Chapter 4

ETHNOBOTANY OF KARBIS

4.1 FOOD

4.1.1 Cereals

Cove lacryma-jobi L. (Poaceae); Tumdak

It is the second most important source of food after paddy. Before the introduction of paddy, tumdak is said to be the only cereal food though today, the crop is used as famine food. The grains are pounded in long (wooden mortar) with lengpum (wooden pestle), winnowed with beleng and ingkrung (bamboo crafts) and cooked like rice, but precaution is taken to avoid excess heating particularly during last stage of cooking. Sangpher (flakes) prepared from the grains is the most preferred item and often served to guests as symbol of love and care. Further, beer brewed from grains is said to be better in taste and aroma than that prepared from rice, the common substrate.

Besides being an important staple food tumdak had been associated with sorrow and grief among Karbis in the past. The fruit, a caryopsis, has hard and smooth coat and when stored in granary perfectly simulates a quicksand. There are many popular legends where granary of tumdak was associated with tragedies including a few cases of suicides. Death involving tumdak or any other crop has great significance in the social life of Karbis as such cases are considered an omen of evil.

Oryza sativa L. (Poaceae); Sok

The grains are pounded and winnowed before cooking with water. Rice cooked in langpong (bamboo tube with a node at one end) is said to have better taste and aroma. Certain cultivars, particularly sticky rice are used for making local food items like sangpher (flakes) and sang aduk (rice flour).

4.1.2 Famine Food

Alocasia macrorrhiza Schott (Araceae); Hensoksu, Henchala

Rhizomes are eaten baked or roasted, also reported by Jain and Borthakur (1980) and (Arora, 1997).

Amorphophallus bulbifera (Roxb.) Blume (Araceae); Hensarku

Petioles are roasted or boiled and eaten during scarcity of food. Corms are boiled and eaten.

Amorphophallus sylvaticus (Roxb.) Kunth., syn. Synantherias sylvatica (Roxb.) Schott (Araceae); Habit hensarku

Petioles are roasted and eaten as famine food.
**Antidesma watii** Hook. f. (Euphorbiaceae); **Han chelanchi**
Tender twigs are roasted in fire and eaten. It is said to have slight salty but palatable taste. The investigator had the opportunity of consuming the food during field study in Singhason hills.

**Artocarpus heterophyllus** Lam., syn. **A. integra** (Thunb.) Merr., **A. integrifolia** L. (Moraceae); **Jangphong**
Unripe fruits are boiled and eaten when conventional cereals are in short supply.
Dried powdered seeds are eaten as substitute for rice during scarcity (Jaiswal, 2010).

**Coix lacryma-jobi** L. (Poaceae); **Tumdak**
The crop is the most important among famine foods known to the Karbis.

**Colocasia esculenta** (L.) Schott (Araceae); **Henru ke-ik**
Tubers eaten boiled during scarcity of rice.
Corms are boiled and eaten (Arora, 1997).

**Catunaregam uliginosa** (Retz.) Siva., syn. **Randia uliginosa** DC., **Tamilnadia uliginosa** (Retz.) Tiruv. & Sastre, **Xeromphis uliginosa** (Retz.) Mahesh **Crudaria javanica** (Rubiaceae); **Chehepi**
Fruits are consumed when other source of staple food get exhausted.

**Cucurbita pepo** L. (Cucurbitaceae); **Bonghom**
Shoots and tender fruits are boiled and as eaten as famine food; often tender fruits and leaves are cooked with some quantity of rice and eaten.

**Dendracalamus hamiltonii** Nees et Arn. ex Munro (Poaceae); **Kaipho**
Shoots are valuable source of famine food; it is cooked alone or with some quantity of rice and eaten. Over eating is said to cause poisoning though not fatal.

**Dioscorea alata** L. (Dioscoreaceae); **Ruichin**
Tubers are cleaned by removing the skin, cooked and eaten. Often, tubers are cooked with a little quantity of rice to make more palatable. Tubers roasted in fire are reported to have better taste and aroma and for which it is preferred.
Tuber are cooked and eaten during famines or scarcity (Mittre, 1997; Singh et al., 1999; Lalramnghinglova, 2002).

The collection of tubers reflects one of the most important traditional knowledge on conservation of bioresources among the Karbis which is guided by an invaluable ethic ‘food for all’. Usually, tubers are collected only when aerial parts have withered, an indicator used for maturity for all tuberous plants. Soil around the tuber is removed from a few inches above the base till the apex of the tuber and the latter is collected leaving the basal part intact with the soil and which ensures growth of the plant in the next
Mussa balbisiana Colla (Musaceae); Lobong
Inflorescence is eaten boiled or baked or fried.
Inflorescence is boiled, astringent and mild bitter taste (Kar & Borthakur, 2007; Begum & Gogoi, 2007).

Mussaenda macrophylla Wall. (Rubiaceae); Vosopeban
Shoots are cut into small pieces and cooked with meat of fowls or goat or pig; method of preparation is same with Ficus hirta.
Tender leaves are eaten raw in salad (Arora, 1997).

Ocimum kilimandscharicum Guerke (Lamiaceae); Lopong
Shoots are cooked with dried fish and alkali solution and eaten; the item is highly aromatic and but claimed to be refreshing.

Olax acuminata Wall, ex Benth. (Olacaceae); Hanboka
Shoots are cooked with or without oil and eaten in curry. Over eating is said to cause giddiness.
Leaves are eaten boiled (Borthakur, 1997; Rao & Shanpru, 1997; Kar & Borthakur, 2008).

Ophiorrhiza ochroleuca Hk.f. (Rubiaceae); Longle mehek
Shoots are cooked with alkali solution and dried fish and eaten.

Oreocnide integrifolia Miq. (Urticaceae); Thehoi
Inflorescences are cooked with specially prepared dried fish called manthu tumtap and eaten as chutney.

Oroxylum indicum (L.) Vent. (Bignoniaceae); Nopakban
Flowers or shoots or both are boiled or baked along with dried fish and alkali solution and eaten as chutney. The plant is said to be bitter for which curry is seldom prepared.
Tender leaves, flowers and fruits are eaten fried or boiled (Bhargava, 1997; Lalramnghinglova, 2002; Kar & Borthakur, 2008).

Oxalis corniculata L. (Oxalidaceae); Vothung mekbob
Leaves are eaten as chutney with salt and chili; the item is said to have sour taste.
Leaves are boiled with dal and eaten (Kar & Borthakur, 2008; Mao, 1993; Singh et al., 1999).

Paedaria foetida Roxb. (Rubiaceae); Rikang menthu
Leaves are cooked with fish or meat and eaten; crushed leaves are mixed with paste of dal for preparing a local eatable called pakori.
Leaves are eaten boiled with chilli and salt (Kar, 2004; Barua et al., 2007; Begum & Gogoi, 2007; Kar & Borthakur, 2008).
Parkia timoriana (DC.) Merr., syn. P. roxburghii G. Don (Mimosaceae); Themuke
Tender fruits are roasted or boiled and mixed with dried fish to prepare chutney; the item has highly pungent odour and, therefore not liked by all.
Fruits are baked and eaten as chutney (Lalramnghinglova, 2002; Kar & Borthakur, 2007).

Phlogacanthus thyrsiformis (Hardw.) Mabb., syn. P. thyrsiflorus (Roxb.) Ness (Acanthaceae); Jok-an (Plate 7f)
Inflorescences are boiled with dried fish or baked and eaten as chutney.
Leaves and flowers are cooked with dried fish or meat (Singh et al., 1999; Kar & Borthakur, 2007; Begum & Gogoi, 2007; Jaiswal, 2010).

Phlogacanthus tubiflorus Nees (Acanthaceae); Pichok lok
Inflorescences are boiled or baked with alkali solution, salt and dried fish to prepare chutney.
Flowers are eaten fried or boiled or baked (Begum & Gogoi, 2007; Kar & Borthakur, 2008).

Phlogacanthus wallichii Clarke (Acanthaceae); Jok an ke-er
Inflorescences are eaten boiled or baked.
Inflorescences are eaten fried; the dish has bitter taste (Kar & Borthakur, 2007).

Phyllanthus acidus (L.) Skeels, Cicca acidus (L.) Merrill., C. distichus Muell.-Arg., (Euphorbiaceae); Takeri thelu
Leaves are cut into pieces and cooked with alkali solution and dried fish and eaten in curry. The dish is said to be palatable and refreshing.

Phyllanthus fraternus Webst., syn. P. neeurii Hook. f., P. amarus Schum & Thonn.(Euphorbiaceae); Longle thelu
Shoots are boiled or fried and eaten.

Physalis peruviana L. (Solanaceae); Thebongkang
Leaves are boiled to prepare a delicacy that has mild sweet taste (Kar & Borthakur, 2008).

Piper thomsonii Hk. F. (Piperaceae); Hanbithi
Leaves are cooked with rice flour and eaten in curry. The dish is often eaten after a hard day’s work or after long journey because the dish is said to relieve body ache. The investigator was served with this dish during field study in Singhasan Hills in October 2001.

Pogostemon benghalense (Burm. f.) Kuntze. (Lamiaceae); Hanbipo
Shoots are cooked or baked with alkali solution, chilli and dried fish to prepare chutney.
Leaves are fried or boiled and eaten (Kar & Borthakur, 2007).
**Pogostemon parviflorus** Benth. (Lamiaceae); *Hanbipo*
Shoots are cooked and eaten as *Pogostemon benghalense*.

**Polygonum affine** Don (Polygonaceae); *Han jareng*
Shoots are cooked with dried fish or small fishes and eaten in curry.

**Polygonum chinense** L. (Polygonaceae); *Okhi morokpo*
Shoots are cooked with dried fish and eaten in curry.
Leaves are used as vegetable (Joseph & Kharkongor, 1997; Barua et al., 2007).

**Polygonum microcephalum** D. Don (Polygonaceae); *Delap*
Leaves are cooked with fish and the dish is considered a revered delicacy. When cooked with pork is said to dissolve fat. Further, slightly spoilt fishes or meat when cooked with leaves is reported to remove the unpalatable smell and prevents food poisoning.

**Polygonum perfoliatum** L. (Polygonaceae); *Hanserong derot*
Shoots are cooked with fish or dried fish and eaten; the taste is said to be sour in taste but refreshing.
Tender shoots are used as vegetable (Kar, 2004; Barua et al., 2007).

**Pothos** sp. (Araceae); *Han sangbe*
Leaves are cooked with dried fish and alkali solution to prepare a traditional delicacy. Method of preparation is similar with *Aristolochia cathcartii*; if not properly cooked the dish is said to irritate throat and mouth.

**Rhus semialata** Murr., syn. *R. javanica* L. (Anacardiaceae); *Thesebo*
Shoots are boiled with dried fish and eaten in curry.

**Rhynchotechum ellipticum** (Wall. ex Dietr.) A. DC. (Gesneriaceae); *Mehek*
Leaves are cooked alone or with corm of arums, *phree kangnek* (*Zingiber rubens*), alkali solution and dried fish. The delicacy is said to be refreshing.
Leaves are used as vegetable (Jain & Borthakur, 1980; Lalrammghinglova, 2002; Patgiri & Borah, 2007; Srivastava & Nyshi Community, 2010).

**Sagittaria sagittifolia** L. (Alismataceae); *Bab henru*
Tubers are eaten boiled or cooked to prepare curry.

**Sauropus androgynus** Merill. (Euphorbiaceae); *Hanvoti*
Leaves are cut into pieces and cooked with dried fish to prepare curry.

**Sesamum orientale** L., syn. *S. indicum* L. (Pedaliaceae); *Nempo*
Dried leaves are crushed manually and cooked with dried fish and eaten in curries that have a slimy touch. Dried leaves are preserved for consumption later. Karbis acknowledge that curry prepared from leaves of *nempo* take least time to cook for which it is often regarded as ‘emergency vegetable’.
Seeds are used in herbal recipe prepared during Bihu in Assam; seeds are also eaten in chutney (Begum & Gogoi, 2007; Mao & Odyuo, 2007).

**Sida cordifolia L. (Malvaceae); Bejangnei**

Shoots are cooked with alkali solution and dried fish and eaten in curry.

**Smilax ocreata A. DC. (Smilaceae); Phelagtung**

Tender shoots are fried and said to have sweet taste (Kar & Borthakur, 2007).

**Solanum anguivi Lamk., syn. S. violaceum Ort. (Solanaeae); Hepi keho**

Fruits are cooked with dried fish and alkali solution for preparing curry; boiled fruits are eaten as chutney. The item is reported to have a bitter but refreshing taste.

**Solanum ferox L., syn. S. indicum L. (Solanaeae); Theso keho, hepi sokran**

Fruits are cooked with sangprot (broken rice grains), dal, alkali solution and dried fish. Fruits are also eaten fried.

Leaves and fruits are used in herbal recipe prepared during Bihu in Assam and a vegetable (Begum & Gogoi, 2007; Barua et al., 2007; Srivastava & Adi community, 2009).

**Solanum gilo Raddi (Solanaeae); Hepi Keho**

Fruits are cooked with dried fish and alkali solution to prepare curry; often boiled fruits are eaten as chutney; both curry and chutney is said to have bitter taste.

**Solanum nigrum L. (Solanaeae); Vocherok a-an, Hepisokran**

Tender leaves and shoots are fried with salt and garlic and eaten or cooked to prepare curry.

Leaves and fruits are boiled to prepare chutney (Lalramnghinglova, 2002; Begum & Gogoi, 2007; Kar & Borthakur, 2008; Srivastava & Adi community, 2009).

**Solanum torvum Sm. (Solanaeae); Theso rongman, Theso bongnai, Thesokumbong**

Fruits are often cooked with shoots of S. nigrum or Hibiscus sabdariffa and/or tomato or brinjal and eaten in curry; the dish is reported to be refreshing. Sometimes fruits are fried with salt or with mustard oil and eaten.

Fruits eaten fried or boiled (Mao, 1993; Lalramnghinglova, 2002; Kar, 2004; Begum & Gogoi, 2007; Singh et al., 1999; Kar & Borthakur, 2008; Srivastava & Adi community, 2009;).

**Spilanthes clava DC., syn. S. acmella auct. Non (L.) Merr. (Asteraceae); Bab soki**

Shoots are cooked with alkali solution and dried fish and eaten; the dish is said to have strong aroma and therefore not liked by all.

**Spondias pinnata (L.f.) Kurz., syn. S. mangifera Willd. (Anacardiaceae); Seming**

Leaves are used in preparation of chutney; the dish is said to be sour in taste.
Flower buds are used to prepare *chutney*; fruits are used to prepare pickles (Chakraborty, 2002; Kar & Borthakur, 2008).

*Tamrindus indica* L. (Caesalpiniaceae); *Tantuli*
Shoots are cooked in preparation of curry; the dish is said to be sour in taste.

*Thunbergia grandiflora* Roxb. (Acanthaceae); *Nong nong*
Flowers are eaten fried and it is said to have sweet taste (Kar & Borthakur, 2007).

*Trachyspermum khasianum* (Clarke) Wolff (Apiaceae); *Kung kung*
Aerial parts are cooked with dried fish and eaten.

*Trema orientalis* Blume, (Ulmaceae); *Thehoi*
Shoots are cooked with alkali solution and dried fish and eaten in curry.

*Trevesia palmata* (Roxb.) Vis. (Araliaceae); *Kokterak*
Inflorescences are boiled and eaten as *chutney*.

*Vernonia* sp. (Asteraceae); *Hanmoiso*
Shoots are eaten raw or mixed with salt, onion and chili and eaten in salad.

*Xanthium strumarium* L. (Asteraceae); *Parok hanthor*
Leaves are often cooked with dried fish and eaten in curry. When boiled with pork produces a revered dish.

*Tender leaves eaten boiled* (Kar & Borthakur, 2008).

*Zanthoxylum armatum* DC., syn. *Z. alatum* Roxb. (Rutaceae); *Jajur*
Leaves and unripe fruits are used in preparation of *chutney* either after boiling or baking; the item is said to emit strong aroma.

*Zanthoxylum rhetsa* (Roxb.) DC., syn. *Z. limonella* (Dennst.) Aist., *Fagara budrunga* Roxb. (Rutaceae); *Arloso hanjor*
Shoots are pounded and eaten as *chutney*. Often leaves are stuffed in bamboo tube along with dried fish and cooked to produce a revered local delicacy.

*Leaves and fruits are used in curries* (Mao, 1993; & Jain & Dam, 1979).

*Zingiber officinale* Rosc. (Zingiberaceae); *Hanso*
Leaves are cooked with dried fish and eaten in curry; when cooked with fish or meat is a pleasant aromatic delicacy.

Rhizome is used in herbal recipe prepared during *Bihu* in Assam (Begum & Gogoi, 2007).

*Zingiber rubens* Roxb. (Zingiberaceae); *Phree kangnek*
Shoots are cooked with dried fish and alkali solution and eaten in curry. Ripe inflorescences are cooked with corm of arums or leaves of *Rhynchotechum ellipticum*,
dried fish and alkali solution to prepare a revered local dish. Dehisced inflorescence resembles a ‘laughing mouth’ and so the name Phree kangnek (phree: the plant; kangnek: to laugh); it becomes bright red in colour which can easily be noticed from a distance (Plate 8d).

**Zingiber zerumbet** (L.) Rosc. ex Seem., syn. *Ammomum zerumbet* L. (Zingiberaceae); Vorek hanso

Leaves are cooked with dried fish to prepare curry. When cooked with small fishes is said to produce a revered delicacy. Both dishes are said to have pleasant aroma.

**Zizyphus mauritiana** Lam., syn. *Z. jujuba* Lam. (Rhamnaceae); Bokuri

Fruits are cooked with petioles of arum to prepare a local dish that have sour but refreshing taste.

### 4.1.3 Edible Fruits

**Actephila excelsa** (Dalz.) Muell.-Arg. (Euphorbiaceae); Han mekphri, Mehphri

Mature seeds are eaten roasted.

**Aegle marmelos** (L.) Corr. (Rutaceae); Thepli

Ripe fruits are eaten.

**Alpinia calcarata** Rosc., syn. *A. bracteata* Rosc. (Zingiberaceae); Hor rangve

Ripe fruits are sweet and often consumed by children tending cattle.

**Artocarpus chama** Buch.-Ham., syn. *A. chaplasha* Roxb. (Moraceae); Phong

Ripe fruits are eaten; seeds are roasted or boiled or fried and eaten.

**Artocarpus heterophyllus** Lam., syn. *A. integra* (Thunb.) Merr., *A. integrefolia* L. (Moraceae); Jangphong

Ripe fruits are eaten; seeds are boiled, fried or baked and eaten.

**Artocarpus lacucha** Buch.-Ham., syn. *A. lakoocha* Roxb. (Moraceae); Ingtat arong

Ripe fruits eaten raw having sweet taste, also reported by Singh et al., 1988).

**Averrhoa carambola** L. (Averrhoaceae); Torte

Ripe fruits are eaten; often, unripe fruits are mixed with chilli and salt and then eaten.

**Baccaurea ramiflora** Lour., syn. *B. sapida* (Roxb.) Muell.-Arg. (Euphorbiaceae); Dampejuk

Ripe fruits are eaten; also reported by Singh et al. (1988).

**Bombax ceiba** L., syn. *B. malabaricum* DC., *Salmalia malabarica* (DC.) Scott. & Endl. (Bombacaceae); Pharkong

Seeds are roasted and eaten; the item is reported to have good taste.
Calamus erectus Roxb. (Arecaceae); Pre
Ripe fruits are eaten.

Carallia lucida Roxb. syn. C. integerrima DC. (Rhizophoraceae); Theng vothung
Ripe fruits are sweet and eaten.

Castanopsis indica (Roxb.) DC. (Fagaceae); Phongrong
Seeds are eaten raw or roasted.

Cucumis melo L. (Cucurbitaceae); Thoithe suri
Unripe fruits are very bitter, but ripe fruits are sour in taste and eaten. Often found growing by roadside or near cattle shed.

Daphne involucrata Wall. (Thymelaeaceae); Jokri
Ripe fruits are eaten.

Dillenia indica L. (Dilleniaceae); Plum-plam
Both ripe and unripe fruits are eaten with chili and salt.

Dillenia pentagyna Roxb. (Dilleniaceae); Cherimpi
Fruits are eaten with salt and chilli.

Elaeagnus caudata Sch. ex Momiyama, syn. E. conferta Roxb., E. latifolia L. (Elaeagnaceae); Selengni
Fruits are edible but sour. Fruits are often used for making pickles.

Engelhardtia spicata Blume (Juglandaceae); Marle, Marloo
Ripe fruits are eaten; it is said to have sweet taste.

Eugenia bracteata Roxb. (Myrtaceae); Jangmi reng reng
Ripe fruits are eaten alone or with chilli and salt.

Flacourtia cataphracta Roxb. (Flacourtiaeeae); Thengpe kondu
Ripe fruits are edible and reported to have sweet taste.

Garcinia cowa Roxb. (Clusiaceae); Pradang
Ripe fruits are edible and said to have mild sweet-sour taste.

Garcinia lancifolia Roxb. (Clusiaceae); Pranso
Ripe fruits eaten alone, sweet; also eaten with chilli and salt in case the fruit is sour.

Garcinia pedunculata Roxb. (Clusiaceae); Pranpre
Ripe fruits are eaten alone or eaten with chilli and salt.

Gnetum gnemon L. (Gnetaceae); Hanthu
Seeds are fried and eaten; it is reported to have pleasant taste.

Hodgsonia macrocarpa (Blume) Cogn., syn. H. heteroclita (Roxb.) Hk.f. & Th. (Cucurbitaceae); Hanthar
Seeds are rosted and eaten; over consumption is reported to cause loose motion.
Melastoma malabathricum L. (Melastomataceae); Bik bik
Ripe fruits are eaten and it often turns the tongue purple. It is a favoured fruit among children tending cattle.

Morus australis Poir., syn. M. indica Thunb. (Moraceae); Inglet
Ripe fruits are black and sweet. Children climbing the plant and enjoying on the fruits is a common scene in rural villages.

Musa paradisiaca L., syn. M. sapientum L. (Musaceae); Lothe
Ripe fruits are eaten; unripe fruits are eaten roasted or boiled.

Passiflora foetida L. (Passifloraceae); Thevu-um
Ripe fruits are eaten; it is reported to be mild sour in taste.

