

# THE MAIWA GUIDE TO NATURAL DYES

WHAT THEY ARE AND HOW TO USE THEM

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WALNUT



NATURAL INDIGO



MADDER



TARA



SYMPLOCOS



SUMAC



SEQUOIA



MARIGOLD



SAFFLOWER



BUCKTHORN



MYROBALAN



KAMALA



LAC



LIVING BLUE  
INDIGO



HENNA



HIMALAYAN  
RHUBARB



GALLNUT



WELD



POMEGRANATE



LOGWOOD



CUTCH



CHAMOMILE



EASTERN BRAZILWOOD  
(SAPPANWOOD)



ALKANET



ONION SKINS



OSAGE



CHESTNUT



COCHINEAL



QUEBRACHO



EUPATORIUM



# NATURAL DYES

## WHAT THEY ARE AND HOW TO USE THEM

**Artisans have added colour to cloth for thousands of years. It is only recently (the first artificial dye was invented in 1857) that the textile industry has turned to synthetic dyes. Today, many craftspeople are rediscovering the joy of achieving colour through the use of renewable, non-toxic, natural sources.**

Natural dyes are inviting and satisfying to use. Most are familiar substances that will spark creative ideas and widen your view of the world. Try experimenting. Colour can be coaxed from many different sources. Once the cloth or fibre is prepared for dyeing it will soak up the colour, yielding a range of results from deep jewel-like tones to dusky heathers and pastels. Variations are easily achieved by manipulating any of the elements of dyeing.

The instructions below will take you through the application of the "classic" dyes: those dyes that artisans and guilds have used for centuries. You will also learn everything you need to experiment with garden dyes or wild harvesting. If you can measure ingredients and boil water you can dye with natural colour.

Maiwa is constantly researching natural dye use and we are confident that a full palette can be achieved through the use of safe, time honoured techniques and recipes.



*For the dyer, nothing matches the excitement of the first dip in the dyebath.*

**These instructions and more are available at [naturaldyes.ca](http://naturaldyes.ca).**

### SOME NOTES BEFORE BEGINNING...

- Learning to use natural dyes is like cooking with colour. And just like cooking, it takes practice and care. Don't rush the process. Attention to detail will give results you are proud to call your own.
- Always use clean non-reactive vessels: stainless steel, unchipped enamel, glass, or plastic. Iron or copper vessels can also be used but the metal will react with the dyebath. Iron will dull or "sadden" colours. Copper will tend to brighten them.
- Dyeing evenly is much more difficult with piece goods than with yarns. It is also much easier to dye protein fibres (wool, silk) than cellulose fibres (cotton, linen, hemp). For best results the beginner is well advised to start with wool or silk yarns.
- Dry all fibres out of direct sunlight.
- Read all instructions before beginning.
- Mixing dyes or mordants and overdyeing can result in that one desired shade. Experimentation pays off and adds an element of creativity to your dyeing. Keep records.
- All dyes are sensitive to water quality. In almost all cases soft water is preferable for washing, scouring, mordanting and dyeing. Rainwater or distilled water can also be used.
- Natural dyes are not recommended for synthetic fabrics or fibres.

### HEALTH AND SAFETY

The following guidelines will help ensure that dyeing is a fun, enjoyable activity:

- Wear a mask when working with powders such as calx, lye, or indigo. Gloves are recommended to protect against colourants, irritants, and solutions which might be acidic or basic. When mixing powders and water always add the powder to the water. Never add water to a measure of powder. Keep pots and utensils used for dyeing completely separate from items used for cooking. Clearly label all containers and substances. Store dyes and chemicals separately and away from foods. Hazardous substances such as lye should be in a locked cabinet. Be mindful of pets and children.
- Testing on a sample is recommended for all projects.
- Customers are responsible for dye and mordant choices and combinations. To the best of our knowledge all the information offered here is true and accurate, however, Maiwa Handprints Ltd. or its staff will not be held responsible for such advice. Dye recipes should be tested prior to all projects. Maiwa Handprints Ltd. will not be held responsible for cost of products and/or labour to produce finished projects.

## TESTING THE WATERS

The acidity or alkalinity of the water used for natural dyeing (both in the mordant bath and the dye bath) will affect the colour. Soft water is best for practically all natural dyes with the exception of madder, weld, logwood and brazilwood. These dyes develop better in hard water, containing calcium and magnesium salts.

For dyes that prefer hard water, calcium carbonate can be added in the form of finely ground chalk, or an antacid (Tum's, Rolaids) tablet. Also soda ash, household ammonia, or wood ash water can be added to push the pH up.

If local hard water needs to be made acidic, add vinegar, lemon juice or a few crystals of citric acid. Water that contains iron can be difficult to use for natural dyeing as it will not be possible to achieve clear, pure colours. In this case colours will be "saddened" that is, muted and darker. Some dyers, however, love the colours they achieve from their water that contains iron – and choose to use distilled water only when they want clear yellows.

At Maiwa we dye in our own studio in Vancouver, where we have soft, pH neutral water. But we also dye in many parts of the world

in which we work. We have learned, for the most part, to work with the water we have and learn recipes that are successful with that water. We have learned to achieve many stunning palettes with many varied water conditions. We will turn to distilled water only when absolutely necessary to achieve a certain colour.

Neutral (pH7) water should be used for rinsing and washing naturally dyed fibres and fabrics, otherwise there may be unwanted colour changes. A set of pH strips is a good way to test the water.



## ABOUT FIBRES AND CLOTH



For the dyer, the fibre world is divided into two types: animal (protein) fibres such as wool, hair, and silk; and plant (cellulose) fibres such as cotton, linen, ramie, and hemp. As mentioned earlier, yarns are the easiest to dye. Woven materials require care to get even coverage. A suitably large dyepot is very important.

Tightness of weave is also a consideration. Garments are the trickiest to dye. Watch out for synthetic stitching (it will not take on colour) and areas of wear or perspiration as they will dye unevenly. When using wools, care is required to avoid felting.

## MEASURES, RECORDS, WOF

### ALL MEASURES IN DYEING ARE BASED ON THE WEIGHT OF DRY MATERIAL TO BE DYED.

This is known as the Weight Of Fibre (WOF). WOF gives a convenient way to state how much dyestuff is needed for a given shade, regardless of whether the dyer wants to colour a few yarns or several metres of fabric. The weight of dyestuff is expressed as a percentage of WOF.

#### For example:

To dye a medium-red with madder, we would use 50% WOF.

Hence, if we had one pound of cotton (450 g) we would need a half-pound (225 g) of madder.

$$\begin{array}{l} \text{Weight of Fibre} \times \% = \text{Weight of Dyestuff (Dry)} \\ \text{(imperial)} \quad 1\text{lb} \times .5 = .5\text{lb (8 oz)} \\ \text{(metric)} \quad 450\text{ g} \times .5 = 225\text{ g} \end{array}$$

Alternatively, cochineal bugs only require 5% WOF for a medium shade. Hence, to dye the same amount of fibre we would need:

$$\begin{array}{l} \text{(imperial)} \quad 1\text{lb} \times .05 = .05\text{lb (1 oz)} \\ \text{(metric)} \quad 450\text{ g} \times .05 = 22.5\text{ g} \end{array}$$

Yarns, fibres, and fabrics are always weighed dry before scouring.

Keeping notes of the weight of fibre and how much dyestuff was used will help plan future projects - clipping a sample of dyed yarn beside the notes makes for a wonderful record.



## SCOUR THE CLOTH OR YARN

Yarns and fabrics need to be scoured before dyeing. Sourced items dye more evenly, the dye penetrates better, and dyed colours are more lightfast and washfast.

**Note:** Fabrics sold as “ready for dyeing” may not need scouring.



*A single length of cloth torn in two. Scoured on the right, not scoured on the left.*

### SUPPLIES:

**FOR COTTON** — Use soda ash & Synthrapol

**FOR SILK & WOOL** — Use orvus paste soap

### HOW TO:

#### SCOUR CELLULOSE FIBRES: COTTON, LINEN, HEMP, ETC.

- 1) Fill a large pot so that cloth or yarns are covered and not crowded.
- 2) For each 450g (1 pound) of goods add 10ml (2 tsp) Synthrapol and 20g (4 tsp) soda ash.
- 3) Simmer for approximately 1 hour. Cotton is full of wax, pectic substances, and oil, all of which must be removed. The resulting wash water may be yellow brown. Bleached white cotton yarns and fabrics may not need as long.
- 4) Allow fibre to cool down slowly and then rinse in warm water.

