

Phytoresources from North Cachar Hills of Assam, India-IV: Bamboos and Rattans

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Abstract: The paper deals with 32 bamboos and 8 rattan species belongs to 11 and 3 genera respectively from North Cachar Hills district (presently known as Dima Hasao) of Assam State and their traditional utilization among the ethnic groups of the district. A total of 9 species of bamboo most preferred for basketry; 6 species of bamboo and one species of rattan used in culture and traditional rites and rituals; 6 species of bamboo and 2 species of rattan as sources of food items; 4 species of ornamental bamboo; 1 each of bamboo and rattan species used for medicinal purpose; 17 species of bamboo used traditionally for both major and minor construction have been recorded. Further naming of 10 villages on the basis of local names of the plants belonging to 9 different bamboo species and 1 species of rattan have also been recorded. Pertinent traditional knowledge about the bamboo and rattan resources prevalent among the ethnic groups of the district was also the part of the study.

Keywords: Phytoresources, North Cachar Hills, bamboo and rattans, traditional uses.

INTRODUCTION

Bamboo, the woody grass of the Family Poaceae and the rattans, climbing or trailing palms of the Family Aracaceae, are wild and of great diversity in the North Cachar Hills of Assam, India. Bamboos and rattans are the most important plant resources after food crops in the life of the ethnic people dwelling in the hill district. This is due to the poor road connectivity in the area as well as the traditional lifestyle of the ethnic groups. The bamboo and rattan resources occupies a special position in their traditional ethnic life *i.e.* tender shoots provide them vegetable, both mature and immature culms provide the materials for construction of house, making household items, agricultural implements and many other items use in their day to day life including in the performing their traditional rites, rituals, etc . The present investigation

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has been undertaken to document the bamboo and rattan resources available in the district and their utilization by the ethnic people of the area.

A perusal of literature on the bamboo and cane resources shows that there is scanty information on traditional / ethnobotanical uses, taxonomic description, diversity and distribution and traditional practice of bamboo management from any part of North Eastern India. However, some relevant work on taxonomy, distribution and uses have been published by Roy (1955), Trivedi and Tripathy (1984), Haridashan *et al.* (1987), Biswas (1988), Hore (1998), Sharma *et al.* (1992), Renuka (1996), Sarkar and Sundriyal (2002), Singh (2002), Sundriyal *et al.* (2002), Barooah and Borthakur (2003), Bhatt *et al.* (2003), Sharma and Borthakur (2008) and Nath *et al.* (2009) etc. has provide important references for the present work.

MATERIALS AND METHODS

North Cachar Hills district is located in the southern part of Assam, India in between 24°58'N and 25°47'N latitudes and 92°27'E and 93°43'E longitudes and has elevations ranging from 140 to 1866 m above msl. The average annual rainfall is 1400 mm to 2300 mm and the area is characterized by sub-tropical humid climate with average relative humidity of 73%-84%. The average maximum mean temperature during summer is between 29°C to 24°C and average minimum mean temperature is between 14°C to 10°C during winter. The district is predominantly inhabited by ethnic groups and more than 70% of the population of the district belongs to Indo -Mongoloid racial stock *viz.* Dimasas, Zeme Nagas, Hmars, Hrangkhols, Biates, Kukis, Sakacheps (Khelmas), Vaipheis and Jaintia (Pnars), etc.

An extensive field work has been undertaken during 2008 to 2010 in various localities of North Cachar Hills of Assam for documentation of the bamboo and rattan resources occurring in the district. The collected plant materials were made into herbarium specimens following the standard herbarium techniques (Jain and Rao, 1977) and later identified with the help of relevant literature and herbarium materials deposited in ASSAM, Shillong, CAL and Herbarium of Forest Research Institute, Dehra Dun. The herbarium specimens on which this study is based have been deposited in the Herbarium of Botany Department, Gauhati University (GUBH).

