

Dyeing - the basics

Contributed by Sally Pointer

Sally Pointer explains how to make some successful first experiments in dyeing fabrics with natural ingredients.

Many plants will make a stain if they are crushed, just think how hard it is to get blackberry juice or grass stains off clothes after a day in the countryside, but relatively few plants produce a colour so strong and lasting to have made them popular as a dye across the centuries.

When you experiment with natural dyes it is a very good idea to try using any material that you know is not poisonous and which you can get in good quantities, but you will probably find that only a few of your experiments give you colours that you want to use over and over again. The point to doing this is that you get to learn a lot about how dyes work and you might be surprised at what interesting colours you can make with very ordinary ingredients including vegetable trimmings.

It's a very good idea always to wear gloves when handling plant materials and dyes, and always dye in areas with good ventilation, outdoors is the best if you think the dye-bath might be a bit smelly! Be very very careful to check that the plant you choose is not going to give you an allergic reaction. Some otherwise vicious plants such as nettles can give lovely colours if you handle them carefully, so take your time and do a bit of research first!

In the simplest experiments, cut up a big handful of your dye-plant and boil it up in a pan of water until the plant looks as though it has given all its colour to the water. Strain out the plant if you like and add a skein of yarn that has been mordanted (see the next section for details) and wetted. Boil the wool in the dye until you think it has taken on a good colour. This may take a few minutes or it may need to soak in the dye overnight after a good boiling. Remember that the wool will be much darker whilst it is wet with dye than it will be once you have rinsed it and let it dry.

When you are happy, take the yarn out of the dye using a stick or tongs and let the excess liquid drain back into the pan. Rinse the skein and hang it up to dry.

It's a good idea to save a sample of yarn from each dye-batch and carefully label it with the type of plant, the type of mordant and any other details that might be useful if you wanted to try to copy the result. Its often the case that a skein of yarn that didn't look very promising at first turns out to be just the right colour for some weaving or embroidery project later on.

Mordants

Although many plants will give a colour, in most cases the colour will wash straight out of the wool unless you treat it first to make the colour stick.

This is known as mordanting and there are several things that can be used.

Historically, stale urine was used a lot as a mordant. It is strongly alkali and also affects the final colour of several dyes. It is still a good one to use but not many people like working with it these days.

Alum is the simplest mordant to use at home. You only need tiny amounts and if you work carefully it is not dangerous. You can get alum in 100g packets from most chemists for about 50-60p, so it is also quite cheap. For most home dye-baths, you will need a teaspoonful of alum, and an old pan that won't get used for food again (try your local charity shop if you haven't got a spare pan!). Put the alum into the pan with lots of water and bring it to the boil. Make sure you have lots of ventilation so you don't breathe too much of the vapour. Add your skeins of wool and let the pan simmer for about 20 minutes. Lift out the skeins and either put them straight into your dye-bath or dry them off until you need them. If you dry them, you'll need to carefully wet them before you use them next.

Make sure you dispose of left over mordant carefully. Small amounts like this are not too bad but any quantity of mordant could have a very damaging effect on the environment.

Alum is generally a very good mordant to use because it doesn't change the original colour of the dye much. Other mordants can make a big difference to the final colour.

Copper sulphite (the blue crystals) will turn most yellow dyes green and can be a very useful way to get different colours. You can make a simple version of this mordant by soaking scraps of copper (a few pennies perhaps) in a jar of strong vinegar until it turns green. Add this to the dye-bath to get some colour changes, but be very careful that it's never left where anyone might try to drink it.

Ferrous sulphite (iron salts) can also make green colours but the end result is usually a 'sadder' shade. Think khaki instead of green to get the idea. It is very useful as a fixative for black dyes.

As this article is very brief I would suggest reading up on the uses of Copper or Iron sulphite before using it. If it is handled carefully it is quite safe but all chemicals can be dangerous and it's best to do your research first than be sorry later!

Some household chemicals such as washing soda and vinegar can also be used to change the acidity of the liquid used in dyeing. Some plants are very changeable and altering the pH of berry dyes in particular can be very impressive.

Dyeing - Yellow

Lots and lots of plants can be used to give yellow, but a few have stood out through the ages as being particularly good.

A perfect dye for your first go is onion skins. Just save the dark yellow skins from several onions until you are ready to use them and then boil them up in a saucepan with enough water to completely cover them until the water turns a very deep brownish yellow.

Strain out the onion skins and return the liquid to the pan. Add your skein of yarn or fibres (wet them first for best results) and gently boil them in the dye. The longer you leave them in the dye-bath, the stronger the colour will be.

Onion skins are especially good because they will work without a mordant (although the colour will last much longer if you use an alum mordant). When you feel the colour is strong enough, remove the skein from the dye and rinse in warm water until the water runs clear. Dry the skein and you're done!

Weld and Dyers Greenweed are two of the best plant yellows, and have been used for hundreds of years because they give strong colours that do not fade easily.

Weld is a plant that loves to grow on disturbed ground. Sites that have been recently built on are a good place to look for it (remember never to wander around active building sites though- they're very dangerous places) and it also really likes roadsides and sometimes sea cliffs. The whole plant gives yellow with an alum mordant and you can get some greens by using copper or iron mordants.

Dyer's Greenweed is no longer common in the wild but it can be grown without too much difficulty. The neat growing habit makes it a nice dyeplant to grow and it produces a very pure, clear yellow with alum. Like weld, it will give some greens with copper or iron mordants.

Both of these dyes can be dried for use later. Just hang up small bunches in a dark, airy place until they are dry, then store them away from light and damp until you want to use them.

