The Palmetto

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Natural Dyes
from Florida Native Plants

by Elizabeth Smith (drawings by the author)

Red maple (*Acer rubrum*) dyes wool a golden tan.

Use of dyes may have all started when early men and women noticed the berry stains on their fingers, and went from there to experiment with adding color to their daily lives. However it may have started, we do know that the first recorded mention of dying and dyeshops appears in a Chinese chronology dated 3000 B.C.

Using natural materials to dye fabrics appealed to me, and I decided to research our native plants to learn which berries, leaves, flowers, or barks would yield dyes. Being an amateur at both dyeing and botany, I searched for boods, looking to history for related European plants, records of early American settlers, Indians --- anything that mentioned color from native plant material.

We know the ancient civilizations in India, Japan, and Egypt had dye industries using plants, insects, and sea creatures to color their handicrafts. The Egyptians were known to have used another important improvement - a substance called a mordant that helped the dye color become permanent. Natural fibers such as wool, silk, and cotton have the property of holding certain chemicals called mordants in their fibers, which then form an insoluble compound with the dye to improve colorfastness.

Throughout Europe, records reflect that dyeing was mainly a trial-and-error process, until scientists and publishers put together a manual for the dye industry.

The American Indians did not leave written records about the native berries and plants they used. We know of some general materials passed down through generations, but little is known of localized knowledge, especially from the east.

The North American settlers continued to use European methods and imported dye products even when they became quite expensive. There were several efforts to grow dyestuffs in colonial America as a commercial crop but they did not succeed. Little is written about the colonial dye materials and processes except those based on traditional European methods. Our knowledge of early experiments with native materials comes mainly from personal papers, family traditions, and recipes passed down from generation to generation.

We would all still be wearing the soft muted colors of natural dyeing if William Henry Perkins had not been experimenting with coal tar in 1856. From this he produced aniline, and from aniline he produced a lavender dye, a color that created excitement in England and spread to the rest of the Europe and eventually to North America. It was said that Queen Victoria wore a "mauve" (the new color!) dress at the Great Exhibition of 1862. Aniline dyes became the standard - the colors were predictable compared to natural dyes, which were often shaped by environmental factors, and offered a wide range of colors not obtainable from natural sources.

Rouge plant (*Raniva humilis*) dyes wool and silk orange.

Natural dyeing survived in the rural areas of America, but died out for commercial use by the end of the 19th

century. Germany led the way in the chemical manufacture of dyestuffs from aniline until World War 1, when a "dye famine" spurred America to compete in the business of large scale dye manufacture. During the shortage, however, the use of natural dyes revived for a time, then lapsed back into the hands of local craftsmen and artists.

One of the reasons natural dyeing has survived is the very reason commercial dyers have rejected them they are impossible to standardize. Natural dyestuffs produce unique colors that may vary widely from dye lot to dye lot. Each plant has subtle differences - live oak twigs from one area may produce a gray color, from another area, a rose color. The soil, weather conditions, and other elements that make up different habitats will cause variations in the dye color. Add to that the miscellaneous lichens, insects, and galls that you may have gathered with the plants and that color changes again.

I had decided to limit my experiments to plants, saving the insects and sea creatures for hardier experimenters, so the next step was to track down the plants and recipes I would need.

After amassing a list of the possible plants native to Florida that had related plants mentioned throughout history, or which seemed to be likely candidates, I was ready to learn how to do the actual process.

First, I needed to decide which mordants should be used to make the dyes colorfast. Certain mordants work best on certain materials wool and silk color best when metallic salts such as alum, chrome, iron, or tin are used. Cotton or vegetable fibers combine best with tannic acid. I selected wool and cotton ply yarns for the first attempts, and later had a chance to use a woven silk fabric.

I chose two mordants that are readily available to me - alum (sold in many food stores) and iron or copperas (sold through a pharmacy). Others are available through chemical supply houses or specialty mail order. Alum is aluminum potassium sulphate and is commonly used with cream of tartar (also from food stores), which acts as a "helper" and also brightens the colors. The iron comes in a form called copperas and is ferrous sulphate. In the old days, the iron dye pot acted as the mordant! Iron will darken or "sadden" colors, often producing grayer or cooler tones.

The recipes say that mordants may be

Live oak (*Quesrcus virginiana*) dyes wool a dusty rose or dark gray, depending on the mordant.

amounts of bark, flowers, and so on, but I decided to follow the basic formula and experiment on my own. For specific and exact recipes (including temperatures), an excellent book *is Dyes From Your Garden* by Bernice Gillette Conner, a recent softcover publication listing her experiments with many Florida plant materials of exotic and native species.

Some of the basic rules of home dyeing are based on common sense: be aware of any toxic plant materials (use with care or not at all); be aware of the poisonous nature of some mordants (store separately from food items and label correctly).