Phyllanthus acidus (L.) Skeels, syn. Cicca acidus (L.) Merr., C. disticha L. (Euphorbiaceae); Takiri thelu
Ripe fruits are sweet; unripe fruits are pounded, mixed with chilli and salt and then eaten.

Phyllanthus emblica L., syn. Emblica officinalis Gaertn. (Euphorbiaceae); Thelu kame
Fruits are eaten raw; often fruits are dried and preserved for consumption later. Fresh fruits are used for making pickles.

Physalis peruviana L. (Solanaceae); Habit bokbok
Ripe fruits are edible but over consumption is said to cause headache.

Rhamnus nepalensis Wall, ex Roxb. (Rhamnaceae); Nok aling
Ripe fruits are eaten; children tending cattle often consume the fruits.

Rhus semialata Murr., syn. R. javanica L. (Anacardiaceae); Thesebo
Ripe fruits are edible; it is sweet. Ants often feed on whitish exudates of fruits.
Fruits are edible (Arora, 1997)

Rubus rugosus Sm., syn. R. moluccanus (non L.) Hk. f. (Rosaceae); Amreng sobai, Thesobai
Ripe fruits are edible; people tending cattle often feed on ripe fruits.

Semecarpus anacardium L. f. (Anacardiaceae); Barla
Ripe fruits are sweet and eaten. However, the sap sometimes causes fatal allergy.

Spondias axillaries Roxb. (Anacardiaceae); Thesili
Ripe fruits are eaten; it is not so palatable due to slimy pericarp but taken as chewing gum during long journey in forest.

Spondias pinnata (L.f.) Kurz, syn., S. mangifera Willd. (Anacardiaceae); Siming
Fruits are eaten; unripe fruits are sour in taste while ripe fruits have sour-sweet taste; drinking water after consuming the fruits is reported to sweeten the mouth.
Sterculia villosa Roxb. (Sterculiaceae); Jintekong
Seeds are roasted in open fire and eaten.
Roasted seeds are taken by Garos of Meghalaya (Rao & Shanpra, 1997).

Stixis suaveolens (Roxb.) Pierre, syn. Roydsia suaveolens Roxb. (Capparaceae);
Tamhidi
Ripe fruits are eaten.

Streblus asper Lour. (Moraceae); Cheri theso.
Ripe fruits are eaten; over eating is said to cause giddiness.

Syzygium cerasoides (Roxb.) Chatt. & Kanjilal (Myrtaceae); Jangmiso
Ripe fruits are eaten alone or with salt.

Syzygium cumini (L.) Skeels, syn. Eugenia jambolana Lamk. (Myrtaceae);
Jangmikethe
Ripe fruits are eaten with salt.

Tamarindus indica L. (Caesalpiniaceae); Tantuli.
Both ripe and unripre fruits are eaten; flowers are also eaten.
Fruits and flowers are edible (Singh et al., 1988).

Terminalia bellirica (Gaertn.) Roxb. (Combretaceae); Kuru
Ripe fruits are eaten but not liked by all due to its bitter taste.

Terminalia chebula Retz. (Combretaceae); Siluka
Fruits are eaten; it is said to have a bitter but palatable taste. Drinking water after consuming the fruits is reported to sweeten the mouth.

Willughbeia edulis Roxb. (Apocynaceae); Keng-et.
Ripe fruits are eaten; it is reported to have slimy but sweet taste. The fruits are also chewed to quench thirst in forest where there is dearth of water.

Zizyphus mauritiana Lam., syn. Z. jujuba Lam (Rhamnaceae); Bokuri
Fruits, both unripe and ripe are eaten; fruits are also made into pickles.

Zizyphus rugosa Lamk. (Rhamnaceae); Bonbokuri
Ripe fruits are edible; it is reported to have mild sweet taste.

4.1.4 Spices and Condiments

Allium sativum L. (Liliaceae); Harsun kelok
Leaves are used to flavour curry and other eatables; it is very a frequently used plant part.

Allium tuberosum Roxb. (Liliaceae); Jirlang
Leaves are added to various types dishes as spice.
**Aralia armata** (G.Don) Seem. (Araliaceae); **Tengnang**
Aromatic leaves are cooked with meat or fish.

**Areca catechu** L. (Areceae); **Kove**
Tender fruits are used for tendering meat.

**Bambusa** spp. (Poaceae); **Chek**
Fermented shoots called *upthor*, are often used to flavour curries. Fish and meat are common dishes where fermented shoots or the juice is added to add flavour. Juice when cooked with larvae of *eri* is a revered local delicacy. Though several species of *Bambusa* are used for this purpose, the Karbis however, prefer the shoots of *Dendrocalamus hamiltonii*.

**Boesenbergia rotunda** (L.) Mansf., syn. *Curcuma rotunda* L., **Boesenbergia pandurata** (Roxb.) Schltr., *Kaempferia pandurata* Roxb. (Zingiberaceae); **Tiha**
The plant is considered as traditional spice of the Karbis. Tuberous roots when cooked with meat, local variety of brinjal and alkali solution is considered revered for its unique aroma and taste; roots are also added to dishes prepared from aroids.

**Calimantha umbrosa** (Bieb.) Benth. (Lamiaceae); **Berai, jerai**
Shoots are considered revered for flavouring delicacies of small fishes; it is reported to remove the undesirable odour and make the dish palatable.

**Caryota urens** L. (Areceae); **Dokechu**
Shoots are aromatic and eaten cooked with meat to increase the taste.

**Citrus aurantifolia** (Chr.) Sw. (Rutaceae); **Tumeng**
Leaves are added to flavour meat particularly during rituals.

**Citrus macrophthora** Montr. Var. *assamensis* Tanaka (Rutaceae); **Hampur**
Dried rind is grounded and added as spice in preparing meat delicacies.

**Coriandrum sativum** L. (Apiaceae); **Mirmindu**
The plant is common source of spice in preparing both vegetarian and non-vegetarian dishes. Its use however, is not common among hill Karbis.

**Dendrocalamus hamiltonii** Ness et Arn. ex Munro (Poaceae); **Kaipho**
Fermented shoots and juice are used to flavour meat and fish delicacies.

**Elsholtzia strobelifera** Benth. (Lamiaceae); **Nempi**
Seeds are fried, pounded and added to flavour salad; it is preferred over sesame.

**Eryngium foetidum** L. (Apiaceae); **Hankeching**
Leaves are used for flavouring meat and fish; it is eaten as *chutney* after mixing with dried fish.

Plants are cooked with vegetables for flavouring (Rao & Shanpru, 1997).
**Homalomena aromatica** Schott (Araceae); **Okhi atehang**
Petioles and dried fishes are stuffed in bamboo tubes and preserved for consumption later. It is claimed that the plant adds flavour to the fermented food.

**Kaempferia galanga** L. (Zingiberaceae); **Bithiphaknur**
Leaves and rhizomes are used for flavouring curries in vegetarian and non-vegetarian dishes.

**Murraya keonigii** (L.) Spr. (Rutaceae); **Dengjari**
Leaves are added to flavour meat; also reported by (Mitre, 1997; Dam & Hajra, 1997).

**Ocimum killimandscharicum** Guerke (Lamiaceae); **Lopong, Lopong birik**
The plant is highly aromatic and cultivated in all *jhum* fields; its use as spice is reported to be traditional to Karbis; the plant is also quoted in a few folk songs. Twigs are dried and preserved for consumption later.

**Pandanus minuta** L. (Pandanaceae); **Bab joha**
Fresh or dried leaves are cooked with rice in order to give aroma to the food. Leaves are cooked with rice and vegetable (Kar & Borthakur, 2007).

**Sesamum orientale** L., syn. **S. indicum** L. (Pedaliaceae); **Nempo**
Seeds are the most common condiment among Karbis; powdered seeds are added for seasoning curries and sometimes eaten in salad.

**Zanthoxylum armatum** DC., syn., **Z. alatum** Roxb. (Rutaceae); **Jajur**
Shoots, tender leaves and fruits are used to flavour dishes, particularly meat items; matured fruits are stored for future use. Fruits are used as spice (Jain & Dam, 1979; Mao, 1993; Angami et al., 2006; Barua et al., 2007; Jaiswal, 2010).

**Zingiber officinale** Rosc. (Zingiberaceae); **Hanso**
Rhizome is a common source of spice; leaves are often cooked with meat or fish. In the hills however, the rhizome is mainly used to flavour meat and rarely vegetarian dishes. It is reported that, the small variety of ginger called *hanso so* is more preferred over the commercial ginger. Rhizome is used as spice (Begam & Gogoi, 2007).

### 4.1.5 Beverages and Drinks

#### 4.1.4.1 Alcoholic Beverage:
**Preparation of Thap (fermentation cakes or yeast starter):** Karbis use many plants in preparing beer. Rice is soaked in water for overnight and then pounded in *long* (wooden mortar) with *lengpum* (wooden pestle) along with plant ingredients to produce a sticky...
powdered mass. Some quantity of *Thap Aphi* or previously prepared cake is added to the powdered mass and then made into cakes, ranging in size from as small as tea plate to the size of rice plate. The cakes are wrapped with paddy straw and dried in the sun for 4-7 days depending on the intensity of the heat. The cakes are then preserved for later use.

For the purpose of fermentation, rice, usually of inferior quality is boiled like rice and spread on mat to cool. The cooked rice is made into fine grains and some quantity of *thap* is added, properly mixed and stored for fermentation.

In the preparation of *thap*, the old cakes serve as spawn while the rice cakes act as medium or substratum for multiplication of microbes. The cooked rice serves as substrate on which microbes act and bring about fermentation leading to the production of beer. Though rice is the usual substrate for fermentation, use of other crops is not uncommon. Plants which are used in the preparation of *thap* and beer are enumerated below.

*Acacia pennata* (L.) Willd. (Mimosaceae); *Themra, Khemra*
Bark is pounded with rice to prepare yeast starter as described above. *Themra*-based beer is said to have pleasant aroma and sweet taste. Use of *themra* is reported to have been introduced by Dimasas, a Scheduled tribe in Karbi Anglong district. Probably, for this reason, the practice could only be observed among Karbis residing in and around Dimasa villages.

*Amomum corynestachium* Wall. (Zingiberaceae); *Khu-eng.*
Leaves are used in preparation of yeast starter; among Karbis the practice is reported to have inherited from the Pnars. *Khu-eng*-based beer is said to have pleasant aroma and sweet taste but more cooling than *A. pennata*-based beer.

*Artocarpus heterophyllus* Lam., syn. *A. integra* (Thunb.) Merr., *A. integrefolia* L. (Moraceae); *Jangphong*
In absence of rice, ripe fruits are used as substrate for fermentation of beer.

*Clerodendrum viscosum* Vent., syn. *C. infortunatum* auct. non L. (Verbenaceae); *Phlek-ik*
Leaves are added during preparation of yeast starter. This is reported to make the beer strong but cause severe heahache as side effect.

Leaves are used in fermentation of rice (Hajra & Baishya, 1997).

*Croton joufra* Roxb. (Euphorbiaceae); *Marthu*
Leaves are used in preparation of yeast cakes. *Marthu*-based yeast starter is traditional to Karbis; Tiwas also use *marthu* but it is difficult to state how they acquired the knowledge. Method of preparation is same as described above.
**Croton roxburghii** Balak., syn. *C. oblongifolius* Roxb. (Euphorbiaceae); **Marthu**
Leaves are used for preparing yeast cakes like *C. joufra*.
Bark is used for fermenting liquor (Jain & Dam, 1979).

**Cymbopogon citratus** Stapf. (Poaceae); **Sok aphi**
Leaves are used for making yeast cakes; leaves are claimed to increase aroma of the beer.
A preparation like tea is made from leaves (Mitre, 1997).

**Musa paradisiaca** L., syn. *M. sapientum* L. (Musaceae); **Lothe**
Ripe fruits are used as substrate for fermenting beer in absence of rice.

**Oryza sativa** L. (Poaceae); **Sok**
*Sang* (rice grains) are used in preparation of yeast cake and also as substrate for fermentation. Method of preparation is discussed earlier.
Rice grains are used for preparation starter for fermentation of beer (Deori et al., 2007).

### 4.1.4.2 Non-alcoholic Beverage:

**Bidens pilosa** L. var. minor (Blume) Sherff. (Asteraceae); **Phuju athai**
Ripe cypselllas are boiled in water to prepare a soft drink like tea.

**Camellia kissi** Wall., syn., *C. caduca* Brandis (Theaceae); **Sa reng reng**
Tender leaves are pounded in mortar with pestle and dried under shade or filtered light. The leaves are boiled in water to prepare a drink that has almost similar taste and aroma as the conventional tea (*Camellia sinensis* (L.) O. Kuntze).

**Combretum roxburghii** Spr., syn. *C. decandrum* Roxb. (Combretaceae); **Arkeng**
Tender leaves are crushed and dried under shade or filtered light. The leaves are boiled in water to prepare a refreshing drink.

**Eugenia bracteata** Roxb. (Myrtaceae); **Reng reng**
Tender leaves are red-coloured; leaves are crushed, dried in sun and used in preparation tea-like drink. Karbis usually take such drink during *jhum* operations.

**Sesamum orientale** L., syn. *S. indicum* L. (Pedaliaceae); **Nempo**
Abscissed dried leaves are collected, crushed and boiled in water to prepare a drink. The taste is said to be not palatable in both taste and aroma, hence, it is practised only when other options are exhausted.

**Solanum ferox** L., syn. *S. indicum* L. (Solanaceae); **Hepisokran**
Dried leaves are boiled and taken as soft drink; it is reported to have unpleasant flavour and hence, not like by all.
4.2. ETHNOEATRICAL PLANTS

4.2.1 Ethnomedicines

In the medicinal practice, the Karbis use large number of plants/plant products or the main components

*Acorus calamus* L. (Araceae); *Lang abab, Pok kang abab*

Shoots are eaten raw or rhizome is made into beads and tied around the waist to relieve from constipation; the practice is continued till recovery.

Leaves and rhizomes are given in dysentery, fever, rheumatism, headache, cold, bronchitis, cough, malaria, arthritis, painful menses, liver disorders, heart and lung troubles, cuts, paralysis, epilepsy, etc. (Megoneitso & Rao, 1983; Nath & Bordoloi, 1989; Mao, 1993; Borthakur, 1993; Kharkongor & Joseph, 1997; Dam & Hajra, 1997; Sharma, 1999; Gogoi & Borthakur, 2001; Bora et al., 2003; Chhetri, 2004; Borthakur et al., 2004; Shareif et al., 2005; Humayun et al., 2006; Hynniewta & Kumar, 2008; Barbhuiya et al., 2009; Sarma & Saikia, 2010).

*Aegle marmelos* (L.) Corr. (Rutaceae); *Thepli*

Juice of ripe fruit pulp is given in empty stomach to relieve from constipation and to increase appetite; it is continued till positive response is observed.

Fruit decoction is used as remedy for dysentery (Nath & Maiti, 2003; Bhardwaj & Gakhar, 2005; Lalfakzuala et al., 2007; Rahman & Wilcock, 2007; Barbhuiya et al., 2009). Leaves are used in the treatment of abscess and fever (Dolui et al., 2004; Jain, 2004)

*Aesculus assamica* Griff. (Hippocastanaceae); *Phak langjang arong*

Leaf juice is dropped into ear for ear complaints (Jain & Borthakur, 1980).

*Ageratum conyzoides* L. (Asteraceae); *Bab jarman, Bab bongnai*

Paste of leaves is applied on fresh cuts to stop bleeding and to heal the wounds.

Leaves are given in fresh cuts, leprosy, fever, throat pain, gynaecological problems, sprains, skin diseases, tumours, etc. (Chaudhuri et al., 1975; Kharkongor & Joseph, 1997; Dam & Hajra, 1997; Chaudhury & Neogi, 1999; Kemp, 2003; Jain, 2004; Sharief, 2007; Noumi & Djeumen, 2007; Srivastava & Adi community, 2009).

Algae; *Chepan*

Fresh water algae of any kind are boiled and the steam is sucked inside the mouth to cure tooth ache; it is repeated for three consecutive days.

*Allium sativum* L. (Liliaceae); *Harsun kelok*

Paste of fleshy leaves is applied as first aid against snake and spider bites. Paste of leaves is applied on fresh cuts to stop bleeding; 2-3 leaves are fried with mustard oil and the oil is applied on nose, chest and back to cure cough, fever and flu in children.
Aqueous extract of bulb is sprinkled around house to drive away insects, snakes and scorpions (Bora et al., 2003). Leaves are used in acute hepatitis, hysteria, flatulence, asthma and whooping cough, epilepsy and earache (Borthakur et al., 2004; Humayun et al., 2006; Hynniewta & Kumar, 2008; Abbasi et al., 2010).

*Alpinia galanga* (L.) Willd. (Zingiberaceae); *Mahabir*
Juice of rhizome alone or with fruits of *Terminalia chebula* and rhizome of *Zingiber officinale* is given twice daily for 3-5 days in treating cough, flu and pharyngitis.
Whole plant is use in cough, ringworms, stomach pain and ear problems (Purkayastha et al., 2007; Barbhuiya et al., 2009).

*Amphineuron opulentum* (Kaulf.) Holttum (Thelypteridaceae); *Bab keso, Ingroto*
Paste of roots is applied on forehead for relieving headache. Leaves are used for occult treatment by the medicine man for acute headache locally referred as *ruiting* and for *Behali* or Rheumatism. The process which is known as *Bab Kesap* is continued for three consecutive days.

*Andrographis paniculata* (Burm. f.) Wall. (Acanthaceae); *Bab keho*
Leaves or its juice is given once daily till recovery in stomach ache and fever including malarial fever.

*Aristolochia cathcartii* Hook. f. (Aristolochiaceae); *Hanresang*
Leaves are crushed and paste is applied on affected part and bandaged in bone fracture; the paste and bandage are replaced regularly till the fracture is healed.
Juice of roots is given against small pox (Kumar et al., 1980).

*Aristolochia indica* L. (Aristolochiaceae); *Re-eto*
Roots are dried, pounded and made into pills. One pill is mixed with water and given to cure stomach ache, twice daily for three days. Root bark is made into beads and worn around the neck as garland to cure sialorrhea of children.
Roots and leaves are given in breathing problems, cholera, diarrhoea, intermittent fever, insect bites, headache and wounds (Saxena et al., 1997; Purkayastha et al., 2007; Yesodharam & Sujana, 2007; Vijayan et al., 2007).

*Aristolochia saccata* Wall. (Aristolochiaceae); *Rikang/Thengkur batelong* (Plate 8f)
Roots are said to be effective remedy for stomach ailments. Dried roots are pounded, made into pills and mixed with water and then given twice daily till recovery of the ailments. It is also used to treat sore throat and cough. Root is an important ingredient in an herbal antidote formula against an evil practice called *bab*.
*Bab* is a deity and practised through witchcraft by one or the other family member of a household among the Karbis. The deity is believed to bring wealth and fortune to the
family and in return the keeper has to sacrifice a human being to appease the deity. When any guest visits the family, the witch invokes the deity by sacrificing the guest. Tuber is used in stomach ailments, spleen, urinary troubles and internal haemorrhage (Borthakur, 1976; Kharkongor & Joseph, 1997; Rao, 1997).

*Averrhoa carambola* L. (*Averrhoaceae); *Torte*
Fruits or its juice is given till recovery in jaundice. This is a common practice in rural villages. Juice of bark or fruit or leaves is claimed to be good antidote against poisoning by *Datura* fruit. Fruits are used for liver diseases, bleeding piles, antiscorbutic, leucorrhoea and bleeding gum (Gogoi & Borthakur, 2001; Saikia & Nath, 2003; Jain, 2004; Borthakur *et al.*, 2004; Lalfakzuala *et al.*, 2007; Purkayastha *et al.*, 2007).

*Azadirachta indica* Juss. (*Meliaceae*); *Neem*
Leaves are boiled in water and the patient is bathed with the water to cure pox. Leaves juice is taken half a glass once daily for three days for curing stomach ailments. Leaves are fried and taken once daily to cure malaria; the practice is continued for about one month. Shoots, leaves, bark and roots are used against malarial fever, dysentery, dental problems, eczema, etc. (Kharkongor & Joseph, 1997; Isalm, 2000; Gogoi & Borthakur, 2001; Saikia & Nath, 2003; Ajibade *et al.*, 2005; Jadhav, 2006).

*Baphicacanthus cusia* Brem. (*Acanthaceae*); *Burot*
Paste of leaves is applied on wounds against dog bite as antidote; it is repeated for three days. Leaves and root are chewed to allay intoxication; root and salt amixed in bioling water is externally scrubbed to cure rheumatism (Huyin *et al.*, 1998).

*Basella alba* L. var. *rubra* (L.) Stew., syn. *B. rubra* L. (*Chenopodiaceae*); *Chitu*
Whole plant is boiled and the juice is given in empty stomach once daily to cure jaundice.

*Begonia roxburghii* (Miq.) DC. (*Begoniaceae*); *Suvat keme, Longle suvat*
Past of rhizome is applied in burns for three days. It is recognised as effective remedy for allergy due to *thengso* (*Rhus sp.*). Stem extract is given to children to treat tongue abnormalities; extract of whole plant is taken to treat jaundice, dysentery, measles, itching, malaria, etc. (Nath & Bordoloi, 1989; Rao, 1997; Kharkongor & Joseph, 1997; Bhardwaj & Gakhar, 2005; Rahman & Wilcock, 2007; Hynniewta & Kumar, 2008; Srivastava & *Adi Community*, 2010; Sajem & Gosai, 2010).
**Begonia thomsonii** DC. (Begoniaceae); **Arlong Suvat**
Paste of rhizome is applied on cuts and burns; it is claimed to effect quick healing.

**Benincasa hispida** (Thunb.) Cogn. (Cucurbitaceae); **Bonghom renglu**
Fruits are boiled in water and the solution is given orally for many days to cure fever.
Paste of leaves is used as antidote against millipede and spider poisons and bee sting.
Leaves and juice are administered orally to treat cough, fever and dysentery (Bhardwaj & Gakhar, 2005; Jaiswal, 2010).

**Bombax ceiba** L., syn. **B. malabaricum** DC., **Salmalia malabarica** (DC.) Scott. & Endl. (Bombacaceae); **Pharkong**
Root extract is given for cough and also for urinary complaints, to promote conception, while the resin or powder of dry root bark is given for nocturnal pollution (Jain & Borthakur, 1980; Maheshwari et al., 1997; Katewa et al., 2003). Seeds are used in liver and stomach troubles, small pox and chicken pox (Saxena et al., 1997; Jadhav, 2006; Das et al., 2008). Flower infusion is given in sterility (Purkayastha et al., 2007).

