	Beliful	Arabian jasmine	*Jasminum sambac*	5	Shrub (planted)
48	Bagan bilash	Gardenia	*Bougainvillea spectabilis*	19	Shrub (planted)
49	Golap	Rose	*Rosa chinensis*	5	Shrub (planted)
50	Surjo mukhi	Sun flower	*Helianthus annus*	7	Shrub (planted)
51	Sylvia	Sylvia	*Saluia pratennis*	about 40	Shrub (planted)
52	Ada	Ginger plant	*Zingiber Officinalis*	19	Shrub (planted)
53	Rujot (Medicinal)	not found	not found	7	Herb (natural)
54	Sheowra	not found	not found	many	Herb (natural)
55	Lutki	Lotkon	*Canscoraandrographioides*	about 10000	Herb (natural)
56	Olotcombol	Not found	*Abroma agusta*	1	Herb (natural
57	Bonjamra	not found	not found	60	Herb (natural)
58	Bekoi	not found	not found	many	Herb (natural)
59	Bonam	not found	not found	1	Herb (natural)
60	Saakni	not found	not found	7	Herb (natural)
61	Pathgatua	not found	not found	19	Herb (natural)
62	Bonaak	not found	not found	7	Herb (natural)
63	Kolum weed	not found	not found	about 10000	Herb (natural)
64	Deshi gash	Sedge	*Carex caespititia*	many	Herb (natural)
65	Satni	not found	not found	3	Herb (natural)
66	German gash	German grass	not found	many	Herb(planted)
67	Napier Gash	not found	not found	many	Herb (planted)

Table 4: List of plant species found in the hilly areas of M.C. College adjacent to SAU.

No.	Local Name	English Name	Scientific Name	No. of Plants	Types
1.	Bot	Banyan Tree	*Ficus bengalensis*	8	Tree (natural)
2.	Bash	Bamboo	*Bambuseae*	6	Tree (natural)
3.	kola	Banana	*Musa sapientum*	9	Tree (natural)
4.	Tula	cotton	*Bombax ceiba*	3	Tree (natural)
5.	Randy	Rain tree	*Albizia saman*	7	Tree (natural)
6.	Pichli	not found	not found	7	Tree (natural)

No.	Local Name	English Name	Scientific Name	No. of Plants	Types
7.	Tetul	Tamarind	*Tamarindus indica*	11	Tree (natural)
8.	kantal	Jackfruit	*Artocarpus heterophyllus*	15	Tree (natural)
9.	Krishnochura	Flamboyant	*Delonix regia*	4	Tree (natural)
10.	Amra	Hong plum	*Spondias pinnata*	1	Tree (natural)
11.	Am	Mango	*Mangifera indica*	19	Tree (natural)
12.	Boroi	Jujubefruit tree	*Zyzyphus mauritiana*	13	Tree (natural)
13.	Jam	Black plum	*Syzygium cumini*	9	Tree (natural)
14.	Neem	Indian Lilac	*Azadirachchta indica*	7	Tree (natural)
15.	Awaal	not found	not found	21	Tree (natural)
16.	Batna	not found	*Cyclobalanopsis oxyodon*	25	Tree (natural)
17.	Pahari raintree	Raintree	*Albizia saman*	19	Tree (natural)
18.	Mon	Indian pennywort	*Centella asiatica*	7	Tree (natural)
19.	Booti Jam	not found	not found	200	Tree (natural)
20.	Kodom	not found	not found	5	Tree (natural)
21.	Kaimula Kaiyengla	not found	*Glochidion sphaerogynum*	4	Tree (natural)
22.	Ram Gua	not found	*pinanga gracilis BL*	3	Tree (natural)
23.	Lohamori Khalta	not found	*Lithocarpus thomsonii*	7	Tree (natural)
24.	Bhuiya Gachh, Bonsum, Bonjolukia	not found	*Cryptocarya amygdalina*	7	Tree (natural)
25.	Kude jam	not found	not found	21	Tree (natural)
26.	Bandor Shasha	not found	*Cucumis hystrix*	8	Tree (natural)
27.	not found	not found	*Hedychium speciosum*	6	Tree (natural)
28.	kantal	Jackfruit	*Artocarpus heterophyllus*	11	Tree (planted)
29.	Kamranga	Carambola	*Averrhoa carambola*	3	Tree (planted)
30.	Simul	Red Silk-Cotton	*Bombax ceiba*	2	Tree (planted)
31.	Betelnut	Areca Palm	*Areca catechu*	22	Tree (planted)
32.	Narikel	Coconut Tree	*Cocos nucifera*	19	Tree (planted)
33.	Jalpai	*Indian Olive*	*Elaeocarpus floribundus*	1	Tree (planted)
34.	Karpur	Camphor	*Cinnamomum camphora*	7	Tree (planted)
35.	Bash	Bamboo	*Bambuseae bamboo*	7	Tree (planted)
36.	Litchu	Litchi	*Litchi chinensis*	3	Tree (planted)
37.	Guava	Guava	*Psidium guajava*	8	Tree (planted)
38.	Pepe	Papaya	*Carica papaya*	11	Tree (planted)
39.	Fodar	not found	not found	25	Shrub (natural)
40.	Kewa	not found	not found	19	Shrub (natural)
41.	Bet	not found	not found	many	Shrub (natural)
42.	Telakucha	not found	not found	1	Shrub (natural)
43.	Dainer Hathpao	not found	not found	1	Shrub (natural)
44.	Citrus	Citrus	*Citrus limon*	17	Shrub(planted)
45.	Bottle brush	Bottle brush	*Callislemon lanecolatus*	17	Shrub (planted)
46.	Rongon	Scarlet Jungleflame	*Ixora coccinea*	13	Shrub (planted)
47.	Dahlia	Dahlia	*Dahlia hybrida*	27	Shrub (planted)
48.	Gada	Marigold	*Tagetes erecta Linn*	About 100	Shrub (planted)
49	Morog ful	Texas plant	*Celosia argntea*	About 100	Shrub (planted)
50	Christmas tree	Christmas tree	*Picea abies*	11	Shrub (planted)
51	Thuja	Arborvitae	*Thuja occidentalis*	15	Shrub (planted)
52	Noyon tara	Periwinkle	*Vinea rosea*	9	Shrub (planted)
53	Joba	China rose	*Hibiscus rosa-sinensis*	7	Shrub (planted)

