United Nations
Educational, Scientific and
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Organisation
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Organización
de las Naciones Unidas
para la Educación,
la Ciencia y la Cultura

The Crafts Council of India

UNESCO/CCI/SYMP/DOC/7
January / janvier / enero 2007
Multilingual document /
Document multilingue /
Documento multilingual

INTERNATIONAL SYMPOSIUM / WORKSHOP ON NATURAL DYES
ATELIER-SYMPOSIUM INTERNATIONAL SUR LES TEINTURES NATURELLES
SIMPOSIO–TALLER INTERNACIONAL SOBRE TINTES NATURALES
(Hyderabad, India / Inde / Índia – 5-12 November / novembre / noviembre 2006)

INTERVENTIONS

(full texts)

This document does not contain all the speakers' texts yet but it will be regularly updated.
Ce document ne contient pas encore tous les textes des interventions. Il sera complété au fur et à mesure de leur réception.
Este documento todavía no comporta todos los textos de las intervenciones. Se completará según se vayan recibiendo.

SESSION / SÉANCE / SESIÓN 1
NATURAL DYES TODAY: DECLINES AND REVIVALS
TEINTURES NATURELLES AUJOURD'HUI : DE LA TRADITION AUX NOUVEAUX DÉVELOPPEMENTS
LOS TINTES NATURALES HOY: DE LA TRADICIÓN A LOS NUEVOS DESARROLLOS
06.11.2006

Chairperson / Président / Presidente :
Sri Ashok Chaterjee (India)

- Dr (Ms) Dominique Cardon (France), "Natural dyes today: why ?" / "Les teintures naturelles aujourd'hui : pourquoi ?" / "Los tintes naturales hoy: ¿porqué?"

- Ms Ji-Hee Kim (Rep. of Korea), "Worldwide network system of natural dyes; 2001 international symposium for natural dyes in Korea" / "Réseau mondial des teintures naturelles ; symposium international sur les teintures naturelles en République de Corée, 2001" / "Red mundial de tintes naturales; simposio internacional sobre tintes naturales en Republique de Corea, 2001"

- Dr (Ms) Karen Diadick Casselman (Canada), "Colour Congress 2002: how and why it happened" / "*Colour Congress 2002*: comment et pourquoi" / "*Colour Congress 2002*: ¿Cómo? y ¿Porqué?"

- Ms Padmini Balaram (India), "Dyed Tribal Textiles of Bastar" / "Textiles tribaux teints de Bastar" / "Textiles autóctonos teñidos de Bastar"

- Ms María Eugenia Davila and Mr Eduardo Portillo (Venezuela), "Reflections on the actual use of natural dyes" / "Réflexions sur l'utilisation actuelle des teintures naturelles" / "Reflexiones sobre el uso contemporáneo de tintes naturales"

- Ms Delphine Talbot (France), "Coloured identity and trends: a natural revival" / "Identité colorée et tendances : un regain naturel" / "Identidad por colores y tendencias: una renovación natural"

The first session was an introduction to the Symposium and aimed at situating the event both within the context of the host country, India, and in a broader global perspective. Sri Ashok Chaterjee kindly accepted to deliver a welcome address to the delegates in the name of Crafts Council of India, and to present his view of the place of natural dyes in the culture and economy of India, both past and present. The other presentations of this session offered various view points on the evolution of the manner in which natural dyes have been perceived in society since the international symposiums on natural dyes, organised in Korea, in 2001, and in the USA, in Iowa, in 2002.

La première session était une introduction destinée à situer la manifestation dans le contexte de l'Inde, pays où se déroulait cet événement, ainsi que dans le contexte global du monde actuel. Sri Ashok Chaterjee a bien voulu accepter, au nom du *Crafts Council of India*, de souhaiter la bienvenue aux congressistes et de leur présenter un tour d'horizon de la place des teintures naturelles dans la culture et l'économie de l'Inde, dans le passé et présentement. Les autres communications de cette session avaient pour but de présenter sous différents aspects l'évolution de la perception des teintures naturelles dans nos sociétés depuis les grands congrès internationaux et généralistes sur les teintures naturelles, qui eurent lieu en Corée, en 2001, et aux USA, dans l'Iowa, en 2002.

La primera sesión fue una introducción al Simposio destinada a situar la manifestación en el contexto de la India, país donde se desarrolló ese evento, así como en el contexto global del mundo actual. Sri Ashok Chaterjee aceptó, en nombre del Concejo de Artesanía de la India, darles la bienvenida a los congresistas y presentarles un panorama del lugar de los tintes naturales en la cultura y la economía de la India, en el pasado y en la actualidad. Las otras comunicaciones de esta sesión tenían por objetivo presentar los diferentes aspectos en la evolución de la percepción de los tintes naturales en nuestra sociedad después de los grandes congresos internacionales y generales sobre tintes naturales, que se realizaron en Corea, en 2001, y en los Estados Unidos, en Iowa, en 2002.

NATURAL DYES TODAY: WHY?

by Dr (Ms) Dominique Cardon[*] (France)
Research Director, UMR5648, Lyons,
French National Centre for Scientific Research (CNRS)

Introduction

As an historian by training and profession, I think it appropriate to situate this symposium in an historical context:

Until the second half of the 19th century, everywhere in the world, natural dyes were the only sources of colours for everyday textiles

(slide 2 presented illustrations from an anonymous dyer's notebook, from the South of France, 18th c. AD.; dancers wearing njop skirts in a mourning ceremony in Cameroun; weaving of a kakahu, the ceremonial mantle of the Maori people in New Zealand and a robe made of ikat-dyed silk, from Central Asia)

They were also used to dye leather and furs, hairs and feathers, matting and basketry, bone, ivory and wood;

(slide 3 presented illustrations of henna hand decorations from Tunisia and India; ; of skin painting with pucoon among Native Americans; and of war decorations in goat hair dyed with madder among the Naga people of N-E India)

They supplied part of the pigments used for painting. They were similarly of great importance as colorants for food, cosmetics and medicines.

(slide 4 presented illustrations of the Sinope Gospels preserved in Bibliothèque Nationale de France, turnsole-painted, 6th c. AD; of an indigo-dyed Qur'an from Qairouan, Tunisia 10th c. AD; of an indigo painted and dyed hanging from Deccan, India, late 18thc AD; a painted textile from the sacred site of Cahuachi, Peru. Early Nazca civilization, 1st-3rd c. AD. ; of a pigment sample from Persian berries, in a Dutch manuscript from Delft, dated 1692 AD).

For both economic and technical reasons, natural dyes were – for industrial applications - almost entirely replaced by synthetic dyes very soon after these were invented.

(slide 5 presented a picture of Sir William Henry Perkin and his discovery, mauveine, patented in 1856 and a quotation of his account of the circumstances for a gazetteer, many years later: « I was in the laboratory of the German chemist Hofmann, I was then eighteen. While working on an experiment, I failed, and was about to throw a certain black residue away when I thought it might be interesting. The solution of it resulted in a strangely beautiful colour. You know the rest. »

On the other hand, they went on being used much longer, and even to this day, in some parts of the world, particularly for the production of textiles of high cultural importance and aesthetic value (traditional textiles, personal artistic creation).

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[*] Dominique Cardon is a Scientific Researcher (Directrice de Recherche) at the C.N.R.S. (Centre National de la Recherche Scientifique) in Lyons, France, whose long pursued research themes are the history and archaeology of textile production and dyeing. She also trained at spinning, weaving and dyeing with traditional dyers and weavers from Ireland and from Andean and Amazonian Peru, and used to create textiles for the Paris High Fashion (Chanel), dyeing with wild local natural dyestuffs and organic-grown dye-plants from her garden in the mountains of the Cévennes. A member of the international group of Researchers into Dyes in History and Archaeology, she is the author of several books on Natural Dyes, the most recent of which received the "Art and Science of Colour Prize", Bronze Award, of the L'Oréal Foundation in 2003.

Why is it time now, with the present Symposium "…naturally – International symposium/workshop on natural dyes", organised jointly by UNESCO and Crafts Council of India, to revisit the world of natural dyes? And why are we more than 600 participants from 57 countries in this Symposium?
This is because the role of natural dyes today, and the contribution they might make in future to our cultures and economies are issues of great relevance to our "global" world.

We must first ask ourselves:

I. Why Natural Dyes went on being used and are still used traditionally and by textile artists

I. 1. Because their aesthetic, coloristic value derives from harmonies of colours that are special to natural dyes

This is a point that was further developed during the 5th session of the symposium, by Ms Sarvenaz Ghanean from Iran, in her paper "Color Gamut of natural dyes used for Persian woollen carpets". As we all know, the special beauty of natural dyes comes from a fundamental difference between them and synthetic dyes: let us take the examples of two major plant dyes, madder red and natural indigo.

(slide 6 showed a printed textile, dyed with madder (*Rubia tinctorum)* and natural indigo from Alsace, France, dated 1820 AD)

While synthetic dyes typically consist of a single colouring molecule, natural dyes almost always result from a synergy of several different colorants, occurring together in the same plant, like here, in the example of madder root, from *Rubia tinctorum.*

(slide 7 showed a macro photo of a transversal slice of madder root and the chemical structures of the many different colorants present, as opposed to the single molecule of alizarin present in a dye obtained using synthetic alizarin)

Natural dyes can even derive from colourless or barely coloured substances in plants and animals, that can be transformed into colorants as a result of the processes of extraction and dyeing invented by humankind over millennia, like in the example of indigo plants, where precursors are converted not only into blue indigotin but into the more purplish indirubin, into isatin, isoindirubin - also red - and isoindigotin, brown.

(slide 8 showed a scheme of the formation of natural indigo from indigo plants)

And this can be easily shown by simple analytical techniques such as thin layer chromatography.

(slide 9 and 10 showed photos of 2 dimensional and 3-dimensional TLC plates showing the differences in colorants compositions between different samples of natural indigo obtained from different plants and synthetic indigo, illustrating research done by Pr. Claude Andary, Faculty of Pharmacy, University of Montpellier, France)

Further discussion on the comparative merits of using natural indigo versus synthetic indigo was beautifully developed in a poster in Hindi that was presented during the symposium by Ms Emma Ronald and Mr David Dunning of the Anokhi Museum of Hand Printing in Jaipur.
It is their complex composition that gives natural dyes their unequalled richness, fullness and subtlety of shades, comparable – in another register of perception – to the harmony of human voice or the sound of violin to the ear.

(slide 11 presented illustrations of the Colour harmony of traditional textiles, on which is based the added value of Natural Dyes: the russet browns obtained from the *ni'hadlaad* lichen used by Navajo dyers; a bogolan cloth dyed with African birch, *Anogeissus leiocarpa*, by Korotumu Coulibaly from Kolokani, Mali; natural dyed rugs of the Dobag Project,Turkey; a .*pua-kumbu* dyed

with indigo from *Marsdenia tinctoria* by the dyers of the Arts and Crafts Society of Sarawak, Malaysia)

This coloristic richness makes natural dyes and the textiles for which they are used integral parts of the world's heritage, no less important than the great monuments of the past.
Many more beautiful examples of the beauty of natural dyes were presented in the following sessions of the symposium and were revealed to our eyes every afternoon during the dye demonstrations.

Another reason why Natural Dyes went on being used and are still used traditionally is

I. 2. Because of the symbolic powers and therapeutic functions traditionally attributed to natural dyes in many civilisations.

This point was beautifully developed by the next speaker in session 1, Dr Kim Ji-hee from Korea, by Ms Rauni Ngarimu from New Zealand in the next session, by Dr Lamya Hayat from Kuweit during the 5th session and other speakers, and in several posters, such as the poster on Indian madder presented by Ms Emma Ronald and Mr David Dunning of the Anokhi Museum of Hand Printing in Jaipur.

A particularly good example is that of the civilisations of ancient China, Korea and Japan, for which the symbolic power of colours was related to the belief in the *kodama* or spirit inhabiting the plant producing the dyes. In this system of thought, *Akane* madder represents fire and light.

Moreover, many of the old dye-plants were also medicinal plants. The root of *Rubia akane* contains a number of medically active constituents and it is reported as antitumour, emmenagogue and haemostatic.

(*slide 11 illustrated the example of Japanese madder, Rubia Akane Nakai, showing a photo of the whole plant with its roots and « Akane », a kimono in Tsumugi work by the artist Fukumi Shimura, in which the reds are due to akane madder*)

This point, particularly the medicinal activity or at least the non-toxicity of many dye plants - not necessarily all of them - naturally leads us to an other series of reasons

II. Why natural dyes are currently regaining a greater importance in our present global society

There are 2 main reasons

II. 1. Because of growing awareness of the threats on natural environments worldwide
Increasing worldwide awareness of the pollution resulting from the production and use of some synthetic colorants, has led to a significant revival of interest in natural colorants in the last years and is inspiring projects for the sustainable and environmentally friendly development of their production.

Natural dyeing symbolizes craft practices which reflect a harmonious, sustainable relationship with the eco system and the local plant reservoir. But this point needs to be examined seriously and discussed, and this was done all along the sessions of the symposium, as well as in a number of posters.

II. 2. Because of accelerated exhaustion of fossil resources
It is true that, just like skins, leather, furs, animal and plant textile fibres, dye plants can/could be renewable resources. In this they are unlike the fossil materials – oil and coal – currently used on a massive scale in the manufacture not only of footwear, clothes and all the other textiles we use in daily life, but also of the almost exclusively synthetic dyes used to colour them.

Everybody now realises that, at the present rate of exploitation of these fossil resources, they will inevitably be exhausted in a more or less remote or near future.
But, on the other hand, inconsiderate use of natural dyes at industrial scale could contribute to the reduction of biodiversity. Therefore, a massive effort of interdisciplinary study is needed in order to optimise the production of textile fibres and natural colorants, if they are to play a more important role than at present in the manufacture of the clothes and textiles of every kind that are needed by present consumers and will be needed in even greater quantities by the expanding world population of to-morrow.

In this prospect, the main question this Symposium should help answer is:

III. Natural dyes today and to-morrow: how?

How can the production and use of Natural Dyes develop significantly in an harmonious and sustainable relationship with the different agricultural systems and the extraordinarily diverse natural environments of the different parts of the world? This was the main topic of discussions during all the week.
This paper proposes some possible research paths and prospects for progress in the field.

III. 1. Optimisation of the selection and of the cultivation and extraction process of the major "historical" dye plants

This raises the question of the working techniques (organic farming, sustainable agriculture), and of the processing of raw materials with due respect for the persons involved and the natural environment.

In session 5, Pr Philip John reported on a recent, wide-ranging European research project concerned with the scientific basis of the sustainable production of plant derived indigo, Spindigo. In session 8, Ms Anne de la Sayette shared the experience gained from a 12-year Research and Development project managed by a Research and Innovation Centre in Horticulture in Rochefort (France) for the industrial revival of plant dyes and pigments.

In sessions 3 and 4, Ms Carmen Bolanos and Ms Grace Guirola de Seassal both from El Salvador, explained the social impact and eco-friendliness, respectively, of the recent revival of the production of natural indigo in their country.

(to illustrate the optimisation of the selection and of the cultivation of some major "historical" dye plants, slide 14 showed a photo of a madder field of the firm Rubia Pigmenta Naturalia, based in Steenbergen,The Netherlands; for blue colorants, slide 15 showed photos of fields of indigo plants in Europe (woad field of the CAPA Cooperative in the south of France, indigo-plant field of Hacienda San Juan Buenavista in El Salvador and Dyer's knotweed field in Tokushima Prefecture, Japan)

The slides also gave some production figures**:**

Madder *Rubia tinctorum*
• Yields of dried roots: ± 2.24 tonnes/hectare
• Maximum yield: 5.55 tonnes/hectare
• Yield of colorants: 27.6 kg/ha to 195.1 kg/ha

Weld *Reseda luteola*
• Yields in dry plant weight 2.8 tonnes /ha to 9.4 t/ha.
• Yield in flavonoid colorants: 100 kg to 181 kg/ha.

It also gave some production figures**:**

Indigo *Indigofera* spp
.• in **India**: 19th c. reports of 22–100 t green matter/ha/year = 135–325 kg/ha/year of indigo cakes; *I. tinctoria* crops: green plant material: 10–13 t/ha/year = 22-55 kg/ha/year indigo cakes
• in **El Salvador**: *I. micheliana* crops give 12-18 kg of indigo/ha the 1st year; 20-39 kg/ha/year from the 2nd year on

Dyer's knotweed *Persicaria tinctoria*
• Yields in dry leaves weight 1.7 and 3.9 t/ha/year
• In optimal conditions, indigo yields of up to 300 kg/ha could be achieved.

Woad *Isatis tinctoria*
• **South of France**: indigo extraction rates:1.9-2.3 /1000 = 1.9- 2.3 kg of woad indigo per tone of fresh leaves = 70-90 kg of indigo per hectare of woad.
• **European research project** SPINDIGO : record yield of pure indigotin = 20 kg/ha/year

III. 2. Researching "new" sources of natural dyes

These may be sources of dyes that are already known but the production and/or valorisation of which could be further developed:

III. 2. 1. Local traditional dye plants

There are hundreds or, more likely, thousands of traditional dye plants that are used in a large number of civilizations and may be less well known internationally and more of a local or regional use, but nevertheless are readily available in different parts of the world.

This symposium, in nearly all papers and posters, provided an exceptional insight into this wide range of potential new sources of natural colorants. It will certainly inspire projects for their cultivation - or collection in a spirit of careful management and sustainability of resources - , and commercialization.

It is very regrettable, and not only in this prospect, that a number of dyers and researchers from developing countries that could not afford the costs of coming to this symposium, were not offered proper funding from national and international institutions nor private companies, because some candidates from Africa and from the Philippines, for instance, are pursuing very interesting research into the rich reservoir of dye plants presented by the floras of their countries.

Indigo-plants, for example, are likely to be far more numerous and diverse than is generally known: two species, one a bush and the other a tree, with a high content of indigoid dyes, traditionally used by different civilizations of South America, are studied in my forthcoming book on *Natural Dyes*.

Another potential source of "new colorants" consists in parts of plants that have not been used traditionally for dyeing but have been found by recent scientific research to contain colorants of good fastness: teak leaves (from *Tectona grandis* L.), for instance, are rich in reddish to brown colorants of the same chemical group as madders – anthraquinones – and of comparably good fastness. This has been demonstrated by Dr. Padma Vankar, from the Indian Institute of Technology, Kanpur, India, in the course of her research into "newer natural dyes". Dyeing of raffia fibres with teak leaves is now current practice in Madagascar, as part of the development programme presented by Ms. Mathilde-Andrée Ethève in session 9 of the symposium.

III. 2. 2. Waste products of plant exploitation for other uses, like food or timber
This is a potentially huge mine of colorants, both already known and new ones. But it implies radical changes in our societies to fully valorise natural resources, instead of generating large amounts of waste products for economical reasons. Within the frame of a "new economy" that

would aim at optimising the valorisation of all vegetable products, even the waste products of the extraction of such colorants could themselves be recycled as fuel or compost.
These issues were discussed and very pertinently exemplified by Ms Rashmi Bharti from India, in session 3, Ms India Flint from Australia and Ms Massiamy Diaby Ouattara from Ivory Coast in session 4, and by Mr Eber Lopes Ferreira from Brazil in session 7.

(slide 16 illustrated two examples of waste products:

- **from timber exploitation**

Pernambuco wood (Brazilwood, *Caesalpinia echinata*) used in the manufacture of violin bows
• World demand from instrument makers = 150-200 tones/year.
The work involves considerable waste:
• 70 or 80% of the pieces of wood are rejected
• 70-80% of waste in the making of a bow
• 1.5 tones of wood is needed to obtain 100 to 200 kg of suitable wood for good quality bows.
• Each bow is made from a piece of wood weighing about 1 kg.

- **from the fruit processing industry**

The example of grape pomace
• 65 million tones of grapes are produced per year.
• Pomace (skin and stems of bunches of grapes) represents 20 % of the weight of grapes processed into wine and juice.
• On average, 1 kg of selected grape pomace yields 50 g of liquid colorant.
• World production of enocyanin colorants extracted from grape pomace = 8000 tonnes a year.)

III. 2. 3. New sources of colorants

In recent years, research into new sources of colorants, inclusively for textile applications, has explored different possibilities, such as:

- cell culture of parts of plants that could not be exploited on a big scale in a sustainable way, such as woody plants (like *al* or Indian mulberry, *Morinda citrifolia*) in which it is the root bark of mature trees that is used and therefore, cannot be harvested without destroying the tree. In Chiangmai University, in Thailand, root cell culture of another common *Morinda* species, *Morinda angustifolia* Roxb. var. *scabridula* Craib., has produced, in only 5 months, 0.6 times the amount of red dyes produced by 2-3 years old plants.

- bacteria and fungi can also be used for the biotechnological production of new natural pigments
Results of experiments with pigment-producing bacteria and Basidiomycetes fungi were presented during session 5, by Dr Ms Perumal and colleagues, from India; and Dr Kiumarsi from Iran – who unfortunately could not come and had to cancel his presentation - had proposed to present his work on dyeing merino wool fabrics with the pigment extracted from *Monascus* fungi grown on rice.
Fungi cultivation certainly offers good prospects for the production of colorants. “Normal” fungi growing in their natural environment are being used by increasing numbers of crafts dyers (this evolution and the art of dyeing with fungi were presented in a beautiful poster – “Mushrooms for colour” - by Ms Andreya von Waldenfels-Marks from Germany. But in addition, it is to be remembered that the colorants extracted from lichens, which are famous for their light- and wash-fastness, are, in all cases, produced by the fungal partner of the symbiont. While using lichens for dyeing is now unthinkable, given their very slow growth and the threat of extinction it would mean for most species, if scientific research could result in the successful cultivation of the fungi responsible for the beautiful lichen dyes, a large new class of high quality colorants would become available.

III. 3. Developing technical processes

Research into the improvement of application processes would result, on one hand, in economies on the quantities of natural dyes needed, and, on the other hand, in upgrading the quality of natural dyes to easily compete with the current quality standards applied to synthetic dyes.
Current research concentrates onto:

- Allowing faster and/or more complete uptake of natural colorants onto the fibres
- Improving light- and wash-fastness of natural dyes

Examples of such possibilities were developed both in session 4, by Dr Pajaera Patanthabutr and Dr Supanee Chayabutra from Thailand, who reported on techniques allowing reduced use of metal mordants by surface modified approach and the application of plasma technology for improving of silk dyeing absorption, and by Ms India Flint from Australia, proposing "alternative and safer mordants for plant dyes"; and in session 5, by Dr Padma Vankar and Ms Rakhi Shanker from India, who commented the results of enzymatic pretreatment on cotton fabric.

III. 3. Joint efforts

(Slide 17 symbolized the union and solidarity of all actors concerned by the revival of natural dyes; it showed a globe with the geographical origins of different indigo-plants, and photos of indigo-dyers from all continents, perpetuating their age-old art)
Above all, in my opinion, the development of Natural Dyes implies - indeed, demands – joint efforts from all concerned actors.

This symposium should lead to the creation of some form of international association - or federation of associations adopting the "umbrella structure" proposed by Dr. Ms Ji-hee Kim from Korea - to help and promote the uses and marketing of natural dyes.

Pooled financial contributions, coming from membership fees, could serve to:

- Help small scale, isolated dyers to buy natural dyes at fair prices directly from producers from the association(s): for example, the Dogon women indigo dyers in Mali, presented in a poster and short film by Ms Isabelle Brouillet, from France, who are eager to revert to the use of natural indigo powder instead of synthetic indigo, not only for cultural and aesthetic reasons but because they have noticed the health problems induced by the use of synthetic indigo powder, both for themselves and for their young children they carry around as they work, exposing them to pollution from the dyeing process.
- Contract economists to calculate:
- the environmental production costs for different natural dyes, in various conditions, as compared to those of synthetic dyes;
- the added cost of natural dyes in various applications, as compared to those of synthetic dyes, considering in both cases the environmental costs of production and disposal of waste products.

Joint efforts could also lead to the creation of:

- national and international certification standards and quality controls for natural dyes and textiles dyed with them, which should ensure the sustainable origin and the authenticity and quality of the colorants used;
- a common, global commercialisation label;
- the common commercialisation by associates of the whole range of their products, enhancing the specialties and value of "terroirs" (provenance): for instance, of the textile productions dyed with indigo from India, or Salvador, or Japanese indigo, or African gara indigo, or European woad, etc.

Lastly, joint financial contributions should allow to contract media – who have been so far very inadequately involved into the promotion of natural dyes - and to launch common, simultaneous, worldwide advertising and marketing campaigns for all the associates' products: both natural dyestuffs and pigments, and textiles dyed and decorated with them.

WORLDWIDE NETWORK SYSTEM OF NATURAL DYES; 2001 INTERNATIONAL SYMPOSIUM FOR NATURAL DYES IN KOREA

by Dr Kim Ji-hee[*] (Rep. of Korea)
Ph.D. in Plastic Art, Director of Museum of Natural Dye Arts

The purposes of launching the journal for the first time in the world along with founding the International Natural Dye Society and hold seminars in Korea, and the meanings of the network to the world of natural dyes

1. Natural dyes throughout history

We know the historical position of Gojoseon (the old name of Korea) and the fact that the first king Dan-gun's ideal of broad human welfare has been handed down to us. The ideal of broad human welfare proclaimed by Dan-gun of Gojoseon pursued a sacred Utopia where all people are profited and live the life of freedom, equality and peace.

In this sense, the International Natural Dye Society was established with the object of reviving natural dyes in the world, exchanging materials, techniques, technologies, growing methods and dyeing processes, and promoting the common welfare of human beings.

The society is not led by any single major country in a pyramidal way or through top-down instructions but run in an umbrella way or through side-by-side consultation. The conference is held in turn by the member countries, and the chairman and executives are appointed from the host country.

2. Natural dyes joining nature with humans

Like the saying, "Man comes from earth and goes back to earth," earth is people's cradle and tomb and their beginning and end. We can see the same principle in natural colors that come from nature, dye cloth and stay with us, and go back to the original color white.

Dyes are obtained from plants, animals and minerals. In ancient times, they symbolized the relation among heavy, nature and man. Dyeing was the combination of the worship of heaven and nature, shamanic acts for defeating enemies, medical acts for treating physical diseases and mental pains, the pursuit of beauty. In this way, the human desire to imitate natural colors has been satisfied through the act of dying in each country.

In addition, natural dyes originate from minerals, animals and plants, fermented dyeing using yeast shows higher fastness than simple heat dyeing, and a single color is discolored but secondary and tertiary dyeing after primary dyeing enhance fastness. In addition, the bond of dye and fabric should be strengthened by giving time for the absorption and ripening of the dye. Dyeing based on such a natural principle is found in harmony observed in nature.

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[*] **Education Back Grounds & Awards**

1) BA. Seoul National University
2) Ph.D in Plastic Arts Daegu University
3) Prize of Minister of Culture and Information 19th National Arts Exhibition (National Modern Museum)
4) International Prize of Fuji TV, 21st International Asian Modern Art Exhibition (Tokyo Museum)
5) The First Prize of Indigo Section by UNESCO Crafts Prize 1998.
6) Grand Prize of International Arts of Peace Festival
7) Grand prix of COREE 2002, Art Contemporary Invite Par Le Mairie De Reme Amondisement De Paris.
8) Grand prix for Culture 2002 of Daegu Metropolitan City
9) The Best Prize for Textile Arts 2002 of Daegu Metropolitan city.
10) Solo-Exhibition (Korea, Japan,, Paris, Denmark, USA, Canada, Malaysia etc. 18 times)
11) 50 of papers for natural dye and traditional patterns.

3. Therapeutic functions of natural dyes and environment-friendly wellbeing products

Traditional natural dyes are classified based on the five major colors. Black is beneficial to the kidney and the bladder, white to the large intestine and the lungs, red to the heart and the small intestine, blue to the liver and the gall, and yellow to the stomach and the spleen.

Besides, each dyeing material has its own medical functions as well as protection from insets, fragrance and antibiosis, so it can be developed into various wellbeing products such as medicine, perfume, cosmetics, soap and food.

Following the principle of natural cycle, natural dyes treat our body and its organs and represent artistic activities to find harmony in diversity.

4. The cores of the network are the operation of the society and the publication of the journal.

According to the purposes and meanings presented above, the cores of the network for the globalization of natural dyes are the operation of the society and the publication of the journal.

The first issue contained 16 papers from 11 countries – the U.S., Korea, Canada, India, Japan, China, Malaysia, Australia, Taiwan, Indonesia and the Philippines. Until now two journals and four proceedings have been published.

After the seminars and the first issue of the journal in Korea in 2001, the International Operating Committee was organized by the proposal of the U.S. just after the American Color Congress in 2002. The next event was planned to be in the U.K. but because of economic situation it is held in India this year.

5. Results of network

We could obtain the following results through the mutual exchanges above.

1) Social meanings of natural dyes
2) Each country's unique uses of dyes and dyeing methods
3) The development of natural mordants and fermented dyeing using yeast
4) Application of new scientific approaches to traditions
5) Rural economic development through the cultivation of dyeing materials
6) High added value through artistic dyeing
7) Expansion to wellbeing industries (textile, apparel, interior, dyeing materials for painting, cosmetics, soap, perfume, insecticide, drink and food, etc.)
8) Expansion to dyeing materials not only from plants but also from animals, minerals, seaweeds and lichen (moss, mushroom, etc.)
9) Use of environmental fabrics and exchange with the areas of wild herbs, Korean paper and tea
10) Exchange of natural dyeing materials and mordant materials, storage methods, etc.
11) Contribution of natural dyeing to creativity as pure art
12) Open national and international contests of natural dying for raising talented persons
13) Introduction of national certification system and operation of an education and certification institution based on the educational network with Korean Craft Promotion Foundation

COLOUR CONGRESS 2002: HOW AND WHY IT HAPPENED

by Dr Karen Diadick Casselman[*] (USA)
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University of New Brunswick, Fredericton, Canada
and Dr Sara J. Kadolph, Iowa State University, Ames, Iowa (USA)

In 1998, at a natural dye workshop I was leading in Maine, USA, an evening discussion about our mutual passion for natural dyes expanded into a dynamic night of ideas - ideas about the artistic, cultural, ecological, historical, and economic aspects of dyes, and how we, a group of women from three countries, could help to advance that agenda. As the long night wore on, our excitement grew: we decided to investigate the possibility of a conference. The 'three' who took on the organization of what became Colour Congress 2002 were an American textile professor, Dr. Sara J. Kadolph (Iowa State University, Ames, Iowa); a USA textile curator, Ms. Laurann Gilbertson (Vesterheim Norwegian-American Museum, Decorah, Iowa); and myself, a dye author and teacher (then writing a Masters thesis on lichen dyes at Saint Mary's University, Halifax, Nova Scotia). All three of us were also practising dyers.

In 1998, we asked ourselves this question: 'With no funding from government and no money from our respective institutions, how can we bring together a diverse group of *international* dye artists, practitioners, and educators?' We established a 1999 planning initiative. The conference location was to be Iowa State University, and we chose May 19-21, 2002, as the dates. We felt strongly that we needed to offer a wide range of in-depth learning opportunities. Within that goal we scheduled dye workshops for May 12-18 (before the conference) and for May 22-26 (after the conference), so that dyers could participate in more than one workshop if they chose to do so. Many took this option, and the workshops were a tremendous success. We accepted 100 papers, 30 dye demonstrations, and 28 posters. Virtually everyone who proposed a paper was accommodated in the program. This diversity and depth was possible because we borrowed the popular academic conference model which features concurrent sessions. This meant that each morning and afternoon, every conference participant could select from a roster of papers offered for that day, and thus attend those specific topics which aligned with their own interests.

As for keynote speakers, to acknowledge international practise, we chose three visionaries from three continents, whose cultural and practical experience went beyond the usual model of natural dyeing. Sara and I were at a dye conference in South Korea when we first met Edric Ong (Sarawak). We recognized immediately that his passionate advocacy of Iban textiles was a spiritual adventure which would have very broad and deep appeal at Colour Congress 2002. Later that year, in Belgium, at a meeting of Dyes in History and Archaeology, I had the opportunity to invite Dr. Harald Böhmer (Turkey). The DOBAG project was both topical and timely. We also invited as North American key note speakers Ms. Rita Adrosko, former textile curator at the Smithsonian Institution, Washington. Her research had brought natural dyes back into the limelight in the USA and Canada, and we wished to honour her contribution at an event in her own country. Colour Congress 2002 was the ideal venue. University of Tennessee professor Jim Liles, author of *The Art and Craft of Natural Dyes*, was a fourth person we invited to play a leading role in Colour Congress. Jim had been ill, but he offered to come and contribute. But Jim Liles died the evening before the conference began. We dedicated Colour Congress 2002 and the conference proceedings to his memory to acknowledge his lasting influence.

How did we locate our audience? We started with my own personal mailings list of dyers I had met teaching in fifteen countries. Sara, additionally, had met dyers in Mexico, Japan, South Korea,

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[*] Karen Diadick Casselman is a fabric artist and author of 4 books about natural dyes. Since 1985, she has taught dyeing, and lectured on dyes, in 15 different countries. In 2000, she received a Governor General's Gold Medal for her Masters' thesis on lichen dye history. Currently she holds a PhD in Textile History from the University of New Brunswick, Canada. Dr Casselman wishes to acknowledge generous support to travel to this UNESCO conference which was made possible by The Canada Council, Ottawa, and by the Nova Scotia Department of Culture, Heritage and Tourism.

Malaysia, and in various European countries. Fortunately Laurann knew museum people in Norway, and also many fibre enthusiasts throughout the USA. Eventually we contacted two hundred people, one at a time, and we asked them to 'spread the word'.

Colour Congress was about artisanal practise, economics, education, horticulture, marketing, research, and dyeing as it implicates gender, culture, and society at large. Earlier I mentioned that we sought to introduce an expanded model of dyeing because the model that had become entrenched in the western world was fraught: it featured a little old lady, wearing an old-fashioned bonnet, stirring a dye pot. (The truth is, I am 'a little old lady' who makes dyes. But I left my bonnet back at the hotel.) We sought to replace the old model of the dyer with a new one which was racially and socially inclusive. Colour Congress 2002 demonstrated to new audiences that dyeing was a vibrant, dynamic, rigorous, exciting and inclusive occupation for women and men all over the globe. One goal of Colour Congress was to expand public perception of natural dye practise. For example, the client who purchases a natural dyed product is as crucial to the mix as are the chemist and the historian. Three exhibits at Colour Congress 2002 were designed to educate the general public, to bring the client to the product, and to advertise the scope and beauty of the incredible colours of the work displayed. The exhibits did just that. The public viewed the displays in awe, and also *the decorative dyers themselves*. The red, blue, purple, yellow, gold, green, black, brown, ochre, and multi-hued textiles, fabrics, rugs, clothing, baskets, embroidery, kimonos, jewellery, and art works in the exhibits communicated that natural dyes were as fashionable, adaptable, and trendy *as the dyers who made them*.

By late 2001 (six months before the conference was to begin) we had received a response from 23 countries. Sadly, political unrest in the world meant that some who wanted to attend could not get permission to leave their own country, or to enter the USA. Some of our participants who did attend faced immigration restrictions which were extremely insensitive, if not in some cases, inhumane. We deeply regret to this day how politics had come to play a role in the 'post 9/11' world. Yet we also knew that individuals from different and disparate worlds could come together. Everyone at Colour Congress 2002, and those of you present here today, know that a creative congruence can overcome collective insecurity and personal inconvenience. That is the common goal we share today, at Hyderabad. I see evidence as I look out over this audience at so many friendly familiar faces.

We also sought to locate agriculture, and dye horticulture, *within* craft practise. Colour Congress demonstrated how specialized dyeing has become. We ourselves were each specialists. For example, Sara Kadolph is a farmer. She drives a truck and a tractor and deals in compost and seeds and worries about rain or too much wind damage to her crops. She is also a full time professor. In that latter capacity, wherever Sara went in Malaysia, and also in Mexico, she saw dyeing as a rural enterprise with enormous economic benefits to women in farm families, and in rural villages. Throughout Scandinavia and Britain, my research uncovered dye practitioners involved in cultural tourism. I researched a female physician who marketed natural dyed stockings in Donegal, Ireland, the late nineteenth century, a woman who earned enough income from dye work that she did not have to practise medicine. Laurann, our Colour Congress colleague, is a specialist in historical clothing, and she is also a rug hooker, so her vision of the conference involved the link between contemporary artisanal dye practise and dyeing as an immigrant experience in the USA. Laurann is clothing and costumes specialist and she took on
Colour Congress as a curatorial exercise. Sara and I both saw agriculture and education as key, and we also believed that new trends in consumerism were soon to have a tremendous impact on natural dyes as a niche-market product. All of us believed in a greatly expanded model of natural dyeing. The participants who attended and presented (again, we had representation from 23 countries) pushed the parameters of natural dye practise, dye entrepreneurship, dye research and history, and the marketing of natural dyes.

Sara Kadolph and I are delighted to play a role in this next important step in the advancement of natural dyeing which has been taken here, today, in India. We applaud the leadership of the Crafts Council of India and UNESCO's Arts and Crafts Section for a partnership which demonstrates the value of cooperation. Dyeing is an artisanal practise which has become, I am happy to say, a

mainstream topic in academe. It has also become an innovative model of cultural tourism. Colour Congress helped to articulate these new directions but it was only a foundation. Our collective desire was for others to build upon that foundation. We also believed it was important to take that next step beyond North America, and beyond Europe.

Now India has responded with this event. The organizers are to be congratulated for sustaining the momentum. Years from now they will continue to see the benefits. On a personal level, it is satisfying indeed to see students of mine from the USA, Britain, Norway, Finland, Australia, South Korea, and Japan. Their activity is a reminder that natural dye education is alive and well. One must believe in the mandate of education in order to withstand the stress and challenges of organizing a conference of this scope. It is exhausting work which requires confidence, commitment, and compassion. In this new world order of political unrest it is gratifying that so many of you came to Hyderabad to support the future of natural dyes. By attending this event you also recognize India's significant historical role in natural dye practise and technology, and their continuing contribution. Colour Congress pointed to this direction, where subsequent events could happen *beyond* the western world.