RESULTS AND DISCUSSION

Present study records the occurrence and uses a total of 32 species of bamboos and 8 species of rattans belonging to 11 and 3 genera respectively in North Cachar Hills. Scientific names of the species, their vernacular name (s), biological status and traditional uses along with relevant field data have been presented in tabular form (Table 1 & 2). In addition certain other information have been provided under specific headings *viz.*, Bamboo basketry and household items; naming of villages derived

from vernacular names of bamboo and rattan (s) in *Dimasa*; bamboos and rattans in culture and traditional rites and rituals and some specific uses other than information provided in Table 1 & 2.

Bamboo basketry and household items

The most preferred bamboo species used in basketry are-*Bambusa cacharensis*, *B. garuchakua*, *B. jaintiana*, *Dendrocalamus longispathus*, *Oxytenanthera parvifolia* and *Phyllostachys mannii*. Some of the most common and important bamboo basketry, household items, utensils and musical instruments are briefly described below.

The Dimasas: *Ju-Kulu*-a conical basket used in rice beer filtration; *Yamsa*-a large mat with intrinsic designs and motifs; *Jembai*-a small fishing basket; *Kojong*-bamboo comb; *Gowai Katho*-raised plate used for offering betel-nut to guests; *Shangkong*-tray for winnowing paddy and rice grains; *Khuthim*-a small basket for keeping small household articles and *Damakho-slim*-a type of *hookah*.

The Hmars (Fig. E): *Hmui*-a spinning wheel; *Herawt*-a cotton fiber separator from boll; *Khuong*-a drum; *Kawng phui*, *Kawng vawn* and *Ta Khlip*-baskets of different types; *Leikhor*-a large container for storing paddy; *Kokte*-a small basket for keeping chilies, etc.; *Konghong*-a small basket used in sowing/broadcasting of paddy seeds in *Jhums*; *Paikul*-a small bag for carrying small articles; *Sani*-a funnel used for filtering rice-beer; *Tuibur*-a traditional *hookah*; *Zampher*-a durable mat; *Buhak*-a medium sized tray having multifarious uses; *Ringkol* and *Hnaml*-a traditional implement for carrying of baskets; *Harswap*-a stool; *Arbawn*-a basket used in rearing chicken; *Arkok*-a basket used as cage of the fowls; *Bemkhong*-a small basket for keeping of small valuables and *Hnang-lukhum*- a typical bamboo made cap.

The Biates: *Koksingnei*, *Champai*, *Merchakok*, *Sengbem* and *Kok*-are baskets of different types and size having multifarious uses; *Ritai*-a hair band used by girls; *Mebor*-cup made of bamboo; *Changal Phar*-a conical basket for extraction of alkali solution; *Sanlai*-a traditional stool; *Rilei*-a medium sized bamboo tray for cleaning grains and the *Isaan-Phan*-the bow used by *Biate* hunters.

The Hrangkhols: *Resem* is a traditional bagpipe-like musical instrument made of dried shell of *Lagermania siceraria* and culm of *Melocanna baccifera* (Fig. F).

The Zeme Nagas/Rongmei nagas: *Kalawang*-is a basket having storage capacity up to about 40 kg. grains; *Jaumu*-a container made of dried shell of *Lagermania siceraria* and designed with split cane; *Moi*-a traditional spinning wheel and the *Hedei*-is a kind of war weapon. *Kepeu*, *Kepeu-peudi*, *Nrei*, *Heirang*-are different spades, the handles of which are up to one meter in length.

Table 1: Bamboo species from North Cachar Hills of Assam, India.