No.	Local Name	English Name	Scientific Name	No. of Plants	Types
54	Gondhoraj	Gardenia	*Gardenia jasminoides*	9	Shrub (planted)
55	Hasnahena	Night-blooming jasmine	*Cestrum octurnum*	7	Shrub (planted)
56	Kamini	Orange Jasmine	*Murraya exotiea*	3	Shrub (planted)
57	Korobi	Oleander	*Nerium oleander*	12	Shrub (planted)
58	Lutki	not found	*Canscora andrographioides*	150-200	Herb (natural)
59	kolum	not found	not found	many	Herb (natural)
60	Bonam	not found	not found	4	Herb (natural)
61	Tulsi	not found	*Ocimum americanum*	many	Herb (natural)
62	Chapra	Goose grass	*Eleusina indica*	many	Herb (natural)
63	Fulka	Leptochloa grass	*Leptochloa chinensis*	many	Herb (natural)
64	Chesra	Bulrush	*Scirpus juncoides*	many	Herb (natural)
65	Prem Kata	Love thorn	*Chrysopogon aciculatun*	many	Herb (natural)
66	Halud Nakful	not found	*Whlenbergia marginata*	many	Herb (natural)
67	Biskatali	Smane weed	*Polygnom nyclonopiper*	many	Herb (natural)
68	Durba	Bermuda grass	*Cynodom doctylon*	many	Herb (natural)
69	Gash	Sedge	*Carex caespititia*	many	Herb (natural)
70	Fan Kachu	Colocasia	*Colocasia virosa*	many	Herb(planted)
71	Anna Kachu	Colocasia	*Colocasia mannii*	many	Herb(planted)

Table 5: List of plant species in plain land of SAU.