I know you join me in the collaborative efforts of the UNESCO section of Art, Craft and Design, and the Crafts Council of India, to further the international dialogue and outreach in natural dyeing. Groups must learn to work together and to co-operate. It is short-sighted to see Colour Congress, and this event (or *any other dye conference*) as competitors. *Partnerships lead to benefits for all.* It is not a competition. It is an opportunity.

We also urge dyers everywhere to share their passion for colour, and their commitment to the artistic, cultural, ecological, and economic benefits of natural dyes. Will there be more events like Colour Congress, and 'Naturally?' We believe the answer is 'yes'. We believe that Colour Congress was one step, and this conference is another one on a continuing and evolving road to cultural recovery and worldwide recognition.

Thank you for coming to Hyderabad. Natural dyes have a past, a present, and a future, thanks to this event.

ACKNOWLEDGMENTS

I am privileged to identify my sponsors whose generous support made it possible for me to deliver this paper: The Canada Council of the Arts, Ottawa, and the Culture Division of Nova Scotia Department of Tourism, Culture and Heritage, Halifax.

DEDICATION

The day on which I present this paper, November 6, 2006, is the anniversary of the death of my husband, Ted Casselman. Sara and Laurann join me in acknowledging the many ways in which Ted contributed to the success of Colour Congress 2002. Colour Congress 2002 also remembers with respect Fred Gerber, Jim Liles, Rita Adrosko, Seonaid Robertson, and Eileen Bolton. Their collective legacy inspires us to continue our work.

BIBLIOGRAPHY

Adrosko, Rita J. 1971. *Natural Dyes and Home Dyeing.* New York: Dover.

Bolton, Eileen M. 1960. *Lichens for Vegetable Dyeing.* London: Studio Books. 2nd edition, 1991: Julia Bolton Holloway & Karen Diadick Casselman, eds., McMinnville, Oregon, USA: Robin & Russ Handweavers.

Böhmer, Harald et al. 2002. *Koekboya*. Ganderkesee, Germany: Remhöb-Verlag.

Diadick Casselman, Karen. 2006. 'Natural Dyes and the Dyer in Britain, 1750-1920.' PhD Thesis

(History Department),University of New Brunswick, Fredericton, Canada.

Diadick Casselman, Karen. 2001. *Lichen Dyes: The New Source Book.* Dover, New York.

Gerber, Fred. 978. *Cochineal and the Insect Dyes.* Oak Ridge, Tennessee. Privately Printed.

Gerber, Fred. 1977. *Indigo and the Antiquity of Dyeing.* Oak Ridge, Tennessee. Privately Printed.

Gulrajani, M.L. & D. Gupta, eds. 2001. *Convention Proceedings on Natural Dyes.* Delhi: Department of Textile Technology, IIT.

Kadolph, Sara J. 2003. *Textiles.* 10th edition. Columbus, Ohio: Merrill & Prentice Hall.

Kadolph, Sara J., & Laurann Gilbertson, eds. 2002. *Proceedings: Colour Congress 2002.* Ames and Decorah, Iowa: Iowa State University and Vesterheim Norwegian-American Museum.

Liles, J. N. 1990. *The Art and Craft of Natural Dyes.* Knoxville: University of Tennessee Press.

Ong, Edric, ed. 2001. *Proceedings*: *World (W.E.F.T.) Eco-Fibre and Textile Forum*. Kuching, Sarawak, Malaysia: Society Atelier Sarawak, Sarawak Crafts Council, and Jabatan Muzium.

Ong, Edric. N/d. *Woven Dreams: Ikat Textiles of Sarawak.* Kuching: Society Atelier Sarawak.

Robertson, Seonaid. 1973. *Dyes from Plants.* New York: Van Nostrand Reinhold.

Robertson, Seonaid. 1963. *Rosegarden and Labyrinth: A Study in Art Education*. London: Routledge and Paul.

AL DYED TRIBAL TEXTILES OF BASTAR

by Ms Padmini Tolat Balaram[*] (India)
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Bastar District is located in the Southern part of the present Chattisgarh State of India. When this research was carried out, Bastar District was the biggest district of the undivided state of Madhya Pradesh, which was then the biggest state of India. Now the same district is divided into three districts namely Kanker, Bastar and Dantewada. Reference to Bastar in this paper means old Bastar district.

In this area, roots of Al trees, which belong to Morinda genus are used for dyeing red color. Mainly the roots of Morinda citrifolia, *Linn* and Morinda coreia, *Buch-Ham* (earlier known as M. tinctoria*, Roxb.)* are used for dyeing red, maroon and brown colors in Bastar.

Presently most of the roots are collected from the forest. However there is a government restriction on collection of wood from this tree. Till the beginning of the 20th Century, This tree, which can grow 50 feet tall, was cultivated. The roots were collected after three years of cultivation, dried and used for dyeing. They were also exported in a large quantity. Therefore during my research I have talked to the local commissioner and was able to convince him to allot five acres of land for cultivation of Al plants to two Al dyeing villages in Bastar.

Statistics of Al cultivation in North-West province of India show that two maunds of seeds yielded 10 maunds of roots. In the book Dyes and Tans of India, Dr. Loitered has mentioned that in Central province 6081 acres were cultivated that yielded 24170 maunds of dye roots. (Balaram 2001:11)

In the past roots of Al were used in various parts of India. North-west Province, Cultivation of Al in Central Province, Bombay Presidency closer to Bastar are noted in my book ‘Bastar Textiles: Designs, Motifs and Natural Dyes’.

Presently the Al dyeing is carried out mainly in Kotpad district of Orissa, as well as in a few villages of Bastar District of Chattisgarh. The process is more or less same in Bastar as well as in Kotpad in Orissa as they are adjoining villages with same communities residing across the state borders.

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[*] Padmini has been a pioneer in researching, experimenting and creating innovative textile arts with natural dyes, in India and Asia, since last 30 years. She has documented the use of natural dyes in Kalamkari paintings in South India, in block printing in the various centers of Andhra Pradesh, Gujarat, Rajasthan, Madhya Pradesh, and dyeing in Orissa, Jammu and Kashmir states of India. Her documentation also includes the use of natural dyes among more than thirty tribes of Madhya Pradesh, Orissa, Arunachal Pradesh, Nagaland, Manipur, Assam, Tripura, Meghalaya, Sikkim, etc. in India and of 16 more minorities of South-West China. Her purpose of documenting this knowledge by traveling to the difficult and at times unapproachable terrain is to preserve the fast disappearing indigenous knowledge and techniques, many of which are not documented so far in the written form.
Apart from India, she has widely researched in Asian countries such as Japan, China, Taiwan, South Korea, Thailand, Laos PDR and Uzbekistan. She has also dyed and conducted workshops in many of these countries and also exhibited her natural dyed textile arts.
She has held more than 24 exhibitions of her natural dyed textile arts, held fashion shows and has published 30 articles in 6 different languages.
She has worked as a consultant for natural dyes to various departments of govt. of India, to UNDP, UNIDO and to Ministry of culture Uzbekistan. She was awarded international fellowships twice from Japan Foundation and once from Asia Scholarship Foundation.

Al Dyeing Process

PRE-DYEING PROCESS

- Al roots are first dried and preserved. They are powdered just before dyeing.
- The yarn is first oiled using caster oil and *ganji*, the rice starch solution.
- Then it is treated in the solution of cow-dung and *ganji* and is dried in sun after it.
- When the yarn dries, it is sprinkled with *kharpani,* an ash solution prepared using ash of wood or residue of some of the local crops. The yarn is kneaded using either hand or feet. This process is continued three to four time each day for about 15 days.
- Then it is washed in river and dried. Now the yarn is bleached and is ready for dyeing.

DYEING RED COLOR

- The bleached yarn is soaked in the solution made using powdered Al dye and water.
- It is then kept overnight in the dye vessel and boiled with the dye at least for one hour.
- The dried yarn is treated with *Kharpani* and dried again. This process is repeated thrice, which deepens the red color.

RE-DYEING FOR ACHIEVING MAROON COLOR

- Red dyed yarn is beaten and wetted using *kharpani* .
- Al powder is sprinkled on it on *fera*, the wooden plank.
- Then it is kneaded with legs and re-dyed by boiling in Al dye powder in the same manner as earlier.
- This second dyeing dyes yarn in maroon color.

RE-DYEING FOR OBTAINING DARK BROWN COLOR

- To dye the yarn in dark brown color, the maroon dyed yarn is dyed third time using *Hirakashi*.

USE OF AL-DYED YARN

These dyed yarns are used for weaving traditional fabrics used by various tribes of Bastar region. Saris locally known as *patas, tuval, dhoti*, yardage for jackets and *kurtas* are woven. Designs are inlayed by hand spontaneously directly by the weavers without any help of drawings on paper. Weavers are mainly male, while the dyers are women.

AL-DYED FABRICS AND THEIR USE

The slide show include the process of dyeing and the designs of the woven fabrics such as *Patas(saris), Tuval* and *Chaddar*(used as shoulder pieces). Description of each slide and explanation of designs would be given spontaneously during the talk.

REFLEXIONES SOBRE EL USO CONTEMPORÁNEO DE TINTES NATURALES EN EL TEXTIL

por Sra. María Eugenia Dávila y Sr. Eduardo Portillo[*] (Venezuela)
tejedores, artistas, investigadores y especialistas en seda

Resumen de la intervención

En la actualidad existe un resurgimiento del uso de los tintes naturales en todo el mundo, obteniendo este un espacio independiente del establecido por la industria química de tintes.

La otrora estrecha relación entre el hombre y la naturaleza ha sido modificada en la sociedad contemporánea; por lo que la transmisión de conocimientos de generación en generación y las prácticas culturales determinadas por los ciclos de la naturaleza para la obtención y uso de los tintes naturales ha tomado inesperados matices.

La utilización de tintes naturales debería estar estrechamente ligada al uso sustentable de estos recursos para garantizar su disfrute a futuras generaciones. No solo la naturaleza puede verse vulnerada por el uso intensivo de estos, también la salud de productores de materiales tintóreos, teñidores y sus familias.

Los complejos procesos requeridos para el teñido con extractos naturales además de la relativa escasez de sus materias primas y los espléndidos resultados que pueden obtenerse con estos constituyen por si solos elementos de valoración en un tejido, aun así estos no son suficientes en un mercado inmerso en una cultura inmediatista y poco conocedor de dichos elementos.

Los tintes naturales, pueden ser mejor apreciados en tejidos que por si mismos tengan un valor agregado importante, por su diseño, complejidad, elaboración, materiales etc, donde la tintura realce estos valores y los eleve a posiciones mas privilegiadas de apreciación. Sería importante transmitir la relación existente entre los colores de estos tejidos con el espacio geográfico del cual se obtuvieron, el hábitat de la especie tintórea y su paisaje humano.

Es urgente fortalecer el espacio de apreciación y valoración de los textiles teñidos con extractos naturales, crear conciencia sobre la importancia de éstos como vehículo en la preservación y difusión de valores culturales, y como medio de expresión contemporáneo.

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[*] María Eugenia Dávila and Eduardo Portillo, weavers, artists, researchers and silk specialist. They work in textiles since 1983, live and work at Mérida, Venezuela, where they established the silk farm VENESEDA and weaving studio MORERA. They work as Consultant and Advisers on sericulture and weaving projects. They travel extensively around the world in search of silk and natural dyes. Their work had been exhibited in Venezuela and abroad and had obtained several prizes ad recognitions. They initiated their career as sericulture students in China and India.
Maria Eugenia Dávila y Eduardo Portillo; tejedores, artistas, investigadores y especialistas en seda. Trabajan en textiles desde 1983, viven y trabajan en Mérida, Venezuela, donde establecieron la finca productora de seda VENESEDA y el Taller de tejidos MORERA. Trabajan como asesores y consultores en proyectos de desarrollo sericícolas y de tejido. Periódicamente viajan alrededor del mundo en busca de seda y tintes naturales. Su trabajo ha sido exhibido en Venezuela y en el exterior y ha obtenido diversos premios y reconocimientos. Iniciaron su carrera como estudiantes de sericultura en China e India.

REFLECTIONS ON THE CONTEMPORARY USE OF NATURAL DYES IN TEXTILES

by Ms María Eugenia Dávila and Mr Eduardo Portillo (Venezuela)
weavers, artists, researchers and silk specialist

Actually there is rebirth of the use of natural dyes in textiles all over the world.

In the contemporary society the original close relationship between man and nature had been modified, this is one of the reasons why the transmission of knowledge from generation to generation and the cultural practices to obtain natural dyes have changed in unexpected ways.

A rational use of natural dyes is necessary to assure that future generations may enjoy their benefits. The intensive use of natural dyes could attempt against nature as well as the health of dye material producers, dyers and their families.

The complex process involved in dyeing with natural extracts, their wonderful results and the relative scarcity of raw material should be good enough to appreciate natural dyed textiles, but unfortunately it is not a reality in the actual ready made culture which has almost no references on this subject.

Natural dyes should be used on textiles with relevant characteristics, important design, complexity, craftsmanship, valuable material, etc., where the color could enhance these values and carries the highest degree of appreciation. It would be important to transmit the relationship that exists between natural dyed textiles, the geographic space from where the dyes come, their habitat and human landscape.

It is urgent to strengthen a space for a better understanding and appreciation of the natural dyes on textiles, to create awareness of their importance as a means to preserve and to disseminate cultural values and as a medium of contemporary expression.

IDENTITÉ COLORÉE ET TENDANCES : UN REGAIN NATUREL
L'impact des couleurs naturelles dans le milieu des tendances…

par Mme Delphine Talbot[*] (France)
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in terms of tendencies in fashion design;
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→ Les couleurs naturelles sont à la mode : quels en sont les enjeux et qu'est ce que cela sous tend de notre société ?
→ En quoi le nouvel engouement pour les couleurs naturelles est il lié à la redéfinition de notre identité au sein de la démarche mondiale ?

Il y a un véritable regain pour la nature, pour les couleurs « vivantes », qui évoluent avec le temps et varient à chaque processus tinctorial. Dans le milieu artisanal, chaque nouvelle teinte obtenue dépend du climat, du lieu où la teinture est opérée, des colorants naturels utilisés (lieu de provenance, lots différents, …), de l'eau du bain de teinture utilisée et du teinturier. Ces paramètres, où le hasard est à considérer avec grand intérêt, promulguent à chaque couleur son unicité.

Teindre, selon des procédés traditionnels et particuliers, est un acte artistique. La notion même d'art[1] se retrouve dans les teintes particulières qui répondent à des attentes de consommation contemporaines. Le processus tinctorial en tant que poïétique, englobe une technique[2], une manière de faire individuelle, le jeu du hasard, le temps qui passe et qu'il fait, … Bref, de multiples paramètres qui font de l'acte de teindre, selon moi, une pratique artistique. Ce parti pris personnel s'inscrit dans une volonté d'en finir avec la hiérarchie qui s'opère entre artisanat et art. Deux termes qui se différencient par une idée centrale d'utilité immédiate ou non de l'œuvre produite. Quand bien même l'œuvre d'art n'est pas définie par son « inutilité », je suis tentée de poser cette question –en excluant du débat la notion de fonctionnel– : qu'est ce que l'utilité ? Qu'est ce qui confère à un objet son utilité, sa nécessité ?

Sans tenter de vouloir répondre à ces questions, je suggérerais de se tourner vers les fonctions primordiales religieuses, magiques, d'information ou même de loisir qui peuvent s'y opérer. Et de considérer avec intérêt l'apport de Yves Deforge[3]- inspecteur pédagogique pour les sciences et techniques industrielles- selon lequel, sans affectivité du « producteur » et/ou du « consommateur » (dans le monde industriel), il n'y a pas d'œuvre reconnue. Cette notion

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[*] Miss Delphine Talbot is a PhD candidate in Art, at the University of Toulouse II, in France. She is researching on *Relations between East Asia and Europe in terms of tendencies in fashion design.* Her field work is mainly about natural dyeing and specific color identities of Japan & the Ryukyus Islands. In order to do her investigation, she studied at the University of the Ryukyus at Okinawa during one year and went back to there this last summer, to complete her research. She is also part-time lecturer at the Vocational University Institute in applied arts *Color and Project* in France, and regularly exhibits her works in France and Japan. She makes installations, almost all the time composed by photographs, handmade objects and "sculptures textile". For her last exhibition (in August), at Urasoe Art Museum in Okinawa, she used natural fibres and dyes.

[1] L'art, d'un point de vue anthropologique, en tant qu'activité menée par des hommes, tendant à la production d'objets spécifiques, porteur de valeurs esthétiques.
[2] Technique tinctoriale référant à une recette transmise de génération en génération là où la teinture n'a pas cessé d'être vivante (comme la tradition de l'indigo au Japon ou en Afrique, par exemple), ou bien, se référant à une recette ancestrale retrouvée dans divers manuscrits, lorsque la teinture naturelle a été remplacée par les colorants de synthèse.
[3] Cf. Yves Deforge, *L'œuvre et le produit*, Collection milieux, Editions Champ Vallon, Paris, 1990.

d'affectivité au sein du processus de conception deviendrait un critère déterminant de ce qui est ou non une œuvre d'art. A ceci, j'ajouterais les qualités d'unicité et d'originalité, qui sont les critères par excellence déterminant ce qui est ou non une œuvre d'art. Dans ce sens, ce qui est le produit de l'art et ce qui est le produit de l'artisanat se rejoignent. Ce qui diffère c'est le concept, la motivation première de l'artiste. Reste à définir ce qui confère la valeur d'être à un rang supérieur ou inférieur. Selon moi, ces deux champs se complètent et s'enrichissent dans un mouvement non unilatéral. Il est nécessaire de sortir de l'idée que le « faire » artisanal est au service de l'art, mais que ces deux démarches s'opèrent et se nourrissent. Fait indubitable, que j'ai pu observer en étudiant dans une université japonaise où les deux disciplines sont enseignées dans une même dynamique. Par l'acte de faire en transformant le matériau dans un élan lié d'instinct et de techniques, l'œuvre qui en résulte est l'unique objet de son créateur. Par cette notion d'unicité, je souhaite à présent revenir au centre du débat sur l'intérêt de plus en plus présent pour les couleurs naturelles, inscrit dans une remise au goût du jour des procédés tinctoriaux utilisant des colorants naturels.

Dans le contexte mondialiste, où les volontés politiques sont à la cohésion, à l'ouverture des frontières et à la mise en commun des savoirs -en corrélation avec les démarches interdisciplinaires émergeant dans le milieu de la recherche en sciences humaines- le désir d'affirmer sa propre identité est plus forte que jamais.

Le concept même de l'« humanisation de la mondialisation »[4] correspond à une volonté d'exister par la re-création de ses repères, de l'éthique même, censée régir nos actes. L'homme occidental a fait de l'humain le centre de l'univers, sûr de lui et inscrit dans une démarche de domination de la nature. De ce fait, il a rompu la chaîne des écosystèmes et détruit l'environnement. Comment pourrait-il se racheter ? Comment contrer le sentiment fort de culpabilité face à ce comportement irresponsable ?

De plus, noyé dans des discours de mondialisation, où la globalisation avance à grand pas, l'individu exige dans un cri son désir d'être. Etre, dans tout ce que cela évoque. Que signifie « être » dans un monde où la course à l'économie générale de masse s'accélère de manière étourdissante ? Qu'est ce qui définit chacun d'entre nous ? Les cultures se mêlent, le travail n'est plus acquis *ad vitam aeternam* et l'information est à la portée de tous, multipliant les modèles possibles. Nous sommes face à une complexité accrue, où chacun se doit de faire le tri, de « se faire » et de se déterminer hors de tout texte fondateur et référentiel. Ce trouble existentiel se lie -de manière ineffable- à l'idée culturellement dominante que « dieu est mort » et que le concept d'« Etat nation » est remis en question dans les sociétés occidentales. De ce fait, chacun se voit en équilibre fragile sur le fil de ses propres idéaux formés par son expérience.

Devant ce doute et cette complexité, l'homme se tourne naturellement -si j'ose dire- vers la Nature, celle qui le préexiste et lui survivra. Cette démarche répond au concept simple d'équilibre : dans un contexte culturel « anthropo-centré » et prométhéen, dont l'on peut aisément constater les failles, l'homme décide de se tourner vers une conception « éco-centrée » en tant qu'appartenant à la biosphère. Ces deux pôles sont d'ailleurs symboliquement matérialisés par l'Occident et l'Orient, dans leur vision opposée de la nature.

Cette opposition généraliste, découlant de prédicats religieux et philosophiques, se vérifie d'une part -pour ce qui est de l'Orient- chez les cultures japonaises et sud-est asiatiques. Là où le domaine de l'homme et celui de la nature ne s'opposent pas, mais exercent un échange constant (par le biais des *kami*[5] au Japon, par exemple), comme le souligne d'ailleurs très justement Augustin Berque dans son ouvrage *Le sauvage et l'artifice*[6] : « *Ce circuit symbolique se traduit évidemment de manière concrète dans la vie sociale (…).* »

Dans la culture asiatique, imprégnée du shintoïsme et du bouddhisme au Japon, l'arbre est vivant

[4] Terme utilisé notamment au sein du Conseil exécutif de l'UNESCO, touchant autant à l'économie qu'à la préservation des cultures.
[5] Kami : divinités japonaises, liées au shintoïsme.
[6] Augustin Berque, *Le sauvage et l'artifice. Les Japonais devant la nature*, Editions Gallimard, Paris, 1986, page 73.

au même titre que l'être humain : « *toutes les choses ont la nature de Bouddha* »[7]. Dans la civilisation chinoise, la nature précède la pensée. La présence de la rivière, de la montagne et de la brume tient une place prépondérante dans le quotidien. L'Europe, elle, rêve plutôt de pierres, et cherche à contrôler et à domestiquer la nature. Ces deux visions de la nature qui semblent s'opposer, découlent de la culture des peuples et en grande partie de leur religion, des mythes fondateurs. Du côté de l'Occident, du christianisme et du jardin d'Éden découle une volonté de maîtriser la nature. Où la nature elle-même est mise à la disposition d'Adam et Eve et provoque en eux le pêcher originel par l'arbre de la Tentation. La « nature enclose »[8] du paradis est une réalité mouvante, elle se déploie dans l'espace de la symbolisation, même si elle est jardin enraciné.

Au-delà de cette antithèse communément appropriée, il se vaut de noter que l'opposition s'exerce aussi entre « civilisation traditionnelle » et « civilisation moderne ». Concepts qui se posent au-delà de référents géographiques et historiques, mais en termes morphologique et typologique. Cependant, l'Orient semble être celle qui parvient à conserver encore des aspects vivants de la « civilisation traditionnelle » qui a disparu partout ailleurs.

C'est cette idée reçue qui engendre les mouvements de consommation de produits dits « ethniques » ou « exotiques ». Termes néo-colonialistes, effaçant l'origine réelle des objets et répondant à des attentes similaires à celles qui s'exerçaient dans l'élite lors des expositions universelles de la fin du 19ème siècle, amenant au regard ce que l'on nommait alors l'art « primitif ». Pour dépasser cet intérêt stérile, il me semble primordial de remettre en question cette prétendue opposition entre l'Orient et l'Occident, et plus particulièrement, entre l'« anthropo-centrisme » et l'« éco-centrisme ». Leur complémentarité évidente se révèle dans le rituel -voire dans l'initiation- aujourd'hui appropriés et récréés individuellement. Parallèlement à cette démarche, l'individu issu de nos sociétés modernes désire se réapproprier la terre en terme d'échange harmonieux et respectueux, à sa propre échelle.

Le milieu du marketing et des sociologues, qui travaillent en collaboration dans le milieu des tendances, a compris cette problématique. Les consommateurs vont se tourner vers des couleurs naturelles, mais aussi patinées par le temps. Ainsi, selon le Salon -référencé et référentiel dans le milieu de la production textile- Première Vision, pour l'automne hiver 2006-2007, les acheteurs sont « *pour la fantaisie et la noblesse au naturel (…) Les nouvelles saveurs des authentiques ont convaincu par la décontraction de leurs finissages lavés, bouillis, réfractés.* »[9] On est dans la patine imitée de celle du temps qui passe, de l'usage répété et de l'« authenticité » copiée de vêtements retrouvés. Selon le même Salon, Hermann Bürlher (créateur suisse) propose un fil de coton -nommé « Rainbow »- doté d' « *une sensibilité variable à la teinture en fonction du degré de concentration de la substance magique. Après tricotage ou tissage en écru, voire confection du produit fini, un bain tinctorial avec plus ou moins de sel et de soude révélera les motifs réalisés avec différents fils de cette qualité.* »[10] La référence à la teinture, en utilisant le terme de « magique », confère au textile cité une valeur unique et rare, comme issue d'un processus de création emprunt de mystères.

Et, comme en témoignait déjà *L'Express Mag*, en hiver 2003[11], le consommateur se préoccupe de plus en plus d'« être », en recherchant l'unique, le personnel, l'authentique. Dans ce sens, le marketing y répond par des séries limitées, des options démultipliées, du sur-mesure, des fripes retravaillées et des accessoires de « customisation » (synonyme tendance de « personnalisation ») : « *A l'ennuyeux objet de série, nous préférons la série limitée, le sur-mesure si nos moyens le permettent, le customisé, le vintage, ancien donc rare…* »[12] Le consommateur émet le désir d'une consommation plus individualisée en phase avec sa personnalité. Cette fascination pour l'unique s'inscrit dans un refus du modèle imposé (même si le modèle est alors

[7] Marc Peter Keane, *L'art du jardin au Japon*, Éditions Philippe Picquier, Arles, 1999, p. 63.
[8] Augustin Berque, « L'appareillage de l'ici vers l'ailleurs dans les jardins japonais », in *L'art des jardins dans les pays sinisés*, Presses Universitaires de Vincennes, Paris, 2000, p. 116.
[9] Première Vision « Au jour le jour : l'actualité du salon automne hiver 06.07 » Numéro 3 – Septembre 2005, page 4.
[10] *Ibid.*
[11] « Rien que pour Moi. Mode, cosméto, design : le culte de l'unique », *L'Express Mag*, n° 2695, du 27 février au 5 mars 2003, Cahier n°2.
[12] *Ibid*, page 12.

remplacé par un autre…). Porter des vêtements qui sont à sa propre image c'est aussi être attiré par son propre reflet : « moi » devient le référent infaillible, de confiance. C'est le désir de se reconnaître, de s'identifier dans le produit qui est revendiqué. « *On affirme son individualité en choisissant la pièce unique d'un jeune créateur ou en « customisant » ses vêtements…* »[13]

Selon Catherine Champeyrol, chargée de développement chez Carlin International -bureau de style-, le consommateur cherche à s'approprier ses achats, à y mettre sa touche personnelle. Dans ce sens, « customiser » et suivre la mode du « vintage », soit personnaliser et se réapproprier des modèles anciens, entre dans cette démarche. Une pièce trouvée dans une friperie, puis transformée, devient unique et authentique.

Ces exemples témoignent d'un véritable mouvement dans le milieu de la mode contemporaine. Ce discours répond à une volonté d'appartenance à ce qui nous entoure et ce qui nous fait vivre : la nature mais aussi le temps ; lié au désir viscéral de se raccrocher à une histoire. Se vêtir des couleurs du temps -en utilisant par exemple la gamme chromatique des teintes appartenant à la nature, comme les bruns des feuillages d'automne, les bleus lavés du ciel ; ou les teintes de l'aurore, en terme de teintes non définissables, voire subjectives- c'est montrer une certaine acceptation et aussi une véritable adaptation à notre milieu. Ce milieu qui se révèle lui-même instable, mouvant et difficilement définissable. C'est, quelque part, revendiquer : je suis en adéquation avec la nature, avec le temps, comme un arbre dont les feuilles changent de teintes à chaque saison. Porter des couleurs naturelles qui évoluent, se patinent, changent, c'est dire : je suis en perpétuelle évolution, je suis un être intelligent qui sait s'adapter à la multitude des informations qui m'assaillent, à la sensation d'accélération des évènements et des concepts.

Ainsi, ce que l'on nomme « couleurs naturelles » ne correspond pas forcément à des couleurs teintes naturellement, mais aussi à des teintes issues de l'espace chromatique de la nature (couleurs de bois, de végétaux, …) et à des « couleurs patinées » (par le temps qui passe et qu'il fait et par la « vraie » usure de notre propre utilisation ; ou, celles données par les créateurs de mode ou les industriels, dans une démarche d'imitation). Dans tous les cas, utiliser ces couleurs est une marque de revendication. Lorsque que ces couleurs sont teintes naturellement, la revendication n'en est que plus forte, plus profondément réfléchie et s'inscrit dans une véritable démarche écologique et politique.

On n'est plus dans le nihilisme Nietzschéen, ni dans un élan révolutionnaire marxiste. On est dans un véritable élan de vie, dans une envie de s'en sortir -pas à n'importe quel prix- en sachant ce qui se trame dans notre monde. On revendique notre désir de savoir et d'être, à notre échelle respective, acteur de ce qui se joue autour de nous. L'individu se réapproprie des codes données et joue des règles. Par cette attitude, il s'adapte à son milieu tout en y apportant sa propre perception, dans un équilibre fragile d'honnêteté et d'authenticité plus ou moins vérifiables.

Se vêtir de couleurs teintes naturellement, c'est donc une revendication des plus entières. Elle correspond à un véritable intérêt pour les artisanats particuliers et elle est une participation active au mouvement écologique qui répond à des nécessités de survivance, de « rachat » de nos erreurs passés. C'est donc assumer un passé commun qui pousse les consommateurs à se tourner vers ces couleurs, comme ils se tournent vers des cosmétologies et des aliments de composition naturelle, voire bio.

Lors des « Troisièmes Rencontres de la Couleur Végétale » -forum organisé par les associations *Filière des Colorants Naturels* et *Couleur Garance*- à Lauris en octobre dernier, la réflexion se posait sur la faisabilité industrielle de la couleur végétale. Au cours de ce symposium étaient posées les questions de normalisation des couleurs obtenues par des colorants naturels. Car une industrialisation sous tend des normes afin de codifier les teintes et de garantir leur stabilité. Industrialiser des couleurs correspond donc à produire des couleurs unies et reconnaissables afin de pouvoir être choisies et utilisées par le plus grand nombre. Pour ma part, je souhaiterais remettre en question cette démarche : le consommateur étant, comme je viens de l'expliquer, à la

[13] *Ibid*.

recherche de couleurs vivantes et naturelles, pourquoi ne pas mettre sur le marché des teintes que je nommerais « couleurs matières » ?

En effet, je pense que le modèle même est à repenser, au lieu de vouloir produire des couleurs -issues de colorants naturels- à l'identique des couleurs issues de colorants synthétiques. En effet, en quoi la norme découlant de procédés de synthèse devrait s'appliquer à un champ qui est d'un autre ordre ? Pour ce qui est de la stabilité, la question peut aussi se poser : pourquoi ne pas commercialiser des textiles qui se patineraient naturellement ? Ceci ne ferait que répondre à une attente véritable du consommateur, qui se verrait grandement flatté et enorgueilli de porter des couleurs uniques, se transformant même au gré de sa vie.

Ce serait apporter une réponse conséquente et réfléchie au désir d'être unique, de participer à un mouvement nouveau et précurseur. Même si cette démarche se généraliserait, chaque teinte resterait de toute façon unique pour chaque consommateur. Il va de soi que cette démarche imposerait une véritable remise en question de la part des industriels et une re-création des palettes colorimétriques. Ceci étant, il n'est pas impossible de faire correspondre à des couleurs normées des « couleurs matières », s'en rapprochant mais ayant des particularités propres et une chromatique variable selon les bains de teinture. Si l'on observe les consommations grandissantes dans le milieu de la décoration, par exemple, pour les produits imitant l'effet de la peinture à la chaux ou les différentes patines murales, il est aisé de comprendre que le consommateur ne sera pas contre l'idée de porter des couleurs évoquant le naturel et le travail artisanal.

Je pense que cela permettrait aussi de lier l'artisanat à l'industrie de manière cohérente et équitable. En soulevant aussi l'importance du critère de traçabilité, en mettant en valeur le lieu où a été produite la couleur. Ce paramètre participerait non seulement à une économie plus équitable, mais aussi à la remise en valeur du lieu d'origine en tant que patrimoine coloré en rendant le consommateur acteur, dans une démarche identitaire (notamment politique). De plus, pour mieux favoriser ce regain, il est fondamental de faire travailler des créateurs sur la forme des vêtements commercialisés dans cette veine ; afin de répondre pleinement au désir des consommateurs et, ultimement, aux véritables attentes et nécessités écologiques.

« *Ce que l'on appelle « perte » de références identitaires ou encore « problème » identitaire doit être salué comme la redécouverte de l'inquiétude et de la richesse du divers. Il convient pour cela de se débarrasser de tout ce qui se fait passer pour de l'universel et qui n'est que du général et de l'homogène, ces artifices inventés pour superviser et couronner un ensemble en faisant peu de cas de la rencontre qui, elle, est toujours singulière.* »[14]

[14] LAPLANTINE François ; *Je, nous et les autres.* Éditions Le Pommier Fayard, Paris, 1999, page 144.

Coloured Identity and Fashion Trends: a Natural Revival

The Impact of natural Colors in the Milieu of Fashion Trends Design

Natural colors are in fashion: what are the stakes and what does this subtend for our society?
In what way is the new general craze for natural colors related to the redefinition of our identity within the global process?

There is a genuine revival for nature, for the “living” colors -which varie with time and with each tinctorial (related to dyeing) process. In the craft industry, each new colour obtained depends on the climate, the place where the dyeing is operated, the natural dyes used (place of source, different batches,…), the water of the dyeing bath used and the dyer. These parameters, where chance plays an important part, promulgate to each color its uniqueness.

To dye, according to traditional and specific processes, is an artistic act. The very concept of art –with an anthropoligical point of view- is found in specific colours, which satisfy the expectations of contemporary consumption. The tinctorial process as a poietique, includes a technique, an individual way of doing, the game of chance, the passage of time and what it does,… In short, multiple parameters that make the act of dyeing, in my opinion, an artistic practice. This personal bias is inscribed in a wish to do away with the hierarchy which occurs between the crafts industry and art. Two terms which are differentiated by a central idea of immediate utility or not of a produced work. When even the work of art is not defined by its “uselessness”, I am tempted to ask this question –while excluding from the debate the concept of functional: what is utility? What confers on an object its utility, its need?

Without trying to answer to these questions, I would suggest turning to the primordial, religious, magic functions of information or even of leisure that can occur here. And to consider with interest the contribution of Yves Deforge –a pedagogical inspector for sciences and industrial techniques- according to which, without affectivity of the “producer” and/or the “consumer” (in the industrial world), there is no acknowledged work. This concept of affectivity, within the process of design, would become a determining criterion of what is or is not a work of art. To this, I would add qualities of uniqueness and originality, which are the criteria par excellence determining what is or is not a work of art. In this sense, the product of art and the product of the craft industry are the same. What differs is the concept, the primary motivation of the artist. What is left to define is what confers the value of belonging to a superior or inferior level. In my opinion, these two fields complete and enrich each other in a non-unilateral movement. It is necessary to leave the idea that “to do” handicrafts work is at the service of art, but that these two processes are brought about and support each other. Indubitable fact, which I could observe while studying in a Japanese university where the two disciplines are taught in the same dynamics. By the act of doing by transforming material in a momentum linked to instinct and techniques, the work that results from it is the unique object of its creator. By this concept of uniqueness, I now wish to return to the center of the debate over the increasingly present interest for natural colors, set in a “trendy” resumption of the tinctorial processes using natural dyes.

In the global context, where the political will is for cohesion, the opening up of borders and the pooling in of knowledge –in correlation with the interdisciplinary measures emerging in the milieu of research in social sciences- the desire to affirm one’s own identity is stronger than ever.

The very concept of “humanization of globalisation” corresponds to a will to exist by the re-creation of our benchmarks, of even the ethics -supposed to govern our acts. The Western man has made the human being the center of the universe, sure of himself and inscribed in a process of domination of the nature. So he broke the chain of the ecosystems and destroyed the environment. How could he redeem himself? How to counter the strong feeling of culpability in the face of this irresponsible behavior?

Moreover, drowned in speeches of the worldwide context, where globalization progresses by rapid steps, the individual demands in a cry his desire to be. To be, in every sense that this evokes. What does “to be” signify in a world where the general mass economy race accelerates in a dizzying way? What defines each of us? Cultures are mixed, work is no more acquired/secured *ad vitam aeternam* –for ever- and information is within the range of all, multiplying the possible models. We are facing a growing complexity, where each one owes it to himself to sort out, “to make himself” and to make up his mind outside of any founding and reference text. This existential disturbance is linked –in an unutterable way- to the culturally dominant idea that “God is dead” and that the concept of “nation-state” is called in question in Western societies. So everyone sees himself in a fragile equilibrium on the chain of his own ideals formed by his own experiences.

In front of this doubt and this complexity, man naturally turns -if I dare say- towards Nature, that which existed before him and will survive him. This process responds to the simple concept of equilibrium: in an “anthropo-centered” and Promethean cultural context, whose faults one can easily note, man decides to turn to an “eco-centered” conception as belonging to the biosphere. Moreover these two poles are symbolically materialized by the Occident and the East, in their opposing vision of the nature.

This generalized opposition, rising from religious and philosophical predicates, is verified on the one hand -for what is from the East- in the Japanese and South-East Asian cultures. Where the realm of man and that of nature do not oppose each other, but exert a constant exchange (through the “kami” –Shintoism deities- in Japan, for example),as Augustin Berque emphasizes this very precisely in his book *The Savage and the Artifice –Le sauvage et l’artifice* (in French): “*This symbolic circuit is obviously translated in a concrete way in social life* (…). ”

In Asian culture, imbued with Shintoïsm and Buddhism in Japan, the tree is living with the same rights as the human being: “all things have the nature of Buddha”. In Chinese civilization, nature precedes thought. The presence of the river, the mountain and the fog holds a dominating place in daily life. Europe, it dreams more of stones, and seeks to control and domesticate nature. These two visions of nature, which seem to be opposite, arise from the culture of the people and mainly from their religion, from the founding myths. On the Western side, from Christianity and the Garden of Eden arises the will to control nature. Where nature itself is at the disposal of Adam and Eve and provokes in them the original sin by the tree of Temptation. The “enclosed nature” of paradise is a moving reality, it is spread in the space of symbolization, even if it is a rooted garden.

