

CHAPTER 5

Indigenous knowledge of natural dyes among the valley weavers of Manipur

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ABSTRACT

Natural plant-based dyes are environmentally friendly dyes that have a rich tradition in India, with varying indigenous practices in different regions across the country. Various dyeing techniques have been used with common basic principles applied since the ancient period. Manipur state in Northeast India has a strong identity with a very rich culture of weaving and dyeing traditional attire using natural plant-based dyes. The Meitei community represent its culture, rituals and status through traditional dresses which are specially woven and dyed through indigenous practices. The study was conducted during 2025-2026 to visit the local weavers and dyeing artisans of the Meitei community of the valley area of Manipur. The study recorded 20 plants used for dyeing different traditional attires, including Pungou Phanek, Mapan naibi Phanek, Inaphee, etc. Among the recorded plants used for dyeing fabrics, the use of Kum (*Strobilanthes cusia*) and Ureirom (*Bixa orellana*) are prominent dyes that hold a strong cultural identity and generational transmission of indigenous knowledge, which are revisited in this chapter. This study could be useful to create awareness about the natural dyes and as an alternative to the toxic and hazardous chemicals used for dyeing fabrics. It would also help to preserve the regional indigenous practices of fabric dyeing techniques.

Key words: Indigenous practices, Phanek, traditional attire, Kum, weaving, Ureirom

INTRODUCTION

Plant-based natural dyes are environment-friendly, biodegradable and non-toxic alternatives to synthetic chemical dyes. Such natural colouring agents are extracted from different plant parts like flowers, leaves, stems, bark, wood, root, etc. and are used for dyeing textiles such as cotton, silk, wool and linen (Prabhu and Bhute, 2012; Kumar *et al.*, 2015; Negi, 2025). These natural dyes produce soft, earthy tones of colour and are highly valued for their aesthetic appeal, cultural identity and safety for health. India has an ancient and rich tradition of natural dyeing that dates back to 2500 BC or during the Indus Valley Civilization period, with evidence of dyeing cotton fabrics derived from plants like indigo (*Indigofera tinctoria*), madder (*Rubia cordifolia*) and turmeric (*Curcuma longa*). During the medieval period, Indigo was exported and highly valued in Europe. Different traditional ways of dyeing flourished in India, including the tie and dye (Bandhani) and Block printing techniques (Bhandari *et al.*, 2025). However, there was a significant decline in natural dyes with the advent of synthetic dyes during the British colonial period in the 19th century due to low cost and ease of application. There has been a recent revival of natural dyes in the last decade due to environmental, health and sustainability concerns (Gokhale *et al.*, 2004). Natural dyeing is deeply rooted in Indian traditional practices across India and is closely linked with local crafts, rituals and cultural identity, still preserving the textile traditions, including the handloom weaving and artisan dyeing. Traditional plant-based dyeing technique varies across India but follows similar principles involving extraction of colour, mordanting and dye application (Bhandari *et al.*, 2025; Singh and Srivastava 2015).

Some of the common techniques of traditional dyeing of fabrics are the direct dyeing method, where plant parts (flowers, leaves, bark or roots) are boiled in water to release pigments (Kumar and Prabha 2018). The fabric is then dyed by directly immersing it in the dye bath without the use of mordants, the mordant dyeing method, where the fabrics are treated with various mordants such as alum, iron or other natural plant extracts before or after dyeing. Mordants help to fix colour, improve colour durability and also produce different shades of colour (Aye *et al.*, 2019). Plants like *Achyranthes aspera*, *Alocasia macrorrhiza*, *Alpinia nigra*, *Eclipta prostrata* and *Pisum sativum* are used as alkaline mordants and plants like *Ananas comosus*, *Averrhoa carambola*, *Citrus latipes*, *Citrus limon* and *Mangifera indica* are used as acidic mordants (Sharma *et al.*, 2005); Vat dyeing or fermentation dyeing involves fermenting plant material to convert it into a soluble form of dye.

