

Wild plants of horticultural importance from the Singhason Hills in Assam

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Abstract

The Singhason Hills in Karbi Anglong district of the Indian state Assam is an underexplored biodiversity-rich region. Indigenous people of Singhason Hills grow many useful wild plants in their homestead gardens primarily for food and to some extent with commercial interest. The present article aims to explore wild plants of horticultural potentials which are common components of homestead gardens in the Singhason Hills. Data was collected through semi-structured interview of household elders, inventory of homestead gardens and survey of local markets. Information on cultivation and uses of 48 plants were recorded during the study which included trees (17), shrubs (12), herbs (17) and climbers (02). Wild products are indispensable source of food, nutrition, medicine and livelihood and also socio-religious needs to local populace. Cultivation of useful wild plants in home gardens augments food production and can lead to domestication and conservation of plant germplasms. Considering present utilization pattern and market demand, horticulture of the following wild plants of Singhason Hills namely *Citrus sinensis* (Linnaeus) Osbeck, *Citrus macroptera* Montrouzier, *Cinnamomum verum* J. Presl, *Canarium resiniferum* Bruce ex King, *Canarium strictum* Roxburgh, *Calamus viminalis* Willdenow, *Aquilaria malaccensis* Lamarck, *Rauvolfia serpentina* (Linnaeus) Bentham ex Kurz and *Thysanolaena latifolia* (Roxburgh ex Hornemann) Honda can be explored to support local food production and livelihoods.

Key words: Singhason Hills, wild plants, home gardens, horticulture, local markets

INTRODUCTION

The horticulture sector encompasses a wide range of crops namely fruits, vegetables, potato and tubers, ornamentals, medicinal and aromatic, spices and plantation crops (Eleventh five year plan, 2007). It also provides ample opportunities for sustaining large number of agro-industries which generate substantial employment opportunities. The horticulture sector contributes around 28 % of the GDP from about 13.08 % of the area and 37 % of the total exports of agricultural commodities (Rather *et al.* 2013). Earlier, focused attention was given to horticultural research and development which placed India as the second largest producer of fruits and vegetables, largest producer and consumer of cashew nut, tea, spices, third largest producer of coconut, fourth largest producer and consumer of rubber and sixth largest producer of coffee in the world (FAO 2007). Today, as a result of synergy between focused research, technological and policy initiatives, high efficiency inputs, horticulture in India, has become a sustainable and viable venture for the small and marginal farmers. India with its wide diversity in climate and soil has given rise to the formation of a variety of ecosystems and accounts for 10 % of Global total production of food crops (FAO 2008).

Different agro-climatic zones in Northeastern region of India contributes towards production of fruits like pineapple (*Ananas comosus*), litchi (*Litchi chinensis*) and even in bamboo (*Bambusa* spp.) and cane (*Calamus* spp.) production. The region is acclaimed for diversity in plant resources which are conserved by the diverse ethnic groups through their traditional practices. It is one of the richest reservoir of genetic variability and diversity of different crops including fruits, vegetables, spices, ornamental plants and also medicinal and aromatic plants (Asati & Yadav 2004). The region is also considered as center of origin of several fruits such as mango, banana and citrus (Shadeque 1989). Local communities of the region are equally dependent on crops (i.e. cultivated species) and wild plants for subsistence and livelihoods. With the growing needs, people depend more on wild products which often results in overexploitation. Exploitation of wild plants generally leads to domestication of selected plants that continues through cultivation and selection over years (Medhi 2014).

