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Full Length Research Paper

Horticultural potential of wild edible fruits used by the Khasi tribes of Meghalaya

S. Jeeva

Department of Botany, Nesamony Memorial Christian College, Marthandam - 629 165, Kanyakumari, Tamil Nadu, India. E-mail: solomon_jeeva@rediffmail.com.

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Plants provide most of the food products consumed by indigenous people in tropical countries. A study of wild edible fruits in the Khasi tribes of Meghalaya was carried out to assess their horticultural importance. One hundred fifty-one species belonging to 49 families were encountered, which include folk name, habit and the season of availability. Among them 100 were trees, 34 shrubs, 12 climbers and 5 herbs. Some edible plants have great economic value and are highly linked with socio-economic development of tribal communities of the state. The importance of documenting the use of wild edible species in this hotspot region is especially important because of rapid loss of biodiversity due to anthropogenic disturbance. The outcome of the present study may be helpful to have an understanding and thus make a conservation strategy of the wild edible species.

Key words: Ethnobotany, indigenous community, Khasi tribe, Meghalaya, wild edibles.

INTRODUCTION

Nutrition/food security is a complex issue, which is influenced by a nation's food security status. However, for most of the developing countries, increasing national agricultural production alone cannot improve food secu-rity. Food production must be actively combined with evaluation, selection and domestication and greater utilization of under-utilized or wild edible plants that are of local or regional importance to effectively increase nutri-tional security. By improving the linkage between produc-tion and utilization, the biodiversity of traditional crops can be safe guarded. The knowledge of traditional food plant is important to promote the cereal staples in a more sustainable way. This is so because this know-how will enable for better food security/nutrition at household level (Ohiokpehai, 2003).

The term ‘wild-food’, though commonly used, is misleading because it implies the absence of human influence and management. In reality, there is a conti-nuum resulting from the development of co-evolutionary relationships between humans and their environment (Bell, 1995) . People have indirectly shaped many of the plants and some have been largely domesticated in home gardens and in the fields together with farmers’ cultivated food and cash crops. Nevertheless, the term ‘wild-food’ is used to describe all plant resources outside of agricultural areas that are harvested or collected for the purpose of human consumption in forests, savannah and other bush land areas. Wild-foods are incorporated into the normal livelihood strategies of many rural people, shifting cultivators, continuous croppers or hunter-gatherers (Bell, 1995).

Indigenous knowledge of wild edible plant is important for sustaining utilization of those plant species (Jasmine et al., 2007). It is important for people to know the pre-vailing traditional food plants in their areas and how they can be improved for sustainable food security/nutrition. The northeast Himalayan region of India is rich in diversity of wild edible plant species, particularly in Meghalaya. Wild edible plants are very important for the well being of the populations in the region, not only as sources of supplemental food, nutritionally balanced diets, medicine, fodder and fuel, but also for developed methods of resource management, which may be fundamental to the conservation of some of the world's important habitats (Cotton, 1997).

There has been a revival of interest in medicinal and wild food plants during the last few decades among the ethnobotanists (Launert, 1981; Maikhuri, 1991; Arora and Pandey, 1996; Pieroni, 1999; Sudhakar and Vedvathy, 1999; Bhatt et al., 2000; Sundriyal and Sundriyal, 2001; Narayanan et al., 2002; Pundir and Singh, 2002. Ramamurthy et al., 2003; Kar, 2004; Dogan et al., 2004; Rajasab and Isaq, 2004; Sundriyal et al., 2004; Xu et al., 2004; Augustine, 2005; Sinha and Lakra, 2005; Tardio et al., 2005;

Angami et al., 2006; John Kennedy, 2006; Kingston et al., 2006a; Sankaran et al., 2006; Kiruba et al., 2007) . In Meghalaya, some studies have been conducted on ethnomedicinal plants used by the tribal communities (Rao, 1981; Kharkongor and Joseph, 1981; Neogi et al., 1989; Douli et al., 2004; Jeeva et al., 2006a; Laloo et al., 2006). However, with forests occupying about 42% area of total geographical area of the state, there is paucity of information on the wild edible fruits of the region. The earlier workers have not paid much atten-tion on wild edible plants of Meghalaya (Singh and Arora, 1973; Vasudeva Rao and Shanpru, 1981; Maikhuri and Gangwar, 1993; Agrahar-Murugkar and Subhulakshmi, 2005). Therefore, the present study was conducted with an aim to enumerate wild edible fruits used by the *Khasi* tribes of Meghalaya. This is an effort to provide base line data that can be helpful in ensuring sustainable utilization of wild edible fruits of Meghalaya.

Land and people

Meghalaya (20.1 N' - 26.5 N' latitude and 85.49 E' - 92.52 E' longitude) 'the abode of clouds' is a treasure trove of Nature, with its richly varied and dense endemic, exotic and cultivated flora. Nature, in its generous abundance, had bestowed on Meghalaya a unique array of vege-tation, ranging from tropical and sub-tropical to temperate (Jeeva et al., 2006b; 2007). This is due to the diverse topography, varied and abundant rainfall and differential climatic and edaphic conditions within the different regions of the State. Even at some places, biotic factors have played an important role in shaping the environ-ment. It is, undoubtedly, a natural lover's heaven and a botanist's paradise (Jeeva et al., 2005a; Jeeva and Anusuya, 2005; Jeeva et al., 2009).

