

INTERNATIONAL MUSHROOM DYE-GEST

Issue #4 A Newsletter of the International Mushroom Dye Institute Fall/Winter 2002

COLOURS TO DYE FOR by Janette McKeown, Dumfries, Scotland

The thrill of seeing hanks of fungi dyed wool hanging on the line to dry never ceases to amaze. However, I did wonder how these colours could be transferred on to other woollen surfaces to increase the number of end products one could produce.

I had become interested in felt making and wanted to obtain this amazing range of fungi dyes on my felt. I was aware that natural dyes were rarely used on that medium today and I began to search for the reasons why.

Felt making is a relatively easy process requiring three ingredients - wool, water and agitation. In the absence of one of the three, the process does not work, but in the presence of all three the process is difficult to stop and the felt gets smaller and smaller and thicker and thicker!!

I began to wonder if all three elements were vital. Wool certainly was necessary and water essential - but could I eliminate agitation? Heat and regular movement were essential for the EVEN dye process - particularly during mordanting, to ensure an even dye take up. Heat is an essential requirement, but could it be transferred slowly, increased to an optimal level and held, without a saucepan over a heat source. I then thought of baking and considered employing the oven.

Over a period of experimentation I began to get very encouraging results, particularly if I chose my felt fibres carefully, taking into account:

- Their natural shrinking ratio and times
- How the fibres were used in the felt - ie laid on the top layer or included in the entire thickness of the felt;
- How the dye was prepared and applied

The subsequent dye process evolved, using steam as the temperature raising agent and the oven as the vehicle. I had achieved what I set out to do - mordant and dye the felt without agitation and so prevent further felting during these two processes.

I was delighted with the results, especially when applied to fine felt. For those who would like to find an alternative way of applying fungi dye to wool I can recommend this process to achieve an ever changing and surprising colour scheme. (Continued inside...)

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IMDI Mushroom Dye and
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Colours to Dye For continued....

MORDANTING PROCESS

- 1 Design the piece of felt (small enough to fit into the container used as a steamer)
- 2 Weigh the dry felt and prepare a mordant bath with the usual ratio for mordant. I use a large glass bowl or casserole dish.
- 3 Thoroughly wet out the felt and totally immerse in the mordant.
- 4 Cover with a lid or aluminium foil.
- 5 Place in a cool oven and allow the temperature to increase slowly to under boiling point over a period of 30 minutes.
- 6 Hold at this temperature for required mordanting time.
- 7 Remove from oven, allow to cool without touching.
- 8 Rinse out and spin (In washing machine). Keep damp.

PREPARE THE DYE SOURCE

The fungi to be used for the dye process may be cooked in the oven while mordanting is in progress. Similar proportions of fungi to wool as in regular fungi dyeing. Only just cover fungi with water - do not make dye too thin a solution. If several colours are to be used, cook at the same time if oven space is big enough to take several containers.

THE DYE PROCESS

- 1 Lay out the mordanted felt (damp) on a large sheet of aluminium foil and fold felt if required.
- 2 Sieve fungi pieces out of dye bath. To get maximum colour I use a plastic sieve.
- 3 Apply dye with a syringe, teaspoon, tooth brush or paint brush to achieve the desired surface design. If felt has been folded, it may be necessary to press with palm of hand over the surface to ensure that the dye reaches the underside.
- 4 Parcel (wrap) in aluminium foil and place in a steamer or bowl lined and covered with foil, ensuring that adequate water surrounds it as one would do with a 'pudding'. Do not allow to dry out.
- 5 Place in cool oven and gradually increase the heat over 30 minutes until under boiling point. Hold at that temperature for the dye process.
- 6 Remove from oven and allow to cool.
- 7 Rinse out in cool water. Then in lukewarm soapy water without rubbing. Rinse.
- 8 Spin and allow to dry naturally.
- 9 Iron when dry. The colours should be amazing. Where water is not of a neutral pH adjust with a vinegar rinse

to blush colour as one would do with normal wool dyeing.