The Singhason Hills in Karbi Anglong district of Assam state is an underexplored biodiversity-rich region. The hills serve as a reservoir of genetic variability and diversity of different crops and their wild relatives. Ethnic groups inhabiting the hills cultivate different local varieties of crops primarily for food; surplus products are often traded to generate cash income. However, agrobiodiversity of the Singhason Hills has been barely studied or evaluated. To ensure supply of resources, many wild species, particularly locally prioritized and rare species are planted in homesteads and also in their farming fields. Besides agricultural products, utilization of wild plants is indispensable not only as source of food but for socio-cultural needs as well (Phangchopi *et al.* 2014). Utilization of wild edible plants has been part of dietary culture of the people. Though wild plants can be collected at ease, selective cultivation of wild plants either for food production, medicine or other utilities is practiced in Singhason Hills. Such practice can be considered as a prelude to domestication and ultimately horticulture of the plants. This can contribute to augmentation of food production and conservation of germplasm. In addition, cultivation of plants will enable farmers to engage in other household chores as they no longer will have to frequent into the forests to collect the plants. The present paper aims to explore the horticultural potentials of wild plants which are common components of homestead gardens in the Singhason Hills.

MATERIALS AND METHOD

Study area

The Singhason Hill range (Fig. 1) in Karbi Anglong district (25° 30' to 26° 36' N and 92° 30' to 93° 54' E), Assam state of India comprises of the Singhason peak (1360 m above MSL) and the adjacent hills including some protected areas such as Mikir Hills Reserve Forest, Kalyani Reserve Forest and Nambor Reserve Forest (Teronpi *et al.* 2015). The hill range is located in the eastern part of the district surrounded by the Rengma hills. The region abruptly rises through successive ranges to the north of the Jamuna River. On the east and west, it gradually slopes down to the neighboring plains of Golaghat and Nagaon respectively while to the north it reaches the Brahmaputra River through a low plateau surface (Phangcho 2001). The hill range with its unique physiography and varied climate that favors luxuriant growth of vegetation, fauna and microbes, is considered as one of the floristic hotspots of Assam. The region supports vegetation of semi-deciduous to semi-evergreen type (Champion & Seth 1968). The Hills is the home to different indigenous groups like *Karbi*, *Kuki*, *Rengma*, *Naga*, *Shyam*, *Hmar*, *Garo*, *Chakma* and Tea-Tribes who have modified the habitat through agricultural and other practices since time immemorial. Agriculture is the main occupation of the people; hunting and fishing are the secondary occupation. Slash and burn (popularly referred as *jhum*) is the chief method of agriculture and paddy is the major crop (Fig. 2). Local communities also collect wild plants and their products primarily for food supplement



Fig. 2. Initial operation in a Jhum field



Fig. 3. A village under study in Singhason Hills

Homestead gardens of the villagers were inventoried to record the grown wild plants. The economic/market value of wild plants and their products were recorded through survey of local or makeshift markets and interview of vendors (Alexiades 1996). The horticultural potentials of wild plants were assessed based on domestication of the plants and its contribution to livelihoods. Ethnobotanical information on wild plants divulged by informants including local names, parts used, availability, processing and uses, and botanical description of the plants (for example habit, habitat, etc.) were recorded in the field diary. The plants were collected during forest walks with informants and home gardens and then identified with the help of floras (Kanjilal *et al.* 1934 – 1940; Bor 1940; Balakrishnan 1981 – 1983). Identity of the plant species were authenticated at the ASSAM Herbarium, Botanical Survey of India, Shillong. Nomenclature and family delimitation for the recorded plants were updated using online database *The Plant List* (www.theplantlist.org). Wild plants studied were tabulated and fed in MS spread sheet for statistical analysis of use categories and plants parts used.