The climate of Meghalaya is moderate but humid. With average annual rainfall as high as 1200 cm in some areas, Meghalaya is the wettest state of India. The maxi-mum temperature in this region rarely goes beyond 28°, whereas winters temperatures of sub-zero degrees are common. The town of Cherrapunji in the Khasi Hills south of capital Shillong holds the world record for most rain in a calendar month, while the village of Mawsynram, near town of Cherrapunji, holds the distinction of seeing the heaviest yearly rains.

The Khasis inhabit the eastern part of Meghalaya, in the Khasi and Jaintia Hills. Khasis residing in Jaintia hills are now better known as Jaintias or Pnars. The Khasis occupying the northern lowlands and foothills are generally called Bhois. Those who live in the southern tracts are termed Wars. Again among the Wars, those living in the Khasi Hills are called War-Khasis and those in the Jaintia Hills, the War-Pnars or War-Jaintias. In the Jaintia Hills, we have Khyrwangs, Labangs, Nang-phylluts, and Nangtungs in the northeastern part and in the east. In the Khasi Hills, the Lyngngams live in the northwestern part. But all of them claim to have descended from the 'Ki Hynniew Trep' and are now known by the generic name of Khasi-Pnars or simply Khasis. They have the same traditions, customs and usage with a little variation owing to geographical divisions.

The traditional Khasi male dress is ‘Jymphong’ or a longish sleeveless coat without collar, fastened by thongs in front. Now, the Khasis have adopted the western dress. On ceremonial occasions, they appear in ‘Jymphong’ and dhoti with an ornamental waist-band. The Khasi traditional female dress is rather elaborate with several pieces of cloth, giving the body a cylindrical shape. On ceremonial occasions, they wear a crown of silver or gold on the head. A spike or peak is fixed to the back of the crown, corresponding to the feathers worn by the menfolk.

The staple food of Khasis is rice. They also take fish and meat. Like the other tribes in the North-East, the Khasis also ferment rice- beer, and make spirit out of rice or millets by distillation. Use of rice-beer is a must for every ceremonial and religious occasion. They have good knowledge about the utilization of forest resources.

The Khasis, the Jaintias and the Garos have a matrilineal society. Descent is traced through the mother, but the father plays an important role in the material and mental life of the family. While, writing on the Khasi and the Jaintia people, David Roy observed, 'a man is the defender of the woman, but the woman is the keeper of his trust'. No better description of Meghalayan matrilineal society could perhaps be possible.

In the Khasi society, the woman looks after home and hearth, the man finds the means to support the family, and the maternal uncle settles all social and religious matters. Earlier in the conservative Jaintia non-Christian families, however, the father only visits the family in the night and is not responsible for the maintenance of the family.

METHODOLOGY

Field trips were conducted during May, 2004 - April, 2006 among the Khasi tribes of Meghalaya. During the field trips we sampled several sites of East and West Khasi hills. Interviews with villagers, local market observations and plant material collection have been carried out during the field trips. Typically, we invited 5 - 6 villagers, considered to be the most knowledgeable on local plant uses to conduct transact walks in forests and its adjacent village. During these walks ethnobotanical information was recorded for edible wild fruits. Folk names were carefully recorded during transect walks and afterwards tested in different elder people to make sure these folk names are most commonly used by the local people. Nutritive values of some commercial wild edible species were collected from different sources and compared with the prominent commercial fruits of India.

Plant specimens were identified with the help of regional and local floras (Kanjilal et al., 1934 - 1940; Balakrishnan, 1981 –1983; Haridasan and Rao, 1985 - 1987) and further counterchecked with the help of the specimens available from Botanical Survey of India, Eastern Circle, Shillong. To eliminate any chance of error in iden-tification, the specimens were collected in flowering and fruiting condition. Voucher specimens were deposited in the Herbarium of Ecology Laboratory, Department of Botany, North - Eastern Hill

