

The Mushroom Dye-Gest

#9 The Newsletter of the International Mushroom Dye Institute Spring / Summer 2005

IMDI Newsletter c/o D. Beebee, (Editor), P.O. Box 428, Forestville CA 95436, USA E-mail: dbeebee@sonic.net

WORKSHOPS to be OFFERED at the 12th INTERNATIONAL FUNGI & FIBRE SYMPOSIUM

- Dyeing of wool, silk and fabric using fungi from the nordic countries (*Cortinarius semisanguineus*, *C.sanguineus*, *C.malicorius*, *Hapalopilus rutilans*, *Tapinella atrotomentosa*, *Phaeolus schweinitzii*, *Ichnoderma benzoinum*, *Sarcodon squamosus*, *Telephora palmata*, *Pisolithus arrhizus*). Experiments with varying pH, and using different mordants
- Paper making. Use of fungus pigment for drawing and writing
- Tablet weaving
- Tapestry weaving
- Felt techniques: Wet felting, Needle felting, Felted "jewellery"
- Broomstick Crochet. Using a crochet hook, one fat knitting needle, and fungus dyed yarn to create household items.
- Botanical illustration and documentation
- Old Scandinavian viking technique: Knotless netting. Making bands, gloves socks etc. using viking and old nordic techniques
- Demonstration and determination of fungi, use of microscopes for identification of mushrooms, and preservation of fresh fungi for later use.
- Using lichens for dyeing.
- Making paper bowls from polypores
- Dyeing with *Fomes pinicola*



**Denmark
23-28 August 2005**

The 12th International Fungi and Fibre Symposium will be held at Haslev Udvidede Højskole from August 23 to August 28, 2005. The site is located in Haslev, a small town 70 km south of Copenhagen. (Go to their Web Site for more information)
<http://theochem.ki.ku.dk/~pgs/fungifibre/fungifibre.html>

The Symposium is organized by the Danish Mycological Society which is celebrating its 100th anniversary in 2005!

*In 1985 the International Mushroom Dye Institute was established for educational purposes in order to advance knowledge in the field of mushroom pigments, dyes and inks. Now 20 years later, in 2005, thanks to your enthusiasm and contributions, the IMDI continues to fulfill this vision.
Thank You!*



Textiles arose from the Forest

By Riikka Räisänen

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Background

My doctoral thesis "Anthraquinones from the Fungus *Dermocybe sanguinea* as Textile Dyes" was accepted in the University of Helsinki in June 2002. In the study, I approached the research problems from the multidisciplinary point of view, which was natural since I am a chemist and a teacher in textiles and clothing. I am interested in history of dyeing, traditional natural dyeing methods as well as modern industrial applications of natural dyes. Also subjects related to natural colorants e.g. environmental and consumer issues are interesting. In the thesis, I developed simple methods for the isolation and characterisation of the anthraquinone pigments from the fungus *Dermocybe sanguinea* (blood red mushroom). Due to the isolation process, I received the pigments in powder form. This is useful when storing the colorants as well as when actually using them, because the concentration of the dyestuff in the dye solution can be measured. This enhances the repeatability of dyeings. In my thesis, I used pure isolated pigments as mordant, acid and disperse dyes both for natural and synthetic fibres. I received new information of the anthraquinones in the fungus *D. sanguinea* and also their suitability for dyeing. The study showed that purified natural anthraquinone compounds can produce bright hues with good colour-fastness properties in different textile materials. Natural anthraquinones have a significant potential as dyes and they will provide useful alternatives even to synthetic dyes in some applications.

New innovations of natural dyes in Finland

In Finland there have been two large projects, financed by the European Union (EU), which concentrated on natural dyes. The project called "SPINDIGO – Sustainable production of plant-derived indigo" started in spring 2001 in several European countries, i.e. England, Germany, Spain, Italy and Finland. The aim of the project was to study and improve the cultivation techniques of the indigo-producing plants *Isatis tinctoria*, *I. indigotica* and *Polygonum tinctorum* and also to develop a simple method for the isolation of indigo. Dyeing techniques were also to be studied. The main object of the SPINDIGO project was to develop the cultivation of new non-food plants in Europe and thus, to provide new sources of

occupation in the countryside. Another EU project, co-ordinated by the EVTEK Institute of Art and

Design at the Espoo-Vantaa Institute of Technology, concentrated on elaborating printing techniques for natural colorants. Both of these projects were developing methods to enable a wider use of natural dyes, even aiming at industrial scale. One of the aims of the "Natural Dyes Product Research and Development Project" of the EVTEK Institute of Art and Design was to train designers and craftsmen to utilise natural dyes in their profession. The project organised many seminars and courses, which were successful. In the year 2003, the "Natural Dyes Product Research and Development Project" took part in the Helsinki International Fashion Fair as well as the Habitare - Furniture and Interior Decoration Fair. Products that were on display were designed and made by the participants of the courses.