RESULT AND DISCUSSION

Diversity and Ethnobotany of wild plants

Wild plant collections by the ethnic groups in Singhason Hills consisted of fruits, flowers, roots, tubers, stems, leaves, barks, etc. particularly for food, nutrition and livelihoods and to a lesser extent medicinal. Forty-eight plants (Table 1) recorded during the study included trees (17), shrubs (12), herbs (17) and climbers (02). Though the list of useful wild plants is extensive, the present study discussed only those wild plants cultivated by local residents in their home gardens and *jhum* fields. Traditional knowledge (TK) of plant utilization revealed diverse use categories like food (39), medicine (21), ornamental (01), rituals (05), construction (02), household chores (01) and crafting (04) [Fig. 4]. Parts used included fruits (20), leaves (14), rhizomes (04), bark (05), tubers (01), tender shoots (02), stems (04), roots (01), inflorescences (04) and whole plants (05) [Fig. 5]. *Dioscorea alata* (tubers), *Gnetum gnemon* (leaves), *Alpinia nigra* (Fig. 6), *Colocasia esculentum* (Fig. 7), and *Clerodendrum glandulosam* are the most collected food plants. In the early history of the Singhason Hills, the Karbi ethnic group consumed bark of *Premna mollissima* as a staple food while many species of *Dioscorea* are used as famine foods during time of food scarcity. *Eryngium foetidum* (Fig. 8) and *Begonia* sp. are commonly collected as wild spices and condiments. *Aegle marmelos*, *Choerospondias axillaris* and *Elaeagnus latifolia* are important cultivated fruit plants. Barks of *Artocarpus lacucha* is often used as a substitute of betel nut, where chewing the barks along with betel leaves after meal is a common hobby of the people in Singhason Hills. *Aegle marmelos* and *Croton joufra* are used in the production of starter cakes for brewing traditional alcoholic beverages. *Croton joufra* is mainly used by the Karbi ethnic group which is considered a source of cultural identity of the Karbis. Revered medicinal plants included *Rauvolfia serpentina* (poisonous bites and dysmenorrhea), *Kaempferia galanga* (poisonous bites and wounds) (Fig. 9), *Curcuma* species (jaundice) and *Aristolochia* species (stomach disorders). Resins of *Canarium resiniferum* (Fig. 13) and *Canarium strictum* are used in rituals (often believed to keep evil spirits at bay) and as a mosquito repellent. Some plants are cultivated for construction and craft such as bamboo, *Gmelina arborea*, *Calamus viminalis* and *Sterculia villosa*. *Oxalacuminata* (Fig. 8) is used during traditional hunting of bees and honey collection. Twigs of the plant is made into torch and burnt; the smoke repels the bees and the hive is collected. Rhizomes of *Etlingera elatior* also serves as good repellent to fend off bees from the beehive while honey hunting.

Wild plants form important source of subsistence and livelihood diversification for the people of Singhason Hills. Wild plants and their products form regular items traded in

Table 1. Wild plants and their uses in Singhasan hills along with their market prices