**Brassica sp.** (Brassicaceae); **Jangho**
Smoke of the seeds is reported to cause drowsiness in bees; this property of seeds is applied for collecting honey from bee hives.

**Brueca mollis** Wall. ex Kurz (Semaroubaceae); **Longle jokri**
The plant is traditionally used for treating malarial fever by rural folk. Juice of bark is taken orally once daily till recovery; it is also given against dysentery.

**Bulbophyllum sp.** (Orchidaceae)
Paste of pseudobulb is applied in wounds and sprain. Juice of pseudobulb is given two times daily to cure dysentery.

**Cajanus cajan** (L.) Millsp. (Leguminosae); **Thekek**
Shoots are crushed with sugar or candy palm and the juice is taken orally in empty stomach in the morning for three days to cure jaundice.
Leaves and shoots are used in disease of mouth, jaundice, diabetes, hepatitis and eye problem (Bora, 1999; Borthakur et al., 2004; Das et al., 2008; Purkayastha et al., 2007).

**Careya arborea** Roxb. (Barringtoniaceae); **Loring**
Extract of root is taken orally to cure dysentery; the herbal preparation is claimed to be very effective but has bitter taste and strong odour.
Paste of bark is applied in cuts and sores (Chaudhuri et al., 1975). Root is chewed twice a day for two days in snake bite (Jain & Singh, 1997).
**Cassia alata L. (Caesalpiniaceae); Chepru abab**

Paste of leaves is applied locally to cure skin disease, particularly ringworm.

Fresh leaves are used to cure allergy and abscesses, ringworm, anthelmintic, scabies, eczema, etc. (Rao & Jamir, 1982; Nath & Bordoloi, 1989; Sharma, 1999; Bora et al., 2003; Lalfakzuala et al., 2007; Nourni & Djeumen, 2007; Rahman & Wilcock, 2007; Das et al., 2008).

**Cayratia pedata (Lam.) Juss. ex. Gangnep., syn. Vitis pedata Vahl. ex Wall. (Vitaceae); Nimso repak**

Juice of leaves is given as antidote against any poison; half a glass twice daily is practiced.

The plant is used as astringent and sometimes used as a substitute for or adulterant of *V. setosa* (Anonymous, 1976).

**Centella asiatica (L.) Urb., syn. Hydrocoytle asiatica L. (Apiaceae); Chong amok**

In the morning, 2-3 leaves are chewed raw and a glass of water is taken for relieving constipation. Leaves are used in herbal recipe for jaundice.

Whole plant is used in treatment of various ailments such as dysentery, cholera, stomachache, fever, asthma, eye problems, fracture, leprosy, etc., and also as tonic (Rao & Neogi, 1980; Rao & Jamir, 1982; Tarafder, 1984; Saxena et al., 1997; Kharkongor & Joseph, 1997; Sharma, 1999; Gogoi & Borthakur, 2001; Chakraborty, 2002; Udayan et al., 2005; Jain, 2004; Shareif et al., 2005; Lalfakzuala et al., 2007; Bora, 1999; Borthakur et al., 2004; Hynniewta & Kumar, 2008; Sajem & Gosai, 2010).

**Cephalandra indica Naud. (Cucurbitaceae); Vo-ak thoithe**

Half-a-glass of juice of fresh or dried tuber, for about four days is reported to remove stomach ailments.

Bark is said to be good for gonorrhoea and dysentery (Islam, 2000).

**Chloranthus officinalis Blume (Chloranthaceae); Hanthening**

Leaves are boiled and juice is given to pregnant woman for many days to reduce complicacy during child delivery.

**Cissus quadrangularis L., syn. Vitis quadrangularis Wall. ex. Wt. & Arn. (Vitaceae); Repi chinglok abab**

The paste of stem is applied locally as plaster in fracture; the paste is replaced on every alternate day till the fracture is healed.

**Citrus maxima (Burm.) Merr. (Rutaceae); Solong**

Fruit, particularly rind is an important component of antidote formula for bab.
**Citrus medica L. (Rutaceae); Thesokedok**
Rind of fruit is used in preparation antidote formula for *bab*.
Fruits are used as antibiotic and in malarial fever (Megoneitso & Rao, 1983; Elanchezhain et al., 2007).

**Citrus paradisi Macf. (Rutaceae); Thesokethor**
Rind of the fruit is used in preparation of antidote formula for *bab*.

**Clerodendrum serratum (L.) Moon (Verbenaceae); Rongpang riho**
Leaves and inflorescence are boiled and the juice is given twice daily to cure fever and stomach ailments.
Whole plant is used against cough, fever, dysentery, asthma, bronchitis, rheumatism and dyspepsia (Khumbongmayum et al., 2005).

**Clerodendrum viscosum Vent., syn. C. infortunatum auct. non L. (Verbenaceae) (Verbenaceae); Phlek-ik**
Paste of tender leaves are mixed with salt and rubbed on skin in curing ringworm.
Root paste is applied on swelling; leaf extract is used in stomach pain and malaria (Barbhuiya et al., 2009).

**Coffea bengalensis Heyne ex Roem. & Schult (Rubiaceae); Mir herai**
Roots along with roots of *Rauwolfa serpentine, Marsdenia tinctoria* and *Premna latifolia* is an antidote formula for dog bite. The patient is advised to refrain from consuming mutton, *bara* (sticky rice) and chilli during the course of treatment.

**Colocasia esculenta (L.) Schott (Araceae); Henruke-ik**
Skin of petiole is bandaged around fresh cuts to stop bleeding and heal the wound.
Petioles and rhizome are applied on cuts, burns and as analgesic for honeybee stings (Rao & Jamir, 1982; Khumbongmayum et al., 2005).

**Conyza japonica (Thunb.) Less (Asteraceae); Jaralut**
Smoke of whole plant repels mosquitos; this is a common practice during *jhum* cultivation in the hills.

**Costus speciosus (Koen.) Sm. (Zingiberaceae); Ai-u po**
Juice of stem is administered for many days in curing jaundice.
Rhizome, roots and leaves are given in viral hepatitis, rheumatoid arthritis, fever, headache, bleeding nose and mouth, tonic, etc. (Rao & Jamir, 1982; Tarafder, 1984; Jain & Singh, 1997; Dam & Hajra, 1997; Sharma, 1999; Nath & Maiti, 2003; Kemp, 2003; Acharyya & Sharma, 2004; Borthakur et al., 2004; Das et al., 2006; Rahman & Wilcock, 2007; Hussain & Hore, 2007; Lalfakzuala et al., 2007; Elanchezhain et al., 2007; Barbhuiya et al., 2009).
**Crotalaria pallida** Dry. (Fabaceae); *Thengkur*

Poultice of root is applied to painful swelling of joints; leaf juice is used as vermifuge (Jain & Borthakur, 1980).

**Crataeva magna** (Lour.) DC., syn. *C. nurvala* Buch.-Ham. (Capparaceae); *Mir chaksu*

Juice of fresh bark is given for urinary complaints, fever, skin diseases, gastric; it is also given as tonic (Jain & Borthakur, 1980; Islam, 2000).

**Croton tiglium** L. (Euphorbiaceae); *Chukok*

Fruits are used as laxative to clear bowels. Consumption of 2-3 seeds is said to loosen the stool and as a result the bowel is cleared. The basis of this traditional practice is germs present in the stomach come out along with faecal matter; it is still vibrant in some pockets of Karbi Anglong district.

Leaf, bark and seeds are used to cure pyoderma; also used as laxative and in stomach ailments (Kharkongor & Joseph, 1997; Vijayan et al., 2007).

**Cucumis melo** L. (Cucurbitaceae); *Thoithesuri*

Unripe fruits are eaten thrice daily to cure fever. Leaves are pounded and immersed in water for overnight night to kill leeches.

**Cucumis sativus** L. (Cucurbitaceae); *Thoithe*

Fruits are eaten raw for relieving urinary problems.

**Cucurbita moschata** (Duch.) Poir. (Cucurbitaceae); *Bonghom tereng*

Paste of leaves is applied locally and bandaged to cure bone fracture; to ensure proper healing the paste is replaced daily for about five days.

Fermented juice of fruits and leaves is given to children in hooping cough (Megoneitso & Rao, 1983). Stalk is applied to stop bleeding from the navel portion of children (Rao, 1997); fruit/leaf decoction is taken for eye problem (Lalfakzuala et al., 2007).

**Cucurbita pepo** DC. (Cucurbitaceae); *Bonghom*

Boiled fruit is eaten to relieve from urinary problems while paste of leaves is applied locally and bandaged to heal bone fracture.

**Curanga amara** Juss. (Scrophulariaceae); *Longlephatho*

Whole plant is used for stomach ailments and fever; fresh leaves are eaten raw while juice of shade-dried plant parts is given orally in the morning in empty stomach. The investigator has adopted this practice May 2004 and found positive result; the herbal preparation is very bitter in taste.
**Curculigo orchioides Gaertn. (Hypoxidaceae); Bab telongkethe**
Paste of rhizome is applied on sprains for three nights to remove internal blood clotting. Juice of rhizome is given to pregnant woman to relieve pain.
Rhizomes are used in skin complaints, piles, gastritis, diarrhoea, jaundice, asthma, diabetes mellitus, stomach ulcer, white discharge in women, dyspepsia, impotency and other ailments (Tarafder & Chaudhuri, 1997; Saxena *et al.*, 1997; Maheshwari *et al.*, 1997; Pal & Jain, 1998; Maity *et al.*, 2004; Vijayan *et al.*, 2007; Rahman & Wilcock, 2007; Das *et al.*, 2008).

**Curcuma caesia Roxb. (Zingiberaceae); Thermit pong-ik**
Juice of rhizome is given half a glass daily for three days in dysentery.
Rhizome is stomachic, diuretic, aromatic, stimulant, carminative and used to cure sprain and bruises, cough, asthma and allergic eruptions (Hussain & Hore, 2007).

**Curcuma domestica Valeton, syn. C. longa L. (Zingiberaceae); Thermit kerne**
Paste and juice of rhizome is applied on cuts to stop bleeding and to heal the wounds and as antiseptic. Traditionally, it is also used during vasectomy of pigs meant for sacrifice to the god *Arnam Kethe*. Testis are removed by a minor operation and the paste is applied to heal the wound as well as to get relieve from pain and juice is also applied externally. The *kurusar* (priest) incantates charms associated with the above ritual. This has been practised by Karbis since time immemorial and has been practising even today. The investigator himself has practised many times at his home as he is also the *kurusar* for the god *Arnam Kethe*.
Rhizome is used as blood coagulant and tonic; also used in cough and cold, food poisoning, diarrhoea, dysentery, gastritis, liver disorders, scabies, ringworm, dental caries and typhoid (Bora *et al.*, 2003; Nath & Maiti, 2003; Saikia & Nath, 2003; Sharma *et al.*, 2003; Borthakur *et al.*, 2004; Bhardwaj & Gakhar, 2005; Kalita *et al.*, 2005; JadHAV, 2006).

**Cuscuta reflexa Roxb. (Cuscutaceae); Rikang ke-et**
Stem is crushed and the juice is mixed with candy palm and then taken twice daily in empty stomach to cure jaundice.

**Cynodon dactylon (L.) Pers. (Poaceae); Duboribon abab**
Juice of whole plant is given for jaundice. However, the recipe is given associated with *charms* when prescribed by the medicine man.
Infusion of whole plant is diuretic and astringent (Humayun *et al.*, 2006). Fresh plant paste is applied on bleeding wounds (Abbasi *et al.*, 2010).
**Datura metel** L., syn. **D. alba** Nees. (Solanaceae); **Hepi sumphrak**
Juice of fruits is administered orally as antidote against dog bite. Precaution is taken to avoid strong dose else it is reported to have adverse effect on the patient. The fruit is also given to people with abnormal behaviour.

Fruit juice is given as eardrop to relieve earache (Purkayastha et al., 2007). To tighten flabby breast, leaves are heated over open fire after steaming them with mustard oil and tied on breast (Borthakur, 1993).

**Dendrocalamus hamiltonii** Nees et Arn. ex Munro (Poaceae); **Kaipho**
Paste of ash is applied locally on burns till the wound is healed. Powder of hairs on leaf sheath is applied on wound to stop bleeding. Liquid endosperm of fruits taste very bitter and often given to cure fever. Branch shoots are eaten raw in mumps.

**Desmodium racemosum** (Thunb.) DC. (Fabaceae); **Nonsangpher**
Roots along with *Hibiscus sabdariffa* and *Sida spinosa* form effective formula for healing bone fracture. Paste of the three components is applied locally and bandaged. The paste is regularly replaced with a fresh one till the fracture is healed.

**Dioscorea alata** L. (Dioscoreaceae); **Ruidok sudo**
Paste of tuber is used against snake and spider bites; it is applied for three consecutive days.

**Dioscorea bulbifera** L. (Dioscoreaceae); **Ruipan**
Paste of whole plant or bulbils is applied on wound in snake bite till recovery; the treatment is claimed to give positive result.

Tuberous roots are eaten during early part of rainy season as a precaution against snake bite and as hairwash (Maheshwari et al., 1997; Punjani & Kumar, 2003).

**Dracaena angustifolia** (Medic.) Roxb. (Agavaceae); **Chorlengso**
Paste of leaves is applied on cuts to stop bleeding; it is also applied on sole to remove cracks.

Leaf juice is applied internally to cure stomach pain (Sharief, 2007).

**Drymaria cordata** (L.) Willd. ex Roem. & Schult. (Caryophyllaceae); **Nonrongman**
For dysentery and stomachache, whole plant is crushed and juice is given twice daily; often the plant is baked and given.

**Dysoxylum binectariferum** (Roxb.) Hk. f. & Bedd. (Meliaceae); **Khrang, Khrang kelok**
Juice of seeds in hot water is given in leprosy; powder of the dry seed is applied externally on leprosy and ulcers (Jain & Borthakur, 1980).
Elephantopus scaber L. (Asteraceae); Non vo-ak
Paste of whole plant is applied on sprains and fracture and bandaged. The paste and bandage is regularly replaced till recovery.

Emilia sonchifolia (L.) DC. (Asteraceae); Han-ik
For dysentery, shoots are boiled and juice is taken twice daily; for the same purpose shoots are baked in banana leaves and taken twice daily.

Equisetum debile Roxb. ex Vaucher (Equisetaceae); Tiso langpong
Juice of aerial parts is given for 3-5 days in jaundice.

Eragrostis cynasuroides Beauv. (Poaceae); Tepli, Tepli tereng
Tuberous roots (2-3 numbers) are eaten raw against pharyngitis problems.

Erythrina stricla Roxb. (Fabaceae); Pharche
Flowers are pounded and given as tonic. A lotion made by burning the wood is applied on facial inflammation (Jain & Borthakur, 1980).

Erythropalum vagum Mast. (Olacaceae); Hanresim
Leaves are used to push back protuding anus in patient suffering from piles. Decoction of mature leaves is given in malaria (Jain & Borthakur, 1980).

Euphorbia hirta L. (Euphorbiaceae); Bab chulang
Shoots are wrapped with banana leaves, baked and given to mother to increase lactation. Whole plant is used for worm disease of children, skin disease, mouth sore, dysentery, bronchial affections and asthma, snake bite, scorpion bite, cough and lochiorrhoea (Nath & Maiti, 2003; Jain, 2004; Khumbongmayum et al., 2005; Ajibade et al., 2005; Jain & Srivastava, 2005; Yesodharam & Sujana, 2007). Roots and leaves are given for lactation after child birth (Rahman & Wilcock, 2007).

Eusteralis linearis (Benth.) Panigrahi (Lamiaceae); Arlong lopong
Whole plant is crushed and wrapped with banana leaves, baked and the paste is applied on forehead to relieve headache; is reported to be hot.

Ficus religiosa L. (Moraceae); Cheri
Fresh bark is immersed in half a glass of water for overnight. In the morning the juice is taken in empty stomach to cure jaundice.

Bark is used in gonorrhoea, liver disorders and as laxative in indigestion (Islam, 2000; Borthakur et al., 2004).

Fissendocarpa linifolia (Vahl.) Bennet, syn. Ludwigia hussopifolia Exell. (Onagraceae); Langmir-ang
Twigs are warmed over fire and rubbed locally to cure foot infections called kengphi; it is continued for three consecutive days.
Garcinia lancifolia Roxb. (Clusiaceae); Pranso
Leaves and fruits are boiled and the patient is bathed with the water to cure small pox; it is continued for three consecutive days. Leaves are taken as stomachic and diuretic while fruits are used in stomach disorders (Rao and &, 1997; Lalramnghinglova, 1999).

Garcinia pedunculata Roxb. (Clusiaceae); Pranpre
Pericarp is used to prepare antidote formulae for bab. Often the rind is boiled and the juice is taken orally to cure blood dysentery. Fruits are used in the treatment of hemorrhoids and urinary trouble (Acharyya & Sharma, 2004; Gogoi & Borthakur, 2001).

Gmelina arborea Roxb. (Verbenaceae); Phang
Flowers are baked and eaten or boiled and the juice is taken for three days to relieve stomach ache. Whole plant is given for stomach ailments, as blood purifier, gonorrhoea, fever, cough, boil affections, blood diseases and poisonous bites (Jain & Borthakur, 1980; Khumbongmayum et al., 2005; Jaiswal, 2010).

Gymnopetalum cochichinense (Lour.) Kurz (Cucurbitaceae); Riho
Juice of dried fruits is drunk for curing dysentery; it is repeated till recovery.

Gynocardia odorata R. Br. (Flacourtiaceae); Thebongkok
Powder of pericarp is used to stupefy bees during honey collection. Fruits are used against toothache and hookworm (Nath & Bordoloi, 1989; Tag & Das, 2004; Chhetri, 2004).

Hedychium coronarium Koen. (Zingiberaceae); Tado
Paste of the rhizome is applied locally to snake bite till the wound is healed; this practice is associated with the popular legend, Korhon Jangreso, and the legend has to be narrated while applying the recipe.

Hedyotis scandens Roxb. (Rubiaceae); Hanthening
Shoots are boiled or baked and given to pregnant woman for smooth delivery.

Helminthostachys zeylanica (L.) Hook. (Ophioglossaceae); Han votar
Root is said to be a potent antidote for millipede poison; paste of roots is applied locally which is regularly replaced for three consecutive days.

Hibiscus sabdariffa L. (Malvaceae); Hanserong
The plant is a locally recognised analgesic and antidote against any type of poison. Paste of leaves is applied to relieve pain caused by bee and wasp stings.
Leaves and fruits are used as blood purifier and in jaundice, hypertension, dysentery and diarrhoea (Maheshwari et al., 1997; Idu et al., 1999; Nath & Maiti, 2003).

*Hodgsonia macrocarpa* (Blume) Cogn., syn. *H. heteroclita* (Roxb.) Hk. f. & Th. (Cucurbitaceae); Hanthar

Pericarp is soaked in water and the solution is taken for three days in dysentery. Paste of pericarp is applied to cure fungal infections on foot.

Juice of fresh leaves is applied on cuts as haemostasis; dried leaf powder is applied externally on chronic ulcer (Lalramnginglova & Jha, 1997).

*Holarrhena antidysenterica* Wall. (Apocynaceae); Bengvoiso

Half a glass of bark juice is given for three days to cure dysentery; latex is applied on fresh cuts to stop bleeding.

Whole plant is used in many ailments- jaundice, anthelmintic, colic, asthma, disentery, digestion, jaundice, leprosy, snakebite, appetizer, cold, diarrhoea, fever, gastric, gout, malaria, menorrhoea, paralysis, piles, rheumatism, leucoderma, eczema, skin, epilepsy, labour and spermatorrhoea (Kumar et al., 1980; Maheshwari et al., 1997; Saxena et al., 1997; Islam, 2000; Jain & Srivastava, 2005; Rahman & Wilcock, 2007).

*Homalomena aromatica* Schott (Araceae); Okhi atehang

The aroma of the rhizome is inhaled for curing influenza (Borthakur, 1976).

*Houttuynia cordata* Thunb. (Saururaceae); Hankumphi

Leaves are baked and eaten for relieving stomach ailments and body ache.

Whole plant is used against muscular pain, diarrhoea, jaundice, constipation, appetizer, cholera and as blood purifier (Borthakur, 1976; Jain 1981; Borthakur, 1993; Gogoi & Borthakur, 2001; Das & Tag, 2006; Barua et al., 2007; Das et al., 2008; Hynniewta & Kumar, 2008).

*Hoya globulosa* Hk. f. (Asclepiadaceae); Methan ade

Paste of leaves is applied for healing wounds and continued till the wound is healed.

Leaf ash is repeatedly applied on dogbite till the wound is healed (Jain, 1981).

*Hydnocarpus kurzii* (King) Warb. (Flacouriaceae); Thebongkok

Smoke of pericarp or stem bark stupify bees; this knowledge is often applied for stupifying bees during collecting honey.

*Impatiens balsamina* L. (Balsaminaceae); Ingphat abab

Paste of flowers is applied to cure wound caused by leeches.

*Indigofera tinctoria* L. (Fabaceae); Duli

Leaves are reported to be highly potent insecticide, particularly ectoparasites.

Root paste applied to kill worms in wounds (Jain & Dam, 1979; Dam & Hajra, 1997).
Ixora acuminata Roxb. (Rubiaceae); Longle pranpre
Powder of dried leaves is applied on wounds; juice of roots is given to woman for relieving pain after child birth.
Paste of underground parts is applied on wounds; root decoction is galactagogue (Jain, 1997). Infusion of tender twigs is given in fever (Nath & Bordoloi, 1989).

Jatropha curcas L. (Euphorbiaceae); Longle pharche
Leaves are used for occult treatment by the medicineman for acute headache locally referred as ruiting. The process which is known as Bab Kesap is continued for three consecutive days. Leaves are warmed and applied between toes to cure foot disease. Stem sap is applied on fresh cuts to stop bleeding.
Bark is used for fixing loose teeth (Gupta, 1981). Aerial parts are used in scabies, toothache, sore throat, rheumatism, cough, cold, masculine pain and body swelling, dysentery, and as antiseptic and tonic (Chaudhuri et al., 1975; Jain & Borthakur, 1980; Maheshwari et al., 1997; Bora, 1999; Islam, 2000; Nath & Maiti, 2003; Bhardwaj & Gakhar, 2005; Jadhav, 2006; Yesodharam & Sujana, 2007).