Beyond this commonly appropriated antithesis, it is worthwy to note that opposition is also exerted between “traditional civilization” and “modern civilization”. Concepts that are posed beyond geographical and historical referents, but in morphological and typological terms. However, the East seems to be that which manages to still preserve living aspects of the “traditional civilization” which have disappeared everywhere else.

It is this generally accepted idea that generates the movements of consumption of products known as “ethnic” or “exotic”. Neo-colonial terms, erasing the real origin of the objects and satisfying expectations similar to those which were exerted on the elite during the World Fairs at the end of the 19th century, bringing to notice what one named then “primitive” art. To go beyond this sterile interest, it seems to me paramount to call in question this alleged opposition between the East and the West, and more specifically, between “anthropocentrism” and “eco-centrism”. Their obvious complementarity is revealed in the ritual -even in the initiation- today adapted and recreated individually. Parallel to this step, the individual resulting from our modern societies wishes to re-appropriate the ground in harmonious and respectful terms of exchange, on its own scale.

The milieu of marketing and of the sociologists, who work in collaboration with the fashion trends designers, understood these problems. The consumers will turn to natural colors, but also “weared out” (to give a patina) by time. Thus, according to the Salon -referenced and reference frame in textile production- *Première Vision*, for autumn-winter 2006-2007, the purchasers are “for imagination and natural nobility (…) New savours of authenticity had convinced by the relaxation of

their washed, boiled, refracted finishing touches. " One finds the patina imitated from that of the passage of time, repeated use and the "authenticity" copied from recovered clothes. According to the same Salon, Hermann Bürlher (Swiss designer) proposes a cotton yarn –named "Rainbow"- equipped with "*a variable sensitivity to dyeing according to the degree of concentration of the magic substance. After knitting or unbleached weaving, even the completion of the finished product, a tinctorial bath with more or less of salt and soda will reveal the designs carried out with various threads of this quality.*" The reference to dyeing, by using the term "magic", confers on the quoted textile a unique and rare value, as the result of a creative process of mysteries.

And, as testified already by *L'Express Mag* magazine, in winter 2003, the consumer is more and more preoccupied with "being", by seeking the unique, the personal, the authentic. In this sense, marketing responds by limited (production) series, many options, by made to order, reworked cloth pieces and customized accessories ("fashion" synonymous of "personalization"): "*To the tedious object of series, we prefer the limited series, on order if our means allow it, the customized, the vintage, old thus rare…*" The consumer express the desire of a more individualized consumption in phase with his personality. This fascination for the unique falls under a rejection of the imposed model (even if the model is then replaced by another…). To wear clothing in one's own image is also to be attracted by one's own reflection: "me" becomes the infallible referent of confidence. It is the desire to recognize oneself, to identify oneself in the product which is asserted. "*One affirms ones individuality by choosing the unique piece of a young designer or by "customising" one's clothes*…"

According to Catherine Champeyrol, in charge of development at Carlin International –fashion trends' office; trends forecasting-, the consumer seeks to adapt his purchases, to give it his personal touch. In this sense, "to customise" and to follow "vintage" fashion, or to personalize and readjust old models, is to be part of this process. A piece found in a secondhand clothes shop, then transformed, becomes unique and authentic.

These examples testify to a genuine movement in the milieu of contemporary fashion. This lecture responds to a will to belong to that which surrounds us and what makes us live: nature but also time; linked to the visceral desire to attach oneself to an history. To dress oneself in the colors of time using for example the chromatic range of colours belonging to nature, like the brown ones of the foliage of autumn, the washed blues of the sky; or the colours of dawn, in terms of non-definable even subjective colours- is to show a certain acceptance and also a genuine adaptation to our environment or background. This environment which itself appears unstable, moving and difficult to define. It is, to some extent, to assert: I am in accord with nature, time, as a tree whose leaves change of colour at every season. To wear natural colors which evolve, patinate, change, is to say: I am in perpetual evolution, I am an intelligent being which knows how to adapt to the mass of informations which assault me, to the sensation of the acceleration of events and concepts.

Thus, what one names "natural colors" does not necessarily correspond to colors dyed naturally, but also to colours resulting from the chromatic space of nature (colors of wood, of plants,…) and to "patinated colors" (by the passage of time or the weather, and by "the true" wear and tear of our own use; or, those given by fashion designers or by industrialists, in a procedure of imitation). In all the cases, to use these colors is a mark of claiming. When these colors are dyed naturally, the claim is stronger, more deeply reflected and falls under a true ecological and political approach.

One is no longer in a Nietzschean Nihilism, nor in a revolutionary Marxist momentum. One is in a genuine momentum of life, in a desire to pull through –not at any price- while knowing what is woven in our world. We claim our desire to know and to be, at our respective scales, players of what is played around us. The individual re-adapts to the given codes and plays by the rules. With this attitude, he adapts to his background while bringing to it his own perception, in a fragile balance of more or less verifiable honesty and authenticity.

To dress oneself in naturally dyed colors, is thus a claim of the most stubborn. It corresponds to a genuine interest for special crafts industries and it is an active participation in the ecological movement which responds to the necessities for survival, of "redemption" of our past errors. It is

thus to assume a common past which pushes the consumers to turn to these colors, as they turn to natural, even organic, cosmetology and food.

During the “Troisièmes Rencontres de la Couleur Végétale” (“Third Meeting of the Vegetable Color)” –forum organized by the associations *Filière des Colorants Naturels* et *Couleur Garance* (*Network of Natural Dyes* and *Garance Color*, French associations)- in Lauris, in 2006-October, the industrial feasibility of the vegetable color was considered. During this symposium, questions on the standardization of the colors obtained by natural dyes were put. For industrialization subtends standards in order to codify the colours and to guarantee their stability. To industrialize colors thus corresponds to produce uniform and recognizable colors in order to be able to be selected and used by the greatest number. For my part, I would wish to call in question this procedure: the consumer being, as I have just explained, in search of living/animated and natural colors, why not place in the market, colours which I would name “material colors”?

Indeed, I think that the model itself is to be reconsidered, instead of wanting to produce colors - results of natural dyes- identical to the colors resulting from synthetic dyes. Indeed, for what should the standard arising from the processes of synthesis be applied to a field which is of another category? As regards stability, the question can also arise: why not market textiles that would patinate naturally? This would only satisfy a genuine expectation of the consumer, who would see himself largely flattered and elated to wear unique colors wich would change as his life is going.

It would be to bring a rational and considered response to the desire to be unique, to take part in a new and precursory movement. Even if this process would spread, each colour would in any case remain unique for each consumer. It goes without saying that this step would impose a genuine calling into question on the part of the industrialists and a re-creation of the colorimetric palettes. This being so, it is not impossible to make standard colors correspond to “material colors”, approximating them but having their own characteristics and chromatics variable according to the baths' of dyes. If one observes increasing consumption in the milieu of decoration, for example, for products imitating the effect of lime painting or the various mural patinas, it is easy to understand that the consumer will not be against the idea of wearing colors evoking naturalness and handicrafts work.

I think that this would also make it possible to bind the craft industry to industry in a coherent and equitable way. By also raising the importance of the criterion of traceability, by emphasizing the place where the color was produced. This parameter would have a hand in not only a more equitable economy, but also in emphasising the place of origin as a heritage of colour by making the consumer player, in a procedure of identity (especially political). Moreover to better facilitate this revival, it is fundamental to make the designers work on the shape of the clothes marketed in this vein; in order to satisfy fully the consumers’ desires and, ultimately, genuine expectations and ecological needs.

As François Laplantine –French anthropologist- says in his book *Je, nous et les autres* (in French), Fayard, Paris, 1999, p. 144: “*What we call « loss » of references or « problem » of identity has to be welcomed as the rediscovery of the variety’s wealth. In this way, we should not forget to notice the singularity of the meeting and let’s not go into what is general and homogeneous, these effects invented to supervise and crown an ensemble without considering the meeting which is always singular*.”

SESSION / SÉANCE / SESIÓN 2
NATURAL DYES TODAY: A GLOBAL HERITAGE
TEINTURES NATURELLES AUJOURD'HUI : UN PATRIMOINE MONDIAL
LOS TINTES NATURALES HOY: UN PATRIMONIO MUNDIAL

06.11.2006

Chairperson / Président / Presidente : Dr Ms Jenny Balfour-Paul (United Kingdom)

- Ms Ruby Ghuznavi (Bangladesh), "Neel: Magical Blue of Bengal" / "*Neel*: le bleu magique du Bengal" / "*Neel*: El azul mágico de Bengala"

- Prof. Zvi Koren (Israel), "Purple of the Levant" / "Pourpre du Levant" / "Purpura del Levanto"

- Ms Zarina Kendjaeva (Uzbekistan), "Natural Dyes from Uzbekistan" / "Teintures naturelles d'Ouzbékistan" / "Tintes naturales de Uzbekistán"

- Ms Fadila Bird (United Kingdom), "Dyes used in the M'zab region" / "Teintures utilisées dans la region du M'zab" / "Tintes utilizados en la región del M'zab"

- Ms Ranui Ngarimu (New Zealand), "Naturally Maori – Fibres and dyes of Maori" / "Naturellement Maori – Fibres et teintures naturelles des Maori"/ "Naturalmente Maori – Fibras y tintes naturals de los Maoris"

- Mr Axel Becker (Norway), "Indigo printing tradition of Norway" / "Tradition de l'impression à l'indigo en Norvège" / "Tradición de impresión al índigo en Noruega"

The second session aimed at presenting a number – inevitably limited, regrettably – of examples of the wealth of cultural traditions connected to dye plants and animals and to the related dyeing techniques with natural dyes, in all regions and countries all over the world; it is a « mini world tour of natural dyes ». A high proportion of oral presentations concerned the rich dyeing heritage of many countries or regions of the world. The distribution of papers into transversal themes chosen for the programme of the Symposium made it possible to present this heritage in a global prospect, and to enhance the technical and cultural similarities, or, on the contrary, the significant differences between dyeing traditions among different civilisations.

La deuxième session était destinée à donner un échantillonnage – forcément limité, malheureusement - de la richesse des traditions culturelles liées aux plantes et animaux tinctoriaux et aux techniques de teinture associées aux colorants naturels, dans toutes les régions et pays du monde ; c'est un "mini-tour du monde des teintures naturelles". Un grand nombre de propositions de communications portaient sur le riche patrimoine tinctorial de divers pays ou régions du monde. La structuration en thèmes transversaux adoptée pour le programme des présentations orales de ce Symposium a permis d'illustrer ce patrimoine dans une perspective globale, afin de rendre les expériences individuelles utiles au plus grand nombre et de mettre en évidence les convergences techniques et culturelles, et par là-même également les différences significatives entre les traditions des différentes civilisations.

La segunda sesión fue destinada a presentar una muestra – obligatoriamente limitada, desafortunadamente - de la riqueza de las tradiciones culturales ligadas a las plantas y animales tintoreros y a las técnicas de teñido asociadas a los colorantes naturales, en todas las regiones y países del mundo; es un « mini-tour del mundo de los tintes naturales ». Un gran número de proposiciones de comunicaciones basadas en la riqueza del patrimonio del tinte en diversos países y regiones del mundo. La estructuración en temas transversales adoptada para el programa de las presentaciones orales de este Simposio permitía ilustrar este patrimonio en une perspectiva global, a fin de reflejar las experiencias individuales útiles en mayor numero y de poner en evidencia las convergencias técnicas y culturales, e igualmente, las diferencias significativas entre las tradiciones en las diferentes civilizaciones.

NEEL: THE MAGICAL INDIGO OF BENGAL

by Ms Ruby Ghuznavi (Bangladesh)*
Managing Director, Aranya – Vice-President, South Asia WCC (Asia-Pacific Region)

The mystery and magic of natural indigo has fascinated people throughout history. Myths and rituals associated with its unique colour and dyeing process have set it apart from other dyes. Its transformation from yellow to green and finally blue, as it oxidises, enthralls and intrigues in equal measure. One of the oldest of all natural dyes, it is the most versatile and valued of the range of colours. It has been used extensively worldwide and remains the last of the natural dyes still in use in some countries.

Textiles excavated from archaeological sites of the 3rd millenium B.C. have revealed burial shrouds edged with indigo stripes. The blues of cave paintings, frescoes, tapestries and textiles from ancient times are a testament to the durability of these colours, exposed for centuries to light, dust and moisture. For thousands of years dyestuffs have been sourced from plants, minerals and insects, providing shades of reds, browns and beiges, etc.-- until indigo extended the colour palate dramatically with its superb range of blues, greens and a host of other blended shades.

A leaf extract, the word indigo is derived from the Greek '*indikon"* (latinised *indicum*) meaning "an Indian substance'. Although there are numerous varieties of the plant the most extensively used one is *Indigofera tinctoria*, primarily a tropical and sub-tropical plant. Its dyeing technique originated in India and is said to have travelled to South East Asia, the Middle East, Africa and America. *Isatis tinctoria*, the European indigo *woad*, spread to Western Asia, the Mediterranean and South America. It was later replaced by imported indigo which had a much higher dye content. *Polygonium tinctorium*, also known as '*dyer's knotweed"*, Japanese indigo or Chinese indigo, produced more dye than *woad*. Used extensively in the past, this variety continues in use in Japan, albeit in relatively small pockets. *Indifera arrecta* and *Lonchocarpus Cyanescens* are the indigenous indigos of Africa, the latter also being referred to as "Yoruba indigo".

While there is more than one source in nature for reds, browns, greys, golds, etc., it is only indigo which yields blue. Combined with yellows, reds, browns and olives, indigo creates an extensive variety of colours not possible in other natural dyes. It is the only dye which dyes all fibres beautifully and does not need mordants to make the colour fast to light and washing.

As well as being versatile, Indigo is the most unique of dyes. Its chemical formulation, as well as its dyeing technique, differs greatly from all other natural dyes. Indigo dye has to be extracted from the leaves through a fermentation process which releases the dye. The simplest method of processing indigo is to soak fresh leaves in a container, adding wood ash and lye, slaked lime, rice wine, urine or a variety of other substances which render the liquid alkaline, reducing oxygen. However, this is only suitable for small scale dyeing and is not effective for deeper shades. The second method is to initiate the fermentation process by composting the leaves in water, which is later dried and stored to be used as and when required. This technique is popular in Japan and parts of Africa.

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Sayyada Ruhi Ghuznavil revived from 1982, natural dyes in Bangladesh. Since 1990 through Aranya, a Fair Trade Micro-enterprise, she has been marketing natural dye products, both in the domestic and export market. She has been involved in Crafts development and Promotion since the 1970s. She is a Founder member of Karika the first crafts marketing organization of Bangladesh. She is also a Founder member of the National Crafts Council of Bangladesh set up in 1985 and was its President from 2002-2005 and remains a member of the Executive Committee. Since 2002 she is Vice-President South Asia Region of the World Crafts Council. She is a member of the Executive Committee of Naripokkho, a women's activist organisation. She is also a Member of the Board of Trustees of Transparency International, Bangladesh Chapter from1995 to date and was its Secretary General from 2004-06. Her publications include, "Rangeen" a definitive book on the natural dyes of Bangladesh and "Naksha", on the designs of Bangladesh. She has also contributed to national and international journals on crafts and development.

The oldest and most widely used method of extraction is by fermenting the leaves (often using entire plants, with leaves and stalks being removed later) in a purpose-built tank or container, agitating it vigorously by stamping on the mixture or using a variety of implements, till the liquid turns green and a thick layer of white froth covers the entire surface of the solution. Gradually the indigo precipitate settles at the bottom and the excess water is drained off until only a thick paste is left.

The precious paste is sieved through a fine mesh or cloth to remove any remaining moisture, dried thoroughly in the shade and stored as indigo crystals, powder or cakes which are easily transportable and can be used over long periods of time. In some communities in China, Africa and West Asia there is preference for a `shine' on indigo fabric which is created through various processes like adding egg white, beating of fabric with mallets, etc.

Indigo dyeing is a delicate process requiring great skill and expert handling to ensure even colouring of yarn or fabric. Unlike other dyes which can be completed in a single attempt, indigo requires multiple immersions and oxidation to build up depths of colour. Sufficient time is allowed between each dipping to ensure colour fastness and durability.

It is curious that in spite of its complexities, different countries learnt to extract blue dye at different times from different species of the same plant. Indigo's universality and practicality has given it a special place in various countries and cultures. It has been equally popular for ritualistic, ceremonial and everyday use. From the *teliarumal* turbans of the peasants to the garments of royalty to temple hangings, indigo was the preferred colour of all peoples.

Indigo has also been known for its healing properties. It is widely believed to have antiseptic and insect repellent qualities. Indigo dyed cloths have been used to wrap newborn babies to facilitate the rapid healing of umbilical cords and protect against infections. To this day farmers and herders in several Asian, African & West Asian countries wear indigo headgear to ward off insects, and as protection against sun and heat. Indigofera has been used in Ayurvedic medicine to treat a whole range of ailments from heart, lung and kidney disorders as also tuberculosis, asthma and gout. The Chinese valued its medicinal properties to detoxify blood and treat the liver. New research suggests that remedies involving indigo in Materia Medicas such as those of Dioscorides and Ibn al-Baytar have scientific validity.

As a commodity of trade, indigo brought unimaginable wealth to those trading in it. Clive's conquest of Bengal in 1757 provided the British with vast territories of fertile land to cultivate indigo and replace the supplies lost from America and the West Indies. European planters were brought in by the East India Company to set up efficient factories, replacing the traditional production method which had earlier made inferior quality indigo in north-west India. Quality and production capacity improved rapidly and by 1815 Bengal exported as much as 3,500 tonnes of indigo. In the peak years, from 1834 to 1847, plantations employed 3 – 4 million people and supplied four-fifths of the world's indigo requirements.

However, the industry suffered from a severe conflict of interest in Bengal. European planters were not allowed to buy or lease land and worked through a system of advances (*dadan*) to local peasants – often through corrupt middlemen, which further exacerbated the situation. Peasants were coerced into cultivating indigo, without being recompensed adequately enough to buy food rather than growing it. There was no consideration for crop failure or any other mishap so the farmers were in permanent debt. They resented it bitterly as, although free in theory, in reality the situation facing them was no different from slavery.

This extreme situation led to peasant uprisings on the plantations, between 1859 and 1862, which are well documented in literature and history. Bengali intelligentsia, sympathetic officials and missionaries joined the peasantry against the mercantile community to bring about a more just legal system in order to safeguard the interests of the farmers. By 1862 their combined efforts led

to the enactment of a law which gave the peasantry the right to decide whether they wished to cultivate indigo or not.

According to historians, the indigo uprising had direct political consequences on British rule in India. The changed situation in Bengal forced the planters to shift the reduced, but still profitable indigo industry, from Bengal to Bihar. It was the desperate condition of the peasants which brought Gandhi to Champaran in 1917, to hold an independent inquiry into peasant exploitation. He was put on trial for refusing to leave the area and his polite, but defiant, stand led to the withdrawal of the case. This was Mahatma Gandhi's first act of peaceful civil disobedience which, thirty years later, lead to the end of British rule in India.

Once the coercion was over, indigo production could have continued at least for the large domestic market, but thanks to the German discovery of synthetic indigo in 1897 and its aggressive marketing in the captive Indian market, it almost wiped out indigo cultivation here in the early 20th century. Only pockets of production currently remain in South India-in Andhra Pradesh and Tamilnadu.

In 1984, a pilot project cultivated and extracted natural indigo in Bangladesh successfully for the first time after a lapse of more than a hundred years. However, when efforts were made to interest farmers in its commercial cultivation, there was great resistance to the very notion of growing indigo again. Its tainted history has remained in the collective memory of the people and no amount of persuasion, including the fact that it would be their own cash crop, made any difference.

In the mid-90's the Mennonite Central Committee (MCC) approached our organization to provide technical support to start an indigo project with the Garo community, who did not share the same negative history around indigo production. They were more amenable to cultivating a crop which would bring in good returns. Besides the fact that the crop requires only four months of each year, there is the added benefit that as indigo is a leguminous plant, it fixes nitrogen to the soil and revitalizes the land for rice and vegetable cultivation.

MCC staff visited indigo centres in India and Thailand to acquire the necessary expertise on the subject. Impressively, the young engineers who worked on this project have developed tools and equipment that simplify the production process quite dramatically.

MCC has been producing and marketing indigo successfully since 2000. This year the organization has begun an experimental project of indigo extraction from a species of indigo grown by farmers in the north of Bangladesh as fertilizer for fallow land between crops. So, despite appearances, it would seem that in fact indigo never did die out completely in Bengal!

PURPLE OF THE LEVANT

by Prof. Zvi C. Koren[*] (Israel)
Ph.D. in Physical Chemistry
The Edelstein Center for the Analysis of Ancient Artifacts,
Department of Chemical Engineering,
Shenkar College of Engineering and Design

Abstract

Phoenician Purples and Biblical Blues were the most expensive, royal and sacred of all ancient textile dyeings. In antiquity, these dyes adorned the textiles of emperors, caesars, kings, high priests, and temples. The purple and violet pigments used in the dyeing process were produced from the hypobranchial glandular extracts of certain *Muricidae* species of Levantine mollusks. Three such species that still exist today in the eastern Mediterranean waters of today's Syria, Lebanon, and Israel are Murex trunculus, Murex brandaris, and Purpura haemastoma, as they are commonly called. The overall process for producing these dyeings was one of the most complex of biochemical technologies in antiquity and was practiced at least three and a half millennia ago. Until recently, historians and scientists were mystified as to how the amazing empirical biochemists of the hoary past were able to perform completely natural chemical dyeings with these water-insoluble pigments. This field of research has been popularized in recent years as more chemical and archaeological discoveries have been made. This talk will include a number of recent discoveries made by the speaker in the area of the archaeological chemistry pertaining to this purple pigment – the Purple of the Levant.

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[*] Prof. Zvi C. Koren (formerly Kornblum) received his Ph.D. in Physical Chemistry from the City University of New York (C.U.N.Y.). In New York, he served as Professor and Chairman of the Department of Chemistry at The Cooper Union for the Advancement of Science and Art. Following his *aliyah* to Israel in 1990, he has been the Director of the Edelstein Center for the Analysis of Ancient Textiles and Related Artifacts at Shenkar College since the Center's inception in 1992. He was also the Head of the Department of Chemical Technologies at Shenkar. Last year, he was awarded the Most Outstanding Faculty Award by the college. This current sabbatical year, he is a Visiting Professor at Hunter College in New York. His main research area is the analytical chemistry and history of ancient colorants, a topic on which he has published and lectured extensively.

NATURAL DYES FROM UZBEKISTAN

by Ms Zarina Kendjaeva (Uzbekistan)*
Master of embroidery and silk carpet weaving

Dear Ladies and Gentlmen and participants of Symposium!

I am very glad that I have the opportunity to participate in Symposium on Natural Dyeing.

My name is Zaina Kenjaeva, I am a master on suzane embroidery. My father is Fatullo Kenjaev who is a master on carpet weaving.

I would like to tell you briefly about my home land, the Pearl of East - Bukhara.

UNESCO organized the celebration of 2500 year jubilee in 1997. Bukhara city is on the World Heritage List of UNESCO. Bukhara is open air museum and located on the Great Silk Road.

There are many generation of craftsmen in Bukhara and till today many of them continue their traditions to pass it to new generations. Bukhara is rich with its different kind of crafts and it survived the generations of blacksmiths, silk embroiderers, gold embroiderers, block printers, metal chasing, potters (ceramists).
(few more sentences about tradition crafts in the area)

During the Soviet times crafts died and there are only few old people who still remember tradition of crafts. Since 1991 Uzbekistan became independent and from the first days of Independence our government and UNESCO helps craftsmen in reviving crafts. I was born in the family of carpet makers and watched how my parents made all different processes: dying, weaving, and embroidering. From childhood I had the good opportunity to take part in the process and to help to my parents.

We read many books on dying in different countries but we know that plants are different in different areas. Our main purpose is to use local plants, it is much cheaper for us. Indigo we bring from Afghanistan and India, but now UNESCO provides us with seeds and we got good results, indigo grows in our country.

September 17, 2001 is very important event in my life, UNESCO had opened the school on carpet weaving and natural dying. Many students could learn the process of dying and weaving.
(few more sentences how the school started and work today)

Now I want to tell you about the process of dyeing:

The natural dye colors we use:

Red color – we get it from the roots of ruyan plant. Then we add mozuz (zhav moz) and 1 day before the dying process we put the silk into alum solution.

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* I am a 22-year-old, third year art student at Bukhara University and master of embroidery and silk carpet waving. I began learning the art of traditional embroidery in 1998 from my mother, a master in the art. Natural dying I learned in 2001 from my father, a master carpet weaver and head of the Carpet Weaving Training School. In 2004, I received the UNESCO/CACSA Seal of Excellence for my work. There were only 6 awarded in Uzbekistan and only 19 totals awarded in the five countries of Central Asia from 105 submissions. Since 19981 have exhibited my embroideries in various countries, including: at the Art in Action Exhibition in Oxford, England (2002), as well as in Kyrgyzstan (2004), Kazakhstan (2000,) Uzbekistan (1999), and 1 have been recognized with certificates for excellence from Kazakhstan (2), Kyrgyzstan (1), and several from Bukhara, Uzbekistan. In 2005 silk and spice festival was concourse for Central Asia embroidery and they chose my embroidery and Invited me in India for symposium and demons tread my embroidery. I was In India to explain and to show my embroidery in 2005 September and I have a certificate. In this time I have also several girls who helping me and I am teaching them also how to embroidery like this beautiful Suzane. I hope to show this year very nice and beautiful Bukhara embroideries.

Red color has 5 different tinctures.

Blue and Green colors – we get it from indigo using fermentation or we can use also hydrosulfite.

Yellow (gold) color – we get from the leaves of the trees (apple tree, mulberry tree, vine and onion skin)

Orange color – we get from onion skin.

Yellow color – we get from pomegranate skin.

Brown color – we get from walnut shell.

Black color – we get from the mixture of pomegranate skin, mozur which is mineral from the mountains.

Wine coloured (Bordeaux) color – we get from cochineal.

The process of natural dying is very interesting and we are always amazed when we dye.

Thank you!

NATURAL DYES USED IN THE M'ZAB REGION OF ALGERIA

by Ms Fadila Bird, MA* **(United Kingdom)**
Freelance advisor to the Museum of the Popular Arts of the Casbah, Algiers

Abstract

The M'Zab region in Algeria is a traditional society, located in the footsteps of the Algerian desert. Its dwellings were built like closed castles in order to survive harsh heat and cold nights. With gardens, watered by a complex system of irrigation, (3000 wells) the dependency on animal flocks and vegetation has been a haven of inspiration for women dyers and weavers. Plants available locally have been used for the colouring process before the arrival of the chemical tints two decades ago. Nowadays, only for personal purposes, older weavers still use natural products. A state incentive is trying to save their knowledge and to get the younger generation to go back to this traditional system.

In this region, most of the carpets are woven in a fine texture. They fulfilled different functions: payer mat or bedding. The short and somehow coarse wool obtained is the result of flocks fed on limited grass. This commodity provides also the material for the rugs covering the walls and some clothing. Whereas, black goats hair, mixed with wool serve as a rain repellent for a tent divider or a burnoose, the local man's cloak. Easily identified by their coloured patterns and decorative meanings, for centuries the choice of colours has been kept faithfully.

Usually a weaver is also a dyer. The introduction of chemical dyes and synthetic fibres has made life much easier for young weavers who prefer also brighter colours. But natural dyes are still used by some older weavers. This requires long preparations and tiring physical work. Plants are bought, then each crushed to reaching a powder. The most popular are a deep red obtained from the roots of the garance plant; the blue from the indigo ; buckets of henna leaves and dry orange skin provide a lovely orange tint ;whereas dry pomegranate skin gives a different brown red . The curcuma powder, imported from India by the caravans, but since grown locally, resembling of that yellow saffron. Hard bark walnut boiled helps to darken any given colour. The dyer also mixes and creates her own green, blue or black. Sometime, she chooses to rinse the wool with lime before colouring it. Alum, the tannin, fixes the colour chosen; even the slightly salty water from wells has the same function. The dyer's work starts with washing the wool several times and lets it dry. A copper basin is filled with water to boil, to receive one colour; a few threads are sampled before soaking yarns of wool. They are removed, rinsed and hung to dry. Usually, the yarn is washed to get rid of residue or excess dye, which should not bleed later. This work has been done by women who have not been educated and work from memory passed from generation to generation. It has been impossible to obtain figures regarding measurements used in their preparation. But even if each time the resulting colours have not been exactly the same, this has served a purpose, each woven product becomes unique.

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* Studied English Literature at the University of Algiers. In 1982, in Mexico, studied Spanish language and a certificate of Maya civilisation, which introduced her to the use of natural colours used by the indigenous population. Between the 11 years spent in Africa, while teaching English, learnt more about woven textiles; studied for a certificate of Art and Architecture of Medieval and Renaissance civilisations at the University of Reading and start to collect data from all the countries visited. Upon her return to England, studied for a M.A degree in Victorian history of Art and Architecture at the Royal Holloway and Bedford College, University of London, Egham. The result led to giving lectures, writing some articles on the costumes used in the Algerian society (since searching on the origin of those costumes). In Kuwait became the president of the Kuwait Textile Association, organising talks and workshops; the interest grew deeper with all different findings and comparison with the weaving and dyeing of Algeria, her birth place. Since, has become a freelance adviser for the Museum of the popular Arts of the Casbah, in Algiers which exhibits often a collection of textiles. After a recent exhibition on carpets, it has been discovered that since 1930 nothing has been written on natural dyes used in the country. The result coincides with the topic of the symposium. The aim of this research is to highlight the priceless heritage of the M'zab region in the intention of publishing it. Even if she came late in this kind of research, her participation at the symposium is backed up by the Curator of the Museum, Mrs Amamra.

After ten years of slow market, the M’Zab is seeing an increase in its weaving industry, a renewal due to the return of tourism. To encourage the remaining use of natural dyes of the past, the State has introduced a financial incentive for its protection. It is too early to assess results but with their realistic approach, once understood, the M’Zab population will defend this precious heritage.

NATURALLY MAORI – FIBRES AND DYES OF MAORI

by Ms Rauni Ngarimu[*] (New Zealand)
Weaver of traditional and contemporary indigenous Maori garments and articles

RUBIACEAE FAMILY – RAUREKAU - COPROSMA AUSTRALIS
Also known as: Manono, Kanono, Papauma

Abstract

Slide 1

Coprosma robusta – Karamu – medicinal
Coprosma acerose – Tarakupenga, tataraheke, tatarahake
These common shrubs may be considered together. Raurekau - Coprosma Australis was formerly known as Coprosma Grandifolia

Slide 2

Maori Medicinal Use – the sap from the inner bark was used for curing itch and rashes. A decoction made by boiling leaves and cut twigs was known to relieve pain in the chest.
Chemical – The colouring matters of Coprosma barks have been extensively investigated. They consist of various anthraquinone derivatives related to the synthetic purgative 1.8 – dihydroxyanthraquinone. All New Zealand Coprosma examined have been shown to contain the iridoid asperuloside.

Slide 3

Growth – Raurekau is a large shrub or small tree up to 6m high with large leaves up to 20cm long found commonly as undergrowth and marginal shrub in lowland and subalpine forests throughout New Zealand.

Slide 4

Flowers occur from April to June often along with drupes of the previous season which take some 12 months to ripen.
It is very tolerant of of sea air and strong off shore westerly winds.

Slide 5
Raurekau was a favourite plant among my ancestors not only for its healing properties but also for the vibrant colour that could be easily extracted and applied to fibre for decoration
Raureakau is still very popular today amongst Maori weavers as it is readily available in the wild, but has also gained popularity as being an attractive plant to grow in the home garden.

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[*] Ranui's native tribal affiliations are Ngai Tahu and Ngati Mutunga. Born 08 February 1946. Ranui is a weaver of traditional and contemporary indigenous Maori garments and articles. Ranui specialises in restoration of kakahu (traditional cloaks). She is the Project Convenor for The Eternal Thread – Te Aho Mutunga Kore – an exhibition of Maori weaving that is currently touring North West America. Ranui has exhibited her weaving both nationally and internationally. Ranui has woven gifts that have been gifted to HRH Queen Elizabeth II (2002) and also to HRH Prince Charles (2005). Ranui designed the kakahu (cloak) presented by the lateTe Arikinui Dame Te Atairangi Kaahu (Maori Queen) to Mayor Gavin Newsome of the City and County of San Francisco during the Maori Art Meets America exhibition in August 2004. Ranui co-designed the kakahu (cloak) worn by the NZ Flag bearer at the Athens Olympics. Ranui has worked in a liaison role for the Olympic committee with Ngai Tahu (2004 – Athens and also for the Winter Olympics 2006). She also worked with the Commonwealth Games committee regarding uniform adornments (2006). Ranui and her sister Miriama Evans co authored a book – Eternal Thread ~ The Art of Maori Weaving – which was a finalist in the Montana New Zealand Book Awards 2006 and a finalist in the Textile Society of America R.L Shep Award 2006 for exceptional scholarship in the field of ethnic textile traditions. Ranui is the immediate past chairperson of Te Roopu Raranga Whatu o Aotearoa – National Maori Weavers Collective of New Zealand. She is President of Korowai Tahi – Ngai Tahu (tribal group) weavers. Ranui is also Principal Tutor and Advisor for Aho I te Rangi Trust (Tribal weaving)

Slide 6

I gather my plant from forest in its natural surroundings.
Maori tradition is that Raurekau is gathered in summer on a hot sunny day. The bark is gathered in the morning from the eastern side of the tree and shavings are taken from the base of the shrub.

Slide 7

The bark is then steeped in boiling water until the desired colour is obtained and the fibre added. Once the fibre has reached the desired colour, the fibre is extracted from the dye and rinsed thoroughly in cold water.

Slide 8

The fibre is then dried and ready for use.

Slide 9

Acknowledgements:
J.T Salmon – New Zealand Flowers and Plants
S.G. Brooker, R.C. Cambie, R. C. Cooper - New Zealand Medicinal Plants

INDIGO PRINTING TRADITION OF NORWAY

by Mr Axel Becker[*] (Norway)
Crafts artist and designer

Abstract

I am running a so-called ”blueprint-workshop” nearby the city of Trondheim, which is Norway’s old capitol in the middle of the my country, up in the high North.
Educated as an artist, I started printing on textiles too, about 25 years ago. At that time I used modern printing techniques and colours, but I felt more and more uncomfortable, because of the chemical contents in the colours I used.
So I took some steps back in time and comfort and started to work with the so- called ”blueprint-technique” about 15 years ago.
The historical Museum in Trondheim has one of the biggest collections of printing blocks in Scandinavia.
Many of them prove the Blueprint-tradition, because you can find rests from the resist on them.
After several journeys to Eastern Europe, where this technique still has some representatives, I practised for myself in over 4 years. Then, declaring my apprenticeship for finished I started my first Blueprint-workshop in 1993.
In the beginning I still copied traditional patterns, first of all from the museum. Butt then I had to make my own designs which I wanted to express in my way.
Still there is the printing- and the dying process 100% in the traditional way, but I guess it is important to develop old professions and integrate them in our modern way of expression.
Compared with many of you I have quite special conditions in Norway:
In our country the chain was broken, so to speak, - because the last Blueprinter closed down his workshop about 70 years ago.
One of the biggest obstacles in Scandinavia was, and still is, our cold climate: it is simply to cold for cultivating ”Indigofera Tinctoria”-plants.
That means that the European Blueprinters always imported Indigo from India and the Far East.
!n 1890`s the so-called ”synthetic Indigo” came on the European marked, which is produced by coal.
The natural explanation for that phenomenon is, that our planet had subtropical climate all over for about 55 million of years ago. Billions of plants, included indigo grew everywhere. Even in areas we today call Scandinavia right up to the North Pole, the Indigo grew in large amount.
After millions of years we still find this Indigo ”stored” in coal. This Indigo is 100% identical with natural Indigo.
More or less all European Blueprinters used that Indigo since about 1900.
In old days there where 3 different craftsmen that worked together:
-One who made the wooden printing blocks
-One who resist-printed on white linen and cotton
-And the one who dipped the textiles in the Indigo-vat 5 -10 times, about 20 minutes each time.
Nowadays I have to combine all professions and carry out all three of them.
Norway is one of the richest countries in the world. For me there is no chance to compete with the commercial textile industry at all. I need hours and hours for one product.
On the other hand the main value of my work is showing the process of the Blueprint and tell the people about its history.
After all these years I had thousands of visitors, -pupils, students and a group of real ”Indigo-fans”, who come to my workshop year after year.

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[*] After practising modern printing techniques on textiles for 15 years, he started a ”Blueprint”-workshop in 1993. He found more than 2000 printing blocks at the Trôndelag Folk Museum in Trondheim, included order-, formula-books etc. Many of the blocks prove that resistprint-techniques and dying with Indigo was used in Middle Norway too. But the last dyers closed their workshops for more than 50 years ago. So he learned the practical part of this profession in Poland and Eastern Germany and after 4 years he started up a studio which he is still running. While taking care of the traditional technique, he doesn’t want to copy old patters only, but tries to express himself as an artist in new patterns and new ways. He is working for industrial countries like Norway which want to let survive their traditional professions.

As you will see in the following DVD the traditional patterns could be inspired or produced all over the world. It is a fact that several patterns from the Historical Museum in Trondheim are exactly the same as you can find them in Germany, in Austria; France, India or Japan. That proves that craftsmen always have been inspired from others, that they copied patterns and used them in their production since.
Nobody could exactly tell us where this or this pattern originally comes from.
If you have ever seen the metamorphosis from the yellow-green going to the blue, when the textile comes up from the Indigo-vat and got fascinated you will never forget it.
I myself look forward to see it each and every time – I am cached in the Indigo world –
I love it.
I love the stillness, the concentration and the meditation it is, when I am printing the resist, - I love the sparkling bobbles on top of the Indigo-vat... all that does not make me rich, but it makes me and many other people happy. What more can I wish?