Botanical name[Family]; Exsiccatae	Local name	Habit	Habitat	Parts used	Market value in ₹	Uses
<i>Aegle marmelos</i> (Linnaeus) Correa [Rutaceae]; AUCD 712, dtd.- 28.11.2012	<i>Thipli</i>	Tree	Terrestrial	Leaves, fruits	10 per fruit	Food, medicine
<i>Alpinia nigra</i> (Gaertner) Burt [Zingiberaceae]; AUCD 720, dtd. 28.11.2012	<i>Tara</i>	Herb	Terrestrial	Rhizomes	10 per bundle	Food, medicine
<i>Alpinia galanga</i> (Linnaeus) Willdenow [Zingiberaceae]; AUCD 769, dtd. 18.12.2014	<i>Pri Kangnek</i>	Herb	Terrestrial	Infloresce nce	10 per bundle	Food, medicine
<i>Amomum dealbatum</i> Roxburgh [Zingiberaceae]; AUCD 751, dtd. 28.04.2014	<i>Phe langdung</i>	Herb	Terrestrial	Infloresce nce	10 per bundle	Food
<i>Annona reticulata</i> Linnaeus [Annonaceae]; AUCD 743, dtd. 26.06.2013	<i>Longle jangphong</i>	Shrub	Terrestrial	Fruits	5 per fruit	Food
<i>Antidesma acidum</i> Retzius [Phyllanthaceae]; AUCD 748, dtd. 28.04.2014	<i>Ingsun</i>	Shrub	Terrestrial	Leaves, fruits	10 per bundle	Food, medicine
<i>Aquilaria malaccensis</i> Lamarck [Thymalaeaceae]; AUCD 737, dtd. 26.06.2013	<i>Chap</i>	Tree	Terrestrial	Stem	-----	Resin for perfume, incense
<i>Artocarpus heterophyllus</i> Lamarck [Moraceae]; AUCD 756, dtd. 28.04.2014	<i>Jangphong</i>	Tree	Terrestrial	Fruits, leaves	10 per fruit	Food
<i>Artocarpus lacucha</i> Buchanan- Hamilton [Moraceae]; AUCD 753, dtd. 13.04.2014	<i>Ingtat arong</i>	Tree	Terrestrial	Barks	10 per bundle	substitute for betel nut
<i>Baccaurea ramiflora</i> Loureiro [Phyllanthaceae]; AUCD 732, dtd. 26.06.2013	<i>Dampijuk</i>	Tree	Terrestrial	Fruits	60 per branchlet	Food
<i>Calamus viminalis</i> Willdenow [Arecaceae]; AUCD 745, dtd. 11.10.2013	<i>Pri</i>	Climber	Terrestrial	Shoots, fruits	10 per leaf wrap of fruits	Food, craft
<i>Canarium resiniferum</i> Bruce ex King [Burseraceae]; AUCD 723, dtd. 18.01.2013	<i>Hijung ke-ik</i>	Tree	Terrestrial	Stem	10 per leaf wrap of resin	Medicine
<i>Canarium strictum</i> Roxburgh [Burseraceae]; AUCD 739, dtd. 26.06.2013	<i>Hijung kelok</i>	Tree	Terrestrial	Stem	10 per bundle	Medicine
<i>Capsicum annuum</i> Linnaeus [Solanaceae]; AUCD 714, dtd. 28.11.2012	<i>Birik</i>	Herb	Terrestrial	Fruits, leaves	10 per leaf wrap	Food
<i>Choerospondias axillaris</i> (Roxburgh) B.L. Burt & A.W. Hill [Anacardiaceae]; AUCD 746, dtd. 28.04.2014.	<i>Siming</i>	Tree	Terrestrial	Fruits, bark	-----	Food
<i>Cinnamomum verum</i> J. Presl [Lauraceae]; AUCD 727, dtd. 26.06.2013	<i>Theng kiching</i>	Tree	Terrestrial	Bark	-----	Medicine, spice
<i>Citrus macroptera</i> Montrouzier [Rutaceae]; AUCD 744, dtd. 26.06.2013	<i>Hampur</i>	Shrub	Terrestrial	Fruits	5 per fruit	Food, medicine
<i>Citrus maxima</i> (J. Burman) Merrill [Rutaceae]; AUCD 741, dtd. 26.06.2013	<i>Ruibab</i>	Shrub	Terrestrial	Fruits	5 per fruit	Food, medicine