Justicia gendarussa Burm., syn. Gendarussa vulgaris Nees. (Acanthaceae); Chektere
Roots is mixed with other plant ingredients and used as antidote for bab.
Tender leaves are mixed with shidal (fermented dried fish) and eaten raw to increase strength; leaves are used in dog/fox bites, boil, fracture and sprains (Nath & Bordoloi, 1989; Nath & Maiti, 2003).

Justicia parviflora Retz. (Acanthaceae); Mirve
Paste of leaves is applied for many days for curing ringwoms on skin.

Kaempferia galanga L. (Zingiberaceae); Bithi phaknur
Paste of rhizome is applied locally as antidote against dog and pig bites. Juice of rhizome (half a spoon twice daily for about four days) is given in children to cure cough. Juice is given to pregnant woman to relieve pain.
Juice of rhizome is administered for smooth delivery and also to remove the death child from the uterus, blood vomiting, mouth sores and tongue blisters in infants (Rao, 1997; Hynniewta & Kumar, 2008).

Kalanchoe pinnata (Lam.) Pers., syn. Bryophyllum calycinum Salish., B.pinnatum (Lam.) Oken. (Crassulaceae); Me abab
Juice of leaves is given twice daily in gall bladder stones; it is continued till recovery.
Paste of fresh leaves is given in acute jaundice (Borthakur et al., 2004). Decoction of root is drunk to treat body inflammation (Rahman & Wilcock, 2007).
Lablab purpureus (L.) Sw., syn. Dolichos lablab L. (Fabaceae); Thepak
Juice of roots is given for three consecutive days in jaundice.

Lagenaria siceraria (Molina) Standl., syn. L. vulgaris Ser. (Cucurbitaceae); Bong, Bonglang
Paste of tender leaves is applied locally to relieve pain caused by bee and wasp stings. Pastes of leaves are used as bandage in bone fracture. Powder of dried seeds is used as snuff in goitre (Jain, 1997).

Leea indica (Burm. f.) Merr. (Leeaceae); Soh pli-pli
Root extract with honey is used as expectorant (Jain & Borthakur, 1980). Stem bark is used for treating wounds (Udayan et al., 2005).

Linostoma decandrum Wall. (Thymelaeaceae); Rumet
Paste of roots is applied on skin to cure ringworms; the infected skin comes out as flakes thus removing the germs. Seeds are used to kill maggots and also as poison to kill rats and mice; paste of flowers are given as tonic; ash is used in facial inflammation (Jain & Borthakur, 1980).

Mangifera indica L. (Anacardiaceae); Therve
Peel of the fruits are pounded, mixed with water and taken once daily to cure dysentery. Leaves and bark are taken against gastric problems, constipation, ulcers, diarrhoea, dysentery, liver disorders, malarial fever, Mahua disease and rheumatism (Islam, 2000; Borthakur et al., 2004; Khumbongmayum et al., 2005; Ajibade et al., 2005; Purkayastha et al., 2007; Das et al., 2008).

Maranta arundinacea L. (Marantaceae); Ruiloru
Rhizomes are given raw or boiled and given to mother to increase lactation.

Marsdenia tinctoria R. Br. (Asclepiadaceae); Bujir
Paste of leaves along with leaves of Baphicacanthus cusia is applied on wounds as antidote for dog bite. It is said that if the victim responds to the treatment the dog dies after a few days.

Micromelum minutum (Forst. f.) Wt. & Arn., syn. Micromelum integerrinum (Roxb.) Wt. et Arn. ex Roem. (Rutaceae); Theng hanso
Extract of the stem is given to hasten the process of delivery and also given in dysentery (Jain & Borthakur, 1980).

Mimosa pudica L. (Mimosaceae); Bab therak
Paste of roots is applied to heal wounds and also used in jaundice. Juice of roots is reported to be a good oral contraceptive; the woman is said to become very weak and hence, advised to have nutritious food.
The roots are used against snake bite and also as a strong snake repellent (Rao & Neogi, 1980). Leaf and root are used for piles and fistula, diuretic, dysentery, fever, cuts and wounds and chronic liver problems (Kumar et al., 1980; Megoneitso & Rao, 1983; Sharma, 1999; Bora, 1999; Borthakur et al., 2004; Lalfakzuala et al., 2007).

*Miribilis jalapa* L. (*Nyctaginaceae*); *Hunnilli amir*
Paste of leaves is applied locally as antidote against millipede bite; paste is applied for many days.
Paste of root given is given in case of piles (Saxena et al., 1997).

*Morinda angustifolia* Roxb. (*Rutaceae*); *Tarlong*
Leaves are used in giddiness; root and stem extracts in urinary problems, dysentery and fever; bark in toochache (Jain & Borthakur, 1980; Kumar et al., 1980; Islam, 2000; Rahman & Wilcock, 2007).

*Morus australis* Poir., syn. *M. indica* Thunb. (*Moraceae*); *Inglet*
Ripe fruits are consumed to relieve urinary problems. On consumption it is claimed that the urine turns black.
Brak is used for anthelia, purgative; leaf decoction is used as gargle in inflammation of vocal cord; while roots are used as astringent (Lalfakzuala et al., 2007).

*Mucuna nigricans* (Lour.) Steud. (*Fabaceae*); *Tarme langbong*
Seeds are used in throat pain, fever with cough (Jain & Borthakur, 1980).

*Murraya koenigii* (L.) Spr. (*Rutaceae*); *Thengsakso, Dengjari*
Juice of leaves is given for 3-5 days to relieve stomach ache.
The plant is given in kidney pain, cholera and as antiseptic and antidote (Nath & Bordoloi, 1989; Islam, 2000; Purkayastha et al., 2007).

*Murraya paniculata* (L.) Jack. (*Rutaceae*); *Dengjir*
Root is given for labour pain, body pain and stomachache (Jain & Borthakur, 1980; Jain et al., 1997).

*Musa vehitina* Wendl. & Drude (*Musaceae*); *Lorop*
Latex is applied on fresh cuts as blood coagulant.
Sap of pseudostem is given in dysentery and on cuts to stopping bleeding (Jain, 1997).

*Musa balbisiana* Coola (*Musaceae*); *Nusador*
Ripe fruits are given to control loose motion; latex of pseudostem is applied on fresh cuts to stop bleeding. Fresh leaf midrib is warmed and applied on toe infection.
Fresh leaf midrib is warmed in fire and applied on the infected teeth in toothache (Saikia & Nath, 2003). Juice of rhizomes is given to cure hepatitis (Borthakur et al., 2004).
**Ocimum killimandscharicum** Guerke (Lamiaceae); **Lopong**
Leaves are potent insecticide against skin parasite or skin bug called *chinrongmi*. Paste of the leaves is applied locally to kill the parasite; it is also used as antidote for snake and frog bites.

**Olap acuminata** Wall. ex Benth. (Olacaceae); **Hanboka**
Cooked leaves are taken for relieving bodyache after a hard day’s work.

**Ophiorrhiza ochroleuca** Hk. f. (Rubiaceae); **Longle mehek**
Paste of leaves or shoots is applied on wounds and bandaged; the paste is replaced at regular intervals till the wound is fully healed.
Juice of leaves is taken orally to relieve headache (Borthakur, 1997).

**Oroxyllum indicum** (L.) Vent. (Bignoniaceae); **Nopakban**
Juice of fresh stem bark is taken orally in empty stomach for jaundice; it is continued for about one week. The investigator himself has used this recipe to get relief from the disease. Paste of bark is applied locally to heal wounds. Baked shoots are taken for relieving stomach ache.
Root is given to woman in empty stomach for safeguard against miscarriage (Tarafder, 1984; Saxena et al., 1997). Fruit decoction is given for easy delivery (Bora, 1999). Leaves and bark is given as drink for strangnary disease, body pain, diarrhoea and dysentery, epilepsy, jaundice, mumps and tonsillitis, rheumatism, paralysis, etc. (Gupta, 1981; Jain et al., 1997; Isalm, 2000; Kemp, 2003; Dholi et al., 2004; Acharyya & Sharma, 2004; Khumbongmayum et al., 2005; Rahman & Wilcock, 2007; Barbhuiya et al., 2009; Jaiswal, 2010). Seeds are orally used in throat infection; paste of bark is applied in cut and wounds for immediate healing (Sharma, 1999).

**Oryza sativa** L. (Poaceae); **Sok**
Uncooked rice is soaked in water for a few hours and given to mother to increase larcion. Rice flour is applied on skin to relieve allergy caused by caterpillars.

**Paederia foetida** Roxb. (Rubiaceae); **Rikang menthu**
Paste of leaves is taken orally to relieve constipation, urinary problems and jaundice; in all cases the practice is continued till recovery.
The extract of fruit is applied as paint over teeth to prolong its life (Sharma, 1999). Decoction of leaves and shoots are given for common cold, swelling of uterus, diarrhoea and dysentery, rheumatism and anthelmintic (Borthakur, 1993; Dam & Hajra, 1997; Rao & Shanpru, 1997; Rao, 1997; Gogoi & Borthakur, 2001).

**Passiflora foetida** L. (Passifloraceae); **The vo-um**
Ripe fruits are eaten to cure tongue sore.
Phlogacanthus thyrsiformis (Hardw.) Mabb., syn. P. thyrsiflorus (Roxb.) Ness (Acanthaceae); Jok-an
Inflorescence is boiled and juice is drunk to relieve stomach pain; it is taken twice daily in empty stomach.
Whole plant is given in various ailments such as fever, skin diseases and abdominal tumour (Lalramnghinglova & Jha, 1997; Kharkongor & Joseph, 1997; Rao, 1997; Dolui et al., 2004; Khumbongmayum et al., 2005; Jaiswal, 2010).

Phragmites karka (Retz.) Trin. ex Steud. (Poaceae); Tibong
Shoots are taken to cure jaundice; six shoots and five shoots are prescribed for boys and girls respectively by the medicineman.

Phrynium pubinerve Blume, (Marantaceae); Lorophanche
Juice of root is applied drop by drop in ears to relieve ear pain.

Phyllanthus fraternus Webst., syn. P. neruiri Hook f. (Euphorbiaceae); Longle thelu
Aerial parts are soaked in water for overnight and the juice is taken in empty stomach in case of jaundice; it is repeated for three days.
Plant paste is taken orally for jaundice (Shareif et al., 2005).

Picrasma javanica Blume (Simaroubaceae); Chap alo, Thenglokso
Fruits are given in digestive disorders (Jain & Dam, 1979).
Decoction of bark is febrifuge and given in dysentery; bark is useful in stomach pain, as maggocide on wounds and as tonic (Jain & Borthakur, 1980; Jain, 1981; Islam, 2000).

Piper nigrum L. (Piperaceae); Ahom birik
Pastes of fruits are applied on wounds as first aid against dog bite.
Fruits are used for placental disorder, stomachache and hepatitis (Lalramnghinglova & Jha, 1997; Borthakur et al., 2004).

Plumbago indica L., syn. P. rosea L. (Plumbaginaceae); Sam-ang
Paste of roots is applied locally to cure skin diseases like ringworm. On application, the epidermal tissues including the infected cells come out as flakes thus, eliminating the pathogens. Application of the paste to wounded skin is, however, avoided.

Plumbago zeylanica L. (Plumbaginaceae); Samlok
Paste of roots is applied locally to cure skin diseases like ringworm and leprosy. Method of action is same with P. rosea.
Whole plant is used in haemorrhoids, skin diseases, diarrhoea, contraceptive, stomach trouble, contraction of uterus, aphthae and muscular pain (Jain, 1981; Borthakur, 1993; Maheshwari et al., 1997; Saxena et al., 1997; Jaiswal, 2010).
Pogostemon pubescens Benth., syn. P. parviflorus Roxb. (Lamiaceae); Hanbipo
Leaves are boiled and eaten for relieving body ache.

Polygonum affine L. (Polygonaceae); Hanjaren
Leaf juice is drunk to cure sinus, ulcers and as antidote against any poison.

Polygonum microcephalum G. Don (Polygonaceae); Delap
Leaves are used as antidote for mushroom poisoning; leaves are baked and the paste is applied on wounds caused by caterpillars.

Pratia nummularia Kurz., syn. P. begonifolia Lindl. (Lobeliaceae); Hilong apuhui
Ripe fruits are rubbed on forehead twice daily for three days to relieve headache. The informant Late Kakrung Inghipi (about 82 years) reported that she herself had used the fruits to relieve headache.
The plant is used for dysentery, asthma, diaphoric and spurge (Anonymous, 1969).

Premna latifolia Roxb. (Vebeanaceae); An kelok, Phle phle
Leaves are said to be very effective in removing ecto-parasites of fowls locally referred as vorek (lices of fowls). Twigs of the plant are placed near the nest of fowls for this. The investigator himself had practised this in his native place.
Leaves and bark are used to supress boils; leaves are given in dropsy (Annonymous, 1969; Islam, 2000).

Premna pinguis Clarke. (Verbenaeeae); Phanglongle
Fresh tuber is pressed against the infected teeth to relieve toothache. The treatment is reported to be hot and leads to temporary loss of sensation of infected teeth. Thus, it acts as local anaesthesia. Paste of tubers is applied to cure inghai (limb adenitis) and sore tongue.

Psidium guajava L. (Myrtaceae); Soprim
Shoots are crushed and the juice is taken for many days to control dysentery.
Leaves and bark are good remedy for stomachache, dysentery, fever, toothache, headache and cholera (Rao & Jamir, 1982; Borthakur, 1993; Islam, 2000; Gogoi & Borthakur, 2001; Bhardwaj & Gakhar, 2005; Purkayastha et al., 2007). Ripe fruit is used in cough and cold (Jadhav, 2006).

Pyrrosia obovata (Bl.) Ching (Polypodiaceae); Babkudam
Leaf paste is applied on cuts to stop bleeding; it is also applied in sprains.

Rauvolfia serpentina (L.) Benth. (Apocynaceae); Methan krokdi, krokdi
Roots are pounded and taken to relieve fever, cough and stomach ache. Root is used in preparation antidote formulae against bab.
Root is used to treat intestinal disorders, fever, malaria, rheumatism, intestinal worms, snake bite and insanity (Kumar et al., 1980; Jain et al., 1997; Saxena et al., 1997; Rao & Shanpru, 1997; Kharkongor & Joseph, 1997; Yesodharam & Sujana, 2007). Leaf juice is taken in high blood pressure (Barbhuiya et al., 2009).

**Rhamnus nepalensis** Wall. ex Roxb. (Sterculiaceae); **Nokaling**

Powder of the fruit with sesame is used as snuff for headache, while powder of the seed is a vermifuge (Jain & Borthakur, 1980).

**Ricinus communis** L. (Euphorbiaceae); **Ingki-an**

Leaves are used for occult treatment by the village medicineman for acute headached referred as *ruiting*.

Leaves and seeds are used in rheumatism, bodyache and headache, dysentery, purgative, spleenmegaly, boils, antidote, dental caries, pyorrhoea, itches, painful menstruation and sun strokes (Megoneitso & Rao, 1983; Borthakur, 1993; Mao, 1993; Maheshwari et al., 1997; Kharkongor & Joseph, 1997; Bora, 1999; Saikia & Nath, 2003; Ajibade et al., 2005; Bhardwaj & Gakhar, 2005; Jadhav, 2006; Rahman & Wilcock, 2007; Das et al., 2008). Seeds or roots are taken after menstruation to induce sterility in women (Jain & Singh, 1997).

**Saccharum officinarum** L. (Poaceae); **Nok**

Juice of the stem is taken orally to treat jaundice; during summer the juice is said to cool the stomach.

Juice of culms preserved for 8-10 years is given in hepatitis and constipation (Borthakur et al., 2004; Baruah & Kalita, 2007).

**Scoparia dulcis** L. (Scrophulariaceae); **Himipi arphek**

Paste of leaves is applied locally to relieve colic pain; decoction of whole plant is given in malaria. Twigs are heated in fire and rubbed locally to cure toe disease called *kengphiin* in Karbi language.

Whole plant is useful in jaundice, irregular menstruation, kidney stone wounds, dysentery, eye sores, pneumonia and diabetes (Jain, 1981; Nath & Bordoloi, 1989; Maheshwari et al., 1997; Tarafder & Chaudhuri, 1997; Kharkongor & Joseph, 1997; Dam & Hajra, 1997; Bora, 1999; Chaudhury & Neogi, 1999; Udayan et al., 2005; Lalfakzuala et al., 2007; Das et al., 2008; Srivastava & Adi community, 2009).

**Setaria sp.** (Poaceae); **Taradung**

Shoots along with *tibong* (*Phragmites karka*) is taken in hitch-cough.
**Solanum aculeatissinum** Jacq., syn. *S. khasianum* Cl. (Solanaceae); *Charra*

Fruits are used in toothache, abortion and to kill maggots (Rao & Jamir, 1982; Megoneitso & Rao, 1983; Borthakur, 1997; Kharkongor & Joseph, 1997; Bora, 1999; Lalramanglinglova, 1999). Flowers are given as tonic; wood ash is used as lotion in facial inflammation (Jain & Borthakur, 1980).

**Solanum ferox** L., syn. *S. indicum* L. (Solanaceae); *Hepi rongman*

In local medicinal practices, fruits are burnt and the smoke is sucked inside the mouth to relieve tooth ache. This is repeated thrice daily for three consecutive days.

Seeds are burnt and the smoke is inhaled into mouth in dental caries (Saikia & Nath, 2003). Fruit and root are given in fever, acute hepatitis, blood vomiting and blood pressure (Nath & Bordoloi, 1989; Maheshwari *et al.*, 1997; Borthakur *et al.*, 2004; Sajem & Gosai, 2010).

**Solanum nigrum** L. (Solanaceae); *Hepi sokran*

Juice of boiled leaves is given in urinary problems and blood pressure; it is continued for many days till positive response is observed.

Tender shoots and fruits are taken in skin disease, infection of nostrils, cough and throat infection, and as liver tonic (Megoneitso & Rao, 1983; Purkayastha *et al.*, 2007; Srivastava & Adi Community, 2009).

**Solanum surattense** Burm. f., syn., *S. xanthocarpum* Schrad. & T. (Solanaceae); *Hepi rongman*

Fruits are burnt and the smoke is sucked inside the mouth to cure tooth decay.

Whole plant used in stomachache, diuretic, antiasthmatic, antigonorrhoea, fever, chest pain, indigestion, asthma, small pox, decaying teeth, aching ear and dog bite (Jain, 1981; Das & Tag, 2006; Humayun *et al.*, 2006; Yesodharam & Sujana, 2007; Das *et al.*, 2008; Abbasi *et al.*, 2010).

**Sterculia villosa** Roxb. (Sterculiaceae); *Jintekong, Jinkong*

Decoction of bark is given for constipation, whereas a paste with ginger is applied on hydrocele (Jain & Borthakur, 1980); petioles are given in rheumatism; root extract is taken as vitamins and against blood dysentery (Rahman & Wilcock, 2007; Das *et al.*, 2008).

**Terminalia bellirica** (Gaertn.) Roxb. (Combretaceae); *Kuru*

Dried fruits are soaked in water for overnight and the juice is taken in empty stomach to cure stomach ailments particularly, dysentery; it is repeated till recovery.
Terminalia chebula Retz. (Combretaceae); Siluka
Juice of fresh fruits is taken for stomach ache; juice of dried fruits is taken in cough, fever and flu.
Fruits are used as appetizer; against small pox, urinary tract infection, bleeding gums, asthma, wounds, stomach ailments and malaria (Nath & Bordoloi, 1989; Kalita et al.; 1995; Sharma, 1999; Das & Tag, 2006; Purkayastha et al., 2007; Yesodharam & Sujana, 2007; Lalfakzuala et al., 2007; Das et al., 2008). Decoction of bark is used as disinfectant, cardiotonic and purgative and in in skin ulcer and toothache (Islam, 2000; Barbhuiya et al., 2009).

Thunbergia grandiflora Roxb. (Acanthaceae); Nong nong
Paste of leaves is used as antidote. A gentle blow of air on affected eyes through internode of stem is reported to cool sore eye.
Leaves are used for stomach complaints, cough, eye infection and septic wounds (Rao & Jamir, 1982; Chaudhuri et al., 1975; Khumbongmayum et al., 2005; Rahman & Wilcock, 2007).

Tragetus erecta L. (Asteraceae); Mirkadomphui
Shoots are crushed, made into pills and taken once daily for three days to cure jaundice.

Tragia involucrata L. (Euphorbiaceae); Bab kangsam
Roots are grinded and the juice is taken for 3-5 days to kill intestinal worms.

Vanda tesselata (Roxb.) Hook f. ex G. Don, syn. V. roxburghii Br. (Orchidaceae); Thengpi nonther
Paste of stem is applied on wounds or cuts to remove thorn from muscle; on application it is said to induce formation of puss and the thorn comes out along with puss.

Vatica lancaefolia Blume (Dipterocarpaceae); Mirkumphor
Extract of the bark is given in dysentery (Jain & Borthakur, 1980).

Xylosma longifolium Clos. (Flacourtiaceae); Thengpi kani, Thengthermit
Bark is boiled in water and the juice is given thrice daily against dysentery.

Zanthoxylum armatum Roxb., syn. Z. alatum Roxb. (Rutaceae); Jajur
Leaf or shoot extract is given to children as anthelmintic and in fever and cough; it is continued for about one week.
Whole plant in given for stomachache and indigestion, cholera, indigestion, tooth ache, madness, pneumonia, typhoid, gout, pox and lice (Kumar et al., 1980; Rao & Jamir, 1982; Nath & Bordoloi, 1989; Barua et al., 2007; Lalfakzuala et al., 2007; Abbasi et al., 2010).
Zingiber officinale Rosc. (Zingiberaceae); Hanso
Juice of rhizome is given for many days in cough, fever and flu. Paste of rhizome is applied on skin to relieve allergy of catterpillars.
Rhizome is given for throat pain, tuberculosis stomach ache, toothache and during pregnancy (Rao & Jamir, 1982; Borthakur, 1993; Saikia & Nath, 2003; Jadhav, 2006; Vijayan et al., 2007). Rhizome is used by the traditional Meitei singers of Manipur (Singh et al., 1999).