When the fabric is dipped into the vat and upon exposure to air, oxidation occurs that helps in developing the final colour. This technique produces long-lasting shades of colour. There are also other traditional ways of dyeing such as resist dyeing method which involves preventing the dye from reaching certain parts of the fabric to create patterns; block printing using stamps; continuous immersion and re-dyeing involving repeatedly dipping and dried in dye solutions; boiling and decoction method involving preparation of concentrated dye solutions before dipping the fabric; cold dyeing involves extraction of delicate plant parts and applying the colours in low temperature to obtain better colour quality. Finally, combination dyeing, where fabric is dyed multiple times with different plant dyes to produce complex shades (Tamilarasi and Banuchitra 2021; Jordeva *et al.*, 2020).

The Manipuri people of the state of Manipur, India, have historical evidence of dyeing traditional attire. Mostly, the Meitei community in the valley and the tribal community in the hills have a rich tradition of using natural dyes in textile making that has been transmitted over time and generations (Devi, 2019). Traditional clothing dyed with various plant ingredients has been documented in the Cheitharol Kumbaba, the Royal Chronicles of Manipur (Chronicles of Kings of Manipur). The traditional garments, such as Pungou Phanek, Moirangphee, Mapan naibi Phanek, including Khwang Phanek, are dyed with local plant parts using traditional practices (Singh and Meitei 2026; Singh *et al.*, 2025). Such garments carry cultural and social identity, ritualistic and symbolic meaning. The present study revisits the culture of the Meitei community of Manipur on traditional practices involving the dyeing of traditional garments that represent the deep cultural significance.

METHODOLOGY

A field survey was conducted to document and analyse the indigenous knowledge of natural dyes among the traditional weavers of selected villages of the valley area of Manipur. Kongpal Khaidem Leikai and Kakching Wairi Khunyai Leikai were selected as study areas where handloom weaving and traditional dyeing practices were widely prevalent and accessible. Primary data was gathered using semi-structured questionnaires and interviews with local weavers, dyers and local artisans. Field notes and photographs were taken with the prior consent of the informants (Figure 1). Information regarding local names, plant parts used and processes for some unique dyes was systematically recorded. Plants used were



Figure 1: Survey work for natural dyes for fabrics and interaction with local weavers; a) M. Lilima Devi, 32 years, Kakching Wairi Khunyai Leikai [Informant], b) Laikhuram Manisang Devi, 76 years, Kongpal Khaidem Leikai [Informant] and c) Interaction with informant

identified using flora books, e-Herbarium specimens and authenticated websites like International Plant Name Index (Singh *et al.*, 2000; Saxena and Brahmam, 1994-1996).

RESULTS AND DISCUSSION

The interaction with local weavers and dyeing artisans of the Meitei community study recorded 20 plants belonging to 18 families and 20 genera for the use of

dyeing traditional dress fabrics (Table 1; Figure 2). Different plant parts, including flowers, leaves, fruits, seeds, bark, stem and rhizome have contributed to a wide spectrum of natural colours. Among the enumerated plants, *Bixa orellana* and *Mallotus philippensis* seeds are known for orange hues and generation of various colour spectrum with the used of mordants. Phanek is a general name of the traditional drape for the women of the Meitei community, which varies greatly in its texture, fabric, design, colour and material used depending upon the occasion to be worn. Pungou Phanek is a traditional drape worn during peaceful ceremonies and social gatherings or during rituals related to offerings to Gods, where the soothing colour ranges signify peace and purity (Figure 3). Mapan naibi Phanek is a traditional drape often used in celebrating social gatherings and Kum Phanek is the type of Mapan Naibi Phanek that has a significant identity as well as royalty that embodies Manipuri heritage and pride of the culture.

The use of Kum (*Strobilanthes cusia*) dyed Phanek have shown evidence since the reign of King Taothing Mang (264-364 AD) in Manipur (Singh and Meitei 2026). The field visits to the local weavers of Kum Phanek revealed that the dyeing process includes fermentation of *Strobilanthes cusia* leaves for 4-6 days and using oyster shell ash as a mordant. The yarn specialized for Kum is dipped into the fermented solution and air-dried before it is woven. Kum dyed phanek gives a black colour and differentiates from other dyes as it forms a grainy finish, gives off a tinch of fermented odour and weighs much lighter (Figure 4). However, its value still stands with cultural pride and status. The use of Kum Phanek has drastically declined due to the availability and ease of using other chemical dyes.