SESSION / SÉANCE / SESIÓN 3
A GLOBAL HERITAGE WITH A SOCIAL IMPACT:
GENDER AND RURAL DEVELOPMENT ISSUES
TEINTURES NATURELLES, UN PATRIMOINE MONDIAL A IMPACT SOCIAL : FEMMES ET DEVELOPPEMENT RURAL
LOS TINTES NATURALES, UN PATRIMONIO MUNDIAL DE IMPACTO SOCIAL: MUJERES Y DESARROLLO RURAL

07.11.2006

Chairperson / Président / Presidente :
Dr (Ms) Pauline Duponchel (France)

- Mr Kandiourou Coulibaly and Mrs Néné Thiam (Mali), "Traditional dyeing with mud in Mali : the bogolan" / "Une tradition de teinture à la terre : bogolan du Mali" / "Teñido tradicional con barros en Malí : el bogolan"

- Ms Carmen Bolaños (El Salvador), "Indigo, an empowering dye" / "L'indigo, puissance d'une teinture" / "Indigo… una tintura con valor"

- Ms Adriana Buitrago Pardo (Columbia), "The colours of my *paramo*" / "Les couleurs de mes hauts-plateaux" / "Los colores de mi páramo"

- Dr (Ms) Riikka Raisanen (Finland), "Natural dyeing in teaching – a learning project which integrates science courses with arts, crafts and design" / "L'enseignement de la teinture naturelle – un projet d'apprentissage qui intégre des cours scientifiques d'art, artisanat et design" / "La enseñanza de los tintes naturales – un proyecto de aprendizaje que integre cursos científicos, de arte, artesanía y diseño"

- Ms Rashmi Bharti (India), "Use of natural dyes in creating sustainable livelihood options in the Central Himalayas" / "Utilisation des teintures naturelles pour la création d'un développement durable en Himalaya centrale " / "El uso de los tintes naturales en la creación de un desarrollo sostenible en Himalaya central"

- Mr Nicolas Perez-Brito (Dominican Republic), "Logwood: survival for a people" / "Logwood: la survie d'un peuple" / "Logwood: la supervivencia de un pueblo" (represented by Ms Cheryl Kolander)

- Mr Edric Ong (Malaysia), "Warpath of the women – NGAR mordanting ritual of the Iban weavers of Sarawak, Malaysian Borneo" / "Campagne des femmes - rituel de mordançage (NGAR) des tisserands d'Iban de Sarawak, Bornéo-Malaisie" / "Warpath de las mujeres - ritual de mordientes (NGAR) de las tejedoras del Iban en Sarawak, Borneo-Malasia"

- Dr (Ms) Liz Williamson (Australia), "Contemporary natural dyeing in Australia" / "Teintures naturelles contemporaines en Australie" / "Tintes naturales contemporáneas en Australia"

- Ms Amy Frey (USA), "Revival of natural dyes in Central Tibet" / "Revitalisation des teintures naturelles dans le centre du Tibet" / "Revitalización de los tintes naturales en el centro del Tibet"

The third session explored the social implications of development programs of support to preserved traditions of dyeing with natural dyes, or of revival of lost knowledge and practices. The presentations in this session offered first-hand testimonies on very important recent cultural, social and economic development initiatives that have significantly contributed to the valorisation of textile productions technically connected with the use of natural dyes in different countries. These testimonies pointed to some major societal changes that may be induced by such programmes, both in terms of task organisation and gender, and in terms of scale of production.

La troisième session a exploré les implications sociales des actions de développement liées au soutien aux traditions tinctoriales encore vivantes, ou à la réintroduction de savoirs et savoir-faire perdus. Les conférenciers de cette session ont témoigné d'actions d'animation culturelle, sociale et économique très importantes dans leur pays et ont beaucoup contribué à la valorisation des textiles décorés par des techniques intimement liées à l'utilisation de teintures naturelles. Leurs témoignages montrent que ces actions entraînent des changements importants dans les sociétés où elles s'insèrent, tant au niveau de la répartition du travail que de l'échelle de la production.

La tercera sesión exploraba las implicaciones sociales de las acciones de desarrollo ligadas al apoyo a las tradiciones del tinte aún vivas, o a la reintroducción de conocimientos o técnicas perdidas. Los conferencistas de esta sesión testimoniaban sobre las acciones de animación cultural, social y económica más importantes en sus países que han contribuido a la valorización de los textiles decorados por técnicas ligadas a la utilización de tintes naturales. Sus testimonios muestran que esas acciones generan cambios importantes en las sociedades donde se insertan, tanto a nivel de la repartición del trabajo como en la escala de producción.

UNE TRADITION DE TEINTURE A LA TERRE : BOGOLAN DU MALI

par Dr (Mme) Pauline Duponchel (France)
présenté par M. Kandiourou Coulibaly et Mme Néné Thiam (Mali)*

Teinture de plantes et de terre, le terme *bogolan* décrit aujourd'hui tout à la fois une technique, un décor et un style. Depuis les années quatre-vingt, le *bogolan* s'est développé dans les centres urbains et a connu la faveur de la mode internationale.

Les mains ont la parole

Auparavant, cette technique était exclusivement aux mains des femmes.

De la teinture artisanale à l'impression industrielle, le *bògòlan* est un procédé complexe où une réaction chimique (tanin acide et oxyde ferrique) permet la fixation des coloris.

Entre leurs tracés indélébiles mais fragiles apparaissent des espaces blancs, autant de motifs associés en thèmes qui transmettent la connaissance parallèlement à la tradition orale. Un vêtement de coton teint à la terre *bogolanfini* est un ouvrage didactique, support de l'éducation par lequel les femmes diffusaient et diffusent encore les fondements de leur culture à travers mythes, récits historiques ou conseils moraux. Les motifs du *bògòlan* constituent une grammaire de signes ou, mieux encore, une écriture.

Chaque signe porte un nom et leur accumulation est « chargée ». En effet, tous les éléments entrant dans la composition d'un *bogolan* ont des propriétés magiques et thérapeutiques. Leur utilisation concentrée sur quelques bandes cousues entre elles diffuse le plus puissant des remèdes, la plus efficace des protections.

Dans la société *bamanan* traditionnelle, les actes dominent la parole. Le silence est érigé en qualité révélant la bonne éducation, la tranquillité d'un caractère, la maîtrise de soi. Dans les langues sans écriture, un discours direct est jugé brutal, presque vulgaire; c'est pourquoi la métaphore, l'image ou l'allégorie sont régulièrement utilisées. Elles sont la preuve manifeste de la finesse intellectuelle et de l'intelligence.

Les qualités d'une œuvre reposent sur des critères unanimement reconnus par les femmes pour qui la finesse du tracé, le contraste des valeurs et la régularité sont mises en avant.

Un patrimoine à conserver et à valoriser

L'obstacle majeur de la technique de teinture à la terre est la conservation à long terme de ses coloris et sa résistance au lavage.

Dans les villes, la rapidité avec laquelle, depuis ces vingt dernières années, hommes et femmes se sont emparés de cette technique a bouleversé les repères d'usage et les décors pour bénéficier d'une autarcie de création économiquement intéressante. Paradoxalement, la marge de liberté créatrice propre à la tradition de cette expression a permis à d'autres de s'en emparer et les femmes ont elles-mêmes enseigné la technique et permis la reproduction de leurs signes.

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* Kandiourou Coulibaly et Néné Thiam sont deux artistes qui appartiennent au groupe BOGOLAN KASOBANE. Ils sont installés à Bamako au Mali. Ce groupe a été créé dans les années soixante dix par Kandioura Coulibaly et deux autres peintres Baba Fallo Keïta et Boubacar Doumbia. Sont venus se joindre au groupe Klétigi Dembele et Souleymane Goro. Ils ont effectué des recherches et ont appris auprès des femmes de la région de Ségou, puis dans toutes les zones de production. Le groupe ne peint qu'avec cette technique des œuvres communes et participe à de nombreuses expositions internationales. Ils travaillent aussi à la création de costumes ou de décors pour des tournages de films (Gimba de Cheick Oumar Sissoko) ou à la mise en scène de pièces de théâtre. Ils s'impliquent aussi dans la décoration intérieure. Les membres de ce groupe sont les principaux acteurs de la résurgence du *bògòlan* au Mali.

La production artisanale est devenue le symbole d'une identité malienne, ouest-africaine dans la sous-région, enfin africaine dès qu'est franchi l'océan Atlantique.

Le changement de statut de ces étoffes a été marqué par le passage d'une valeur d'usage à une économie de marché. La tradition (teinture à la terre sur des bandes de coton filé et tissé main) s'est nourrie de la modernité (impression industrielle). Ce mouvement de réciprocité s'est effectué grâce à l'impulsion de certaines personnalités passerelle entre différentes cultures qu'ils soient artistes, stylistes ou décorateurs.

INDIGO… UN COLORANTE CON VALOR

por Sra. Carmen Bolaños[*] (El Salvador)
Visual Artist and Graphic Designer

I'd like to thank my co-sponsors IICA, Instituto Interamericano de Cooperacion a la Agricultura, the Ministry of Economy of El Salvador, UNESCO and the CCI, Crafts Council of India for this unique opportunity to share our common interest: Natural Dyes.

Even though indigo was our main crop of export for over three hundred years, indigo farming as well as indigo dyeing techniques were lost for the last 80 years.

The revival of farming, extracting and the use of the indigo dye in El Salvador may be attributed to several actors, both national and international. Among them we have: our government, GTZ-The German Cooperation in the search for better ways of farming and extracting the dye; JICA-Japanese International Cooperation Agency- through their permanent help to learn techniques to use on textiles and IICA, Instituto Interamericano de Cooperación a la Agricultura.

The combined efforts have given fruits: we Salvadoreans grow and use indigo all over the country again. Rural areas and cities are involved. Indigo, a key cultural heritage is back with us, and with it new jobs. It is important to point out the job creating effect of indigo. As owner of a workshop and two small specialized stores I can testify to some issues: on the one hand it becomes a source of income for women and for men. Since we are using many needles and thread techniques and our women are skilfully gifted, I have noticed Shibori and other textile techniques are easily adopted by them. Most of the women working with indigo in rural areas,other private workshops – most owned by women- or that I hire in my workshop contribute to their homes and families with their effort. Before indigo they didn't have an appealing nor stable source of income. Or maybe I should say we didn't. As for men, they work in the farms for the most part, but not solely. In Econature Products, my workshop, they are the dyers, and batik craftsmen; but we find them also in the occidental and oriental parts of the country doing remarkable work.

Both in the agricultural area as in the dyeing field, we can find men and women. And then we have a third component which is the sales shops. Most craftshops in the country now include in their inventory naturally dyed products, indigo being the most outstanding. As for me I have two specialized natural dyes small shops, one of them located in the duty free area of El Salvador's International Airport, and I feel proud to say we provide a stable source of income to our sales personnel as well, both for the rural area of the airport as for the San Salvador kiosk. Our people enjoy a salary above the standard minimum wage and also receive all legal benefits including health system care. And last but not least important, all the repercussions of the indigo affair in El Salvador tend to create a renewed self esteem. A renewed self esteem that is important for our youth, for our women, for our men.

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[*] Ms Carmen Bolaños studied architecture in Guadalajara, Mexico, and has taken art courses in England, Mexico, the US and El Salvador. Worked with wooden crafts 1984-1989. Has participated in many group exhibitions, and in two solos. One installation was exhibited in Washington representing El Salvador women. Has been working with natural dyes since the beginning of 2001 with the first Japanese Volunteer JICA sent to our country. She has two specialized stores in El Salvador, one is at the duty free area of the International Airport of El Salvador. Will soon open another in the workshop, that will also function as a place for tourists to see the processes of dying, of preparing textiles, batik. Has planted indigo in the garden, and it is about 2 meters high, and very healthy, with flowers, and/ or with seeds at the right time for people to get to know the plant. The workshop will feature an ILCD screen showing the indigo extraction process and also pictures of other stores and places in El Salvador. Has also worked closely with the other three Japanese volunteers who have come to El Salvador, and is now learning and working Itayime technique. Attended the international congress in El Salvador in 2004 too.

Abstract

El principal producto de exportación de El Salvador por varios cientos de años fue el indigo o añil. Su cultivo estuvo intrínsicamente ligado a la economía y la cultura salvadoreña. De la comercialización del mismo se crearon grandes fortunas…. Nuestro indigo viajó a lugares remotos y fue muy apreciado por su alta calidad.
Sin embargo, y con el surgimiento de los colorantes naturales, el mismo fue siendo desplazado hasta casi desaparecer totalmente en el siglo pasado. Desde principios de los años 90's se han venido haciendo esfuerzos de recuperación del mismo, en un inicio a nivel cultural únicamente, y luego con la participación de instituciones de gobiernos amigos y sus instituciones, como JICA – con voluntarios japoneses, enseñando la técnica del teñido, GTZ – Cooperación Alemana apoyando en el cultivo del mismo y en formas óptimas de extracción, el gobierno de El Salvador, por medio de CONCULTURA a nivel de investigación cultural, IICA con su apoyo para crear un Congreso Internacional de Colorantes Naturales y otros apoyos de diversa índole; el indigo de El Salvador regresó a formar parte del tejido cultural de El Salvador.
Nuestros padres escucharon a sus padres hablar de una planta llamada índigo o añil. Ahora también nosotros y nuestros hijos la conocemos y disfrutamos.
En este siglo, el índigo se encuentra presente nuevamente en la mayor parte del territorio nacional, y su presencia se ha hecho sentir en el área rural y urbana.
En el área rural ha servido para que mujeres, y hombres también, aprendan un nuevo oficio, una nueva forma de trabajar y expresarse y obtener ingresos económicos. También ha servido para pensar en los abuelos y evocar alguna sonrisa al recordar sus historias de añil del pasado. En el área rural en pequeños poblados visitados por turistas también encontramos que se han abierto pequeñas tiendas con ropa azul. También encontramos stands o bazares donde también se ofertan productos azules al visitante. Algo salvadoreño de tradición.

Por otro lado, los productos teñidos son variados, y es que hay mucha inspiración, trabajo, curiosidad, juego por hacer con este colorante natural. Los textiles predominan sobre cualquier otro sustrato utilizado para teñir. **(A continuación se presentarán los siguientes protagonistas testimoniales en esta área**: Azulinas – empresa liderada por mujeres de Santa Ana, occidente del país y que fabrica ropa casual y de moda. También en Santa Ana se encuentra la Sra. UCA Rufatti, que elabora carteras y bolsas.
Vanesa Mazorra y Jorge Bustamante- joven pareja dueños de Xiquilite, linda tienda en el pueblo de Suchitoto, donde se origina la siembra del indigo en El Salvador- y que le da un carácter muy especial al pueblo. Otros han seguido su ejemplo en menor escala dentro del mismo poblado.
En San Miguel, zona Oriental del país tenemos al grupo ADAZOES, conformado por cultivadores de indigo y artesanos y artesanas. También en el oriente del país en Morazán, están mujeres que trabajan con mezcal como la niña Rosa Méndez. En Juayúa, occidente del país, en la llamada Ruta de las Flores está Laura Flores y otros artesanos y artesanas. En la zona paracentral de El Salvador se encuentran modernas tiendas surtidas con productos de artesanos de diversas localidad, como un ejemplo de estas Nahanché, pero hay otras que también serán mostradas. Se harán breves tomas de gerentes de instituciones de apoyo al artesano como CASART, ATA, y otros relevantes. Y, por supuesto también de algunos artesanos que trabajan en mi empresa y que se han especializado en alguna área de teñido.
En breve, mi presentación será una panorámica de la difusión del índigo en el territorio nacional, de quiénes lo trabajan, y ellos mismos contarán de manera sintetizada en qué manera sus vidas han cambiado desde que se iniciaron con la utilización de índigo.

LOS COLORES DE MI PARAMO

por Sra. Adriana Buitrago Pardo[*] (Colombia)
Founder and Director of Craft Project

La **Fundación YTACHOQUE Manos y Oficios** se fundo en el año 2001 en la zona de Cogua Cundinamarca, la cual constituye una reserva natural estratégica para la región por su riqueza en agua, flora y fauna; esta zona de páramo (2600 metros sobre el nivel del mar) inspiro el propósito de enseñar a la comunidad, especialmente campesina, oficios artesanales con base en los recursos naturales que tienen a su alcance. Por tales razones hemos explorado oficios como la tejeduría, la cerámica y la talla en madera.

Principalmente el oficio de la tejeduría, nos ha permitido desarrollar un gran potencial entre las mujeres de la comunidad, quienes se destacar por su habilidad como tejedoras y por otra parte, ha motivado la investigación y búsqueda de gran variedad de colores naturales que damos a la lana de oveja a partir de experimentos con la vegetación nativa de la zona y cuyo resultado ha sido el desarrollo de una amplia gama de colores y tintes naturales que han enriquecido y embellecido nuestros productos artesanales.

Todo este proceso nos ha dado muchas ganancias. A nivel cultural, a permitido el rescate de la tejeduría como un oficio milenario que acumula la experiencias de antepasados en cada uno de sus momentos: hilado, tinturado y tejido. A nivel económico ha permitido encontrar soluciones y beneficios para la comunidad tales como la ocupación del tiempo libre, el aumento de los ingresos económicos y el mejoramiento de la calidad de vida de quienes desarrollan el oficio así como de sus familias. A nivel social a permitido que las personas se acerquen, dialoguen y compartan saberes en un encuentro cotidiano que nos permite socialización y capacidad de asociación y trabajo en equipo. Todo esto, en un ambiente de absoluto respeto con el medio natural que nos rodea del cual extraemos lo necesario para nuestros oficios pero sin dañarlo y al contrario, fomentando una filosofía de armonía entre los seres humanos y la naturaleza.

El encuentro con los colores que nos ofrece el páramo ha sido una experiencia enriquecedora y maravillosa; en contacto permanente con el medio, paso a paso hemos ido reconociendo las plantas que desde hace mucho tiempo fueron utilizadas por nuestros ancestros para dar tinte a la lana de oveja tales como el Corono, Nogal, Romaza, Chilca y otras muchas con las que obtenemos gamas de verdes, amarillos, marrones, morados, azules y otros que dan color a nuestros oficios y a nuestro que hacer asociativo.

Los procedimientos que utilizamos para el tratamiento de la lana, para la búsqueda y aplicación del tinte, para la tejeduría misma, son totalmente tradicionales y sencillos ya que nuestro propósito es que la comunidad retome las cosas naturales que dan tanto beneficio a la humanidad.

Todo este aprendizaje y el desarrollo de procesos artesanales adecuados que privilegian el cuidado de la naturaleza, han generado en la comunidad mayor acercamiento y comunión con el entorno haciendo que se imprima en el oficio un sentimiento de amor que complementa los productos artesanales, los cuales reflejan identidad cultural y calidad, haciéndolos competitivos en el mercado nacional e internacional, lo que constituye un potencial empresarial que con mayor apoyo podría convertirse en una experiencia digna de mostrar en todo el mundo.

La Fundación **YTACHOQUE Manos y Oficios**, ha sido promotora y gestora en esta labor que ya cumple varios años desarrollando conocimientos y habilidades en la comunidad, a través de los cuales hemos evidenciado la necesidad de crear un centro artesanal en la zona del páramo que

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[*] Colombian Craftswoman who works as a weaver. During last years she has dedicated to investigate and work the natural dyes with mountain plants. In the year 2001, she founds with her sister the Foundation “Ytachoque Hands and Labours” with the main intention to teach artesian labours to vulnerable communities, considering available natural recourses. The natural dyes are an important elements to enrich the handicrafts of the region, give a cultural identity and benefit the familiar economy.

sea manejado por la comunidad y en el que se puedan hacer procesos de hilado, tinturado, producción y comercialización con excelente calidad.

Todas las anteriores son razones que nos alientan para dar continuidad a esta labor que realizamos en la zona pese a todas las dificultades y retos que hemos tenido que superar; en este sentido, seguiremos aportando conocimientos y oficios que contribuyan a mejorar nuestra relación con el entorno y especialmente, a mejorar las condiciones de vida de los seres humanos que luchan cada día por ser mejores individuos.

POEM - Text

- AMAZING DREAMS

  HERE COME THE MEMORIES
  CHANGING LEGEND INTO FACT
  THE ROAD FROM YESTERDAY
  A WAY OF THE PRESENT
  WE ARE PART OF A SUMPTUOUS GRAND DESIGNED
  DISCOVERING THE SECRETS FOR THE FUTURE
  TURNING MYTH INTO TRUTH
  "Let's open…….this road"

  SUEÑOS MARAVILLOSOS

  LLEGAN LAS MEMORIAS
  TRANSFORMANDO LA LEYENDA EN REALIDAD
  LA SENDA DEL AYER
  UN CAMINO EN EL PRESENTE
  SOMOS PARTE DE UNA CREACION MAGISTRAL
  DESCUBRIENDO LOS SECRETOS PARA EL FUTURO
  CONVIRTIENDO EL MITO EN VERDAD
  ¡ Abramos este sendero!

- OUR COLOMBIAN PARAMO'S COLOURS (TITLE)
  Los colores de nuestro Páramo Colombiano (Titulo)

- THE PAST…..THE PRESENT……WALKIING TO THE FUTURE…..YTACHOQUE. (Narration)

  El presente…..El pasado……Caminando hacia el futuro…YTACHOQUE (Narración)

- RAICES (roots) DREAMS OF OUR ANCESTORS (Sueños de nuestros antepasados) CULTURES (Culturas) ETHNIC (Etnia) IDENTITY (Identidad) TRADITIONS (tradiciones) ARTS & CRAFTS (Artesanías)
  SENSATIONS (Sensaciones)

- LET'S SEE OUR POSITION (MAPS) - Miremos nuestra posición (Mapas)

- NATURAL DYE'S WORK - Trabajos con tintes naturales

- PROCESS– Proceso – YTACHOQUE WAS BORN – 1996
  Ytachoque nació en 1996.
  TO SHEAR (Esquilar) HANDS THAT SHAPE THE FUTURE (Manos que forman el futuro) TO SPIN (Hilar)

- DYE (Tinte) - ECOLOGICAL NARRATION - Narración Ecológica

  ……IS AN ECOLOGICAL BRIDGE UNITING SEVERAL PARTS OF HAND'S LABOR. IT COMES FROM A LEGACY WITH ITS OWN INDENTITY, TEACHING AND HELPING PEOPLE IN THEIR DEVELOPED ARTISTIC TALENTS, CONSERVING THE CULTURAL HERITAGE OF THEIR ANCESTORS.

  Es un puente ecológico que une parte de manos laboriosas provenientes de un legado de identidad propia, enseñando y ayudando a la gente en el desarrollo de sus talentos artísticos, conservando sus tradiciones y herencias culturales.

- **DYES A VITAL RESOURCES (LIST)** - Tintes un recurso vital (Lista)

  What do the dyes give and help to our Colombian Communities?
  A Universal posibility.
  A better life style.
  Hope, faith and culture.
  Sensations, emotions with happiness.
  Developed of the artistic talents.
  To see the beautiful show of colours.
  Trade opportunities

  LET'S WORK TOGETHER

  Pushing the children, peasant teenagers, single mothers, and fragile old people without job, to learn how to be productive from the region resources.

  WHAT ABOUT A MUTUAL HELP?
  THIS COULD BE YOUR OWN DREAM!
  YTACHOQUE!
  HANDS MADE SIGNAL

  TINTES UN RECURSO VITAL (Lista)

  Que nos aportan los tintes a nuestras comunidades colombianas?
  Un universo de posibilidades…
  Mejor estilo de vida.
  Fe, esperanza y cultura.
  Sensaciones, emociones y alegría.
  Desarrollo de talentos artísticos.
  Mostrar diversidad de color proveniente de la naturaleza.

  TRABAJEMOS UNIDOS!

  Impulsando la niñez, jóvenes campesinos, madres solteras, adultos sin empleo, aprender como ser productivo desde los recursos de la región.
  ¡COLABOREMOS! Este podría ser su propio sueño YATACHOQUE Señal de manos laboriosas.

VOCABULARY - VOCABULARIO YTACHOQUE – Señal de manos laboriosas

(Hand's made signal)
Amazing - Maravillosos
Dreams - Sueños
Dyes - Tintes
To shear - Esquilar
To spin - Hilar
Happiness Felicidad
Legend - Leyenda
Road - Sendero
Myth - Mito
Truth - Verdad
Past - Pasado
Present - Presente
Future - Futuro
Memories - Memorias
Hand's labor-Manos laboriosas
Artistic talentes- Talentos artisticos
Life Style - Estilo de vida
Hope - Esperanza
Faith - Fe
Culture - Cultura
Trade Opportunities - Oportunidad comercial
Work - Trabajo
Pushing the children - Impulsando la niñez
Peasant teenagers – Jóvenes campesinos
Single mothers- Madres solteras
Fragile people - Gente frágil
Region resources – Recursos regionales
Mutual Help - Colaborémonos
Own dream - Sueño propio
Cold drizzle - Páramo
Ancestors - Antepasados
Born - Nacer
Signal - Señal
Products - Productos
Developed - Desarrollo

NATURAL DYEING IN TEACHING – A PROBLEM BASED LEARNING PROJECT WHICH INTEGRATES SCIENCE CLASSES WITH ARTS, CRAFT AND DESIGN

by Dr (Ms) Riikka Räisänen*, Ph D (Finland)
Lecturer, Department of Home Economics and Craft Science,
Section of Craft Science and Textiles Teacher Education
University of Helsinki, Finland

Good morning Ladies and Gentlemen,

Today I will shortly explain a problem based learning project in which we integrated different school subjects in a context of natural colorants. This project was carried out at a comprehensive school in Finland.

Finland is situated in the North Europe. Our school system has a long tradition in having craft as a compulsory subject for every pupil. Craft is taught in schools from the 1st grade to the 9th grade.

Craft is a very important school subject because it has a positive effect on pupils in various ways, both physically and psychologically. For the pupils the art of making with their own hands is constructive.
For example

- Fine motor coordination is trained during craft classes, for example while sawing or crocheting.
- Different craft techniques train the co-operation between an eye and a hand.

In craft, pupils will have the opportunity for positive experiences, when they realize that they are able to do something for themselves with their own hands. We also believe that many theoretical phenomena could be brought into concrete practise thought craft. Working in a project that lasts the whole school year advances skills in persistent working and group work.

We carried out the project in the years 2003 and 2004 in co-operation with the Section of Textile Teacher Education of the University of Helsinki and the Etelä-Kaarela Upper Comprehensive School in Helsinki.

We had several aims for the project. Firstly we wanted to increase co-operation between the university and the society, in this case the upper comprehensive school. The school was a public school in a Helsinki suburb. Pupils involved were from 13 to 14 years old that means the 7th graders. Students from the University of Helsinki, Section of Textile Teacher Education took part in the project. They did their final teacher training being responsible for the craft lessons.

Recently there has been a lot of debate about integration of different school subjects. Because our school system is very divided and every subject is taught in its own lessons, it is difficult for a pupil to piece together reality as completeness. - How to understand entire processes in stead of phenomena separate from each other. One of the problems about integration at schools seems to be the lack of ideas. Thus, our aim was to offer schools ideas how to put integration of different subjects into practise.

We wanted students to learn by solving problems of their everyday lives. In addition, we found the theme natural colorants a good way of teaching environmental issues, environmental protection and ecological values.

On the viewpoint of research, we were interested in the question of how the integration of different school subjects affects students' motivation and learning.

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* (Born in 1967) - Doctor of Philosophy. Ms Räisänen also has a Master's degree in Education (textiles teacher) and Bachelor's degree in Science in chemistry. She works as a lecturer in the University of Helsinki, in the Section of Craft Science and Textiles Teacher Education, where she is in charge of textile technology and dyeing.

This project was based on my doctor's thesis. In the thesis, I developed a simple method for the isolation of the pigments from the fungi *Cortinarius*. Pigments were separated and analyzed using chromatography. The pigment powder was applied as dyes for different natural and synthetic textile fibres. Because the techniques used were simple and required little instruments, I got the idea of applying them at school, in chemistry and craft lessons.

The curriculum of the project contains the complete process from collection of plants to isolation of pigments and further on from dyeing or printing with the pigment powder to finished craft products.

The project started with biology classes during which a field tour was organized. Students collected and identified the fungi *Cortinarius semisanguineus*. These fungi are common in Finland and they contain similar dyestuffs than those in the roots of *Rubia tinctoria*. In chemistry, the dyestuffs of fungi were studied. Simple chemicals, equipment and techniques were needed for the isolation and characterisation processes. Anthraquinone pigments were obtained in a powder form.

In craft, the pigment powder was used to dye or print wool and silk yarn or fabric. Dyed materials were made into complete products, for example slippers or bags. At the end, an exhibition was organized in a library or other public premises.

There were different techniques used for the composing of the pattern. Here pupils used a collage of coloured papers as a technique. They got their ideas for the simple shapes from a museum in which they visited.

Pupils prepared printing pastes by themselves and used various techniques for printing, for example stencil, printing frame or resist printing with tape.

Printed fabrics were made into complete products. In this case, bags.

Another time pupils made slippers out of self dyed yarn. The design for the cover of the slippers was accomplished using aquarelle technique and searching an interesting area out of the picture with a window, a hole in a paper. The cover of the slippers was completed with a rug technique.

Every year after the project, there was an exhibition. The exhibition was very important. It made the whole year's work complete and visible also for the families.

Some results:

- The project was meaningful and interesting both for pupils and teachers.
- In the opinion of the pupils chemistry was difficult to understand and pupils would have liked to have more explanations about different steps of reactions.
- However, chemistry was more interesting than usually, when it was now connected to a concrete and important phenomena, colour and textile dyes.
- Pupils liked craft lessons the most.
- The pattern designing processes were different and something what pupils would have not thought them selves.

- Both teachers and pupils thought that it was possible to learn more and better in a project than in a traditional way. This was especially girls' opinion and it seems that integration increases girls' motivation towards sciences.
- Teachers' co-operation increased, which was fortunate. This enhances positive atmosphere in a school.
- Exhibition was educational in various ways.

I want to close my speech to the words of one 14 years old pupil: "Yes, just that I understand the whole thing and not only what I see!"

Tank you for your attention!

More about this project can be seen on my websites
http://www.leeds.ac.uk/educol/documents/00003413.htm
http://home.edu.helsinki.fi/~riraisan/tutkimus/integraatiop/index.htm

USE OF NATURAL DYES IN CREATING SUSTAINABLE LIVELIHOOD OPTIONS IN THE CENTRAL HIMALAYAS, INDIA

by Ms Rashmi Bharti[*] (India)
Co-founder and Secretary of Avani, Uttaranchal, India

Avani is a voluntary agency working with the creation of livelihood opportunities in remote rural areas of Kumaon, Uttaranchal, India. This region lies in the Central Himalayan range and our state shares a border with Nepal in the East and Tibet in the North.

We work in 40 villages in two districts of Bageshwar and Pithoragarh. The Avani centre is located at Tripuradevi, a small village in Pithoragarh district. We have been working with appropriate technology (solar energy, rainwater harvesting and pine needle gasification), natural dyeing and traditional craft in order to create livelihood opportunities in these villages.

During the past nine years of its work, Avani has provided solar lights for domestic lighting to more than 1500 families in 104 villages and hamlets. Most villages are away from the roadhead and are unelectrified. These systems are now being managed entirely by a team of solar technicians trained by Avani from the same villages where the solar systems have been installed.

The genesis of the textile program came about in the context of making solar technology accessible to the poorest of the poor. To do this, we needed to increase the paying capacity of the poor families so that they could pay for the use of solar lights.
A small village of traditional artisans who could not afford the solar lights is where we started learning about textiles from the local artisans. These artisans belonged to the Shauka community, who used to be traders with Tibet before the borders closed down after the Chinese occupation of Tibet. The weavers worked mainly with Tibetan sheep wool to make thick blankets and carpets. Slowly we worked on revival of finer spun yarns to produce tweed fabrics and introduced natural dyes in the carpets and tweeds made locally.
The Bora Kuthalia community used to work traditionally with hemp fibre. With the younger generation not willing to continue with this craft, the skill was slowly disappearing. We started with the spinning and weaving of Tibetan wool fabrics with both these communities in order to preserve the skill.

In order to make this livelihood base more sustainable, we realized that just working with Tibetan Sheep wool would not give us the market base we need. Therefore, we started looking at other locally available fibres. Our state was producing very good quality mulberry cocoons that were auctioned to traders from Bangalore and Benaras with very little value addition in the hills. Looking at this gap, we decided to introduce the spinning and weaving of wild silks in the villages that would also ensure a larger market base.

Since then, we have been working with the creation of contemporary textiles in wool and wild silks like eri, muga, tussar and oak tussar. All the fibres are dyed in natural dyes ensuring the eco friendliness of the textiles.

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[*] Rashmi Bharti has been working with issues related to rural development for the past 15 years. It was a desire to make a shift from an urban area to a rural one that inspired her to move to the mountains about ten years ago, where she co-founded a voluntary organization Avani, along with her husband.
Avani works with the creation of livelihood opportunities through appropriate technology, traditional craft and farm-based activities. They have worked with local capacity building for management of all these enterprises. In the past ten years of their work they have set up the following: a community managed rural solar electrification program; a rural electronic and mechanical workshop that manufactures solar water heaters as well as solar driers; a profitable business with handmade, high quality textiles in wool and silk dyed with natural dyes only; cultivation of wild silks like eri and muga as a backward linkage to the textile program; collection and cultivation of natural dyes; trained local youth in all the above skills. Their work in its entirety has benefited over 1500 families in more than 100 villages and hamlets. The skill development of unskilled youth and disadvantaged women has been an integral part of our work.

Keeping in mind the fragile ecology of the Himalayas, we did not want to introduce anything that would cause pollution of soil and water. Therefore, we started work extensively with natural dyes as:

- Natural colors come from nature…
- They do not harm the soil and water of the area where they are used…
- They are friendly to the humans who wear them….
- They are an expression of our original self and our creativity…
- Careful use of natural colors helps preserve the balance of man and nature…

All our textiles are dyed with locally grown natural dye plants except for indigo and lac for blue and red respectively.
Avani has been working with natural dyes since 1999 and has experimented with more than 50 plants of our area for their dye yielding properties. We are now working with women's groups for cultivation of some dye plants and collection of dye materials for generating income in the villages. We are also using locally available organic soaps for washing.

In the present context of deforestation and pollution of soil and water, the process of production is as important as the product itself. We discourage the harvesting of roots for dyes as that destroys the plant itself. Secondly, we only use plants that are plentifully available and do not use any plant that is not in abundance.

We harvest rainwater from the rooftops in underground storage tanks and use this water for natural dyeing. All the wastewater is then filtered and recycled for irrigation of vegetables. It is a closed cycle and no water is wasted as we live in a water deficient area. The mordants that we use are mostly salt, iron water, berberis fruits and leaves, vinegar, citric acid and alum. We use copper, tin and chrome very minimally.
Some of the dye plants that we use for different colors are as follows:

- Marigold flowers
- Walnut
- Catechu
- Myrobolan
- Indigo
- Lac
- Onion skin
- Turmeric
- Rhododenderon flowers and leaves
- Eupetorium

We have also developed a range of natural colors for painting for children with the natural dyes. These paints use turmeric and therefore, it creates a market for the turmeric cultivated by the women's groups.

The fibres that are dyed with the plants mentioned above are:

- Wild silks like eri, muga, tussar and oak tussar (all these yarns except muga are hand spun and hand woven)
- Tibetan sheep wool, Australian merino wool,
- Linen

The production of these naturally dyed, hand woven textiles is done in six decentralized production centres. These centres are located one to three hours' walk from the nearest road head and cater to a cluster of villages that are located nearby. This enables the artisans to get work near their homestead. We work in a radius of 40 kms where most villages are located off the nearest roadhead. In three villages, the people have donated land to Avani to build training and production centres for their village.

Presently we are also working on cultivation of wild silks like eri and muga with small farmers. Eri silk is cultivated on castor plants that grow wild in our hills. Muga silk is a special silk of India and looks like spun gold. The host plants of this silk are indigenous fodder trees of this area that have been slowly disappearing. We are reintroducing this species in the villages.
The cultivation of silk is providing a source of income to the farmers and also leading to reforestation of wastelands.

We have also developed some models of spinning wheels and a calendering machine that run on solar power or energy generated through gasification of pine needles. These machines can be operated in villages that are not electrified and can increase the productivity of a spinner. We use solar heated water for natural dyeing. The heating for the last 20 degrees Celsius is done on gas, thereby conserving fuel.

We have followed the principles of conservation, preservation and recycling to create an enterprise that uses local raw material and local skills to produce contemporary textiles. This creates a source of livelihood in the village itself and allows the artisans the choice to live and work in their homestead without migrating to plains in search of livelihoods. Over 550 artisans in about 40 villages and hamlets are involved in this enterprise. About 85 percent of the artisans are women. Many artisans have bought solar light for their homes with income from spinning and weaving.
This artisan's collective has now been registered as an independent cooperative called the Kumaon Earthcraft Self Reliant Cooperative. Slowly, this cooperative will handle all functions of this enterprise on its own with Avani providing support when needed.

Our products:

- Allow the artisan to earn a fair wage
- Allow the artisan to earn a living without displacement from the village
- Use clean energy like solar energy or electricity produced by gasification of pine needles, at all stages of production
- Do not harm the soil or water of the area where they are produced

We hope our products will carry the mystery, magic and fragrance of the Himalayas…

LOGWOOD: SURVIVAL FOR A PEOPLE

by Mr Nicolas Perez-Brito[*] (Dominican Republic)
(represented by Ms Cheryl Kolander, USA)

LOGWOOD

Logwood is the Heartwood dye of the tree Palo de Campeche, "Wood from Campeche", which grows natively in the Yucatan of Mexico and along the coast of Belise. It was brought to the Caribbean Islands by the Spanish and English conquerors in the 16th century. There it rapidly naturalized and grows abundantly. It prefers dry hills, so is a good resource to use in marginal or waste land. The tree has spines so it is often planted as part of living fences. It is best known in my country as a black hair dye.

MY FAMILY:

I grew up in a large community of extended family in the beach dune ecology of the north coast of the large Caribbean island of Hispaniola. When I was a child we were a community of about 100 cottages, all traditional hand-built from local materials. The food we ate was all local. We caught, grew or gathered fish, shellfish, land crabs and wild birds for protein; yucca (manioc), batata (sweet potato) and nyame (true yam) for starch; plus wild and planted fruits and greens. We used local herbs for medicine.

