

Typical dyeing process for cotton

DYEING PROCEDURE FOR COTTON WITH NATURAL DYES

- Requirements:-
- Natural Dye: -
- Mordants: - Alum, Ferrous sulphate, Stannous chloride
- Soft water (hardness less than 50-ppm.)
- Dye pot: It should be in Stainless steel or glass or porcelain.
- Temperature indicator / thermometer
- Heating medium

Preparing the RFD (Ready for Dyeing) textile material

- You can apply your own process. It is advisable that the material should be at least semi (Half) bleached.
- **Pre Mordanting:-** (If Required)
- Add required quantity of required mordant (2-4%) in luke warm water, stir well and filter it.
- Raise the temperature of solution to 80°C.
- Immerse the textile RFD material in the solution and stirrer the same so that material should be in movement for 20 – 25 min. Drain the liquor and slightly squeeze the mordanted material and don't wash.
- After mordanted textile material, and proceed for next Mordanting or dyeing as per recipe.

Dyeing

- Add the required quantity of dye in luke warm water , stir well and filter it ***(if simultaneous Mordanting is required add the required quantity of mordant and dye in the same dye bath before immersing the material in it)***
- Raise the temperature of solution to 80°C.
- Immerse the above mordent textile materials in the dye bath for 30 – 35 min.
- During the entire course of dyeing the material should be in movement.

Post Mordanting:- (If Required)

- Drain the liquor and slightly squeeze the dyed material and don't wash.
- Add required quantity of required mordant in luke warm water, stir well, filter it and add to dye bath.
- Raise the temperature of solution to 80°C.
- Immerse the dyed textile material in the solution and stirrer the same so that material should be in movement for 20 – 25 min. In case of using Ferrous sulphate as post mordant the mordanting should be conducted at ambient temperature.

Post Treatment:-

- Drain the liquor and slightly squeeze the dyed material.
- Wash the dyed material with plain water.
- Wash the dyed material with 0.5 gpl non ionic detergent at 60°C.
- Again drain the liquor and slightly squeeze and wash the dyed material with plain water until the detergent rinse out.
- Treat the material with your own method of fixing agent and softener as you required.

Recipe for Cotton dyeing

SHADE OBTAIN	MORDANT (I)	VEGETABLE DYE MORDANT (II)	VEGETABLE DYE
Light yellow		Tectona—8% + CuSO_4 -1.5%	
Medium Yellow		Punica—8% + CuSO_4 -1.5%	
Mustard yellow	K. Alum-8%		Punica-5%
Light pink		Terminalia arjuna-5%+ CuSO_4 -1%	
Brown Pink		Catechu—5% + CuSO_4 -1%	
Maroon	Cationic fixer-3.5%	K. Alum-8%	Lac-8%
Light Brown	FeSO_4 -2%	Terminalia arjuna—7%	

DYEING PROCEDURE FOR SILK WITH NATURAL DYES

- Requirements:-
- Natural Dye: -
- Mordants: - Alum, Ferrous sulphate, Stannous chloride
- Soft water (hardness less than 50-ppm.)
- Dye pot: It should be in Stainless steel or glass or porcelain.
- Temperature indicator / thermometer
- Heating medium

Preparing the RFD (Ready for Dyeing) textile material

- You can apply your own process. It is advisable that the material should be at least semi (Half) bleached.
- ***Pre Mordanting:-*** (If Required)
- Add required quantity of required mordant in luke warm water, stir well and filter it.
- Raise the temperature of solution to 80°C.
- Immerse the textile RFD material in the solution and stirrer the same so that material should be in movement for 20 – 25 min.
- Drain the liquor and slightly squeeze the mordanted material and don't wash.
- After mordanted textile material, and proceed for next Mordanting or dyeing as per recipe.

Dyeing

- Add the required quantity of dye in luke warm water , stir well and filter it ***(if simultaneous Mordanting is required add the required quantity of mordant and dye in the same dye bath before immersing the material in it)***
- Raise the temperature of solution to 80°C and maintain the pH of the bath from 3.0 to 3.5 by acetic acid (if required).
- Immerse the above mordent textile materials in the dye bath for 30 – 35 min.
- During the entire course of dyeing the material should be in movement.

Post Mordanting:- (If Required)

- Drain the liquor and slightly squeeze the dyed material and don't wash.
- Add required quantity of required mordant in luke warm water, stir well, filter it and add to dye bath.
- Raise the temperature of solution to 80°C.
- Immerse the dyed textile material in the solution and stirrer the same so that material should be in movement for 20 – 25 min. In case of using Ferrous sulphate as post mordant the mordanting should be conducted at ambient temperature.

Post Treatment

- Drain the liquor and slightly squeeze the dyed material.
- Wash the dyed material with plain water.
- Wash the dyed material with 0.5 gpl non ionic detergent at 60°C.
- Again drain the liquor and slightly squeeze and wash the dyed material with plain water until the detergent rinse out.
- Treat the material with your own method of fixing agent and softener as you required.
- **Note:** All the given percentage of mordents and dyes in the recipes are OWF (on the weight of fabric). Material should be in wet position before immersing in the dye bath.