4.2.2 Ethnoveterinary medicines

Though basically agrarian society, the Karbis domesticate several animals namely poultry, pigs, cows, dog, goats, etc., and to treat the diseases of these animals they developed certain recipes based mainly on plant materials.

Achyropermum wallichianum (Benth.) Hook. (Lamiaceae); Ingthan abab
The plant is highly aromatic; twigs of the plant are kept in cattle shed and the aroma is claimed to expel/kill maggots.

Amphineuron opulatum (Kaulf.) Holttum (Thelypteridaceae); Babkeso
Fronds are placed near the nest of fowls and the strong odour of the plant is claimed to kill or drive away ecto-parasites of poultry called vorek.

Anoectochilus sikkimensis King & Pantl. (Orchidaceae)
Paste of leaves is mixed with poultry feed and given to fowls; this is reported to prevent occurrence of epidemic disease called avur.

Aristolochia cathcartii Hk.f. (Aristolochiaceae); Hanresang
Paste of leaves and shoots is applied on fractured bone and then bandaged; the paste is regularly replaced till the bone is healed. The practice is commonly applied on fowls, pigs and goats.

Careya arborea Roxb. (Barringtoniaceae); Loring
Bark is pounded and the juice is given to cattle in dysentery.

Caryopteris foetida (D.Don) Thellung (Verbenaceae); Pherklum alo
Twigs are kept near fowls’ nests to control ecto-parasites of poultry called vorek; the strong aroma of the plant is reported to kill or drive away the parasites.

Cycas pectinata Griff. (Cycadaceae); Or-o
Paste or powder of seeds is mixed with poultry feed and given to fowls; this is said to increase egg laying capacity of fowls.

Desmodium racemosum (Thunb.) D.C. (Fabaceae); Non sangpher
Paste of tubers and *Aristolochia saccata* leaves is applied and bandaged with crushed-stem of *Sida spinosa* to cure fracture in fowls and pigs.

**Elephantopus scaber** L. (Asteraceae); *Voputpo atar abab*

The stem is crushed and used as bandage to heal fracture in domestic fowls.

**Hedyotis scandens** D. Don (Rubiaceae); *Bi akengkung*

Paste of roots is applied and bandaged to cure sprains in goats.

**Hibiscus sabdariffa** L. (Malvaceae); *Hanserong*

Aerial parts are boiled in water and the juice is administered in all types of poisoning. The investigator had the opportunity to treat a calf who had accidentally consumed DDT (Dichloro Dipheny Tetrachloroethane) during one of his field visits.

**Kaempferia galanga** L. (Zingiberaceae); *Bithiphaknur*

Juice of rhizome is mixed with poultry feed (rice or paddy) and given to fowls to prevent occurrence of epidemic disease locally referred as *avur*.

**Micromelum minutum** (Forst. f.) Wt. & Arn., syn. *M. integerrinum* (Colebr.) Wt. & Arn. ex Roem. (Rutaceae); *Thenghanso*

Fruits are given to fowls to prevent an epidermic disease called *avur*.

**Moringa oleifera** Lam. (Moringaceae); *Sondon*

Paste of stem bark is mixed with DDT and applied on wounds to kill maggots in cattle.

**Ocimum killimandscharicum** Guerke (Lamiaceae); *Lopong*

Leaves are potent insecticide against skin parasite or skin bug of dog called *ingro* in Karbi language. Paste of leaves is applied to kill the parasite.

**Prunus persica** (L.) Batsch. (Rosaceae); *Sopho*

Paste of leaves is used as maggocide in cattle.

**Pogostemon auricularis** (L.) Hassk. (Lamiaceae); *Ingphat abab*

Paste of whole plant applied on wounds to kill maggots in cattle; further, twigs of the plant are kept in cattle shed and the aroma is claimed to expel/kill maggots.

**Premna latifolia** Roxb. (Verbenaceae); *Phle phle*

The plant is highly aromatic; twigs are placed in a poultry house to kill or drive away the parasites. The investigator has practiced this in his native place at Dokmoka.

**Pueraria tuberosa** (Willd.) DC. (Fabaceae); *Saheb aphurui*

Paste of leaves is applied to kill maggots in cattle.

**Sida rhombifolia** L. (Malvaceae); *Thongphrang*

Stem is crushed to produce a fibrous sheet and injured leg of fowl is bandaged with it to cure fracture.
Sida spinosa L. (Malvaceae); Jagrong
Use and method of preparation is same as S. rhombifolia.

Stemona tuberosa Lour. (Stemonaceae); Nune hiru
Paste of tubers is applied externally on dogs to kill ingro or lice.

Tragia involucrata L. (Euphorbiaceae); Bab kangsam
Paste of roots is mixed with food and given to dog to remove intestinal worms.

Zanthoxylum armatum DC., syn. Z. alatum Roxb. (Rutaceae); Jajur
The plant is recognised as a potent larvaesites; paste of fruits and leaves are applied on wounds to remove maggots in domestic animals.

4.3 ETHNOICHTHYOTOXIC PLANTS

Aesculus assamica Griff. (Hippocastanaceae); Phak langjang, Himipi hiru
Fruits are crushed and immersed in small water bodies to stupefy small aquatic organisms like prawns. This is often practiced by women and hence, referred as Himipi hiru (himipi: widowed women; hiru: herbal fish poison).
Juice of bark is used for fish poison (Islam, 2000).

Albizzia stipulata Boivin (Mimosaceae); Te-ir
Roots are mixed with other commonly used ichthyotoxic plants to stupefy fishes.

Aralia armata (G. Don) Seem. (Araliaceae); Tengnang
Fruits are crushed along with other poisonous herbs and the mixture is used for stupefying fishes.

Capsicum sp. (Solanaceae); Birik
Fruits are mixed with ichthyotoxic plants during fishing; the poisoned-water is reported to cause irritation of skin.

Careya arborea Roxb. (Barringtoniaceae); Loring
Root bark alone or mixed with other ichthyotoxic plants are crushed and immersed in water to stupefy fishes.
Root bark is crushed and used to stupefy fish (Kamalkishor & Kulkami, 2009).

Cassia siamea Lam. (Mimosaceae); Narlong
Bark of stem is crushed and used for stupefying fish.

Catunaregam nutans (DC.) Tiruv., syn. Randia dumentorum Poir. (Rubiaceae); Ruthe
Fruits are pounded and immersed in water body to stupefy fishes, particularly in stagnant small water bodies. Fruits seasoned for 2-3 days is claimed to produce better result than fresh fruits.
**Citrullus vulgaris** Schrad. (Cucurbitaceae); *Thoithe dumpre*
Leaves are crushed and mixed with water bodies to stupefy small aquatic organisms like prawns; larger organisms are said to be not affected by the plant.

**Derris elliptica** Benth. (Fabaceae); *Rumet*
Roots are crushed on the bank of stream and then immersed into water to stupefy fishes; it is the most commonly used ichthyotoxic plant (Plate 9a).

**Linostoma decandrum** Wall. (Thymelaeaceae); *Ruteng*
Roots are crushed near water body and immersed in water during fishing. The stupefied fishes, however, are reported to have reduced taste. Further, the poison-laced water is said to cause serious allergic reactions on skin.

**Litsea cubeba** (Lour.) Pers., syn. *L. citrata* Blume, *L. kingii* Hk. f. (Lauraceae); *Ing-ing*
Fruits are used to stupefy fishes as *A. stipulata*.

**Mimosa himalayana** Gamble, syn. *M. rubicaulis* Lamk. (Mimosaceae); *Sirhup*
Bark of stem is crushed and used for stupefying fishes in streams.

**Polygonum hydropiper** L. (Polygonaceae); *Bab birik, Lang abirik*
Whole plant is crushed and immersed in water body to stupefy fish; crushed plant is inserted into hole to stupefy fishes such as eel, *Cuchia* sp., etc.
The plant is used as fish toxicant (Taq et al., 2005; Kalita et al., 2007).

**Stemona tuberosa** Lour. (Stemonaceae); *Artu hiru*
Tubers are crushed and immersed in water body to stupefy fishes; it is claimed to stupefy only prawns and small fishes in small water bodies only.

**Zanthoxylum armatum** DC., syn., *Z. alatum* Roxb. (Rutaceae); *Jajur*
It is regarded as a potent ichthyotoxic plant. Fruits are pounded and immersed in water bodies to stupify fishes; often powdered fruits are mixed with other ichthyotoxic plants to make the application more effective.
Fruits used for stupifying fish (Mao, 1993).

**4.4 SOCIO-RELIGIOUS PRACTICES**
Karbis use many plants during rituals; rituals are practised based on legends and the plants used are said to be directly or indirectly associated with the concerned deity or deities. Further, many plants are also considered taboos on consumption or cutting; this practice is also based on legend and violation of this social taboo is said to annoy the concerned deity. However, certain plants considered taboos are used in rituals but on such occasions the plants are not taken inside the house.
4.4.1 Sacred Plants

*Acacia oxyphylla* Graham ex Craib. (Mimosaceae); *Save*

Twigs are used in the religious ritual called *Kachecham* which is performed to purify the soul of deceased person who meets with unnatural death (accident, suicide, etc.).

*Alstonia scholaris* (L.) Br. (Apocynaceae); *Thengmu*

Twigs are used in the ritual locally referred as *Seh aphrang* or *Duikhrai*; the ritual is performed when the patient is suspected to have encountered an evil spirit of sacred groves. Common symptoms include sudden high fever accompanied by vomiting. However, the plant is considered highly forbidden among Karbis; even bringing the plant inside the house is a taboo.

*Aporosa octandra* (D. Don) Vickery, syn. *A. dioica* (Roxb.) Muell.-Arg. (Euphorbiaceae); *Tamsir*

Twigs are used in the ritual dedicated to deity of groves.

*Areca catechu* L. (Arecalesae); *Kove*

Tender fruits are used during propitiation of house hold deities called *Rong Arnam* and *Rit anglong*. *Kurusar* or priests are forbidden from consuming arecanuts of new season unless the fruits are first offered to above household deities.

*Arundo donax* L. (Poaceae); *Arpik*

Aerial parts are used in the ritual *Lamke maja*, in order to nullify enemies’ curse or evil eyes.

*Bombax ceiba* L., syn. *B. malabaricum* DC., *Salmalia malabarica* (DC.) Schott & Endl. (Bombacaceae); *Pharkong*

Twigs are used in the ritual *Someme*; the ritual is dedicated to the fertility of couple.

*Byttneria pilosa* Roxb. (Sterculiaceae); *Samphat*

The plant is used in the rituals for negating influence of evil spirits or enemy’s influence.

*Calamus erectus* Roxb. (Arecalesae); *Pre*

Leaves are used during community religious festival called *Ajo Rongker*. On the occasion, leaves are placed in all houses; the plant is believed to possess divinity to drive away evil spirits.

*Rongker* is a community religious festival which is performed annually for the well being and prosperity of the village and the people.

*Callicarpa arborea* Roxb. (Verbenaceae); *Arhi*

Branches are used in the ritual called *Chojun*; on the occasion *Arnam Kethe*, the supreme deity of the Karbis is propitiated.
Canarium strictum Roxb., syn. C. resiniferum Brace ex King (Burseraceae); Hijung
Exudate of bark is burnt during propitiation of household gods; the smoke and fragrance is considered revered and paralleled with modern incense sticks.

Canna indica L. var. C. nepalensis (Cannaceae); Cho-ik
Leaves are used in the ritual someme; offering to the deity is made on leaves of this plant.

Capsicum sp. (Solanaceae); Birik
Whole plant is used in the ritual Chojun.

Carex baccans Nees (Cyperaceae); Ingre
Whole plant is used in the religious ritual called Kachecham.

Castanopsis indica (Roxb.) DC. (Fagaceae); Phongrong
The plant is considered as one the most sacred plants; it is used in the ritual Chojun for propitiating the deity Arnam Kethe.

Cassia siamea Lam. (Mimosaceae); Narlong
Leaves are used during a community religious festival called Ajo Rongker. Traditional belief on the plant is same as Calamus erectus.

Catimbiom malaccense (Burm. f.) Holttum, syn. Alpinia malaccense (Burm.) Rose. (Zingiberaceae); Tara
Leaves are used in the ritual Rong arnam, a household deity.

Celosia argentae L. (Amaranthaceae); Mir-ang
Inflorescence is used during the invocation of a household deity Peng; the deity is considered as the Protector of the family.

Clerodendrum hastatum Lindl. (Verbenaceae); Maharlosum
Leaves are used during a ritual for curing protuding anus.

Cymbidium aloefolium (L.) Sw. (Orchidaceae); Vomu achimi
The plant is used in the ritual Chojun.

Dendracalamus hamiltonii Nees et Arn. ex Munro (Poaceae); Kaipho.
Leaves, braches and stem are in all rituals including Chojun.

Dracaena angustifolia (Medic.) Roxb. (Agavaceae); Chorlengso
Twigs are used in the ritual Dor; this household deity is claimed to prevent family members from epidemic desease. The plant is used in Banjar kekan (Plate 9b), a traditional dance performed during Chomkan or festival of purification of souls of the death.

Duabanga grandiflora (Roxb. Ex DC.) Walp. (Sonneratiaceae); Mongin
Twigs are used in the ritual someme.
**Emperata cylindrica** L. (Poaceae); **Phelang**
Whole plant is used in the ritual *Chojun*.

**Erythrina stricta** Roxb. (Fabaceae); **Pharche**
Twigs are used in the ritual *Someme*.

**Eugenia bracteata** Roxb. (Myrtaceae); **Jangmi reng-reng.**
Twigs are used in the ritual *Someme*.

**Ficus hispida** L. f. (Moraceae); **Ingthum**
Leaves are used in the ritual *Ingthum aseh* to cure boils.

**Ficus religiosa** L. (Moraceae); **Cheri**
Twigs are in the ritual locally referred as *Seh aphrang* or *Duikhrai*. However, the plants is forbidden from taking inside the house.
Revered as the most sacred plant in India and often mentioned in ancient vedic literature (Mittre, 1997; Vartak & Gadgil, 1997; Bhargava, 1997).

**Floscopa scandens** Lour. (Commelinaceae); **Chehe lobar**
Whole plant is used during the ritual called *Chojun*.

**Garuga pinnata** Roxb. (Bureraceae); **Timur**
Leaves are used in the ritual *Someme*.

**Gmelina arborea** Roxb. (Verbenaceae); **Phang**
Leaves are used in the ritual *Vophang-phang aseh* in order to cure cough in children.

**Gnetum gnemon** L. (Gnetaceae); **Hanthu**
Leaves are cooked with or without meat and offered to deities during rituals; this practice is locally called *Thekar*.

**Hedychium spicatum** Ham. ex Sm. (Zingiberaceae); **Mirtaksu**
The plant is used in the ritual *Chojun*.

**Heptapleurum venulosum** Seem. (Araliaceae); **Toksarethengsong, Hi-i aripak**
Leaves are used in the ritual *Toksari* to cure pox-like disease. Twigs are kept below the pillow to prevent bad dreams.

**Inula cappa** (D. Don) DC (Asteraceae); **Cilimpui, Tilimpui**
Whole plat is used during the propitiation of a household deity *Chokor bura*; the deity is claimed to protect family members from dysentery and diarrhoea. During the occasion garland made from the leaves is tied around the neck of the goat to be sacrificed. This practice is reported to have been inherited from the Tiwas.

**Kydia calycina** Roxb. (Malvaceae); **Arlak**
Twigs are used in the ritual *Someme*. 
Lagenaria siceraria (Molina) Standl., syn. L. vulgaris Ser. (Cucurbitaceae); Bong
In rituals beer is filled in shells and offered to deities; during traditional marriage called Adam Asar specially prepared beer is filled in gourd shells and offered to the would-be father-in-law of the groom.

Lannea grandis Engl., syn. Odina Wodier Roxb. (Anacardiaceae); Tiji arong
Twigs are used in the ritual Some'eme.

Laportea crenulata Gaudich (Urticaceae); Bab kangsam
Twigs are used in the ritual Lamke'h; the deity is said to possess divinity in preventing family or individuals from influence of evil spirits.

Lygodium japonicum (Thunb.) Sw. (Schizaeaceae); Banchek
The plant is used in the ritual for negating the influence of evil spirits on individuals.

Marsdenia tinctoria R. Br. (Asclepiadaceae); Sibu
The plant is used for the same purpose as Lygodium japonicum.

Mucuna nigricans (Lour.) Steud. (Fabaceae); Tarne
Leaves are used during the ritual to nullify curses of enemies.

Mucuna pruriens (L.) DC., syn. M. prurita Hook f. (Fabaceae); Phlom phlom
The plant is used for the same purpose as Lygodium japonicum.

Musa paradisiaca L., syn. M. sapientum L. (Musaceae); Langdung
Inflorescence is used during the propitiation household deities Rong arnam, Theng and Chokorbura. Leaves are used in all rituals; saplings are used in the ritual Rit Anglong.

Ocimum sanctum L. (Lamiaceae); Tuluhi
The plant is said to possess divinity to ward off evil spirits; in ritual it is used only during propitiation of the household deity Rong Arnam.

Ocimum canum Sims. (Lamiaceae); Mir krem
The plant is used during funeral rites; the plant is said to emit an aroma similar to that emitted by a dying person.

Phlogacanthus tubiflorus Nees. (Acanthaceae); Nimsopéchok
Whole plant is used in the ritual Chojun.

Phrynium parviflorum Roxb. (Marantaceae); Lomet
Leaves are used in the ritual Teke aseh (ritual of tiger).

Phrynium pubinerve Blume (Marantaceae); Loru
Leaves are used in the ritual Chojun (Plate 9c); on the occasion it cannot be substituted by leaves of other plant and all offerings to the deity are placed on leaves of this plant.

Piper diffusum Vahl. (Piperaceae); Bithi okang
Leaves are used during propitiation of household deities Rong arnam and Rit anglong.
**Piper nigrum L. (Piperaceae); Ahom birik**

Powdered seeds are spread over plants used in the ritual Chojun; such practice is said to purify the plants.

**Rhynchothecum ellipticum** (Wall. ex Dietr.) A. DC. (Gesniriaceae); **Mehek**

Leaves are cooked with dried fish and locally prepared alkali solution and used in ritual for offering to deity.

Leaves used in funeral ceremony (Srivastava & Nyishi Community, 2010).

**Saccharum sp. (Poaceae); Tarsing**

Stem along with inflorescence is used in the ritual Chojun; a platform is made with stems of the plant where Arnam Aton (holy basket) is placed (Plate 9c).

**Schima wallichii** (DC.) Korth. (Theaceae); **Chingnan**

Twigs are used in the ritual Someme.

**Semecarpus anacardium** L. f. (Anacardiaceae); **Barla**

Wood is used during propitiation of a deity in order to cure allergy caused by the same plant; nine bunbles of wood is placed at the base of the stem.

**Smilax ocreata** DC. (Smilacaceae); **Phelangtung**

Leaves are used during propitiation of the deity for nullifying influence of evil spirit on individuals or family.

**Solanum melongana** L. (Solanaceae); **Hepi**

The plant used in the ritual Chojun.

**Tabernaemontana divaricata** (L.) R. Br., syn. **T. coronaria** (L.) R. Br. (Apocynaceae); **Mirherai**

Leaves are used in ritual to cure an ailment called Ahop herai in children; the symptoms include loose greenish faecal matter.

**Tetrameles nudiflora** R. Br. (Datiscaceae); **Pak arong**

Twigs are in the ritual Someme.

**Thunbergia grandiflora** Roxb. (Acanthaceae); **Nong Nong**

The plant is used in the ritual Lamke in order to protect the family from evil eyes.

**Zingiber officinale** Rosc. (Zingiberaceae); **Hanso**

Rhizome is used in devination to ascertain the cause of disese. In such a situation when a patient does not respond to a medicine, a person expertise in divination is approached to ascertain the cause of the illness. The person study the history of the patient; he takes two halves of a piece of rhizome, use charms and mention suspected deities (based on history of the illness) and then throw them on the ground. If the rhizome pieces fall parkup-pangthai (one up and one down) in response to a particular deity, the deity is suspected to
be the cause of the disease. In order to confirm the deity, it is repeated thrice and if the result is repeated, the deity is confirmed to be the cause of the disease. The patient family is the advised to propitiate the suspected deity for recovery of the patient. This practice is called *sangkelang*; it is still vibrant among Karbis.

Some learned persons also, use a marine mollusc called *Sobai* (*Cypraea moneta* L.; family *Cypraeidae*) instead of *Z. officinale*, to predict the cause of illness in patient. In yet another category of divination, learned person use spear to identify the cause of illness of patient (Plate 9d).

The plant is believed to possess divinity that can ward of evil figures such as Tisso, Chekama, etc. For this the plant is usually planted in homestead garden.

### 4.4.2 Taboos

**Alstonia scholaris** (L.) Br. (*Apocynaceae*); *Thengmu*
The plant is used in ritual connected with evil spirits. For this the plant is considered highly evil; even mushrooms growing on the wood is not consumed by the Karbis.

**Antidesma acidum** Retz., syn. *A. diandrum* (Roxb.) Roth., (*Euphorbiaceae*); *Ingsum*
*Ingti* subclan among the Karbis do not consume this plant; according to legend the ancestor of this subclan managed to cross a flooding river by catching hold of the twig of *ingsum* growing on the bank.

**Basell alba** L. var. *rubra* (L.) Stew., syn. *B. rubra* L. (*Chenopodiaceae*); *Chitu*
Consumption is a taboo for all Karbis. According to a legend, there was an enmity between two brothers in which one of the brothers used the juice of the plant to resemble his blood.

**Benincasa hispida** (Thunb.) Cogn. (*Cucurbitaceae*); *Bonghom kelu, Bonghomkelok*
Any part of the plant is not consumed by *Kurusar* (priest).

**Byttneria pilosa** Roxb. (*Sterculiaceae*); *Samphat*
The plant is considered a taboo as it is used in rituals to ward off evil spirits.

**Dendralamus hamiltonii** Ness et Arn. Ex Munro (*Poaceae*); (*Poaceae*); *Han-up*
Karbis who perform the community *Rongker* festival do not consume bamboo shoots of the new season before celebration of the said festival; violation of this social rule is said to annoy the community deity who used to visit the village in the guise of tiger.