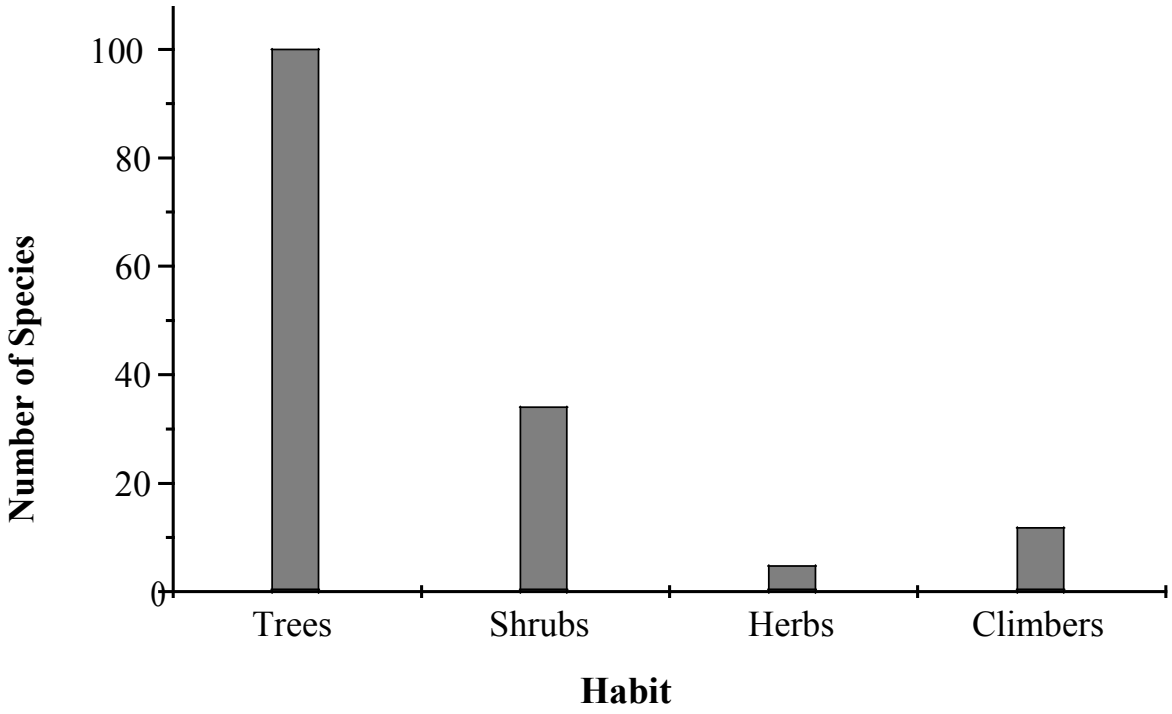

Figure 1. Number of wild edible fruits in different category.

University (NEHU), Shillong.

RESULTS AND DISCUSSION

A total of 151 species (49 families and 86 genera) wild edible fruits used by the *Khasi* tribes of Meghalaya have been recorded. Ethnobotanical data listed in Appendix 1 includes botanical names, family, folk names, habit and season of availability. This is about 8% of the total species (1886) of vascular plants identified in Meghalaya (Haridasan and Rao, 1985 - 1987). The past studies provided a comprehensive review of edible fruits and nuts in the tropics. Mugnozza (1996) estimates an untapped potential of about 3000 tropical fruits worldwide. Because local communities are extremely knowledgeable about local plants, ethnobotanical studies are crucial for documenting plant resource uses.

Habit-wise distribution of plants depicts that the number of wild edible tree species was markedly high (100) and it was followed by shrubs (34), climbers (12) and herbs (5). The tree species are more important in terms of wild edibles, as they constitute 66.22 % with respect to species composition (Figure 1). The most frequently used wild fruits are Moraceae (13 species), Rosaceae (12 species), Euphorbiaceae (10 species), Myrtaceae and Rutaceae (9 species each). The most frequently used genera are *Garcinia* (8 species), *Ficus* and *Eugenia* (7 species each) and Solanum (5 species). The monospecific and monogeneric families were counted as 20 and 33, respectively (Table 1). The shift in taxonomic position at species and genus levels, and increased number of families having single species and genus indicates over-exploitation of certain plants.

Several methods of fruit use have also been recorded. Ripe fruits are mostly eaten raw (*ca*. 85%) whereas unripe fruits are used variedly and cooked as vegetable, mixed with curry, eaten with salt or cooked with dry fish. Fruits such as *Antidesma diandrum*, *Baccaurea sapida*, *Castanopsis indica*, *Dillenia indica*, *Elaeagnus latifolia*, *Ficus hispida*, *Garcinia* sps. etc., are consumed raw. The unripe fruits of *Dillenia indica* and *Ficus hispida* are cooked as vegetable. The species *Myrica esculenta* is extensively used for preparing sauce and help to generates extra income among the indigenous women. People in different areas use their local resources independently. The past studies showed that the different tribes of other parts of northeast India (Gangwar and Ramakrishnan, 2000), as well as, Southern Yunnan (Jin et al., 1999) have intensively used similar wild fruits. This proves the diversification of knowledge among the indigenous people in region to region and nation to nation.

The seasonal availability of wild fruits does have an affect to a certain extent. The flowering starts between January and March, in case of majority of the species, which accounted for about 52 per cent of the total plant species described. The fruiting, however, varies from species to species. The phenological characters, especially flowering and fruiting, are very essential elements to understand ways of conservation measures for the particular species.

Table 1. Family wise distribution of the wild edible fruits of Meghalaya.

