

འབྲུག་གི་ནང་འཁོད་ལྗོངས་སྐད་པ་བཟོ་ནིའི་བྱ་རིམ་གནས་ཚད།

BHUTAN STANDARD

Traditional Natural Dyeing Procedure for Madder and Lac Dye



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འབྲུག་གི་ནང་འཁོད་ལྷོ་ཆག་སྐྱད་པ་བཟོ་ནིའི་བྱ་རིམ་གནས་ཚད།

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FOREWORD

This Bhutan Standard for Traditional Natural Dyeing Procedure for Madder and Lac Dye was drafted by Sub-Committee on Natural Dye SC 03 and adopted by Bhutan Standards Bureau after the draft finalized by the Textile and Handicraft Technical Committee TC 06 and approved by the **Bhutan Standards Bureau Board (BSB Board) in July 2022.**

This standard is subject to systematic review after five years to keep pace with the market trends, industrial and technological developments. Any suggestions and further information may be directed to the concerned Technical Committee.

འབྲུག་གི་ནང་འཁོད་ལྗོངས་སྐད་ཀྱི་ཐོན་ལས་ཀྱི་རིམ་གཞི་ཚད་

Traditional Natural Dyeing Procedure for Madder and Lac Dye

1 Introduction

In Bhutan, the art of weaving and natural dyeing are part of our culture and tradition. Natural dyeing dates back to ancient times when all dyes were extracted from natural sources such as plants, animals or minerals without any chemical treatment. They are mostly eco-friendly, biodegradable, less toxic, and less allergenic. While modern synthetic dyes have largely replaced traditional methods in industrial production, the traditional dyeing procedures still hold cultural and historical significance which are still practiced by some of the weaving communities and natural dye artists in the country.

Organizations such as Agency of Promotion of Indigenous Craft (APIC), Handicraft Association of Bhutan (HAB), Tarayana Foundation, SABAH Bhutan and Royal Textile Academy (RTA) are trying to revive and impart this art by providing free training, workshops and awareness programs in communities all across Bhutan. Private dye artists are equally involved and active in educating and encouraging locals while also promoting the art of natural dyeing in the country.

This document provides specifically the process of traditional natural dyeing with Madder (*tsoe*) and Lac (*jatsoe*) and contains the old age dyeing recipes that has been passed down through generations.

2 Scope

This document prescribes the dyeing procedure for Madder and stick Lac using age-old Bhutanese traditional dyeing skills. It also provides first-hand information and guidance for natural dye users to maintain the quality of dyed yarns.

3 Normative References

No normative references are cited.

4 Terms and Definition

For the purpose of this standard, the following definitions shall apply.

4.1. Naka pani (dz)/Kilung(sh)

Refers to soap berry used as a cleaning agent for washing the yarns

4.2. Zim (dz/sh)

Refers to Asiatic sweet leaf used in pre-mordanting the yarns/ fabrics.

4.3. Tsoe (dz)/Laniru(sh)

Refers to Madder used as a dye ingredient to extract red or orange color. The Madder plant contains a pigment called alizarin, which is responsible for its vibrant red color

4.4. Jatshoe(dz)/Tshos(sh)

Refers to Lac used as a dye ingredient to extract red/or pink/ or purple color.

4.5. Tsangja or Rum(dz)/Yangshaba(sh)

Refers to Indigo used as a dye ingredient to extract turquoise blue/ or green color.

4.6. Tago- poko (dz)/ Kheysi khoptang(sh)

Refers to walnut hulls used as a dye ingredient to extract brown color.

4.7. Youngka(dz/sh)

Refers to Turmeric used as a dye ingredient to extract yellow color.

4.8. Jobchi(dz)/Khala Bokpe

Refers to buckwheat used as a dye ingredient to extract shades of gray/green.

4.9. Tshogdhen(dz)

Refers to the base color which is achieved through pre-mordanting.

4.10. Ara (dz/sh)

Refers to local distilled alcohol used as an ingredient during fermentation of indigo dye.

4.11. Pho (dz) / Pham (sh)

Refers to local yeast used as an ingredient during fermentation of indigo dye.

4.12. Gothey chu(dz)/ Khari (sh)

Refers to ash water used to alkalize the indigo vat.