Note! Choose non poisonous mushrooms only.

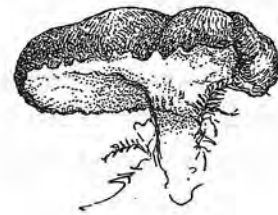
2 Do not allow containers to dry out.

3 Use camping oven if available. Fungi dyes are well covered so should not cause a problem.

4 Fungi giving colours from one side of the colour spectrum work best; also similar pH requirements.

Happy felt making and successful dyeing!

(See photos of Hats on color page. This is the method of dyeing introduced by Janette McKeown at the Natural Dye Colour Congress held in Iowa in May 2002 and reported in the previous IMDI news letter (#3). Ed.)



A brief report from Lincolnshire, England

by Jean Mounter

As you see we do not achieve a great deal but perhaps all we do can move on to greater things.

In Lincolnshire though there is plenty of interest I have not been able to persuade any to dye with fungi. I have been asked to set up a display when Lincolnshire hosts the AGM and conference in April 2004 and look forward to spreading information.

We have abundance of papermaking fungi and *Inonotus hispidus* for dyeing, *Hypholoma* and boletes (though I do not achieve a fast dye with boletes, that is - the variety of colours are, after a short time, lost to a brownish colour). Brian and I have offered our services to give talks to Guilds and those are favourably received. In all guilds we visit there are always those who make paper and they are most interested in the use of fungi in this craft. In addition to the information I can give for fungi dying there is interest in the fringe crafts - tablet weaving and nal binding (having mastered the very easy form and another which is not so easy). We are often asked if suitable fungi can be purchased.

Wherever we go we sense the English aversion to even touching fungi and I hope that although care is needed with the blue dyes (actually not to be found here) we can encourage folks to use those which are totally inert.

MUSHROOM DYEING IN ALASKA by Carol Lee

On August 16th we loaded up and set out for Alaska. The drive up was about 3400 miles and simply beautiful. Every time we stopped for the night, camping, we headed into the woods and came out with mushrooms. Unfortunately few were good dyers. But the truck was loaded with all my mushroom books so we could identify as we went.

We arrived in Alaska, and my first disappointment awaited me. I was looking for wide open spaces, and found that you can hardly get through the woods. Mushrooms are there, but getting to them is a chore. Moss grows a foot deep, and makes walking very interesting. You never know exactly what is under the moss. It had been very wet, and cool, and the boletes were about gone. I did find "Slippery Jacks", and they make a nice dyebath. The Cortinari mushrooms were everywhere and then came the hard part of deciding what we had. We found the *C. semi-sanguineus*, *C. cinnabarinus*, *C. croceofolius*, *C. croceus*, and always the *C. brunneus*. Why doesn't the *C. brunneus* give a good color? I always find baskets of them! I found a good supply of *Thelephora terrestris*. These were very dark, growing on piles of pushed up peat like dirt. We got good browns going into greens with these mushrooms. And for the first time, I found one tiny *Hapalopilus nidulans*...wish I could have come up with a basketfull.

We had a small two day workshop hunting and cooking mushrooms in the woods out on Chena Hot Springs Road. We did come up with good colors and that is always a delight. Reds, yellows, browns and greens. Then came my Granddaughter's open house at Tananah Jr. High School in Fairbanks. Nothing would do but that we go meet her teachers, etc. When we came to the Science room, I caught a gleam in her teacher's eye that should have warned me I was about to be commandeered. My Granddaughter had been telling her teacher about me and my projects, and that I was in Alaska gathering mushrooms and had held a workshop. Would I come and talk to the classes? I agreed to this, and before it was all settled, I found myself teaching 6 classes.....128 7th grade students.....natural dyeing, focusing on Mushrooms in the dyepot.

In each class the students were asked to go out and gather whatever mushrooms and other things that might make dyes. We did three dyepots in each class, at least one, most had two with mushrooms in them. In the interest of time, I had pre-mordanted samples and tied them into bundles. One for each of the 128 kids, myself and the teachers. Add this to the 18 dyepots for the day, and we had a lot of yarn cooking!