Fabrics marked PFD (Prepared for Dyeing) may only need a light scour or none at all (always test before omitting). To lightly scour fabrics (not yarns) you may use a top-loading washing machine. Use the above recipe and hot water.

### HOW TO:

#### SCOUR PROTEIN FIBRES: SILK, WOOL, HAIR, ETC.

- 1) Fill a large pot so that cloth or yarns are covered and not crowded.
- 2) For each 450g (1 pound) of goods add 5ml (1 tsp) orvus paste soap.
- 3) Heat gently to 60° C (140° F) for approximately 1 hour. Turn gently but do not agitate
- 4) Allow fibre to cool down slowly and then rinse in warm water.

Fabrics marked PFD (Prepared for Dyeing) may only need a light scour or none at all (always test before omitting). To lightly scour fabrics (not yarns) you may use a top-loading washing machine. Use the above recipe and warm water. To avoid felting do not agitate.





# MORDANTS, TANNINS & MODIFIERS

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Colourfast dyeing usually requires a mordant. Mordants are metallic salts that facilitate the bonding of the dyestuff to the fibre. Cellulose fibres also require a tannin in order to bond well. Tannins are not technically mordants (they are not metallic salts) but they are often included when speaking about the mordant process for cellulose fibres - as in, "mordanted with alum at 15% WOF and myrobalan at 5% WOF"

Some natural dye recipes still call for the use of heavy metal mordants such as chrome. Historically these were introduced during

the industrial revolution and we do not recommend them. Heavy metal mordants can be toxic, presenting real challenges for safe use and disposal. Moreover most colours obtained through the use of heavy metals may be obtained through overdyeing or variations in the dye procedure. For those who wish to obtain a mordant from plants, *Symplocos* is a natural bio-accumulator of alum.

Mordant procedures for protein and cellulose fibres are not interchangeable.

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## MORDANTS



### ALUM

*Potassium Aluminum Sulfate*

Potassium aluminum sulfate is the mordant most frequently used by dyers for protein (animal) and cellulose (plant) fibres and fabrics. It improves light and washfastness of all natural dyes and keeps colours clear. It is inexpensive and safe to use. This form of alum is refined from bauxite, the raw state of aluminum ore, and is free from the impurities (such as iron) some other alums may contain. Use at 15% WOF.



### ALUMINUM ACETATE

Aluminum acetate is often the preferred alum mordant for cellulose fibres and fabrics. It is refined from bauxite with acetic acid as a purifying agent. For this reason some dyes develop to a richer shade on cellulose when mordanted with aluminum acetate. Aluminum acetate is the recommended mordant when printing with natural dyes. It is more expensive and sometimes hard to find. Use at 5-8% WOF.



### ALUMINUM TRIFORMATE

Aluminum Triformate is a gentle cold temperature mordant for natural dyes on cellulose and protein fibres. In the world of natural dyeing this is an exciting addition to the mordants available. At Maiwa, we have been testing aluminum triformate with all our dye, tannin, and fibre recipes for over two years. We have run all samples through rigorous light-fast and wash-fast testing and our conclusions are that this is an excellent mordant for wool and silk as it does not require heat in the mordant stage - and yet it creates a strong bond between the mordant dyes and the fibre.

For a cold temperature mordant for cellulose fibres this is an easy one step mordant procedure. However, we have found the light-fastness is less across many natural dyes. This is increased by doing a tannin process before the aluminum triformate process.

At Maiwa, for all our natural dyeing of cellulose, we still prefer to use our workhorse cellulose mordant process of tannin then alum and soda ash or aluminum acetate with or without tannin first. We are most excited about being able to use aluminum triformate on proteins without heat. Use at 5-8% WOF.

### HOMEMADE ALUMINUM ACETATE



Aluminum acetate can be made from sodium acetate and potassium aluminum sulfate. Depending on the availability of these materials in your area, this can be cost effective.

To make enough aluminum acetate to mordant 1 kilo of fabric, combine in 3 litres of hot tap water:

- 150 g sodium acetate or calcium acetate
- 150 g potassium aluminum sulfate

This can be added to your mordant bath ([see the how-to section](#)).

## TANNINS

Tannin is used to assist the mordants of cellulose fibres and fabrics. Alum does not bond very well with cellulose fibres. However, tannin bonds well with cellulose and once treated with tannin, alum will combine with the tannin-fibre complex. Many dyestuffs contain tannin (black oak, pomegranate, cutch, fustic, oak gall etc.) and do not need an additional tannin.

Tannins can be clear or they can add colour to the fibre, and this is an important consideration when selecting a tannin. Experiment with different tannins and find the one that works best for the colours you like.

### Clear Tannins: “Gallic”

Gallnut, Tara, some Sumacs

### Yellow Tannins: “Ellagic”

Myrobalan, Pomegranate, Black Oak, Fustic

### Red-Brown Tannins: “Catechic”

Cutch, Mimosa, Quebracho, Tea leaves, and some Sumacs.

See the Natural Dye section for more information on each tannin.





## MODIFIERS



### CREAM OF TARTAR

Cream of tartar (potassium bitartrate) is a salt of tartaric acid. It is commonly obtained as a sediment produced in the wine-making process. Cream of tartar is an optional addition to the dyebath to soften wool, brighten shades, and point the colour of some dyes (it will move the fuschia of cochineal to a pure red). Cream of tartar works best with protein fibres but is seldom used with silk. It is not used with cellulose fibres. Use at 5-6% WOF.



### IRON *Ferrous sulfate*

Like alum, Iron is a metal mordant which will increase the fastness of any colour. Unlike alum however, It is far from neutral; making other dyes darker and richer. Iron will also “sadden” bright colours. It is most often used with cellulose fibres like cotton, linen, rayon and hemp and should be used with care on protein fibres as it can make them slightly hard or brittle. If used in the mordant process colour shifts are more distinct than if added while dyeing. Most dyers apply iron as a post-dye process. Iron should be used at 2-4% WOF. Above 4% may damage fibres.

1. Measure ferrous sulphate at 2% WOF. Dissolve in hot water. Add to kettle. Fill the kettle with enough hot water to fully cover the fibre when added.
2. Add wet, mordanted or dyed fibre,
3. Heat to 71 - 77°C (160 - 170°F) hold for 30 minutes.
4. Rinse well. Remember to thoroughly scrub a pot that has been used to iron mordant or it will contaminate the next dye.

### HOMEMADE FERROUS ACETATE

When printing with natural dyes, we recommend changing ferrous sulfate to ferrous acetate to avoid bleeding and ferrous transfer (the migration of iron).

- 5 g ferrous sulfate
- 100 ml vinegar
- 3 g lime (calcium hydroxide)

Combine the ingredients in a plastic container and stir well. If thickening is required, weigh the amount of ferrous acetate you wish to thicken and add 1% of guar gum.

Ferrous acetate needs to be fixed to the cloth. We use chalk (calcium carbonate) 50g in 5 litres of warm water. Once your goods that have been treated with ferrous acetate are fully dry, dip them into this solution. This solution may be kept and reused again and again. Generally you may refresh with 50 g of chalk after each 10 kg of fabric.