No.	Local Name	English Name	Scientific Name	No. of Plants	Types
1.	Krishnochura	Royal Poinciana	*Delonix regia*	2	Tree (natural)
2.	Bash	Bamboo	*Bambuseae bamboo*	7	Tree (natural)
3.	Neem	Indian Lilac	*Azadirachchta indica*	7	Tree (natural)
4.	Khudejam		*Syzygium fruticosum*	5	Tree (natural)
5.	Boroi	Jujube fruit tree	*Zyzyphus mauritiana*	11	Tree (natural)
6.	Kadam	Wild cinchona	*Anthocephalus chinensis*	3	Tree (natural)
7.	Akashmoni	Ear leaf acacia	*Acacia auriculiformis*	4	Tree (planted)
8.	Mangium	Brown salwood	*Acacia mangium*	2	Tree (planted)
9.	Banana	Banana	*Musa sapientum*	29	Tree (planted)
10.	khoir	black cutch	*Acacia catechu*	1	Tree (planted)
11.	Kalokoroi/Sirish	Woman's Tongue tree	*Albizia lebbeck*	2	Tree (planted)
12.	Raintree	Rain tree	*Albizia saman*	13	Tree (planted)
13.	Ipil-Ipil	White lead tree	*Leucaena leucocephala*	1	Tree (planted)
14.	Bot	Banyan Tree	*Ficus bengalensis*	9	Tree (planted)
15.	Amloki	Indian gooseberry	*Phyllanthus emblica*	4	Tree (planted)
16.	Day fal	False Mangosteen	*Garcinia xanthochymus*		Tree (planted)
17.	Minjiri	Kassod Tree	*Cassia siamea*	1	Tree (planted)
18.	Telsur	Rock Dammar	*Hopea odorata*	1	Tree (planted)
19.	Bilimbi	Bilimbi	*Averrhoa bilimbi*	2	Tree (planted)
20.	Tentul	Tamarind	*Tamarindus indica*	1	Tree (natural)
21.	Polash	Sacred Tree	*Butea monosperma*	2	Tree (planted)
22.	Arhar	Pigeon pea	*Cajanus cajan*	1	Tree (planted)
23.	Debdaru	Ashoka Tree	*Polyalthia longifolia*	21	Tree (planted)
24.	Arjun	Arjuna myrobalan	*Terminalia arjuna*	2	Tree (planted)
25.	Bohera	Beleric myrobalan	*Terminalia bellirica*	2	Tree (planted)
26.	Horitoki	Gall nut	*Terminalia chebula*	1	Tree (planted)
27.	Amra	Hong plum	*Spondias pinnata*	1	Tree (planted)

No.	Local Name	English Name	Scientific Name	No. of Plants	Types
28.	Am	Mango	*Mangifera indica*	27	Tree (planted)
29.	Jam	Black plum	*Syzygium cumini*	2	Tree (planted)
30.	Mahgoni	Honduras Mahogany	*Swietenia macrophylla*	1	Tree (planted)
31.	kantal	Jack fruit	*Artocarpus heterophyllus*	11	Tree (planted)
32.	Kamranga	Carambola	*Averrhoa carambola*	1	Tree (planted)
33.	Simul	Red Silk-Cotton	*Bombax ceiba*	2	Tree (planted)
34.	Betelnut	Areca Palm	*Areca catechu*	23	Tree (planted)
35.	Narikel	Coconut Tree	*Cocos nucifera*	13	Tree (planted)
36.	Jalpai	*Indian Olive*	*Elaeocarpus floribundus*	1	Tree (planted)
37.	Karpur	Camphor	*Cinnamomum camphora*	7	Tree (planted)
38.	Jarul	Giant Crape-myrtle	*Lagerstroemia speciosa*	5	Tree (planted)
39.	Bakul	Spanish cherry	*Mimusops elengi*	2	Tree (planted)
40.	Litchu	Litchi	*Litchi chinensis*	3	Tree (planted)
41.	Guava	Guava	*Psidium guajava*	8	Tree (planted)
42.	Pepe	Papaya	*Carica papaya*	19	Tree (planted)
43.	Tula	Cotton	*Bombax ceiba*	2	Tree (planted)
44.	Nageshar chapa	Ceylon Ironwood	*Messua ferrea*	1	Shrub (natural)
45.	Lojjaboti	Memosa	*Mimosa pudica*	many	Shrub (natural)
46.	Kata Mehedi	Golden Dewdrops	*Duranta repens*	3	Shrub (natural)
47.	Krishnochura	Flamboyant	*Delonix regia*	4	Shrub (natural)
48.	Mehedi	Henna	*Lawsonia inermis*	3	Shrub (planted)
49.	Citrus	Citrus	*Citrus limon*	17	Shrub(planted)
50.	Botam ful	Common Globe Amaranth	*Gomphrena globosa*	5	Shrub (planted)
51.	Bakul	Indian medlar	*Mimosops elengi*	3	Shrub (planted)
52.	Debdaru	Ashoka	*Polythia longifolia*	17	Shrub (planted)
53.	Surjo mukhi	Sun flower	*Helianthus annus*	5	Shrub (planted)
54.	Beliful	Arabian jasmine	*Jasminum sambac*	6	Shrub (planted)
56.	Bagan bilash	Gardenia	*Bougainvillea spectabilis*	14	Shrub (planted)
57.	Golap	Rose	*Rosa chinensis*	3	Shrub (planted)
58.	Ada	Ginger plant	*Zingiber officinalis*	18	Shrub (planted)
59.	Petunia	Petunia	Petunia inflorescence	3	Shrub (planted)
60.	Pine	Pine tree	*Pinus sylvestris*	4	Shrub (planted)
61.	Kamini	Orange Jasmine	*Murraya exotiea*	1	Shrub (planted)
62.	Korobi	Oleander	*Nerium oleander*	1	Shrub (planted)
63.	Dahlia	Dahlia	*Dahlia hybrida*	37	Shrub (planted)
64.	Bottle brush	Bottle brush	*Callislemon lanecolatus*	19	Shrub (planted)
65.	Rongon	Scarlet Jungleflame	*Ixora coccinea*	11	Shrub (planted)
66.	Krishnochura	Peacock flower	*Delonix regia*	4	Shrub (planted)
67.	Sylvia	Sylvia	*Saluia pratennis*	About 60	Shrub (planted)
68.	Gada	Marigold	*Tagetes erecta Linn*	About 200	Shrub (planted)
69.	Kashuripana	Water hyacinth	*Eictthornia arassepes*	many	Herb (natural)
70.	Shapla	Water Lily	*Nymphaea nouchali*	many	Herb (natural)
71.	Mutha	not found	*Cypyrus rotendos*	many	Herb (natural)
72.	Sobuj Nakful	not found	*Cypyrus deformis*	many	Herb (natural)
73.	Ulu	Cogon grass	*Imperala cylindrica*	many	Herb (natural)
74.	Arail	Swamp rice grass	*Lecersia hexandra*	many	Herb (natural)
75.	Nunia	Common purlane	*Portulaca otenareca*	many	Herb (natural)