**Ficus bengalensis** L. (*Moraceae*); *Cheri hanthor*
Leaves are used in *Duikhrai*, a ritual associated with evil spirits. For this the plant is considered evil; even mushrooms growing on the wood is also not consumed.
**Ficus religiosa** L. (Moraceae); *Hota Cheri*
The belief is same with *F. benghalensis*.

**Musa paradisiaca** L., syn. *M. sapientum* L (Musaceae); *Langdung*
*Kurusar* (priest) who propitiate deity *Chinthong Arnam* observe taboo on consumption of inflorescence of this plant.

**Pairia hirsuta** Hk. f. (Anacardiaceae); *Handing*
Taboo on consumption is observed by all Karbis.

**Thunbergia grandiflora** Roxb. (Acanthaceae); *Nong Nong*
The belief is same with *F. benghalensis*.

**Zanthoxylum rhetsa** (Roxb.) DC., syn. *Z. limonella* (Dennst.) Alst. (Rutaceae); *Hanjor*
Consumption is a taboo for all Karbis; however, this taboo is not observed among Karbis who practice Christianity.

**Zingiber purpureum** Rose., syn. *Z. cassumunar* Roxb. (Zingiberaceae); *Hanso ka-et*
The plant is a taboo in homestead garden as the plant is associated with evil spirits.

### 4.5 MATERIAL CULTURE

The Karbis are dependent on plant, animal and also mineral resources for meeting their material culture. Plants of varied habit (climbers, shrubs and trees) are used to meet their material requirements. Often raw materials are seasoned before use.

#### 4.5.1 House building

**Bambusa affinis** Munro (Poaceae); *Inghin*
Stem which is small and compact, is best used for making roof of house. Stems are seasoned by immersing in water preferable below mud, for 3-4 weeks and then dried in sun. This is reported to make the stem resistant to attack by insects.

**Babusa pallida** Munro (Poaceae); *Chek duk*
Stem is used for roofing (Jain & Borthakur, 1980); also used as knife handle and walking stick.

**Bambusa nutans** Wall. ex Munro (Poaceae); *Chek keme*
Stem is used in post and roof while *jintak* or split stem is used as cordage.
Stem is used for post and roof (Jain & Borthakur, 1980); also split stem are used for making crafts.

**Bambusa tulda** Roxb. (Poaceae); *Artungso*
Stem is for making roof of huts.
Stem is used for roofing (Jain & Borthakur, 1980); for its light weight it is used as fishing rod.
Callicarpa arborea Roxb. (Verbenaceae); Arhi
Stem is used for post; it is reported to last for about 2-3 years.

Careya arborea Roxb. (Barringtoniaceae); Loring
Stem is used for post in house; leaves are used as wrappers for making biri.

Cassia fistula L. (Caesalpiniaceae); Honaru
Stem is favoured choice for post as it is said to be highly durable.

Castanopsis indica (Roxb.) DC. (Fagaceae); Phongrong
Stem is used as post and is reported to be very durable.

Chonemorpha fragrans (Moon) Alston (Apocynaceae); Rikang parve
Stem is used as cordage for tying firewood, crops, etc.

Cayratia pedata (Wall.) Gagnep syn. Vitis pedata Vahl. ex Wall. (Vitaceae); Solanggalar
The stem is split into desired thickness and used as cordage; the fibres are used in building house in area where bamboo is absent. People living in Dhansiri reserve forest near Diphu town use this plant as the sole source of fibres.

Dendrocalamus hamiltonii Ness et Arn. ex Munro (Poaceae); Kaipho
The plant is used for almost all purposes; stem is used as post, wall and cordage in construction of house. In the hills and in rural areas, a complete house is built using bamboo splits as cordage. In some places bamboo culms are used for thatching (Plate 9e). There is a popular among the people that 'a Karbi is born with Kaipho (D. hamiltonii) and dies with Kaipho'. It is because Karbis practice certain rituals during pregnancy and birth during which bamboo splits are used; after death the corpse is laid on a bamboo mat, tied to a bamboo pole with bamboo splits and taken to cremation ground. Therefore, for the Karbis life begins with bamboo and ends with bamboo.

Dipteris wallichii (R. Br.) Moore (Dipteridaceae); Babdiplir, Lodiplir
Leaves are used for thatching huts in areas where Emperata cylindrica is scarce.

Dysoxylum binectariferum (Roxb.) Hk. f. ex Bedd. (Meliaceae); Khrang kelok
Stem is used as post in construction of house.

Emperata cylindrica L. (Poaceae); Phelang
The plant is the main source for thatching, also reported by Jain and Borthakur, (1980).

Garuga pinnata Roxb. (Burseraceae); Timur
Stem is used as post; it is reported to be durable.
Gmelina arborea Roxb. (Verbenaceae); Phang
Stem is used as post but it is not highly favoured as the wood is soft and get decayed easily.
Stem is used as post (Jain & Borthakur, 1980).

Hibiscus sabdariffa L. (Malvaceae); Hanserong
In the hills, stem is dried, peeled and used as cordage particularly in construction of huts.
Bark is used as fibre (Mitre, 1997; Maheshwari et al., 1997).

Lagerstroemia Flos-Reginae Retz. (Lythraceae); Chehar
Stem is said to be revered for post in construction of house. The wood is hard and said to be resistant to termites and wood decaying microbes. Also, leaves are used for wrapping biri.

Livistona jenkinsiana Griff. (Arecaceae); Jasera
Leaves are used for thatching houses; this is a common practice in Langlokso area Karbi Anglong district.
Leaves are used for thatching (Jain & Borthakur, 1980) and used for making hand fan.

Mesua ferrea L. (Clusiaceae); Mir charne
Stem is usually used as post in construction of house.
Stem is used for post (Jain & Borthakur 1980).

Neohouzeaua dallooa (Gamble) A. Camus (Poaceae); Tereng
Stem is split and used for making house wall; often stem is used for roofing.
Stem is split and used for making house wall (Jain & Borthakur, 1980). Stem is used for collecting liquor in crude stil (Teron, 2005) (Plate9f).

Phrynium pubinerve Blume (Marantaceae); Loru
Leaves are used for thatching also reported by Jain and Borthakur (1980).

Pinus kesiya Royle ex Gordon, syn. P. khasiana Roxb. (Pinaceae); Thengpi jangthu
Stem is split longitudinally and used as wall for house.

Sterculia villosa Roxb. (Sterculiaceae); Jintekong
Bark is peeled and seasoned by drying in sun for a few days; it is used for almost all purposes. It is a common source of fibres among the Karbis.
Bark is used as fibre Mittre (1997).

Terminalia myriocarpa Heurck & Muell.-Arg. (Terminaliaceae); Turtung
Stem is regarded as the most favoured resource for post in construction of house; the wood is hard and highly durable.

Trema oreintalis Blume (Ulmaceae); Rampak
Bark is used for binding purposes; stem is used in roofing but usually not used for post because the wood is soft.

*Vitica lanceaefolia* Blume (Dipterocarpaceae); *Mir kumphor*

Stem is used for post; it is reported to be moderately durable.

### 4.5.2 Agricultural Implements and Tools

Karbis use general implements and tools for agriculture such as knife, spade, sickle, etc., as observed in other tribes. However, in areas bordering Meghalaya they used tools used by the Pnars and Khasis; in other areas both the Karbis and Tiwas use similar agricultural tools but different from the tools used by the Pnars.

### 4.5.3 Crafts

The rich collection of crafts observed among the Karbis showcase a rich repository of knowledge of the people. Crafts are mainly made from three plant resources—wood, bamboo and cane. Certain crafts play important role in the socio-religio-cultural life of the Karbis (Plate 10a-c). List of plants that make up raw materials for the various crafts prevalent among Karbis is given below.

*Abrus precatorius* L. (Fabaceae); *Chuselok*

Seeds are used to make eyes of birds in the traditional wood craft *Jambili Athon* (Plate 4f).

*Aralia armata* Roxb. (Araliaceae); *Tengnang*

Matured thorns are used for making ear ring.

*Areca catechu* L. (Arecaceae); *Kove*

Wood is used for making *harpi*, a weaving implement.

*Artocarpus chama* Buch.-Ham. (Moraceae); *Phong*

Wood is used for making *long*, traditional wooden mortar.

*Bambusa affinis* Munro (Poaceae); *Inghin*

Culm with node at the base is used as *Honthari langpong*, a tube for inserting roll of weft during weaving.

*Bauhinia anguina* Roxb. (Caesalpiniaceae); *Tiso adon arikang*

Flat stem is often used as ladder in a poultry house.

*Calamus erectus* Roxb. (Arecaceae); *Pre*

Stem is split, seasoned and then used as cordage particularly for fastening bamboo and wood crafts. *Anchoho*, basket made from the stem (Plate 9d) and used for for retrieving rice from granary is considered an asset.

*Calamus tenuis* Roxb. (Arecaceae); *Pretor, tor*

Use is similar with *C. erectus*
**Caryota urens** L. (Arecaceae); **Dok kechu**
Wood is considered revered for making **harpi**, a weaving implement.

**Croton caudatus** Giesel. (Euphorbiaceae); **So-ik**
Stem is often used as a base or **anghoi** of baskets. Fresh stems are seasoned in the sun for the sap to dry, before it is used.

**Dalbergia tamarindifolia** Roxb. (Fabaceae); **Subin rikang**
Stem is used for **anghoi** (base) of baskets; it is reported to be durable.

**Dendrocalamus hamiltonii** Ness et Arn. ex Munro (Poaceae); **Kaipho**
This is the most versatile of all plant resources. Stem split called **jintak** is used for making crafts. In the hills all bamboo crafts are made from **D. hamiltonii**. Branches are used as knife and spade handles; bamboo splits is used for making crafts, fence, etc. Bamboo culm with a node at the base referred as **langpong** in Karbi are processed and used for storing household items; dried fish is mixed with salt and petioles of **Homalomena aromatic** and stuffed in **langpong** for fermentation and stored for consumption later (Plate 9e)

**Eugenia bracteata** Roxb. (Myrtaceae); **Jangmi reng reng, Reng reng**
Stem is the traditional source for **lengpum** (pestle) used for threshing paddy and other items; wood is compact and reported to be highly durable.

**Gmelina arborea** Roxb. (Verbenaceae); **Phang**
The wood is claimed to be medianly hard and can be curved with crude tools such as knife and also take up good polish. Important crafts made from wood of **G. arborea** include **chobak** (utensil for distributing cooked rice), **lumphlak** and **lumhor** (both spoons), **mei** (spinning implement), **longtok** (mortar), **honlam** (weaving implement) and other implements.

**Holarrhena antidysenterica** Wall. (Apocynaceae); **Bengvoi**
Use and preference of the plant is same as with **G. arborea**.

**Mangifera indica** L. (Anacardiaceae); **Therve**
The wood is often preferred for making **long** (mortar).

**Mesua ferrea** L. (Clusiaceae); **Mir charne**
Wood is used for making knife handle and a weaving implement called **harpi**.

**Murraya paniculata** (L.) Jack. (Rutaceae); **Dengjir**
Wood is compact and hard and often used as walking stuff. The top of the stuff is often curved with an elephant or a deer or a rhino head. There is a popular phrase relating to this plant- "**Bot Bot nangsoi dengjir achin, jangsoi pakending, athak ingnar/thijok**
pardon chim” [Read as Bot made a stuff (chin) from dengjir, an elephant (ingnar) or thijok (deer) is perched at the top].

_Wrightia tinctoria_ Br. (Apocynaceae); _Bengvoi ke-er_

The wood is the traditional source of material for making the traditional woodcraft of Karbis called _Jambili Athon_ (Plate 4f). The perfect choice is said to be the middle stem from a cluster of three stems.

4.5.4 Herbal Dyes

Colours are not only source of beauty but also cultural identity of the Karbis. Dyes of varied colours are extracted from plant, animal and mineral resources. Yarns/clothes/garments/crafts dyed with specific colours are used during rituals, and cultural and religious occasions. As for instance the traditional woodcraft _Jambili Athon_ is always coated black. Important plants as sources of dyes or as mordants are listed here.

_Aporosa octandra_ (D. Don) Vickery, syn. _A. dioca_ (Roxb.) Muell.-Arg. (Euphorbiaceae); _Tamsir_

The plant is used during dyeing of yams with lac (_Coccus lacca_ Kerr). Lac is placed in long (wooden mortar) and pressed with lengpum (wooden mallet) to extract the red dye and then mixed with adequate quantity of water. Leaves of _Aporosa octandra_ are placed at the bottom of the dish and yams are placed above it. The lac extract is added up to the extent it immerses the yams. Finally, another layer of _A. octandra_ leaves are placed above the whole. Yams are boiled till about three-fourth of the lac solution has evaporated; it is cooled and kept for overnight. The yams are dried for sometime and again boiled till red colour of desired intensity is fixed to the yams or garments. In the dyeing process _A. octandra_ is used as mordant and also claimed to prevent colour from fading.

Lac-dyed yams are traditionally used for weaving _jambili_ (traditional bags) (Plate 9f), _poho_ (turban) and _pi sarpi_ (cloth used by elder women). Lac insect is the traditional source of red dye among Karbis and probably other hill tribes as well.

_Baphicacanthus cusia_ Brem. (Acanthaceae); _Burot_

Blue dye is extracted from leaves; leaves are crushed, mixed with water and boiled along with yams or garments. Boiling is continued till the materials are properly dyed. The dyed yarns are used for weaving _choi hongthor_ and _pini_ (women lower garment).

Indigo dye is obtained from aerial parts; it is used to dye traditional clothes among _Hani_ tribe (Huyin _et al._, 1998).
**Croton caudatus** Geisel. (Euphorbiaceae); **So-ik**
Sap of the stem is used to dye teeth and the traditional wooden craft *Jambili Athon*. Fresh twigs are fed to fire and the sap is collected and mixed with sesame oil or mustard oil to prepare black dye; the dye is applied on teeth to prevent tooth decay and on *Jambili Athon* (Teron, 2008).

**Cucuma domestica** Valeton, syn. *C. longa* L. (Zingiberaceae); **Thermit keme**
Rhizome is an important source of yellow dye. Fresh rhizomes are properly washed, sliced and then boiled with water in a large container. The infusion is boiled with yarns; boiling is continued till the yarns take up desired intensity of colour. The yarns are then dried, initially in shade and later in the sun. *Cucuma*-dyed yarns are used in weaving any garments.
Yellow dye is extracted from rhizome (Akimpou *et al.*, 2005, Sharma *et al.*, 2005).

**Ehretia acuminata** R. Br. var. *serrata* (Roxb.) (Ehretiaceae); **Chorsim**
Leaves are used as mordant similar to *Aporosa octandra*.

**Garcinia xanthochymus** Hk. f. (Clusiaceae); **Thechampreng**
Yellow dye for colouring yarns and garments are extracted from fruits. Fresh fruits are cut into pieces and boiled in a large container; method of dyeing is similar with *Curcuma domestica*.
Juice of the fruits is used as adhesive to different dyes (Akimpou *et al.*, 2005).

**Indigofer tinctoria** L. (Fabaceae); **Duli**
Blue dye is extracted from the plant; paste of leaves is boiled along with yarns or garments. Method of dyeing is similar with *Curcuma domestica*. Leaves along with flower buds are said to give brownish tinge to garments.

**Justicia parviflora** Retz. (Acanthaceae); **Mirve**
A pink/red colour for dyeing *jintak* (bamboo splits) is extracted from the plant. Shoots and leaves are stuffed in a *langpong* (bamboo tube with node at the base) and pounded with a stick. Adequate water is added and stirred and then *jintak* are added and boiled till the latter becomes red/pink. Crafts made from such coloured *jintak* are considered revered; such items include *hijap* (hand fan) and *tarso* (small mat).

**Masrdenia tinctoria** R. Br. (Asclepiadaceae); **Bujir**
The plant is the traditional source of indigo dye called *sibu* among Karbis. Leaves are pounded and the paste is transferred to a container and left to rot for about one week. Then the paste is properly mixed and dried in shade and stored for use later.
During dyeing, powdered *sibu* is mixed with adequate quantity of water and locally prepared *pholo* (alkali solution). Yarns are dipped in *sibu* solution and allowed to stand
for about five days; yams are dried in sun and again soaked in *sibu* solution. The process is repeated till colour of desired intensity is produced. 

_Sibu*-dyed yarns are used for weaving traditional costumes *pini* (women dress), *choihonghor* (traditional jacket), *bapi* (garment for carrying baby) and other garments.

**Morinda angustifolia** Roxb. (*Rubiaceae*); _Tarlong_

Yellow dye is extracted from roots. Barks of roots are dried and crused to fine pieces and stored for use later. During dyeing a layer of pounded bark of *thengmerok* (*Wendlandia puberula* DC.; *Rubiaceae*) is placed at the bottom of the dish. Above this, yarns are placed and powder of *tarlong* is spread above the yarns. Adequate quantity of water is added and then boiled. The process of dyeing is similar with lac. *Thengmerok* powder prevents the yarns from coming in contact with the utensil as it is said to render the yarns brittle. *Tarlong*-based yarns are used for weaving any type of garments.

Roots are used for extraction of yellow dye (Mitre, 1997; Rao & Shanpru, 1997).

**Shorea robusta** Gaertn. (*Dipterocarpaceae*); _Hai_

Shoots are pounded in bamboo tube and adequate quantity water is added; *jintak* (bamboo splits) are added and then boiled. The process of dyeing and use is similar with *Justicia parviflora*. This practice is observed among the Karbis of eastern subdivision and the knowledge is said to have acquired from other community.

**Terminalia bellirica** (Gaertn.) Roxb. (*Combretaceae*); _Kuru_

Fresh fruits are rubbed on fibres or ropes to give black colour; besides colour it renders the strings smooth and durable. Bow strings, strings for snares and fishing strings are often dyed with the fruits of _kuru_.

**Terminalia chebula** Retz. (*Combretaceae*); _Siluka_

Colour and method of application is same with _T. bellirica_.

**Wendlandia puberula** DC. (*Rubiaceae*); _Thengmerok_

The plant is used for dyeing yarns with iron flakes. Pieces of wood is placed at the base of a container and yarns are placed above it; a mixture of powdered iron flakes and water is added and boiled till the yarns are dyed to the desired shade. The wood is added to prevent yarns from coming in direct contact with the utensil, which is reported to make the yarns brittle.

### 4.5.5 Handloom Textiles, Biological Motifs and Traditional Costumes

Spinning and weaving is an important pastime occupation of women among the Karbis. In the past, expertise developed in weaving was considered a qualification to become a bride and also status in the society. Traditional costumes are often adorned with beautiful
motifs and designs depicting indigenous flora and fauna, objects of various types and even some abstract figures. Clothing needs of all types are weaved on back strap loin looms. *Pholo* (*Gossypium herbaceum* L.) and *ingki hom* (Eri silk) are the traditional sources of fibres for weaving garments. Recently people have been spinning fibres of *Bombax ceiba* L. as substitute of the two sources. Fruits of *kokdang* (*Pandanus assamensis* St. John) were used as comb during making of the *aranck* (warp) for the loom. Motifs and designs are weaved or embroidered by any of the following indigenous techniques *viz.* *kerip, ketur, keran, kehom, keroi, kepharlem* and *kethak*. Traditional motifs and designs on textiles are not for mere display but are emotionally associated with their social, cultural and religious life. The similarity in material culture of Karbis and Tiwas observed in some respects may be attributed to their co-habitation in the same geographical area and reciprocal influence of their cultures. This reflects the dynamic nature of Traditional Knowledge of people. Some traditional garments of the Karbis include *pini, vamkok, jarong, choi hongthor, pilu, jeso, jir-ik, seleng, pekok, rekong, poho*, etc. Plants and the various motifs and designs weaved on traditional costumes include *suve arvo* (*Acacia oxyphylla* Graham ex Craib), *phongrong angsu* (*Castanopsis indica* (Roxb.) DC., *Chehe amek* (crab’s eyes), *Chetung* (tortoise), *Thoithe suri arvo* (*Cucumis sativus* L.), *plim-plam abo* (*Dillenia indica* L.), *Bidumkek* (*Diplazium esculentum* (Retz.) Sw. (Plate 11a), *Hambi akron* (*Entada pursaetha* DC.), *Ingthe* (reed), *Kecking arveng* (Gandhi bug), *Lobong arong* (banana plant), *Long aling* (base of traditional wooden mortar), *arleng* (Man), *Mirjove angphar* (*Acacia leucophloea* (Roxb.) Willd.), *sarku* (umbrella), *Rot ahem* (Aeroplane), *Ingsumahar angphar* (*Rubus rugosus* Sm.), *vorale* (Spangled Drongo), *Thero* (monkey), *Voram* (peacock), *hijap* (hand fan) and *jambili athon* (traditional wood craft).

4.5.6 Ethnocosmetics and Ethnodetergents

*Aristolochia cathcartii* Wall. (*Aristolochiaceae*); *Hanresang*

Leaves are crushed and applied on head as hair wash; it is said to give good result by way of silky and smooth hairs and remove dandruff.

*Baphicacanthus cusia* Brem. (*Acanthaceae*); *Burot*

Leaves are used for tattooing also reported by Jain and Borthakur (1980). First, prick is made with thorn of *Citrus* spp. or prickles of cane, from forehead to the chin and juice of the crushed leaves is applied drop-by-drop along the line of prick. The juice penetrates the skin and form tattoo. The practice was prevalent in the past and today can be observed only among elder women.
Byttneria grandiflora DC., syn. B. aspera Colebr. ex (Roxb.) (Sterculiaceae); Vo arkokpo arikang
Stem bark is crushed and applied on hair, also reported by Jain and Borthakur (1980).

Byttneria pilosa Roxb. (Sterculiaceae); Samphat
Roots are pounded and the paste is applied for washing hair. It is reported to produce good foam and but irritate the eyes.

Caesalpinia bonduc (L.) Roxb., syn. C. cristata L. (Caesalpiniaceae); Kangburu
Fruits are used as detergent; pericarp is crushed and rubbed on clothes as detergent for washing clothes. It is claimed to clean dirt properly.

Elastostema platyphylum Wedd. (Urticaceae); Tengnap
Shoots are crushed and paste is applied on head as hair wash; it is reported to render the hair soft and also remove dandruff.