Botanical name[Family]; Exsiccatae	Local name	Habit	Habitat	Parts used	Market value in ₹	Uses
<i>Citrus sinensis</i> (Linnaeus) Osbeck [Rutaceae]; AUDC 725, dtd. 26.06.2013	<i>Theso</i>	Shrub	Terrestrial	Fruits	10 per fruit	Food, medicine
<i>Clerodendrum glandulosum</i> Lindley [Lamiaceae]; AUDC 750, dtd. 28.04.2014	<i>Pherklum</i>	Shrub	Terrestrial	Leaves	10 per bundle	Food, medicine
<i>Colocasia esculenta</i> (Linnaeus) Schott [Araceae]; AUDC 738, dtd. 26.06.2013	<i>Henru</i>	Herb	Wetland	Whole plant	10 per bundle	Food, medicine
<i>Curcuma zedoaria</i> (G.F. Christmann) Roscoe [Zingiberaceae]; AUDC 724, dtd. 26.06.2013	<i>Tharmit</i>	Herb	Terrestrial	Rhizome	-----	Medicine
<i>Dendrocalamus hamiltonii</i> Nees & Arnott <i>ex</i> Munro [Poaceae]; AUDC 749, dtd. 28.04.2014	<i>Kaiph</i>	Herb	Terrestrial	Whole plant, tender shoots	40 per piece	Food, construction, handicrafts
<i>Dillenia indica</i> Linnaeus [Dilleniaceae]; AUDC 716, dtd. 28.11.2012	<i>Plimplum</i>	Tree	Terrestrial	Fruits	5 per fruit	Food, medicine
<i>Dioscorea alata</i> Linnaeus [Dioscoreaceae]; AUDC 706, dtd. 28.11.2012	<i>Phurui</i>	Climber	Terrestrial	Tubers	20 per kg	Food, medicine
<i>Elaeagnus latifolia</i> Linnaeus [Elaeagnaceae]; AUDC 717, dtd. 28.11.2012	<i>Selegni</i>	Tree	Terrestrial	Fruits	20 per kg	Food
<i>Ensete superbum</i> (Roxburgh) Cheesman [Musaceae]; AUDC 764, dtd. 18.11.2014	<i>Lobong kengtong</i>	Herb	Terrestrial	Fruits	-----	Food
<i>Eryngium foetidum</i> Linnaeus [Apiaceae]; AUDC 705, dtd. 28.11.2012	<i>Vorek Jokasu</i>	Herb	Terrestrial	Leaves	10 per bundle	Condiment
<i>Etilingera elatior</i> (Jack) R.M. Smith [Zingiberaceae]; AUDC 767, dtd. 18.11.2014	<i>Pindong</i>	Herb	Terrestrial	Rhizomes	10 per bundle	Mouth freshener, appetizer, medicinal
<i>Garcinia lanceifolia</i> Roxburgh [Clusiaceae]; AUDC 710, dtd. 28.11.2012	<i>Pranso</i>	Shrub	Terrestrial	Leaves, fruits	10 per bundle	Food
<i>Garcinia pedunculata</i> Roxburgh <i>ex</i> Buchanan-Hamilton [Clusiaceae]; AUDC 709, dtd. 28.11.2012	<i>Pranpri</i>	Tree	Terrestrial	Fruits	7 per fruit	Food
<i>Garcinia xanthochymus</i> Hooker <i>f. ex</i> T. Anderson [Clusiaceae]; AUDC 757, dtd. 28.04.2014	<i>The champering</i>	Shrub	Terrestrial	Fruits	-----	Food
<i>Gmelina arborea</i> Roxburgh [Lamiaceae]; AUDC 718, dtd. 28. 11. 2012	<i>Phang</i>	Tree	Terrestrial	Stem	-----	Wood for traditional craft
<i>Gnetum gnemon</i> Linnaeus [Gnetaceae]; AUDC 742, dtd. 28.04. 2014	<i>Hanthu</i>	Herb	Terrestrial	Leaves, infloresce nce, fruits	10 per bundle	Food, medicine
<i>Kaempferia galanga</i> Linnaeus [Zingiberaceae]; AUDC 766, dtd. 28.04.2014	<i>Bithi Phaknur</i>	Herb	Terrestrial	Rhizome, leaves	5 per bundle	Food, medicine
<i>Lippia alba</i> (Miller) N.E. Brown <i>ex</i> Britton & P. Wilson [Verbenaceae]; AUDC 759, dtd. 28.04.2014	<i>Naka lopong</i>	Shrub	Terrestrial	Leaves	10 per bundle	Food, medicine