The present study would play an important role in promoting awareness of natural dyes as a safe and eco-friendly alternative to the toxic and hazardous chemicals commonly used in fabric dyeing. It also contributes to the preservation and recognition of regional indigenous knowledge and traditional dyeing practices, ensuring their continuity for future generations.

Table 1: Plants used as natural dyes for fabrics used by local weavers and artisans of the Meitei community

Botanical Name	Local Name	Family	Part(s) used
<i>Bixa orellana</i> L.	Ureirom	Bixaceae	Seeds

<i>Carthamus tinctorius</i> L.	Kusum lei	Asteraceae	Flowers
<i>Celosia argentea</i> L.	Haorei angangba	Amaranthaceae	Flowers
<i>Clitoria ternatea</i> L.	Apragita	Fabaceae	Flowers
<i>Curcuma longa</i> L.	Yaingang	Zingiberaceae	Rhizome
<i>Hibiscus × rosa-sinensis</i> L.	Juba kusum	Malvaceae	Flowers
<i>Impatiens balsamina</i> L.	Khujang	Balsaminaceae	Flowers
<i>Ipomoea quamoclit</i> L.	Nungarei angangba	Convolvulaceae	Leaves
<i>Mallotus philippensis</i> (Lam.) Müll.Arg.	Ureirom laba	Euphorbiaceae	Seeds
<i>Musa x paradisiaca</i> L.	Laphu	Musaceae	Stems
<i>Parkia timoriana</i> (DC.) Merr.	Yonchak	Fabaceae	Fruit / Stem
<i>Phyllanthus emblica</i> L.	Heikru	Phyllanthaceae	Fruits
<i>Piper betle</i> L.	Kwa mana	Piperaceae	Leaves
<i>Prunus domestica</i> L.	Heikha	Rosaceae	Fruits, leaves and bark
<i>Psidium guajava</i> L.	Pungdon	Myrtaceae	Fruits
<i>Punica granatum</i> L.	Kaphoi	Lythraceae	Fruit rind
<i>Strobilanthes cusia</i> (Nees) Kuntze	Kum	Acanthaceae	Leaves and stems
<i>Tagetes erecta</i> L.	Sanarei	Asteraceae	Flowers
<i>Tectona grandis</i> L.f.	Chingshu	Lamiaceae	Leaves
<i>Zizania latifolia</i> (Griseb.) Hance ex F.Muell.	Ishing kambong	Poaceae	Fungus- infected culms