Colorants from *Cortinarius* sp. in textile printing

The colorants obtained from fungi give a valuable addition to the traditional natural dyeing with plants. I am interested in fungi because they serve as an interesting, economical and renewable source of raw material. The plant cannot be destroyed because only the fruit bodies are gathered and the main mycelium remains in the ground. The only disadvantage is that the harvest yield is highly depended on the weather and rains. One year there are plenty of fungi while another hardly any. Fortunately, fungi can easily be dried and thus stored for years. *C. sanguineus* (or *Dermocybe sanguinea*) grows in conifer forests and is relatively common

throughout Finland and Scandinavia, apart from the area above the Arctic Circle.



The other *Cortinarius* species, subgroup *Dermocybe*, i.e. *C. semisanguineus* and *C. armillatus*, are also rich in red anthraquinone pigments. In our recent research project the aim is to use isolated pigments as dyes for textile printing. The aim is to develop an economically efficient method for picking of fungi, isolating of pigments and using the pigment powder for industrial scale printing.



Verihelttaseitikki. *Dermocybe semisanguinea*. Photo by Kirsi Pussinen



Veriseitikki. *Dermocybe sanguinea*. Photo by Päivi Kovanen

Extracting the pigments



Väriaineiden eristäminen sienistä:
sienten homogenisointi puskuriliuokseen.

Isolation of pigments from fungi:
fruit bodies of fungi are homogenized into buffer solution.



Väriaineiden eristäminen sienistä:
liuotusaineen tislaminen.

Isolation of pigments from fungi:
distillation of organic solvent



Väriaineiden eristäminen sienistä:
väriaineiden saostuminen.

Isolation of pigments from fungi:
precipitation of pigments



Sienistä eristettyä värijauhetta.
Pigment powder isolated from fungi.



Veriseitikkistä ja verihelttaseitikkistä saatuja värisävyjä.
Hues obtained from *Dermocybe sanguinea* and *D. semisanguinea*.

All Photos above
by Riikka Räisänen

We have already made experiments on small-scale printing. The results have been encouraging and we are eager to continue the study in a larger scale. The advance of the isolated anthraquinone pigment powder is that the concentration of the dyestuff in the printing paste is easily measured and controlled. One of the problems, when using the natural dye extracts for textile printing in large scale, has been the stoppage of the printing screens. Water extracts of plants are complex mixtures of different components and they contain plenty of impurities, which cause problems especially in large-scale printing. As isolated and re-crystallised, anthraquinone mixture is very suitable for the printing purpose.

Together with my students I organised an exhibition of interior textiles printed with dyes obtained from *C. sanguinea* and *C. semisanguinea*. The exhibition was held in the Botanical Garden of the University of Helsinki between 1st March and 3rd April 2005.

(<http://home.edu.helsinki.fi/%7Eeriraisan/tutkimus/sp/sienipaino.htm>).

Our textiles were printed in the company Painoakat Ltd., which is a semi-industrial printing studio. Päivi Kovanen made the main design called *Sprit of the Forest*. At the moment our fungal printed textiles are on show in the Lusto Finnish Forest Museum. These textiles are part of the larger exhibition *Forest and Fabrics*, which is on show from April 22, 2005 to Jan 8, 2006. The main theme of the exhibition is fabrics and textile art with forest-related motifs (<https://www.lusto.fi/engl/index.htm>).

Conclusions

Natural dyes and dyeing is part of the craft tradition and culture, which restoration and maintenance are important. Research is the key issue, which has significance when keeping the craft culture alive as well as when utilising the characteristic craft tradition in entrepreneurship. As a renewable source of raw material, plants and fungi could be utilised more widely as textile dyes. This has also significance in offering sources of livelihood in the countryside. My desire is to co-operate with different institutes, organisations and individuals in the aim of increasing knowledge in the field of natural colorants.

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Commercial textile printing with mushroom pigments



Päivi Kovanen suunnittelema painokangaskuvio Metsänhenki.
"Spirit of Forest" designed by Päivi Kovanen.



Kankaiden painamista Painoakoissa, Porvoossa.
Printing fabrics in the Confiture Printing Studio Painoakat in Porvoo.

All Photos by Riikka Räisänen



Liukuväripainatus veriseitkin väriaineilla. Painokuosin on suunnitellut Bella Nordquist.
Printing design by Bella Nordquist.



The research group: Persons from the left Jenni Ruusunen, Sari Hiltunen, Reetta Virtanen, Riikka Räisänen and Päivi Kovanen.
(Standing before the printed textile of "Spirit of the Forest")

Dye Class in Mendocino
By Florentine Whyte



The season of rain pouring down from heaven delights every friend of the mushroom.