Botanical name[Family]; Exsiccatae	Local name	Habit	Habitat	Parts used	Market value in ₹	Uses
<i>Moringa oleifera</i> Lamarck [Moringaceae]; AUCD 711, dtd. 28.11.2012	Sondon	Tree	Terrestrial	Leaves, pods	10 per bundle	Food
<i>Oxalys acuminata</i> Wallich ex Benth [Oxalysaceae]; AUCD 736, dtd. 26.06.2013	Hanbok / Hankedok	Herb	Terrestrial	Leaves	10 per bundle	Food, medicine
<i>Paederia foetida</i> Linnaeus [Rubiaceae]; AUCD 721, dtd. 26.06.2013	Rikang nemthu	Herb	Terrestrial	Leaves	10 per bundle	Food, medicine
<i>Parkia timoriana</i> (A.P. de Candolle) Merrill [Fabaceae]; AUCD 762; Dtd.18.11.2014	Themukek	Tree	Terrestrial	Tender pods	5 per fruit	Food
<i>Phlogacanthus thyrsoiflorus</i> Nees [Acanthaceae]; AUCD 755, dtd. 13.04.2014	Jok aan	Shrub	Terrestrial	Infloresce nce	10 per bundle	Food, medicine
<i>Phyllanthus acidus</i> (Linnaeus) Skeels [Phyllanthaceae]; AUCD 747, dtd. 28.04. 2014	Thelu	Shrub	Terrestrial	Fruits	10 per bundle	Food
<i>Phyllanthus emblica</i> Linnaeus [Phyllanthaceae]; AUCD 708, dtd. 28.11. 2012	Thelu kame	Tree	Terrestrial	Fruits	10 per bundle	Food
<i>Polygonum microcephalum</i> D. Don [Polygonaceae]; AUCD 761, dtd. 28.12.2014	Delap	Herb	Terrestrial	Whole plant	10 per bundle	Food, medicine
<i>Rauvolfia serpentina</i> (Linnaeus) Benth ex Kurz [Apocynaceae]; AUCD 740, dtd. 26.06. 2013	Methan krokdi	Shrub	Terrestrial	Bark, leaves, roots	-----	Medicine
<i>Sterculia villosa</i> Roxburgh, [Malvaceae]; AUCD 768, dtd. 18.11. 2014	Jintakong	Tree	Terrestrial	Bark	-----	Craft
<i>Thysanolaena latifolia</i> (Roxburgh ex Hornemann) Honda, [Poaceae]; AUCD 726, dtd. 26.06.2013	Arphek	Herb	Terrestrial	Whole plant	40-50 per bundle	Household chores
<i>Vanda tessellata</i> (Roxburgh) Hooker ex G. Don [Orchidaceae]; AUCD 754, dtd. 28.04. 2014	Mirdan	Herb	Epiphyte	Whole plant	-----	Ornamentals

local or makeshift markets (Fig. 14). Consumers have positive attitude towards consumption of wild products for being 'organic'. Generally, local women and children are engaged in both collection (Fig 12) and trading of such wild plant materials. Trading of wild plants is still unorganized in the district; either collectors sell the products to the retailers or sell them directly to consumers. Market value of the products is not regulated; the products are divided into a visible quantity and sold at Indian rupees of 10 – 20. Each visible quantity weighs approximately 200 – 300 grams, which are either tied in bundles or wrapped in leaves.

Commercialization of wild plant resources of Karbi Anglong district including Singhason Hills has not been properly realized and at present limited to a few plants namely bamboos, canes, *Citrus macroptera*, *Citrus sinensis*, *Aquilaria mallacensis*, *Thysanolaena latifolia* and *Cinnamomum verum*. Extraction and supply of these products is regulated/monitored by local Forest Departments.

Domestication/Cultivation of wild plants of Singhason Hills

Indigenous people of Singhason Hills region grow many useful wild plants in their homestead gardens for domestic requirements and to some extent for economic interest. The main purpose of cultivation, albeit abundance in the wild, is to avoid frequent visits to forests to



PLATE - I. Fig. 6. *Alpinia nigra*; Fig. 7. *Colocasia esculenta*; Fig. 8. *Olax acuminata*; Fig. 9. *Kaempferia galanga*; Fig. 10. *Croton tiglium*; Fig. 11. *Eryngium foetidum*; Fig. 12. Collection of tuberous root-stock of *Dioscorea* sp.; Fig. 13. Extruded resin from the trunk of *Canarium resiniferum*; Fig. 14. Vegetables on sale in local market; Fig. 15. *Rhynchosyris ellipticum*