## HOW TO MORDANT SILK OR OTHER PROTEIN FIBRES

### STANDARD MORDANT RECIPE

- 1) Weigh the fibre dry, then scour.
- 2) Measure alum at 15% WOF
- 3) **OPTIONAL:** Measure cream of tartar at 6% WOF (see cream of tartar in the additive section above).
- 4) Dissolve the alum (and the optional cream of tartar) in very hot water in a non-reactive container.
- 5) Add the dissolved chemicals to the dye kettle with enough warm water 45°C (110°F) to cover the fibre when it is added - usually a 30:1 ratio of water to fibre. Stir well.
- 6) Add the scoured, wet fibre. Over 30-45 minutes bring the temperature up to 90° C (195°F) just under simmer for wool and 85°C (185°F) for silk. Rotate the yarn or fabric frequently so the alum is evenly distributed. Hold for one hour, gently turning the fibre regularly.
- 7) Let cool in the bath for 20 minutes.
- 8) Remove the fibre from the mordant bath. Rinse well in cool water and allow to hang evenly over a non-reactive rod (stainless steel, plastic) until it stops dripping. Store the yarn or cloth in a damp white cloth for 24-48 hours. Keep it damp during this entire period.
- 10) Once completely dry mordanted yarns and fabrics may be stored indefinitely.



## HOW TO MORDANT COTTON OR OTHER CELLULOSE FIBRES

Cellulose fibres can be fully dried and stored before dyeing. Fibres do not need to be re-mordanted between dyes. Once a fibre has been mordanted it can be dyed and then overdye without any further mordanting.

### INITIAL STEPS

- 1). Weigh the fibre dry, record the weight, then scour.
- 2). Choose your tannin.  
*The tannin bath must always be done first.*
- 3). Choose one of the alums from the mordant process below.

### THE TANNIN PROCESS

- 1) Measure tannin to the recommended WOF for the tannin you are using. Dissolve in hot water.
- 2) Fill the kettle with enough hot water 120°F - 140°F (48°C - 60°C) to cover the fibres.
- 3) Add your chosen tannin, stir.
- 4) Add the scoured, wet fibres.
- 5) Let soak for 1-2 hours. Stirring occasionally (cover kettle so it stays warm).
- 6) Remove the fibre and very gently rinse and wring – or spin out in a centrifuge (Spinnex), or the spin cycle of a washing machine. In order not to have to re-wet-out your fibres, do not allow fibre to dry before proceeding to the alum mordant.

You can let the fibres steep in the tannin bath for an additional 8-24 hours. Steeping may give deeper colours, but always test your fabric-water-pot combination when steeping for more than a couple of hours.



### THE MORDANT PROCESS

*Note: For more effective mordanting on fibres such as linen we mordant twice with alum. For example we will mordant once with alum at 15% WOF and then again with a fresh mordant bath of alum at 10% WOF. Or we will do a tannin/alum/alum mordant to achieve slightly richer colours.*

For the procedures below you do not “cook” the fibre. Begin with very hot tap water 48°C - 60°C (120°F - 140°F). It is not necessary to heat the bath again to maintain temperature.

#### ALUM (*Aluminum Potassium Sulfate*) \_\_\_\_\_

- 1) Fill the kettle with enough hot water 120°F - 140°F (48°C - 60°C) to cover the fibres. Stir.
- 2) Measure soda ash at 2% WOF. Dissolve in hot water and add to the kettle.
- 3) Measure alum at 15% WOF. Dissolve in hot water and add to the kettle.
- 4) Add wet fibre (already treated with tannin) to your kettle.
- 5) Let soak for 1-2 hours (cover the kettle so it stays warm).
- 6) Now the fibre may be: **a.** Rinsed and remordanted, **b.** Rinsed and dyed, **c.** Left to steep for an additional 8-24 hrs and then rinsed, **d.** Rinsed and dried to dye later.

#### ALUMINUM ACETATE \_\_\_\_\_

*Note: Some dyers omit the initial tannin process when using Aluminum Acetate. In our experience we have found keeping the tannin process results in superior lightfastness.*

*See our recipe for homemade alum acetate on pg. 5 under modifiers.*

- 1) Measure aluminum acetate at 8% WOF. Dissolve in hot water and add to the kettle.
- 2) Add wet fibre (already treated with tannin) to your kettle.
- 3) Fill the kettle with enough hot water 120°F - 140°F (48°C - 60°C) to cover the fibres. Stir.
- 4) Let soak for 1-2 hours (cover the kettle so it stays warm) or steep overnight.
- 5) Chalk (fix) the fibre. Aluminum acetate must be fixed prior to dyeing. In some cultures this is known as dunging (as cow dung is used, which is high in phosphates). To 5 litres of warm water add 50g of chalk (calcium carbonate). Fully wet the fibre and wring out. Rinse thoroughly after chalking. These solutions may be kept and refreshed after every 10kg of fibre.

As an alternative to chalking you may use 100g of wheat bran to 5 litres of warm water. The wheat bran needs to soak for about 30 minutes before adding your fibre. The wheat bran option is sometimes preferable for processes using thickened mordants. Rinse thoroughly afterwards.

- 6) Now the fibre may be: **a.** Dyed immediately, **b.** Dried completely for dyeing at a later date.



## ALUMINUM TRIFORMATE

**Note:** Aluminum triformate can be used to mordant both protein and cellulose fibres, and is the only cold mordant for protein.

- 1) Use 5 - 8% WOF. Dissolve powder in lukewarm tap water and add to a stainless steel or plastic bucket mordant bath. Fill the bath with enough water so that your fibre can move freely.
- 2) Leave completely submerged in the mordant bath for at least 8 to 24 hours - stirring occasionally. Squeeze out any air pockets and if necessary weigh down yarns or fabric with non-reactive items like glass mason jars or stainless steel bowls to avoid them coming above the surface.
- 3) Remove fibres from mordant bath, lightly rinse, dry completely, and proceed to dyeing.
- 4) When mordanting is complete your mordant bath can easily be disposed of down a household drain - it is now a weak alum/formic acid.

**Note:** Do not heat aluminum triformate as irritating fumes may develop and the mordant may be damaged.

### Instructions for using the GPL (grams per litre) method.

- 1) Use 20 grams of aluminum triformate per litre of room temperature water. Dissolve powder in small amount of lukewarm tap water and add to a stainless steel or plastic bucket mordant bath. You will need to make enough mordant bath so your fibres can be completely saturated. Squeeze out any air pockets in fabrics or yarns so your fibres can remain under the surface.
- 2) Fibre needs to be in the mordant 8 to 24 hours (we usually leave 24 hours). At all times fibre needs to be under the surface. Remove fibres from mordant bath, lightly rinse, dry completely, and proceed to dyeing.
- 3) This GPL mordant bath can be used over and over until there is no more liquid.



**Note:** Using tannin for cellulose, prior to aluminum triformate mordant, increases light fastness.

See page 9 for the tannin process.



# DYEING

Before beginning, keep in mind that dyes are not like paints: dyes combine with fibres to give character and personality, depth and texture. They do not produce a uniform, even, shade. It is these variations that give an added dimension and excitement to natural dyes. Like fine wines that change with the years to reflect the weather of the seasons, the conditions of the soil, and the tastes of the vintner; dyes will give slightly different shade each time they are used. They will alter when you change the dyeing conditions, mordants, colour pointers (such as cream of tartar and iron) and over dye. Experiment and play with this potential (keeping notes will help). Recipes for dyes are listed with each dyestuff.

## STANDARD PROCEDURE FOR DYEING

(Check the specific dyestuff for variations)

1. Measure your dyes.
2. Add hot tap water to your dye kettle. Add enough water so that the fibres can move freely (don't add the things to be dyed just yet!). If you don't add enough water you may get uneven colours, if you add too much water you will lower the concentration of your dyes.
3. Add your dyestuff to the dye kettle.
4. Wet out your yarns or cloth.
5. Add your scoured, mordanted, wetted yarns or cloth to your dye kettle.
6. Bring heat up slowly - the exact temperature will depend on the fibres you are dyeing and dye you are using. The temperature should be no higher than 85° C (185° F) for silk, 90° C° (195° F) for wool, and 93° C (200° F) for cottons, linen and hemp fibres. Some dyes (such as madder) will release different colourants at different temperatures, check the recipe of the dyestuff you are using.
7. Most dyes require that the temperature be held for 1 hour. During this time the materials to be dyed should be gently turned on a regular basis.
8. Turn off the heat and allow the dyebath to cool slowly.
9. Some colours will benefit from staying in the dyebath overnight - exceptions are most yellow dyes and logwood.
10. Remove items from the dyebath and rinse gently in cool water. Hang to dry out of direct sunlight.





