



Traditional Knowledge of Herbal Dyes and Cultural Significance of Colors among the Karbis Ethnic Tribe in Northeast India

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Research

Abstract

A study of traditional Karbis knowledge of dye and dyeing techniques was conducted in Karbi Anglong District, Assam, India. The use of dyes for imparting specific color or color combinations was found to play an important role in the social and religious life of the Karbis. Cotton (*Gossypium herbaceum* L.) and eri silk are the traditional sources of yarn or fibers for weaving garments. Yarn, fibers and garments are often dyed (e.g., black, blue, indigo, yellow, red, pink) with plant extracts, animals products, and even minerals. Dyes or colors carry important cultural value and therefore, uphold cultural identity. Traditional knowledge of herbal dyes and dyeing is facing threats from synthetic dyes and acculturation.

Introduction

Dyes are colorants having several applications in textiles, crafts, cosmetics, and tattoos. Humans have developed inclinations toward certain colors considered to be lively and attractive. In ancient times plant dyes were used for coloring animal hides and tattooing skin. These were important during religious festivals and wars as well as for painting cave dwelling walls. Color is believed to give magical powers, protect them from evil spirits and to help achieve victory in war (Siva 2003). The earliest written record (ca 2600 BC) of dyes is in China. During the Indus Valley civilization (ca 2500 BC) findings of colored garments and traces of madder (*Rubia cordifolia* L.) in the ruins at Mohenjodaro and Harappa are evidence of dye use at that time. In Egypt, mummies have been found wrapped in dyed clothes. The Christian holy book (Bible) has mention of use of many natural dyes including saffron (Gulrajani 2001). Henna was known to be used even before 2500 BC. By the 4th century AD, dyes sources such as woad, madder, well, Brazilwood, indigo and a dark-pur-

ple were known. Brazil was named after the red dye made from Brazilwood (Gulrajani 1992).

Synthetic chemical dyes are suspected to be harmful causing allergic, carcinogenic and other detriments to human beings. By contrast, natural dyes are thought to be environmentally friendly and beneficial. For example, indigo gives a cooling sensation, while turmeric (*Curcuma longa* L.), the brightest of naturally occurring yellow dyes, is a powerful antiseptic, thought to revitalize the skin (Mahanta & Tiwari 2005).

The Northeast region of India contributes in a large proportion to the total biodiversity of India. The region is part of the Indo-Burma Biodiversity Hotspot. The region is also inhabited by numerous ethnic groups, who practice their own traditions and customs unmindful of developments and changes around them. Various tribes of the region still practice the traditions of dyeing textiles, skin, and crafts with colors of different shades extracted from plants, animals (particularly insects), and minerals. In the present

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paper, traditional knowledge on dyes and the practice of dyeing garments and yarn among the Karbis, an ethnic tribe of the region is presented.

Herbal dyes occupy a prominent place in the cultural life of the Karbis. Though dyeing undoubtedly has a long history among the people, it is difficult to trace due to a lack of written records. The use of natural dyes and knowledge about techniques of dyeing textiles, crafts, tattoos, etc. with colors are unique when compared with other tribes of the North-eastern region and elsewhere. *Gossypium herbaceum* L. and eri silk are the traditional sources of yarn or fibers for weaving garments. Yarn or threads, locally referred as **hon** (**pholo ahon** for cotton yarn and **honki ahon** for eri silk yarn) or garments, are often dyed with varied colors (e.g., black, blue, indigo, yellow, red, and pink) extracted from plants, animals and minerals. Herbal dyes are also used for coloring crafts and tattooing. Certain plants are used as dye mordants.

Brief Account of the Karbis

The Karbis are one the major tribes of the North-eastern region of India. Though scattered over all sister states of the region, their habitations are mainly concentrated in the Karbi Anglong and North Cachar Hills Districts of Assam (Figure 1). Ethnically the Karbis are Mongoloids and speak a Tibeto-Burmese language (Bahttacharjee 1986, Lyall 1908, Phangcho 2001). They call themselves Arleng, meaning “man” in general. Karbis are mainly agriculturists and practice shifting cultivation of multiple crops. Rice is the staple food sup-

ported by wild vegetables. Locally prepared rice beer is a common alcoholic drink.