Utilization of wild plants in Singhason hills based on use category

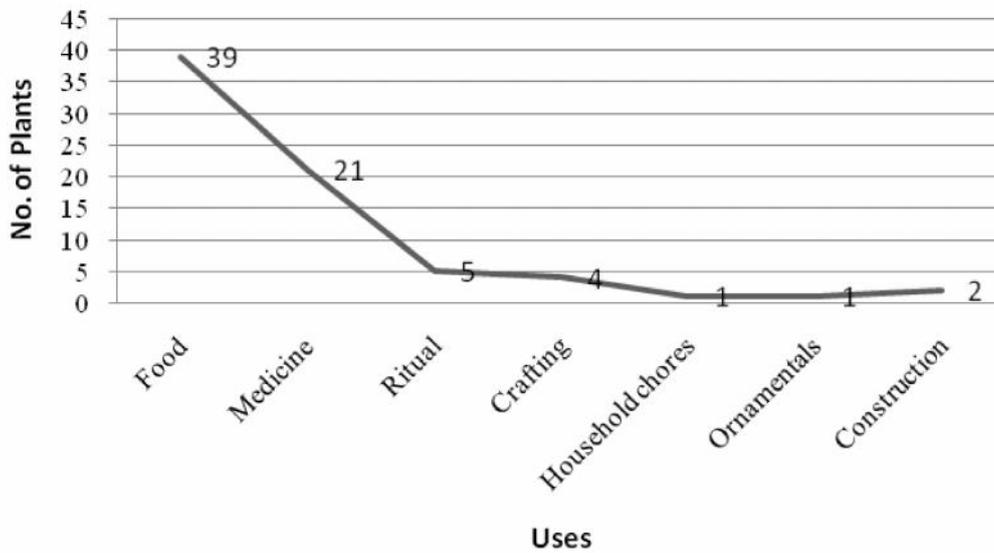


Fig. 4: Use categories of wild plants collected by ethnic groups of Singhason Hills

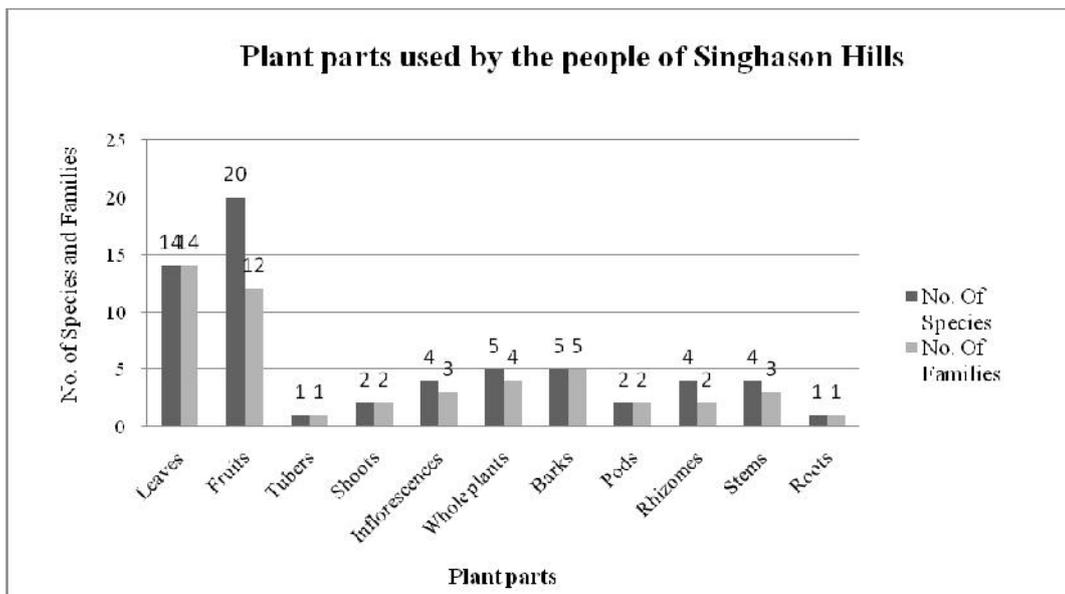


Fig. 5. Diversity of plant parts used by the people of Singhason Hills for different purposes