Rank	Family	Genus	Species	Rank	Family	Genus	Species
1	Moraceae	4	13	26	Meliaceae	1	2
2	Rosaceae	5	12	27	Moringaceae	1	2
3	Euphorbiaceae	6	10	28	Piperaceae	2	2
4	Myrtaceae	2	9	29	Vacciniaceae	1	2
5	Rutaceae	5	9	30	Acanthaceae	1	1
6	Anacardiaceae	6	8	31	Actinidiaceae	1	1
7	Clusiaceae	1	8	32	Ampelidaceae	1	1
8	Elaeocarpaceae	2	5	33	Berberidaceae	1	1
9	Solanaceae	1	5	34	Boraginaceae	1	1
10	Tiliaceae	1	4	35	Burseraceae	1	1
11	Vitaceae	3	4	36	Capparidaceae	1	1
12	Caprifoliaceae	1	3	37	Cornaceae	1	1
13	Fagaceae	1	3	38	Cucurbitaceae	1	1
14	Myrsinaceae	3	3	39	Gnetaceae	1	1
15	Rhamnaceae	1	3	40	Lecythidaceae	1	1
16	Rubiaceae	3	3	41	Menispermaceae	1	1
17	Sapindaceae	3	3	42	Myricaceae	1	1
18	Saurauiaceae	1	3	43	Passifloraceae	1	1
19	Verbenaceae	3	3	44	Portulacaceae	1	1
20	Annonaceae	2	2	45	Sabiaceae	1	1
21	Arecaceae	2	2	46	Santalaceae	1	1
22	Dilleniaceae	1	2	47	Sapotaceae	1	1
23	Ebenaceae	1	2	48	Sterculiaceae	1	1
24	Flacourtiaceae	1	2	49	Urticaceae	1	1
25	Melastomataceae	2	2		Total	86	151

Wild fruits have been important sources of indispensable nutrients. Nutritional value of fruits cannot be judged without analysis. However, the fact that most wild fruits have high nutritional value, especially in protein, carbohydrate, vitamin C and some essential minerals has been shown (Table 2 - 4). The other workers of different regions reported similar results. From the above findings, it can be concluded that the wild edible species are a good source of various nutrients, which are other comparable with the most commercial species and also cheaply available. Therefore, the consumption of these species by the indigenous people may be of considerable significance. So, the wild food plants are not exclusive to the indigenous community, rather, they are essential parts of the diets of the entire local population.

The collection and consumption of wild fruits have played an important role in indigenous community for their day to day life. Mostly women and children are engaged in collection of wild edibles. About 80% of the wild edibles are drawn from sacred groves and other forest areas and sold in the market by poorer community for income (Jeeva et al., 2006a). These wild products being lesser- known and less available have a good market value. However, the influence of wild fruit collection of indigenous community in daily life has been reduced with the introduction and cultivation of cultivated fruits and the changes in their life styles.

Moreover, the traditional healthcare system is an age-old practice in Khasi tribes of Meghalaya. From the present study, it is found that most of the wild edible plants are used in traditional healthcare system. This system in the ethnic communities is conservation-oriented and has great potential. The earlier study showed that about 90% of the rural population in hilly terrain depends on traditional healthcare system (Kingston et al., 2006b). Traditional knowledge about wild resources is handed down from generation to generation(Jeeva et al., 2005b; Jeeva et al., 2005c; Kiruba et al., 2006; Prakash et al., 2006; Jeeva et al., 2006c). Reorientation of indigenous community psyche towards usefulness of wild edible plants will be an effective tool for restoration of traditional knowledge system inherent in tribal people. This can easily be achieved, if the government of India launches programmes involving local community on care and share basis for conservation of such genetic resources. The necessary steps should also be taken for cultivation of important wild edibles in agroforestry systems. Undoubtedly, this traditional wisdom may someday constitute the traditional heritage of the people of Meghalaya.

Table 2. Chemical composition of some important wild edible fruits of Meghalaya*.

Plant species	Moisture (%)	Ash (%)	Fibre (%)	TSS (%)	Vitamin C (%)	Fat (%)	Protein (%)	Carbohydrate (%)	Total sugar (%)	Lignin (%)	Cellulose (%)
Baccaurea sapida Roxb.	35.39	3.85	20.48 ± 0.38	13.96 ± 2.02	0.273 ± 0.0544	0.73 ± 0.64	5.58	51.90	10.87 ±1.16	17.10 ±0.20	13.78 ± 1.93
Eleagnus latifolia L.	87.31	3.16	9.30 ± 3.14	8.63 ± 0.24	0.072 ± 0.0016	0.52 ± 0.035	7.80	74.06	2.10 ± 0.03	2.65 ±0.84	12.87 ± 1.39
Prunus cerasoides D. Don	83. 00	3.11	7.32 ± 1.13	6.50 ± 0.23	0.319 ± 0.001	0.59 ± 0.015	3.50	84.07	6.96 ± 0.313	18.11 ± 3.15	11.56 ±0.087
Rubus ellipticus Smith.	80.60	4.10	7.90 ± 0.24	6.60 ± 0.78	0.011 ± 0.006	7.10 ± 1.55	4.00	72.70	8.50 ± 0.66	15.10 ± 0.18	17.30 ± 4.39
Spondias axillaris Roxb.	65.68	2.70	39.90 ± 0.15	9.90 ± 1.06	0.036 ± 0.014	0.05 ± 0.006	4.11	52.28	2.31 ± 0.07	19.44 ± 1.25	25.81 ± 2.19
Zanthozylum rhetuza Wall.	25.55	3.44	11.51 ± 3.13	7.00 ± 1.07	-	0.53 ± 0.130	5.56	76.36	3.61 ± 0.80	17.13 ± 3.90	16.15 ± 1.11

- Not estimated. *Sundriyal et al., 2001.