Botanical name; Coll. no.; date & place	Vernacular name(s)	Biological status	Uses
<i>Bambusa arundinacea</i> (Retz.) Willd. Syn. <i>Bambusa bambos</i> (Linn.) Voss. PM-609;16-12-2007; Choto Waphu	<i>Kotoh bah</i> (AS), <i>Washu</i> (DI)	Wl	i. Construction of houses. ii. Branches as fencing. iii. Traditional agricultural implements and weapons, etc.
<i>Bambusa auriculata</i> Kurz.; PM-610; 22-09-2008; Gurubari	<i>Makal bah</i> (AS), <i>Washi</i> (DI)	Cv	i. House construction & household items ii. Young bamboo split as cordage.
<i>Bambusa balcooa</i> Roxb.; PM-611; 20-12-2008; Dikrik	<i>Bholuka bah</i> (AS), <i>Wayung</i> (DI), <i>Hepai/ Pum</i> (ZE)	Cv	i. Construction of houses, bridge, fencing and also bow. ii. Fresh/fermented shoots as vegetable. iii. Rhizomatous part use in sculpture.
<i>Bambusa balcooa</i> Roxb.; PM-612; 26-10-2008; Michidui	<i>Bhaluki Bholuka bah</i> (AS), <i>Wayung</i> (DI) , <i>Hepai/ Pum</i> (ZE)	Cv	i. Construction of houses, bridge and fencing, etc. ii. Fresh/fermented shoots as vegetable. iii. Rhizomatous part use in sculpture.
<i>Bambusa cacharensis</i> R. Mazumdar.; PM-613;07-12-2009; Sampharidisha	<i>Walao/Watshi</i> (DI), <i>Pereng</i> (ZE)	Wl	i. House construction & fencing, etc. ii. Fresh/fermented shoots as vegetable. iii. Preferred for use in basketry.
<i>Bambusa garuchakua</i> Barooah and Borthakur.; PM-614; 25-12-2008; Diyungmukh	<i>Bhenda/ghora bah</i> (AS), <i>Washi</i> (DI)	Cv	i. Light construction and fencing, etc. ii. Young bamboo split as cordage.
<i>Bambusa jaintiana</i> R. Majumdar.; PM-615; 08-12-2009; Sampharidisha	<i>Washi</i> (DI)	Wl	i. Light construction and good for household items.
<i>Bambusa multiplex</i> (Lour.) Raeush ex Schult. Et. Schult. Syn. <i>Bambusa nana</i> Roxb.; PM-616;12-01-2009; Dibrari	<i>Dang bah</i> (AS), <i>Wa kashiba</i> (DI), <i>Reel</i> (HM)	Cv	i. Cultivated as hedge plant or live fencing.
<i>Bambusa pallida</i> Munro.; PM-617; 12-01-2009; Dibrari	<i>Bijuli bah</i> (AS), <i>Wamli</i> (DI)	Cv	i. Specially used for roofing in house. ii. Loin loom weaving implements.
<i>Bambusa pseudopallida</i> R. Mazumdar.; PM-618; 22-09-2008; Gurubari	<i>Wamli</i> (DI)	Wl	i. Use for roofing in house construction. ii. Light construction.
<i>Bambusa tulda</i> Roxb.; PM-619; 22-09-2008; Gurubari	<i>Jatibah</i> (AS), <i>Washi</i> (DI), <i>Hebeu</i> (ZE)	Cv	i. Construction of house and hanging bridges.
<i>Bambusa vulgaris</i> var. <i>vittata</i> A.C. Riviere.; PM-620; 12-01-2009; Disgao razi	<i>Sonali bah</i> (AS), <i>Washi</i> (DI)	Cv	i. Cultivated ornamental plant.
<i>Bambusa vulgaris</i> forma <i>waminii</i> (Brandis) Wen.; PM-621; 12-01-2009; Haflong town	<i>Kolosi bah</i> (AS)	Cv	i. Cultivated ornamental plant.
<i>Chimonobambusa callosa</i> (Munro) Nakai Syn. <i>Arundinaria callosa</i> Munro.; PM-622; 25-12-2008; Diyungmukh	<i>Wa shu</i> (DI), <i>Rou</i> (KU)	Wl	i. Light construction and fencing, etc.

Table 1 contd.