No.	Local Name	English Name	Scientific Name	No. of Plants	Types
76.	Kalmilata	not found	*Ipomoea aquatica*	many	Herb (natural)
77.	Joina	not found	*Schleichera oleosa*	many	Herb (natural)
78.	Tulsi	not found	*Ocimum americanum*	many	Herb (natural)
79.	Pani long	Winged water	*Ludarigia octovalvis*	many	Herb (natural)
80.	Chagla gocha	not found	*Ageratum conyzoides*	many	Herb (natural)
81.	Dhekishak	Fern	*Dryopteris serratodentala*	many	Herb (natural)
82.	Kashordam	Water primsose	*Ludwigia adseendens*	many	Herb (natural)
83.	Amrul shak	Indian sorree	*Oxalin europaea*	many	Herb (natural)
84.	Kanduli	Nudiflora	*Murdannia nudiflora*	many	Herb (natural)
85.	Ket para	not found	*Hedyotis corymbosa*	many	Herb (natural)
86.	Halud Nakful	not found	*Whlenbergia marginata*	many	Herb (natural)
87.	Bon sharisha	Wild mustard	*Brassica kaber*	many	Herb (natural)
88.	Kanai bashi	Spider wort	*Commelina bengalensis*	many	Herb (natural)
89.	Mikania lata	not found	*Mikania scandens*	many	Herb (natural)
90.	Helencha	Ocepin water primrose	*Jessica repens*	many	Herb (natural)
91.	Bathua	Lambsquarter	*Chenopodium album*	many	Herb (natural)
92.	Kata Notey	Spiny pig weed	*Amaranthus spinosus*	many	Herb (natural)
93.	Khuda Shama	Jungle grass	*Echinocholoa colonum*	many	Herb (natural)
94.	Durba	Bermuda grass	*Cynodom doctylon*	many	Herb (natural)
95.	Chapra	Goose grass	*Eleusina indica*	many	Herb (natural)
96.	Fulka	Leptochloa grass	*Leptochloa chinensis*	many	Herb (natural)
97.	Chesra	Bulrush	*Scirpus juncoides*	many	Herb (natural)
98.	Chanchi	not found	*Alternanihena sessilis*	many	Herb (natural)
99.	Carpet Grass	Carpet grass	*Axonopus compressus*	many	Herb (natural)
100.	Fulchaise	not found	*Cyperus nomonalis*	many	Herb (natural)
101.	Chira ghas	not found	*Saripus supinus*	many	Herb (natural)
102.	Prem Kata	Love thorn	*Chrysopogon aciculatun*	many	Herb (natural)
103.	Ban Mula	Wild radish	*Raphanus raphanistrum*	many	Herb (natural)
104.	Biskatali	Smane weed	*Polygnom nyclonopiper*	many	Herb (natural)
105.	Napier Gash	not found	not found	many	Herb (planted)
106.	Para gash	Para grass	not found	many	Herb (planted)