## “DYE BAG” RAW DYESTUFF FOR YARN DYEING

Raw dyestuff may be challenging to remove from yarns after dyeing. To avoid this problem we recommend making a dye bag for the dye material. We use white, tightly-woven, polyester fabric to make a dye bag that will contain the dyestuff, yet leave plenty of room for the dye material to swell, release colourants, and move about. Form a bag to contain the measured dyestuff and close the opening securely. The entire bag is then immersed in the dyepot with the yarns. The fabric used to make the dye bag may be reused multiple times.

## ABOUT EXTRACTS

The dye colourant always needs to be extracted from host material (roots, barks, petals, or leaves). Usually this extraction happens in the dyebath, but sometimes (as with indigo, cutch, or any of the insect dyes) it is an entirely separate process.

We sell natural dyes as both raw materials and extracts. Extracts are very concentrated and so smaller amounts are needed compared to working with the raw material.

Our general philosophy is to work with dyes in their raw form. Working with raw materials increases your feeling for the material and gives you control over both process and colour.

## AFTER DYEING

Natural dyes will “set up” over time. Depending on the dyes used, maximum fastness is achieved by letting the cloth set for a period of one to two weeks before working with the cloth or washing it with soap. Here is what we recommend:

Directly after the dyeing process, gently wash in lukewarm water without soap. Allow to dry completely. During this wash you want to remove any dyestuff (powdered madder for example) and ensure the cloth or yarns are clean.

Then, after two weeks or more you can wash with lukewarm water and a PH neutral soap. Remember to store dyed fabrics and yarns out of direct sunlight.





# MAIWA'S FAMOUS NATURAL DYES

CREATING COLOUR NATURALLY

*For over 30 years*

MAIWA.COM



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# MAIWA'S NATURAL DYES & EXTRACTS

For dyeing we give the WOF as a range. There are a number of factors which will influence your final colour (such as fibre type) and so the range indicates what you might expect to use under normal conditions. Note that extracts are more concentrated than raw dye-stuff and you will seldom need to go higher than the WOF we recommend.



**ALKANET**  
*Alkanna tinctoria*

Dyer's alkanet is a very attractive purple colourant that is found in the roots of plants belonging to the borage family. It grows uncultivated throughout central Europe and extends to central Asia and North Africa. The extracted pigment is often used in cosmetics, soaps and pigments. The violet colourant from alkanet is not soluble in water. Before a dyebath is made the alkanet root must be soaked in a solution of alcohol and hot water – colourless rubbing alcohol or methylated spirits can be used (some dyers who do not like the smell of either of these solvents use vodka!). The colours produced on mordanted fabric and yarns are shades of grey, lavender and purple. The colours achieved are beautiful but have moderate light fastness.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%.

**DYEING:** Use dried alkanet at 75-100% WOF for a medium to dark depth of shade. First, soak the alkanet in alcohol (or methylated spirits) for several days to extract the colour. When the liquid has developed a strong colour, add enough water for the fibres to move freely in the solution. Add the mordanted fibres and gently heat this dyebath - no higher than 60°C (140°F) - until all the colour has been taken up.

**OPTIONS:** Adding iron to the dyebath at 2% WOF creates a range of greys and grey-violets.



**BUCKTHORN**  
*Rhamnus*

Buckthorn species such as *Rhamnus infectorius*, *R. amygdalinus*, and *R. oleodides* are native to the Middle East and the Mediterranean. The fruits of Buckthorn are also known as Persian berries and the juice of these unripe berries is historically used to make the pigment known as "sap green."

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%. The addition of 5% cream of tartar during mordanting will improve light fastness.

**DYEING:** Use buckthorn ground on mordanted fibre at 15% WOF, and buckthorn extract at 4-10% WOF for a medium depth of shade.



**CHESTNUT**  
*Castanea sativa*

Chestnut trees grow in many parts of the world and are a great source of tannins. They dye a warm brown colour. Chestnut is also well known for its ability to dye silk black with the addition of log-wood and an iron mordant.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%.

**DYEING:** Use extract on mordanted fibre at 5-10% WOF for a medium depth of shade.



**DYERS CHAMOMILE**  
*Anthemis tinctoria*

*Anthemis tinctoria* is part of the daisy family. It grows throughout North America, Europe and throughout the Himalaya region. It is often used in Turkish carpets for warm, strong yellows and is mixed with madder for tangerine colours. Chamomile is best on protein fibres with an alum mordant.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%.

**DYEING:** Use dried chamomile at 50-100% WOF for medium to strong warm yellows. First soak the chamomile in hot water for an hour. Add fibre and slowly bring the temperature up to about 80°C (180°F). Hold at temperature for about an hour.

**OPTIONS:** Adding madder to the dyebath gives some of the most beautiful tangerine colours.



**COCHINEAL**  
*Dactylopius coccus*

Cochineal is the most important of the insect dyes. The females of *Dactylopius coccus* colonize the prickly pear (nopal) cactus native to Mexico, Central and South America and the Canary Islands. Peru is currently the primary export country, shipping out over 4000 metric tons annually. This dye is a common additive to food, drugs and cosmetics. Cochineal has excellent light and washfastness and produces a powerful range of fuchsias, reds and purples. Although expensive, cochineal has a high concentration of carminic acid and only small amounts are needed.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%.

**DYEING WITH THE EXTRACT:** Use at 0.5 to 2% WOF for a medium depth of shade.

**DYEING WITH THE BUGS:** Only 3-8% WOF is needed for a medium depth of shade. The colourant is first extracted from the dried insects as follows: Gently grind the insects in a blender or use a mortar and pestle to crush them to a fine powder. Put this powder into a saucepan and cover with three inches of water. Boil for 30 minutes. Strain the liquid and set aside. Place the cochineal pulp back in the saucepan and again cover with water and boil for 30 minutes. Add this decanting to the first decanting. Repeat 2 more times. Some dyers will then keep the remaining pulp in a jar of water for several weeks and use it for future dyebaths.

The combined decantings are used to make a dyebath. Because Cochineal is sensitive to acids and bases soaps used to pre or post wash your fibres must have a neutral pH.

**OPTIONS:** If cream of tartar at 6% WOF is added to the alum mordanting bath or the dyebath, the colour achieved will be more towards Christmas red. With the addition of iron at 2-4% WOF to either the mordanting bath or the dye bath the colour will shift towards purple. Cochineal can be shifted to orange with the addition of an acid (citric) and to a deep fuschia with the addition of an alkaline (soda ash).



**CUTCH**  
*Acacia catechu*

This powder is an extract prepared from steeping the wood of the *Acacia catechu* tree in hot water until a syrupy liquid emerges. This is dried and then ground into powder. Cutch is common to most parts of India, Burma, Indonesia and Peru. Indian cutch is by far the most beautiful. It is a good source of colourfast shades of cinnamon, nutmeg, and clove. Cutch extract contains tannins as well as the dye component catechu. It is easily soluble in water. Cutch has excellent light and washfast properties.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose fibres either 1). Just use cutch alone at 15-30 or 2). For a deeper colour, use a clear tannin (like oak gall) and then alum at 15% and soda ash at 2% and then dye as below.

**DYEING WITH THE EXTRACT:** Use cutch at 15-30% WOF to dye a medium depth of shade. Completely dissolve the powdered cutch (it may be a little sticky) in boiling water and add it to dyebath.

**OPTIONS:** Deeper colours can be achieved by first soaking cutch extract in a weak mixture of caustic soda. Add 1 tsp lye or sodium hydroxide to 4 litres (1 gallon) of water. Soak for 1 hour. Then add more water and neutralize with acetic acid or vinegar to pH7. Add this neutral solution to the dyebath. Fibres are then added and the dyebath is kept at a low simmer for at least two hours. Cutch is not easily exhausted and dyebaths can be used multiple times for lighter shades.

