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Short communication

Plant species diversity in the traditional homegardens of Meitei community: a case study from Barak Valley, Assam

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Abstract

A survey of plant species in the traditional homegardens of Meitei community was conducted in Rajubari village of Cachar district in Barak Valley (southern Assam), in northeast India. A total of 92 species (38 trees, 10 shrubs, and 44 herbs) were enumerated from 36 homegardens. Meitei homegardens, locally called *Ingkhol*, also varied widely in size, shape, and composition. Food products, firewood, medicinal plants, ornamentals, and some cash income are obtained from these gardens. The tree legume, *Parkia timoriana* (locally *yongchak*) is a characteristic feature of the Meitei homegardens. Intensification of betel nut (*Areca catechu*) production has been observed in some gardens. Many of the traditional crops grown in the Meitei homegardens have a role in the conservation and maintenance of living 'heirlooms' and such practices need to be strengthened. The baseline data generated suggest that traditional homegarden is a site for biodiversity management and conservation by the Meitei community.

Keywords: Agrobiodiversity conservation, *Ingkhol*, Species inventory.

Homegardens are integral components of the traditional farming system where many annual and perennial plant species are planted and maintained by the members of the household. Tropical homegardens are also considered as self-sustaining systems that besides the high diversity and soil conservation potential are a source of diverse socioeconomic products and benefits (Kumar and Nair, 2004). They are important for *in situ* conservation and according to Articles 7, 8 and 10 (c) of the Convention of Biological Diversity, inventorisation of such areas can help in the identification and conservation of biodiversity (Das and Das, 2005). The purpose of the present study was to document species composition and their utilization in the '*Ingkhol*' – a traditional homegarden maintained by Meiteis in Rajubari village (24°4'16"N, 92°43'310"E) in Cachar district of Assam in northeast India, located about 25 km away from the Silchar town. The study was done with the objective of understanding the role of the traditional communities in management and conservation of homegarden biodiversity.

Thirty six homegardens (70% of the gardens with good plant diversity) were surveyed and the household elder members interviewed about the uses of each species. Local names were recorded for all species. Plant species in the homegarden were identified by consulting the regional flora (Kanjilal et al., 1934–40) and other publications (Nayar et al., 2003). The herbarium at the Botanical Survey of India, Shillong was consulted for confirmation of the identified species.

Homegarden size in the study village ranged from 0.07 to 0.78 ha, with a mean size of 0.20 ha. This falls well within the range of the global inventories on tropical homegardens (Kumar and Nair, 2004). Most of the households (55%) in the village earned their livelihoods by doing small scale business (e.g., grocery shop, vegetable vender), followed by farming (18%) and miscellaneous jobs outside the village. The villagers also reared cattle, fowls, and pigs mainly for domestic consumption and sometimes for income generation.

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Organic wastes generated by the household and animal dung were used as manure. The female members also took part in cash income generation by weaving and selling traditional clothes and by preparing/selling rice flakes. Average size of the households was six (range: 2 to 19). Majority of the houses were constructed with bamboo and mud and had corrugated sheets (53%), straw (28%), and *Imperata* grass (19%) as the roofing material. Some of the homegardens (30.5%) had also ponds where *Ipomoea aquatica* and *Neptunia prostrata* are grown.

A total of 92 species (38 trees, 10 shrubs, and 44 herbs) belonging to 43 families were found in the homegardens of the study village (Table 1). The greatest numbers of species were found in the family Fabaceae with 12 species followed by five species each in Lamiaceae and Poaceae. Twenty two families were represented by single species. Thirty species were more frequent (present in > 50% gardens) in the homegardens, most of which were used as vegetables.

Meitei homegardens exhibit a complex structure, both vertically and horizontally. In the present study, the vegetation of the homegarden showed five different canopy layers, viz. emergent layer (15 m or more tall), main canopy (10 to 15 m), understory (5 to 10 m), shrubs (1 to 5 m), and herb (less than 1 m) layer. The emergent layer was mainly composed of *Artocarpus heterophyllus*, *Bambusa balcooa*, and *Areca catechu*. The main canopy layer was dominated by *Mangifera indica*, *Parkia timoriana*, *Tectona grandis*, and *Toona ciliata*. Understory consisted of *Citrus grandis*, *Musa balbisiana*, and *Toona ciliata* and the shrub layer was dominated by *Melastoma malabathricum* and *Adhatoda vasica*. Herb layer composed of vegetables and tree saplings (e.g., *Clerodendrum indicum*, *Corchorus capsularis*, *Areca catechu*, and *Citrus grandis*). The structural parameters of the Meitei homegardens in the study village were very similar to the other previously documented tropical homegardens (Kumar et al., 1994). Ten horizontal zones were also recorded in the study gardens, although these were not systematically arranged. These microzones included bamboo groves, spice zone (e.g., *Allium odorum*), cattle sheds,

courtyards in front of the house, out-house, ponds used for fishery and for planting *Neptunia prostrata* and *Ipomea aquatica*, residential zone, vegetable growing area, boundary zone, and the sacred zone.