Not only does it mean free, delicious food but also new and free pigments for the fungi dyer. Mendocino, CA, a small village of 1000 people, invites the world to participate in a wine and mushroom festival every year. During this busy time of eating and drinking, the Mendocino Art center offers a class in the mushroom dyeing taught by Miriam C. Rice or Andreyana von Waldenfels-Marks.

Andreyana's class starts slowly with yoga and breathing, followed by a quiet mind that focuses on books and images of important dye mushrooms. She tells stories about her teacher and mentor Miriam C. Rice, of international symposia in Europe and Australia, and how these small fungi created a web of contacts all around the planet.

Smells of simmering mushrooms permeate the classroom. Each student's assignment is to care for one dye pot, including altering the pH on the following day, and to ensure that every classmate receives samples of that particular pigment. With the additions of washing soda, the grey pigment of *Hydnum (Sarcodon) imbricatum* turns to blue, the brown of *Hydnellum peckii* changes to grey-green and the grey of *Hapalopilus nidulans* turns to purple.

The class is alive, the video about Miriam Rice is playing to accompany the busy schedule with visual inspiration and the spirit of Miriam moves around the room. Quiet time sets in when students sit down to sort out the many samples of silk, horsehair, wool, linen, hemp yarns and fabrics – 90 in all – to create their own dye books. With the help of the hole punch, yarn samples are threaded into the card stock pages allowing a clear look at all the shades and

nuances of the particular pigments. It also helps to include drawings of the fungi in the sample book while they are on the table for clearer identification next time. The web of stories continues, the dye pots are steaming, and hundreds of yarn samples are hanging out in the wind for the delight of the finches that feather their nests with them when they think we are not looking.



Robin Fitzpatrick Borgers arranging some of her mushroom dyed samples in Andreyana's class.

As you might already know, Andreyana has taught mushroom dyeing for the past 26 years in countries that include Denmark, Scotland, Germany (her native land) and the east and west coast of the U.S. Miriam's assistant for all these years, she teaches how to make paper and paper bowls from polypore mushrooms as Miriam, the originator of all the mushroom science, has developed. Her latest is the creation of Myco-Stix, crayons made from fungi pigments. Hope to see you in Mendocino in 2005!

For further information about Mushroom Dye classes in Mendocino, CA, please contact at Andreyana von Waldenfels at andreyana@mcn.org

A MARVELOUS MYCOLOGIST

By Carol Lee © 2005

In the past nearly 20 years of searching for mushrooms for my dyepots, I have encountered many mycologists, both professional and amateur from around the world.

One of my all time favorite mycologist... her will tell you he is really an entomologist... is Samuel Ristich...better known as Sam. I first encountered Sam at my very first Fungi and Fibre Symposium at Saranac Lake, New York in 1997.

Every morning at 7:00am, I would find Sam at a large round table in the cafeteria, and quickly the chairs around it would fill as he displayed the fungi he gathered on his early morning walk. For most of an hour he would hold forth with information about the fungi world with all of us absorbing the masses of information.

Over the past seven years, I have kept in touch with Sam, asking questions, picking his fantastic brain with questions about fungi, and occasionally about the bugs. He always is free with his information and help in both fields. What a remarkable mind, and man.

This last July, 2004, I happened to be teaching in New York, and having a few free days decided to drive up to Maine and see if I could find Sam. Finding his home was the easy part, finding Sam was another story. It was pouring rain when we got there, Sam was not at home, but his daughter said he was off on a mushroom foray some 60 miles to the south, but would be back later in the afternoon.

Later that day we returned to find Sam at home. He looked just as I had remembered him from 7 years earlier. I was welcomed with a huge smile and hug, and "Whooooeeel, I'm so glad to see you", rang across the yard. His excitement was contagious, and we launched into a fast and furious conversation on what and where we had been foraging for mushrooms.

Sam had brought in a very large *Fomes* mushroom, seen in the picture. His home is a wonderland of mushroom books, pictures, mushrooms, etc. I felt wonderfully at home since as in my home, stacks of books were beside most chairs. In spite of his years,

Sam has slowed very little that I could see, and he continues to feed his mind with his studies.

Our time was way too short, and I look forward to another encounter come next year would I find myself in the eastern USA. I can only hope that I will find myself chasing the merry mushrooms for my



dyepots with as much agility and joy as Sam. His knowledge is wondrous to behold and I am thrilled to know him and call him friend.

NEMF 2005 – the 11th Annual Samuel Ristich Foray

at Mont Alto, Pennsylvania, USA
8/11/05 - 8/14/05

Instructor(s): Sam Ristich, Doug Bassett,
Ernst Both, Bart Buyck,
Glenn Freeman, Roy Halling, Gary Lincoff,
Rosalind Lowen, Walt Sturgeon, Rodham
Tulloss, Roy Watling, and Tom Volk.
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<http://www.nemf.org/files/2005/2005.html>

NOTE: There will be a mushroom papermaking class offered, that will be taught by Kimberly and Rebecca Plischke of the Western PA. Mushroom Club.