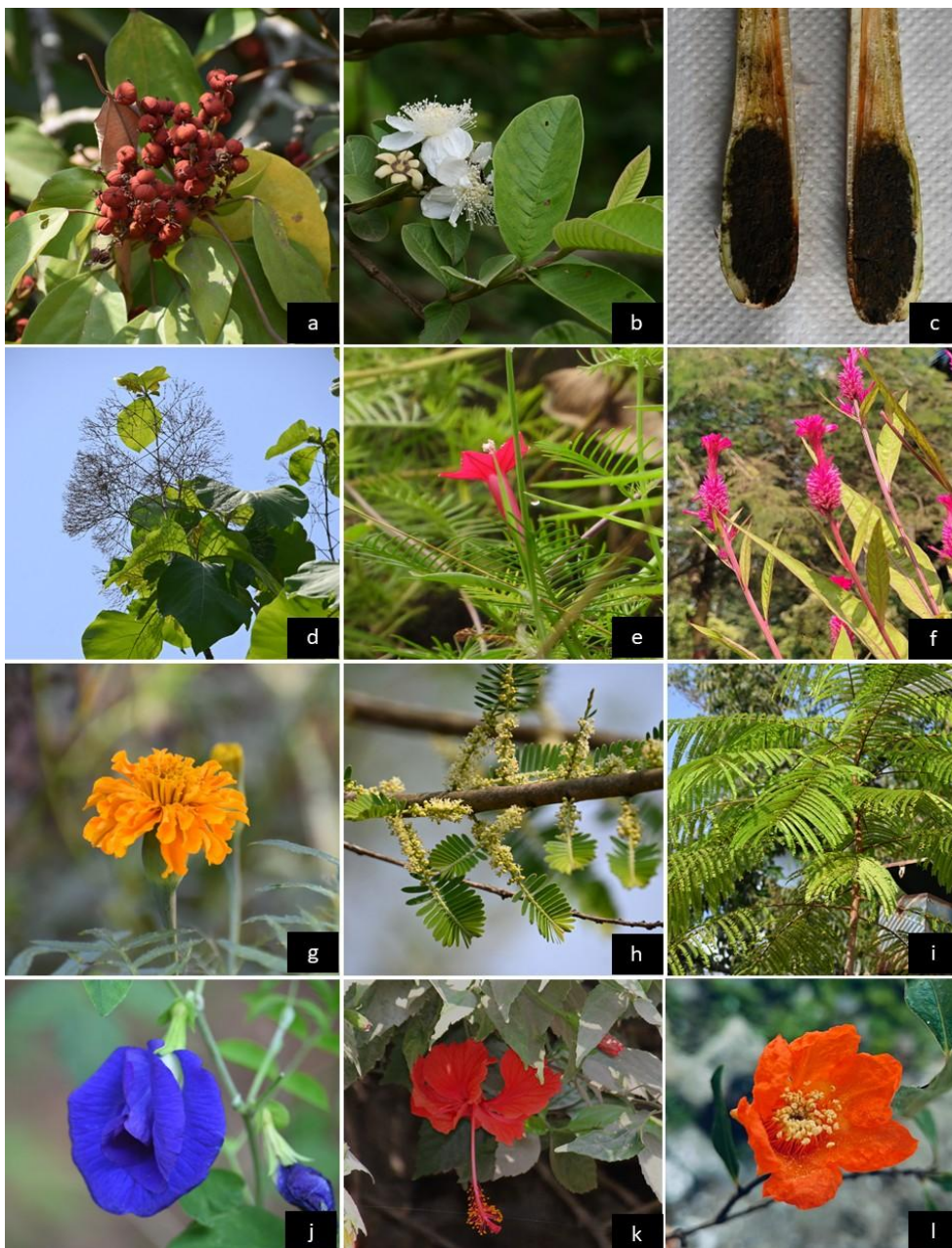


Figure 2: Some important plants used as natural dyes for fabrics; a) *Mallotus philippensis*, b) *Psidium guajava*, c) Fungus-infected culms of *Zizania latifolia*, d) *Tectona grandis*, e) *Ipomoea quamoclit*, f) *Celosia argentea*, g) *Tagetes erecta*, h) *Phyllanthus emblica*, i) *Parkia timoriana*, j) *Clitoria ternatea*, k) *Hibiscus rosa-sinensis* and l) *Punica granatum*