Table 3. Mineral content of some important wild edible fruits of Meghalaya*.

Plant species	N (%)	P (%)	K (%)	Ca (%)	Fe (%)	Zn (μg/g)	Mg (%)	Cu (μg/g)
Baccaurea sapida Roxb.	0.780 ± 0.114	0.132 ± 0.003	0.730 ± 0.009	0.158 ± 0.001	0.075 ± 0.001	600.00 ± 154.13	0.504 ± 0.043	76.67 ± 69.46
Eleagnus latifolia L.	1.250 ± 0.074	0.096 ± 0.001	0.910 ± 0.002	1.470 ± 0.758	0.180 ± 0.031	1186.66± 162.73	0.544 ± 0.026	46.66± 5.44
Prunus cerasoides D. Don	3.790 ± 0.091	0.179 ± 0.008	0.470 ± 0.021	0.204 ± 0.113	0.211 ± 0.002	201.66 ± 3.60	0.585 ± 0.098	11.33± 3.81
Spondias axillaris Roxb.	0.353 ± 0.030	0.156 ± 0.059	0.673 ± 0.034	1.583 ± 0.919	0.109 ± 0.039	831.25± 55.69	0.675 ± 0.012	60.00 ± 14.14
Zanthozylum rhetuza Wall.	0.870 ± 0.026	0.139 ± 0.010	0.718 ± 0.214	0.883 ± 0.603	0.054 ± 0.018	1163.33 ± 69.97	0.353 ± 0.109	116.66± 25.96

*Sundriyal et al., 2001

Table 4. Nutritive value of most prominent commercial fruits of India[#].

Name of Fruit	Moisture (%)	Protein (%)	Fat (%)	Mineral matter (%)	Fibre (%)	Carbohydrate (%)	Ca (%)	P (%)	Fe (%)	Vitamin C (%)
Apple	85.90	0.30	0.10	0.30	-	13.40	0.01	0.02	1.70	2.00
Banana	61.40	1.30	0.20	0.70	-	36.40	0.01	0.05	0.40	1.00
Fig	80.80	1.30	0.20	0.60	-	17.10	0.06	0.03	1.20	2.00
Grape	86.70	0.90	0.10	0.40	3.00	10.10	0.03	0.02	0.30	17.00
Guava (Hills)	85.30	0.10	0.20	0.60	4.80	8.10	0.05	0.02	1.20	16.00
Jack fruit	77.20	1.90	0.10	0.80	1.10	18.90	0.02	0.03	0.50	-
Litchi	84.30	0.70	0.30	0.70	2.25	9.40	0.21	0.31	0.03	Trace
Mango (Ripe)	86.10	0.60	0.10	0.30	1.10	11.80	0.01	0.02	0.30	13.00
Orange	87.80	0.90	0.30	0.40	-	10.60	0.05	0.02	0.10	68.00
Pineapple	86.50	0.60	0.10	0.50	0.30	12.00	0.02	0.01	0.90	63.00

[#]Sundriyal, 19

Conclusion

The retention of knowledge by both young and aged people on the uses of the wild edible fruits attests to the continuing importance of these natural resources for subsistence and as a part of the cultural heritage of the *Khasi*s. In general, people of this region are well versed in the folk names of ethnobotanical plants. Evaluation of the nature and the potential of these plants should proceed from a broad perspective. First, all ethnobotanical and indigenous plants of this area require greater evaluation of nutritional, pharmacological, and toxicological properties. Interpretation of scientific data must be done in the context of the nutritional and subsistence needs of Khasis.

Further research needs to be focussed on the basic biology of the plants. Much remains to be understood of their systematics, reproductive biology, ecology and biogeography. Investigations are needed into productivity, harvestability and regeneration status of wild edible plant species. Surely it makes no sense to advocate exploitation that leads to destruction and elimination of the plants. Introduction of some of the wild edibles like *Baccaurea sapida, Castanopsis indica, Dillenia indica, Elaeagnus latifolia, Garcinia pedunculata, Myrica esculenta etc.,* into the home gardens of local people will play a great role, not only in terms of protection strategy but also because of their horticultural value.

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Appendix

Appendix 1. Wild edible fruits used by indigenous communities of Meghalaya.