We all speak Spanish, but with a local dialect and many words still based in our long-forgotten native language. We long ago adopted the Catholic religion and used to celebrate the fiestas of the saints every two weeks. With the change to the modern world, much of this tradition has been lost. However we still maintain our family based social life and extemporaneous song fests in the evenings.

As children, neither I nor my siblings got to go to school, as there was none in our area. Instead we learned from the grandparents who watched us while our parents worked to feed, house and clothe us. This was all in a way we came to think of as "poor", yet in retrospect I can say, it was a totally natural life.

As an adult I watched as the community of Los Cocos lost population. Old people died or wanted to be near a hospital. Young people wanted the modern city life. I always loved the fresh air, the beach and the simple and quite life.

Tourism brought hardship to us, because all the fish, crabs and produce went to the foreign visitors. Still, Los Cocos survived with a dozen families until this year. This year, in March, tourism destroyed this last living example of the Coastal Taino (Native Indio) lifestyle. We watched from the evacuation buses, under military guard, as our fruit trees and beautiful cottages were bulldozed before our tear filled eyes.

THE LOGWOOD PROJECT:

In 1999 Cheryl Kolander, of Aurora Silk, came to Los Cocos in her quest for Logwood as a dye. I was the one called to help process it. The first lot was all hand rasped. On her second visit Cheryl brought a hand-held electric planer, and we processed both Logwood and Fusticwood, a yellow heartwood dye. Through the Aurora Silk website, Cheryl has sold our excellent grade of Logwood and Fusticwood for seven years. Logwood is used to produce the best black, and also hues of purple, with different mordants.

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[*] Nicolas Perez-Brito has been supplying Logwood and Fusticwood to the Logwood Project since 1999, from wildcrafted trees in the Dominican Republic.

These dyestuffs are always ecologically harvested. In the case of Logwood, we typically harvest naturally broken large branches, or trees that have been cut down by others, such as from land being cleared for houses. I personally replant four to ten trees for each one harvested. We lost many trees when the community was destroyed, but are now replanting on land purchased by the project.

Economically, the Logwood Project has moved from a charity (non-profit) to a Joint Venture, ½ Dominican and ½ American. Sales are steady but still very slow, which is best for now, as we do not want to see this resource over-exploited. It takes at least 25 years for a good sized dye heart to grow. Large scale textile industry use of Logwood could wipe out all the current trees before replacements can mature.

Because of the forced relocation of my family-community, the Logwood Project and the income from it are even more important. In 1999 a resurgence of the Los Cocos Traditional Lifestyle dune-ecology community began, with re-investment of the money earned from the new Logwood trade. An access bridge was built, running water was brought in, cottages and kitchens were built or repaired. Sadly all that was destroyed in March, without compensation.

Now we must try to individually survive in a hostile modern world that requires money, and more money all the time. Yet in my country there are no jobs and there is no money, especially for the older members of the community who grew up without education. The Logwood Project and the income from it are even more important. We have much hope that the Logwood Project will help us survive, not just as individuals, but as a resurgent community.

I wish to add that Nicolas and the Logwood Project have been the victim of land loss at the hands of the Central Government Bank of the Dominican Republic. The “Projecto Costa del Norte” of the bank, in April 2006, has destroyed the home, community and ecology of Nicolas and his entire 4,000 inhabitant village. The Logwood Project in the Dominican Republic has been destroyed by this same action. Tyria, and the Logwood Project under the aegis of “Mama DOC” Inc., non-profit, will continue to support Logwood production worldwide. Nicolas has sent me fresh Logwood tree seeds to share. See me after this session.

Cheryl Kolander

WARPATH OF THE WOMEN - MORDANTING RITUAL OF THE IBAN WEAVERS OF SARAWAK, MALAYSIAN BORNEO

by Mr Edric Ong[*] (Malaysia)
President, Society Atelier Sarawak (The Arts and Crafts Society of Sarawak)

INTRODUCTION

The Iban are the biggest ethnic group of Sarawak in Malaysian Borneo. Numbering almost half a million in number, they traditionally live along the main river systems having migrated from Kapuas River Basin of Kalimantan Borneo some 40 generations ago. The majority still live in longhouses farming the land (swidden agriculture) although more and more Iban now live in urban towns working in the civil service or in the business sector.

In the traditional Iban Culture, the 'Pua-Kumbu' warp-ikat weaving is outstanding as the 'high art' of their material culture. Technically excellent in comparison to any other ikat weaving of other cultures the 'Pua-Kumbu' is powerful in its allegorical symbol being woven for ritual and ceremonial purpose associated with the Iban old religion and festivals.

The origins of the warp-ikat weaving technique have been the debate of anthropologists. Many have concluded that the Austronesian races brought them in when they migrated from the hinterland of South China through the then landmass of Sunda Shelf Linking the Southeast Asian Islands of today. Thus a Dong-Son Cultural origin may be the ancestry of Sarawak's Indigenous people.

The intricate warp 'Pua Kumbu' textiles has long been recognized by textile scholars and collectors as one of the finest in the world. Historically, these textiles play an important role in the social life of the people; and women weavers were accorded status due to their weaving and dyeing skills.

The 'spiritually-ordained' dye-mistress in performing the mordant-ceremony of the cotton yarn was initiating the **'Ngar'** or **"kayau indu"** literally meaning **'warpath of the women'** in the days when 'headhunting' was also considered a 'spiritual' excursion.

The mordants comprise of various types of gingers, nut oils known as 'kepayang oil',and palm salts. The rituals associated with the 'ngar' ceremony are threatened with extinction as the weaving community of women gets smaller.

WOVEN DREAMS

Many traditional Iban textiles known as 'Pua-kumbu' had their designs derived from dreams given by the weaving goddess known as Kumang or Meni, thus earning themselves the term "Woven

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[*] Edric Ong is the President of Society Atelier Sarawak, the Arts and Crafts Society of Sarawak in East Malaysia. He is also the Immediate Past President of the ASEAN Handicraft Promotion and Development Association (AHPADA), an organization that administers the UNESCO-AHPADA Craft Seal of Excellence since 2000.
An architect by training, he has designed several landmarks such as the Sarawak Cultural Village and the Kuching International Airport in Sarawak, East Malaysia. His interest in the heritage of his country has caused him to write several books eg. Sarawak Style, Pua-Kumbu-Iban Textiles;Woven Dreams-Ikat Textiles of Sarawak.
A noted speaker at International conferences, he has set up the World Eco-Fiber and Textile (WEFT) Network to further the cause of natural fibers and dyes. He was the Convenor of the WEFT Forum 1999, 2001 and 2003.He has won several awards including the Australia Culture Award; Pegawai Bintang Sarawak; and received Seals of Excellence from UNESCO-AHPADA and the Japanese G-Mark for many of his designs in the arts and crafts.
He has curated many exhibitions in Malaysia, Singapore, Thailand, Philippines, Korea, Australia, Japan, India, France, Sweden, United Kingdom and USA.

Dreams"

In attempting to compare and relate some similar features in say a Dong-Son bronze drum and an Iban textile, one can perhaps see the basic motifs like the spirals, hooks and s-shapes that have been meticulously tied in to the patterns.

Designs and symbols are completely composed on the stretched out yarn, without reference to any drawings. Each weaver, according to her weaving status, has limitations to her expressions until she attains "master-weaver" level.

Some common symbols include birds, deer, snakes, leeches, centipedes, squirrels, frogs, flowers and fruits. The higher symbols are of humans and spirits.
The Iban traditionally believe that life is a balance of harmonious living of men and spirits. Birds of augury and omens are carefully observed; offerings are made to appease the spirits in miring or sacrificial ceremonies.

Weaving with spirit images are highly regarded and rare. Many are associated with headhunting rites or the "soul-searching" trances when the shaman goes on a spiritual journey to heal a sick person.

When asked to describe the traditional Iban world-view of life, an Iban would say that they live in a world of trees, animals and thousands of insects; they share the same environment of jungle life with non-humans. Their daily interaction with their natural surroundings therefore influenced their world-view and their beliefs.

Life to the Iban is a continual process of balancing the existence of all beings, whether natural or supernatural, all objects have souls of their own. In daily activities, the soul of man, "mensia", and that of gods or spirits, "petara antu", often come into contact and influence one another.

The spirit world and the world of man are closely linked in delicate balance, and it is man's duty to follow the "adat" given by the gods, in order that the balance of these two worlds can be maintained.

The traditional belief of the Iban is that man has "separable soul" (ie. everything has two parts) which consist of the physical body ("tuboh") and the soul ("semengat"). The "semengat" moves out of the body during sleep, and the wanderings of the soul during sleep make up the Iban's idea of DREAM or "MIMPI".

LEGENDS

The earliest Iban legends and myths feature patterned cloth such as the story of Seragunting.

"One day, an Iban hunter, Menggin, shot a bird and as he went to retrieve it, it became a woman's skirt, the "bidang". Concealing the garment in his arrow case, Menggin hurried home. Soon, a beautiful girl, Dara Tinchin Temaga, who was in reality the daughter of the major god, Singalang Burong, appeared to inquire about her skirt. After a time, she consented to become the mortal's wife and later bore him a son, Seragunting.

Soon, she tired of mortals and prepared to return to more amorous affairs in heaven. Before leaving, she wove two coats for her husband and son that were called "jackets of the birds" because of their pattern. These were capable of transporting Menggin and Seragunting to heaven should they wish to join her.

Eventually, after the mother had returned to heaven in the form of a bird, the son donned his jacket and followed her. In heaven, it was a time of mourning for a deceased warrior, and Seragunting was taught to observe the omen birds, to take heads to avenge the dead and how the newly taken head was to be received into the great blankets, the Pua, and the details of the Festival of the

Dead. Seragunting returned to the world and taught these culture traits to all the Iban." –recorded by missionary Howell in 1909.

In Iban creation story, a Pua cloth was used to cover a carved wooden statue. Then Raja Entala, the Creator God, shouted at the statue three times and it came to life. He also created two birds called "Ara" and "Iri", who then proceeded to create the rest of the world. Iban women relate how their ancestors were taught in dreams, the art of weaving the Pua Kumbu patterns, by Kumang and Lulong. These are the two sisters who live along the Gelong River of Panggau, the spiritual abode of Nabau, Lord of Snakes, who is their grandfather. Sometimes, they are referred to as the weaving goddesses, together with another deity, Meni. All these deities appear at will as snakes ("Ular") to humankind in dreams.

CLASSICAL PATTERNS

There are several"classical" patterns in Pua Kumbu which are recorded to have their origins through "dream" inspirations given by the weaving goddesses, and as such are known as "spiritual" cloth. They were usually woven for use in important rituals eg. "buah rang jugah" (dragon's breath), "buah sempuyong" (skull basket), "buah bali belumpong" (the void), "buah baya" (Crocodile), "buah berinjan" (Creeper), used in headhunting and in padi planting rites.

Such important and "potent" symbolism in the cloth were always believed to be divinely inspired. Any weaver attempting patterns beyond her "ordained" weaving hierarchy or status would be in danger of "layu" or "withering".

As a warp-"ikat", where all the patterning is tied on the warp-threads, the tying process is the most important, and the actual weaving (filling in the weft threads) is therefore rather mechanical, a matter of adding "body" to the cloth. A firm or tight tie would ensure a good "resist" during the dye bath and result in a clarity of patterns.

DYES

The range of colour used by the Iban in dyeing their cotton yarn and tied-up warp is limited, shades of brown most frequently form the background to the patterns; the most effective is a reddish brown; brown is also the usual colour of the yarn used as weft. Although blue is sometimes used to get a darker overall effect.

The Iban usually dye the background colour first, whether it be a light or reddish brown (from the roots of the morinder citrifolia known as 'engkudu'), reserving the pattern so that it appears light or white; darker spots and other colours are the result of a second dyeing with indigo leaves.

The traditional manner of mordanting the cotton yarn is restricted to master-weavers who have been 'spiritually ordained' by the weaving goddess 'Kumang' and /or 'Meni'. Such women were known as 'Orang tau nakar tau ngar', which means 'She who knows the secret of measuring out the drugs in order to obtain the rich colour', and for this work she is well paid, the usual fee being a small jar (tepayan), a sacred stone (plaga), a small bell (grunong), and a brass ring (chinchin tembaga). Among some Iban groups, they make offerings to these goddesses, asking blessings for the mordanting of the cotton yarn that will enable the absorption of good natural dye colours. The Dye-mistress would bite a piece of steel in order to strengthen her soul. This steel is called 'kris semangat'. The whole mordanting ceremony is called "NGAR' and is often refered to as" kayau indu', or 'warpath of the women'.

Some other ethnological references also record:
"The Iban bachelor in order to win the affections of a maiden must needs get a head (known as 'trophy skull')first, similarly the Iban maiden to win the affection of a bachelor must needs be accomplished in the arts of weaving and dyeing.

THE WEAVERS' STATUS-SYSTEM

The role that weaving and weavers play in the Iban society cannot be less emphasized as when they are described as "Historian, Poet and Chemist". (Quote: Datin Paduka Empiang Jabu)

WEAVER- HISTORIAN

The Pua weaving or the Pua Kumbu is a ritual blanket used for religious ceremonies, festivals ("Gawai"), ceremonies associated with birth, death, healing or "soul-searching" and war of headhunting. It serves as a means of communication between this world and the world of ancestors, spirits and gods.

Here, the weaver puts down a woven graphic design of the Iban animistic beliefs, the spiritual realm ("petara" or "antu") and the "world view" of life around them ie. the trees, animals, insects, jungle life, natural and supernatural life. The designs are vested with meaning and energy. The more powerful a design, the closer it brings an Iban to the spiritual world. The more powerful the design, the greater the danger for the weaver.

Therefore, although one may be able to identify specific elements of design symbols in the Pua eg. spirit-figures, animals, insects, reptiles, flowers or man-made objects, it is the composite design that is significant in classifying the blanket for use.

WEAVER-POET

Pua of original design and with powerful symbolism (usually those for ritual and ceremonial use or portraying legends) are given praise names or "julok".

Examples

a) "Keleku Ambun Belabuh"
Translated : "The dew falls in waves, the pattern is crying out for the warrior to go out and conquer the land and to cut down the coconut."
In short, the women are urging the men to go out headhunting.

b) "Kilat Ngerar Tau Terebai Keh Langit"
Translated : "Lightning flashing across the heavens."

One therefore would be inclined to compare the Pua Kumbu to a Chinese scroll painting. The pictorial beauty is complimented by the calligraphic verses. But in Pua Kumbu, the praise name or "julok" is passed on orally, and not written or woven on her art piece.

WEAVER- CHEMIST

All the dyes used in the traditional Pua Kumbu are vegetable in origin, and the method of preparing the "mordant bath" for the cotton yarn and the actual dye-bath are only carried out by special divinely-ordained weavers accorded the status of "Indu Tau Nakar Tau Ngar" or "She Who Knows the Secret of Measuring Out the Ingredients in Order to Obtain the Rich Colours".

The whole dye-process is called **"Kayau Indu" or "Warpath of the Women",** thereby stressing the importance that weaving and dyeing is for women in the Iban society just as headhunting is for the men.

WEAVER- STATUS

The Iban weaver's competence and skills place her in her community :

1) Indu Nakar Indu Ngar
   - A competent woman.
   - A woman who knows how to mix and use the vegetable dye successfully.

2) Indu Nengkebang Indu Muntang
   - A woman who can produce her own design; she has tattoos on her fingers, and wears a porcupine quill with a cotton strand.

3) Indu Sikat Indu Kebat
   - A skillful weaver.

4) Indu Ternuai Indu Lawai
   - A good hostess and homemaker.

5) Indu Paku Indu Tubu
   - An ordinary housewife.

The weaver falls into the top three categories and her status is accorded to her in the “Adat Mati” or Obituary. The “Adat Terbalu” given to the husband of a weaver is also higher than that given to the husband of an ordinary Iban woman.

A NEW SPIRIT

The fine art of Iban Pua Kumbu weaving is defined by how well the weaver is able to tie the “curl” or the “hook” that is so characteristic of the Pua Kumbu weaving. It is related in a “julok” or poetic language to me by Bangie Ak Embol :-

> The curl must not be larger than a lady’s thumb,
> It must be “tight and close”,
> It is like your nail sticking to your flesh,
> It is like the tadpole sticking to the leaf,
> Fallen into the swift flowing stream,
> It is like true friendship,
> Never betraying one another.

Contemporary Iban weavers such as Bangie anak Embol and Nancy anak Ngali, who are Christians still believe that their original master-pieces of Pua-Kumbu are derived from dreams, now given by the Holy Spirit.

The tradition of Iban Pua-Kumbu weaving has excelled in the longhouse community of Rumah Garie, Sungai Kain. Since 1988, the weavers have mastered the weaving using silk yarn with natural dyes in the back-strap loom. To quote a Textile Museum curator friend, they became the only floor-loom, back-strap, warp-ikat silk weavers in the world!

NEW FAITH

Karama, Bangie and her group of weavers became evangelical Christians some 17 years ago .Today, they have discarded the traditional taboos of old, and have found in their faith a new liberty and a new spirit! Instead of making the traditional sacrifices to the weaving goddess like Kumang during the “Ngar” mordant bath ceremony, special Christian prayers and blessings are made.

It is through this new liberty that has allowed them now to rediscover and repeat the old patterns that were previously associated with the former headhunting rites. They have also discovered that in their mastering the silk yarn on their back-strap looms, they are able to tie the fine patterns, as well as achieve beautiful natural dye colours quite quickly because silk yarn did not require a mordant bath, unlike cotton yarn! The doors were open to new discoveries and new frontiers of expression of the IBAN IKAT WEAVING.

NEW GENERATION

Bangie Ak Embol is now the acknowledged leader among her community of weavers, having inherited the mantle from her mother, Karama Ak Dampa, who passed away in February 2006 at the age of 84. . She is now the “Indu Nakar Indu Ngar’ who supervises the whole process of the “Ngar” mordant bath nowadays. In a traditional sense amongst the weaving community of women particularly in the Kapit District, the status of the master weaver/dye master is still highly regarded. However, this is only so amongst the Iban people knowledgeable about the Art of Pua Kumbu weaving.

Outside this circle, in the Iban society at large, (what more to say, amongst other people groups), such traditional high status and role is little appreciated or recognized. The new generation of Iban girls would aspire more to be lawyers, teachers, nurses, and secretaries, anything but a weaver!

Perhaps the recent honours won by Bangie and Karama in the UNESCO CRAFTS PRIZE COMPETITION FOR NATURAL DYE WEAVING (ASIA PACIFIC) in 1998, and the UNESCO-AHPADA CRAFT SEAL OF EXCELLENCE, plus the publicity that is being accorded to them, with invitations to exhibit their textile art in overseas galleries and museums, have contributed to a current high esteem appreciated by the weavers. This has given the weavers a boost in the recognition of their art.

It is heartening to know, and to see, that at least in one family, that of Karama and Bangie, that the tradition of Iban textile art will continue from generation to generation. Her daughters-in-law, Regina, Milin and Anna are now accomplished weavers, and her grand- daughters are already assisting in tye-ing, and learning through observation what her grandmother and great-grandmother are doing in the “Ngar” mordant bath for cotton yarn, and the natural dye process. There is therefore continuity in the handing down of skills and tradition through the weaving art at Rumah Garie.

NEW LESSONS

As the master painter uses his brush strokes in all confidence, so does the Iban Pua Kumbu weaver tie her threads; a curl here, a curl there, none bigger than her thumb, moving across the warp by the light of her oil lamp.

Not till the loom is silent
And the shuttles cease to fly
Shall God unroll the canvas
And reveal the reason why.

The dark threads are as needful
In the Weaver’s skillful hand
As the threads of gold and silver
In the pattern He has planned.

CONTEMPORARY NATURAL DYEING IN AUSTRALIA

by Dr (Ms) Liz Williamson[*] (Australia)
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College of Fine Arts, University of New South Wales in Sydney

Abstract

The paper gives an overview of natural dyes and dyeing in Australia as used by contemporary textile artists and designers. Interest in natural and plant dyes has grown over recent years with the phenomena of bush camps, concern for the environment and profile given plant dyeing by leading practitioners.

Textile artists both indigenous and non indigenous, working in various textile disciplines, incorporate natural, plant and mineral colorants into their work.

Natural dyes have been incorpoarted into printed, embroiderd, woven and baskery with the colour, shade, tone, character and atmosphere created by the natural colour plays a central role in the finished work. For each individual artist sourcing, perfecting, layering and refining these colours has been an exciting journey of discovery and an integrat part of their practice.

This paper will also reference past usage, traditions and the rich colours sourced through Australian native flora and comment on how natural dyes are being viewed by emerging artists designers.

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REVIVAL OF NATURAL DYES IN CENTRAL TIBET

by Ms Amy S. Frey[*] (USA), Tibet Poverty Alleviation Fund, Lhasa, Tibet, PRC
and Christopher D. Buckley, Torana Carpets, Beijing & Shanghai, PRC

Abstract
Traditional natural dyeing methods, once thought to be extinct in Tibet, still survive in some rural areas. Recently, these traditional methods have undergone a revival in the Panam-Gapur area of Central Tibet, under an initiative run by the Tibet Artisan Initiative (TAI, a project of the Tibet Poverty Alleviation Fund). The natural dyestuffs used by the Panam-Gapur villagers include materials that are unique to Tibet (green plants *showang* and *nyachol*, and a lichen *bangtsen*), as well as commonly known materials (indigo, madder, rhubarb, walnut, and lac). The local indigo dyeing process is related to fermentation methods used elsewhere but is also unique in some respects and highly effective, producing deep indigo blues with a single immersion in the dye vat. In addition to documenting these traditional dyeing processes, this study also contains important findings for development organizations engaged in work to revive traditional skills. It demonstrates that where traditional knowledge still exists within a local community, crafts lost for a generation or more can be successfully revived by creating a sustainable market for the products, even if no technical training is provided to the artisans.

Introduction
Since 2002 the TAI has been running a program to help village-based artisans in Tibet create sustainable livelihoods by making traditional textiles and other hand-made items. When the TAI first surveyed the handicrafts scene in central Tibet in 2000, it was found that many basic weaving skills for making carpets and flat-weave textiles survived, but that traditional dyeing methods had disappeared: all the items on local markets were dyed with synthetic dyes of poor quality. This reflects a pattern seen in rural communities worldwide, where cheap and easy-to-use synthetic dyes have replaced traditional dyes and practices. In the case of Tibet, these trends were exacerbated by social and cultural shocks between 1959 and the late 1970s, which caused the closure of monasteries (important customers for top quality textiles prior to 1959) and collectivization of village communities. As a result, few high quality textiles were produced during the period of 1959-1990s.

The TAI program encourages artisans to produce textiles dyed with natural dyes by paying a premium price for such items. Initially the program focused on the Panam-Gapur (Wangden valley) area of central Tibet because this region has a rich tradition of textile making. Early results from the program were promising, with naturally dyed items being produced to a reasonably consistent standard within a few years. Items are sold mainly through the Dropenling Handicraft Development Center, established in Lhasa by the TAI, the primary customers being overseas visitors to Tibet. This program will be expanded to include other areas of Tibet, with an element of skills training to help accelerate the learning process and to provide access to new techniques and information for weavers who are otherwise isolated. As a preliminary step, natural dyeing in the Panam-Gapur area was assessed in this study, with the aim of documenting traditional methods.

How this study was conducted
Individual artisans were interviewed in their homes in the villages of Panam and Gapur in Shigatse Prefecture. All of the artisans had been making textiles for the TAI project for several years prior to this study, but none had received any specific advice from the TAI on dyeing methods. In a preliminary interview, the artisans were asked which traditional dye materials and methods they used. In a follow-up study visit, three artisans were selected to demonstrate their dyeing processes, which were documented by observation, questioning, and by photographing the processes.

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The Tibetan names (in italics) were recorded for dyestuffs and other materials. Due to dialect differences, names and pronunciations can vary in villages only a few miles apart. Few villagers are literate, so literary forms are not readily available. We have opted for informal phonetic versions of the Tibetan words reported in this study, for intelligibility for non-Tibet specialists and because we are not language specialists. Fortunately, despite dialect differences, names for key materials were found to be reasonably consistent and recognizable from place to place.

Selected textiles woven in the Panam-Gapur region
Although there are a wide variety of textiles produced in the Panam-Gapur region, we focused our study mainly on yarn dyed for the following, as they are most commonly dyed with natural dyes in this area.

Flat weaves:
Nambu – A general term used for narrow, woven wool fabrics, commonly woven in on a wooden frame treadle loom.
Sherma – Considered the highest quality *nambu*, *sherma* is a fine weft-faced flat weave woven in narrow strips (15cm to 25cm wide) on a wooden frame treadle loom. Traditionally, the warp was wool, but now cotton is more commonly used. *Sherma* is used to make aprons *(pangden*), belts (*kyerag*), and traditional jackets/robes (*chuba*). *Pangden* (aprons) are universally worn by Tibetan women from the villages and are made from 3 strips of *sherma* or other fabric stitched together selvedge to selvedge. The strips of fabric are horizontally striped and multi-colored. Colors, styles and materials vary greatly between cities and villages.

Pile carpet:
Wangden drumtse – A knotted carpet with a warp-faced back, traditionally used as a sitting carpet in homes and in monasteries. These carpets are constructed on a vertical wood or metal frame loom, and consist of a thick pile with a low knot count.

Biographical sketches of the dyers in this study

Choedon - Female, age 39
Choedon is well known in her village and the surrounding areas as a master weaver and dyer. At the age of 9, she learned to spin fine wool yarn for *sherma* from her mother's friend, who was a master weaver employed by a local noble family. This family made a business selling the top-quality *sherma*. Later, as a teenager, Choedon studied carpet weaving at the Gyantse carpet factory. From age 19-27, she learned how to use natural dyes from her mother and her mother's friend. She developed her skills in weaving sherma, carpets and blankets, as well as in natural and synthetic dyeing, by working in other people's homes. As indigo dyeing was not widely practiced at this time, and she wished to keep her recipe secret, she would mix the indigo at home, then take it to her customers' houses. Most other families were using only synthetic dyes - this is still the case. Although Choedon has started to use more natural dyes for products ordered by Dropenling/TAI, she still uses mostly synthetic dyes for other (local) customers.

Dhagui - Male, age 50
At the age of 34, Dhagui taught himself how to weave traditional Wangden drumtse. Like most local weavers, he traveled to other villagers' homes to weave carpets for them. Prior to 2003, he had no experience with natural dyes, using only synthetic dyes for his carpets. At the request of TAI, he started to learn how to dye wool using natural dyes. Both his wife's sister, Phurchok, and another Wangden weaver, Chumbe (also part of this study), shared their dye recipes and techniques with him. Interestingly, they both had similar methods and recipes.
According to Dhagui, the use of natural dyes ended in his area in 1969, with the beginning of collectivization in Tibet. In the last 2-3 years (2003-2006), other villagers have again started dyeing with indigo, but he doesn't think they know how to use other natural dyes. Although there may still be some elders in the village who remember how to do natural dyeing, many of them are too old to remember the techniques and recipes clearly. He has tried to learn from his mother, who is 68, but her answers have been contradictory.

Chumbe - Male, age 52

Starting at age 12, Chumbe learned to weave Wangden drumtse from his father in Gapur village. Both of his parents were skilled in the use of natural dyes and began to pass this knowledge on to him when he was 17. During his childhood, synthetic dyes were unavailable in his village, so most families used natural dyes for their hand-woven textiles. This practice stopped for about 10 years in the 1970's, during collectivization in Tibet. Chumbe began using natural dyes again at age 28 and has since passed on his knowledge to 15 families, including Dhagui's. He stated that he feels comfortable with most of the natural dyes, except lac. He doesn't feel that the dyeing techniques have changed much over the years, with the exception of the introduction by alum as a mordant in recent years by a rug-buyer from overseas (Rupert Smith). Also, they no longer use *sitsue* and *matsue* as much, preferring ash as a fixing agent.

Table 1. Summary of natural dyes used in Shigatse-Panam-Gapur region

Common name or description and scientific name, if known, in parentheses	**Tibetan name**	**Common colors produced**	**Form and use**	**Source**	**Mordants/ modifiers used**
Madder *(Rubia tinctorium or cordifolia)*	*Tsoe*	pink, orange, red	dried root, ground to powder	Nepal/India via local market	*pudok*, ashes, *sitsue*, yeast, *dotsah, matsue*
Indigo *(source unknown)*	*Ram*	blue	blocks or chunks, ground in liquid	Nepal/India via local market	yeast, *chang*, rhubarb, lime (calcium carbonate)
Walnut *(Juglans sp)*	*Takpa* (Lhasa) *Takor* or *Urtsue* (Shigatse dialect)	pinkish-tan, brown, black	dried hulls, ground to powder	Kongpo region of eastern Tibet via local market	*pudok*, baking powder, "salt"
Lac or "sticklac" *(Laccaic acid)*	*Gyasar*	red, purple	blocks or chunks, ground to powder	Nepal/India via local market	dry roasted barley flour or wheat flour, *bangsten, sitsue, matsue*
Rhubarb (root) *(Rheum sp)*	*Churtsa*	yellow, green (over-dyed with indigo)	dried root, ground to powder	local market – grows locally on mountains– picked and dried by local villagers	sour *chang, sitsue, bangtsen*, salt, yogurt, d*otsah*
Rhubarb (leaves and stems) *(Rheum sp)*	*Cholo*	yellow, green (over-dyed with indigo)	leaves and stems, dried and ground to powder or used fresh (in season)	local market – grows locally on mountains – picked and dried by local villagers	sour *chang, sitsue*
"Wild rhubarb"	*Shomba* or *Showang* (name used in Panam County)	yellow, green (over-dyed with indigo)	whole plant, ground fresh and made into balls (only a small amount of root), or dried for use in winter	grows locally along roads, fields, houses – closer to mountains is considered better quality	sour *chang, sitsue*
Orange lichen – grows at very high altitudes in Tibet (*Cetraria sp*)	*Bangtsen*	reddish-brown	whole "plant" - also used in traditional Tibetan medicine to treat "nerves"	gathered by nomads from the mountains	yeast, *matsue* Usually no mordant is used – *bangsten* acts as a mordant. Rarely used alone as a dye because it is expensive
Large shrub – grows on local mountains	*Kyepa*	yellow	dried root, stem or trunk, ground to powder	grows locally near Wangden village	*sitsue*, sour *chang, dotsah, matsue*
Green plant with white flowers	*Nyachol*	walnut-brown	root – used fresh (in season)	grows locally in Gapur area	yeast, salt, *dotsah, matsue*
Green plant with white flowers	*Nyachol*	Greenish yellow	leaves and flowers – used fresh (in season)	grows locally in Gapur area	sour *chang, sitsue*

Table 2: Mordants/modifiers used in Shigatse-Panam-Gapur region:

English common name or description	Tibetan name	Form and use	Source
Alum	*Dotsah* ("stone salt")	crystal form - ground to powder	outside market – brought to some artisans by carpet buyer
Natron or sesquicarbonate of soda (Dunsmore, 76)	*Pudok*	white powder (also used as washing powder for hair and clothes, as well as an additive in making butter tea and cheese)	local market via Nagchu region of central Tibet – gathered from lakes
Sour-tasting chemical: Alum, borax, trona, other?	*Sitsue*	White/yellow "cheese-like" mineral, found on the surface of damp shale strata as an efflorescent surface deposit. Used mostly for yellow colors.	found near lakesides and hot springs in Tibet
Sour-tasting chemical: Alum, borax, trona, other?	*Matsue*	Light green color mineral found underground near hotsprings – similar to *sitsue.* Used mostly for red colors.	found near lakesides and hot springs in Tibet
Chalk (calcium carbonate)	*Sagar or Garah*	white powder	dug locally – used to white-wash local houses
Barley beer – weak and sour	*Chang* – specifically *Singdong* or *Seewa*	liquid	made locally from fermented barley
Raw wheat flour	*Duship*	flour	local market
Barley flour	*Tsampa*	flour	local market
Yeast	*Changtse*	round "patties", ground to powder	local market
Cow dung ash or wood ash	*Khothal*	mixed into paste with water and applied to pre-dyed yarn, or added directly as powder to dyebath	from household use
Wool-washing water	*Pelku*	liquid – usually left to sit in covered container for weeks/months	waste water from washing wool (ideally from male sheep) – no soap used
"Wild rhubarb"	*Shomba* or *Showang* (name used in Panam County)	whole plant, ground fresh and made into moist balls (only a small amount of root) – these can be dried for use in winter	grows locally along roads, fields, houses – closer to mountains is considered better quality
Orange lichen – grows at very high altitudes in Tibet	*Bangtsen*	whole "plant"	gathered by nomads at high altitudes

Natural dyestuffs and dye methods

We found a consistent set of dyestuffs used in the Panam-Gapur area, including widely used types of indigo, madder, rhubarb, walnut and lac, local herbaceous plants *showang* and *nyachol,* and an indigenous lichen called *bangtsen*. The dyeing methods for all these materials (except for indigo) are typical of rural dyeing methods, and involve grinding or crushing the materials, heating with water in a pot, adding the yarn and heating at or near boiling temperatures for a few minutes or up to an hour. The ingredients are generally not weighed or measured accurately, but judged by eye. Dyeing usually proceeds until the color looks right to the dyer.

The artisans we studied all followed similar methods, but the precise details vary from artisan to artisan, and also according to the season and availability of materials. Dyebath temperatures are not closely regulated except in the case of indigo. Dyes are measured in the way that most good cooks measure ingredients – a pinch of this, a handful of that - until the desired color is achieved. With that in mind, the measurements given here are a rough estimation based on direct observation or on interviews with the dyers. During our research, we received many different descriptions of dye recipes and combinations to create various colors but we have only listed in detail the ones that we observed first-hand.

If the natural dyestuffs do not produce the desired color, dyers will sometimes over-dye the yarn with synthetic dyes. This can make identification of naturally dyed textiles more difficult, as the dyers do not always want to admit to using synthetic dyes.

Mordants/Modifiers
The general name in Tibetan for mordant is *sahtsoe*, which literally means "eat dye". Mordants are used inconsistently by the dyers in this study, depending on their availability and on the level of experience of the dyer. Mordants are defined here as materials used to help fix the color of the dyes into the yarn, while modifiers are defined as materials that are used to change the colors of the dyes, but are not dyes themselves. (Liles, 211) It was not always clear in our research the exact purpose of some of the substances in the dyeing process, nor do the dyers always agree on their use. For example, one dyer uses *pudok* as a mordant, while another claims that he does not use it at all because it makes the colors more likely to bleed. As a result, we have listed all additional substances added to the dyebaths (with the exception of other obvious dyes) under the general heading of "Mordants/Modifiers".

Because of the varying quality of the natural dyes used in Tibet, as well as inconsistent methods and conditions, the colors achieved vary. Most of the local wool used is not washed with soap, only with cold water. As a result, it retains much of the natural oils (lanolin) in the wool. This makes it easier to hand-spin, but makes dye-uptake into the wool less consistent. It is interesting to note that *pudok* (natron), which is a commonly used mordant, is also used as a washing powder and is a strong grease-cutter. This material may assist in breaking down some of the oils in the wool to allow the color to penetrate more easily and "level" the dye.

We conducted a basic light-fastness test on all of the naturally dyed yarns observed in our study by leaving them in full high-altitude sunlight for 2 weeks (approximately 6 hours per day), and found that they were very lightfast under this condition. The most obvious color change was in the rhubarb-dyed yarns, which actually darkened slightly with exposure to the sun, presumably due to oxidation of the dye material.

Indigo dyeing method
In Tibet, indigo is considered to be the most difficult of natural dyes to use successfully. Because it is most susceptible to changes in temperature and contaminants, the dyebath often "spoils" and does not dye the yarn. Many Tibetans believe that outside visitors bring bad luck (*nueba*), which can spoil the indigo dyebath. This belief extends to other natural dyes, especially those that are more difficult to use. As a result, natural dyeing is rarely done in the presence of anyone other than close family members.

The indigo process used by Tibetan weavers is interesting in several respects. Firstly, it uses both bacterial *and* yeast fermentation to achieve the reduced form of indigo needed for dyeing. The dyebath is prepared by allowing the dirty water from washing sheep wool to stand for a week or two until it develops a distinctive odor like stale pond water, a characteristic sign of anaerobic bacterial fermentation. During the actual dyeing process, yeast is added and the dyebath is warmed to create a vigorous yeast fermentation. This second fermentation seems to be mainly responsible for the indigo reduction during the dyeing process. We speculate that the function of the bacterial fermentation is to prime the bath to ensure that when the yeast fermentation begins, it is anaerobic right from the start (yeast is capable of both aerobic and anaerobic fermentation), ensuring a successful dye reduction.

A second interesting feature is the use of the water from washing sheep wool, which echoes 19th century European dyeing techniques (Liles, 86-87). We do not know whether Tibetan dyers developed this unusual method independently, or whether the methods ultimately derive from the same source.

A third important point is that the Tibetan method is capable (in skilled hands) of producing a deep indigo shade in a single immersion in the dyebath, something that is difficult to achieve by other

methods. It has been remarked that traditional dyeing methods that use a mild reduction, as opposed to the strong reduction of modern chemical methods, can be more effective at producing deeper indigo shades. With repeated immersions of the fabric a strong chemical reducing agent, such as hydrosulfite, is liable to reduce and strip indigo that has already been deposited (Liles, 57). The milder reducing conditions of the Tibetan dyebath, indicated by the blue-grey color of the dyebath and the blue-green color of the yarn as it is removed from the bath, seem to avoid this problem. It seems likely that the circulation of liquid near the surface of the Tibetan bath sets up a continuous cycle of mild reduction and oxidation, conducive to the gradual deposition of solid oxidized indigo on the wool surface. Tibetan dyers themselves remark that dyeing is most effective in this surface region. Low fastness and crocking may be potential problems with a mildly reduced dyebath, however, because if the dye is not completely reduced, it will not fully penetrate the yarn and is more likely to wash or rub off (Liles, 65).

Indigo dyeing by Choedon:

We observed indigo dyeing of fine wool yarn used for weaving *sherma* at Choedon's workshop/home.

1) Grind indigo with *chang* (barley beer) in a stone mortar; then let the liquid sit, covered, in the mortar for two months. (This liquid was prepared prior to our visit.)
2) When ready to dye wool yarn, add the following to an earthenware pot over a fire. (The dyebath we observed had only been prepared a few hours earlier. Ideally, it would have been started the previous day.)
    a) Leftover liquid from previous indigo dyeing – 50% of dyebath.
    b) Old wool-washing water (*pelku*) – 40% of dyebath. Heat the bath moderately (do not boil as this would kill the yeast).