Recipe for Silk dyeing

Shade Obtain	Dye + Mordants	Dye + Mordants (IInd Step)
Yellow	K.Alum-6% + Punica-5%	
Orangeish Yellow	Rubia-5% + K. Alum-5%	
Olive green	Punica -6%+ K. Alum-5% + FeSO4 – 1%	
Pinkish red	Lac – 4% + SnCl2 – 2%	
Maroon	Lac – 6% + Oxalic acid – 6% + SnCl2 – 2%	
Light purple	Lac.-4%+K.Alum-1%+Citric acid-3%	
Purple	K.Alum-5% + Tarataric acid–2.5%+ Lac-3%	
Violet	Lac- 4% +K.Alum-2%+FeSO4-0.6%	
Light Gray	Lac+Tannic acid – 2% + FeSo4 – 2%	Space-B 6%+ CuSO4-2%
Gray	Terminalia arjuna-4%+ Ganga-2%+FeSO4-2%	
Light Brown	Terminalia arjuna-5%+ CuSO4 – 2%	
Bronze	Catechu – 3% + CuSO4 – 1.5%	
Radish Black	Lac- 4%+Ganga-2 After 15 min. FeSO4-2%	
Grayish Black	Lac-2%+Ganga-4%+After15 min. FeSO4-2% After 10min.Oxalic-6%+After10min.NaOH-2%+Soda Ash-10% After 10 min.+ FeSO4-2% For15 min.	

.Steps showing Natural dyeing process



Roots, barks, and woody materials

- Most wood products release best color when soaked in water or overnight. While there are few exceptions, most woods do not yield good color when boiled directly. Soak wood, bark, or roots, for thirty minutes before boiling is recommended. If the dye liquor still looks weak, simmer longer, upwards of three hours.
- Many woody materials will not yield a significant dye color unless a modifier is added. Experimentation is required here. In a small containers place a small amount of the dye liquor, mixing different mordants, and auxiliaries will yield different colors.

Roots, barks, and woody materials

Some woody products yield colors only under basic conditions, adding soda ash and or baking soda will extract the color desired.

Wood sizes, sawdust works best, but not every piece of wood you collect will be in the form of sawdust. Use of a wood/leaf chipper, of the garden variety to chip the wood up, and then allow it to soak for several hours.

Straining off the chips, placing the dye liquor into a bucket, and grind the chips in food grinder/processor. Then replacing the chips into the original dye bath, often with more liquid gives more color.

Flowers

- Flowers are a bit easier than woody materials. Soak the flowers overnight, before heating up the dye liquor. Sometimes freezing the flowers before boiling liberates the color very easily, otherwise bringing the dye bath up to a simmer, 40-70° C, where it remains for thirty minutes. Addition of a mordant to the dye bath while the dye materials are still in the pot is a convenient method. Sometimes multiple extractions to extract the color from the dye materials may be required. Otherwise allow the pot to cool before using for dyeing.
- Even a potato masher may be able to mash the flowers after they have soaked. This aids in extracting additional dye color from the flower heads.

Fruits and Vegetables

- Using the same method with fruits and vegetables as with flowers, however it may be run through a food grinder/processor first, to ensure the greatest amount of color extraction.
- Following are a few basic recipes that are recommended often for dyeing fabrics.

Genda (Marigold)

- Color obtained: Bright Yellow to Khaki Greens
- Place Marigold Blossoms into a plastic bucket and cover them with hot, not boiling, water. A 5-Litre bucket or container will work well for this method. Marigolds will yield the greatest color if allowed to soak for an 6-10 hours. Just place the solution in a warm area, such as a sunny window, heat to a simmer
- Leave this solution to sit, in a warm place, soak overnight.
- Remove Marigold from the resultant liqueur, and place it in compost pit
- Place your Marigold liqueur into a dye pot, place pot onto heat source and bring the solution to a simmer.
- Place your wetted fabrics into the dye pot and allow to simmer for two hours.
- Remove from heat and allow the fabric to remain in the dye bath, overnight or longer if desired.
- Allowing the fabric to remain in the dye pot, as the dye bath cools, allows for more of the dye molecules to bind with the fabric for deeper and darker shades..
- Remove fabric from the dye bath and rinse the fabric thoroughly. Some dye color will rinse off in the process, this is normal.

PRECAUTION/SAFETY NOTE

- Extracting and using the dyes should be carried out with adult supervision and any part of the activity using boiling water must be carried out by the teacher. Rubber gloves should be worn whenever the dyes are handled.
- Because dyeing substances and mordants can be poisonous, there are some important rules to follow when dyeing:
- Dyeing should never be done in cooking vessels.
- Water quality should be checked, hard water is not recommended.
- All measuring and stirring spoons, scales, thermometers, jars, etc. should be separately used for dyeing purpose.
- The work area should be covered.
- Wearing gloves to avoid contact with the skin is necessary.
- Dyeing should be done in a well-ventilated area or outdoors.
- Rinsing fabric thoroughly after dyeing to remove all excess chemicals is essential.
- Do not inhale steam from your dye baths.
- If you experience any itching, burning, rash, or other reaction, get away from the dye bath.