Using a dye recipe is like using any other recipe. A good cook knows to gather equipment and assemble ingredients before starting to cook.. Use non-metallic pots and utensils, as the metals may affect the desired dye color. I use a canning kettle of enameled

Pokeberry (Phytolacca americana) colors wool a deep rose.

porcelain, wooden spoons for stirring and lifting, and plastic measuring spoons for the mordants. Be sure to keep pots and all utensils used for dyeing separate from other cooking containers and tell your family not to use them for any sort of food preparation. Some purists use only distilled water because rain water may contain minerals and tap water has chemical additives that will affect the color. I believe early dyers used whatever water was available, and feel that tap water does not add an amount of chemicals that would severely distort the colors.

If you do the dyeing indoors, be alert for noxious odors and provide plenty of ventilation. Most of the dye baths I tested required about one quart of plant material (leaves, flowers, roots, berries, twigs, or chopped bark) to 2 gallons of water to dye approximately 2 ounces of yarn. These were simmered together until the color was released, from 20 minutes to an hour. Intensity of color could be regulated by adding more dye material or more water, also by the length of time the fabric or fibers are left in the dye bath. Fibers or fabrics should always be wet before immersing in the dye bath to enable the color to be absorbed evenly.

You may want to strain the plant material from the dye bath first. I use a colander to strain bark and twigs, and an old dishcloth for flowerheads, small stems, and leaves. Pour the dye bath back into the pot and add the wet fabric or fibers, continue to simmer gently, never crowding or squeezing.

I found most materials took about 30 minutes to reach the desired color. Before removing the fabric from the bath, pinch some of the water out of the fibers; this shows the color closest to the final result after rinsing and drying.

Rinse thoroughly until the water runs clear, and then hang out of direct sunlight to dry. I have color samples from eight years ago that still retain the same hues. These were not exposed to our bright Florida sun, though, but even our best synthetic dyes don't always stand up to that!

Most natural dyes are soft shades that reflect the natural world around us - greens, yellows, and browns of all

Beach sunflower (helianthus debilis) colors wool pale greenish-beige or tan with different mordants.

shades; gray, rose, and peach tones. The colors derived from berries tend to be the most fleeting - over time the colors mellow into softer and paler versions of the originals.

My dye samples were made from native plants in my backyard or cultivated species throughout the neighborhood. Friends shared berries, walnut husks, and Spanish moss for ex-perimenting. Some plants brought forth amazing colors, while some that I had high hopes for (such as beautyberry) were duds.

I had the best results with 100% virgin wool needlepoint yam in an off-white unbleached color. I tried the same dyes and mordants on cotton *knitting ply* and usually got paler versions of the wool color. The silk was "China" silk given to me by a friend. Silk yielded the same tones as those on the wool, sometimes with a slight variation. Finding pure fibers is not easy. Those that I used were available without having to order specialty items from a hobby or weaving source.

Wool dyes to a golden yellow with *Coreopsis*.

ABOUT THE AUTHOR: Elizabeth Smith is not an expert on dyes or native plants, but enjoys fabrics, fibers, and the native plants in her garden. Her ex-perimentation with native dyes is ongoing. Readers are invited to add new species to her list of dye plants. Write the author at P. 0. Box 8092, Naples, FL 33941-8092. [Yikes – if she isn't an expert, who is! – ed.]

RECOMMENDED BOOKS

Complete Illustrated Book of Dyes from Natural Sources. Arnold and Connie Krochmal.

Dyes From Your Garden. Bernice Gillette Conner. E. E. Seeman Publishing, Inc., Miami, FL.

Natural Dyes and Home Dyeing. Rita J. Androsko. Dover Publications, New York, NY.

Natural Dyes from Florida Native Plants

Plant	Part used	Mordant	Color obtained
Beach sunflower *Helianthus debilis*	flowers	alum + cream of tartar	wool — pale green-beige
		copperas	wool — tan
Coreopsis *Coreopsis* species	flowers, stems	alum + cream of tartar	wool — golden yellow
		copperas	wool — golden brown
Elderberry *Sambucus simpsonii*	berries	alum + cream of tartar	wool — dusty rose
Ficus *Ficus aurea*	berries	alum + cream of tartar	wool — rose-tan
Groundsel *Baccharis* species	leaves	alum + cream of tartar	wool — pale yellow
		copperas	wool — gray-green
Live oak *Quercus virginiana*	bark	no mordant	wool — dusty rose
	leaves	copperas	wool — dark gray
Pokeweed *Phytolacca americana*	berries	alum + cream of tartar	wool — deep rose cotton — pale pink silk — rosy peach
Prickly pear *Opuntia* species	ripe fruit	alum + cream of tartar	wool — melon cotton — pale peach silk — peach
		copperas	wool — pink silk — pink
Red maple *Acer rubrum*	leaves	alum + cream of tartar	wool — golden tan cotton —pale yellow
Rouge plant *Rivina humilis*	berries	alum + cream of tartar	wool — orange
		copperas	silk — pale orange
St. John's wort *Hypericum* species	leaves, flowers	alum + cream of tartar	wool — bright yellow
Spanish moss *Tillandsia usneoides*	all	alum + cream of tartar	wool — golden tan cotton — pale tan
		copperas	wool — tan
Walnut *Juglans* species	husks	alum + cream of tartar	wool — cinnamon
Wax myrtle *Myrica cerifera*	leaves	alum + cream of tartar	wool — pale yellow
		copperas	wool — gray-green

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