This "wool-washing water" contains dirt and lanolin from the wool, which probably serves as "food" for the yeast in fermenting and reducing indigo.

3) Grind yeast and rhubarb root together in stone mortar and add powder to dyebath
4) Add liquid indigo (*chang* and indigo liquid that has been fermenting for 2 months). The combined percentage of the yeast, rhubarb and liquid indigo in the dyebath is 10%. The color of the dyebath at this point is dark gray.
5) Stir occasionally and check temperature of dyebath (Choedon put drops of liquid on the back of her hand – similar to testing the temperature of milk in a baby bottle). If the dyebath is too cool, it will not dye the yarn. Adding more yeast/rhubarb powder will increase the temperature.
6) When bubbles rise to the surface of the dyebath, the slightly damp yarn can be added. The yarn should float to the top of the dyebath. If the yarn sinks to the bottom, the dye is no good. There may be no change at all in the color of the yarn if the dye is not good.
7) When the yarn is ready to remove from the bath, the dyebath is frothy and the yarn floats on top.
8) For a darker color, add more indigo liquid and yeast/rhubarb powder; then add the yarn back into the dyebath for a longer time.
9) The color will darken as it is exposed to sun and air.
10) Remove yarn from dyebath and allow it to cool before rinsing.

We observed a slight color change as the yarn was removed from the dyebath and was exposed to air. The initial color was a green-gray-blue, which quickly darkened and brightened to a more typical purplish indigo blue. The indigo was therefore already in a partially oxidized form when it was removed from the bath, confirming the relatively mild nature of the reduction. According to Choedon, if the dye has not been fermented long enough, the color will not be as fast. The yarn we observed was unevenly dyed. Choedon stated that this was typical because the dye floats on the surface of the bath, so the yarn near the surface picks up color faster than the yarn deeper in the pot.

Indigo dyeing by Dhagui:

We did not observe indigo dyeing at Dhagui's home, but recorded his description of the dyeing process.

1) Add pieces of indigo to fresh water and boil until indigo dissolves – approximately five minutes.

2) Add indigo liquid to stone mortar and grind, adding chang (barley beer) as needed – for at least ½ day or more – until all small piece have dissolved.
3) When ready to dye, add wool-washing water and fermented indigo liquid to pot over fire.
4) Add rhubarb root powder for a lighter blue or yeast for a darker blue.
5) Never boil; just keep the dyebath warm.
6) Add yarn and move pot to a warm area to sit for 2 hours or more, depending on the color desired. More indigo liquid can also be added to darken the color.

According to Dhagui, the color does not darken after removing the yarn from the dyebath.

Indigo dyeing by Chumbe:
We did not observe indigo dyeing at Chumbe's home, but recorded his description of the dyeing process. We did see indigo liquid in preparation in a mortar, which looked similar to the one used by Choedon.

1) Add pieces of indigo to a small amount of water in stone mortar and grind continually for 10 days, or occasionally for up to six months.
2) Keep a pot containing wool-washing water, yeast and rhubarb warm for one week. This liquid develops an intense "pond-water" smell. For a lighter blue, add more rhubarb; for a darker blue, add more yeast.
3) When ready to dye, add the indigo liquid to the pot containing the wool-washing water, rhubarb and yeast. Bring the pot almost to boiling, then add the yarn. Keep the yarn in the warm dyebath for 8 hours. This dyebath can be kept and re-used over weeks or months by adding more wool-washing water and more indigo liquid as needed.

Rhubarb dyeing by Choedon:
We observed rhubarb dyeing of fine wool yarn used for weaving *sherma* at Choedon's workshop/home.

1) Place metal pot containing barley beer (*chang*) over a fire.
2) Add ground rhubarb root and heat.
3) Add yarn and boil 30-40 minutes.
4) Remove yarn from dyebath and allow it to cool before rinsing.

No mordant (other than the barley beer) was added to the rhubarb dyebath during our visit, but Choedon stated that *sitsue* could be added to make a brighter yellow, or that washing powder could be added to make the color darker.

Rhubarb dyeing by Chumbe:
We observed rhubarb dyeing of thick wool yarn used for weaving *Wangden drumtse* at Dhagui's workshop/home.

1) Add water to metal pot over a fire.
2) Add 1.5 – 2 cups ground rhubarb root.
3) Add 1 small skein yarn.
4) Boil 15 minutes.
5) Remove yarn from dyebath and allow it to cool before rinsing.

No mordant was added to the rhubarb dyebath during our visit, but Chumbe stated that yogurt could be added to make a pale yellow.

Half of the rhubarb-dyed yarn was reserved for over-dyeing/mordanting with orange lichen (*bangsten*). We were unable to see the lichen used alone for dyeing due to the small amount of the lichen available, so it is unclear whether the lichen is working as a dye or as a mordant, or both.

1) Add 1 large piece of lichen to the left-over rhubarb dyebath on the fire.
2) Add 1 small skein yarn.
3) Heat until the lichen turns white.
4) Remove yarn from dyebath and allow it to cool before rinsing.

According to Chumbe, if the rhubarb and lichen are added to the dyebath at the same time, yeast is also added to "soften" the plants and make the color release more easily.

***Shomba/Showang* dyeing by Choedon:**

Showang is generally favored over rhubarb for over-dyeing with indigo to make brighter greens. We observed *showang* dyeing of fine wool yarn used for weaving *sherma* at Choedon's workshop/home.

1) Crush fresh plant (with only a small amount of root, as this makes the color more red) and form into wet balls (approximately baseball-sized). These balls can also be dried and used for dyeing in winter.
2) Add sour barley beer (*singdong*) to metal pot over fire.
3) Add and dissolve 5-6 balls of *showang* in boiling barley beer.
4) Add 1 skein yarn and boil at least 1 hour.
5) Remove yarn from dyebath and allow it to cool before rinsing.

No mordant was added during our visit, but normally Choedon adds *sitsue*. She claims that *sitsue* helps to fix the dye and makes it slightly more greenish.

The whole skein of *showang*-dyed yarn was over-dyed with indigo:

1) Before dyeing, more indigo liquid and yeast/rhubarb powder is added to existing dyebath and heated.
2) Add *showang*-dyed yarn to dyebath, heat for 15-30 minutes.
3) Remove yarn from dyebath and allow it to cool before rinsing.

The expected grass green color did not appear with the indigo over-dye. Instead, the color was a gray-brown. The cause for this was unclear. The gray-brown yarn was later over-dyed again in the leftover *showang* dyebath and turned a good medium green. In accordance with Tibetan custom, the initial poor result was blamed on bad luck due to the presence of strangers (the researchers) in the household.

A second lot of yarn was dyed with the leftover rhubarb/barley beer dyebath with *showang* added:

1) Add more barley beer to existing dyebath.
2) Add *showang* balls.
3) Add 1 skein yarn and boil 30 minutes.
4) Remove yarn from dyebath and allow it to cool before rinsing.

The resulting yellow color was slightly more greenish than the rhubarb-only dyed yarn.

Walnut dyeing by Choedon:

We observed walnut dyeing of fine wool yarn used for weaving *sherma* at Choedon's workshop/home.

1) Add ground walnut hulls to water in metal pot over fire. At this point, madder can be added to dyebath for a darker brown color, or rhubarb can be added for a more yellowish brown.
2) Boil 15-20 minutes.
3) Add *pudok.*
4) Add 1 skein yarn.
5) Boil 1.5 – 2 hours.
6) Remove yarn from dyebath and allow it to cool before rinsing.

Choedon explained that, as with madder, soaking the dyestuff overnight softens it and releases the color more easily. No mordant was added during our visit, but Choedon sometimes uses the "salt" fixative that comes in Chinese synthetic dye packets if the quality of the walnut dye is not very good or if she doesn't have enough dye. According to Choedon, temperature does make a difference with walnut dyes: higher heat creates a lighter color, while lower heat encourages a darker color.

A second lot of yarn was dyed with the remaining walnut dyebath with rhubarb added:

1) Add .5 cup of ground rhubarb and extra water to walnut dyebath.
2) Add 1 skein undyed yarn.
3) Boil 30-40 minutes.
4) Remove yarn from dyebath and allow it to cool before rinsing.

Madder dyeing by Choedon:
We observed madder dyeing of fine wool yarn used for weaving *sherma* at Choedon's workshop/home.

1) Add fresh water to metal pot over fire.
2) Add 4-5 cups ground madder and boil 1.5 hours. Ideally, the madder is soaked in water overnight to soften the plant and allow the color to be released more easily.
3) Add 1 skein yarn.
4) Add 1 tablespoon *pudok* and boil 6-7 minutes.
5) Add 3 cups cow dung ash (*khothal*), stir and boil 5-6 minutes. The ash darkens the color.
6) Remove yarn from dyebath and allow it to cool before rinsing.

The color achieved was a dark red, very different from the color achieved by Chumbe, which was a pinkish orange color. Presumably, this was due to the ash added to the dyebath.

Madder dyeing by Chumbe:
We observed madder dyeing of thick wool yarn used for weaving *Wangden drumtse* at Dhagui's workshop/home.

1) Heat fresh water in metal pot on wood/dung-burning stove.
2) Add 1.5 cups ground madder.
3) Add .5 cup yeast.
4) Add 500g yarn.
5) Add 1 cup ground madder.
6) Add 1 cup *dotsah.*
7) Boil, stir, and cover pot.
8) Add more ground madder, *dotsah* and fresh water over a 2 hour period of boiling. (Total amount of madder added was approximately 10-15 cups. Total amount of *dotsah* was approximately 1.5 – 2 cups.)
9) Boil for 2 hours.
10) Remove yarn from dyebath and allow it to cool before rinsing.

Chumbe told us that less madder is needed if it is soaked in water overnight to soften it. Alternatively, less dye is needed to achieve the same result if it is added to the water with more *dotsah*, and warmed (not boiled) together with the yarn in the same pot for up to 3 days.

One third of the madder-dyed yarn was reserved for over-dyeing with rhubarb:

1) Add .5 cup ground rhubarb to left-over madder dyebath.
2) Add .5 cup *dotsah.*
3) Add 1 skein madder-dyed yarn.
4) Boil for 20 minutes.
5) Remove yarn from dyebath and allow it to cool before rinsing.

One third of the madder-dyed yarn was reserved for over-dyeing with walnut hulls:

1) Add 2 cups ground walnut hulls to left-over madder dyebath.
2) Add 1 skein madder-dyed yarn.
3) Add .5 cup *dotsah.*
4) Boil for 20 minutes.
5) Remove yarn from dyebath and allow it to cool before rinsing.

Chumbe stated that to make a darker color, cow dung ash or wood ash can be rubbed into wet madder-dyed yarn. The yarn is then wrapped in plastic to keep it warm and wet to allow the ash to work. Choedon mixes ash and *pudok* together before rubbing it into the yarn. This process is also used with woven wool fabric (*nambu*).

Discussion
(i) Dyeing technology
The dyeing recipes and techniques used by Tibetan weavers differ in detail, but are similar in essence to dyeing techniques used in rural areas in other parts of the world, with the possible exception of the indigo dyeing technique, which has some unique features. The local plants used (*showang, nyachol, bangtsen*) have not been documented previously as far as we know. It is not

clear what role the yellow and green colors produced using *showang* and *nyachol* played historically. Previously, we have assumed that most yellow and green colors on antique textiles are rhubarb root and rhubarb over-dyed with indigo, but the assumption that most yellow colors come from rhubarb root should be re-evaluated in the light of these learnings.

The use of a local lichen, *bangtsen*, is interesting. The exact role that it plays in dyeing is not completely clear, but most weavers told us that they rarely used it alone, perhaps because the lichen is relatively difficult to obtain in large quantities. Rather, they used it as an additive to yellow, red, orange and brown colors to obtain darker shades. Many lichens have been shown to contain alum as well as color (Grae, 51); judging from the dyers' comments this may be a factor with *bangtsen*. We observed the effect of *bangtsen* on rhubarb dyeing, where the color changed from the characteristic deep yellow with rhubarb alone, to a much darker orange-brown shade with the addition of the *bangtsen*.

Red-brown and orange-brown shades, when seen in antique textiles, are generally assumed to be derived from madder, but this our study indicates that Tibetan dyers have traditionally had other means of obtaining these shades other than madder alone. We saw shades in this range being produced from the rhubarb + *bangtsen* mixture and also from rhubarb + walnut over-dye. Tibetan dyers also use lac dye to make a brighter red shade, but we did not observe this in our study.

The use of ash as a mordant, in this case rubbed into the yarn as a moist powder or put into the dye pot in the final stages of madder dyeing, is characteristic of traditional village dyeing techniques. The alkaline pH of ash tends to give darker shades, as well as helping to fix the color.

(ii) Socio-economic aspects

Remarkably, we were able to witness to a fairly complete natural dyeing repertoire from an area where natural dyeing was considered all but extinct until recently. All the knowledge (with the possible exception of the use of imported alum) has been re-learned from older members of the community, in the age range of 55-70 years (70 being near the limit of life expectancy in rural Tibet). It seems therefore that this transfer of knowledge has occurred "just in time".

The TAI's experience shows that local techniques can be successfully revived after a long break of 30-40 years, provided that a few members of the community can recall the basic steps. The only intervention required in this case was to provide a steady market for naturally dyed textiles: this is important because learning a new dye process requires effort and experimentation on the part of the artisan. We believe that skills training may still have a part to play in helping weavers in the surrounding areas to re-learn natural dye techniques, but this will focus on local, versus imported techniques.

Based on our experience, we believe that programs to re-introduce natural dyeing to areas where the practice has lapsed should consider carrying out a similar study to this one, so that unique local knowledge can be retained and built upon, as opposed to importing different dyeing methods from outside the locality. Secondly, an economic incentive in the form of a steady market where price is based upon quality is also a key factor for success.

Acknowledgements

We would like to thank the Tibetan Artisan Initiative, the Tibet Poverty Alleviation Fund, the TAR Poverty Alleviation Office, and the Chengyuan Handicraft Commercial Industry Bureau for their continuing support during this research.

References

Brown, Rachel, 2000. *The Weaving, Spinning, and Dyeing Book.* New York: Alfred A. Knopf

Dunsmore, Susi, 1993. *Nepalese Textiles.* London: British Museum Press

Grae, Ida, 1974. *Nature's Colors.* New York: Macmillan

Liles, J.N., 1990. *The Art and Craft of Natural Dyeing*. Knoxville: The University of Tennessee Press

Smith, Rupert, "Wangden Meditation Weaving". Online at www.asianart.com

SESSION / SÉANCE / SESIÓN 4
SUSTAINABILITY AND ECO-FRIENDLINESS OF NATURAL DYES
TEINTURES NATURELLES : DÉVELOPPEMENT DURABLE ET PRÉSERVATION DE L'ENVIRONNEMENT
TINTES NATURALES, DESARROLLO SOSTENIBLE Y PRESERVACIÓN DEL MEDIO AMBIENTE
07.11.2006

Chairperson / Président / Presidente : Mr David Redpath (United Kingdom)

- Ms Grace Guirola de Seassal (El Salvador), "Good practices for the production of indigo in El Salvador " / "Bonnes pratiques de production de l'indigo au Salvador " / "Buenas practicas de producción del índigo en El Salvador"

- Dr (Ms) Pajaera Patnathabutr and Dr (Ms) Supanee Chayabutra (Thailand), "Thailand approach towards sustainable development in natural dyeing" / "Approche thaïlandaise du développement durable dans le domaine des teintures naturelles" / "Acercamiento de Tailandia hacia el desarrollo sostenible en los tintes naturales "

- Ms India Flint (Australia), "Alternative (and safe) mordants for plant-based dyes" / "Mordants aernatifs (et sans danger) pour les teintures à base de plantes" / "Mordientes alternativos (y sin peligro) para los tintes a base de plantas"

- Ms Shalini Sahoo (India), "Ethical dyeing and the tribes of Northeast India" / "Teinture et éthique des populations du Nord-Est de l'Inde" / "Tintes éticas en los pueblo del Nor-Este de la India"

- Ms Luc Elina Herinivonirina (Madagascar), "Vegetable dyes in Madagascar: preservation of biodiversity to promote artisanal tradition" / "La teinture végétale à Madagascar: préserver la biodiversité pour promouvoir la tradition artisanale" / "Los tintes vegetales en Madagascar: preservación de la biodiversidad y valoración de la tradición artesanal"

The questions raised by the preceding session were also relevant to the theme of the fourth session. Both sessions considered the field of natural dyes from complementary points of view, in the common prospect of sustainable development. In this respect, the (relatively) poor representation of producers of natural colorants among these responding to the UNESCO survey is remarkable, particularly as opposed – paradoxically at first sight – to the frequent statement by craft dyers that they face « no problem of supply». This apparent paradox, and the necessity to clearly address the problem of sustainable and adequate supply in colouring plant raw materials, was one of the main issues of the Symposium: what pressure does the probable increased use of natural dyes represent on the natural environment. Can it become a threat and how adequately can it be answered by the cultivation of dye plants?

Les questions abordées lors de la précédente session sont également liées au thème de la quatrième session. Les deux sessions ont examiné sous deux angles complémentaires le rôle des teintures naturelles dans une perspective de développement durable. A cet égard, il faut noter la (proportionnellement) faible représentation des producteurs de colorants naturels parmi les personnes ayant répondu au questionnaire diffusé depuis deux ans, et – ce qui paraît paradoxal au premier abord - l'affirmation fréquente de la part des artisans teinturiers qu'ils n'ont « pas de problème d'approvisionnement ». C'est ce paradoxe, et la nécessité d'aborder clairement la question de l'approvisionnement en matières premières colorantes végétales et de la pression – voire de la menace – qu'il peut présenter pour les environnements naturels, qui ont fait de la problématique écologique l'un des points forts de ce Symposium.

Las cuestiones abordadas en la precedente sesión están igualmente ligadas al tema de la cuarta sesión. Las dos sesiones examinaban desde dos ángulos complementarios el rol de los tintes naturales en una perspectiva de desarrollo sostenible. Al efecto, es necesario señalar la (proporcionalmente) poca representación de los productores de colorantes naturales entre las personas que respondieron al cuestionario difundido desde hace dos años, y – lo que parece paradójico a primera vista – la afirmación frecuente de los artesanos tintoreros de que no tienen problemas de aprovisionamiento. Es esta paradoja, y la necesidad de abordar claramente la cuestión del aprovisionamiento de materias primas colorantes vegetales y la presión – incluso la amenaza – de que pueden presentarse problemas con el medio ambiente natural, que hacían de la problemática ecológica uno de los puntos fuertes del Simposio.

SUSTAINABILITY AND ECO-FRIENDLINESS OF NATURAL DYES
¨Buenas Practicas de Producción de INDIGO en El Salvador, C.A.¨

por Sra. Grace Guirola de Séassal[*] (El Salvador)
Designer/Artist - President of the Associación de Añileros de El Salvador

Abstract

Presentación de AZULES: la Asociación de Añileros de El Salvador, que agrupa a productores y teñidores para comercializar producto a tiempo, con calidad y transparencia con los clientes***. (4 min.)***

Un cortometraje (DVD) sobre la extracción del AÑIL en El Salvador. ***(6 min.)***

Protección del medio ambiente por medio de Capacitaciones, Servicios y Accesoria que da la Asociación de Añileros AZULES durante el manejo de desechos líquidos y sólidos en la extracción del Indigo y promoviendo la sostenibilidad por medio de ventas de abono orgánico y asocio de cultivos. El desarrollo de Agroturismo da impactos positivos en nuestra economía y la promoción de nuestra Identidad Cultural. ***(10 min.)***

[*] President of the Associación de Añileros de El Salvador – Association/NGO for the promotion of the use of indigo “Azules”
Designer/Artist using natural dyes (Azul Maya and Bleu des Champs)
Individual Farmer (Hacienda de Indigo San Juan Buenavista)
Re-activated the production and processing of indigo in a small urban community promoting ecologically friendly methods of production and rescuing its cultural heritage through producing and dyeing with indigo.

THAILAND APPROACH TOWARDS SUSTAINABLE DEVELOPMENT IN NATURAL DYEING

by Dr (Ms) Pajaera Patnathabutr and Ms Supanee Chayabutra* (Thailand)
Research Centre for Art and Design Materials
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Abstract

Natural dyed textiles in Thailand have been received worldwide attention, mainly due to their unique and high quality handicraft products. Her Majesty Queen Sirikit of Thailand has contributed tremendous efforts to promote Thai local weaving cloths in local villages for the balanced achievement of sustained economic in developing country, improved social equity and eco-friendly approaches. According to Her Majesty's concern on quality and standard of Thai silks, the "Thai Royal Peacock" trademark is currently employed to accredit high-quality Thai Silks. The quality of four kinds of Thai silks is distinguished by their raw materials and methods of production including declaration of natural dyeing and non-environmental polluted chemical substances. Moreover, Thai government policy on promotion of "One Tambon, One Product (OTOP)" crafts has driven the village production as well as Small and Medium Enterprises (SMEs) on natural dyeing products such as fabrics, cloths and handicrafts. Non-wood forest products (NWFP) as natural dye resources became main focus, especially, bark of harvesting species such as annatto tree, sappan wood, ebony, cutch tree, jackfruit tree, and indigo. Current natural dyeing researches in Thailand focus on development of standard dyeing methods for environment and sustainable development, such as Reduction of metal mordant by surface modified approach; Application of Plasma technology on improving of silk dyeing absorption; Improvement of efficiency natural dye extraction; Systematic knowledge management on local natural dyeing process for green, brown, and black shade; Establishment of testing centre for color measurement and fastness testing for natural dyed products, and Technology transferring of standardized natural dyeing process to villagers and producers.

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Pajaera Patnathabutr is Assistant Professor at Department of Materials Science and Engineering, Faculty of Engineering and Industrial Technology, Silpakorn University, Thailand. Since her Ph.D. graduation from University of Cambridge, UK in 1999, she has involved in Natural dyeing researches and development of new Inorganic Thin Layer Technology to reduce amount of metal mordants in natural dyeing in co-operation with Professor Dr.-Ing Volker Rossbach, TU-Dresden, Germany. Currently, they engaged in Research Centre for Art and Design Materials, funded from National Metal and Materials Technology Center (MTEC), National Science and Technology Development Agency (NSTDA), Ministry of Science and Technology, Thailand, to promote university-industrial co-operations in Arts, Crafts and Fashions including Ink-jet and Laser printing.

ALTERNATIVE (AND SAFER) MORDANTS FOR PLANT-BASED DYES

by Ms India Flint[*] (Australia)
Costumier, artist, farmer and writer

As a dual national Latvian-Australian, I dedicate this paper to my grandmother and my mother who taught me the Latvian dye traditions from which my practice has evolved.

Prior to the discovery of the first aniline dye in 1856, all colours applied to textiles came from natural origins. Although the diverse range of sources including molluscs, lichens, insects, minerals, peat bogs and plants was collectively and somewhat romantically described by the term 'natural dyes' some of the extraction processes used were far from natural. The addition of potentially toxic chemicals to dye baths had unhealthy implications for both the dye practitioner and the environment.

Delightful terminology including 'aqua fortis', 'orpiment', 'oil of vitriol' and 'prussian blue' implied, respectively, nitric acid, arsenic trisulphide, concentrated sulphuric acid and ferric ferrocyanide. Illustrations of eighteenth century dye workshops encourage the speculation that a significant percentage of dyers of that era would have enjoyed a shortened life expectancy.

In more recent times even domestic textile dyeing using plant materials has also involved the use of adjunct mordants. These mordants range from relatively harmless compounds such as alum (potassium aluminium sulphate), table salt (sodium chloride) and vinegar (diluted acetic acid) to dangerous and potentially lethal substances such as chrome (potassium dichromate), tin (stannous chloride), copper (copper sulphate) and iron (ferrous sulphate).

While table salt is edible, disposal of salt water (especially in Australia) is difficult without compromising the environment. Our country already has a significant salt problem. The heavy metallic salts in particular are not only potentially injurious to the health of the dyer, they present serious ecological difficulties in terms of safe post-dyeing disposal. For the individual, disposing of the residual metal salts traditionally used in small scale domestic or workshop dyeing poses a serious problem, requiring evaporation pits to reduce the residue to a manageable sludge, thus minimising the volume of material for disposal. Unfortunately, the question of safe disposal of the toxic sludge is one that has not yet been resolved satisfactorily.

Strictly speaking a mordant as defined by chemists is a metal with a valence of at least two and the attachment of mordants to dyes is by means of a covalent and a coordinate bond.[15]

For the purpose of this discussion mordants will be loosely defined as substances of organic or inorganic origin that fix dyes or influence colour outcomes at some stage in the dye process. In the application of plant dyes they are substances that act as a bridge, or bond, between the molecules of the substrate (the fibre being dyed), and the substance that is being used to dye it. Traditional mordant substances include such acids as tannic acid, sumac, gall nuts, bark extracts, oleic and stearic acids, Turkey red oil; and metallic substances such as various combinations or soluble salts of chromium, aluminium, iron, copper, and tin.[16]

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[*] Costumier, artist, farmer and writer India Flint completed an MA in 2001 investigating eucalyptus dyes for textiles, developing the eco-print that has become the signature of her textile practice. She is represented in a number of European Museum collections and has lectured in ecologically sustainable Print Dye practice at the University of South Australia. Her book 'Eco-colour' will be published by Murdoch Books in 2007. Presently she is engaged in research within the School of Fashion & Textiles at RMIT University, working with salvage textiles in conjunction with ecologically sustainable plant dyes within the context of philosophically 'green' alternative fashion.

[15] http://stainsfile.info/StainsFile/theory/mordant.htm

[16] http://www.greatvistachemicals.com/dyes_and_pigments/mordant_dye.html

In this paper I will discuss the use of alternative mordants in specific relation to the application of dyes sourced from flora (i.e. from roots, berries, bark, leaves, seeds, wood or fruit) in an aqueous solution. Mordants may be applied before, during or after dyeing. I will refer to these processes as pre-mordant, co- mordant, and post-mordant. The final result of a dye application may vary considerably depending on the processes that are implemented. The results will also vary according to the sequence of procedures, the climate in the region of harvest, the time of year and the water used (both in irrigation of the plant material and as basis for the dye bath).

Mordants used in ecologically sustainable dye practice can include wood ash, seawater, fruit vinegars, urine (both fresh and stale), soybean protein, whey protein, eggs, rice flour paste and a range of plants according to availability, locality and abundance. Rhubarb and sorrel leaves are rich in acids, acorns and acacia barks contain tannins and the flesh of onions contains sulphur. All of these substances are useful assists in dyeing. The skins of *Punica granatum* (pomegranate) yield a yellow dye as well as exhibiting mordant properties. When examining plants for mordant possibilities look carefully at the genus and species names for clues; for example just as 'tinctoria' tells us the plant was traditionally used for dyeing, and 'officinalis' that it had medicinal applications, so too can we find indicators for mordants in the binary nomenclature. Oxalis could indicate oxalic acid, salix the presence of salicylic acid and so forth.

The contemporary disposition to use household cleaners of unknown chemical constitution as dye assists is somewhat disturbing. Not everything sold for use in domestic cleaning is safe, far from it. When such substances are applied in conjunction with other chemical assists the results are not predictable and potential toxicity cannot be reliably assessed. Enthusiastic launderers in the sixties discovered (by accident) that combining chlorine bleach with the available washing detergents of the day caused a chemical reaction resulting in the emission of chlorine gas – used in the trenches of World War I.

Mordants and dyes will have different effects depending on the fibres used (protein, cellulose or synthetic). The method of preparation of the substrate (wet/dry/scoured/greasy/starched etc) will also influence the end colour result.

A further variable is introduced with the use of the dye vessel as (additional) co-mordant. Witness the interesting effects of pot-as-mordant on *Hypericum tetrapterum* (St Peter's Wort). When processed in stainless steel, this plant gives yellow on cellulose fibres and a purplish red on protein fibres. Cooking in an aluminium pot will change the colour outcome on both cellulose and protein fibres to a rich and substantive green. Similar effects have been noted on *Hypericum perforatum* (St John's Wort) sourced in Germany.[17]

Research also indicates that the pH of the water used to establish the dye bath (as well as possible adulterants in the reticulated service) may have a dramatic effect on the resultant colour. In teaching dye classes across Australia, for example, I have found a variation in the pH of water available in households from 5 (at Geelong, Victoria) to 8 (at Orange, New South Wales; Perth, Western Australia; and Launceston, Tasmania). Add to this the varying proportions of unknown salts and minerals in addition to known chemicals and results can often surprise.

The water in Adelaide is piped from the River Murray (a salt-compromised and polluted waterway traversing the eastern states of Australia) to open air reservoirs in the Mount Lofty Ranges. Chlorine is added on the way to storage where 400 tonnes of Copper sulphate (added to control algae) annually join the cocktail. Consider the impact of a daily evaporation rate of at least half an inch in concentrating the levels of soluble pollutants as well as the further impact of fluoridation. In a drought year (such as this one) little or no rain falls to dilute this mixture.

When teaching last month in Adelaide I was much surprised to find that a dye-bath of *Eucalyptus sideroxylon*, where the expected outcome that I had outlined to my students (frequently achieved before in water from the same supply) which would normally be a bright red on protein fibres was

[17] Experiments at Göttingen, Germany, during travels in 1999

in actual fact a lime green. Among the number of possible variables available we concluded that we may have been accessing the supply shortly after the annual Copper sulphate addition, a reasonable hypothesis given the tendency toward green when some eucalypts are processed in copper vessels.

Quite simply, just as every plant has the potential to give colour in the dye pot, there are an infinite range of possibilities and permutations for the employment of plant extracts as pre-mordants. It is important that the user is selective in the choice of plants, bearing in mind rarity, legality, speed of regeneration, depth of colour, economic management of the dye-bath, user safety (in the case of toxic plants) and ultimate disposal of the solution.

Spontaneous plants (more prosaically known as weeds) are also inexpensive sources of possible mordants. Their harvest and utilization has the added benefit of removing or lessening undesirable plant infestations. For example *Oxalis pes-caprae* a luminous yellow flowered plant introduced to Australia from South Africa is not only a source of dye (brilliant yellow without pre-mordant, orange in the presence of ash) but enriches and deepens the effect of eucalypt dyes on wool. Simply fermenting *Oxalis pes-caprae* also produces an orange colour. The fruit of another spontaneous plant, known variously as the pie/paddy/afghan/wild melon (*Citrullus lanatus*) is extremely alkaline and although in itself not the producer of an exciting dye colour, radically shifts the colour obtained from *Eucalyptus cinerea* on wool from a deep red to a rich dark chocolate.

The examples used in illustrating this paper reference the range of variations to be achieved in examining the dyes extracted from the genus *Eucalyptus* in conjunction with a broad spectrum of alternative mordants, both cellulose and protein fibres and with the effects over time of the 'pot as mordant'.

The eucalypts are an evergreen hardwood genus endemic to the Australasian region embracing well over one thousand species and sub-species. Eucalypts are represented across the Australian continent in all but the harshest of the arid interior regions, although they can be found in desert areas marking the positions of soaks and watercourses. Their range extends to 9º N (Philippines) and as far south as 44º in Tasmania [18] with the greatest variety of species concentrated in the temperate zones[19]. Eucalypts have successfully colonised many other parts of the world including southern Europe, Asia and west coast U.S.A.

Dyes from the genus are substantive on protein fibres (eg wool, silk), meaning that colour can be fixed without the use of additive chemical mordants. Dramatic colour shifts can be induced by pre-mordant with other plant material, co-mordant with the addition of scrap metals to the dye bath or the use of dye vessel as mordant and post-mordant in other aqueous solutions. The genus shares an interesting feature with a number of other dye plant families (ie *Isatis*, *Indigofera* and *Polygonum*) in that the potential dye colours are not immediately apparent upon visual inspection of the plant. *Eucalyptus cinerea*, for example, bears blue grey leaves. Upon immersion in hot water these almost immediately become emerald in colour, after ten minutes simmering they turn khaki and begin to release visible colour into the solution. It should be noted however, that the colour of the dye bath prepared from fresh leaves (gold brown) does not necessarily indicate the colour of the dyed textile, which ranges from green (5min) through gold and orange (about 25 min) and eventually deep chestnut red (45 min)[20]. Leaves from eucalypts will give different colours depending on whether they are used fresh (i.e. picked green), used dried (picked and dried) or collected in a desiccated state from the ground beneath the tree (here again there will be different results depending on the residual colour in the leaf). Leaves picked from different sides of the same tree can sometimes give different results.

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[18] DOUGHTY Robin. 2000.The Eucalypts – A Natural and Commercial History of the Gum Tree. Johns Hopkins University Press, Baltimore and London.

[19] BROOKER M.I.H.& KLEINIG D.A. 1999. Field Guide to Eucalypts, Vol 1. Bloomings Books, Hawthorn, Australia

[20] Curiously, the discoverer of this species, Baron Ferdinand von Mueller (noted eucalyptologist and erstwhile Director of the Royal Melbourne Botanic Gardens) overlooked this species when preparing dye samples from indigenous species for the 1866 Intercolonial Exhibition.

Material processed from species grown in different geographic locations may also offer dramatically different dye results. Additional variables may be created through the choice of dye processes. The traditional approach is to extract the dye by boiling the leaves in water, straining off the liquor, and then heating the textile in the solution. The most intense and clear colours are obtained by restricting processing of plant material to one hour prior to dyeing the textile. Longer cooking facilitates the release of kino from the leaves, inhibiting the dye process and shifting colours toward dark brown. Another option is 'solar dyeing'. The plant material and the textile to be dyed are placed in close contact (with added water) in an airtight container, and left in a sunny spot for at least four weeks (and sometimes months).

The ecoprint[21] (a steam contact process which has become the recognised signature of my work) reveals that eucalypt leaves may contain a multiplicity of colours. Because the process uses steam i.e. heated pure water it offers rapid assessment of potential colour. When the leaves are boiled, however, the colours become blended. For example the delicate orange-edged lime green print of *Eucalyptus globulus* on wool or silk becomes a uniform khaki in a neutral water bath.

Applying eucalyptus dyes to a cellulosic substrate is more difficult.[22] Protein fibres are slightly alkaline in nature, allowing eucalyptus dyes (slightly acidic when prepared in a neutral aqueous bath) to bond substantively. Cellulose fibres are generally neutral and require treatment in order for dyes to be fixed. Traditional Japanese soy mordants made by grinding dried soy beans and soaking them in water work well as precursors to dyeing with eucalypts. After soaking the ground beans, the liquid is strained off. The fibre to be dyed is then soaked in the liquid, squeezed and hung to dry. Bear in mind that the quality of the water (and anything dissolved in it) that is used as carrier for the soy will have a bearing on the later colour outcome. Fabric mordanted with soy can be stored up to a year before being dyed and in some practices all of the pre-mordant is applied annually in one large batch.[23] Commercially prepared brands of soymilk can be just as useful, if somewhat more expensive, obviating the need for grinding equipment, as can the run-off from the production of tofu (useful for smaller applications).

Mordants particularly useful on cellulose fibres also include tea, ash water, sea water, acorn milk, whey (from cheese production), skim milk, eggs, acacia barks and the variety of saps obtainable from thistles and *euphorbia* species. Such saps can be painted or printed on to the substrate which is then over-dyed after the sap has dried. Exquisite patterns can also be made by fresh leaves beaten directly into the cloth, using the 'hapa-zome' [24] technique, with or without an applied pre-mordant. The print is then fixed using a steam iron or heat-press. Subsequent over-dyeing of cloth thus treated will colour these leaf patterns in a variety of shades, usually related to but darker than the coloured substrate.
Be aware that the effectiveness of mordants will vary according to how and when they are applied. For example ash water, made by mixing a small quantity of ash (I use a ratio of roughly 100 grams of ash **:** 10 litres of water) is useful as a pre-mordant for cellulose fibres, however when added to eucalypt dye baths as a co-mordant tends to muddy all outcomes to dull browns. Ash from different plant varieties will have different chemical compositions and may affect dyes differently.

The beauty of natural dyes lies in the multitudes of possible variations. When using such haphazard and relatively spontaneous materials as I do, standardization is not the goal. The object of the game for me is to produce ever more beautiful colours and patterns and to celebrate the diversity that comes with a regionally based practice situated in a context of 'slowness' where time is literally of the essence. Slow dyeing, like slow food and slow fashion requires more time and effort, but generates extraordinary results.

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[21] FLINT India, 2001, MA Thesis 'Arcadian Alchemy – Ecologically Sustainable Dyes for Textiles from the Eucalypt Forest'
[22] Curiously, *Amyema miraculosa*, a mistletoe which grows on a eucalypt substrate, will dye both cotton and wool, where eucalyptus dyes more readily bond with protein fibres
[23] Conversation with Japanese resident Jorie Johnson in Denmark, January 2000
[24] A technique in which colour is applied directly to the substrate by beating plant materials between layers of cloth, using a small wooden mallet. In Japanese hapa = leaf, zome = dye. I gave the name to the technique after using it extensively on location in Japan to colour a floor-cloth for a floating stage at Yamaguchi Centre for Arts & Media.

In conclusion, I submit that in the contemporary world where environmental concerns are of ever increasing importance, the use of toxic chemical adjunct mordants can no longer be justified. It is up to the individual dyer to explore the resources available in their locality, to determine which of these might have application in the dye pot. Remember that what we use will ultimately be poured on to the earth, whether locally or tipped down a sink and transported elsewhere. Sustainable practice begins at home, with the individual.

ETHICAL DYEING AND THE TRIBES OF NORTHEAST INDIA

by Ms Shalini Sahoo[*] (India)
Textile designer

Three years back all my investigations with natural dyes were staggered with the guilt of using chemical mordants.
Added to this was the persistent fastness and reproducibility problems.
I wanted to understand natural dyeing in its most aboriginal context.
This hunger set me on this revelatory journey to the tribes of Northeast India.