Botanical Name	Family	Local Name	Habit	Flowering/Fruiting
Actinidia callosa Lindl.	Actinidiaceae	Mei-soh-khan	Shrub	April-August
Aegle marmelos (Linn.) Correa	Rutaceae	Soh-bel	Tree	-
Aglaia edulis A. Gray.	Meliaceae	Dieng-soh-longar	Tree	March-June
Aglaia roxburghiana Miq.	Meliaceae	-	Tree	February-March
Antidesma bunius Spreng.	Euphorbiaceae	Dieng-soh-silli	Tree	April-August
Antidesma diandrum Roth.	Euphorbiaceae	Dieng-japen	Tree	April-February
Antidesma ghesaembilia Gaertn.	Euphorbiaceae	-	Tree	March-February
Antidesma khasianum Hk.f.	Euphorbiaceae	Dieng-soh-sillih	Tree	July-November
Aphania rubra (Roxb.) Radlk.	Sapindaceae	Dieng-soh-jymmang	Shrub	November-April
Ardisia floribunda Wall.	Myrsinaceae	Theilang-rong	Tree	June-February
Artocarpus chaplasa Roxb.	Moraceae	Dieng-soh-ram	Tree	March-August
Artocarpus gomezianus Wall ex Trecul	Moraceae	-	Tree	July-September
Artocarpus integra Thunb.	Moraceae	Dieng-soh-phan	Tree	February- September
Artocarpus lakoocha Roxb.	Moraceae	Armu(G)	Tree	February-August
Baccaurea ramiflora Lour.	Euphorbiaceae	Soh-ram-dieng	Tree	-
Baccaurea sapida Roxb.	Euphorbiaceae	Dieng-soh-ram-dieng	Tree	April-July
Bridelia stipularis Bl.	Euphorbiaceae	Risan-um	Shrub	September-March
Bursera serrata Colebr.	Burseraceae	Dieng-soh-mir	Tree	March-April
Calamus erectus Roxb.	Arecaceae	Soh-thri	Shrub	-
Caryota urens Linn.	Arecaceae	Kwai-cha	Tree	-
Castanopsis indica A. DC.	Fagaceae	Dieng-sarag(J)	Tree	February-December
Castanopsis purpurella (Mq.) Balak.	Fagaceae	Dieng-soh-stap	Tree	-
Castanopsis tribuloides A. DC.	Fagaceae	Dieng-soh-ot	Tree	September-February
Cayratia japonica (thunb.) Gagnep	Ampelidaceae	Syrbuid(J)	Climber	April-June
Citrus hystrix DC.	Rutaceae	Soh-kyniet	Tree	March-February
Citrus latipes (Swingle) Tanaka	Rutaceae	Soh-heh	Shrub	-
Citrus medica Linn.	Rutaceae	Soh-manong	Shrub	March-February
Clausena heptaphylla W. & A.	Rutaceae	Dieng-siang-mat	Shrub	April-December
Cornus capitata Wall.	Cornaceae	Dieng-soh-japhon	Tree	April-September
Cudrania javanensis Trecul.	Moraceae	U-sia-kiang	Tree	April-November
Cyathocalyx martabanicus Hk.f. & Th.	Annonaceae	-	Tree	-
Debregeasia longifolia Wedd.	Urticaceae	Soh-tyrsim	Tree	June-February
Dillenia indica Linn.	Dilleniaceae	Soh-kyrbam	Tree	June-April
Dillenia scabrella (D.Don) Roxb.ex Wall	Dilleniaceae	Agatchi-badura(G)	Tree	March-July
Diospyros kaki Linn.	Ebenaceae	Dieng-iong(J)	Tree	March-September
Diospyros lanceaefolia Roxb.	Ebenaceae	Dieng-thang	Tree	April-February
Docynia hookeriana Dcne.	Rosaceae	Dieng-soh-phoh	Tree	February-September
Docynia indica (Wall.) Decene	Rosaceae	Soh-phoh	Tree	February-September
Donella roxburghii (G. Don) Purre.	Sapotaceae	-	Tree	April-May
Dryptes assamica (Hk.f.)Pax et Hoffm.	Euphorbiaceae	Dieng-pankher	Tree	October-April
Ehretia acuminata Br.	Boraginaceae	Dieng-basier	Tree	March-April
Elaeagnus latifolia Linn.	Elaeocarpaceae	Soh-shang	Shrub	November-May
Elaeagnus pyriformis Hk.f.	Elaeocarpaceae	Dieng-soh-blor	Shrub	November-April
Elaeocarpus floribundus Bl.	Elaeocarpaceae	-	Tree	May-December
Elaeocarpus lanceaefolius Roxb.	Elaeocarpaceae	Dieng-soh-khyllam	Tree	June-December
Elaeocarpus prunifolius Wall.	Elaeocarpaceae	Soh-khyllam-eit-blang	Tree	January-October
Embelia sessiliflora Kurz.	Myrsinaceae	Soh-jew-tenksai	Climber	September
Emblica officinalis Gaertn.	Euphorbiaceae	Soh-mylleng	Tree	March-February
Eugenia bracteata Roxb.	Myrtaceae	-	Tree	January-December