Dyeing - Red and Orange

Historically, one of the most important red and orange dyes has been madder. Several plants in the same family have roots that give pink, red and orange dyes and remains of the plant have been found in the Viking age excavations at Coppergate in York.

Madder can be grown as can its relatives dyers woodruff and ladies bedstraw, but it is very rare in the wild these days. It can be bought quite easily from herbalists and dye suppliers.

Scientifically, madder is a very interesting dye. The colour in the root, known as alizarin, is developed by a special enzyme whilst it is being heated, and to get the best colour it is important that the madder is heated up very slowly and carefully. If you rush it, you have much less chance of getting a good red and you are more likely to get brickly oranges and peaches.

Even though it can be hard to know exactly what colour you will get with madder, I really like it as a dye. Just add a small handful to a pan of water and slowly slowly heat it up over a couple of hours. Strain out the dye (the chopped up root can be used again but will give pale peaches and pinks next time) and add yarn or wool that has been mordanted with alum. Keep the dye very hot but not boiling for as long as it takes for you to get a good colour.

The dye left in the pan will keep dyeing paler shades until it has completely run out, so its quite an economical dye to use, and very useful if you want a range of shades to use in weaving. It also reacts to different levels of acid or alkali in the water, so you could experiment with additions of lemon juice or washing soda in the dyebath to see what effect that has on the colour.

Madder will never give a perfect 'pillar box' red with mordants such as alum, though sometimes you can get pretty close. In the past, mordants like tin were used to get the brightest reds from madder, but tin is quite poisonous to work with and I don't suggest it for the beginner.

An insect known as cochineal also produces a bright red and purple, as does the kermes insect. In the past these dyes were very expensive and cochineal can still be bought today although kermes is very hard to get hold of.

Dyeing - Blue and Green

Blue is one of the hardest colours to get with natural dyes because so few plants produce it. The best known are woad, and indigo, which is still used to dye denim blue.

Woad can be very easily grown from seed, but be warned it can escape a little bit and you might find it all over the garden if it sets seed. In the first year it looks a bit like lettuce seedlings, but in its second year it shoots up and produces yellow flowers and black seedpods.

The dye is best made with the first year leaves, and you have to either ferment it in a strong alkali or chemically extract the colour to get blue. It is possible to get pink shades from woad as well, but the blue is the main goal when working with it.

It is beyond the scope of this little article to give extensive instructions for fermenting woad using natural alkalis such as stale urine, so all I'm going to do here is cover one way of chemically extracting the dye.

You need to take a big handful of fresh, first year woad leaves and rip them up into little pieces. Put them into a jug and pour very hot but not boiling water over them. Let this stew for a while to make a strong 'woad tea' before straining out the leaves and squeezing out all the juice. The 'tea' will be a brown colour. Next, add in, a bit at a time, a tiny bit of washing soda diluted in a little water and whisk it in until the tea turns dark green. The next part is the tricky bit, you need to heat the liquid very carefully until it reaches no more than 50° C. Now sprinkle on a very small amount of a chemical called sodium dithionite (its sometimes sold as 'Spectrolite' and another version is called 'Thiox'). This chemical removes oxygen from the dye-bath, and this is important because woad only binds to fibres in an anaerobic environment. The chemical will need about half an hour to work, in which time make sure the dye does not get stirred and keep a cover on it. When it is ready, it will have turned yellow.

To use the dye, make sure the wool is thoroughly wet, and carefully slide the skein into the dye. Leave it for a minute or two, then just as carefully slide the skein back out, letting the excess dye drain back without dripping.

The next part is magical to watch, as the air comes into contact with the dye it changes the colour from a pale yellow first to green and finally to blue. Let the skein dry out in the air before rinsing it. If it's not dark enough you can dunk it again in the dye-bath.

The dye-bath will keep producing blue until it runs out of pigment, and if the liquid turns green whilst you are dyeing it means that too much air has got in. Warm it gently again, give it a stir, then sprinkle on more sodium dithionite to remove the air again.

o get green, use wool that has already been dyed yellow. Traditionally, wool dyed with weld then woad was called 'Lincoln green'. And wool dyed with dyers greenweed then woad was called 'Kendal green'.

Natural and synthetic indigo powder can also be bought from dye suppliers and is used in exactly the same way. You mix it with warm water then start at the point where the washing soda was added. The colour of woad and indigo is chemically so close that archaeologists have trouble telling it apart on old textiles.

Dyeing - other colours

Purple can be obtained by dipping red into a woad dye, but quite a lot of berries such as blackberry or elderberry will give nice purples. Be warned though, the vast majority of vegetable or fruit dyes will fade with time especially if they are in strong light, so whilst they are a lot of fun to experiment with, they do not tend to be as lasting as dyes like woad and madder.

Historically, the very best purple came from the murex shellfish. The mollusc had to be crushed to extract the dye, which was processed much as woad was, by fermenting it in strong alkalis.

Black can be obtained by using oak galls and an iron mordant, although iron needs using carefully as in quantity it can weaken fibre.

Brown can be made with many barks and also plants such as heather. If you try using bark be careful not to damage trees when you harvest it, much better to use bark from wood that is going to be used as firewood.

Speaking of firewood, lichens were traditionally used to give a whole range of dyes, but they are under great threat in the wild and should never be collected. The exception to this is if you have firewood with lichens on, in which case it makes sense to try some experiments with bits salvaged from the blaze.

It's always worth considering the environmental effect of harvesting any potential dye plant. Often you can use material that would otherwise be destroyed by mowing, hedge trimming or gardening and leave the rarer wild specimens alone.

Sally Pointer's website offers a wealth of information on subjects from top to toe (literally - from pointy hats to making your own shoe lasts) as well as some wonderful things for sale handmade by Sally in Wales.