Foeniculum vulgare Mill. (Apiaceae); Mirjangsik
The fragrant smell of the plant is used as body deodorant and also for courting girls. The plant is used in ethno-magico practice called bai. If a girl is unwilling to marry a boy, a witchman use charms using the plants, if the girl inhale the fragrance of the magic-laced plant she changes her heart for him, which she refused. The same is applied to boys also. The effect however, is reported to be short-lived. Practice of bai is common among elephant mahuts; the power of bai is reported to help in tamming wild elephants.

Grewia multiflora Juss. (Tiliaceae); Singnam longdak
The plant is among the commonly used herbal hair wash among the Karbis. Bark is peeled and pounded to a fine paste and used for washing hair and scalp. It is reported to render hair soft and silky and effectively remove dandruff.

Hedychium coronarium Koen. (Zingiberaceae); Tado
In the past, the white fragrant flowers (Plate 1 lb) are often worn on ears among males and on hair among women; the flower is considered as a symbol of beauty. On festive occasions it was a common practice among young boys and girls.

Hibiscus rosa-sinensis L. (Malvaceae); Hanserong
Paste of shoots and flower buds are applied on head for washing hairs; this practice is common in the plains and is said to be influenced by other tribe.

Indigofera dusua Buch.-Ham. ex Don (Acanthaceae); Bujir
Leaves are used for tattooing; method of application is similar with Baphicacanthus cusia.
Bark is used for tattooing (Jain & Borthakur, 1980).
**Kydia calycina** Roxb. (Malvaceae); *Arlak*
Bark is crushed and applied on head for washing hair and scalp.

**Maoutia puya** (Hook. f.) Wedd. (Urticaceae); *Hanhai*
Roots are crushed to a fine paste and applied on head for washing hair. It is claimed to render hair soft and silky although with a mild irritation of the scalp.

**Marsdenia tinctoria** R. Br. (Asclepiadaceae); *Bujir, Sibu*
Leaves are used for tattooing; method of application is similar with *Baphicacanthus cusia*.

**Oenanthe javanica** (Blume) DC. (Apiaceae) *Mirjangkob*
Whole plant is worn on hair or ears as body adornment. The plant is used in ethnomagico practice called *bai*.

**Phlogacanthus tubiflorus** Nees (Acanthaceae); *Pichoklok*
Leaves are crushed and used as detergents for washing clothes.
Leaves are used for washing hair (Jain & Borthakur, 1980).

**Pholo** (charcoal-based alkali solution)
Fresh alkali solution (prepared from various plants such as *Dendrocalamus hamiltonii*, *Brassica campestris*, *Musa sapientum*, *Sesamum orientale* and *Tertrameles nudiflora*) is boiled with eri cocoons to remove dirt; it is also used as hair wash for a very dirty scalp.

**Sapindus mukorossi** Gaertn. (Sapindaceae); *Phanphe, Thaukri*.
Fruits are employed as detergent for washing clothes.
Seed coat is used for bathing and washing (Mehta & Bhatt, 2007).

**Sesamum orientale** L., syn. *S. indicum* L. (Pedaliaceae); *Nempo*
Among the Karbis, the plant is unanimously considered as the king of hair wash. Fresh leaves are crushed and made into fine paste and then applied on head for washing. It is reported to produce good foam and effectively cleanse dandruff and render hairs silky and soft. The foam is reported to be friendly to scalp, eyes and skin.
Leaves are used for bathing (Mehta & Bhatt, 2007).

**Smilax ocreata** DC. (Smilacaceae); *Phelamgtung*
Unripe fruits are used for tattooing (Jain & Borthakur, 1980).

**Solanum xanthocarpum** Schrad., syn. *S. surattense* Burm. f. (Solanaceae); *Hepi vorot*
Unripe fruits are boiled and the coloured solution is used for dyeing garments.

**Sterculia hamiltonii** (Ktze.) Adelb., syn. *S. indica* Merr. (Sterculiaceae); *Sankru*
Tender leaves are crushed and applied on head for washing hair and scalp.
Wedelia sp. (Asteraceae); Mirphe-e kelok

The fragrant smell of the plant is used as body adornment and also for courting girls. The plant is also used in bai practice.

4.6 PREPARATION OF SAIINE OR LIME

The Karbis use lime particularly with arecanut and betel leaves; lime is mainly procured from markets. Karbis possess sound knowledge of preparing lime when supply of commercial lime is exhausted. Egg shells and shells of longdak (snail) are burnt and the ash is mixed with water and made into paste and then used as lime. It is reported to be stronger than the commercial lime. Sometimes inner whitish part of shell of jar-op (Mytilus sp.) is scratched with knife and directly used as substitute for lime. Lime is also used as medicine; during the outbreak of epidemic disease in the 1960s and 1970s, lime was applied on ears, neck, chest and forehead by residents of the investigator’s place. Recently lime was applied on body parts to prevent a mysterious disease characterised by shortening of genital parts. Lime is also applied on fresh cuts to stop bleeding; it is mixed with tobacco and rubbed on skin to cure ringworm.

4.7 PREPARATION OF PHOLO (ALKALI SOLUTION)

Locally prepared alkali solution called pholo is the mainstay of Karbi recipe. Charcoal is the principal substrate for preparation of the solution. Traditionally, charcoal of Kaipho (Dendrocalamus hamiltonii Ness et Arn. ex Munro), produced by burning of plant debris for jhum, is collected and stored in a basket. Some quantity of charcoal is taken in a conical bamboo craft called pholobisir and water is poured from above; the leach through the column of charcoal and the leached solution is collected in a container (Plate 8b). The solution is highly alkaline and used for making various indigenous dishes. Pholo is also used as detergents for washing clothes; in traditional medicinal practices to cure stomach ache below the navel. Pholo adds flavour to dishes and produce unique aroma but the aroma varies depending on the source of the substrate. Kaipho-based pholo is the most sought after. The practice however, is declining due to availability of commercial soda. Other sources of charcoal for making pholo include, hanjang (Brassica campestris L.; pericarp of fruits), nempo (Sesamum orientale L.; pericarp of fruits), lorop (Musa velutina Wendl. & Drude; sheaths) and Musa sapientum L.; sheaths) and Pak (Tetrameles nudiflora R. Br.; wood). Pholo is also made from charcoal of cheri (Ficus religiosa L.) but the solution is used for dyeing only. The pholo so prepared is never taken inside the house as the plant is considered a taboo.
4.8 SIMILES AND METAPHORS

For the Karbis, plants and animals are not only used to sustain life but also serve as sources of inspiration and knowledge. The close association with forests and intrinsic knowledge about plants have provided them certain criteria for comparison of plants/plants parts with human being and their activities. The intricate relation of the Karbis with their biological environment is reflected in their folklore, folklife, fibbles, proverbs, etc. As such certain plants and animals become the object of similes and metaphors and known as Sarlamthe in Karbi dialect. The similes and metaphors often used in day-to-day life are briefly discussed below.

Hanso ditrak, pangnimhak
Rhizome of Zingiber officinale, known as hanso in Karbi is compared with expression with pause.

Moral: Certain delicate matters thoroughly discussed in public and one should grasp the theme of the topic just by reference of certain words just as ginger can be identified by its aroma.

Hanso akreng pupe, lam akreng pupe

Hanso (Zingiber officinale) produces the same characteristic aroma even in dry condition.

Moral: Important information should not be forgotten easily, for it will return to haunt the individual or family just like ginger does not lose it aroma even in dry condition.

Chetung kekortang amonit, chobak theklopta kaphere
A person once beaten by chetung (tortoise) is afraid of even chobak, a wooden craft used for serving food. Chobak when kept up side down resembles the back of a tortoise.

Moral: A person who has once been betrayed is always wary of deception when a similar situation is encountered and, thus, takes necessary precautions.

Hanglu chepatu, ahijang vangkuk
Hanglu (Monitor lizard) when chased pushes its head into a hole leaving its back exposed to attack.

Moral: A fool who criticise others but not being able to hide his short comings or a clever person without productive thinking has no meaning and is compared to a hiding hanglu leaving its back exposed for attack.

Ai-upo achin
The weak of Ai-upo (Costus speciosus) is compared to a person with little knowledge of the concerned matter.
Moral: A situation when the defence is inferior to opponents similar to the weak stem of *C. speciosus* that cannot be used for *chin* (walking stick).

Sirim rupat kehon

*Sirim* (otter) is compared with an unwise decision.

Moral: Unwise decision by deliberately asking an inefficient person to do important work, a situation similar to asking a fish eating otter to guard fishes who is very fond of fish.

*Aphu athak cheri che-e*

Here the menace of *cheri* (*Ficus* sp.) to a person who deliberately invite trouble.

Moral: Inviting trouble deliberately allowing *Ficus* sp. to grow will ultimately annihilate the host plant.

Cheri basa kachehang

The menace of *Cheri* (*Ficus* spp.) is compared with protecting unfaithful person.

Moral: A person known for his notoriety is given an important portfolio, a situation similar to allowing *Ficus* to grow on another plant.

*Chetung aso langbi kelo*

The character of *chetung* (tortoise) is to a situation of endless waiting.

Moral: Sending a person with doubtful commitment to complete important work, thus, creating unordinate delay. In other words a situation of fruitless waits who is not expected to turn up, similar to a situation of releasing a tortoise into in water and waiting for its return!

*Bonghom ason arengphu chepangtang*

The hard *areng* (pericarp) of *Bonghom* (pumpkin) to person with doubtful integrity.

Moral: This phrase is applied to a person who often makes big talks without truth or a situation when a person hide his sorrow and tries to come in terms with others, just as a pumpkin is hollow inside but appears strong from outside.

*Loru athe ason kangbob thap*

Formation of fruits of *Loru* (*Phrynium pubenerve*) on petiole is compared with comment not related with the theme of discussion.

Moral: A comment not associated with the topic of discussion, just like fruits of *loru* are formed on petiole which is usually are formed at the nodes of branch.

*Thekek-hantharvo ason angden-anghoi dokksi chetheng-cheputa chetontedetlo*

Pods of *Thekek* (*Cajanus cajan*) and *Hantharvo* (*Lablab purpureus*) ic compared with human limitations.
Moral: It is improper to interfere in other internal matter just like pods of *thekek* and *hantharvo* have distinct septa between ridges and forrows.

**Chehe aso chopathe**
The offsprings of *Chehe* (crab) devouring their mother is compared with unfaithful children.

**Moral:** Children who torments their parents a situation similar to a mother crab tiredlessly rearing her offsprings only to be devoured by them.

**Kebartang ahilong, angthor chetheklongle**
Inability of *Hilong* (earthworms) to re-enter its hole is compared with people unable to return to simple life style.

**Moral:** Common man once addicted to lavish life style cannot revert back to simple life style; he will try to cling on to easy life by indulging in undesirable activities.

**Aronkle thordakte, atheta thordak**
Nature of inheritance of characters by offsprings.

**Moral:** Parents with good or bad traits will be inherited by their children. As for example *tungmeng* (*Citrus* sp.) and *Pranso* (*Garcinia pedunculata*) will always produce offsprings that produce fruits having sour taste.

**Bang angru rupam keti**
Beating of *hiru* (ichthyotoxic plants) during community fishing festival is compared with punctuality.

**Moral:** The phrase refers to punctuality; all activities have to be executed in time in the same line as *hiru* has to be beaten rhymically.

**Thengrak un-e, lobong pano**
When you cannot cut *thengrak* (heartwood) look for *lobong* (banana) plant.

**Moral:** Targeting weaker section of people or juniors when someone is scolded by the superiors.

4.9 MISCELLANEOUS

**Ajuga macrosperma** Benth. (Lamiaceae); **Bata so-ik**
Twigs are placed on top of unthreshed paddy stack to protect from evil spirits.

**Artocarpus heterophyllus** Lam., syn. *A. integra* (Thunb.) Merr., *A. integrefolia* L. (Moraceae); **Jangphong**
Stem bark is used for masticatory as a substitute for areca nut (*Areca catechu*). Latex is mixed with latex of *Ficus* spp. and boiled. On cooling the content becomes sticky and is used as adhesive locally referred as *lande*; the latter is used for catching birds without
killing them. The adhesive is coated on branches where birds are reported to often sit, or adhesive coated sticks are placed in the field by keeping baits. When birds sit on lande-coated branches or stick it gets glued to the wings. As a result, birds are unable to fly and are caught. Leaves are given to goat as fodder. The plant is planted for recreation

Plant is used for recreation (Jain & Borthakur, 1980).

**Artocarpus lacucha** Buch.-Ham. (Moraceae); **Ingtat arong**

Bark is used as masticatory in absence of areca nut, also reported by Borthakur (1997).

**Bridelia stipularis** Blume (Euphorbiaceae); **Thebehi**

Juicy pericarp is used as adhesive for paper works like kite making.

**Cajanus cajan** (L.) Millsp. (Leguminosae); **Thekek**

The plant is one of the favoured hosts for lac cultivation.

**Cassia siamea** Lam. (Mimosaceae); **Narlong**

It is planted for recreation purpose.

**Coix lacryma-jobi** L. (Poaceae); **Lek tumdak**

Grains are used for making necklace; also reported by Elanchezhain et al. (2007) and Mittre (1997).

**Combretum roxburghii** Spr., syn. **C. decandrum** Roxb. (Combretaceae); **Arkeng**

Sap of stem is used for drinking and cooking purposes.

**Ehretia acuminata** R. Br. var. *serrata* (Roxb.) (Ehretiaceae); **Chorsim**

Pericarp of fruits is used as adhesive for making kites.

**Entada pursaetha** DC., syn. **E. phaseoloides** (L.) Merr. (Mimosaceae); **Hambi**

Stem sap is used for drinking and cooking purposes. Seeds are used in traditional sports called *Hambi Kapathu*. However, today the sport is fast disappearing.

**Ficus bengalensis** L. (Euphorbiaceae); **Thesit kelok**

Leaves are given to goat as fodder.

**Ficus religiosa** L. (Moraceae); **Hota cheri**

The plant is used for rearing lac.

**Gmelina arborea** Roxb. (Verbenaceae); **Phang**

Fruits are often consumed by wild pigs and deers; poachers consider this plant a hunting ground for these animals.

Plant is used for recreation (Jain & Borthakur, 1980).

**Lagenaria siceraria** (Molina) Standl., syn. **L. vulgaris** Ser. (Cucurbitaceae); **Bong**

Seeds are removed from matured fruits, processed and used for storing seeds and water (Plate 11c)
Leea indica (Burm. f.) Merr. (Leeaceae); Sopli-pli
The plant is a favoured choice for lac host.

Litsea cubeba (Lour.) Pers., syn. L. citrata Blume (Lauraceae); Bi angti, Ing ing
Leaves are fed to goat as fodder.

Litsea monopetala (Roxb.) Pers. (Lauraceae); Sopin-um
Wood is used for fuel (Jain & Borthakur, 1980).

Mangifera indica L. (Anacardiaceae); Tharve
Plant is used for recreation (Jain & Borthakur, 1980).

Melia azedarach L. (Meliaceae); Hanthepli
Fruits are used by children as bullets for locally made toy gun.
Wood is considered as good quality fuel (Jain & Borthakur, 1980).

Mussaenda glabra Vahl. (Rubiaceae); Lande, Voso lande
Root is used as adhesive called lande for trapping birds. Roots boiled along with latex of Ficus spp. and Artocarpus heterophyllus. Further steps are similar with A. heterophyllus.

Phyllanthus emblica L., syn. Emblica officinalis Gaertn. (Euphorbiaceae); Thelu
The plant is mentioned in folk song relating to Adam Asar, Karbi traditional marriage. It is reported that this folk song was first sang under this tree and for this the song is also popularly referred as Thelu alu (Thelu: P. emblica; alun: song).

Premna latifolia Roxb. (Verbenaceae); Phle Phle
Leaf is depicted in folk song relating to Adam Asar. A portion of the song reads ‘........, phle phle palosok, nong nong pahorbong’ (.....leaves of phle phle was rolled to resemble a glass, while fruit of nong nong was used to resemble bottle gourd). Thunbergia grandiflora is referred as Non nong.

Nicotiana plumbaginifolia Viviani (Solanaceae); Duma
Leaves are seasoned and used for making biri.

Schima wallichii (DC.) Korthals (Theaceae); Chingnan
Ash or dust of the wood is said to irritate the skin, so it is often avoided for fuel.
Wood is used for fuel (Jain & Borthakur, 1980).

Sesamum orientale L., syn. S. indicum L. (Pedaliaceae); Nempo
Twigs are placed at the top of unthreshed paddy to prevent from evil spirits; this is practice is observed among Karbis of Rongpangbong area.

Sida spinosa L. (Malvaceae); Jakrong
Whole plant is used as broom. Plants are cut just after flowering and sun-dried for a few days till leaves are shed.
**Sida rhombifolia L. (Malvaceae); Thongphrang**  
Aerial parts are used as broom; processing is same as with *S. spinosa*.

**Terminalia myriocarpa Heurch & Muell.-Arg. (Terminaliaceae); Turtung**  
Plant is used for recreation (Jain & Borthakur, 1980).

**Thysanolaena maxima (Roxb.) O. Ktze. (Poaceae); Arphek**  
Inflorescence is used as brooms.

**Cayratia pedata (Wall.) Gagnep, syn. Vitis pedata Vahl. ex Wall. (Vitaceae); Nimso ripak**  
Stem produces potable water which can be used for drinking and cooking purposes; it is reported to cause mild irritation.

### 4.10 Indigenous Knowledge of Use of Flora and Fauna as Indicator for Predicting Annual Seasons

The hill Karbis observe many characteristics of flora and fauna and physical factors as indicators for predicting annual seasons and for day-to-day activities such as cultivation, harvesting forest resources (i.e., honey, food, medicines, tubers, roots, timber, fibres, etc.), poaching, fishing, festivals, marriage and other activities. A folk calendar consisting of 12 hypothetical months and solely guided by biological and physical factors has been practising among the Karbis. The Karbi New Year however, starts from 1st February. Details of *Karbi* Folk Calendar and associated floral and faunal, and physical indicators along with popular phrase associated with the month or period are enumerated below.

**Enumeration**

**Thang Thang** (February) ‘Thang, thang rit lang’

This month is characterised by flowering of *Pharche* (*Erythrina stricta* Roxb.; Fabaceae) and *Pharkong* (*Bombax malabaricum* DC; Bombacaceae). These are the most important indicators of this period which reminds the people of the appropriate time to look for new *jhum* land which is clearly reflected by the phrase ‘Thang Thang, rit lang’ (*rit:* jhumland; *lang:* to look for). Other important indicators of this month includes flowering of *Prandang, Pranso* (*Garcinia lanceaefolia* Roxb.; Clusiaceae), *Jokri* (*Altingia exelsa* Noronha; Hamamelidaceae), *Marloo, Mirchokpip, Mirthere, Toklanksot* (*Ipomoea cymosa* Roem. & Sch.; Convolvulaceae), while *Poma* (*Toona ciliata* Roem.; Meliaceae) and *Marthu* (*Croton joufra* Roxb.; Euphorbiaceae) starts forming new leaves.
The-re (March) ‘The-re, mam te’

This period is indicated by hot days and is considered as the most suitable period for drying slash produced from clearing of forest. The phrase ‘The-re mam te’ reflects it all (mam: plant debris; te: to dry). Flowering of Jangmi (Syzygium cumini L.; Myrtaceae), marthu, mirborung, theng hanso (Micromelum minutum (Forst.f.) Wt. & Arn.; Rutaceae), phree, te-or (Sapium baccatum Roxb.; Euphorbiaceae); and mircharne (Mesua ferrea L.; Clusiaceae) starts forming characteristic new leaves; fruits of hanjor (Zanthoxylum rhetsa (Roxb.) DC.; Rutaceae) starts ripening, mass egg laying of a local species of fish referred as nuhong are also important indicators of this month.

Jangmi (April) ‘Jangmi, meh ri’

This period coincides with hectic courtship and nesting of all types of birds; their melodious chirping can be heard during the day. The days are hot and windy. Tharve (Mangifera indica L.; Anacardiaceae), jangphong (Artocarpus heterophyllus Lamk.; Moraceae), phang (Gmelina arborea L.; Verbenaceae) starts flowering. These features are reported to reflect the best time for burning slash, which Karbis carry out without fail. Because, these biological and physical features usually foretell a shower. It is believed that profuse flowering of tharve and jangphong foretell storm in the days that follows. A seasonal bird Thong Kangko appears and sing a characteristic notes ‘O thong kangko, botor vanpo’, read as ‘thong kangko has come with new season’ (botor: season). Hepi (Solanum melongena L.) and birik (Capsicum frutescens L.; Solanaceae) starts forming new leaves; jangmi, pranso, vekek (Mangifera sylvatica Roxb.; Anacardiaceae) starts fruiting; sojong (Citrus sp.; Rutaceae) starts ripening; phurui (Dioscorea spp.; Dioscoreaceae) starts germinating. This coincide with cackling of vohar and vorek (both wild fowls) and indicates last part of the month. Observing these features people simultaneously sow seeds of paddy and thengthe (Zea mays L.; Poaceae) and thoithe (Cucumis sativus L.; Cucurbitaceae) and till the soil. Animals such as chetung (tortoise), ureng, kako (Ambyostoma sp.), pherui (snakes) and chehang (monitor lizard) start laying eggs. The days are windy so it is easy to built fire. Therefore, usual practice is people go to jhum land without carrying fire along with them. Fire is built by rubbing a dry bamboo split called ‘meh ari’ (meh ri in short) against a dry bamboo stick called ‘meh thengdang’ (thengdang in short). The phrase ‘jangmi meh ri’ refers to people looking for a suitable ‘meh ri’ to built fire, which is a common scene of this month. Another method of building fire is by rubbing two pieces of stones against each other. This is a tedious method and usually not preferred, at least during this period. Vohar and Vorek (jungle fowls) start laying eggs and this mark the end of this month.
Aru (May) ‘Arupo, ram nong’

People continue to till the soil in the jhum land. On the other hand, people clean up previous year’s jhum land (if interested) followed by sowing of seeds and tilling of soil as highlighted by the phrase ‘Aru, ram nong’ (ram: old jhum land; nong: to till the soil). Chirping of Vomongve, a seasonal bird can be heard; germination of leftover grains in the field; phang continue to flower; bengvoi (Holarrhena antidysenterica Wall.; Apocynaceae), arhi (Callicarpa arborea Roxb.; Verbenaceae), chingnan (Schima wallichii (DC.) Korth.; Theaceae), tantuli (Tamarindus indica L.; Caesalpiniaaceae) start flowering; pranso ripens, are important features of this month. The most reliable indicator of this period is marked profuse vegetative growth of hankedok and which constitute the handiest vegetable for people working in the jhum field. Important animal indicator of this month includes appearance of moth stage of an ant called hanghoi in large number. The moth is very delicious and often consumed; also often used as fish bait.