The mushrooms that came in with the kids created a lot of interest.....some were pretty far gone, and the smells that came from the science room were interesting to say the least. We set them with the books to identify what they had brought in, some went into the trash, some into the dyepots. It was great to see the amazement on the faces when the colored yarns began to appear.

The following day, the kids took their notes, the samples from all the 18 dyepots, and made a books of color. It opened a new way of looking at the world for many of these kids. As usual the questions were coming hard and fast about what makes color. There is always a group of seriously interested kids in a class, some just are there because they have to be, and there are always the clowns with the funny questions.....Will "poop" make a color???

I was always able to answer with straight face. "yes, all depends on what the animal was eating". There was a lot of discussion of why the color of the mushroom did not make the color of the dye. Why one mushroom gives lots of color and others very little. Kids of that age do want to have answers. And the ideas for projects for Christmas flew through the air. The teacher was willing to do after school projects with the kids, so they were all off to hunt the mushrooms. It was an interesting and unexpected chance to teach. A little alarming due to the preparatory work that I was not expecting, but the results were well worth it. Always nice to open the door of Fungi to a new audience!

IFFF summer meeting:
We only had a small group attend the IFFF summer meeting. We spent one day hunting for mushrooms in the incredibly dry mountain areas here in Wyoming. No rain for the entire summer had dried up even my tried and true mushroom hunting areas. We found just a very few small mushrooms and those at around 10,500'. The dyeing day was fun as we had other mushrooms on hand, and had a somewhat larger group on hand that day due to it being the regular weekend for my annual Mushroom Foray and Dyeing Workshop. Lovely colors coming out of the dyepot. We did discuss the upcoming IFFF Symposium in Australia, and at this point it appears that the USA contingent will not be very large. We had a great time as always, even without good mushroom hunting.

USA Website for IFFF:
I have not received any additional pictures to expand this website. If anyone has any, I would appreciate having them to add pages to the site. Look at:
<http://www.geocities.com/fungiandfibre>

USING MORDANTS

by Carol Lee

There is absolutely nothing wicked about any mordant. There is however a mass of misinformation bordering almost on hysteria about using mordants. You use items in your kitchen and bathroom nearly everyday that contain chemicals that are more dangerous than using the mordants. You put gas in your car frequently and the fumes from this as well as the gas itself is incredibly toxic, but who worries about that.

This is not to say that you can use mordants carelessly. Use your head, use the proper amount of both mordant and fiber and dispose of it in the yard, the garden, or even down the drain. Many of us have had this left over mordant bath tested, water supplies tested, etc. and such minute amounts of mordants are left in the pot after mordanting your fiber, it is like the "distance of an inch on the way to the moon". And that is a quote from my Sister who is the President of the Water, & Sewer Board for the city of Golden, Colorado. She contends that it is safest to pour your used mordant bath down the drain into the sewer system. **And here we are talking about those of us doing home dyeing or even limited studio dyeing, not large commercial companies.**

Alum, considered the safest of the mordants, will give soft lovely tones. Alum is the most common of the mordants. You get a touch of alum every time you put on your deodorant, bake cookies, sooth your stomach. Eat pickles, more alum.

Chrome, considered the more dangerous of the mordants (but not if handled properly) gives colors that cannot be obtained any other way. It reacts differently with each dyepot, often yellowing, sometimes greening the dye color. Light a match, a whiff of chrome up your nose, drink a soda, more chrome.....leaching from the can. Take a vitamin, there is the chrome again.

Tin is considered the second most dangerous mordant....keep your head away and do not breath the fumes of this or any other mordant pot. Always mordant in a well ventilated area. Drink canned fruit juice.....here comes the tin

Copper is a mineral dye as well as a mordant. It always greens the dye color. Use Miracle grow for your flowers and veggies.....there goes the copper. Most fertilizer will have some copper added

Iron will sadden any dyebath, but is also responsible for the lovely blues, purples, etc. from the dyebaths. It can help obtain dark browns and blacks from almost any dyebath. Drinking Geritol, here comes the iron.....cook in an iron skillet.....more iron.