Ethnobotanical and traditional knowledge of the Karbis, and the district in general, have been reported (Borthakur 1976a,b, 1981, 1997a,b, Gogoi *et al.* 2005, Jain 1991, Jain & Borthakur 1980, Saklani & Jain 1994, Sarkar 1993, Teron 2005, 2006, 2008, 2009, Teron & Borthakur 2009, Teron & Gogoi 2004, Teron & Sanjappa 2005). There are many reports on herbal dyes and techniques of dyeing from India and the North-eastern region including Assam (Borthakur 1997b, Kar & Borthakur 2008, Mahanta & Tiwari 2005, Ningombam *et al.* 2012, Siva 2007). Siva (2007) and Mahanta and Tiwari (2005) have no mention of herbal dye use among the Karbis. Borthakur (1997b)



Figure 1. Karbi Anglong District, Assam, India.

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and Kar and Borthakur (2008) have reported plant dyes among the Karbis but lack the methods of dye preparation and cultural implications.

Methods

Study Area

Karbi Anglong district lies between latitudes 25°30'-26°36' N and longitudes 92°90'-93°54' E (Figure 1) covering a geographical area of 10,434 km².

Study of Traditional Knowledge of Plant Use

Field study was conducted among the Karbis of the Karbi Anglong district area during the period 2003-2009. An unstructured interview method was adopted for the study as informants (i.e., elders, both men and women) were illiterate. Informants were first apprised of the objectives and potential intellectual property (if any) arising out of the study. They were requested to narrate the use of dyes and dye yielding plants, the process of dyeing and the signifi-

cance of colors in their socio-religious life. Some specific questions were asked pertaining to issues like legends connected with dyes, taboos and occasions on which yarn of specific colors are used, etc. Narrations by informants, local plants, animals and minerals used in dyeing were recorded during field study.

Plants were collected from the field, preserved as voucher specimens following standard herbarium techniques (Bridson & Forman 1998, Jain & Rao 1977) and deposited in the herbarium of the Life Science Department, Assam University, Diphu Campus, for future reference. Information collected from different primary sources at different locations was compared and observations made on actual plant use were duly noted to avoid ambiguity.

Results

Plants, insects, and minerals discussed by informants as being used extracted for dyes and mordants are given in Table 1.

Table 1. Plants, an insect, and a mineral used as dyes and a mordant by the Karbis, Karbi Anglong District, Assam, India.

Scientific name	Karbi name	Parts used	Color/use	Objects dyed
<i>Aporosa octandra</i> (Buch.-Ham. ex D. Don) Vickery (Phyllanthaceae)	Tamsir	Twigs and leaves	Mordant	Used with lac & mineral dyes
<i>Croton caudatus</i> Geiseler (Euphorbiaceae)	So-ik, kung kung	Sap of twigs	Black	Crafts, teeth
<i>Curcuma longa</i> L. (Zingiberaceae)	Chong-ut	Rhizomes	Yellow	All garments except pini
<i>Garcinia xanthochymus</i> Hook.f. (Clusiaceae)	Thechanpreng	Fruits	Yellow	Garments except pini
<i>Indigofera tinctoria</i> L. (Fabaceae)	Duli, duri	Leaves, flower buds	Indigo/Blue	All types of garments
<i>Justicia comata</i> (L.) Lam. (Acanthaceae)	Mirve	Leaves and shoots	Pink	Crafts
<i>Kerria lacca</i> Kerr, 1782	Laha	Insects	Red	All garments except pini
<i>Litsea glutinosa</i> (Lour.) C.B. Rob. (Lauraceae)	Chalavan	Bark	Black	Cordage
<i>Machilus gamblei</i> King ex Hook.f. (Lauraceae)	Artuchingnan	Bark	Red	Garments except pini
<i>Marsdenia tinctoria</i> R. Br. (Apocynaceae)	Sibu, bujir	Leaves	Indigo/Blue	Pini , tattoo
Minerals	Ingchin ahi, arlong		Black	Garments except pini
<i>Morinda angustifolia</i> Roxb. (Rubiaceae)	Tarlong	Roots	Yellow	All garments except pini
<i>Shorea robusta</i> Gaertn. (Dipterocarpaceae)	Hai aronk	Tender leaves	Red	Crafts
<i>Strobilanthes cusia</i> (Nees) Kuntze (Acanthaceae)	Burot, buthe	Leaves	Indigo/Blue	Choihongthor, jir-ik, pelu
<i>Terminalia bellirica</i> (Gaertn.) Roxb. (Combretaceae)	Kuru	Fruits	Black	Cordage