4.13. Bangtsho (dz/sh)

Refers to the dyeing method where the dye bath undergoes the controlled fermentation for a few days or a week to extract the desired color.

4.14. Dyeing

Refers to the process of imparting color to materials, typically by immersing them in a dye solution or applying dye directly to the surface.

4.15. Mentsi (dz) /Khomang Churpu (sh)

Refers to Quince used to fix dye.

4.16. Amla (dz)/ Chhor-gin Sey (sh)

Refers to Gooseberries used to fix dye.

4.17. Tong (dz)/Thung churpu (sh)

Refers to wild apple used to fix dye.

4.18. Churtsho (dz/sh)

Refers to the dyeing method where it uses natural citric acid such as khomang in the dye bath.

5 Raw materials

5.1 Types of yarn and fabrics

Cellulose based: Cotton and nettle

Protein based: Wool and silk

5.2 Dye materials from plants and animals

Sl. No	Local Term /Common Name	English Name	Scientific Name
1.	<i>Naka pani/Kilung</i>	Soap Berries	<i>Sapindus mukorossi</i>
2.	<i>Zim</i>	Asiatic sweet leaf	<i>Symplocos paniculata</i>
3.	<i>Laniru/Tsoe</i>	Madder	<i>Rubia cordifolia</i>
4.	<i>Jatshoe</i>	Lac	<i>Laccifer lacca</i>
5.	<i>Yangshaba/TsangJa/Rum</i>	Indigo	<i>Strobilanthes cusia</i>
6.	<i>Tago</i>	Walnut	<i>Juglans regia</i>
7.	<i>Youngka</i>	Turmeric	<i>Curcuma longa</i>
8.	<i>Jobchi</i>	Bitter buckwheat	<i>Fagopyrum esculentum</i>
9.	<i>Ara</i>	Distilled alcohol	
10.	<i>Pho/Pham</i>	Yeast	<i>Saccharomyces cerevisiae</i>
11.	<i>Gothey</i>	Wood ash	<i>Fraxinus spp.</i>

5.3 Mordant

Sl.No	Local Term /Common Name	English Name	Scientific Name
1.	<i>Khomang /Khomang Churpu</i>	Quince	<i>Chaenomeles speciosa</i>
2.	<i>Zim</i>	Asiatic sweet leaf	<i>Symplocos paniculata</i>

6 Dyeing procedure

6.1 Madder (Tsoe)

6.1.1 Scouring

The yarn/fabric has to be washed thoroughly to remove natural and artificial impurities. This process makes the yarn clean, and helps in absorbing the dye evenly. *Nakapani*, the cleaning agent used, is boiled in water to extract a soap like gel. The yarn/ fabric is then immersed in hot water with *Nakapani* extract and boiled for 10-15 minutes. This is followed by washing and rinsing of yarn/fabric in cold water.

6.1.2 Pre-mordanting

In the traditional method of dyeing, *zim* extract is used for every color except Indigo dyeing. It is used as the base color '*tshog dhen*' that helps in fixing the color and fastness. *Zim* leaves have to be boiled for more than an hour, and then strained to remove any solid particles. The washed yarns are then boiled in the *zim* extract for 15- 20 minutes.

6.1.3 Ingredients

Yarn: 1kg
 Madder powder : 2 kgs or
 Madder stem: 4 kg
 Dried *Zim* : 1 kg
Khomang Churpu :250 grams or
 Water:20 L

6.1.4 Process

- i. In a pot, add madder powder/stem in the water and boil until the color is visible.
- ii. Add quince in the water to the dye pot and boil the mixture for an hour.
- iii. After simmering for an hour, strain the liquid in the different pot and pour hot water to remove any solid particles.
- iv. Dip the *zim* treated yarn into a dye solution and boil for an hour and let it cool down (or soak the yarn overnight in the dye solution for good results).
- v. Wash the yarns gently with cold water to remove any dye residuals, wash until the water runs clear.
- vi. Dry in the shade for better results.

Note 1: In case of flawed shade or dissatisfaction with the dyed shade, one can treat it again by following procedure (i-v). Pre-mordant steps are not required during retreatment.

Note 2: The same dye bath and the cooked madder can be reused for dyeing lighter shades until the dye is exhausted.