collect the plants. Some common commercial plants are also cultivated to increase production for the generation of cash income. Ornaments are grown for their aesthetic values. Further, it is a cultural practice of the people to grow rare plants in their homestead gardens. During field study, it was also observed that cultivation of wild species is mainly driven by commercial potentials of the plants (Table 1) as cultivation in homestead gardens augment production.

People of Singhasan Hills also collect many useful wild plants which are not regular components of their home gardens but offers potential for cultivation. Plants of this category include *Aglaonema* sp., *Homalomena aromatica* (Sprengel) Schott, *Lasia spinosa* (Linnaeus) Thwaites, *Oroxylum indicum* (Linnaeus) Kurz, *Physalis peruviana* Linnaeus, *Nephelium* sp., *Mangifera sylvatica* Roxbergh, *Syzygium* spp., *Polyalthia* sp., *Holarrhena pubescens* Wallich ex G. Don, *Croton tiglium* Linnaeus (Fig 10), *Rhynchoetechum ellipticum* (Wallich ex D. Dietrich) A. DC. (Fig. 15) and *Bauhinia* spp., to name a few. These plants have utmost importance in terms of food, medicines and fodder in the Hills. Nevertheless, domestication of these wild plants by the residents of Singhasan is still underexplored.

Implications for conservation

Though the primary objective of wild plant cultivation in Singhasan hills is to increase food production, this unintended practice by local residents can lead to domestication and conservation of plant germplasms. The cultivated wild plants serve as a repertoire of germplasms and promote diversity of cultivars through selection and natural breeding. This activity not only ensures genetic resource conservation but also provides a domain for the development of new horticultural crops. Near sufficient production in home gardens will ease collection pressure on wild plants leading to regeneration of the populations in their natural habitats. Thus, cultivation of wild plants will not only lessen frequency of visits to forest and augment food production, but also can contribute towards *in situ* conservation of potential species. Furthermore, such involuntary domestication of wild plants promotes organic agriculture and enhances agro-ecosystem health (including biodiversity), biological cycles and soil biological activity.

CONCLUSION

The Singhasan Hills provide indispensable provisioning, regulating, cultural and supporting services to local communities in particular and the district in general. Wild products are indispensable sources of food, nutrition, medicine and other livelihoods and also socio-religious needs to local populace. But, the forest resources are declining due to overexploitation including excessive illegal felling for timber. Domestication can serve as a tool for food production, diversification of livelihoods and conservation of biodiversity. Such practice in Singhasan Hills (and any other part of the world) can contribute towards food security and livelihoods of the people on one hand and conservation of plant germplasms on the other hand. Among the wild plants of Singhasan Hills *Citrus sinensis*, *Citrus macroptera*, *Cinnamomum verum*, *Canarium resiniferum*, *Canarium strictum*, *Calamus viminalis*, *Aquilaria malaccensis*, *Rauvolfia serpentina* and *Thysanolaena latifolia* have potentials for horticulture. Cultivation of these plants in home gardens or in jhum fields have been practiced by the people. This is suggestive of adaptive ability of these wild plants to the local climate and agronomic features. To cite a remarkable example, *Citrus sinensis* has been successfully domesticated and developed into a promising horticultural crop in the Singhasan Hill region. Today, many families own orange orchard and commercialization of orange fruits has contributed towards local economy and development. However, further research is needed to focus on the basic biology, agronomic properties and chemical constituents of potential plants and explore the scope for development through the intervention of biotechnology.

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