Traditional Knowledge of Dyeing Yarn or Garments among the Karbis

Dyeing yarn or garments is a job exclusively of women and involves various stages that sometimes may take a year to get the desired result. According to a popular legend still vibrant among the Karbis, dyeing with **sibu** (*Marsdenia tinctoria* R. Br.) was discovered and introduced by a lady named Kareng Hansepi, popularly referred to as Rengpi Varijang. Similarly, Lenjovar Tumjang (belonging to the Timung clan) first used the **jopi-ir** (bees wax) during weaving to smooth the warp. These two women are still recognized and remembered as expert weavers among the Karbis and their legends pertaining to origin of dye and weaving are narrated on certain festive occasions. Herbal dyes are also used for coloring crafts and tattooing. For some dyes a mordant is used. The prevalent methods of dye extraction and processing yarn and garments are discussed below sorted by color produced.

I. Blue/Indigo dyes

Strobilanthes cusia (Nees) Kuntze (Figure 2) leaves are extracted and used for an indigo dye. Leaves are pounded in a **long** (wooden mortar) with **lengpum** (wooden mallet), the paste is transferred to a container (dish or basket) and allowed to ferment for a week. The paste is

then mixed properly, dried in shade, and then stored for future use. Dried paste is powdered, mixed with an adequate quantity of water and **pholo** (alkaline solution prepared from charcoal of bamboo or wood), and the mixture is kept undisturbed for three nights. The intensity of the color is tested by putting a finger into the solution and if the dye firmly adheres to the skin, then the solution is said to be ready for dyeing. A solution may need to remain for some more days if it does not pass this test. Yarn or garments are dipped into the solution gradually from one end. After five days, the yarn or garments are taken out and excess dye is rinsed with water. Yarn or garments are dried in the sun and again soaked in the dye solution. The process is repeated three to five times until a desired shade is obtained.

Burot-dyed yarn is used for weaving **choihongthor** (jackets) (Figure 3), **jir-ik** (cloth for carrying a baby), **pelu** (bed sheets), and other items.

Marsdenia tinctoria is the traditional source of the indigo dye, called **sibu** among the Karbis. Preparation of the dye and the process of dyeing are similar with *S. cusia*. However, the shades of color vary depending on the time of the collection of material. When only tender leaves are used, it produces blue color. When both leaves and flowers are mixed, a red tinge against a blue background is



Figure 2. *Strobilanthes cusia* (Nees) Kuntze (Acanthaceae) in Karbi Anglong District, Assam, India.



Figure 3. A bachelor attired with **burot**-dyed jacket dyed with *Strobilanthes cusia* (Nees) Kuntze in Karbi Anglong District, Assam, India.



Figure 4. A girl wearing a **pini** or lower garment dyed with *Marsdenia tinctoria* R. Br. in Karbi Anglong District, Assam, India.

produced. The latter combination of color is most preferred among women. Often powder of **mirve** (*Justicia comata* (L.) Lam.) is added with **sibu** to produce a red shade on the garments.

Yarn dyed with **sibu** is used to weave **pini** (a garment for women) (Figure 4).