Appendix 1. Contd

Eugenia claviflora Roxb.	Myrtaceae	Chambu(G)	Tree	March-May
Eugenia sp.	Myrtaceae	-	Tree	March-June
Eugenia jambolana Lam.	Myrtaceae	Dieng-ramai	Tree	April-July
Eugenia operculata Roxb.	Myrtaceae	Thot-kak(G)	Tree	April-July
Eugenia praecox Rob.	Myrtaceae	Dieng-myrchang	Tree	December-April
Eugenia praetermissa Gage.	Myrtaceae	-	Tree	November-April
Ficus auriculata Lour.	Moraceae	-	Tree	-
Ficus cunia Ham.	Moraceae	Dieng-thylliang-sang(J)	Tree	January-December
Ficus hirta Vahl.	Moraceae	Dieng-soh-rompain	Tree	November-April
Ficus lanceolata Ham.	Moraceae	-	Tree	April-June
Ficus nemoralis Wall.	Moraceae	Dieng-surme-blang	Tree	December-February
Ficus pomifera Wall.	Moraceae	-	Tree	January
Ficus roxburghii Wall.	Moraceae	Dieng-soh-lampin	Tree	April-June
Flacourtia cataphracta Roxb.	Flacourtiaceae	Dieng-soh-mluh	Tree	March-January
Flacourtia jangomas (lour.) Raeusch.	Flacourtiaceae	-	Tree	-
Fragaria nilgerrensis Schdl.	Rosaceae	-	Herb	-
Garcinia cowa Roxb.	Clusiaceae	Rengran(G)	Tree	March-August
Garcinia kydia Roxb.	Clusiaceae	Dieng-soh-longksan	Tree	February-August
Garcinia lanceaefolia G. Don.	Clusiaceae	Dieng-soh-jadu	Shrub	February-July
Garcinia paniculata G. Don.	Clusiaceae	Dieng-soh-longkor	Tree	December-July
Garcinia pedunculata G. Don.	Clusiaceae	Dieng-soh-danei	Tree	September-February
Garcinia spicata Hk.f.	Clusiaceae	Dieng-soh-kwang	Tree	May-February
Garcinia tinctoria (DC) W.F.Wight	Clusiaceae	Dieng-soh-rynsan	Tree	March-January
Garcinia xanthochymus Hk.f.	Clusiaceae	Dieng-soh-khyllung	Tree	March-February
Gardenia campanulata Roxb.	Rubiaceae	Soh-mai	Tree	March-November
Glycosmis pentaphylla Corr.	Rutaceae	Dieng-soh-sning	Tree	January-April
Gmelina arborea Roxb.	Verbenaceae	Dieng-lophiang	Tree	February-July
Gnetum montanum MG.F.	Gnetaceae	Mei-lar-iong-um	Climber	February-December
Grewia elastica Royle.	Tiliaceae	Dieng-thap-ballieh	Tree	April-November
Grewia hirsuta Vahl.	Tiliaceae	Soh-synting	Shrub	November-January
Grewia sapida Roxb.	Tiliaceae	-	Shrub	March-May
Emblica officinalis Gaertn.	Euphorbiaceae	Soh-mylleng	Tree	March-February
Grewia sclerophylla Roxb.	Tiliaceae	-	Shrub	May-September
Haematocarpus thompsoni Miers.	Menispermaceae	-	Climber	April-May
Holboellia latifolia Wall.	Berberidaceae	Sa-tymbra(J)	Shrub	February-November
Lantana camara Linn.	Verbenaceae	Dieng-sohpang-khlieh	Shrub	June-February
Leea macrophylla Roxb.	Vitaceae	Pharun-barne	Herb	August-March
Lepisanthes rubiginosa (Roxb.) Leenh.	Sapindaceae	-	Tree	May-June
Litchi chinensis Sonner.	Sapindaceae	Soh-manir	Tree	January-June
Maesa indica Wall.	Myrsinaceae	Dieng-soh-jala-tyrkai	Shrub	March-December
Mallotus philippinensis Muell.	Euphorbiaceae	Dieng-chandon	Tree	August-May
Mangifera indica Linn.	Anacardiaceae	Dieng-soh-pieng	Tree	February-July
Medinilla rubicunda Bl.	Melastomataceae	-	Tree	-
Melastoma malabathricum Linn.	Melastomataceae	Dieng-soh-khing	Shrub	February-December
Meliosma pinnata Roxb.	Sabiaceae	Dieng-soh-naior	Tree	April-September
Melodorum verrucosum Hk.f. & Th.	Annonaceae	Jyrmi-soh-ram-khlaw	Climber	March-January
Momordica dioica Roxb.	Cucurbitaceae	-	Climber	-
Moringa oleifera Lamk.	Moringaceae	-	Tree	-
Moringa pterygosperma Gaertn.	Moringaceae	-	Tree	January-May
Myrica esculenta Buch.-Ham.	Myricaceae	Dieng-soh-phie	Tree	-
Passiflora edulis Sims.	Passifloraceae	Soh-brap	Climber	-
Pegia nitida Colebr.	Anacardiaceae	-	Shrub	-