An alum mordant yields toffee browns. The addition of iron at 2-4% WOF yields chocolate browns, while a 5% soda ash or calcium hydroxide rinse will redden the cutch colour. The addition of 2% WOF hydrogen peroxide during the final 15 minutes of dyeing will darken cutch considerably. Allowing the fibre to cool down and sit in the dyebath overnight will give the darkest shades.



**EASTERN BRAZILWOOD  
(SAPPANWOOD)**  
*Caesalpinia sappan*

Brazilwood is from the heartwood of trees of the genus *Caesalpinia*. Originally an old-world dye, the country of Brazil was named after the species *Caesalpinia echinata* found on Brazilian coastlines. Historically harvested (then overharvested) brazilwood is now protected.

Sappanwood *Caesalpinia sappan* is found throughout east Asia and is also known as Eastern Brazilwood. This wood is high in tannin and the colourant brazilian. The dyebath can be used multiple times for lighter colours and the wood chips can be dried for future use. Startling variations can be achieved (bright orange to blue red) when the pH level of the dye bath is manipulated. Fabrics dyed with brazilwood are fast to washing but somewhat fugitive to light.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%.

**DYEING:** Brazilwood develops best in slightly hard water. Adding finely ground chalk (or a Tum's tablet – 1 to each 4 liters of water) brightens the brazilwood colour, especially if there is no lime in the local water. Adding osage extract will yield rich warm reds

and iron will turn the fabric to a mulberry wine colour. A dip in indigo will produce purples. Change the pH level to an acid to get an orange red or use an alkaline (like soda ash) to get blue-red to brilliant purple.

**DYEING WITH THE EXTRACT:** the extract will produce lovely warm reds when dyed at a 2-5% WOF and deep crimson reds when dyed at 5-10%.

**DYEING WITH THE WOOD:** Use at 25-50% WOF. This dye takes time to be extracted - simmer of the wood chips for 1-3 hours and leave to cool overnight or longer (some dyers leave for days). Add fibre to bath and the first dyebath will produce a deep crimson red and the next dye bath can be used to achieve beautiful shades of pink and coral.



**EUPATORIUM**  
*Agertina adenophora*

This dyestuff comes from a genus of flowering plants in the aster family. *Ageratina adenophora* is known by many common names, including eupatory, sticky snakeroot, and crofton weed. *Eupatorium adenophorum* is a synonym. There are many species of the genus Eupatorium that contain colourants; interestingly, the 1882 bulletin of the Royal Gardens, Kew, records two species known as Paraguay indigo. Eupatorium gives soft egg-yolk yellows that range into oranges.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%.

**DYEING WITH THE EXTRACT:** Use at 10-15% WOF for a medium depth of shade.

**DYEING WITH THE GROUND LEAVES:** Use 20-30% WOF for a medium depth of shade.

**OPTIONS:** When used with an iron mordant eupatorium can give earthy moss greens, when overdyed with indigo it provides a satisfying range of yellow to blue-greens.



**FUSTIC EXTRACT**  
*Chlorophora tinctoria*

An extract prepared from the heartwood of a tree from the Mulberry family, *Chlorophora tinctoria*. Fustic produces a range of colours from daffodil yellow to deep gold to orange. When used as an underdye with indigo Fustic yields forest greens and teals. Fustic has a high light and washfastness and exposure to strong sunlight may actually darken colours.

**MORDANTING FOR YELLOWS & BROWNS:** Use alum mordant at 15% WOF for protein fibres and then, in a separate bath, use fustic (see below). For cellulose fibres either 1). Just use fustic alone at 2-4% or 2). For a deeper colour, use a clear tannin (like oak gall) and then alum at 15% and soda ash at 2% and then a separate fustic dyebath (see below).

**DYEING WITH THE EXTRACT:** Use at 4-6% WOF for a medium depth of shade. Keep the dyebath temperature at about 85°C (185°F) for wool and cotton and 77°C (170°F) for silk. At a higher temperatures the colour will turn to a dull brown yellow.

**OPTIONS:** With the addition of iron at 2-4% WOF fustic yields beautiful sage greens. By dyeing in a copper pot or adding clean copper pennies to the dyebath, clear yellows will emerge. When combined with madder or cochineal, fustic will give true reds, when mixed with logwood purple, fustic will give rich olive greens.



**GALLNUT**  
*Quercus infectoria*

Gallnut (oak gall) is used to mordant cellulose fibers and fabrics before an alum mordant. Gallnuts from oak trees are a rich source of natural clear tannin. A gallnut is produced by oak trees as a defense against parasitic wasps who deposit their eggs in small punctures they make on young branches. The tree excretes a tannin-rich substance that hardens and forms a gallnut. These are collected and ground to be used in dyeing.

**MORDANTING WITH THE EXTRACT:** Use at 6-8% WOF.

**MORDANTING WITH GROUND GALLNUTS:** Use at 10-15% WOF.



**HIMALAYAN RHUBARB**  
*Rheum emido*

Himalayan Rhubarb is a natural dye obtained from the roots of a mountain rhubarb variety that grows in the Himalayas. It gives deep golden tones varying from yellows to yellow-reds.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%.

**DYEING:** Use at 10-30% WOF for medium to dark depth of shade. Simmer mordanted fibres gently for 1 hour.





## HENNA

*Lawsonia inermis*

Henna leaves are harvested from the shrub *Lawsonia inermis*. The dye comes from leaves that are dried and ground into a powder. Henna produces a brown colour tending toward a red-orange on protein fibres. Henna bonds well with protein, hence it is used to dye skin (mendhi), hair, fingernails, leather, silk and wool. On cellulose fibres henna yields light yellow greens.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%.

**DYEING:** When using ground henna at 20-50% WOF on mordanted fibres, rich browns are achieved on protein fibres and “latte” like colours to soft greens on cellulose fibres. There is no need to make an extract, just add the powder directly to the dyebath. Simmer the fibres in the dyebath until the desired colour is obtained – approximately 1-2 hours.

**OPTIONS:** Iron at 2-4% can slightly enrich the brown colour. Altering the pH of the henna dyebath does not alter the colour.

**NOTE:** Spent henna pulp may be used as a reducing agent for an indigo vat (see our indigo instructions).



## INDIGO (NATURAL)

*Indigofera tinctoria*

Maiwa has a dedicated instruction sheet for indigo titled: “How to Dye With Indigo”. Natural indigo powder is an extract prepared from *Indigofera tinctoria*. Indigo is the legendary source of colour-fast blues. Its ability to produce a wide range of shades has made it the most successful dye plant ever known. Indigo grows all over the world but flourishes best in hot, sunny, humid areas. Indigo can give clear blues that range from the tint of a pale sky to a deep navy that is almost black. Maiwa’s indigo comes from a farm in south India and is very strong. It reduces beautifully in an indigo vat.



## KAMALA

*Mallotus philippinensis*

Kamala is a powdery substance obtained from the fruit of *Mallotus philippinensis*, a small evergreen that is also known as the monkey-face tree (because monkeys are said to rub their faces in the fruit). Kamala is found throughout tropical India. Kamala dye is very similar in behavior and colour to annatto. Kamala dyes golden yellows to tangerines with moderate lightfastness on cotton.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%.

**DYEING:** Kamala yields rich vibrant oranges at 20% WOF. Slightly deeper shades are obtained on protein fibres.

Kamala is not very soluble in water, so it is necessary to extract the colourant before dyeing. To extract with alcohol, soak the powder with twice its volume of isopropyl or ethyl alcohol. Let stand for 2 hours stirring occasionally. Add the alcohol/kamala mixture to the dyebath.

To extract with soda ash, mix the Kamala powder with half of its weight of soda ash in twice its volume of water. Let stand stirring occasionally. Add the entire mixture to the dyebath. After dyeing rinse first with a vinegar solution and then thoroughly with water. Kamala dyes a beautiful orange yellow on silk and wool. It dyes lighter yellow shades on cotton.

**OPTIONS:** When iron at 1-2% WOF is added deep moss greens are obtained. Over or under dyed with indigo produces forest greens.