Sibu leaves are also used to make **duk** or womens' facial tattoos. The skin on the forehead down to the nose and chin is pricked with a *Citrus* spp. thorn or *Calamus* spp. prickles. **Sibu** leaves are ground, mixed with sesame oil, made into a paste, and then the juice is applied drop-by-drop along the line of pierced skin. The juice penetrates the skin and forms the tattoo mark.

Indigofera tinctoria L. alone or in combination with **bujir** (*M. tinctoria*) and **burot** (*S. cusia*) is used for coloring garments and yarn. The dyeing process is same as used with **sibu**. Garments dyed with **duli** alone produce an indigo color with a brownish tinge. For this, it is often mixed with **sibu** to produce deep blue color with a brownish shade, a preferred choice of women. Garments dyed with **duli** however, are said to cause skin irritation.

Marsdenia tinctoria, *S. cusia* and *I. tinctoria* together are referred to as **sibu** since the three plants produce indigo dye. But, *M. tinctoria*, being most predominantly used among the three plants, is generally **sibu** among the Karbis and to outsiders.

II. Black dyes

Aporosa octandra (Buch.-Ham. ex D. Don) Vickery is used as a mordant when dyeing yarn with minerals. Black colored minerals are pounded into fine powder and mixed with water. Leaves of **tamsir** (*A. octandra*) are placed at the bottom of the container and above this yarn is placed. Another layer of **tamsir** leaves are placed above the yarn and the mineral solution is added until it submerges the upper **tamsir** layer. The yarn are then boiled until three-fourths of the solution has evaporated. It is then allowed to cool down over night. Usually boiling is repeated thrice and each time fresh mineral solution is added; this is reported to produce black color of the desired shade. Yarn is then sun dried before it can be used for weaving garments. The bottom layer of **tamsir** leaves prevent yarn from coming in direct contact with the container which is reported to make the yarn brittle. The upper layer of leaves controls or reduces the rate of evaporation so that the dye solution gets maximum time to react with yarn.

Croton caudatus Geiseler sap is used for preparing black dye used for coloring crafts, teeth, for tattoos. Fresh branches are fed into a fire causing sap to exude. This is collected in a container and mixed with sesame or mustard oil. The result is applied on crafts, particularly **jambili athon**, traditional Karbis wood crafts (Figure 5). After a first coating, the craft is dried for some time and polished. Another coat of the dye is applied if necessary. Finally, it is rubbed with muslin or soft cotton cloth to make the craft black, glossy and shiny (Teron 2008). Sap of *C. caudatus* is mixed with sap of **dengjirso** (*Murraya paniculata* (L.) Jack.) and **theng sakso** (*Murraya koenigii* (L.) Spreng.)



Figure 5. **Jambili athon**, traditional Karbis wood craft dyed with sap of *Croton caudatus* Geiseler in Karbi Anglong District, Assam, India.

for preparing a black dye used to color **chong** and **nok** (shields and swords). The process of application is similar with the coloring of the **jambili athon**. Sap of *C. caudatus* was also used in the past to dye teeth. This is reported to prevent the teeth from developing gingivitis and make the teeth strong.

Terminalia bellirica (Gaertn.) Roxb. fruit are used for dyeing fibers, particularly bow and catapult strings. The fruit pericarps are pounded into a paste that is applied uniformly on strings and then dried. On drying, the strings become black and smooth. The real purpose is actually not the color but on application the strings become smooth, preventing separation of individual threads, thus, making them durable.

Litsea glutinosa (Lour.) C.B. Rob. stem bark also is used for coloring bow and catapult strings. The process of dyeing and the result are similar with that related with *T. bellirica*.