Botanical name; Coll. no.; date & place	Vernacular name(s)	Biological status	Uses
<i>Chimonobambusa jainiana</i> Das & Pal.; PM-623; 12-01-2009; Disgao	<i>Wa mishel</i> (DI), <i>Kepaii</i> (ZE)	W1	i. Light construction and fencing, etc.
<i>Chimonobambusa quadriangularis</i> (Fenzi) Makino; PM-624; 08-12-17.2009; Sampharidisha	<i>Washi thapra</i> (DI)	Cv	i. Agricultural implements & weapons. ii. Outer hard part of the culms use as blade skinning animals & cutting umbilical cord in new born baby.
<i>Dendrocalamus asper</i> Roem. and Schult (Baker ex. Heyne); PM-625; 21-09-2008; Upper Bagetter	<i>Washi</i> (DI)	W1/Cv	i. Construction of houses, etc. ii. Prefer to make handle of household & agricultural implements, etc.
<i>Dendrocalamus giganteus</i> Munro.; PM-626;26-10-2008; Nriachi bunglow	<i>Wa mishel</i> (DI), <i>Kepaii/Mpin</i> (ZE)	W1	i. Construction of houses, etc. ii. Culms used to store & carry water, salt and fermented food, etc. iii. Scrapped bamboo wool is use to bandage fresh cuts and wounds. iv. Longitudinally culms split use in bamboo drip irrigation (<i>Dihakhaw</i> -DI).
<i>Dendrocalamus hookeri</i> Munro; PM-627; 20-12-2008; Dikrik	<i>Washi</i> (DI)	W1	i. Construction of houses, storage of water, salt and fermented food, etc.
<i>Dendrocalamus longispathus</i> Kurz.; PM-628; 05-11-2009; Barail reserve forest	<i>Walao</i> (DI)	W1	i. Mostly used for making mat and other household items (baskets).
<i>Dendrocalamus patellaris</i> Gamble. Syn. <i>Ampelocalamus patellaris</i> (Gamble) Stapleton; PM-629; 12-01-2009; Shombudhon Razi	<i>Wa mishel</i> (DI), <i>Kepaii</i> (ZE)	W1/Cv	i. Pillars and other structures for construction. ii. Storage of water, salt, fermented food ,etc.
<i>Dendrocalamus hamiltonii</i> Nees et Arn. ex Munro ; PM-630; 12-01-2009; Sarkari bagan	<i>Kako bah</i> (AS), <i>Washi</i> (DI), <i>Gareu</i> (ZE)	W1	i. Entire culms used for construction of floor of houses with raised platforms. ii. Making of house walls, mats and baskets.
<i>Dendrocalamus strictus</i> (Roxb.) Nees.; PM-631; 12-01-2009; Disgao razi	<i>Wa mishel</i> (DI), <i>Kepaii</i> (ZE)	W1	i. Construction of houses and bamboo drip irrigation.
<i>Dinochloa maclellandii</i> (Munro) Kurz.; PM-632; 29-10-2008; Laisong	<i>Wa dukha</i> (DI)	W1	i. Fresh young culms split use as cordage.
<i>Gigantochloa albociliata</i> (Munro) Kurz. ; PM-633; 05-11-2009; Barail reserve forest	<i>Wathi gisim</i> (DI), <i>Phesa bash/Kali chundi</i> (AS/Bengali)	W1	i. Long culms lightly thrashed and split longitudinally are woven to make walls of houses.

Table 1 contd.

Botanical name; Coll. no.; date & place	Vernacular name(s)	Biological status	Uses
<i>Melocanna baccifera</i> (Roxb.) Kurz Syn. <i>Melocanna bambusoides</i> Trin.; PM-634; 07-12-2009; Sampharidisha.	<i>Mulibah</i> (AS), <i>Wathi</i> (DI), <i>Nria</i> (ZE)	W1	i. Thrashed culms are woven to make walls and ceiling of houses. ii. <i>Dimasas</i> use the woven wall as boundary markers of the housing plot iii. Fresh/fermented shoot eaten cooked as vegetable, with dry fish/pork meat. iv. <i>Damakhoslim</i> (DI)/ <i>Tuibur</i> (HM), a kind of <i>hookah</i> is made from the culms. v. Fresh culms used as cups and glasses. vi. Culms used to make rainproof roof.
<i>Melocalamus compactiflorus</i> (Kurz) Benth. Syn. <i>Dinochloa compactiflora</i> (Kurz) Mc Clure ; PM-635; 07-12-2009; Sampharidisha	<i>Wayung</i> (DI)	W1/Cv	i. House & bridge construction, etc. ii. Fresh/fermented tender shoots are preferred most.
<i>Melocalamus indicus</i> R. Mazumder; PM-636; 08-12-2009; Sampharidisha	<i>Washim</i> (DI)	W1	i. Use in construction, etc. ii. Fresh tender shoots are preferred by the <i>Dimasas</i> .
<i>Oxytenanthera parvifolia</i> Brandis ex Gamble.; PM-637; 22-09-2008; Gurubari	<i>Wathai-washi</i> (DI)	W1	i. Basketry/household items. ii. Fresh/fermented shoots as vegetable. iii. Seeds brewed to prepare local traditional beer <i>Judima</i> by the <i>Dimasas</i> .
<i>Phyllostachys manii</i> Gamble.; PM-638; 07-12-2009; Sampharidisha	<i>Wadreng</i> (DI)	W1	i. Mostly used for making mat and other household items (baskets).
<i>Pseudosasa japonica</i> (Sieb. & Zucc. ex Steud.) Makino ex Nakai.; PM-639; 12-01-2009; Topodisha	<i>Wa apatani</i> (DI)	Cv	i. Grown as ornamental plant and live fencing.
<i>Schizostachyum helferi</i> (Murno) R. Majumder; PM-640; 23-10-2009; Miyungkhor	<i>Wa misher</i> (DI)	W1	i. In a <i>Dimasa</i> folk tale, mention about the species is known in the locality.