The first tribe documented and studied were the Khasis.
The Khasis are a matriarchal clan and inhabit the central and eastern part of Meghalaya.
Living with the Khasis I realised that when one develops a product from the basic raw material, he shares a special relationship to it.
The women of this community rear their Eri cocoons, **s**pin the yarns,
Dye them and then weave them into shawls.
For dyeing, the women get together.
It begins with going to the forest to collect the dye materials, **c**oming back, readying the dye…
This process of dyeing is special.
In a world which has to relearn natural dyeing after using chemical dyes for one and a half centuries.
The way the Khasis dye would leave most of us gaping.
The yarn is not pre treated or wetted before dyeing.
On this dry yarn the chopped leaves and rhizomes are spread.
It is then folded and kept in a pot with dye materials to boil.
During the dyeing which continues for a couple of hours the yarn is not agitated much.
After dyeing the yarn is removed from the hot bath and the excess colour is left to drip.
It is then dried in shade. The process is repeated thrice, with an interval of fifteen days.

The second tribe documented was the Tai Shyams.
The Tai Shyams are a part of the Khamyang tribes who migrated from Thailand to upper Assam.
Earlier the Shyams dyed and wove all their garments.
Colours were also symbolically used by married Shyam women.
Who cover the upper half of their body in white. This represents heaven.
From the navel till the mid thigh symbolises Earth and is clad in a green wrap.
Beneath this is hell and is therefore draped in black.

The traditional Shyam textiles had several natural colours.
From this relatively rich colour palette, the Shyams only remember to make the blue.
The reason can be that since all these colours had their sources from the heartwood of trees,
Yellow from the heart wood of, *Artocarpus heterophyllus*,
red from the heartwood of*, Morinda tinctoria*
The ever depleting forest cover made these methods of obtaining the colours less and less sustainable, and was thus lost over by time.
Unlike these the source of the colour blue was from leaves of *Strobilanthus flaccidifolius*.
and was cultivated by every household.
In two districts of upper Assam, I visited three Shyam villages.

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[*] Shalini Sahoo is a textile design graduate from the National Institute of Design (Ahmedabad, India). For the last two and a half years, she has been working with “Tribesmen” in the Northeast region of India. Already in her Diploma project she had worked towards exploring the aboriginal context of natural dyes. Her work can be largely divided into three parts the first involves documentation of the natural dye practices of tribes. The second part is laboratory analysis of the field findings. The third part of her work is giving the assimilated knowledge back to the people in useable form. In her attempts to re-establish natural dyes, she has conducted three workshops for the tribal women. She has published a hand booklet for natural dyes in the local language. And has set up a model for natural dye unit in Tamulpur, Assam. Her main area of work lies in systems design analysis. She has formulated the Ethical dyeing Manifesto. Based on it she has conducted several experiments on the flota of Assam and Meghalaya. And developed 88 assorted mordant free shades on Eri silk. Ms Sahoo is currently based in Germany.

In these three villages I found five old women who knew to make natural dyes by practice,
Of these five women only one still continued dyeing, she is seventy nine years old.

She is fondly called Ja which means grandmother.
When I told Ja that I am interested to learn the dyeing from her
she came near me, smiled…put her hand on my back and whispered...
"I will teach you something that no one in future can ever teach."
My interaction with Ja, helped me understand the other world of dyeing
A world where measurements are with assumptions.
The old lady in the schoolmaster's house told me,
"We don't measure when we dye, but we know how much things have to go in the bath."
Ja's relationship to her plants was very special, I remember when she was cutting her *sibus* for fermentation, she did it carefully, and repeatedly told us that one should not pull the plants too hard while cutting.
In her little garden she kept moving from one part to another, making sure she never took too much from one.
Here this special relationship to plants keeps coming back to me.

The tribes are nature sufficient; nature apparently has solutions to all their needs.
The interaction with them and analysis of dyeing through the ages brought gratifying insights.
These insights were assimilated to define the directions for the lab experiments.
And the "Ethical Dyeing Manifesto" was formulated.
The clauses of the Ethical Dyeing Manifesto ensure sustainable usage of natural dyes without hurting the Earth and other life processes.

The Ethical Dyeing Manifesto
T*he Earth sustains us all.*
I*t is therefore important that in our interaction with her, we treat her with gratitude and respect.*
G*reed should not govern us.*
W*e need to give back what we take, in a form that helps the natural cycles and makes life easier for all other living organisms.*
T*he philosophy of ethical living needs to be the basis for dyeing ethically.*

The clauses for ethical dyeing

1. To not use synthetic chemicals at any stage of the dyeing process.
2. To conserve the sources of natural dyes by not consuming the roots, heartwoods or barks of perennial trees as dye material.
3. To avoid the use of plant materials that is food to man and animals.
4. To minimise the use of (plant organs that propagate a species) flowers, seeds, fruits gathered from the wild.
5. To cultivate the required dye plants.

Accordingly eighty-eight assorted shades were developed. This was of course, done without the use of metal salts and other chemical mordants.

From my laboratory to the tribal villages I constantly move between two worlds. I move out from one into the other, constantly hoping that when I return back I will have deeper insights.
The problem is: we have understood natural dyeing very well at the nano level,
But what we have missed to understand is the macro level in which things operate.
Thus implying that our failure with natural dyes lies in our inability to understand the System in which it fuctions.
When I think of tribes what strikes me first is the basic nature and quantity of things around them.
From the tribal village to my lab, from the macro to the micro.
Away from them, I still continue with my journey…
Maybe 'Colour' is a metaphor as the alchemist's quest for gold. The journey is the essence.'

(The above text was presented in combination with visuals)

LA TEINTURE VEGETALE A MADAGASCAR : PRESERVER LA BIODIVERSITE POUR VALORISER LA TRADITION MALAGASY

par Mme Luc Elina HERINIVONIRINA[*] (Madagascar)
Weaver and dyer

C'est un grand plaisir pour moi d'être parmi vous aujourd'hui afin d' exposer brièvement le thème qui s'intitule : **« La teinture végétale à Madagascar : préserver la biodiversité pour valoriser la tradition malagasy. »**

Avant d'aborder ce thème, je vais d'abord vous présenter Madagascar et parler de sa potentialité en matière de teintures végétales.

Madagascar est la cinquième île au monde du point de vue superficie. Elle se trouve dans l'Océan Indien à 400km à l'Est de l'Afrique. La capitale s'appelle Antananarivo. Les langues officielles sont le Malagasy et le Français. Autrefois appelée l'Ile Verte, maintenant on la nomme l'Ile Rouge à cause de l'existence de nombreuses nuisances qui dégradent son environnement.

1- La teinture végétale à Madagascar

a) Historique

La pratique de la teinture végétale est une coutume ancestrale qui date de la royauté et est transmise de génération en génération. En effet, des documents historiques, des écrits, des tableaux et des photos, montrent les portraits des rois et de leurs cours drapés dans des « lamba » (tissus) multicolores. Le « lambamena » est un linceul teinté avec des plantes et dont la couleur rouge domine. Il servait et sert encore à ensevelir les morts lors des cérémonies d'enterrement et d'exhumation.

b) La potentialité de Madagascar en teinture végétale

Malgré la dégradation de sa biodiversité, Madagascar possède encore une réserve naturelle immense au niveau de ses ressources en plantes tinctoriales.

D'après Andrée Mathilde ETHEVE, auteur du manuel intitulé « TEINTURES NATURELLES », « Madagascar possède au moins dix fois plus de plantes tinctoriales que la France ». Récemment, une enquête a permis de conclure que la Grande Ile a plus de **180** types de plantes tinctoriales recensées dont **65** espèces sont endémiques de Madagascar. Donnons quelques exemples :

- le **Nato** (labourdonnaisia madagascariensis) dont l'écorce donne la couleur rouge se trouve dans la région de Fianarantsoa.
- le **Bongo** (danaïs latisepala) dont la racine donne la couleur orangée est une plante utilisée comme fixateur. On le trouve au Sud et au Nord de Madagascar.
- l'**Harongana** (haronga madagascariensis) d'où l'on extrait le brun à partir de l'écorce. Il pousse partout à Madagascar.
- le **Tambarasaha** (burasaia madagascariensis) d'où l'on extrait le jaune à partir de la racine. On peut le trouver dans les Hauts Plateaux.

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[*] Luc Elina Herinivonirina was born on March 3rd 1973. She lives in Arivonimamo, 50kms from Tananarive the capital. She studied in primary, secondary schools in Arivonimamo and got her baccalaureate diploma there. Next, she went to the University to major in management for two years. After that, she began to follow many kinds of handcrafts training especially weaving. Lastly, she has worked as silk weaver. In September 2004, she worked with PROTA (Plants Resources of Tropical Africa) on the endemic plant researches of Madagascar, followed by a research and experimentation on plant dyeing with Dominique CARDON (Director of CNRS in Lyon-FRANCE) in May 2005 in Ambositra, Ankarafantsika in Madagascar. And then, in March 2006, she collaborated with Eric Mallet about the natural dyeing of mohair. She was among the team which dealt with UNIDO about the dyeing of thread of silk utilised during the "day of the silk" in December 2005. She has a workshop of dyeing and weaving in Arivonimam

- la **Vaombe** (aloe vaombe) dont les feuilles donnent la couleur violette. Elle pousse dans la région Sud de Madagascar mais on peut le transplanter sur les Hauts Plateaux.

D'autres espèces ont été introduites à Madagascar comme les **indigotiers,** qu'on peut trouver partout mais surtout dans la région de Majunga (Besalampy, Ambongo,…) et de Tuléar. Il y a aussi le mavoadala ( ) ; le coréopsis ; l'eucalyptus ; le mimosa ;…

2- Donner de l'intérêt à la teinture végétale c'est préserver la biodiversité

Actuellement, chacun peut constater la montée des tendances des produits « bio » dans beaucoup de domaines de la vie quotidienne. Par amour pour la nature, entre autres, la demande en matières et en intrants naturels ne cessent d'augmenter dans le secteur de l'habillement et de la mode en particulier. Beaucoup de consommateurs exigent des artisans, des stylistes et des créateurs, des produits traditionnels et surtout naturels.
Qu'y a-t-il de plus naturel que la teinture végétale?
La teinture naturelle et surtout végétale a toujours été pratiquée à Madagascar. Néanmoins elle risque de disparaître au profit de la teinture chimique à cause de l'épuisement de certaines plantes. En effet, des dangers menacent les plantes tinctoriales malgaches comme les exploitations abusives de certaines espèces et la déforestation. De nombreuses espèces sont utilisées comme bois de construction et comme bois de chauffe. Les feux de brousse et le « tavy » (pratique de cultures sur brûlis) provoquent des dégâts non négligeables. Des actions ont été déjà entreprises pour la sauvegarde de ces richesses naturelles. Elles sont surtout focalisées sur les reboisements (destinés plutôt à la protection de l'environnement) et l'augmentation des aires protégés. Des conférences et des séminaires ont été organisés à Madagascar par le gouvernement, les agences de développement et les ONG pour informer et sensibiliser les gens sur la nécessité de la préservation de la nature.

3- Donner de l'intérêt à la teinture végétale c'est valoriser la tradition malagasy

Les traditions artisanales malgaches en matière de teintures végétales se sont focalisées surtout sur la teinture des fibres naturelles (soie, raphia, coton, mohair…).
Les procédés sont encore rudimentaires et sont très variés comme :
- la longue cuisson de plusieurs jours des écorces ou des bois,
- l'utilisation à l'état brut des cendres et des boues,
- la cuisson simultanée des fibres et des plantes tinctoriales,
- la pré- cuisson des fibres avec les plantes à tanin et à aluminium.

Ces procédés donnent des résultats qui ne sont pas toujours fiables. Certaines couleurs sont très solides au lavage, à la lumière ou à la transpiration (ex : fil de soie sauvage teinté en rouge avec du Nato, *(Labourdonnaisia Madagascariensis*) tandis que pour d'autres, les procédés sont à perfectionner surtout si l'utilisation n'est plus funéraire mais pour l'ameublement et l'habillement.
Cette tradition est aussi marquée par :
- l'existence de plusieurs teinturiers traditionnels gardant jalousement leur savoir-faire.
- l'utilisation exclusive de la même plante pour obtenir une couleur donnée sans faire d'autres recherches.
- l'existence de quelques localités qui se sont spécialisées sur la teinture végétale comme dans les régions d'Ambositra et d'Ambalavao dans le centre-sud de Madagascar, de Besalampy et d'Ambongo dans le Nord et d'Arivonimamo et de Mahatsinjo dans le centre.

Malgré une très longue pratique traditionnelle de la teinture végétale, le niveau technique des artisans malagasy reste encore à améliorer, compte tenu aussi du fait qu'une bonne partie des connaissances sont en train de disparaître. Des actions de redécouverte des pratiques anciennes sont en cours. Si on s'oriente sur des techniques plus modernes une collaboration avec d'autres pratiquants étrangers s'avère nécessaire sinon indispensable.

En conclusion, nous tenons à préciser que Madagascar possède une énorme potentialité en matière de plantes tinctoriales. Mais de multiples dangers menacent cette richesse, donc il est nécessaire d'envisager des collaborations et des échanges de procédés techniques avec d'autres pratiquants et chercheurs d'autres pays. L'organisation d'ateliers, des conférences comme ce symposium permet ainsi aux artisans d'élargir leurs horizons, de développer et de perfectionner leur technique.

Mesdames et Messieurs merci de votre aimable attention.

In Madagascar an African Island in Indian Ocean, the dyeing with plants takes a large plage on Malagasy customs. Kings' and their families' portraits were shown draped with clothes of all colors, natural of course. The red shroud (lambamena) for wrapping the dead in exhumation ceremonies is one of those traditions.Madagascar is also characterised by some species of plants growing all along the year and the existence of endemic plants like "nato" (labourdonnaisia madagascariensis). Unfortunately many jeopardies are threatening this richness as forest fires and abusive cuts. Currently the Government and NGOs act to protect the environment.

SESSION / SÉANCE / SESIÓN 5
SCIENTIFIC AND TECHNICAL ADVANCES
PROGRÈS SCIENTIFIQUES ET TECHNIQUES DANS LE DOMAINE DES TEINTURES NATURELLES
PROGRESOS CIENTIFICOS Y TÉCNICOS EN EL CAMPO DE LOS TINTES NATURALES
08.11.2006

Chairperson / Président / Presidente:
Dr Harald Böhmer (Germany)

- Pr Philip John (United Kingdom), "Natural indigo: scientific basis of extraction and purity" / "Indigo naturel : base scientifique de l'extraction et critères de pureté" / "Índigo natural: aspectos científicos de la extracción y criterios de pureza"

- Dr (Ms) Padma Vankar and Ms Rakhi Shanker (India), "Use of enzymes in natural dyeing" / "Utilisation des enzymes dans la teinture naturelle" / "Utilización de enzimas en los tintes naturales"

- Dr K. Perumal (India), "Microbial pigments for textile dyeing" / "Pigments produits par cultures bactériennes pour la teinture des textiles" / "Pigmentos producidos por cultivos bacterianos para el teñido de textiles"

- Dr (Ms) Lamya Hasan Jowhar Hayat (Kuweit), " Extraction of red color water insoluble shikonin dyes from *Arnebia decumbens* (Boraginaceae)" / "Extraction des colorants rouges insolubles dérivés de la shikonine à partir d'*Arnebia decumbens* (Boraginaceae)" / "Extracción de colorantes rojos derivados de la shikonina, insolubles en agua, de *Arnebia decumbens* (Boraginaceae)"

- Dr (Ms) Sharada Devi (India), "Fastness from plants for natural dyes" / "Résistance des teintures extraites des plantes tinctoriales" / "Resistencia de los tintes extraídos de plantas tintoreras"

- Dr (Ms) Sarvenaz Ghanean (Iran), "Color gamut of natural dyes used for Persian woollen carpets" / "Gamme des couleurs naturelles utilisées pour la fabrication des tapis persans" / "Gama de tintes naturales utilizadas para la tintura de las alfombras de lana persas"

- Dr (Ms) Katarzyna Schmidt-Przewozna (Poland), "New ideas and technologies of natural dyeing applied in bast fibres" / "Nouvelles idées et technologies : teinture naturelle appliquée aux fibres" / "Nuevas ideas y tecnologías: tintes naturales aplicados a fibras"

- Ms Karen Urbanek (USA), "Natural colorants/new fibres: corn, bamboo, soy and milk proteins"/ "Colorants naturels/nouvelles fibres : maïs, bambou, soja et protéines de lait" / "Colorantes naturales / nuevas fibras: maíz, bambú, soja y proteínas de leche"

The fifth session is the only session in the Symposium that presented researches into new possible sources of natural dyes or into the development of techniques allowing bigger scale applications of natural colorants in textile arts, crafts and industries.

Even though the present symposium/workshop on natural dyes was not specifically aiming at gathering mostly scientific researchers, but the wider range of different categories of individuals and organisations concerned by natural dyes, it is surprising and somewhat worrying to realize that this session could accommodate nearly all the proposals of oral presentations concerning this

theme received in due time; this would seem to indicate that not enough research effort is focused on this field. However, this session offered very interesting prospects for new sources of natural colorants and significant improvements in application processes that could inspire participants to the symposium and lead to future developments. It also revealed the importance that is being given in India to this research field, with several presentations in this session representing scientific laboratories and institutions from the host country of this Symposium.

As an outcome of the symposium, a reflection could be pursued on the means to sensitize public and private research institutions in order to encourage and intensify research in this field.

La cinquième session était la seule session du symposium consacrée à la présentation de recherches portant sur de nouvelles sources de teintures naturelles ou visant à la mise au point de techniques permettant des applications plus importantes de ces colorants dans les arts, artisanats et industries textiles.

Même si ce symposium n'était pas spécifiquement destiné à rassembler des chercheurs scientifiques mais, plus largement, les différentes catégories d'acteurs de la filière des teintures naturelles, il est un peu préoccupant de constater que cette session rassemblait en fait la quasi-totalité des propositions de communications reçues dans les délais prévus, ce qui tendrait à dénoter un défaut de recherche dans ce domaine. Cette session ne présentait pas moins de perspectives intéressantes de nouvelles sources de colorants naturels et des perfectionnements importants dans les procédés d'application, qui pourraient inspirer les participants au symposium et déboucher à la suite de celui-ci sur des actions de valorisation. Elle révèle aussi l'importance accordée en Inde à cette branche de recherche, puisque plusieurs communications au sein de cette session émanent de laboratoires et institutions scientifiques du pays d'accueil du symposium.

A la suite du symposium, il conviendrait de réfléchir aux moyens de sensibiliser les institutions de recherche publiques et privées afin d'encourager et intensifier la recherche dans ce domaine.

La quinta sesión fue la única sesión del congreso consagrada a la presentación de las investigaciones basadas en nuevas fuentes de tintes naturales o dirigidos a la puesta al día de técnicas que permiten aplicaciones más importantes de estos colorantes en las artes, artesanía e industrias textiles.

Asimismo, aunque este simposio no estaba específicamente destinado a reunir investigadores científicos sino, más ampliamente, las diferentes categorías de actores de la filial de tintes naturales, es un poco preocupante constatar que esta sesión agrupa de hecho, la casi totalidad de las proposiciones de comunicaciones recibidas en el lapso previsto, lo que podría denotar un defecto de investigaciones en ese campo. Esta sesión no presentaba menos perspectivas interesantes para nuevas fuentes de colorantes naturales y de perfeccionamientos importantes en los procesos de aplicación, que podrían inspirar a los participantes al congreso y desembocar seguido a esto, en acciones de valorización. Ella revela también la importancia acordada en India a esta rama de la investigación, debido a que varias de las comunicaciones en el seno de esta sesión provienen de laboratorios e instituciones científicas del país anfitrión del congreso.

Seguido al simposio, sería conveniente reflexionar a cerca de los medios de sensibilizar a las instituciones de investigación públicas y privadas a fin de estimular e intensificar la investigación en este campo.

NATURAL INDIGO: SCIENTIFIC BASIS OF EXTRACTION AND PURITY

by Prof. Philip John[*] (United Kingdom)
Professor of Plant Biochemistry, School of Biological Sciences,
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The presentation concerns research carried out as part of the largest and most wide-ranging research project of recent years concerned with the scientific basis of the production of a natural dye. Spindigo (2001-04), the sustainable production of plant derived indigo (www.spindigo.net) was funded (€3.4 million) by the European Commission with the aim of providing underpinning research and technology to enable European farmers to grow and extract indigo at a cost and purity that would allow their product to satisfy the demand for natural indigo from textile companies and fashion designers.

The extraction process was developed principally for use with woad (*Isatis tinctoria*) leaves. A robust, farm-based, high-throughput system was tested on farms throughout Europe. Its operation included a short hot-water extraction of the indigo precursors, followed by a rapid cooling of the steep water, and alkaline hydrolysis to form indigo. A patented resin-based system was also developed in which the precursors were trapped on resins, with indigo formation in situ. This latter system was limited by speed and issues of sustainability, but has potential for further development.

A strategy for obtaining a purer product was adopted which involved a better understanding of the nature of the impurities normally found in natural indigo, and how they interacted with the indigo. This allowed us to devise means of avoiding the inclusion of impurities in the product. Our strategy was to make a clean product, rather than clean up a dirty product. Our research led us to develop a model of indigo-impurity interaction, from which it became clear that it was important to avoid soil contamination of the leaves, and to maximize yield of indigo during extraction. When these were accomplished, then the goal of 90% purity could be achieved.

The natural indigo produced during the project was successfully used by fashion houses in the production of new lines of clothes of different kinds: woolen dresses, nettle fibre blend jackets and waistcoats, cashmere blend knitwear. These are all natural fibres, for which our indigo was a natural partner. Tests for light fastness and rubbing resistance (DIN standards) all showed that the natural indigo performed as well as the synthetic product. The extraction process was included in our 70-page Environmental Impact Assessment of the whole production process. The agronomic and extraction methods we developed were incorporated into brochures and pamphlets (Agronomic Blueprints) written in the languages of the countries concerned for farmers to put into practice.

References

Angelini, L.G., John, P., Tozzi, S. and Vandenburg, H. (2005) Extraction of indigo from *Isatis tinctoria* L. and *Polygonum tinctorium* Ait. as a basis for large-scale production. In: Proc. Conference on Industrial Crops and Rural development . Ed by MJ Pacual-Villalobos et al pp 521-533.

Garcia-Macias, P and John, P (2004) The Formation of Natural Indigo derived from Woad (*Isatis tinctoria* L.) in Relation to Product Purity. J Agric Fd Chem 52, 7891-7896.

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PUBLICATIONS: John, P. (1992) Biosynthesis of the Major Crop Products. John Wiley & Sons Ltd, Chichester. 176 pp. Scientific papers in the fields of bioenergetics and plant science: over 120.

ULTRASONIC NATURAL DYEING OF COTTON FABRICS WITH ENZYMIC PRETREATMENTS

by Dr (Ms) Padma S Vankar[*] and Ms Rakhi Shanker (India)
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Abstract: Two step ultrasonic dyeing of cotton fabric with natural dyes such as *Terminalia arjuna, Punica granatum, Rheum emodi, Tectona grandis* and *Acacia catechu* have been developed in which an appropriate enzyme is complexed with tannic acid and used as pretreatment. This was found to be comparable with one step dyeing. The effectiveness of three enzymes—Protease-amylase, diasterase and lipase were determined. For all the five natural dyes, the dye uptake as well as the CIELab values showed improvement by enzymatic treatment. The tannic acid-enzyme-dye combination method offers an environmentally benign alternative to the metal mordanted natural dyeing. Scanning electron microscopy show surface characteristics at different stages of dyeing. The effect of sonication on the dyeing is compared with conventional heating.

Keywords: Natural dyeing, tannic acid, enzymes, *Punica granatum, Rheum emodi Terminalia arjuna*, *Tectona grandis* and *Acacia catechu*

1. Introduction: Natural dyeing of cotton fabric has always posed challenge. Several metallic salts, and bio- mordants have been used by researchers. Tannins were utilized as mordants to increase the uptake of cationic dyes onto cotton wherein cotton was firstly treated with tannin extract and then with a metal salt solution prior to dyeing, so as to impart adequate wash and light fastness to the dyed fabrics, of the various metals used Fe, Al, Cu, Pb, Sn are few of them which are used very frequently. Further development of this approach led to dyed cotton to improve the fastness of the dyeing but posed serious ecological constraints. We had used enzymes for dyeing cotton with two natural dyes namely-tectona and catechu [1,2] and found very encouraging results. Enzymes have enjoyed considerable use in the textile industry for many years in the textile industry[3-7]; for example, amylases are used in desizing, cellulases are employed in denim finishing and the bio-polishing of cellulosic fibres, proteases are used in leather, silk and wool processing and pectinases –amylase, lipase and diasterase are used in the bio-preparation of cotton fabrics. Furthermore, since no reference could be found pertaining to the use of an enzyme in conjunction with tannic acid for the improvement of the fastness of these two natural dyes on cotton fabrics. We tried to use the above mentioned strategy in two ways--simultaneous use of dye, tannic acid and enzyme treatment as well as by step wise treatment of fabric by tannic acid-enzyme complex and then dyeing, marked improvement of dye uptake and the wash fastness of each of the dyes in terms of change in shade was observed.

2. Experimental Materials:
The cotton fabric used was mill scoured and bleached cotton fabric of 160 g/m^2 was further treated with a solution containing 5 g/l of sodium carbonate per 160 g of the fabric and 3 g/l of non-ionic detergent (Labolene) per 160g of the fabric, under the boiling condition for 4 h, after which time it was thoroughly rinsed and air dried at room temperature.

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Dyes used are-- *Terminalia arjuna* , *Punica granatum* and *Rheum emodi, Tectona grandis* and *Acacia catechu*(CAS numbers are not known)
Enzymes used are-- Protease-amylase, diasterase and lipase. All other chemicals used were laboratory grade reagents.

Dyeing
Dyeing was carried out in two ways:
i) One step: The dye, tannic acid and the enzymes (in the ratio of 20 gm natural dye , 10 gm of tannic acid and 10 gm enzymes per liter for 100gms of the fabric) were all taken in one bath and the moist fabric was dipped for 3 hours at temperature 30-40^{0}C. The dyed fabrics were dipped in 500ml of dye-fix solution (2gm/l) for 1 hour and then it was rinsed thoroughly in tap water and allowed to dry in open air.
ii) Two steps: The tannic acid and the enzymes (in the ratio of 10 gm tannic acid and 10 gm enzymes in 1l) were first treated onto taken in one bath and the moist fabric (100 gm)was dipped for 3 hours at temperature 30-40^{0}C. Dyeing was then carried out of this fabric with 20 gm /l dye solution. The dyed fabrics were dipped in 500 ml of dye-fix solution (2 gm/l) for 1 hour and then it was rinsed thoroughly in tap water and allowed to dry in open air.

Enzyme treatment
Reactivity for the enzymes used are given in Table-1. All the three natural dyes to specific enzyme reactivity were assessed by both the processes (one step and two steps) in order to check the best suitability. Treatment conditions for the enzymes used are given in Table-2. After treatment all samples were rinsed and squeezed.

Table-1 Reactivity of Natural Dyes with different Enzymes in one step process by sonication

Dyeing by sonication	Tannic Acid +Lipase	Tannic Acid +Diasterase	Tannic Acid +Protease & Amylase
Rheum emodi	41.24%	13.92%	27.38%
Terminalia arjuna	----------	----------	24.42%
Punica granatum	----------	47.30%	---------
Tectona grandis	----------	56.40%	----------
Acacia catechu	----------	----------	30.05%

Table-2 Reactivity of Natural Dyes with different Enzymes in two steps process by sonication

Dyeing by sonication	Tannic Acid +Lipase	Tannic Acid +Diasterase	Tannic Acid +Protease & Amylase
Rheum emodi	45.63 %	24.55 %	30.45 %
Terminalia arjuna	54.45 %	30.60 %	8.59%
Punica granatum	45.23 %	53.59 %	57.16 %
Tectona grandis	35.88%	57.09%	36.99%
Acacia catechu	25.80%	34.70%	40.70%

Effect of ultrasound
Generally, the sonochemical activity arises mainly from acoustic cavitation in liquid media. The acoustic cavitation occurring near a solid surface will generate microjets the microjet effect facilitate the liquid to move with a higher velocity resulting in increased diffusion of solute inside the pores of the fabric. In the case of sonication, localized temperature raise and swelling effects due to ultrasound may also improve the diffusion.
The stable cavitation bubbles oscillate which is responsible for the enhanced molecular motion and stirring effect of ultrasound. In case of cotton dyeing, the effects produced due to stable cavitation may be realized at the interface of leather and dye solution. Dye uptake was studied during the course of the dyeing process for a total dyeing time of 3 h with and without ultrasound. About 57%, 53% and 45% exhaustion of dyes (punica, terminalia and rheum respectively) can be achieved in 3 h dyeing time using ultrasound while compared to only 40 %, 25% and 27% in absence of ultrasound in stationary condition for natural dyes respectively as shown in table 4 and 5.

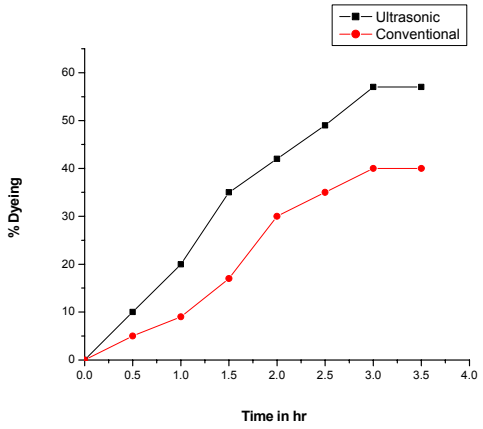


Figure- I Ultrasonic dyeing with Punica

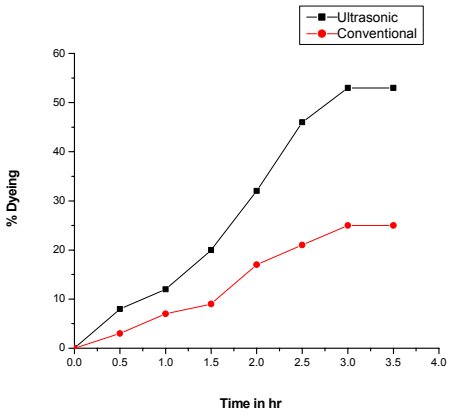


Figure-II Ultrasonic dyeing with Terminalia

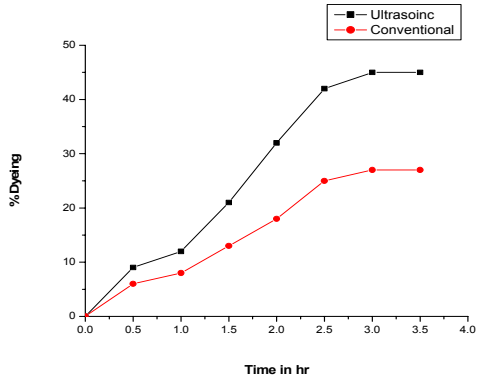


Figure- III Ultrasonic dyeing with Rheum

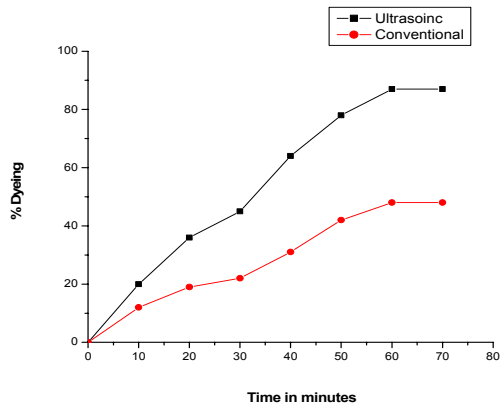


Figure-IV Ultrasonic dyeing with Catechu

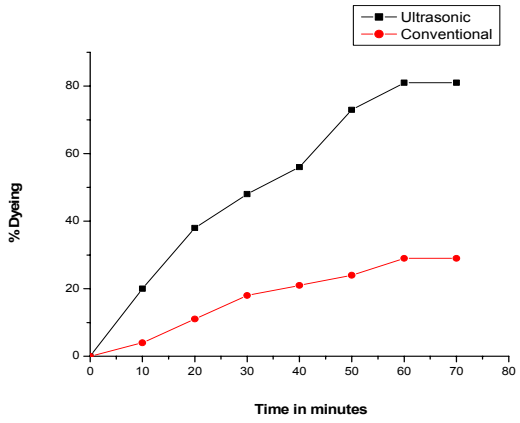
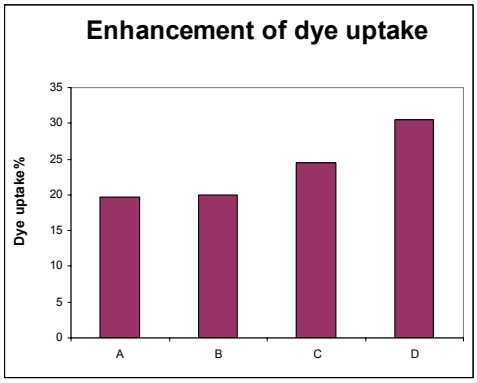


Figure-V Ultrasonic dyeing with Tectona

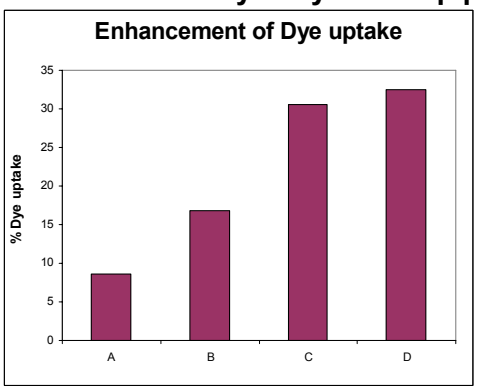
It was observed that for *Punica granatum* with diaterase, *Rheum emodi* with lipase and *Terminalia arjuna* with protease and amylase enzymes, *Tectona grandis* with diasterase and *Acacia catechu* with protease& amylase give best colorimetric data on dyeing by one step methodology. However, the best colorimetric data on dyeing by two steps methodology for *Punica granatum* was with lipase, *Rheum emodi* with protease and amylase and *Terminalia arjuna* with lipase, *Tectona grandis* with diasterase and *Acacia catechu* with protease& amylase enzymes. This shows that enzyme to dye reactivity is altered when the order of addition is changed in the dyeing process as shown in bar-diagram-I-III.

Bar –diagram showing choice of enzyme towards different natural dyes by two step process



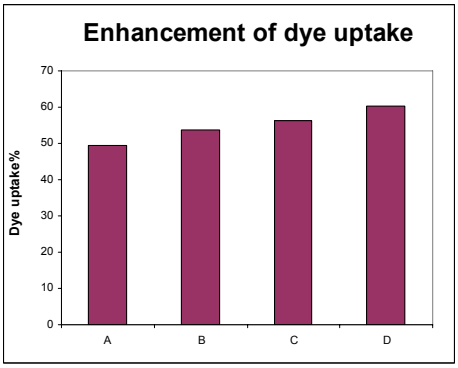
Bar-diagram I for Rheum emodi

A------RE + Tannic + Lipase
B------RE + Tannic Acid
C------RE + Tannic + Diasterase
D------RE + Tannic + Protease &Amylase



Bar-diagram II for Terminalia arjuna

A------TA + Tannic + Protease &Amylase
B------TA + Tannic Acid
C------TA + Tannic + Diasterase
D------TA + Tannic + Lipase



Bar-diagram III for Punica granatum

A------PG + Tannic Acid
B------PG + Tannic + Diasterase
C------PG + Tannic + Protease &Amylase
D------PG + Tannic + Lipase

Table 3- Shows CIE lab values of catechu and tectona dyed fabric pretreated with enzyme

Dye	Enzyme	L*	a*	b*	Wash fast IS-687-79	Light fast IS-2454-85
Catechu	Pro-Amyl	50.033	10.403	30.504	4-5	4-5
Catechu	Diasterase	53.061	6.562	20.500	4-5	4-5
Catechu	Lipase	51.330	7.345	25.367	4-5	4-5
Tectona	Diasterase	60.234	10.002	25.303	4-5	4-5
Teactona	Pro-Amyl	61.221	9.005	22.453	4-5	4-5
Tectona	Lipase	62.439	8.222	21.566	4-5	4-5

Table- 4 Effect of different enzymes on the colorimetric data obtained for tannic acid/enzyme/ Punica granatum dye by one step method for cotton

Dye-Enzyme-TA	L*	a*	b*	Wash fast IS-687-79	Light fast IS-2454-85
Control	58.066	6.510	32.319	4	4
PG-Pro-Amy-TA	56.956	5.745	29.984	4-5	4-5
PG-Dias-TA	58.089	6.072	32.259	5	5
PG-Lipa-TA	57.604	6.349	31.330	4-5	4-5

Table-5 Effect of different enzymes on the colorimetric data obtained for tannic acid/enzyme/ *Rheum emodi* dye by one step method for cotton

Dye-Enzyme-TA	L*	a*	b*	Wash fast IS-687-79	Light fast IS-2454-85
Control	51.510	11.940	28.486	4	4
RE-Pro-Amy-TA	51.606	12.468	28.594	4-5	4-5
RE-Dias-TA	52.164	12.866	29.971	4-5	4-5
RE-Lipa-TA	52.867	14.196	31.641	5	5

Table- 6 Effect of different enzymes on the colorimetric data obtained for tannic acid/enzyme/ *Terminalia arjuna* dye by one step method for cotton

Dye-Enzyme-TA	L*	a*	b*	Wash fast IS-687-79	Light fast IS-2454-85
Control	40.126	18.907	18.177	4	4
Term-Pro-Amy-TA	40. 165	19.422	17.865	4-5	4-5
Term-Dias-TA	40.033	17.482	17.945	4-5	4-5
Term-Lipa-TA	40.003	19.329	18.261	4-5	4-5

4. Conclusion

All the three enzymes when used in conjunction with tannic acid were found to enhance the dyeability of five different natural dyes. Enhancement of dye uptake in the case of Punica, Rheum and Terminalia by ultrasonication is about 17 %, 18 % and 28 % respectively. It was observed that for *Punica granatum* with Lipase, *Rheum emodi* with protease and amylase and *Terminalia arjuna* with Lipase enzymes give best colorimetric data on dyeing *Tectona grandis* with diasterase and *Acacia catechu* with protease& amylase give best colorimetric data on dyeing by one step methodology. However, the best colorimetric data on dyeing by two steps methodology for *Punica granatum* was with lipase, *Rheum emodi* with protease and amylase and *Terminalia arjuna* with lipase, *Tectona grandis* with diasterase and *Acacia catechu* with protease& amylase enzymes. Even the fastness properties in all the cases show good results. The one step tannic acid-enzyme-dye developed for the ease of industrial application offers an ecofriendly process which should be popularized as an alternate method to the tannic acid-metal mordant-dye method. This is a definite step towards cleaner production in the area of natural dyeing where effluent management requires special attention.