## LAC EXTRACT

*Kerria lacca*

From the scale insect *Kerria lacca* found throughout India, south east Asia, Nepal, Burma, Bhutan and south China. Lac is found in the wild and is also cultivated. The female lac insects invade host trees and the insect secretes a resin that covers its colony. When harvested, the covering is broken off the branches and is known as stick lac. The resin is used to make shellac. The dye must be extracted from the stick lac before it can be used to colour cloth.

Lac extract yields crimsons to burgundy reds to deep purples. The colours are similar to those from cochineal but warmer, softer, and more muted. The lac dye has high light and washfastness on silk and wool. Only small quantities are needed for a medium depth of shade.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%. Note that lac extract has reduced light and washfastness on cellulose fibres.

**DYEING WITH THE EXTRACT:** Use at 5-10% WOF for a medium to dark depth of shade. Dissolve extract in water and simmer with fibre for 45 minutes, leave overnight for richest colours.

**OPTIONS:** Lac is very sensitive to pH. A beautiful red can be obtained by adding cream of tartar at 6% WOF. Alternatively, adding an alkali like soda ash will yield plum purples. The addition of iron at 1-2% WOF will give blackened purples.



## LOGWOOD

*Haematoxylum campechianum*

Logwood is the heartwood of *Haematoxylum campechianum*. Logwood yields deep, rich, red-purple to orchid blues and has been prized as a dyestuff since the 16th century. The logwood tree grows in Mexico, Central America, The Dominican Republic, Venezuela, Brazil, the Guyannas, Madagascar, and India. When mixed with iron, logwood gives good blacks – a colour difficult to achieve with natural dyes. Logwood has good washfastness but moderate lightfastness – a bit of iron improves the lightfastness dramatically.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%.

**DYEING WITH THE EXTRACT:** Use at 1-2% WOF for a medium shade.

**DYEING WITH THE WOOD:** Logwood chips will give a medium depth of shade at 10-15% WOF. Pour enough boiling water over the logwood to make a dyebath and soak overnight. Pour off this liquid and use for the first (and strongest) dyebath. Simmer fibres for about one hour, keeping the temperature between 77-83°C (170-180°F). If a darker colour is required leave fibres in dyebath overnight. The logwood chips can be soaked again and the liquid used for lighter shades.

Logwood develops best in slightly hard water. Adding finely ground chalk (or a Tum's tablet) brightens the logwood colour, especially if there is no lime in the local water. Cream of tartar can be added (at approximately 6% WOF) to push logwood to a purple-navy, adding osage or fustic gives grey-greens, cochineal gives purples, coffee bean browns are obtained by adding cutch, navy can be had with a dip in indigo, greys to blacks are made with the addition of iron.



## MADDER

*Rubia tinctorum, Rubia cordifolia*

We carry two types of madder *Rubia tinctorum* (Dyer's madder) and *Rubia cordifolia* (Indian madder). We also carry an extract named Madder Rich. Madder is one of the oldest known dyestuffs. It is used to produce turkey reds, mulberry, orange-red, and terracotta. In combination with other dyes madder can give crimson, purple, rust, browns, and near blacks. Madder is cultivated throughout India, south east Asia, Turkey, Europe, south China, parts of Africa, Australia and Japan. Madder is a complex dyestuff containing many colourants. By manipulating mordanting, pH, and temperature a range of shades can be obtained. There are many historic recipes including one from Turkey which brings out the purpurin from madder resulting in a purple.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%. For deep brick reds on cellulose choose the aluminum acetate at 8%.

**DYEING WITH THE EXTRACT:** Use at 3-8% WOF for a medium depth of shade. To achieve reds and avoid browns keep the dyebath under 180°F (82°C).

**DYEING WITH THE POWDERED ROOTS:** Madder is dyed at 35-100% WOF for a medium to dark depth of shade. Madder develops to its deepest and richest reds in hard water – water containing calcium and magnesium is ideal. If the water is soft add calcium carbonate (a single Tum's tablet to 4 litres of water works well). Add dye material to dye pot and cover with water. Bring up to about 60°C (140°F) and hold for an hour. Add fibres and continue cooking for another 1-2 hours.

*Rubia tinctorum* Alizarin is the primary dye molecule, it gives the famous warm Turkey red colour. Also present are munjistin, purpurin, and a multitude of yellows and browns. For clear reds of *Rubia tinctorum* do not let the temperature go above 72°C (160°F). At higher temperatures the browns of this madder plant come out and dull the colour.

*Rubia cordifolia* Munjistin is the primary dye molecule, it gives the famous reds found in Indian chintz and painted cottons. Also present in the roots are small quantities of alizarin, purpurin, as well as many yellows and browns. *Rubia cordifolia* is not as affected by high temperature. The madder dyebath can be reused two or three times for lighter shades.

**OPTIONS:** Madder, in combination with cochineal yields a true red, with iron yields garnet, bright orange with alum and cream of tartar, brick red with alum mordant and a higher heat (*cordifolia* only), the addition of acetic acid or vinegar plus iron will push the colour to a rich brownish-purple.

**NOTE:** Spent madder pulp may be used as a reducing agent for an indigo vat (see our indigo instructions).





## MARIGOLD

*Tagetes*

This dyestuff consists of dried and ground flower heads of the *Tagetes* species. It yields rich vibrant yellows, green-yellows and oranges with 20 -30% dried marigold to WOF. Marigold is cultivated all over the world for its decorative flowers, for religious festivals and for its colourant. Marigold has a moderate light and washfastness.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%.

**DYEING:** Use at 20-30% WOF for a medium depth of shade. Add the dried flowers to the dye pot, cover with water and simmer for half an hour to extract the colour. Strain the dye liquid and add to dye pot. Add fibres and simmer until the desired shade is achieved. With the addition of iron at 2% WOF warm olives can be made.



## MIMOSA EXTRACT

*Acacia mearnsii*

Acacias have been used as a source of tannins since the times of ancient Egypt. *Acacia nilotica* is also known as Egyptian Mimosa. Our Mimosa comes from *Acacia mearnsii* (also known as black wattle) it is cultivated extensively for this purpose and is one of the world's most important sources of vegetable tannin. It is heavily used in the leather tanning industry. Mimosa is a catechic or red-brown tannin like quebracho and cutch. It will impart a light peach colour when used as a tannin at the recommended strength of 8-10 % WOF.



## MYROBALAN

*Terminalia chebula*

This dyestuff consists of ground nuts of the *Terminalia chebula* tree. This tree grows in Nepal, India, Sri Lanka, Burma, Thailand, Indochina and south China. Myrobalan may be used in the mordant procedure or as a dye, giving a light buttery yellow. It is an important tannin for use on cotton in India and southeast Asia due to the light warm colour it imparts to the cloth. Myrobalan is a good foundation for overdyeing. It is also the perfect colour to lay down under a single indigo dip for teal. When used in the tannin procedure, myrobalan requires 15-20% WOF. If using to create a soft butter yellow use 20-30% WOF.

**MORDANTING FOR THE YELLOW COLOUR:** Use alum mordant at 15% WOF for protein fibres and in a separate bath use Myrobalan at 20% WOF. For cellulose fibres either 1). Just use myrobalan alone at 20-30 or 2). For a deeper yellow, use a clear tannin (like oak gall) and then alum at 15% and soda ash at 2% and then a separate myrobalan dye bath at 20-30%.

**DYEING:** Add myrobalan powder to the dye or mordant bath, bring bath up to 55°C (130°F) and then add fibre. Continue heating bath to a high simmer (approximately 83°C (180°F)) hold for one hour. Adding iron (2-4% WOF) to the bath will produce soft lichen greens to deep grey-greens. Over or underdyeing with indigo produces clear teal shadows.



## ONION SKINS

*Allium cepa*

Onion Skins are a nice introduction to natural dyes for novices, children, and those who delight in colour from kitchen waste. Onion skins give shades of clear maroon-brown to golden yellow on protein fibres and lighter equivalents on cellulose. To obtain satisfying colours from onion skins use at 20% WOF. Simmer for 1 hour, remove the skins and add your mordanted cloth. For a more thorough extraction simmer for an hour then let stand overnight before dyeing. Onions skins have medium fastness.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%.