My Father was a Research Scientist at an experimental farm, first for the State of Missouri and later for the Federal Government. They used test plots using different chemicals and fertilizers and then studied the "run off" after irrigation or rain. When I asked him about the above chemicals, he said "They come from the earth, put them back in the earth". When you read most of the Hazard Sheets on chemicals, they start talking about donning your "bio hazard suit" and "shoveling" ...wait a minute, "shoveling", now lets say Chrome...how many shovel loads have you used in your Natural Dyeing lifetime? Put things in perspective, use your head and happily mordant away for a great range of dyepot colors.

I prefer to premordant my fibers whenever possible. It gives such lovely colors. When using the mordant in the dyebath, you are restricted to the one color obtained, plus the dye material will absorb a good deal of the mordant. Mordants help to retain the color in the fiber, as well as let the fiber absorb or latch on to the color. They give you a palette of colors to work with and all from one dye bath. Stop listening to the media hype, and the sensationalism that scare tactics give, use your head, work carefully in a well ventilated area, and enjoy the colors.

Chrome and Chromates

by Erik Sundström

Sodium or potassium dichromates have been suggested as mordants, ever since they were used with the first synthetic mauvein dye in 1856. Potassium dichromate was preferred, since sodium dichromate absorbs moisture and becomes slimy. The dichromates are orange to brownish red and will stain the wool themselves without helping the natural dyes to fasten, and they may produce interesting color combinations.

Water soluble chrome compounds are generally either green chrome(III) salts where the chrome is the positive ion, or chromates where the negative ion is chrome(VI) with oxygen. Chromates were once regarded as innocent and even tried as medicines, but in the 1970's they were found to be so dangerous and the occupational health regulations became so severe, that they may only be handled in closed systems by personnel in full protective suits.

The main reason is that the cells of our body are only prepared to handle water soluble ions of the kinds occurring in nature. This means among negative ions: carbonate, sulphate, chloride and hydroxyl, but not chromate, and among positive ions hydrogen, ammonia and most metals except lithium, caesium and some of the heaviest like lead, cadmium or mercury. The cell walls will keep an equilibrium by shuttling sodium, potassium, magnesium and calcium back and forth, and failure to do so leads to nervous problems. Among other metals, iron is needed for blood and muscles in rather large amounts, and zinc in small amounts for tissue repair. Metals which could be mistaken for iron must be kept out so as not to disturb the iron process, and among them are copper and chrome, and tin will be kept out so it will not be mistaken for zinc.

There is no defense against chromate ions, however, since they do not occur in nature, and they can easily enter into the cells.

Once they get in, they can attach as mordants to protein to make it water repellent. Chromates are also strongly oxidizing with their oxygen burning or breaking other cell component.. When this occurs, chrome(VI) turns to chrome(III) which disturbs the action of iron. By then the immune system becomes aware that something is wrong, but has no indication of any dangerous stuff passing through the cell membrane, so it starts looking for some probable enemy to fight. You may then become allergic to something close-by, but not chromates. If you are a dyer you might become allergic to wool, a tanner might be allergic to leather, etc. Chromates are also carcinogenic and may start fires. They will also disturb the microorganisms in water purification plants, so it is not permitted to dump chromates in the drains.

(Dr. Erik Sundström, chemist and mycologist, is co-author of "Färga med svampar", and the author of a new Swedish book about pigments of natural dyes.)

"Colours to Dye For"
by Janette McKeown
Felting with
Dye Mushrooms
(see article page 1)



A blocked hat made from a beret. Fungi used were *Phaeolus schweinitzii*, *Cortinarius sanguineus*, *Inonotus hispidus*.