Abbreviations used:

1. Ethnic communities: (AS)-Assamese, (DI)-Dimasa, (HM)-Hmar, (HR)-Hrangkhol, (KU)-Kuki, (RN)-Rongmei Naga and (ZE)-Zeme Naga.

2. Biological status: W1-wild and Cv- cultivated.

Following are the most common basketry items viz. *Khailim* (DI)/ *Rel* (HM/BI)/ *Lalpi* (KU)/ *Kaukdun* (ZE/RN) - a common type of large water proof basket of about one meter in height with decreasing radius towards the bottom. It is used to keep clothes

Table 2: Rattan species from North Cachar Hills of Assam, India.

Botanical name; Coll. no.; date & place	Vernacular name(s)	Biological status	Uses
<i>Plectocomia assamica</i> Griff.; PM-641; 20-12-2007; Jatinga	<i>Raigongang</i> (DI)	Wl/Cv	i. Basketry, household items, agricultural implements and as cordage. ii. Fruits are edible with sour taste.
<i>Calamus flagellum</i> Griff.; PM-642; 20-12-2007; Jatinga	<i>Raigong longerba</i> (DI)	Wl	i. Basketry, household items, but the use as cordage is most common.
<i>Calamus gracilis</i> Roxb.; PM-643; 20-12-2008; Dikrik	<i>Raigong dukha</i> (DI)	Wl	i. Basketry and household items.
<i>Calamus rotang</i> L.; PM-644; 20-12-2007; Retzol	<i>Raigong phang gidiba</i> (DI), <i>Tingdon</i> (HM), <i>Heart</i> (ZE)	Wl/Cv	i. Pith of the young shoots eaten cooked as vegetable or <i>Chutney</i> . ii. Sticks of about 1.5 m for self defense.
<i>Calamus tenuis</i> Roxb.; PM-645; 21-12-2007; Longma-III	<i>Raigong dukha</i> (DI), <i>Jui</i> (ZE)	Wl/Cv	i. Preferably used as cordage in basketry.
<i>Calamus acanthospathus</i> Griff.; PM-646; 20-12-2007; Jatinga	<i>Raigong phang gidiba</i> (DI)	Wl	i. Preferably used in household items and agricultural implements.
<i>Daemonorops jenkinsianus</i> (Griff.) Mart.; PM-647; 20-12-2007; Retzol	<i>Raigong gidiba</i> (DI), <i>Heart/Jui</i> (ZE); <i>Thiam/Rumai-tuni</i> (HR)	Wl	i. Use in making heavy household items like tables, chairs and stool etc.
<i>Calamus leptospadix</i> Griff.; PM-648; 20-12-2007; Retzol	<i>Raigong dukha</i> (DI)	Wl	i. Bamboo basketry and agricultural implements.

Abbreviations used:

1. Ethnic communities: (AS)-Assamese, (DI)-Dimasa, (HM)-Hmar, (HR)-Hrangkhoh, (KU)-Kuki, (RN)-Rongmei Naga and (ZE)-Zeme Naga.