III. Red/Pink dyes

Kerria lacca Kerr, 1782 is one of the traditional sources of red dye among the Karbis, and probably other hill tribes of northeast India as well. Fresh lac insect hives are placed in a mortar and pressed with a wooden mallet. A red extract of the insect is transferred into a container. Water is added and the hive is pressed further. The process is repeated until the dye is completely extracted. **Tamsir** (*A. octandra*) leaves are placed at the bottom of a container below yarn to be dyed. Lac extract is added up to the extent that it immerses the yarn. The yarn is then boiled until about three-fourth of the lac solution has evaporated, then it is cooled and kept for over night. The yarn is dried for some time and again boiled with fresh lac extract until properly dyed.

Lac-dyed yarn is traditionally used for weaving **jambili** (traditional bags), **poho** (turbans), and **pi sarpi** or elderly women's cloth (Figure 6).

Justicia comata (L.) Lam. leaves produces a pink/bright red dye. Leaves are pounded into a paste that is transferred to **langpong** (a bamboo culm with the node open at one end) and water is mixed in until the desired mix is achieved. **Jintak** (split bamboo) is placed in the tube and boiled until the desired color intensity is produced. This is cooled and the **jintak** is dried in the sun and stored for future use.

Mirve-dyed **jintak** is used for making crafts such as **hijap** (hand fans). Such



Figure 6. Women wearing **pisarpi**, white-red or red-black striped cloth in Karbi Anglong District, Assam, India.

dyed-crafts are considered a symbol of beauty and assets in Karbi society. Often **mirve**-dyed items are offered as gifts by young boys to girls to showcase their love and knowledge. Though this plant is not used for dyeing yarn or garments, it is probable that the dye also can be used for dyeing textiles.

Machilus gamblei King ex Hook.f. bark is used for preparation of the red dye. Bark is cut into pieces, dried and boiled in water along with yarn. The process of dyeing is similar to lac. This plant is an alternative source of the red dye in the absence of lac.

Shorea robusta Gaertn. shoots are extracted to produce a red dye often used for dyeing crafts. Shoots are pounded and boiled in water along with **jintak** (split bamboo) in a bamboo tube until the desired color shade is produced. In this way, the **jintak** becomes bright-red. This knowledge however, seems to be restricted to areas where the plant (*S. robusta*) is available and probably the Karbis acquired this knowledge from some other community.

IV. Yellow dyes

Morinda angustifolia Roxb. (Figure 7) root is a major source of yellow dye. Roots are cut into pieces and dried in sunlight. The material is then pounded and stored for future use. During dyeing, a layer of pounded root of **thengmerok** (*Wendlandia puberula* DC.) is placed at the bottom of the container followed by the yarn to be dyed, another layer of **thengmerok** and finally, an adequate quantity of **tarlong** powder. An adequate quantity of water is added and the yarn is boiled for a few hours, and then sun dried for some time. The yarn is boiled three times each time with fresh dye powder after which the desired color intensity is said to be produced. The **thengmerok** powder is added to prevent yarn from contacting the container bottom as it is said to cause yarn brittleness. Yarn dyed with **tarlong** is used for weaving various types of garments.

Curcuma longa rhizomes constitute an important source of yellow dye. Rhizomes are sliced into thin pieces and transferred into a container with an adequate quantity of water. Yarn is immersed into it and boiled for a few hours



Figure 6. *Morinda angustifolia* Roxb. (Rubiaceae) in Karbi Anglong District, Assam, India.

until a yellow color of the required shade is obtained. Yarn is allowed to cool and then dried under shade.

Turmeric is not a favored choice for yellow dye as the color gradually fades with time.

Garcinia xanthochymus Hook.f. stem bark is an important source of yellow dye. Bark is made into fine pieces and dried in the sun. The material is then pounded into fine powder and stored for future use. While dyeing, a layer of powdered bark of **thengmerok** is placed at the base of the container followed by the yarn and powdered **thampreng** is uniformly spread over the yarn. An adequate quantity of water (based on experience) is added and then boiled for a few hours until about three-fourths of the water has evaporated. It is then allowed to cool over night. Yarn is then dried in the sun for a few hours and again boiled with fresh dye powder. Boiling for around three rounds is reported to produce yarn with the desired yellow shade.