Five felted berets staged at Rovaniemi 2001..
Dyes used from L to R Clockwise:

- a. *Cortinarius semi-sanguineus*, *Inonotus hispidus*, Alum & Iron
- b. *Inonotus hispidus*, *Cortinarius semisanguineus*, Alum
- c. *Phaeolus schweinitzii*, *Cortinarius semi-sanguineus*, Alum & Iron
- d. *Paxillus atramentosus*, *Haplophilus nidulans*

"Once again, the East came West: Susan Hopkins brought her gnomes and shepherds and mordants and talent to not one, but TWO Oregon mushrooming events this year. The Portland, Oregon Mycological Society Fall Mushroom Show saw folks crowding around in the World Forestry Center to watch her lift the wools from the small steaming pots, with appropriate (and oft repeated!) instructions on the art; the North American Mycological Association Annual Foray at Diamond Lake, Oregon saw her holding forth in her cabin, again with steam rolling upward and colors transforming wools. Lots of fans, both times; perhaps there may yet be a dyer's group started in the west. We had a distinct shortage of hydnellish fungi, but good old *P. schweinitzii* abounded. Luckily, the attic at 1943 S.E. Locust Avenue gave up its usual bounty of 'shrooms of color." Maggie Rogers, Portland, Oregon



Mushroom Dyed Gnomes visiting in Oregon with Susan Hopkins,

Mushroom Dyeing in Alaska
by Carol Lee

This is the *Cortinarius* (see article in this issue)



semi-sanguineus mushroom and resulting dyed yarn.

Mushrooms were found in the woods by Chena Hot Springs road near Fairbanks, Alaska



Cortinarius croceofolius

"With the *C. croceofolius*, we got pretty strong red-orange by changing the pH to 8.5 - 9"

Ratio of Mushroom to fibers was 1:1 dried wt.



Cortinarius semi-sanguineus

NEWS FROM FINLAND... A NEW BOOK...

Räisänen, Riikka 2002. *Anthraquinones from the Fungus Dermocybe sanguinea as Textile Dyes*. Ph.D. Thesis, University of Helsinki. Department of Home Economics and Craft Science Research Report 10. Vantaa: Dark. ISBN: 952-10-0537-8.

ABSTRACT

In this study, I have wanted to approach the use of natural colorants as textile dyes from a multidisciplinary viewpoint. I have combined chemistry, biochemistry, textile technology, history and craft studies to understand the complicated systems involved in natural dyeing. Natural dyes lie in the centre of the past and the future. They were the first dyes used and still they will have many application opportunities ahead of them. Research together with new techniques and changing attitudes will influence the old fashion scene, where natural dyes are considered worthless because of their poor colour-fastness properties and high material costs.

In the study, I have been interested in both the historical and traditional aspects of natural dyeing as well as the modern industrial applications of the pure natural compounds. I used crude fungal extracts, but also pure natural compounds as dyes for different textile materials. The anthraquinone compounds were isolated from the ectomycorrhizal fungus *Dermocybe sanguinea* by a simple enzymatic method. The two main pigments in the fungus, emodin and dermocybin, were separated from the anthraquinone mixture and they were applied as mordant dyes to wool and polyamide and as disperse dyes to polyester and polyamide, using the high temperature (HT) technique. In the dyeing processes, low concentrations of mordants, i.e. 10% of the weight of the fibre (owf) of $KAl(SO_4)_2$ (alum) and 1 or 0.5% owf of other mordants were used. The colourfastness of dyed materials was tested according to the international standards.

In the mordant dyeing experiments, emodin dyed wool and polyamide yellow and red, depending on the pH of the dye bath. Dermocybin gave purple and violet colours. The colour fastness of the mordant-dyed fabrics varied from good to moderate. In the disperse dyeing experiments, emodin dyed polyester bright yellow and dermocybin bright reddish-orange, and the fabrics showed excellent colour fastness. Fungal extracts obtained from traditional recipes dyed wool and silk well even at low concentrations of mordants.