2. Biological status: Wl-wild and Cv- cultivated.

and jewellery, etc. *Longkhai* (DI)/ *Pai kawng* (HM)/*Bentak* (BI)/*Kaa* (RN)-a medium sized basket use for carrying goods. It is carried on the back with the help of a cane strap i.e. *Longkhai du* (DI) and *Faibong* (HM) on the fore head of the carrier. *Dikhankhra* (DI)/ *Kawng vang*, (HM)/*Bengrit* (KU) - are similar to the *Longkhai* (DI) but larger in size and for carrying fire wood, agricultural products and water in bamboo culms. *Khamplu* (DI)/*Dan* (HM) - a small bamboo basket used for measuring grains having the capacity of about 5 kg. of paddy/rice. *Maijai* (DI)/*Vaisol* (HM) -is rounded tray about ½ m radius with holes used to sieve paddy.

Village names derived from vernacular names of bamboo and rattan

The names of the 10 *Dimasa* villages derived from the vernacular names of 9 and 1 species of bamboo and rattan respectively has also been provided in the Table 3.

Bamboo and rattans in culture and traditional rites and rituals

Bamboo and rattans are indispensable in almost every social and religious occasion of all the ethnic groups inhabiting North Cachar Hills. Offering of rice beer (*Judima*-DI) in freshly made cups from culms of *Melocanna baccifera* to deities is an essential

Table 3. The names of the *Dimasa* villages derived from the vernacular names of bamboo and cane.

Sl. no.	Name of villages	Vernacular names of the plants	Botanical name
1.	<i>Boro waphu</i>	<i>Wa</i> -Bamboo; <i>guphu</i> -white	<i>Dendrocalamus giganteus</i> Munro.
2.	<i>Boro washilling</i>	<i>Wa</i> -Bamboo; <i>shilling</i> -garden	<i>Dendrocalamus hamiltonii</i> Nees et Arn. ex Munro
3.	<i>Choto waphu</i>	<i>Wa</i> -Bamboo; <i>guphu</i> -white	<i>Dendrocalamus hookeri</i> Munro
4.	<i>Choto washilling</i>	<i>Wa</i> -Bamboo; <i>shilling</i> -garden	<i>Dendrocalamus hamiltonii</i> Nees et Arn. ex Munro
5.	<i>Railing-hadi</i>	<i>Rai</i> -Cane; <i>Hadi</i> -wet land paddy	<i>Daemonorops jenkinsianus</i> (Griff.) Mart.
6.	<i>Wadreg disha</i>	<i>Wadreg</i> -Bamboo; <i>Disha</i> -stream	<i>Phyllostachys mannii</i> Gamble
7.	<i>Wajao</i>	<i>Wa</i> -Bamboo; <i>Gajao</i> -Red	<i>Dinochloa maclellandii</i> (Munro) Kurz
8.	<i>Washu bil</i>	<i>Wa</i> -Bamboo; <i>Shu</i> -thorn	<i>Chimonobambusa callosa</i> (Munro) Nakai
9.	<i>Wathi disha</i>	<i>Wathi</i> -Bamboo; <i>Disha</i> -stream	<i>Melocanna baccifera</i> (Roxb.) Kurz. syn. <i>Melocanna bambusoides</i> Trin.
10.	<i>Wayung disha</i>	<i>Wayung</i> -Bamboo; <i>Disha</i> -stream	<i>Melocalamus compactiflorus</i> (Kurz) Benth.

practice in various worshipping ceremonies by the *Dimasas* and also use for offering the same to the guests in different socio-religious occasions by all the ethnic groups. Again, ceremonial offering of *Calamus tenuis* leaves to the deity is a must in *Farakoba*, a religious rite of the *Dimasas*. Culm of *M. baccifera* is used to make a kind of traditional bamboo flute *Muree-wathisa* by the *Dimasas*. A welcome gate, known as *Fangsla*, made during *Bushu Dima* (Harvesting festival) is made only from bamboo. Bamboo species with variable culm sizes like- *Bambusa auriculata*, *B. cacharensis*, *B. jaintiana*, *B. pallida*, *B. tulda* and *M. baccifera* are used for the purpose.