Table 6: List of plant species found in Medicinal plant adjacent to SAU campus.

No.	Local Name	English Name	Scientific Name	Types
1.	Banana	Banana	*Musa sapientum*	Tree (planted)
2.	Amloki	Indian gooseberry	*Phyllanthus emblica*	Tree (planted)
3.	Day fal	False Mangosteen	*Garcinia xanthochymus*	Tree (planted)
4.	Telsur	Rock Dammar	*Hopea odorata*	Tree (planted)
5.	Bilimbi	Bilimbi	*Averrhoa bilimbi*	Tree (planted)
6.	Tentul	Tamarind	*Tamarindus indica*	Tree (natural)
7.	Horitoki	Gall nut	*Terminalia chebula*	Tree (planted)
8.	Amra	Hong plum	*Spondias pinnata*	Tree (planted)
9.	Jam	Black plum	*Syzygium cumini*	Tree (planted)
10.	Khudejam		*Syzygium fruticosum*	Natural
11.	Neem	Indian Lilac	*Azadirachchta indica*	Tree (natural)
12.	kantal	Jackfruit	*Artocarpus heterophyllus*	Tree (planted)
13.	Kamranga	Carambola	*Averrhoa carambola*	Tree (planted)
14.	Betelnut	Areca Palm	*Areca catechu*	Tree (planted)

No.	Local Name	English Name	Scientific Name	Types
15.	Coconut	Coconut Tree	*Cocos nucifera*	Tree (planted)
16.	Jalpai	*Indian Olive*	*Elaeocarpus floribundus*	Tree (planted)
17.	Arhar	Pigeon pea	*Cajanus cajan*	Tree (planted)
18.	Bakul	Spanish cherry	*Mimusops elengi*	Tree (planted)
19.	Arjun	Arjuna myrobalan	*Terminalia arjuna*	Tree (planted)
20.	Bohera	Beleric myrobalan	*Terminalia bellirica*	Tree (planted)
21.	Litchu	Litchi	*Litchi chinensis*	Tree (planted)
22.	Guava	Guava	*Psidium guajava*	Tree (planted)
23.	Pepe	Papaya	*Carica papaya*	Tree (planted)
24.	Citrus	Citrus	Citrus limon	Tree (planted)
25.	Khuda Shama	Jungle grass	*Echinocholoa colonum*	Herb (natural)
26.	Mehedi	henna	*Lawsonia inermis*	Tree (planted)
27.	Chanchi	not found	*Alternanihena sessilis*	Herb (natural)
28.	Chira ghas	not found	*Saripus supinus*	Herb (natural)
29.	Prem Kata	Love thorn	*Chrysopogon aciculatun*	Herb (natural)
30.	Ban Mula	Wild radish	*Raphanus raphanistrum*	Herb (natural)
31.	Biskatali	Smane weed	*Polygnom nyclonopiper*	Herb (natural)
32.	Bathua	Lambsquarter	*Chenopodium album*	Herb (natural)
33.	Kata Notey	Spiny pig weed	*Amaranthus spinosus*	Herb (natural)
34.	Pani long	Winged water	*Ludarigia octovalvis*	Herb (natural)
35.	Chagla gocha	not found	*Ageratum conyzoides*	Herb (natural)
36.	Dhekishak	Fern	*Dryopteris serratodentala*	Herb (natural)
37.	Kashordam	Water primsose	*Ludwigia adseendens*	Herb (natural)
38.	Amrul shak	Indian sorree	*Oxalin europaea*	Herb (natural)
39.	Kanduli	Nudiflora	*Murdannia nudiflora*	Herb (natural)
40.	Chalta	Indian dellenia	*Dillenia indica*	Tree (planted)
41.	Mandar	Indian Coral Tree	*Erythrina variegata*	Tree (planted)
42.	Bon sharisha	Wild mustard	*Brassica kaber*	Herb (natural)
43.	Lojjaboti	Memosa	*Mimosa pudica*	Shrub (natural)
44.	Helencha	Ocepin water primrose	*Jessica repens*	Herb (natural)
45.	Shapla	Water lily	*Nymphaea nouchali*	Herb (natural)
46.	Mutha	not found	*Cypyrus rotendos*	Herb (natural)
47.	Bakul	Indian medlar	*Mimosops elengi*	Shrub (planted)
48.	Fan Kachu	Colocasia	*Colocasia virosa*	Shrub (natural)
49.	Anna Kachu	Colocasia	*Colocasia mannii*	Herb (natural)
50.	Nunia	Common purlane	*Portulaca otenareca*	Herb (natural)
51.	Kalmilata	not found	*Ipomoea aquatica*	Herb (natural)
52.	Tulsi	not found	*Ocimum americanum*	Herb (natural)
53.	Lutki	not found	*Canscora andrographioides*	Herb (natural)
54.	Goddhipata	not found	*Dalhousiea bracteata*	Natural(Shrub)
56.	Rujot (Medicinal plant)	not found	not found	Herb (natural)
57.	Satni	not found	not found	Herb (natural)
58.	Dainer Hath paa	Common ash	*Fraxinus excelsior*	Tree (natural)
59.	Batna	not found	*Cyclobalanopsis oxyodon*	Tree (natural)
60.	Bandor Shasha	not found	*Cucumis hystrix*	Tree (natural)
61.	Lohamori Khalta	not found	*Lithocarpus thomsonii*	Tree (natural)
62.	kola	Banana	*Musa sapientum*	Tree (planted)