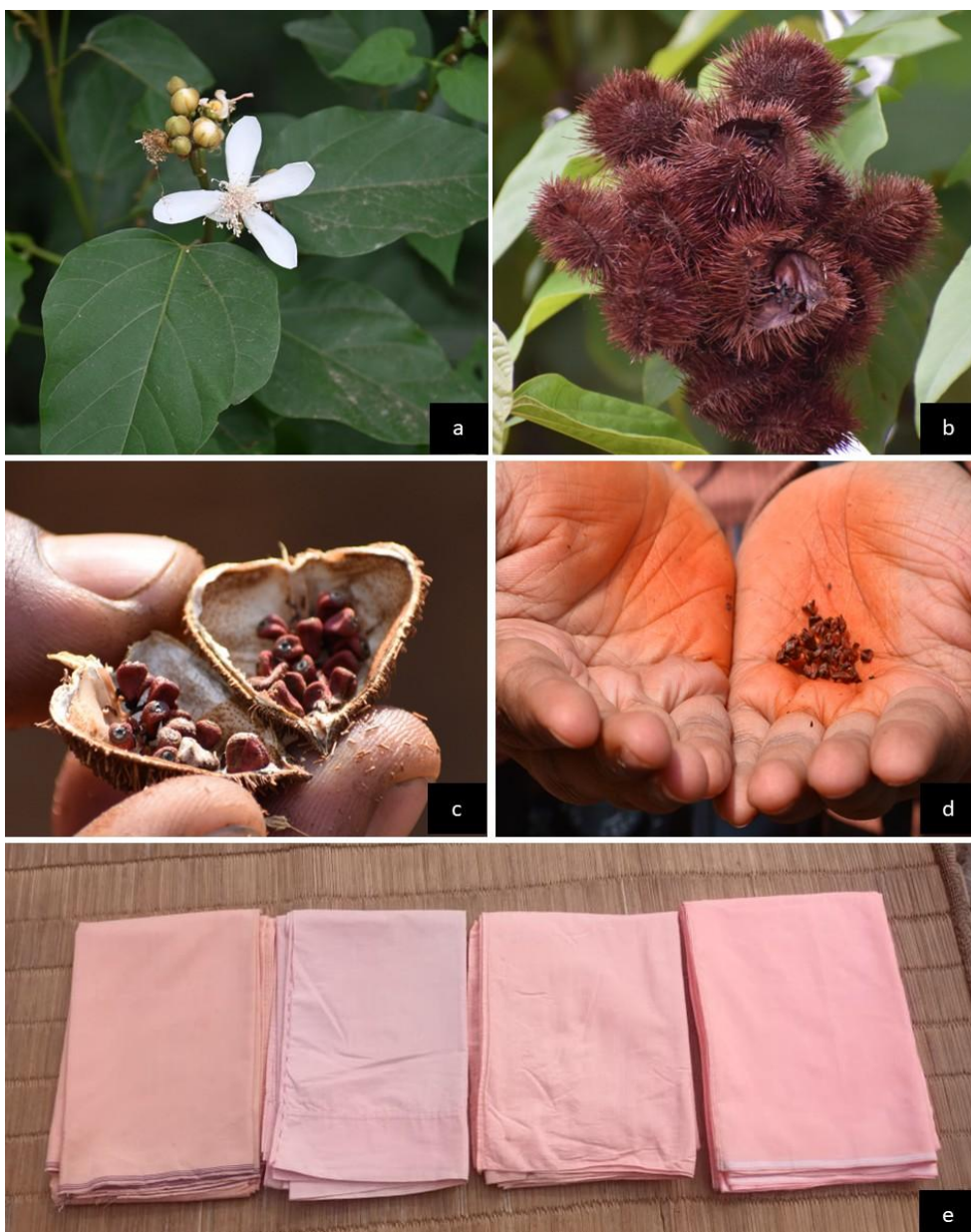


Figure 3: Dyeing of Pungou Phanek (drape) using Ureirom (*Bixa orellana*); a) Flower of *B. orellana*, b) Fruit of *B. orellana*, c) Seeds of *B. orellana*, d) Colour from seeds and e) Different shades of Ureirom dyed drape