Available from:

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...And VIDEO of the 10th IFFS SYMPOSIUM is AVAILABLE !

Do you remember the young couple who was scurrying around with a video camera at the 10th International Symposium in Finland? Well, they have finally completed their video and it is now available to us!!!

Sharing the Colours:

A Documentary video
of the 10th Fungi & Fibre
Symposium in Rovaniemi, Finland
2001

- colourfull and inspiring journey into the spirit of fungi & fibre symposium
- interesting things to learn from workshops, interviews, forays and Exhibition

-The video is available in English, Swedish and Finnish versions (and both in American and European video- formats)
About 1 hour video, total cost 50 Euros including mailing

Bookings and inquiries : Virpi Virolainen
e-mail: ekometsa@sci.fi



11th INTERNATIONAL

FUNGI AND FIBRE SYMPOSIUM

I hope all readers have received a copy of the brochure for this event. To reduce costs, we have sent the majority via Email; it is also available on our website www.greenskills.green.net.au. Look under "noticeboard" and click on "11th International Fungi & Fibre Symposium - July 2003". The brochure can be downloaded as a PDF file, as HTML pages or separately, depending on your computer's capabilities. If you cannot get access this way, please write to us: IFFS 2003, PO Box 577, Denmark 6333, WESTERN AUSTRALIA, Phone: 618 9848 1019; Facs.: 618 9848 2061 and we will post you a copy.

Some of the excellent workshop leaders at the Symposium include those who have taught at previous Symposia, but some are highly skilled Australian practitioners you may not have met. Two of them are:

Nalda Searles, whose course is 'Wearable Adornment Using Your Fungi-Dyed Fibre'. One of this country's most highly regarded contemporary fibre textile artists, examples of her work (including her exquisite basketry) can be found in many public and private collections, both internationally and in Australia - including the National Gallery in Canberra. She gains inspiration from remote places in the bush and utilizes the natural objects she finds there. She once told me that all she buys from craft shops are needles for sewing.

Peggy Buckingham, a founder of the modern textiles movement in Australia. She has helped organize the Textile workshop events *Fibre Forum* and *Fibres West* and is a highly skilled textile dyer of many years' standing. She was recently commissioned to dye all the fibre for a state government - commissioned tapestry to commemorate the Centenary of the Federation of Australia... In 1998-9, Peggy began working with me on a preliminary survey of Australian fungi for dyes. She will teach 'Dyeing Cotton with Fungi'.

Katrina Syme, IFFS 2003 Organizer.

NEWS FROM AUSTRALIA by Katrina Syme, Denmark, Western Australia.

Much of Australia is suffering from severe drought, but rainfall in the south-west corner is only slightly reduced. We have not escaped the bush fires however, and two are still flaring in the north and north-west of the Denmark Shire.

In 2002, I traveled to a small fungi conference in South Australia. Post-conference, we drove to the arid Southern Flinders Range where we discovered fungi in the moist depths of stark, red-walled gorges, then up and over towards Victoria, through country already showing the effects of the drought, where no rain had fallen for months and the time for planting the new season's crops had passed.

Efforts to encourage the study of fungi continues here and with enthusiasts from the Western Australian Naturalists' Club, forays and workshops were held in remnant bushland in the suburbs of the capital city, Perth and in the Jarrah (*Eucalyptus marginata*) forests in the south-west.

Almost all the dye species I found have been dried and kept for next July and the only dyeing has been with species of *Pisolithus*, many of which are common here. Fruit bodies of *P. albus* begin to emerge during the summer heat, often pushing up the bitumen on the sides of highways. *P. marmoratus* favours home tennis courts and happily appears through the surface, to the despair of the owners. These are two species which the advance of human progress has indeed favoured! I have been asked to present a lecture at the second Fungimap Conference in the south-eastern highlands of the state of Victoria in May next year. My talk will focus on fungi and fibre and I hope to get permission to collect some different species of fungi in the *Nothofagus cunninghamii* rainforests, for use during the 11th Symposium.