No.	Local Name	English Name	Scientific Name	Types
63.	Olotcombol	Not found	*Abroma agusta*	Herb (natural
64.	Shishoo	Indian Rosewood	*Dalbergia sissoo*	Tree (planted)
65.	Mon	Indian pennywort	*Centella asiatica*	Tree (natural)
66.	Joba	China rose	*Hibiscus rosasinensis*	Shrub (planted)
67.	Gondhoraj	Gardenia	*Gardenia jasminoides*	Shrub (planted)
68.	Surjo mukhi	Sun flower	*Helianthus annus*	Shrub (planted)

Table 7: Medicinal Uses of some important medicinal plants found in SAU campus.

No	Medicinal plants	Habit and Habitat	Uses
1.	Sylvia (*Celosia Criatata L*)	Herb Found in SAU campus	The plant is used in biliousness, dysentery, diarrhea, painful menstruation, snake-bite and also used as demulcent, alexiteric, astringent, emollient for opthalmia.
2.	Bonnobotaphul *(Gomphrena Celosioides Mart)*	Herb Waste lands, roadsides, dry sandy soil.	This weed also causes, it is claimed, skin problems in cattle, and hay fever, asthma and dermatitis in some people.
3.	Latamouri, Digera.*(Digera Muricata (L.) Mart)*	Herb Cultivated lands and along roadsides.	Plant is cooling, astringent to the bowels in small doses and laxative in large doses; useful in biliousness. *Flowers* and seeds are useful in urinary discharges.
4.	Goburanotey *(Amaranthus Lividus Willd)*	Herb Roadsides,waste lands.	The boiled leaves and roots are given to children as a laxative; they are applied as an emollient poultice to abscessess, boils and burns. Root juice along with sugar or molasses is given in dysentery.
5.	Boroapang (Cyathula Capitata Moq*)*	Herb Roadsides and dry grassy places	Used for some medicinal purposes against cough, dysentery, cholera and intestinal worms.
6.	Shaknotey (*Amaranthus Viridis L.*)	Herb Found in SAU campus	The plant is cooling, alexiteric, laxative, stomachic, appetizer and antipyretic; used in burning sensation, hallucination, leprosy, bronchitis, piles, leucorrhoea and constipation. The leaves are used as an emollient. The root is heating and expectorant; lessens the menstrual flow; useful in leucorrhoea and leprosy
7.	Datashak,Notiyasag *(Amaranthus Blitum L)*	Herb. Found in SAU campus	This plant is used as stomachic, good remedy for the roundworm, emollient and it also used in biliousness, haemorrhagic-diathesis and blisters.
8.	Kantanotey *(Amaranthus Spinosus L)*	Herb Found in SAU campus	The plant is cooling, laxative, diuretic, stomachic, antipyretic and galactagogue; improves appetite; useful in burning sensation, hallucination, leprosy, piles, bronchitis, leucorrhoea, constipation and flatulence.
9.	Malancha Shak (*Alternanthera hiloxeroides*)	Herb Found in SAU campus	Plant is used for hazy vision, night blindness, malaria, post natal complaints, prolapsus ani, fistulas ani, diarrhoea, dysentery and puerperal fever.
10.	Chanchi,Sanchi-shak. (*Alternanthera Sessilis*)	Herb Found in SAU campus	Plant is galactagogue, cholagogue and febrifuge; Decoction with little salt is drunk to check blood vomiting.