Vosik (June) ‘Vosik, hen-up kardik’

The most important indicator of this month is blooming of an undershrub Mirvosik. Bamboo (Dendrocalamus hamiltonii Nees et Arn. ex Munro; Poaceae) starts forming new shoots and therefore, it is a common scene people peeping through bamboo stands looking for the shoots for consumption. The phrase ‘Vosik, hen-up kardik’ reflect this activity (hen-up: bamboo shoots; kardik: to peep). Sopleple (Leea indica (Burm.f.) Merr.; Leeaceae) an important lac host starts forming new leaves; keng-et (Willughbeia edulis Roxb.; Apocynaceae) and jangphong fruits, vekek ripens; voputpo, a seasonal bird appears and their melodious notes can be heard throughout the day. These are trusted indicators of the month. Thijok (Deer) and phakleng (wild pigs) give birth to young ones; vorek and vohar start hatching and the chickens can be seen feeding on laha aso (lac insects). In other words appearance of laha aso is considered as indicator for hatching of vorek and vohar. Thengthe and thoithe start flowering. Also, this period is characterized by rapid regeneration of phang (bamboo stands) forming large canopies and which often cause shading to crops. People clearing such undesirable bamboo stands are common activity during this period. This act of clearing is called ‘phang kechek’ (phang: bamboo stand; kechek: to break canopy). By this time most people completes tilling their land as well as sowing. Flowering of another floral indicator paipe, a local grass indicates end of tilling and sowing of crops. The Karbis believe that seeds sown after the blooming of this grass do not reach maturity.
**Jakhong (July) 'Jakhong, hen-up Kardong'**

This period is indicated by the rapid growth in height of bamboo shoots which is explained by the phrase ‘jakhong, hen-up kardong’ (hen-up: bamboo shoots; kardong: marked growth). People are free from jhum related work and therefore, they get busy collecting bamboo shoots for immediate consumption and storage. Bik-bik (*Melastoma malabaricum* L.; Melastomataceae) starts fruiting; *jangphong, tharve, keng-et, marloo, tampejuk* (*Baccaurea ramiflora* Lour.; Euphorbiaceae) and *jangmi* ripens. Weeding starts and after a hard day’s work, people enjoy by consuming various fruits including *thengthe* and *thoithe*, a common scene of this period. A local species of frog starts crocking; and *Vosobiku*, a seasonal bird starts singing.

**Pai Pai (August) ‘Pai pai, sok mandu lut jai’**

Ripening and harvesting of an early variety of a local cultivar called *soksu* (ahu) marks the arrival of this month. People can usually be seen carrying paddy in the *mandu*, a small farm house in the jhum and the phrase ‘pai pai, sok mandu lut jai’ aptly reflects this scene (*mandu*: farm house; *lut jai*: to carry inside). Also, this is the first phase of harvesting of the season. Flowering and fruiting of most plants come to completion. Late variety of upland paddy ‘chubok’ starts flowering, *phong* (*Artocarpus chama* Buch.-Ham.) and *ingtat* (*Artocarpus lacucha* Buch.-Ham. Roxb.; Moraceae) ripens; birds like *Vo ingkek* (heron), *Vo terank* (heron) and *vokek* (parrot) start hatching. Very often their siblings can be seen feeding on the ripening fruits of the aforesaid plants. *Bonghom* (*Cucurbita pepo* DC.; Cucurbitaceae) starts fruiting; roaring of leopards in the forests can often be heard. Snakes and spiders become very aggressive which coincide with their breeding period. For this people usually remain cautious while moving in the forests.

**Chiti (September) ‘Chiti, hen-up ahi’**

The advent of this period is indicated by the fruiting of *okhi seeming* (*Spondias pinnata* (L.f.) Kurz (Anacardiaceae) and is considered as the most appropriate time for poaching deer. Because the animal is very fond of the fruit and is trapped or shot by poachers who wait in hiding nearby. Leopard continues to roar and snakes and spiders still remain aggressive. Ripening of *soprim* (*Psidium guajava* L.; Myrtaceae) and harvesting of *laha* are also reliable indicators of this period. This period is best suited for preparing a special item of fermented bamboo shoots referred as ‘hen-up ahi’. The shoots are cut into fine pieces and stored in bamboo baskets called *hor hi* for fermentation. This is reported to increase flavour of the food. In olden days even pork and *bonghom* are stored along with *hen-up* to enhance aroma and taste of the meat and the fruit. Preparation of *hen-up ahi* is associated with celebration of harvesting festival.
by performing traditional dance called Hacha Kekan or Hen-up Ahi Kekan. This dance is highly honoured as bamboo shoots constitute an important source of food, next to paddy. Today however, this festival is losing its shine mainly due to change of habitat and modernization.

**Phre (October) ‘Phre, sokthe’**

*Chubok*, an upland cultivar of paddy starts ripening and this feature has long been used as traditional indicator of this month which is exemplified by the phrase ‘*phre, sokthe*’ (*sok*: paddy; *the*: ripens). *Tamir* (*Pennisetum typhoideum* Rich.; Poaceae.) and *tumdak* (*Coix lacryma-jobi*; Poaceae) flowers; *nempo* (*Seasamum orientale* L.; Pedaliaceae) flowers (Plate 11d) and fruits. These features foretell arrival of a shower. Flowering of *thebo* (*Ficus glomerata* Roxb.; Moraceae) and *thekek* (*Cajanus cajan* (L.) Millsp.; Fabaceae) are also considered as good indicators for their day-to-day activities. *Vo kathaiso*, a seasonal bird is often seen sitting in long rows on house top and leafless branches. During this month, granary usually become exhausted and common people often suffer from hunger because *chubok* (paddy) is still a month away for harvesting. It is reported that *nilo* (unusual high temperature) and heavy rain or appearance of notorious weed, pest, etc. during this month foretell possibility of a misfortune called *akhim* (famine) in the coming days.

**Phaikuni (November) ‘Phaikuni, sokbui pangni’**

Arrival of this precious month is predicted by the ripening and harvesting of *chubok* and stacking of the same is big heaps called *sokbui*. Simultaneously, harvesting of paddy starts in the plains. *Sokbui pangni* literally means stacking of unthreshed paddy (*sok*: paddy; *pangni*: to stack). It is reported that ripening and harvesting of *chubok* is sufficient to predict to commencement of this month. Aggressive feeding of paddy by *vokek* in unharvested field is a common scene of this period. Fruiting of *phongrong* (*Castanopsis indica* (Roxb.) DC.; Fagaceae) is an indicator worth mentioning. *Hanserong* (*Hibiscus sabdariffa* L.; Malvaceae), *tamir*, *mar loo* and *thengbon* (*Lablab purpureus* (L.) Sw.; Fabaceae) ripens. Aerial parts of aroids, zingibers and dioscoreas die or wither during this period. This factor is used as an indicator for maturity of tubers or rhizomes and harvesting of the same.

**Matijong (December) ‘Matijong, sokbui chejong’**

Stacking of unthreshed is almost complete and *sokbui* small or big is evident in all houses (in plains) or *jhum* fields (in hills) even from distant places. People can commonly be heard comparing the sizes of *sokbui* of their neighbours which is corroborated by the phrase ‘*Matijong sokbui chejong*’ (*sokbui*: paddy stack; *chejong*: to
point). Vegetation remains dry. Intense activity of threshing paddy is a common feature in the countryside. People carrying nempo, pholo (Gossypium herbaceum L.; Malvaceae) and other minor jhum products from jhum field to their villages is also a common scene associated with this month.

Arkoi (January) ‘Arkoi, sok roi’

Hectic activity of carrying bundles of paddy from jhum field to native village is reported to indicate the arrival of this month as the phrase ‘Arkoi, sok roi’ says it all (sok: paddy; roi: to carry). In olden days completion of carrying paddy from the field is celebrated by performing the traditional dance called Hacha Kekan (Festival of Harvest), also regarded as cultural identity of Karbis. Bechurang (fermented rice) specially prepared for the occasion is used to solemnise the festival (Teron, 2006). Today however, this festival is hardly performed which is a cause of concern for the society. As for biological indicators, defoliation of poma, defoliation of marthu as well as formation of buds is considered important features of this month. Flowering of vekek marks end of this month.

Most of the indicators enumerated above are reported to be reliable and its use is still vibrant among the hill Karbis. Of the hundreds of indicators known to them, only those which have remained faithful since decades have been discussed in this paper. It is pertinent to mention that the Folk Calendar is strictly based on floral and faunal characters of hilly areas and may not necessary be applicable in the plains.

**4.11 INDIGENOUS KNOWLEDGE OF SUSTAINABLE UTILIZATION AND CONSERVATION OF NATURAL RESOURCES**

Karbis possess invaluable Indigenous Knowledge System (IKS) pertaining to the management and sustainable utilization of natural resources vis a vis protection of their culture. Practice of bulk IK among the Karbis is governed by Customary Laws and incorporated into their culture. Customary Laws, therefore, play important role both in the management and utilization of resources and protection of culture and associated IK. These practices are still vibrant among the Karbis and the same have been orally passed down from generation to generation. Further, expertises on crafts among boys and textiles among girls are recognized as a qualification for marriage in rural Karbi society, in addition to good health and hard working. The traditional practices of management and utilization of natural resources have been grouped into five classical categories which are enumerated below.
I Sensible Practices: These include practices which are practiced in day-to-day life such as extraction of biological resources, jhum cultivation, behavior, community laws, crafts, textiles, poaching, fishing, etc. The most outstanding and well documented sensible practices are collection of tubers of *Dioscorea* species and bamboo shoots.

Usually, tubers are collected only when aerial parts have withered, an indicator used for maturity for all tuberous plants. Collection of tubers among Karbis is guided by an invaluable ethic 'food for all'. Soil around the tuber is removed from a few inches above the base till the apex of the tuber and the latter is collected leaving the basal part intact with the soil (Plate11e) and which ensures growth of the plant in the next season. The hole so produced is filled with soil and dry leaves. This practice has many advantages- continuity of the plant is ensured; tubers of next season will be much bigger than the previous crop due to lose soils and humus. Thus, *Dioscorea* species is conserved for years.

Collection of *Hen-up* or bamboo shoots (*Dendrocalamus hamiltonii*) reflects one of the rich TKS among the Karbis. Newly formed shoots are collected for immediate consumption as these cannot be stored for long period. Often late season shoots (September-October) are collected for immediate consumption as well as for storage during which shoots usually reach an appreciable height. Instead of cutting at the base, shoots are mechanically removed by shaking as a result of which only the apical soft part of it breaks and falls to the ground. The shoots are cleaned, cut into small pieces and stored for fermentation. The remaining part of the shoot which is comparatively hard undergoes normal growth and finally attains maturity. This practice of collection is undoubtedly sound as it gives ample scope for conservation of bamboo for years. Traditionally, collection of bamboo shoots is associated with festival of harvest called *Hen-up ahi kebi*, whereby shoots are fermented in a large bamboo basket called *horhi* (Plate 11f). During the fermentation which last for a few months the fermented juice called *upthor alank* is collected in bamboo tubes called *lankpong*. Often pork and pumpkin are also added to *hen-up* for fermentation. Village elders sing the legends relating to the origin of bamboo while young boys and girls perform the *Hacha Kekan* (traditional dance) and make merry.

Catching of *Vojaru* (Long-tailed Drongo) reflects a clear case of sustainable practice. The tail of the bird is used as head gear which is eligible to people with status in the society. The population of the bird is not very large in the wild. The bird is not killed but caught with indigenously prepared glue called *Lande*. Latex of *Cheri hanthor* (*Ficus*...
*benjamina* L.) is collected in *lankpong* (bamboo tube) (Plate 12a) and boiled alone or with latex of other species of *Ficus* with mustard oil. Boiling is continued till the solution becomes red and then allowed to cool and then transferred into bamboo tube. Bamboo twigs are coated with *lande* and then placed on *vo-um* (cage) using the female drongo bird as bait. When the male *Vojaru* tries to sit on the *vo-um*, the wings get glued to the *lande*-coated twigs and cannot fly for some time. Immediately the bird is caught by the poacher who remains hiding nearby. The required tail is removed and the bird is released again which will produce a new pair of tails. The same technique is applied to catch other birds like eagle and crane but suitable bait is used for these birds.

In ancient Karbi society knowledge of trapping birds with *lande* is considered as a qualification for boys in searching life partner.

In *Jhum* operations felled trees such as *Te-or* (*Sapium baccatum* Roxb.), *Jangmi* (*Syzygium cumuni* (L.) Skeels), *Chingnan* (*Schima wallachii* (DC.) Korth.), *Ingku* (*Bauhinia variegata* L.), *Loring* (*Careya arborea* Roxb.) are not removed from the field because these woods are ideal substrata for edible mushrooms (Plate 12b). While collections old mushrooms are removed except a few fruit bodies as source of spawn. It has been reported that presence of old fruiting bodies interferes with the formation of new fruit bodies.

II Customary practices: These include practices based on mandatory customary laws which are binding on each and every individual in the society.

*Lam Kido* or *Kido* is an indigenous means of communication amongst social dignitaries. The *Lindokpo* of traditional institution usually communicates with his *Habe* (subordinate at village level) through an indigenous device called *Kido*. It is made of bamboo splits with characteristic knots that reflect the urgency of the message. *Kido* functions as Royal Symbol because the message of the sender (i.e., the *Lindokpo*) will be delivered orally by the messenger but the accompanying *Kido* gives authenticity of the message (Teron & Gogoi, 2004).

It is customary to use certain crafts and wear traditional dresses and ornaments during rituals, festivals and even in day-to-day life. While it is mandatory to serve food to *Pimpo* (members of traditional institution) with traditional spoon called *chobak*, a wooden craft, it is customary to prepare *horpo* with *seh* (bamboo craft) and serve *horpo* (beer), water with *sero* (wood craft) and meat with *mucham* (bamboo craft) (Plate 10a-c).

Narration of legends relating to the origin of *Jambili Athon*, the traditional woodcraft of the Karbis is socially permitted only on the occasion of *Chomkan*, the
festival of death. Divine singer called Lunsepi sing the folk song relating to the origin of 
the craft at the base of the same. It is customary for elderly women to wear the costliest 
earring called Nothengpe on the occasion.

III Beliefs: This category of practices includes those that are based on traditional beliefs 
and ethics. Poaching of male Vo-ingkek (Herons) is partly governed by customary 
laws and ethics. It is a crime to kill the bird during the ripening of Ingtat and Phong 
Aronk (Artocarpus lacucha Buch.-Ham and A. chama Buch.-Ham. respectively), which 
coincides with hatching of young Vo-ingkek, as the male bird collect for for the young 
herons and the mother.

It is a taboo to collect resources from or contaminate in and around sacred groves 
as such acts is believed to enrage the deities associated with the sacred site. Collection of 
materials from burial or cremation ground is also a taboo. Further, bamboo once used in 
funeral, other bamboos from the same grove cannot be used for house hold purposes.

On the occasion of ritual called Chojun and Peng, leaves of Gnetum gnemon L. 
are cooked and offered to deities and the practice is called Thekar.

IV Non formal societal education: This includes non-formal education imparted by 
parents and the society. Parents often use many phrases particularly to children with the 
objective of imparting education or frightening them not to commit certain acts that may 
be harmful for their careers which, if reminded/advised in normal language the children 
may not pay heed. Some such phrases used for imparting non formal societal education 
are briefly enumerated below.

Lumphlak inglek kertang (Licking of spoon is a taboo): The Karbis believe that licking 
utilisls is a character of animals and if performed by human reflects bad habit and low 
morale. Advising children along this line will deter them from committing such 
undesirable act.

Osomar nempo chono, ening ludet apot (Consumption of sesame by children will make 
them dull): Children are very fond of powdered nempo (Sesamum indicum). In a Karbi 
society keeping nempo is almost a tradition. If children are not discouraged by saying 
‘consuming sesame will make their brain dull’, they will completely consume the 
material.
Ajo luji chelang kertang, chom chechardet apot; Ajo chu chingsok kertang, paheme det apot, pajangre det apot (It is not a healthy practice to spent time infront of dressing table else one will become an orphan): This phrase is dedicated to teenagers who often waste precious time in front of dressing table. In rural Karbi society where people spent whole day in jhum field, such wastage of time is not encouraged. Therefore, this phrase is often used to deter them from wasting time precious time.

Lumphlak pen cheteng re, chonghudet apot (Do not beat a person with spoon else you will become a thief): This is in fact a lesson particularly to girls. Some girls have the habit of beating others with anything at hand even with lumphlak (spoon). If such habit develops, she may not hesitate to take up knife and other dangerous object against her children. To deter girls from developing such dangerous habit this deterrent phrase is often used. Another morale of this phrase is to remind mothers the importance of lumphlak, utensil for serving food.

Kove kelep nijok angbong padai kertang, eso akleng thelot apot tang (Do not cut arecanut nut by beating at the middle of post of houset, your children will meets his/her end): Usually people have the habit of using any object as base for cutting another object. If it is post of a house it is likely to produce ugly marks. To discourage people from doing such undesirable acts, the phrase is used to remind people.

Meh-hi chechak un-e te, nipi-hupo atam arju un-e det apot (If you cannot tolerate smoke, you will not be able to tolerate the scolding of your in-laws): It is beyond the capacity of normal persons to breath in a smoky condition for long period. In rural society one has to blow air particularly if the wood is not properly dry, to build fire which produces lot of smoke. This phrase is used to encourage persons to be patient and maintain coolness because if he stops in the pretext of suffocation the fire will not be built. Further, it is a ploy to persuade the person to complete the work else, the speaker may be asked to do the job.

Ajo ingsu chephe kertang, emek ave det apot (Do not remove thorn from your body at night, you will lose your eyesight): In rural villages where there is no electricity, removing thorn from body at night risk creating unnecessary wound to the body. Children who usually do not listen to parents, using frightening phrase prevents them from doing such act.
8a. A women weighing tubers of *Ipomoea batatas* with single pan balance.

8b. *Pholobisir*, a sieve for preparing *pholo* or alkaline solution.

8c. Fermentation of bamboo shoots in *langpong* or bamboo tubes.

8d. Fruit of *Hodgsonia macrocarpa*.

8e. *Zingiber rubens*, inflorescence is a common vegetable.

8f. *Aristolochia saccata*, root is an important antidote.
9a. Participants beating roots of *Derris elliptica* during fishing; (Inset: sapling of the plant).

9b. *Banjar kekan*, traditional dance of the Karbis using leaves of *Dracaena angustifolia*.

9c. *Chojun* ritual of the Karbis, a platform is made from stem of *Saccharum* sp and wrapped with leaves of *Phrymion pubinerve*.

9d. A witch practicing *Sangkelang* or divination to identify the cause of illness.

9e. A hut in Ampu village, Hamren subdivision with roof thatched with bamboo stem.

9f. *Bhot*, a crude stil for distillation of alcohol from rice beer; the two outlets is made from stem of *Neohouzeaua dallooa*. 
Plate 10

10a. *Horpo* or rice beer being served with *Seroh*, a wooden craft during the ritual *Chojun*.

10b. Rice being served with *Chobak*, traditional craft of the Karbis.

10c. A woman sieving rice beer with a bamboo craft *Seh*, during *Chojun*.

10d. A cane basket *Anchoho* (arrow) for retrieving rice from the pot.

10e. A woman stuffing dried fish in bamboo tube for fermentation.

10f. A Karbi bachelor with *Jambili* (bag) during the festival *Chomkan*.
Plate 11

11a. Beh dumkek, motif of circinate leaves of Diplazium esculentum (box) on garment of the Karbis.

11b. Hedychium coronarium, snake antidote and cosmetic.

11c. Langbong or Gourd shell; a Karbi man washing his face from water stored in the shell.

11d. Nempo (Sesamum orientale), leaves for hair wash, blooming is an indicator of the month October.

11e. A sustainable technique of collecting tuber of Dioscorea sp. among the Karbis (arrow).

11f. Horhi, basket for fermenting bamboo shoots for the harvesting festival called Hacha kekan.
12a. Collection of latex from stem of *Ficus benjamina*.

12a. *Helminthostachys zeylanica*, food and antidote plant.

12e. *Zanthozylum rhetsa* (in circle), consumption is a taboo for priests among the Karbis, Tiwas and Pnars.

12b. Edible mushroom growing on log of *Sapium baccatum*.

12d. *Krengsa* (*Pueraria wallichii*), roots are medicinal and food.

12f. *Averrhoa carambola*, fruits are commonly used against jaundice.


13c. *Dipteris wallichii*, leaves are used for thatching huts.

13d. People carrying *Narenga benghalensis*, a common grass for thatching houses.

13e. A Tiwa man serving *Chu* (rice beer) with *Tran*, a container made from bamboo splits.

13f. A Tiwa man showing plate made from inner part of bamboo culm.

14b. Tiwa bachelors perform during Wanchoa festival.

14c. Girls winnowing rice flour on the occasion of *Wanchoa* festival.

14d. Tiwas playing on musical instruments on the occasion of *Wanchoa* festival.

14f. *Takra* or volunteers display their acts on the occasion of *Wanchoa*.
15a. Fruits of *Castanopsis indica* being sold in Zirikindeng market.

15c. *Baccuarea ramiflora*, a common fruit sold in local markets.

15b. *Boesenbergia rotunda*, a common spice among the Pnars and Karbis.

15d. *Begonia rubro-venia*, a common vegetable but taboo for Pnar priests.

15e. *Eranthemum* sp., medicine for dermal infections.

Plate 16

16a. **Rauvolfia serpentina**, a commonly used plant for diarrhea and fever.

16b. **Zanthoxylum armatum**, a food, medicinal and potent ichthyotoxic plant.

16c. Branches of *Castanopsis* sp. and gourd shells tied to the main post of a Pnar house.

16d. Seasoning of *Calamus* sp. for fastening crafts.

16e. **Baphicacanthus cusia**, source of blue dye among the Karbis and Pnars.

16f. Dyeing yarns with rhizome of *Curcuma domestica* at a Pnar house in Mynser village.