A bamboo bier called *Bangflong* is used by the *Dimasas*. Although several species are used but *Bambusa tulda* is preferred and more bamboos used to make the bier signifies the higher social status of the deceased in the society. Similarly tombs, known as *Maukhlong* are also made of different species of bamboo.

Some other uses

Edible species: A total of 6 edible bamboo and 2 edible rattan species have been recorded during the present investigation. Tender shoots of *B. balcooa*, *B. cacharensis*, *M. baccifera*, *Melocalamus compactiflorus* and *M. indicus* are made into thin slices and eaten cooked as vegetable either fresh or fermented. *M. baccifera* is the most preferred species and eaten cooked with pork or dried fish by all the ethnic groups. Again the seeds/grains of *Oxytenanthera parvifolia* are used to prepare traditional fermented drink/beer known as *Judima* by the *Dimasas*. The inner soft pith of the

shoots of *Calamus rotang* are eaten cooked by *Hmars*, *Kukis* and *Zeme Nagas* and the fruits of *Plectocomia assamica* are eaten raw.

Ornamental species: *B. multiplex*, *B. vulgaris* var. *vittata*, *B. vulgaris* forma *waminii* and *Pseudosasa japonica* are cultivated as ornamental and/or hedge plants.

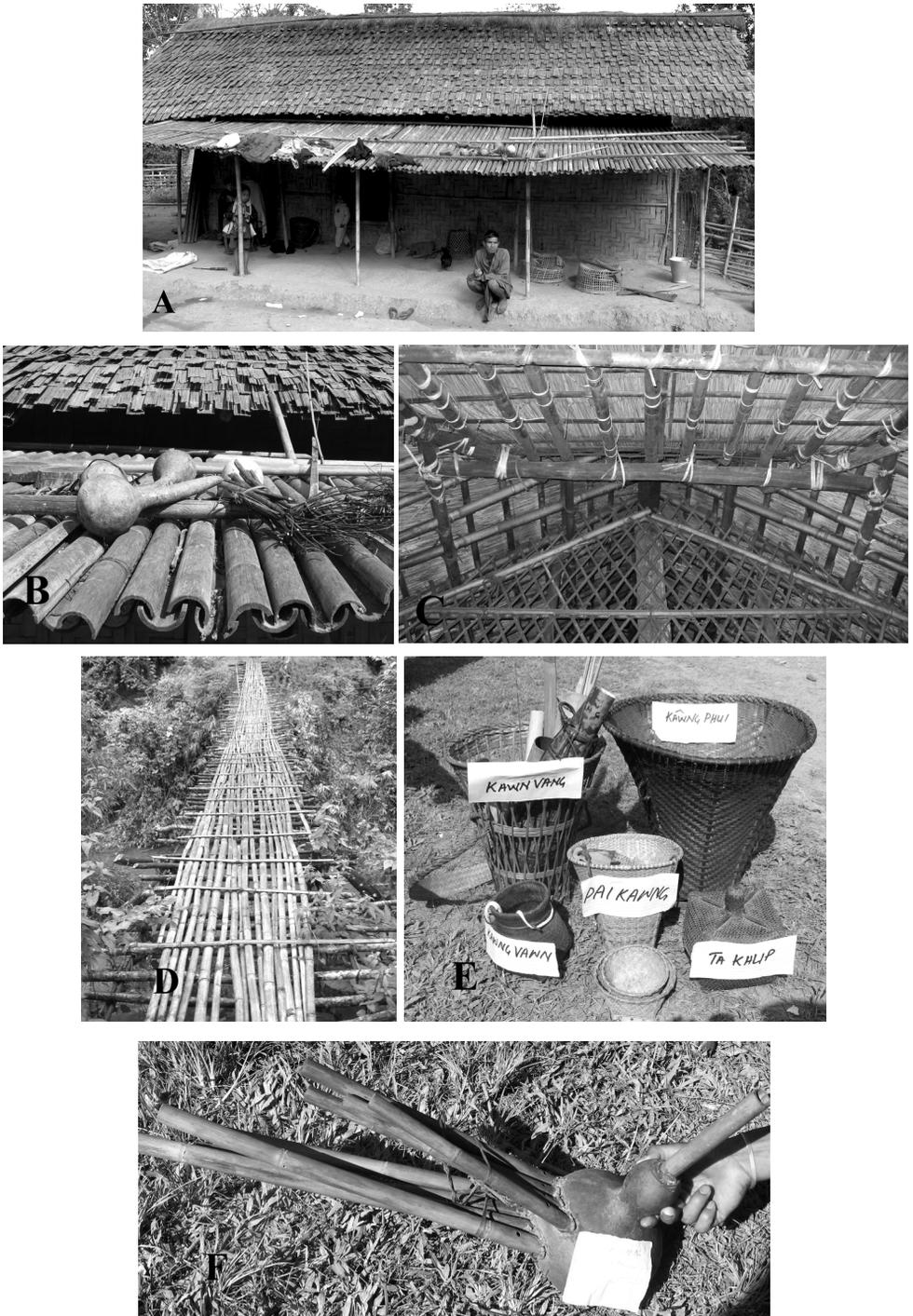
Medicinally used species: The wool made by scrapping the fresh culm of *D. giganteus* is used to bandage fresh cuts and wounds by the *Dimasas* and *Zeme Nagas* as first aid. Stem of *Calamus tenuis* is used locally to cure nails infected with fungus. In the process one end of a dried thin split pith of about 6 cm long is inserted in one corner of an infected nail and at the other end is burned. Thus, the fume released cures the nail from infection.

