Japanese Indigo Summer Dye Recipe

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If you are new to natural dyeing, this may seem fairly involved, however once you are familiar with the different steps you will most likely find it flows very smoothly... and, like so many others, you may find yourself drawn again and again to the magic of indigo dyeing!

Like baking bread, this is a wonderful thing to do on a day when you have a good span of free time and a few other small chores or projects to do while waiting for things to unfold.

You will need:

Up to 6 oz wool, silk, cotton, linen or other natural fiber
(yarn, roving, or fabric)
Mild detergent (Synthropol or a pH-neutral liquid dish soap)
1 lb fresh Japanese Indigo leaves from mature plants
(leaves from mature plants will bruise blue when crushed or dried)
1 tablespoon baking soda or soda ash
1 Tbsp Thiourea Dioxide OR Sodium Hydrosulfite* (also known as Color-run Remover, which can usually be purchased from anywhere selling dye supplies, or ordered online from Dharma Trading Co.)
Large glass jar w/ lid (4 quart)
Large pot, big enough to hold the jar with room to spare
Cooking thermometer (preferably one with a clip that allows you to attach it to the edge of your cook pot)
Two buckets
Large spoon, tongs, or stirring stick (I use a piece of bamboo), reserved for dye projects.

*Note: we offer two different methods for creating your dye bath. The first utilizes the chemical Thiourea Dioxide to remove oxygen from the bath in the final steps of preparation. This allows the bath to be ready in a single afternoon. If you prefer not to use this chemical, you may instead ferment your indigo bath to remove the oxygen. This method requires a few extra days, and a few extra ingredients, but should yield the same results!

SCOUR

First, weigh your dry fibers, and note this measurement. This recipe can be used for up to 10 oz of fiber, but be aware that the more fiber you dye in a single dipping, the lighter your color results will be. For more saturated blues, as the one shown above, I recommend dyeing between 2oz and 5oz of fiber at once.

Okay, so if you have not already done so, it is generally a good idea to pre-wash or “scour” your fibers before putting them in the dye bath. This will remove any residue that might interfere with the indigo pigment’s ability to bind to the fiber. This can be done ahead of time, or while you are preparing the indigo bath.

To scour, fill a pot with warm water (making sure the pot is large enough for the fibers to move freely). Add a small squirt of pH-neutral soap, and stir gently (generally ± 1tsp per gallon of water). Submerge the fibers in the pot and place on the stove, heating to just below a simmer. Allow the fiber to sit for 15-50 minutes in the hot soap bath. If you are working with cotton fiber, bring the water to a simmer, and heat for 1 hour. Turn off the heat and, using a spoon or tongs, remove your fibers and place them in a clean colander over the sink or hang them to drain. Fill a bowl with fresh hot water, add the fibers, and gently rinse. Take care if you are working with roving or fine wool not to agitate the rinse bath too vigorously, or you may encounter matting or felting. I have found that submerging the fibers in warm water and carefully but firmly squeezing them between my hands or pressing them against the bottom of the washbasin is enough to circulate the clean water through without inducing felting. When you are satisfied, and it may take another rinse if you used a tad too much soap, remove the fibers from the rinse water.
THE BATH

Strip the Indigo leaves from the plant stems and pack into a 2- to 4-qt glass jar (the indigo pigment precursor is concentrated in the leaves, and the stems do not contribute pigment to the dye pot). Cover the leaves with warm water, lightly secure with a lid or cover the jar with a small plate, and place in a large pot on the stove. Fill the pot with warm water to surround the jar, as much as you can without causing it to float. Heat until the water starts to steam, making sure the temperature does not get much higher than 165 degrees Fahrenheit (this is important, as too high a temperature will denature the pigment). Allow the jar to sit over very low heat, maintaining 165 degrees F for 2-3 hours. Check regularly to be sure the pot is kept at a steady temperature. If you like, this wait time can be used to opuc up your fiber- or fabric-to-be-dyed with shibori, otieh resist or ikat fiber tying! (this is a topic for a different how-to sheet, so if you are not familiar with these techniques, a quick internet search will give you plenty of ideas and info to get inspired).

After 3 hours or so, the water in your dye jar should have turned to a deep chestnut-brown color. Strain the liquid from the jar into a bucket, squeezing any remaining water from the leaves.

At this time, if you are doing the same-day recipe and your fiber is dry, put the fiber in a separate bowl and cover with warm water to soak (conserve water by using the water left in the pot from steaming your jar).