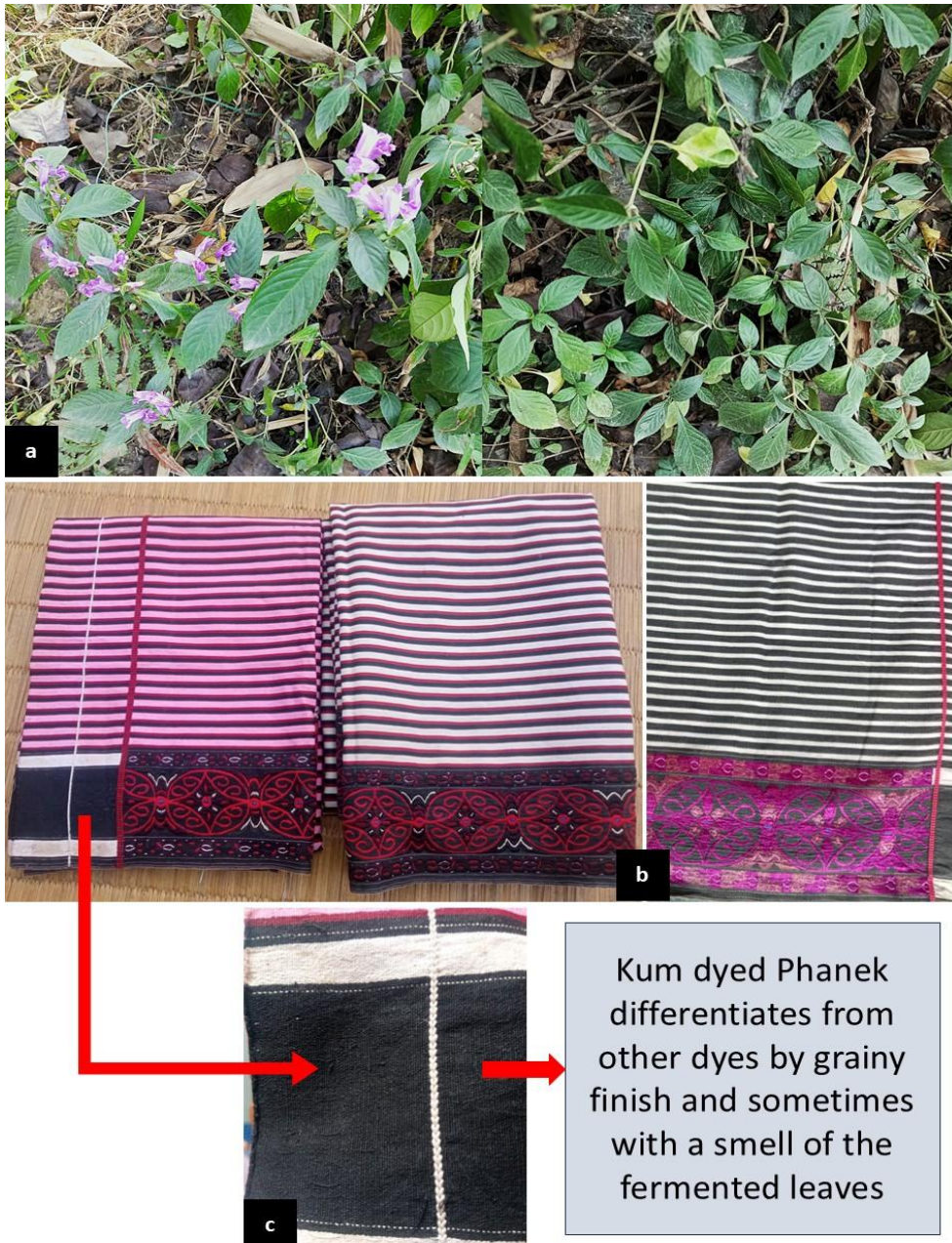


Figure 4: Dyeing of Mapan Naibi Phanek (traditional drape) also known as Kum Phanek: a) Kum pambi (*Strobilanthes cusia* plant) in its habitat [Photo credit: Tombi Longjam], b) Mapan Naiba Phanek also known as Kum Phanek and c) The black part at the end of the drape is woven using threads specially dyed with Kum leaves and later embroidered over it

FUTURE ASPECTS

- i. Traditional dyeing techniques required scientific validation.
- ii. Normalization of dye extraction and application procedures to be more accepted in the contemporary textile industries.
- iii. The new pigments made using non-toxic or natural dyes like *Zizania latifolia* which have never been explored previously.
- iv. Cultivation and sustainable harvesting of primary dye plants such as *Bixa orellana* as a way of ensuring that there are raw materials.
- v. The eco-textile industries that use natural dyes to increase livelihood opportunities of local weavers.
- vi. Proper digitalization of indigenous dyeing knowledge needs to be recorded.
- vii. Government policy and campaign for encouraging natural dye and natural handloom policies.
- viii. Natural dye integration in the global markets with a specific inclination to organic, sustainable and environmentally friendly products.

CONCLUSION

The study demonstrates that the weavers of the Imphal valley possess rich indigenous knowledge of natural dyeing, utilizing a diverse range of locally available plant species and their plant parts, including leaves, flowers, fruits, seeds, bark, stems and rhizomes skilfully employed to produce a wide spectrum of colours, reflecting both ecological awareness and cultural heritage.

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