Dye and Color Significance in the Socio-religio-cultural Life of the Karbis

Color carries valuable information in Karbi society: it gives elegance to garments, garments dyed with specific col-

ors reflect cultural identity, fibers of specific color are used during religious occasions and certain colors and garments are considered taboo. The following terms reflect the role of dyes in the cultural life of the Karbis.

1. **Amen ke-ir, honjeng kekok** (Naming ceremony): After detachment of the umbilical cord, a name is given to a baby by tying **hon kevai** or yarn of white color spun with **takiri** (a crude spinning wheel) on the right wrist (Figure 7). Elderly women recite the history of a deceased member of the family and ask him to take rebirth and then name the baby in honor of the deceased member (Karbise believe in rebirth and immortality of souls).
2. **Melur** (a ritual lamp): During certain rituals, **melur** are lit to appease deities. For this, **hon kevai** is wetted with mustard oil and used as a wick.
3. **Rongker** (a community festival): During Rongker, the **kurusar** (priest) uses **hon kevai** to perform a special ritual in honor of the tiger god (Figure 8).
4. **Ahop**: (a natural physiological change in infants characterised by sticky-greenish stools that lasts for a few days). To reduce the frequency or duration of **ahop**, a priest performs divination and a brass ring is



Figure 7. White yarn tied to right wrist of a child as part of naming ceremony in Karbi Anglong District, Assam, India. White-red-black threads are put around the neck to reduce **ahop**.



Figure 8. A priest arranging white yarn during the community festival **rongker** in Karbi Anglong District, Assam, India.

tied to white-black-red colored **hon** and put around the baby's neck (Figure 7).

5. **Duikhrai** (ritual to appease a deity): When a person suddenly falls ill due to the influence of sacred grove spirits, Duikhrai is performed to appease the deity and assist recovery of the patient. Red and black **hon** are used along with other items on the occasion.
6. **Karjong kekur** (a ritual to reunite body and soul): Karbis believe that the soul of a person wanders out of the body and the person suffers from mental depression due to the influence of evil spirits. Karjong Kekur (Karjong: soul; Kekur: to invite) is performed to reunite the soul with the body. A brass ring is tied with white **hon kevai** and suspended from a bamboo twig. It is claimed that the soul, which appears in the form of a tiny spider, walks on the yarn that is caught and placed on the head of the patient accompanied by incantations from a priest.
7. **Jambili athon** (traditional Karbis wood crafts): Crafts such as **jambili athon**, **chong** (shields) and **nok** (swords) are always painted with black dye extracted from plants.
8. **Pi sarpi** (elderly women's cloth): Garments with red, white and black stripes usually used by elderly women.
9. **Pini** (women's lower garment): These are always dyed with **sibu** (*M. tinctoria*) or indigo and the color is said to uphold the identity of Karbi women.

Taboos: **Sibu** dye is taboo to men. **Kurusar**, who are always men, do not accept any edibles from women during the period of dyeing. Further, women handling **sibu** are not allowed to make **horkangthir** (rice beer used in rituals) and **hankangthir** (food to be served to the priests and social dignitaries). The plant itself is not taboo, but, because it is used to dye **pini**, handling of such cloth by men (washing, covering the body, etc.) is considered to be an indication of moral flaws.

Conclusions

Karbis knowledge of dyes has been acquired through long years of observation, possibly through trial and error. Unfortunately, the wealth of traditional knowledge pertaining to herbal dyes and dyeing is fast moving towards oblivion due to the availability of cheap chemically dyed yarn in the market and lack of interest among the young generation. Further studies are required to understand the history of Karbis dye use and oral traditions. Studies could also revitalize natural dye use by creating awareness and commercialization of certain natural dyes through systematic approaches and planning. This could enhance the rural economy and also preserve traditional knowledge and culture. **Sibu** (*M. tinctoria*) and **burot** (*S. cusia*) can easily be cultivated through seeds and cuttings and therefore, can offer ample opportunities for large scale cultivation. These plants are still grown in homestead gardens in rural villages.

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