Add 1 Tbsp baking soda or soda ash to the bucket of dye water to alkalize the bath. This will create the environment that the indigo pigment precursor (indoxykol needs to undergo necessary changes in chemical composition to become indigo pigment. For this to happen, the bath also needs oxygen! Pour the dye bath back and forth between two buckets, around 10 minutes, until water has turned bluish green or bluish brown. It may take a bit longer, depending on how vigorously (or placidly) you pour. If you have been pouring back and forth energetically for more than 15 minutes and are not sure you have seen a change in the bath, have faith and continue to the next step. If you swear to yourself the bath has not changed color, you may need to check the pH, which should be close to pH 10. More baking soda or soda ash may need to be added to raise the pH appropriately.

Same-day method:
(See below for fermentation method) Add 1 Tbsp Thiourea Dioxide (or Sodium Hydrosulfite) to the bath, gently stirring it into the solution … this will remove oxygen from the bath, now converting the indigo pigment you have created to its water-soluble form. Cover and wait 30 minutes, or until the bath has turned yellow-green. If your bath does not change color within 1 hour, add a tad more Thiourea Dioxide, and wait another 15 minutes.

Fermentation vat:
If you would rather wait and let the natural process of fermentation remove oxygen from the bath, it will take around 3-5 days before it is ready, depending on ambient temperatures (warmer=faster fermentation). Follow the above steps, until it is time to add the Thiourea Dioxide. Instead, pour the dye bath into a small plastic bucket or other opaque container with a lid. Stir in 3 Tbsp corn or rice syrup, and 1/2 c. wheat or rice bran. Cover and keep in a warm place. The bacteria responsible for fermenting the vat will use up the oxygen in the bath, essentially performing the same task that the chemical would. When the liquid beneath the surface has turned yellow-green, the vat is ready.

DYE

Gently submerge your pre-soaked fiber in the bath, and move it around under the surface… be careful not to add oxygen back into the bath (avoid drips and vigorous swishing motions). Let the fiber sit in the bath for 10 minutes. Remove, gently squeezing excess liquid back into the dye bath as you raise the fiber out…

… and watch as your dye project turns from yellow-green to blue when it is exposed to air! Allow it to fully oxidize by hanging it up and making sure all portions are exposed. After 20 minutes or so, you can dip the skein again for a slightly darker shade, and repeat the process successively until the bath is exhausted. Alternatively, divide your fiber into two or three sections, and dip one after another to obtain a range of hues as the pigment in the bath is reduced.

This recipe was adapted from those published by Dorthy Miller (Indigo from Seed to Dye), Rita Buchanan (A Dyer’s Garden), and Rebecca Burgess (Harvesting Color). I highly recommend all of these resources in addition to hands-on experience!
If for some reason you do not get anything that looks like blue, maybe…

…you did not use fresh, mature leaves (unlikely, if you did the bruise-test and picked the leaves the same day).

…the leaves were harvested too late in the season, when cold winter temperatures have already begun.

…the bath overheated during the initial steaming, denaturing the indigo pigment.

…the bath was not alkaline enough (might happen if you are using tap water that is inherently acidic); check the pH and if it is below pH10, add a tad more baking soda or soda ash, wait a bit, and try again.

…the bath was not properly oxygenated; more time needs to be spent pouring the bath between buckets, then continue with the final steps.

…more Thiourea Dioxide or fermentation time is needed to convert the pigment to its water-soluble form; when ready, the bath will be yellowish green in color beneath the surface. A blue film may form on the surface, where indigo pigment is reacting to oxygen in the air.

… the Thiourea Dioxide used was too old. This chemical has a shelf life of around 1 year. If your dye bath does not turn yellow-green within 2 hours of adding the chemical, then this may be the case.

And finally, a general note on over-dyeing with Indigo:

Indigo can be combined with other natural dyes to create many exciting colors! This is done by dyeing your fabric or fiber with one color, and then over-dyeing it with another. If you are planning to combine indigo with a natural dye that requires a hot dye bath, remember: indigo pigment can denature under high temperatures. If you want to combine indigo with a natural dye such as Weld, which requires a heated bath, then dye your fabric or fiber with Weld first, and then over-dye it with indigo. In dyeing with the hot bath first, followed by the cool indigo bath, you will avoid possible frustration should the heated bath accidentally boil and denature your precious blue!