Table 8: Site-specific (hilly areas/plain lands) plant species.

No.	Plant species found only in hilly areas, not in plain land	Plant species found only in plain land, not in hilly areas
1.	kola (*Musa sapientum*)	Pepe (*Carica papaya*)
2.	Lutki (*Canscora andrographioides*)	Akashmoni (*Acacia auriculiformis*)
3.	Fodar	Khuda Shama (*Echinocholoa colonum*)
4.	Pichli	Durba (*Cynodom doctylon*)
5.	Kewa	Chapra (*Eleusina indica*)
6.	kolum	Fulka (*Leptochloa chinensis*)
7.	Bet	Chesra (*Scirpus juncoides*)
8.	Fan Kachu (*Colocasia virosa*)	Chanchi (*Alternanihena sessilis*)
9.	Anna Kachu (*Colocasia mannii*)	Carpet Grass (*Axonopus compressus*)
10.	Bash (*Bambuseae bamboo*)	Ban Mula (*Raphanus raphanistrum*)
11.	Neem (*Azadirachchta indica*)	Biskatali (*Polygnom nyclonopiper*)
12.	Randy (*Albizia saman*)	Bathua (*Chenopodium album*)
13.	Shewtadrone (*Leucas aspera*)	Kata Notey (*Amaranthus spinosus*)
14.	Bot	Am (*Mangifera indica*)
15.	Dainer Hathpao	Mandar (*Erythrina variegata*)
16.	Awaal	Tula (*Bombax ceiba*)
17.	Batna (*Cyclobalanopsis oxyodon*)	Randy (*Albizia saman*)
18.	Pahari raintree (*Albizia saman*)	Mehedi (*Lawsonia inermis*)
19.	Booti Jam	Tetul (*Tamarindus indica*)
20.	Ram Gua (*Pinanga gracilis BL*)	Kantal (*Artocarpus heterophyllus*)
21.	Lohamori Khalta (*Lithocarpus thomsonii*)	Krishnochura (*Delonix regia*)
22.	Bhuiya Gachh (*Cryptocarya amygdalina*)	Amra (*Spondias pinnata*)

various diseases. There is no actual figure how many medicinal plants are used in Bangladesh.

We found some important medicinal plants in the hilly areas of SAU and in hilly areas adjacent to SAU (Table 6). The most common medicinal plants found in those areas were Chanchi (*Alternanthera sessilis*), Malanchashak (*Alternanthera philoxeroides*), Katanotey (*Amaranthus spinosus*), Ashwagondha, Lojjaboti, Anantamul, Satamuli, Sarpagondha, Ghritokumari, Goraneem Khuedjam, Horitoki, Bohera, Dhekishak, Bonjamra, Ada, Amloki, Bel, Mutha, Tulsi, Thankuni, Sylvia etc.

Conclusion

The study was carried out to investigate the status of genetic diversity of plant species in hilly areas and plain lands of Sylhet Agricultural University (SAU) and in hilly areas adjacent to SAU during January, 2015 to June, 2015. The highest number of tree species were are found in hilly areas of M.C. College adjacent to SAU whereas the lowest number of tree species are found in the area of Vice-chancellor's bungalow of SAU. Both naturally grown and planted trees, herbs and shrubs along with a good number of medicinal plants were found in the studied areas which created wonderful genetic resources in that region.

Many plant species along with the medicinal plants were identified in the studied areas which may be the good source of genetic material for future study. Therefore, good management practices are needed for conserving these plant genetic resources.

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