Nine use categories of plant species have been recorded in the studied village (Table 1). Vegetables formed the predominant category followed by fruits and medicinal plants. The households exchanged/shared vegetables such as *Parkia timoriana* and other legumes among friends and neighbours. The other utility classes, e.g., timbers, ornamental, sacred plants and spices, although important, comprised only of a few species per category. The homegardeners also conserved seed and planting materials. They, however, procured seeds or planting materials of species which they could not maintain. An important characteristic of the homegarden in the present study was the predominance of indigenous fruit trees, as also in the Kerala homegardens (Kumar et al., 1994). Plants such as *Eupatorium birmanicum*, *Ocimum sanctum* and *Toona ciliata*, are also planted by the Meiteis for religious purposes. A total of 19 different types of plants have been used by these villagers for medicinal purposes. Some plant species are also used for hair care (e.g., *Pogostemon purpenoscens* and *Ageratum conyzoides*). Most of the homegardens have a separate zone for spices like *Allium odorum*, *Eryngium foetidum*, and *Houttuynia cordata*. This practice of growing traditional spice crops in the *Ingkhol* by Meiteis is an important component of a “living heirloom” and needs strengthening (Maheshwari, 1997).

Areca catechu is used as a masticator (fruit), and for fencing, broom, and fuel (leaves and trunk) purposes. Being a cash crop, areca palms are intensively managed in the Meitei homegardens. *Parkia timoriana* was ubiquitous in the homegardens and is one of the important trees which is conserved from generation to generation by the Meiteis. Bamboos are generally grown in the backyard or away from other plants. Four species of bamboos were recorded viz. *Bambusa balcooa*, *B. cacharensis*, *B. nutans* and *B. vulgaris*. Bamboo has multiple uses in the village economy. It is used for making a vast array of household items and agricultural implements, and the young shoots are used

Table 1. Major plant species found in the homegardens of Meitei community, Rajubari, Assam, India.