**DYEING:** To obtain satisfying colours from onions skins use at 20% WOF. Simmer for 1 hour, remove the skins and add your mordanted cloth to the dyepot. For a more thorough extraction simmer for an hour then let stand overnight before dyeing. Onions skins have medium fastness.



## OSAGE ORANGE

*Maclura pomifera*

Osage Orange consists of the shredded wood of the tree *Maclura pomifera*. Osage contains a yellow dye similar to fustic and black oak and yields clear, true yellows to soft yellow greens that have a high light and wash fastness. It yields good depth of shade at 20-30% WOF. Osage grows throughout the south and central United States. The tree was originally planted to help with wind erosion, the wood was used to build fences and was hard enough for wagon wheels. Osage has overgrown many areas and is being cut down for firewood. Our supplier rescues these logs and chips them for us or soaks them in water and through a solar process extracts the liquid concentrate.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%.

**DYEING WITH THE EXTRACT:** The liquid extract may be added directly to the dyebath. Use at 5-8% WOF for a medium depth of shade. When using the extract, the yellow develops fairly quickly, leaving goods in the dyebath for extended periods of time will result in a duller colour.

**DYEING WITH THE WOOD:** When using the osage sawdust, use at 15-30% WOF for medium shade. Soak it in water for a few hours or overnight. When soaking is complete, bring this bath up to simmer and cook for an hour. Strain off the dye liquid and use for the dyepot. Add the fibre and simmer for about 45-60 minutes.

**OPTIONS:** Dyeing in a copper dyepot or adding a few clean copper pennies to the dyebath will brighten the yellow. Adding 2-4% iron to the dyebath will produce olive greens. Over or under dyeing with indigo yields bright emerald and leaf greens.



## POMEGRANATE

*Punica granatum*

An extract or a powder from the rinds of pomegranates *Punica granatum*, this dyestuff is high in tannin and improves the light and washfastness of any dye with which it is mixed. In India and south east Asia it is used as both a dye and in the mordant process. Pomegranate yields soft yellows to green-yellows when used as a dye.

**MORDANTING FOR THE BROWN COLOUR:** Use alum mordant at 15% WOF for protein fibres and, then in a separate bath use pomegranate (see below for WOF). For cellulose fibres either 1). Just use pomegranate alone at 15-20% or 2). For a deeper colour, use a clear tannin (like oak gall) and then alum at 15% and soda ash at 2% and then a separate pomegranate dyebath (see below for WOF).

**DYEING WITH THE EXTRACT:** Use at 5-8% WOF.

**DYEING WITH THE POWDERED RINDS:** Use at 15-20% WOF. Add to hot water, ensure it is thoroughly mixed and then add the fibre. Simmer for about 1 hour. If a darker colour is required leave in the dyebath overnight.

**OPTIONS:** When combined with iron, pomegranate yields yummy warm cement greys and deep moss greens. It is often mixed with the more fugitive turmeric dye to brighten the yellow and make it lightfast.



## QUEBRACHO

*Schinopsis quebracho-colorado*

This dye comes from a tree native to South America, which is very high in tannins. The dye can vary in colours from coral, warm red brown, yellow or green depending on the species.

**MORDANTING FOR THE BROWN COLOUR:** Use alum mordant at 15% WOF for protein fibres and then, in a separate bath, use quebracho (see below). For cellulose fibres either 1). Just use quebracho alone at 15% or 2). For a deeper colour, use a clear tannin (like oak gall) and then alum at 15% and soda ash at 2% and then a separate quebracho dyebath (see below).

**DYEING WITH THE EXTRACT:** Use extract on mordanted fibre at 5-10% WOF for a medium depth of shade.

**DYEING WITH POWDER:** Use 20-30% WOF for a medium depth of shade.

**OPTIONS:** To deepen the quebracho colours add an alkali or iron mordant.



## SAFFLOWER

*Carthamus tinctorius*

Safflower is an annual thistle. This plant is most known for the oil that can be derived from its seeds, however, the petals are a most magical dyestuff. Yellows, surprisingly sharp pinks, orange-reds, and corals can be extracted from safflower. Soaking petals in water at room temperature gives a yellow which can be collected and used to dye any mordanted natural fibre. Repeated soaking will exhaust the yellow at which point pinks may be obtained by "turning the bath" (drastically changing the pH to alkaline and then back to slightly acidic).



**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%.

**DYEING YELLOW:** Use 100-200% WOF for a medium to dark depth of shade. Put the safflower in cold water for a minimum of one hour. Use a pillow slip or make a bag of closely woven cloth that can fit the inside a large pot. Strain the safflower through this bag and gently squeeze. Set the liquid aside for dyeing. Repeat the procedure twice more, each time starting with fresh water and saving the yellow water.

Combine the water from the first three soakings in a dye kettle. Add mordanted fibre (protein or cellulose) and simmer with the extracted yellow dye for 45 minutes. Note: this is the only time heat is applied.

**DYEING PINK (CELLULOSE ONLY):** Start as above with 100-200% WOF – Repeat the soaking of safflower until the water has very little yellow. This may take an additional four or five soakings. Each time start with fresh water. You may discard the waste water after soaking.

After the final soaking, thoroughly squeeze the bag containing the safflower to eliminate as much water as possible. Drape this bag in a large pot and add 4 to 5 litres of water which you have turned to pH 11 through the addition of soda ash. (Use a pH meter or pH papers). Be careful as a pH above 11 will ruin the dye. After a minimum of one hour remove the bag and gently squeeze. Keep this now reddish water and turn it slightly acidic (pH 6) by adding an acid such as white vinegar. Now add your fibres (these do not need to be mordanted) to the bright red liquid and leave overnight. Note: There is no heating in the procedure to get pink.

Wool will not take the pink colourant.



### SEQUOIA

*Sequoia sempervirens*

Sequoia comes from Californian Coastal Redwoods. The dyestuff occurs in minute quantities in the seed cones, and only reaches useable quantities as a by-product of seed collection and reforestation programs. Sequoia yields rich purple browns when dyed at 15% WOF. Shades achieved are beautiful but with moderate light-fastness.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%.

**DYEING:** Use at 15% WOF for rich purple browns. The dyestuff may be added directly to the dyebath. Add dye material to dye pot and cover with water. Bring up to about 60°C (140°F) and hold for an hour. Add fibres and continue cooking for another 1-2 hours.



### SUMAC

*Rhus coriaria*

Sumac is a small tannin-rich tree which was used by many of North America's indigenous peoples to obtain a variety of browns and blacks. D. Cardon relates a process from 1881 that included a sumac extraction, bloodroot and roasted ochres, to achieve a deep black on wool. Sumac is often used as an alternative to other tannins and its use in combination with iron will give a grey with a slightly pinkish nuance. Sumac can also be used on its own as a dye. No other tannin is needed. Use at 20% WOF.

**MORDANTING FOR THE LIGHT BROWN COLOUR:** Use alum mordant at 15% WOF for protein fibres and then, in a separate bath, use sumac at 20% WOF. For cellulose fibres either 1). Just use sumac alone at 20% or 2). For a deeper colour, use a clear tannin (like oak gall) and then alum at 15% and soda ash at 2% and then a separate sumac dyebath at 20% WOF.



### SYMPLOCOS

*Symplocos racemosa*

Symplocos is a bio-accumulator of aluminum. The leaves naturally store alum and so by harvesting the plant, drying and grinding the leaves, dyers can access an organic supply of this important mordant. Our symplocos is obtained through the Babali Foundation ([plantmordant.org](http://plantmordant.org)) a group dedicated to preservation of the plant and cultural ecosystems. Maiwa has a separate instruction sheet for symplocos.



### TANNIN BLEND

*Ground quebracho and sumac blend*

Tannin is used to assist the mordants of cellulose fibres and fabrics. Alum does not bond with cellulose fibres as well as it does with protein fibres. However, tannin bonds well with cellulose. and once treated with tannin, alum will combine with the tannin-fibre complex. Many dyestuffs contain tannin (black oak, pomegranate, cutch, fustic, etc) and do not need an additional tannin.

This is a blend of tannins mainly composed of quebracho and sumac. It will leave a very light red-brown colour on cloth. Use at 10-20% WOF as part of the mordanting procedure.