6.2 Lac (Jatsho)

6.2.1 Scouring:

The yarn/fabric has to be washed thoroughly to remove natural and artificial impurities. This process makes the yarn clean, which helps to absorb the dye evenly. *Nakapani* extraction with water is traditionally used as a cleaning agent. Boil yarn/fabric with *Nakapani* extract for 10-15 minutes in hot water, wash and rinse in cold water

6.2.2 Pre-mordanting:

In the traditional method of dyeing, *zim* extract is used for every color except indigo. It is used as the base color *tsnog dhen* that helps in fixing the color and fastness. *Zim* leaves have to be boiled for more than an hour, and then strained. The washed yarns are then boiled in the *zim* extract for 15- 20 minutes.

6.2.3 Ingredients:

Yarn:1kg
Lac: 3 kg
Dried *Zim*:1kg
Roasted wheat: 250 grams
Yeast: 70 grams
Water: 20 L

6.2.4 Process

- i. In a pot, put Lac and pour the boiling water, soak and stir it. Pour hot water onto the Lac, little by little and keep on stirring and grinding the lac to extract the dye, repeat the process until the lac turns light brown, gummy and smooth.
- ii. Strain the Lac solution in a different pot.
- iii. Add 250 grams of roasted grinded wheat into the lac solution.
- iv. Add yeast equivalent to 70 grams into a lac solution.
- v. Stir and mix the solution thoroughly for 5 minutes.
- vi. Dip the *zim* treated yarn into the solution and keep the solution in a warm place for a week. The temperature should be maintained between 25-30 degrees for proper fermentation to happen.
- vii. Stir the solution gently twice a day, once in the morning and once in the evening for even pigmentation and try to keep the yarn at the bottom of the solution.
- viii. In 1 week, we can see clean water in Lac solution. (White bubble comes out which indicates that the dye has been absorbed by the yarn).
- ix. After the Lac solution is warm add 2 liters of Symplocos water.
- x. Boil it for 30 minutes.
- xi. Soak the yarn for 15 minutes till the dye solution becomes warm.
- xii. Wash the yarns gently with cold water to remove any dye residual, rinse until the water runs clear.
- xiii. Lay it on the grass or in shade and let it dry.
- xiv. If the color is not even; repeat the process.

Note 1: The byproduct of the lac known as 'lacha' can be used to seal the handles of the farming tools, and in the polishing and sealing of the traditional earthen pots.

Note 2; Traditionally dyers seal the Lac solution with cow dung and keep under the stalk of compost for a minimum of one week in order to activate the process of fermentation, if compost is not available, one can seal the solution and keep it in a warm place; the temperature should be maintained between 25-30 degree Celsius or heat up to 25-30 degree before dyeing.

Note 3: It is to be noted that powdered form of Lac is best to extract the dye faster.

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Points to remember

- a) There might be variation in shades depending on the types of yarns, dye materials source, water types and cooking time.
- b) In case of flawed shade or dissatisfaction with the dyed shade, one can treat it again by following the procedure.
- c) Same recipe and dyeing procedure will apply for fabric dyeing.
- d) The dyed yarns/fabrics should be washed in cold water with mild PH neutral detergent to retain the color for a longer period of time.

7 Test

Testing for color fastness and overall dye quality are carried out physically in the following ways:

i. Wash fastness test

The dyed yarns are washed with cold water for 30 minutes. After 30 minutes, excess water is removed and air dried at room temperature. Compare the result with the unwashed fabrics and see the differences in shades.

ii. Light fastness test

The dyed yarns are washed in normal cold water for 30 minutes. After 30 minutes, excess water is removed and dried in direct sunlight for 2 hours. Compare the result with the unexposed fabrics and see the differences in shades.

iii. Visual test

The dyed yarns are visually checked to see the evenness of the shades.

8 Tools and Equipment

- a) Stainless brass/steel pot
- b) Stainer
- c) Spatula
- d) Rubber Gloves
- e) Apron
- f) Mask
- g) Buckets
- h) Jugs
- i) Muslin Cloth
- j) Weighing scale
- k) Measuring scale
- l) Stove
- m) Thermometer
- n) Cooking Vessels
- o) Stirring rods

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