Species used in construction: Depending on the nature of construction the most preferred bamboo species are- *B. arundinacea*, *B. auriculata*, *B. balcooa*, *B. cacharensis*, *B. jaintiana*, *B. pallida*, *B. pseudopallida*, *B. tulda*, *Dendrocalamus asper*, *D. giganteus*, *D. hookeri*, *D. patellaris*, *D. hamiltonii*, *D. strictus*, *Melocalamus compactiflorus*, *M. indicus* and *Oxytenanthera parvifolia* (Figs. A, B, C & D).

Again, *Gigantochloa albociliata* and *M. baccifera* are mainly used in making wall of the thatch house. The longitudinally split culms are thrashed and hand woven according to the size of the wall of the house. Excepting the edible rattan species like *Plectocomia assamica* and *Calamus rotang*, others are used for the making of bamboo basketry/household items and for tying in construction.

It is noteworthy that some bamboo and rattan species viz. *B. arundinacea*, *B. cacharensis*, *B. jaintiana*, *B. pseudopallida*, *D. asper*, *D. patellaris*, *D. strictus*, *M. baccifera*, *Melocalamus compactiflorus*, *Calamus tenuis*, *C. leptospadix*, *C. gracilis*, *C. rotang* and *Plectocomia assamica* have been recorded to be either cultivated or protected in and around the vicinity of the villages. The main reason behind it is the easy access for frequent use of these resources instead of going to forest for collection.

It is important to note that due to over exploitation of bamboo for meeting the needs of the paper mills, habitat destruction due to *Jhum* cultivation and deforestation due to developmental activities like east-west corridor highway road projects and construction on new broad gauge railway lines, the bio-resources including the bamboo and rattan resources of the district are depleting very fast. The *Schizostachyum helferi* is recorded to be most rare bamboo species in the district. Conservation schemes with appropriate inputs both from scientific studies and prevailing indigenous knowledge of the ethnic groups can save these valuable bio-resources the area. So, it is now an urgent need to setting up of a bamboo and rattan garden in the area which can be helpful for study, conservation and management of the available species in the area. Again, a proper planning and scheme should be implemented immediately to avoid



Figures A: a *Dimasa* house made of bamboo, **B:** Bamboo roof, **C:** Roof made of bamboo and wood, **D:** a hanging bamboo bridge, **E:** *Hmar* bamboo basketry and **F:** *Resem*- a *Hrangkhol* traditional bagpipe.

any kind of human interference in the existing reserve forests and bamboo forests to save the bio-resources. For this kind of activities the traditional knowledge and participation of the local ethnic groups are also most important.

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