Appendix 1. Contd

Peperomia pellucida H.B. & K.	Piperaceae	-	Herb	-
Phlogacanthus thyrsiflorus (Roxb.) Nees.	Acanthaceae	Dieng-soh-kajut	Shrub	December-April
Piper longum L.	Piperaceae	-	Climber	May-December
Portulaca oleracea Linn.	Portulacaceae	-	Herb	January-July
Premna herbacea Roxb.	Verbenaceae	Bol-sal-thanuri	Shrub	January-July
Prunus cerasoides D.Don.	Rosaceae	Dieng-soh-iong-krem	Tree	October-June
Prunus jenkinsii	Rosaceae	Sa-tanghi(J)	Tree	-
Prunus nepaulensis (Ser.) Steud.	Rosaceae	Soh-iong	Tree	October-August
Pseudostreblus indica Bureau.	Moraceae	Dieng-chiri-khlaw(J)	Tree	June-February
Psidium guajava Linn.	Lecythidaceae	Soh-pyriam	Tree	January-December
Pyrularia edulis A.DC.	Santalaceae	Dieng-soh-klong	Tree	April-November
Pyrus communis Linn.	Rosaceae	Soh-phoh	Tree	-
Pyrus pashia D.Don.	Rosaceae	Soh-shur	Tree	March-January
Randia uliginosa DC.	Rubiaceae	Suskeng(G)	Tree	May-February
Rhus semialata Murr.	Anacardiaceae	Dieng-soh-ma	Tree	May-April
Rubus ellipticus Sm.	Rosaceae	Soh-pero	Shrub	February-June
Rubus khasianus Cordot.	Rosaceae	Soh-shiah	Shrub	July-September
Rubus lasiocarpus Smith.	Rosaceae	Dieng-soh-khaw-iong	Shrub	March-July
Rubus moluccanus Linn.	Rosaceae	Soh-nybbah	Shrub	January-December
Saurauja nepaulensis DC.	Saurauiaceae	-	Tree	December-January
Saurauja panduana Wall.	Saurauiaceae	Dieng-ja-la-ngap	Tree	April-November
Saurauja roxburghii Wall.	Saurauiaceae	Dieng-soh-la-pied	Tree	March-August
Semecarpus anacardium Linn. F.	Anacardiaceae	Dieng-soh-bhala	Tree	July-March
Solanum barbisetum Nees.	Solanaceae	Soh-podok	Shrub	August-May
Solanum indicum Linn.	Solanaceae	Soh-ngan	Shrub	June-February
Solanum kurzii Br.	Solanaceae	Khim-kha(G)	Shrub	March
Solanum spirale Roxb.	Solanaceae	Soh-jhari	Shrub	May-February
Solanum xanthocarpum Schrad & Wendl.	Solanaceae	Dieng-soh-podok bakthang	Herb	December-February
Spondias axillaris Roxb.	Anacardiaceae	Dieng-saliat	Tree	February-December
Spondias mangifera Willd. Sans.	Anacardiaceae	Dieng-soh-pair-kynthai	Tree	March-February
Spondias pinnata (Linn.f.) Kurz.	Anacardiaceae	Dieng-soh-pier	Tree	March-November
Sterculia coccinea Roxb.	Sterculiaceae	-	Tree	
Stixis suaveolens (Roxb.) Bail.	Capparidaceae	-	Climber	March-June
Syzygium cumini (Linn.) Skeels	Myrtaceae	-	Tree	February-June
Syzygium tetragonum (Wt.) Kurz. (Dennst) Balak.	Myrtaceae	Dieng-soh-sarlei	Tree	-
Tapira hirsuta Hk.f.	Anacardiaceae	Da-cheng-brup(G)	Shrub	April-February
Tetrastigma leucostaphyllum (Dennst) Balak.	Vitaceae	Syrpung(J)	Climber	January-May
Vaccinium donianum Wight.	Vacciniaceae	Dieng-soh-rongkham	Shrub	February-May
Vaccinium griffithianum Wight.	Vacciniaceae	Soh-ryngkham	Shrub	April-May
Vangueria spinosa Roxb.	Rubiaceae	Soh-mon	Tree	April-September
Viburnum foetens Dcne.	Caprifoliaceae	-	Shrub	April-July
Viburnum foetidum Wall.	Caprifoliaceae	Soh-lang-ksew	Shrub	July-September
Viburnum simonsii Hk.f. & Th.	Caprifoliaceae	Soh-lang-eit-ksew	Tree	June-November
Vitis rugosa Wall.	Vitaceae	-	Climber	November-January
Vitis rumicisperma Laws.	Vitaceae	-	Climber	June-November
Zanthoxylum budrunga Wall.	Rutaceae	Dieng-ka-shyrang	Tree	September-April
Zanthoxylum oxyphyllum Edgw.	Rutaceae	Jaiur-blai(J)	Shrub	May-October
Zanthoxylum rhetuza Wall.	Rutaceae	Dieng-soh-mirik	Tree	April-September
Zizyphus jujuba Lamk.	Rhamnaceae	Dieng-soh-broi	Tree	September-February

Appendix 1. Contd.

Zizyphus mauritiana Lamk.	Rhamnaceae	Soh-broi	Tree	February-June
Zizyphus rugosa Lamk.	Rhamnaceae	Dumakpul(G)	Tree	March-July

Abbreviation: (–) not known, (G) Garo, (J) Jaintia.
All these plants are present in Khasi hills, except some species, which are present in Garo hills and Jaintia hills and marked as G and J, respectively.