

INTRODUCTION TO BOTANICAL DYES



Natural vs Chemical Dye

Natural dyes are biotic; they come from living things. Most dyes are plants but there are many fungi and a few animals that are used in natural dyeing as well. Chemical dyes are all byproducts of the petroleum industry which uses non-renewable raw materials. Natural dyeing uses non-toxic materials whereas chemical dyes use harsh chemicals that may require special disposal techniques. Natural dyes are sustainable, renewable and are easily grown in your own garden.

A Brief History of Natural Dyes

Archaeologists have found evidence of textile dyeing dating back to the Neolithic period. In China, dyeing with plants, barks, and insects has been traced back more than 5,000 years. Color has been an easy way to identify belonging to a community, signifying social standing or marking rituals. Think of royalty wearing purple, funeral goers wearing black, war-time uniforms, school or athletic team “colors”.

The discovery of chemical dyes in the mid-19th century excited the textile community. Chemical dyes could be produced in large quantities, were easier to use, and could be used on synthetic fibers as well. Although many fiber artists continued to use natural dyes, commercial textile production embraced the use of chemical dyes.

In the early 21st century, the market for natural dyes has been making a come-back. Consumers are more concerned about the health and environmental impact of chemical dyes, which require the use of toxic fossil fuel by-products for production. Natural dyeing is non-toxic and can produce colors that cannot be achieved with chemical dyes. Dye gardens are becoming quite popular with textile artists and gardeners alike.

General Guidelines for Dyeing with Botanicals

Basic Equipment

1. A few large stock pots, ideally stainless steel
2. Strainer or colander
3. Tongs
4. Spoons
5. Kitchen scale accurate to 1 g
6. Thermometer
7. pH paper

8. Heat source
9. pH neutral soap
10. Gloves

Preparing Fiber for Dyeing

Any natural fiber can be used for natural dyeing. Fibers are divided into two types; **cellulose**: cotton, linen, bamboo, hemp, and **protein**: wool and silk. All fibers should be washed before dyeing and some fibers require a more thorough cleaning called **scouring** (boiling in washing soda). Fibers labeled RTD or PFD have been prepared for dyeing and only need a normal machine washing.

Most dyes also require the application of a **mordant** to the fiber before dyeing. A mordant is a mineral salt that helps the dye to make a stronger bond with the fiber. The most common one is **Aluminum potassium sulfate** or Alum (which can be purchased in the pickling section of the grocery store). The two types of fiber require different mordants.

You need to know the dry weight of your fiber to determine quantities of mordant or dye.

MORDANT TYPES AND AMOUNTS

Fiber	Protein	Cellulose
mordant	Alum	Aluminum acetate
amount	10% WOF	8% WOF
use	In a hot bath for 30 minutes	In a cold bath 12 hours

***WOF means the weight of dry fiber**

Once your fiber has been mordanted you can use it right away or save it for later, just make sure to label it if you aren't using it right away because it will not look or feel different than your unmordanted fiber.

Preparing the Dye bath

Pick your plants and depending on what part of the plant is used, remove that from the whole plant. You can use the plant material fresh or dried and each plant will have recommendations for how much to use depending on how much fiber you are dyeing but a good rule of thumb for any fresh material is 100% WOF. Don't forget to weigh your plant material before putting it in the pot!

Once you are ready to dye put the plant material in a large stainless steel pot and add water. Bring the temperature up gradually and keep it at a simmer (160-175 F or 71-80 C) for 30 to 60 minutes. You can then strain off the plant material and put the dye liquid back in the pot.

Dyeing the Fiber

All fiber should be **wetted out** before dyeing, this simply means soaking in water until it is completely wet. Wool and raw silk take longer to wet out than other fibers. Put the wetted out fiber in the pot and add water as needed to cover the fiber (the

amount of water does not matter). Bring the temperature up to simmer and keep it there for 30 to 60 minutes. You can leave the fiber in the pot until it comes to room temperature. Once it's cool take it out and place on a drying rack to dry. You can then gently wash with a pH neutral soap and rinse until rinse water is clear.

Dye Plants to Grow in Your Garden

PLANT	PART OF PLANT	COLOR	% dry material needed	notes
Weld <i>Reseda luteola</i>	leaves, flowers	Brilliant yellow	50%	Add an alkaline if your water is acidic
Madder <i>Rubia tinctorum</i>	roots	Red, orange, pink	35-100%	Alkaline pH for red, neutral or acidic pH for orange. Dry roots. Don't go above 160 F
Dyer's coreopsis <i>Coreopsis tinctorum</i>	flowers	orange	50-100	
Dyer's chamomile <i>Anthemis tinctoria</i>	flowers	yellow	50-100	
Goldenrod <i>Solidago species</i>	flowers	yellow	100	
Black walnut <i>Juglans nigra</i>	Nut with husk	brown	1 nut for each 100 g	Harvest just after nut falls from tree, store in freezer
Coneflower, Black-eyed-Susan <i>Rudbeckia species</i>	flower	yellow-green		
Rhubarb <i>Rheum species</i>	Roots and leaves	yellow-green		
Lady's bedstraw <i>Gallium verum</i>	roots	Pink, purple	100-200% WOF	
Safflower <i>Carthamus tinctorius</i>	flowers	Yellow to pink	100% WOF	Very pH sensitive
Marigold <i>Tagetes species</i>	flowers	yellow	100% WOF	
Onion <i>Allium cepa</i>	Outer skin	yellow-orange	50% WOF	

Hollyhock <i>Alcea rosea</i>	flowers	pink-red	100% WOF	Cold dye, not very lightfast
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These are the general instructions for any natural dye and as you experiment and research you will find out that each dye has its own personality and may do better fresh or dried, need a slightly lower or higher pH or may benefit from a post dye modification to improve its lightfastness. Here is a list of resources that will help you on your journey.

Local Supplier of materials and books

- Earth Guild 33 Haywood St, Asheville, NC 28801
- Natural Dye Study Group, 4th Sunday of the month at Local Cloth, Asheville. Register [here](#)

Books

- The Art and Science of Natural Dyes, Joy Botrup and Catherine Ellis. Shiffer 978-0-7643-5633-9
- Wild Color, Jenny Dean. Mitchell Beazley 1-84000-084-8
- The Modern Natural Dyer, Kristine Vejar. 78-1-61769-175-1
- The Art and Craft of Natural Dye, JN Liles. Tennessee Press 978-0-87049-670-7
- Natural dyes: Sources, Traditions, Technology and Science, Dominique Cardon 978190498200

Online resources and suppliers

- botanicalcolors.com
- maiwa.com
- Grahamkeegan.com
- wildcolours.co.uk