**TARA EXTRACT**  
*Caesalpinia spinosa*

*Caesalpinia spinosa*, commonly known as tara, is a small and thorny tree with red pods that grows in the dry areas of Peru. It belongs to the pyrogallol group. In its natural state, the concentration of tannins is 35-55%. After the extraction process, the content may increase to 72-75%.

This vegetable tannin is used in the leather industry to obtain very bright and light-colored leathers. It does not oxidize easily thanks to its low content of free gallic acid. Tara powder is also used in the fabric printing process, as a mordant, and to make dyes using ferric salts. It is often used for vegetable tanned leathers that need to be light-resistant. Use at 15% WOF.



**WALNUT**  
*Juglans nigra*

Walnut (Eastern Black Walnut) *Juglans nigra*. This dyestuff is obtained from the bark of the tree and also from the green husks of the fruit. Domonique Cardon has called walnuts “great living laboratories of dye production.” Walnut is a substantive dye and can be used without a mordant. It can be used alone to produce warm deep taupes or to give extra depth in combination with other dyes.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres and cellulose fibres (there is enough tannin in walnut that mordanting with tannin is not required).

**DYEING:** Maiwa carries dried walnut husks and powdered walnut husks. Each can be used at 30-50% WOF for a medium depth of shade.

**OPTIONS:** Historically walnut has been used with madder (both *rubia cordifolia* and *rubia tinctorum*) to produce mahogonies. Walnut responds well to over dyeing with iron producing rich grey/browns.



**WELD**  
*Ruseda luteola*

*Reseda Luteola* is also known as Dyers Weld, Dyers Rocket, and Dyers Mignonette. It produces an excellent light and washfast yellow and is a strong clear yellow to combine with indigo for emerald and leaf greens. Traditionally cultivated throughout Europe as a yellow dyeplant it still flourishes on embankments or beside railways and roads. Weld gives strong intense yellows which are clear and bright.

**MORDANTING:** Use alum mordant at 15% WOF for protein fibres. For cellulose, first mordant with tannin at 8% WOF, then either 1). Use alum at 15% with soda ash at 2% or 2). Use aluminum acetate at 8%.

**DYEING WITH THE EXTRACT:** Use at 4-6% WOF for a medium depth of shade.

**DYEING WITH THE PLANT MATTER:** Use at 20-30% WOF for a medium depth of shade. Pour boiling water over the plant material and allow to stand overnight. Add more water and bring the pot to a simmer but not more than 160 F as too high a temperature will dull the yellow. Strain off the dye liquor into the dye-bath. The plant material can be reused two or three times for light shades. Add the fibre to the dye bath and simmer below 160 F for about one hour.

Weld develops best in slightly hard water. Adding finely ground chalk (or a Tum's tablet - 1 to each 4 litres of water) brightens the weld colour, especially if there is no lime in the local water.

**OPTIONS:** The strength of weld makes it a good choice for over dyeing with indigo to obtain teals and greens.

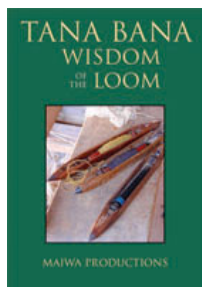
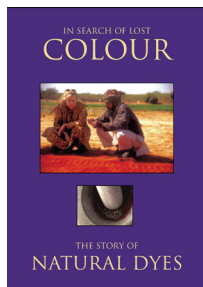


**WOAD**  
*Isatis tinctoria*

Woad is the common name of *Isatis tinctoria*. In Medieval Europe it was the only source of blue dye for textiles. The leaves of the woad plant contain the same dye molecule as *Indigofera tinctoria*, although in much weaker concentration. This makes colouring with woad a more subtle and delicate art. The same recipes used for indigo may be used for woad. The shades obtained from woad are slightly different and call to mind the areas where it was most popular - the south of France.

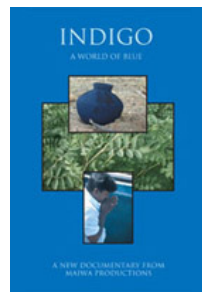
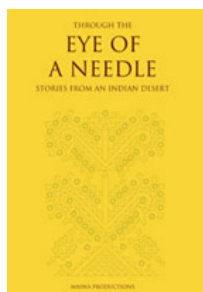


## MAIWA DOCUMENTARIES



**IN SEARCH OF LOST COLOUR** travels the world to document the growing, harvesting, extraction and use of natural dyes. From the Bogolanfini mudprinting of Mali to the madder-root of Turkey, from the cochineal insect to the rare shellfish purple, this documentary provides a look at some of the most exotic colours in existence. In many areas the use of natural dyes is perilously close to extinction - and yet traditional techniques and cultures often use processes which are environmentally sound and economically beneficial. Join us for an unforgettable exploration into the history of colour and its use. 90 minutes.

**TANA BANA** is our second feature-length documentary film on craft. Here you will find works of great beauty and skill, ingenious variations, and delicate figures. Shot in rural locations in Africa, Laos, Indonesia, India, and Pakistan, this documentary takes you to the world of looms, weaves, and artisans. 60 min.

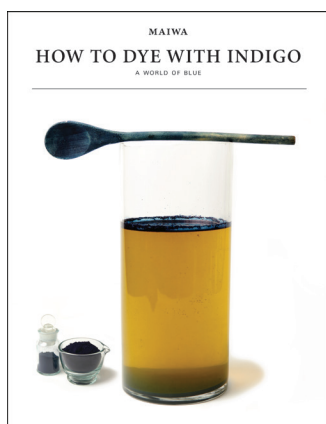


**THROUGH THE EYE OF A NEEDLE** is the story of a unique group of craftswomen. Follow their journey as they return to creating the world-class embroidery that made their ancestors famous. The incredible stories of the women from the KMVS co-operative are recorded here through video, song, laughter, and stitch. 30 min.

**INDIGO A WORLD OF BLUE** shot on location in southern India, Sindh, Pakistan; the Vientiane District of Laos; the island of Sumba, Indonesia; Yogyakarta, Indonesia, village Dhamadka, India; and Suleymanköy, Turkey, Featuring renowned indigo scholar Jenny Balfour-Paul speaking about indigo history, traditions, superstitions and lore. 60 min.

Trailers and downloads are available online at [www.maiwa.com](http://www.maiwa.com)

## MAIWA INFO SHEETS



### HOW TO DYE WITH INDIGO

Co-authored with Michel Garcia, this info sheet presents a number of options for reducing agents from fruit to other dyes such as henna.

**FREE ONLINE:**  
[maiwa.com](http://maiwa.com)  
[naturaldyes.ca](http://naturaldyes.ca)

## SOME NATURAL DYE REFERENCES

### NATURAL DYES:

#### SOURCES, TRADITION, TECHNOLOGY AND SCIENCE

*By Dominique Cardon*

#### KOEKBOYA: NATURAL DYES AND TEXTILES: A COLOUR JOURNEY FROM TURKEY TO INDIA AND BEYOND

*By Harald Böhmer with Charlotte Kwon (of Maiwa)*

#### THE ART AND SCIENCE OF NATURAL DYES

*By Joy Boutrup and Catharine Ellis*

#### INDIGO

*By Jenny Balfour-Paul*

#### ECO COLOUR

*By India Flint*

#### WILD COLOUR

*by Jenny Dean*

### Maiwa's Natural Dyes

[naturaldyes.ca](http://naturaldyes.ca)

### Everything for the Textile Arts

[maiwa.com](http://maiwa.com)

### Maiwa School of Textiles

[maiwa.teachable.com](http://maiwa.teachable.com)

Customers are responsible for dye and paint choices and recommendations. Maiwa staff do their best to assist customers in estimating quantities, procedures and products. Maiwa Handprints Ltd. or its staff will not be held responsible for such advice. Dye recipes should be tested prior to all projects. Maiwa Handprints Ltd. will not be held responsible for cost of products and/or labour to produce finished projects. Instructions are available free with each product purchased, please ensure you read and understood them before beginning. 38.

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