Species	Family	Common names	Local names	Plant form	Frequency (%)	Uses
<i>Abelmoschus esculentus</i> (L.) Moench.	Malvaceae	Lady's finger	<i>Bhelendri</i>	Shrub	97.2	Vegetable
<i>Adhatoda vasica</i> Nees.	Acanthaceae	Malabar nut	<i>Nongmangkha</i>	Shrub	61.0	Medicine
<i>Ageratum conyzoides</i> L.	Asteraceae	Floss flower	<i>Khongjainapi</i>	Herb	38.9	Hair care
<i>Allium odorum</i> L.	Alliaceae		<i>Nakkuppi</i>	Herb	100.0	Spice
<i>Alocasia cucullata</i> (L.) Schott.	Araceae	Swamp taro	<i>Maru kabi</i>	Herb	75.0	vegetable
<i>Alocasia indica</i> Roxb.Sch.	Araceae	Aroids	<i>Yendem amubi</i>	Herb	41.7	vegetable
<i>Amaranthus spinosus</i> L.	Amaranthaceae	Prickly amaranth	<i>Chengkruk</i>	Herb	75.0	Vegetable
<i>Ananas comosus</i> (L.) Merr.	Bromeliaceae	Pineapple	<i>Kihom</i>	Herb	72.2	Fruit
<i>Areca catechu</i> L.	Arecaceae	Arecanut	<i>Kwa</i>	Tree	83.3	Masticatory
<i>Artocarpus heterophyllus</i> Lamk.	Moraceae	Jackfruit	<i>Theibong</i>	Tree	91.7	Fruit, timber
<i>Bambusa balcooa</i> Roxb.	Poaceae	Bamboo	<i>Wa</i>	Tree	77.7	Construction
<i>Bambusa vulgaris</i> Schrad.ex Wendl.	Poaceae	Bamboo	<i>Wa</i>	Tree	30.5	Construction
<i>Brassica campestris</i> L.	Brassicaceae	Mustard	<i>Hanggam</i>	Herb	88.0	Vegetable
<i>Capsicum frutescens</i> L.	Solanaceae	Chilly	<i>Morok</i>	Herb	69.0	Condiment
<i>Centella asiatica</i> (L.) Urban.	Apiaceae	Indian pennywort	<i>Peruk</i>	Herb	72.2	Medicine
<i>Citrus grandis</i> (L.) Osbeek.	Rutaceae	Pummelo	<i>Nobap</i>	Tree	71.7	Fruit
<i>Clerodendrum indicum</i> (L.) Kuntze.	Verbenaceae	Tubeflower	<i>Kuthap</i>	Herb	25.0	Medicine
<i>Colocasia antiquorum</i> L.	Araceae	Eddo	<i>Yendem</i>	Herb	75.0	Vegetable
<i>Colocasia sp</i>	Araceae	Taro	<i>Pankhok</i>	Herb	41.0	Vegetable
<i>Corchorus capsularis</i> L.	Tiliaceae	White jute	<i>Ananba</i>	Herb	75.0	vegetable
<i>Cucumis sativus</i> L.	Cucurbitaceae	Cucumber	<i>Thabi</i>	Herb	38.9	Vegetable
<i>Cucurbita maxima</i> Duch.	Cucurbitaceae	Pumpkin	<i>Mairel</i>	Herb	72.2	Vegetable
<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Bermuda grass	<i>Tingthou</i>	Herb	25.0	Sacred
<i>Lablab purpureus</i> (L.) Sweet.	Fabaceae	Hyacinth beans	<i>Hawai uri</i>	Herb	80.5	Vegetable
<i>Eryngium foetidum</i> L.	Apiaceae	False corriander	<i>Awa phadigom</i>	Herb	38.9	Spice
<i>Gardenia jasminoides</i> Ellis.	Rubiaceae	Jasmine	<i>Kaboklei</i>	Shrub	41.7	Ornamental
<i>Ipomoea aquatica</i> Forsk.	Convolvulaceae	Swamp cabbage	<i>Kolamni</i>	Herb	30.5	Vegetable
<i>Lagenaria siceraria</i> (Molna) Standley.	Cucurbitaceae	Bottle gourd	<i>Khongdrum</i>	Herb	55.0	Vegetable
<i>Leucas aspera</i> Spreng.	Lamiaceae		<i>Mayang lambum</i>	Herb	65.0	Medicine
<i>Lycopersicon esculentum</i> Mill.	Solanaceae	Tomato	<i>Khamen asinbi</i>	Herb	60.0	Vegetable
<i>Mangifera indica</i> L.	Anacardiaceae	Mango	<i>Heinou</i>	Tree	88.3	Fruit
<i>Melastoma malabathricum</i> L.	Melastomaceae			Shrub	30.5	Ornamental
<i>Mimosa pudica</i> L.	Fabaceae	Sensitive plant	<i>Kangphal ekaithabi</i>	Herb	47.2	Medicine
<i>Momordica cochinchinensis</i> Spreng.	Cucurbitaceae	Sweet gourd	<i>Karol</i>	Herb	50.0	Vegetable
<i>Musa balbisiana</i> Colla.	Musaceae	Banana	<i>Laphu</i>	Tree	88.3	Fruit
<i>Ocimum gratissum</i> L.	Lamiaceae	Ram tulsi	<i>Tulsi amubi</i>	Herb	100.0	Sacred
<i>Ocimum sanctum</i> L.	Lamiaceae	Holy basil	<i>Tulsi</i>	Herb	27.0	Sacred
<i>Oxalis corniculata</i> L.	Oxalidaceae	Indian Sorrel	<i>Yencin</i>	Herb	41.7	Vegetable
<i>Parkia timoriana</i> (A. DC.) Merr.	Fabaceae	Tree bean	<i>Yongchak</i>	Tree	52.8	Vegetable
<i>Phaseolus lunatus</i> L.	Fabaceae	Double bean	<i>Kalandari</i>	Herb	63.8	Vegetable
<i>Pogostemon purpurascens</i> Dalz.	Lamiaceae		<i>Sangbrei</i>	Herb	50.0	Hair care

Contd.....

Table 1. Contd.....

<i>Polygonum posumba</i> Buch. Han. ex. D. Don.	Polygonaceae		<i>Phakpai</i>	Herb	55.0	Spice
<i>Polygonum sp</i>	Polygonaceae		<i>Chawaisabi</i>	Herb	60.0	Fish poison
<i>Psidium guajava</i> L.	Myrtaceae	Guava	<i>Pungdon</i>	Tree	41.7	Fruit
<i>Solanum melongena</i> L.	Solanaceae	Brinjal	<i>Khamen</i>	Herb	60.0	Vegetable
<i>Thevetia peruviana</i> (Pers.) K.Schum.	Apocynaceae	Yellow oleander	<i>U-tonglei</i>	Shrub	47.2	Ornamental
<i>Toona ciliata</i> M.Roem.	Meliaceae	Cedrella	<i>Tairel</i>	Tree	33.3	Sacred
<i>Vicia faba</i> L.	Fabaceae	Broadbean	<i>Hawaimubi</i>	Herb	83.3	Vegetable
<i>Vigna unguiculata</i> (L.) Walp.	Fabaceae	Cowpea	<i>Hawaiashangbi</i>	Herb	97.2	Vegetable
Others* (43 species)					2.8–19.4	Multiple uses

*Species with frequency less than 25%

as food. Among the four species, *B. balcooa* is the most important and was present in 78% of the homegardens. It is used as weaving equipment by the Meitei women and also used for construction of houses and for fencing. The study revealed the diversity of plant species being managed in *Ingkhol*, the traditional homegardens of Meiteis in Rajubari village. There is an urgent need to strengthen and document such systems of natural resource management by the traditional societies.

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