Acknowledgement

The authors express their sincere thanks to Khadi and Village Industries Commission (KVIC) for financial support.

References:

1. Shanker, R., Tiwari, A., and Vankar, P.S., (2005) M.Sc, Biochemistry dissertation (unpublished results).
2. Shanker, R. and Vankar, P.S.,(2005) Dyes and Pigments, submitted.
3. Tsatsaroni,E., Liakopoulou-Kyriakides,M., Dyes and Pigments (1995), 29(3), 203-209.
4. Liakopoulou-Kyriakides, M., Tsatsaroni, E., Laderos, P., and Georgiadou Dyes and Pigments (1998), 36(3), 215-221.
5. Burkinshaw, S.M. and Bahojb-Allafan, B.,(2003) Dyes and Pigments, Vol-58, 205-218.
6. Burkinshaw, S.M. and Bahojb-Allafan, B., (2003) Dyes and Pigments, Vol-59, 71-97.
7. Burkinshaw, S.M. and Bahojb-Allafan, B., (2004) Dyes and Pigments, Vol-60, 91-102.
8. Kubelka P (1948), New Contributions to the Optics of Intensely Light-Scattering Materials. Part I, JOSA, 38 (5), 448–451.
9. Kubelka P (1954), New Contributions to the Optics of Intensely Light-Scattering Materials Part II: Nonhomogeneous Layers, JOSA, 44 (4), 330-335.
10. Indian Standards Institution (BIS), Handbook of Textile Testing,(1982), Manak Bhawan, New Delhi, 539, 550, 553, 569.

MICROBIAL PIGMENTS FOR TEXTILE DYEING

by Ms Perumal. K., E. Sumathi and Ms S. Chandrasekarenthiran (India)
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Abstract

The dyestuff industry is suffering from the increases in costs of feedstock and energy for dye synthesis, and they are under increasing pressure to minimize the damage to the environment. The industries are continuously looking for cheaper, more environmentally friendly routes to existing dyes. The cost efficiency, extensive labour, extensive land requirement and use of expensive solvent for extraction of pigments/ colour/dyes from higher plants are being heavily criticized. In this way the pigments from microbial sources are a good alternative because of the reason that the microbial system can grow and produce colour within a short period of time (maximum of 15 days) and in a limited space requirement. For industrial usage this will be highly advantage when compared to higher plants. The recent authorization of a fungal food colorant has fuelled research to explore the extraordinary chemical diversity and biodiversity of microbes for the biotechnological production of pigments as natural colorants. In the present paper it has been made possible to create fungal pigments as natural colorants for the application in textile dyeing. The present study focused on isolation, identification of pigment producing bacteria, basidiomycetes fungi and extraction of pigment for dyeing. The study on microbial pigment production and their application in textile dying is at bench scale level at MCRC. The growth, pigment production, optimization and characterization of 3 colors (red, yellow and pale green) from 3 different bacteria such as *Serratia marcescens, Pseudomonas fluorescens* and *Erwinia amylovora* have been standardized on cost effective natural medium. Among the 3 pigmented bacteria *Serratia marcescens* was studied extensively and developed a cost effective natural solid medium containing coconut endosperm. The pigmented bacterium was harvested within 48 hrs and the methanolic extracts yielded red pigment (55% bacterial dry eight basis). The production and extraction of pigment from *Serratia marcescens* was evaluated for its cost benefit analysis. The pigment was produced form bacteria and extracted with an investment of Rs. 11.70 / litter of bacterial cultures. The interaction of the bacterial pigment on silk and cotton fabrics were stronger and did not fade even after exposing to sunlight drying and repeated washing whereas the paper pulp added with bacterial pigment comparatively lost its color fastness during drying and exposure to sun light. The fungal pigment (*Ganoderma lucidum* wild collection) and the pigment extracted from the dry barks of *Accasia melanoxylan* applied on the paper pulp resulted in deep colour shades. The colour shades in paper sheets were not altered when exposed to sunlight drying.

Twenty two mushrooms were collected, identified and extracted for pigment production, of which 14 mushrooms were collected from Kodaikanal forest and 8 from MCRC campus, Tharamani, Chennai. The fungal basidiocarp used for pigment extraction yielded different shades of yellow (*Boletus edulis,*), orange (*Armillaria tabescens)* and brown (*Armillaria tabescens*) color.

Dyeing of cotton yarn with fungal extracts

The methanolic and acetone extracts of yellow and brown pigment from the two fungi (*Boletus edulis* and *Armillaria tabescens)* were pooled together and used to dye 3g of cotton yarns by dipping in 10ml of pigment extract followed by solar drying and heating at 60^0 C for 2 hrs in a hot air oven and the process was repeated three times for a good shade of yellow. The effect of various mordant on fungal pigment was studied by incorporating 5 ml of different mordants like Alum, Ferrous Sulphate, Copper Sulphate, Chromate, Tin and *Terminalia chebula* (Myrabolan) separately to the cotton yarn (250g each) and soaked for 15 min. After the completion of soaking, cotton yarns were completely drained from the mordant. The pre-mordanted yarns were soaked in fungal pigment solution for 30 min. The individual cotton yarns were then dried in sun light for 2 hrs. The sun-dried yarns were further evaluated for its color, light and wash fastness. Washing with tap water tested wash fastness and heat resistance of the dyed yarn was checked at various temperatures such as 35^0C, 45^0C and 65^0C for 30 min in the oven. The change of color was compared with standard color charts.

Conclusion

The pigment extracts tested for dyeing in cotton yarn showed their fastness, suitability for dyeing and paves an innovative cost effective method for the use of microbial pigments for dyeing cotton and silk fabrics.

EXTRACTION OF RED COLOR WATER INSOLUBLE SHIKONIN DYES FROM *ARNEBIA DECUMBENS (BORAGINACEAE)*

by Dr (Ms) Lamya Hasan Jowhar Hayat[*] (Kuweit)
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Kuwait University, Dept of Biol. Sc.

Abstract
The air dried roots of *Arnebia decumbens (Boraginaceae)* were powdered and extracted using continuous soxhlet with different solvents to obtain maximum yield

Solvent Selection

Solvent	***Percentage leached***
Ethanol	95.22
Acetone	54.08
Methanol	51.06
Chloroform	47.64
Toluene	40.56
Ethyl acetate	39.74
n- hexane	33.78
Petroleum ether	26.82

The table above shows that the color extracted is water insoluble. he color is maximally obtained by ethanol.

The content of the crude material were specified by acid washed silica gel chromatography.Four different dyes have been identified: Shikonin; deoxyshikonin acetylshikonin and isovaleryl shikonin.

The red crude extract color could be changed to **brownish – red** by adding methanol; **bluish purple** by adding ferric chloride or **dark blue** solution upon addition of alkaline solution.

The ethanol extract was used to color cotton and wool threads used for weaving rugs in Al- Sado society of Kuwait.
The color is fixed; it did not fade away washing with detergents or exposing it to the sun for a long period of time. This is because of the hydrophobic nature of the dye.

The anti microbial activity of the 4 compounds of the crude extract of *Arnebia decumbens* were tested against 5 microorganisms. The test resulted in positive effects on Bacillus subtilis ; Sarcina lutea ; Eacherichia coli ; Saccharomyces pastorianus and Candida albicans

The crude extract of *Arnebia decumbens* not only works as a coloring material but also protect the woolen rugs against moth destruction functions.

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FASTNESS FROM PLANTS FOR NATURAL DYES

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Abstract

Dyes from natural sources in India have an ancient history interwoven with its culture. It is interesting to note that India is one of the few civilizations to perfect the art of fixing natural dyes to the cloth. Eventhough suffered with a set back for over one and half centuries, natural dyes have a revival due to increasing interest manifested in protecting the environment from the toxic effluents resulting from the unbridled use of synthetic dyes.

The available literature on natural dyes lacks source wise fastness data from plants. Natural dyes from plant sources generally contain coloring pigments such as flavons, flavanoids, anthocyanins, anthraquinons, carotenoids, indigoids, etc. While flowers and leaves contain less amount of pigment, barks contain rich source of colored pigments. All pigments present in plants do not produce fast shades on textiles. Potential dye sources from various parts of plants and trees such as flowers, barks, leaves, seeds etc., for textiles were experimented for their fastness on natural textiles such as cotton, silk and wool with a view to develop source wise fastness data.

The flower sources generally contain flavons, anthocyanins and few carotenoids. These dyes produced a range of yellow to greenish yellow, mustards, khaki shades, pista greens, greenish brown to dark brown, pinks to reds, russets to deep maroons on cotton, silk and wool. The shades were brighter and deeper on protein fibres than on cotton due to better receiptability of protein fibres. The fastness grades to washing, sunlight, rubbing and perspiration for majority of samples of cotton and silk ranged from good to excellent with the use of mordant combinations as fixing agents rather than using single mordants. However, wool samples showed fair to good fastness.

The colored pigments from bark sources are primarily tannins in concentrated form. Majority of the barks yielded light to dark browns, greenish and grayish brown colours. Good to excellent fastness was observed in majority of the samples from cotton, silk and wool for all conditions of use. However, staining on cotton fabric was observed for washing and alkaline perspiration in majority of the samples.

Leaves also contain color pigments suitable for coloring textiles in less quantity. Shades such as buff, dark almond, olive greens, yellowish greens, greenish greys, light rust and browns, henna green etc. were produced on cotton, silk and wool. Slightly darker shades were obtained on wool. The shades were found to be fast in majority of cotton and samples. These dyes showed fair to good fastness on wool.

Other sources such as annatto seeds provided very bright yellow to orange shades on all textiles. Dyes from roots produced yellows, yellowish greens, light to dark browns and dyes from gums produced dark maroon shades. Good fastness was observed in light shades. In case of dark shades staining was observed in washing, wet rubbing and perspiration.

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Electronic cataloguing of the shades ‘Natcolourtex’ was developed with user friendly software.

COLOUR GAMUT OF NATURAL DYES USED FOR PERSIAN WOOLLEN CARPET

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Abstract

Among the variety of handicrafts which have been produced from countless materials in infinite shape, design and application, the Persian carpet is matchless due to its unique design, fantastic pattern and the vivid color harmony as well as its economic importance.

Considering the importance of the extent of color gamut of different dyestuffs, color gamut of different natural dyes on wool that is in fact related to color gamut of Persian carpet has not been scientifically considered.

It can also be compared with the color gamut of synthetic dyes which are unfortunately replacing the natural ones. It is anticipated that the color gamut of natural dyes is much smaller than the synthetic ones but this has never been scientifically reported.

In this project, color gamut of different natural dyes on wool, under different dying conditions, and by using different colorimetric methods, is precisely considered.
Also many different statistical tools such as Principal Component Analysis have been used in order to determine and compare the basis functions and color gamut of natural dyes with Munsell color chips as a typical surface color and a pallet of woolen yarns dyed by a mixture of recommended synthetic dyestuffs.

Principal Component Analysis, abbreviated (PCA), has been an important and useful mathematical tool in color technology for over 50 years. It is readily accessible through statistics software such Systat and SAS and high-level programming languages such as Matlab (Mathematical Laboratory).

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Area interested: Chemical structure of natural dyes – Improvement of traditional dyeing methods using natural dyes – Using various mordants for obtaining different shades as well as achieving best color fastness – Comparing natural dyes used for Persian woolen carpet to synthetic dyes, with respect to factors fastness, reproducibility, color appearance and economical values – Implementation of color physics on Persian woolen carpet – Comparing the basis functions and color gamut of natural dyes with synthetic dyes and Munsell color chips.

NEW IDEAS AND TECHNOLOGIES OF NATURAL DYEING APPLIED IN BAST FIBRES

by Dr (Ms) Katarzyna Schmidt-Przewozna[*] (Poland)
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Abstract

The paper presents the analysis of differences of colour obtained on linen samples with and without CORONA treatment dyed with natural dyestuffs.

We compared the colour differences obtained on samples dyed with: Annatto Bixa orellana L., Tumeric Curcuma Longa L., Weld Reseda luteola L.,
Cochineal Dactylopius coccus Costa, Cutch Acacia catechu Willd,, Madder Rubia tinctorium L., Woad Isatis tinctoria L.
The samples after the process of natural dyeing showed a wide colour range with a big palette of shades. The technology CORONA treatment applied during cellulosic fabrics finishing process give better conditions for natural dyeing, as a result of improvement of hydrophilic properties.

Keywords: CORONA, natural dyestuffs, mordants, linen, green products

INTRODUCTION:

The Institute of Natural Fibres has participated in a EU research project CORTEX, which was coordinated at the University of Minho in Portugal. One of the Institute's task was to investigate efficiency of CORONA treatment applied to linen fabrics and its effect on results of dyeing the fabrics with natural dyes. A CORONA discharge is produced between two electrodes, with a high voltage and frequency of 20-40 kHz.

A *Life Cycle perspective* is absolutely necessary for product development as optimisation has to be achieved from an economical and quality standpoint. Main focus of Eco product lies in finishing. However, such processes may not be considered without relation to the materials, yarn manufacturing, knitting and weaving. In our research we are interested in comparing of eco-friendly technology in natural dyeing and creation of modern, ecological textile products.

After preliminary recognition of plants likely to show dyeing properties we began applying those dyes on natural fabrics: linen, hemp, silk, wool.

Where were the sources of dyestuff found? During the whole period of the research hundreds of dyeing experiments have been done in order to find dyeing plants giving the widest range of colours, brightness of colours and also economical in use. Due to difficulties in obtaining several dyestuff and dyeing garden was set up at the Institute in 2003. For experiments wild growing or imported plants were also used.

One of the main objectives of our program is creation of colour card for natural fibres, introduction of cultivated plants for dyeing and promotion of our results in modern technology of dyeing. Within the cooperation with the University of Minho in Portugal about 120 dyeing experiments have been done on linen fabrics to compare results of dyeing with and without CORONA treatment.

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MATERIAL AND METHODS:

For dyeing two different kinds of 100% linen fabrics have been used.

Fabrics 23122 - fabrics A

Condition of CORONA treatment

- Number of passages 3+3
- Power 1,51kW
- Velocity 2,44 m/min

Fabrics 42002 - fabrics B

- Number of passages 6+6
- Power 1,51kW
- Velocity 2,44 m/min.

Dyeing conditions of linen fabrics:

- temp. 95˚C
- gradient 1˚C/ 1 min.
- Time of dyeing 30 min.
- changes of temp to 50˚C
- gradient 2˚C/1 min. gradient 2˚C/1 min.

In our treatments were used:

- mass of linen sample - 7g sample
- 150 ml dye bath
- natural dyestuffs

Equipment: laboratory dyeing machine: IBELIUS I L- 720

For comparing results of dyeing with and without CORONA 120 trials have been made. Six plant dyes and one insect dye have been used. For dyeing process water extracts of dyes have been applied.

1.COCHINEAL *Dactylopius coccus* COSTA

Cochineal is a traditional red dye of pre-Hispanic Mexico. This precious dyestuff was obtained from an insect that lives on Opuntia *plant.. They required fast colours, i.e., those that would not fade derived from native cochineal for various shades of red, crimson, lilac, pink and violet.* ***Cochineal*** *is also the name of the crimson or carmine colour dye. The coloring comes from carminic acid.*

Photo 1. Opuntia plant with Cochineal

TABLE 1. Cochineal dyeing results on linen samples A with Corona treatment (samples 1-6), without CORONA (7-12)

Natural dyestuff	mordant	colour	result
Sample1-CORONA	No mordant	Light peach	bad
Sample2- CORONA	0,2% alum	violet	Good, special effect
Sample3- CORONA	0,2% copper sulphate	lilac	good
Sample4- CORONA	0,1 % citric acid	peach	good
Sample5- CORONA	0,1 % alum	Pink lilac	good, special effect
Sample6- CORONA	0,2% alum	Rose pink	Good, special effect
Sample7	No mordant	lilac	bad
Sample8	0,2% alum	bright violet	good
Sample9	0,2%copper sulphate	lilac	good
Sample10	0,1 % citric acid	light peach	good
Sample11	0,1 % alum	pink	good
Sample12	0,2% alum	Rose pink	good

Conclusions:

- The cochineal dyed samples shown good results of colour.
- Different mordants give differences in colours.
- In treatments with mordants as: alum, copper sulphate, citric acid, those colours were obtained: lilac, dark lilac, violet, pink, rose, dark rose, peach.
- Without mordants it is not possible to obtain good colour with use of Cochineal.
- In Corona treatment on Sample 2,5 and 6 we observed a special design effect resembling melange.

2. MADDER *Rubia tinctorium* L.

Madder Rubia tinctorium *L., is one of the most ancient dyes. It was known 3.000 B.C. as a sourses of red colour. The roots of this plant contain alizarine, purpurin, rubian, rubiadin, ruberythric acid. Madder was cultivated in Europe, Middle East, Turkey . The Turkey-red and other shades are adjective dyes, different mordants bringing many shades of red, pink, lilac, purple, brown, orange and black.*
(1. pp.124)
Photo 2. Madder roots, INF plantation

Table 2. Madder dyeing results on linen samples A with Corona treatment – (samples 1-6), without (7-12)

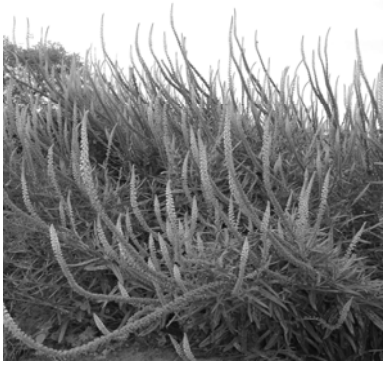
Natural dyestuff	mordant	colour	result
Sample1-CORONA	No mordant	orange	good
Sample2- CORONA	No mordant	orange	good
Sample3- CORONA	0,2% alum	orange	good
Sample4- CORONA	0,2 % soda	orange	good
Sample5- CORONA	0,05% citric acid	light orange	good
Sample6- CORONA	0,1%alum+0,1%soda	yellow rose	good
Sample7	No mordant	rose	good
Sample8	Special pretreatments	red	good

Sample9	0,2% alum	rose	good
Sample10	0,2 % soda	rose	good
Sample11	0,05% citric acid	Light orange	bad– unevenly dyed
Sample12	0,1%alum+0,1%soda	red	bad – unevenly dyed

RESULTS:

- Sampled with Corona treatments are more yellow
- Samples dyed without Corona treatments are redder
- Corona gives better results in evenly dyeing of the samples

3. WELD *Reseda luteola* L.



Reseda luteola L. is one of the oldest yellow plant and produces some of the most yellow light and wash fast yellow shades. Weld is typical mordant dyes. The plant contain luteolin and apigenin. Weld produced colours: yellow, intensive yellow old gold, olive green, gold. (1.pp119)

Photo 3. Weld – INF experimental plantation.

Table 3. Weld dyeing results on linen samples A and B with CORONA treatment – (samples A 1-3), (samples B 4-6) and without CORONA (samples A 7-9). samples B 7-12)

Natural dyestuff	**mordant**	**colour**	**result**
Sample1 CORONA	No mordant	Light yellow	good
Sample2 CORONA	0,2% alum	Light yellow	bad
Sample3 CORONA	0,2% copper sulphate	Yellow olive	good
Sample4 CORONA	No mordant	yellow	good
Sample5 CORONA	Alum + soda	yellow	good
Sample6 CORONA	0,2% soda	yellow	good
Sample7	No mordant	Light yellow	bad
Sample8	0,2% alum	Light yellow	bad
Sample9	0,2%copper sulphate	Yellow olive	good
Sample10	No mordant	yellow	bad
Sample11	Alum + soda	Light yellow	good
Sample12-Fabric B	0,2% soda	yellow	bad

RESULTS:

- Copper sulphate mordants in Weld dyeing gives the best yellow result.
- Good results were obtained also with a combination of alum and soda and without mordants, but colour is not very strong
- The surface of samples with Corona treatments were evenly dyed.

4. TUMERIC – *Curcuma longa* L.

Tumeric is the source of very strong and bright yellow. The main producer of this plant was India, but it was also cultivated in China, South East Asia and tropical countries.
The dye is extracted from the fresh or dried rhizomes of the plant. Curcuma longa contain curcumin natural pigment. It is substantive dyes with good wash fastness and poor light fastness. Tumeric produced dye colour: bright yellow, yellow, old gold, green, gold, ochre.(1. pp.111)

Photo 4. Tumeric

Table 4. Tumeric dyeing results on linen samples A and B with CORONA treatment – (samples 1-3), without CORONA (4-6)

Natural dyestuff	**mordant**	**colour**	**result**
Sample1-Fabric A	No mordant	gold yellow	good
Sample2-Fabric A	0,2% citric acid	yellow	good
Sample3-Fabric B	0,2 ferrous sulphate	dull yellow	good
Sample4- Fabric A	No mordant	light sun yellow	good
Sample5- Fabric A	0,2% citric acid	gold yellow	good
Sample6- Fabric B	0,2 ferrous sulphate	sun yellow	Bad – uneven colour

RESULTS:

- Sampled with Corona treatments are more bright and saturated
- Samples dyed without Corona treatments are yellow.
- Corona gives better results in evenly dyeing of the samples 3 (with ferrow mordant)

5. CUTH *Acacia catechu*

Catechu is purified extract of wood Accacia catechu. The plant of Accacia catechu is about 15 meter high. This mainly composed of Catechu-tannic acid with catechin, catechu red and quercetin. Natural Dye: different shades of brown

Photo 5. CUTH *Acacia catechu* plant.

Table 5. Cuth dyeing results – *Acacia catechu* with Corona treatnment – (samples 1-6), without (7-12)

Natural dyestuff	mordant	colour	result
Sample1-Fabric A	No mordant	Light brown	good
Sample2-Fabric A	0,2 ferrous sulphate	Dark brown	good
Sample3-Fabric A	0,2% citric acid	tabac	good
Sample4-Fabric B	no mordant (1/4dye)	brown	good
Sample5-Fabric B	0,2% ferrous (1/4)	Dark brown	good
Sample6-Fabric B	0,2% citric acid(1/4)	Light brown	good
Sample7-Fabric A	No mordant	Light brown	good
Sample8-Fabric A	0,2 ferrous sulphate	Dark brown	good
Sample9-Fabric A	0,2% citric acid	tabac	good
Sample10-Fabric B	no mordant (1/4dye)	brown	good
Sample11-Fabric B	0,2% ferrous (1/4)	Dark brown	good
Sample12-Fabric B	0,2% citric acid(1/4)	Light brown	good

RESULTS:

- After dyeing with cutch a wide range of brown colours was obtained.
- Homogenous dyeing.
- In Corona treatment on Sample 1-6 we observed a special design effect resembling melange.

6. ANNATO *Bixa orellana*

Annato Bixa orellana L., is a small tree belonging to family Bixaceae originated in tropical countries. These seeds are processed to obtain the orange-yellow pigments, bixin and norbixin.
Colours: orange, light orange, peach.(1. pp.98)

Photo 6. ANNATO *Bixa orellana* tree.

Table 6 Annato dyeing results with CORONA treatment – (samples 1-6), without CORONA (7-12)

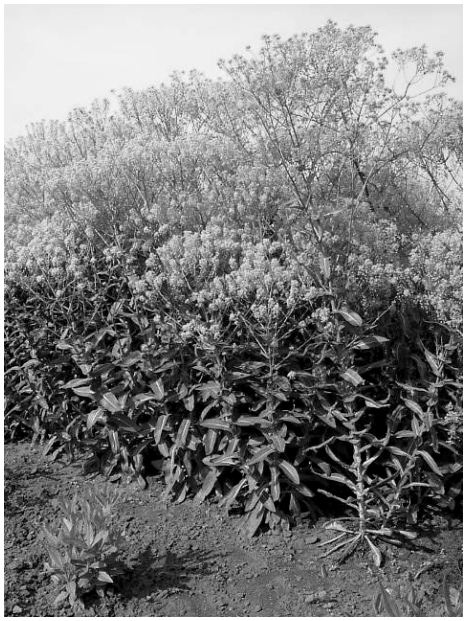
Natural dyestuff	mordant	colour	result
Sample1- A CORONA	No mordant	Light peach	good
Sample2- A CORONA	0,2% soda	peach	good
Sample3- A CORONA	0,2% citric acid	orange	good
Sample4- B CORONA	No mordant	peach	good
Sample5- A CORONA	0,2% soda	orange	good
Sample6 A CORONA	0,2% citric acid	Light peach	good

Sample7- A	No mordant	Light peach	good
Fabric8 A	0,2% soda	peach	good
Fabric9 A	0,2% citric acid	orange	Bad- uneven color spots
Fabric10 B	No mordant	peach	good
Fabric11 B	0,2% soda	orange	good
Fabric12 B	0,2% citric acid	Light peach	good

RESULTS:

- Soda mordants in annatto dyeing gives the best orange result.
- The colour without mordants are good, but lighter than with soda.
- The colour with CORONA is more orange, and without CORONA is more red
- The surface of samples with CORONA treatments were evenly dyed.

7. WOAD *Isatis tinctoria* L.



Woad Isatis tinctoria *was a native of southeastern Europe, presumably either around Greece and Italy or southwestern Russia, and spread quickly throughout Europe in prehistoric times.*
This plant became the dominant blue dye in Europe, especially in western Europe.
Dyer's Woad was formerly much cultivated in Britain for the dye extracted from the leave.
Isatis tinctoria is a biennial plant that is a source of the blue dye chemical, indigotin,
The blue dye chemical indigotin, from indigo or woad, is the only natural "vat" dye. (1. pp100)

Photo 7. *Woad Isatis tinctoria* L. INF plantation.

Table 7. Woad dyeing results – *Isatis tinctoria* L. with CORONA dyeing treatment sample 1, without CORONA treatment sample (2,3)

Natural dyestuff	mordant	colour	result
Sample1- A CORONA	Vat dyeing	Navy blue	good
Sample2 - A 50% of dye	Vat dyeing	blue	good
Samples 3 A	Vat dyeing	Navy blue	good

RESULTS AND DISCUSION

Comparison of selected samples of linen fabrics dyed with and without CORONA treatment are shown in the table below (Table 11).

Table 11. Results of spectrophotometric analysis of samples of linen fabrics dyed with and without CORONA treatment.

Natural dyestuff	ΔL	Δa	Δb	ΔC	ΔH	ΔE	Remarks

Weld sample 5 sample11 **alum and soda**	0,55	-3,55	1,47	2,34	-3,04	-3,88	**CORONA** -slightly darker -less red -less yellow -more saturated and bright -significant hue difference for CORONA advantage
Weld sample 3 sample 9 **copper**	-0,20	-0,46	-1.61	-1,56	0,61	1,69	**CORONA** -slightly darker -slightly less yellow -duller
Tumeric sample 3 sample 6 **citric acid**	-2,85	3,80	-0,49	-0,71	-3,77	4,78	**CORONA** - slightly darker - redder - brighter - significant hue difference
Tumeric sample 1 sample 7 **no mordant**	0,86	-3,43	17,3	17,22	-3,81	17,66	**CORONA** -less red -much more yellow -much brighter hue -difference so big that it is difficult to compare the samples (another hue obtained)
Annato sample 1 sample 6 **no mordant**	-0,77	3,43	1,07	1,88	3,03	3,68	**CORONA** -slightly darker -redder -slightly more yellow -very bright and saturated hue -quite big, easily noticeable change of hue
Annato sample 2 sample 7 **soda**	-0,61	-0,82	-1,5	-1,71	-0,1	1,81	**CORONA** -less red -less yellow - slightly less saturated colour
Cochineal sample 5 sample 11 **alum**	-4,81	-1,83	-9,01	-3,49	-8,51	10,38	**CORONA** - much darker - slightly less red - less yellow - duller hue - very big difference in hue
Cochineal sample 2 sample 8 alum 0,2%	10,41	-10,35	2,34	-10,55	1,17	14,86	**CORONA** - much lighter - less red -less blue -much less bright and much duller
Cochineal sample 3 sample 8 **copper**	1,53	-0,65	-0,46	-0,61	-051	1,72	**CORONA** - slight difference -slightly darker -minimally less red - minimally more blue - minimally less bright
Madder sample 1 sample 7	0,34	2,81	8,11	6,96	-4,62	8,36	**CORONA** -redder -much more yellow

no mordant							-more saturated and bright hue -big difference in colour
Madder sample 6 sample 12 **alum** **soda**	2,06	3,30	2,05	3,86	-0,46	4,40	**CORONA** -lighter -redder -more yellow -brighter - quite big difference in colour
Madder sample 3 sample 12 **alum**	3,75	-1,9	2,10	0,15	2,69	4,62	**CORONA** - lighter - less red - more yellow - quite big difference in hue
Cutch sample 2 sample 8 **ferrow**	-3,26	2,01	1,44	2,34		4,09	**CORONA** - lighter - less red - less yellow, less saturated - duller - quite big difference in hue
Cutch sample 1 sample 7 no mordant	0,3	-0,75	-0,77	-1,03		1,1	**CORONA** -slight difference in hue -slightly lighter -slightly less red
Woad	-0,49	0,09	0,45	0,46		0,67	**CORONA** - slight difference in hue -slightly darker -slightly redder -more blue - slightly brighter

L- lightness
a, b – coordinates of colour
∆C- differences of saturation
∆H- hue differences
∆E- total differences of colour

CONCLUSIONS:

- FABRICS TREATED WITH CORONA ARE MORE EVENLY DYED, DO NOT HAVE LIGHTER SPOTS.
- IN SOME SAMPLES DIFFERENCES IN HUE AND SATURATION WERE OBSERVED IN COMPARISON WITH THE SAMPLES NOT TREATED WITH CORONA.
- IN CASE OF DYEING WITH COCHINEAL AND CUTCH A MELANGE EFFECT APPEARED, WHICH IS INTERESTING FROM DESIGNING POINT OF VIEW BUT NEEDS MORE INVESTIGATION AS REGARDS DYEING RESULTS.
- Different mordants yield differences in values of colour parameters.
- During the experiments a wide range of colours has been obtained including several shades of yellow, orange, red, pink, violet green and brown and blue.
- The samples dyed with addition of mordants display fair and good resistance of the colour to washing, perspiration, nd light.

THE TESTS HAVE SHOWED THAT LINEN NATURALLY DYED FABRICS ARE NOT ONLY ECOLOGICAL PRODUCTS BUT ALSO INTERESTING PROPOSAL FOR INDUSTRY. SIMPLIFYING DYEING PROCESS WITH CORONA TREATMENT ELIMINATES NECESSITY OF WASHING THE FABRICS, PRE-TREATMENT AND GUARANTEES MORE EVENLY DYEING.
Thanks to application of CORONA treatment, it is possible to obtain "GREEN" products with lower quantity of chemicals applied during processing, especially for natural dyed fabrics.

The technology of natural dyeing investigated at INF is an example of CORONA treatment applied during cellulosic fabrics finishing process, what gives better conditions for dyeing and bleaching, as a result of improvement of hydrophilic properties.

ACNOWLEDGEMENTS:

We would like to thank for cooperation in EU research project CORTEX, which was coordinated at the University of Minho in Portugal. Project.
Special thanks to: N. Carneiro, A.P. Souto and also to group of young scientists working together in CORTEX Project.

References:

1. J. Dean *WILD COLOUR*, OCTOPUS PUBLISHING GROUP, LONDON, PP.98, 100,111, 119,124, (1999).
2. M.L.Gulrajani., D.GUPTA *NATURAL DYES AND THEIR APPLICATION TO TEXTILES* DEPARTMENT OF TEXTILE TECHNOLOGY, INDIAN INSTITUTE OF TECHNOLOGY, NEW DELHI, (1992).
3. K. SCHMIDT-PRZEWOZNA „Historical Dyes in Poland and Their Revival" in *Dyes in History and Archaeology* , Archetype Publications, pp 110-116 (2005).

NATURAL COLORANTS / NEW FIBERS: BAMBOO, CORN, SOY AND MILK PROTEINS

by Ms Karen Urbanek[*] (USA)
Artist and independent researcher

Cultures around the globe have always made yarn and cloth from local sources of fiber.
Each fiber presented challenges due to inherent properties that often made processing and dyeing difficult, or limited in range. Improvements in agriculture and technology greatly increased the range of possibilities, but seemed to lead in the direction of synthetic fibers and synthetic dyes. The transfer of labor from field to factory for fiber creation and processing has been increasing for decades, with more and more emphasis on generating fibers from liquefied components using high technology.

Pressure from both governments and local populations is slowly resulting in cleaner environments around the world as global visibility focuses attention on polluting industries and their effects on the health of workers and the communities around them. Cleanup is expensive. The textile industry increasingly relies on environmentally friendly practices for both economic and environmental reasons. Even synthetic fibers are now produced by cleaner means. The specter of global warming and vast quantities of waste on an overburdened planet are pushing us toward maximum efficiency: the complete use of natural resources by recycling manufacturing and agricultural waste.

The textile industry is developing fibers termed “new synthetics from natural sources”. They present the same challenges to dyers as those traditionally used: how to obtain a stable spectrum of natural colors. This study documents investigative mordanting and dyeing procedures carried out in a controlled environment on four of these “new” fibers: bamboo, corn, soy and milk proteins.

Fiber made from bamboo product waste appears to be one of the newest and most promising fibers, as it has many interesting attributes.

Fibers from corn, soybean and milk proteins are not new:
Corn fiber was used briefly in the 1940s and 1950s, and then was superseded by synthetic fibers, but now is touted as the fiber of the 21st century.

Several milk protein fibers were created in Europe and the U.S. in the 1930s and 1940s. They were used primarily as a substitute for wool in felt hats, for horsehair in upholstery, and in some clothing, but mostly fell out of use after World War II due to minor flaws and the ascendance of cheap manmade fibers. They have now been resurrected and improved using micro technology.

Soybean fiber was used by Henry Ford of the U.S. for upholstery and clothing in the 1930s. A more modern version has been under development in China for the past 15 years as a substitute for cashmere.

Each of these four non-petroleum fibers can be found in fiber and yarn through retail outlets in both natural and dyed forms, though not dyed with natural materials.

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[*] Karen Urbanek is an artist and independent researcher living in the San Francisco Bay area of the United States. She has worked with groups in many countries, including Armenia, Azerbaijan, Bolivia, Mexico and the Philippines to reintroduce and improve the use of natural dyes. Her methodologies make efficient use of valuable materials to obtain repeatable colors from natural sources while adhering to the highest ecological standards. Her personal philosophy is based upon three precepts:
-knowledge of dyeing is based upon the work of those that came before us,
-that knowledge can be furthered through responsible research, and
-sharing this knowledge completes the dyer’s circle that extends around the world, back and forth through time.

FIBER OVERVIEW

Fiber	BAMBOO	CORN	MILK	SOY
Type	Cellulose	Cellulose	Protein	Protein
Source	Manufacturing waste	Low grade corn meal	Milk casein	Tofu by-product
Current Brand Names	Bamboo™ Spun Bamboo™ EcoKashmere™	Ingeo™ NatureWorks™ Kanebo Corn Fiber™	Silk Latte™	Everblaze™ Soy Silk™
Appearance	Ivory white or bleached white Bright sheen Soft	Sharp white Available semi-matte or bright Soft, similar to wool	Pale gold Lustrous soft, silk like	Pale gold (deeper color and softer sheen than milk protein fiber) Soft, smooth, light
PH range	pH 5-9	pH 5-9	pH 5-9	pH 5-9
Max temp	100C/212F	170C/338F melt point	100C/212F	100C/212F
Strengths	Green, Biodegradable Anti-bacterial @70% Anti-fungal Breathable, cool	green, biodegradable Excellent UV stability Hypoallergenic Low shrinkage High resilience Excellent wicking, Low odor retention Low flammability Dyes, screen prints well	green, biodegradable anti-bacterial contains 17amino-acids same pH 6.8 as skin	green, biodegradable anti-bacterial, sterile 97% UV absorption Moisture absorption Superior break strength
Weaknesses	Low tensile strength (wet 40% lower) Difficult to wet out Slower dye take-up	Sensitive to heat and salt Iron/tumble dry prohibited Difficult to dye	Initial powdery residue 40% lower tensile strength when wet	Compacts when wet Slow or uneven dye absorption
Blends	cashmere cotton rayon wool	Cotton rayon wool	cashmere cotton silk wool ramie	cashmere cotton flax rayon silk wool
Products	medical supplies, home furnishings, clothing, food packing	containers, cups, pens, trash bags, disposable diapers, towels, clothing	T shirts, sportswear underwear, outerwear	bedding, towels, knitwear, underwear

• Fiber roving was used for all investigations rather than yarn so that paper could be made showing a block of color for purposes of comparison. Each of the rovings was the natural color; no bleached fibers were used.

•Water source was pH7 tap water from a city treatment plant in the San Francisco Bay Area of California in the United States.

•Calculations were based upon the gram weight of fiber. All samples weighed 100 grams so that accurate dyeing results could be obtained and duplicated at will.

•Mordanting and dyeing procedures were carried out separately for each fiber to eliminate uneven strike rate as a factor in obtaining comparative results.

•Each of the four fibers received exactly the same treatment as to temperature, volume of water and timing of procedures. Each was treated with the same amounts of mordants, dyestuffs and additives, using stainless steel vessels.

• All mordant and dye baths had a water to fiber ratio of 25:1 (except iron and indigo).

An initial comparison trial was performed for cellulose fibers bamboo and corn with three pre-scouring variables and two mordanting procedure variables, followed by dyeing with 10% Madder Extract:

Scouring Experiment Variables

No scour	Plain hot water	pH 7
Soda Soak	Hot water + 2% soda ash (Sodium Carbonate NA2CO3)	pH 10
Industrial Scour Solution	100F water +5.5% Scour + 2% soda ash (Sodium Carbonate NA2CO3)	pH 10

Mordanting Experiment Variables

Tannin-Alum	Step 1	8% Myrobalan Extract 87.8C/190F 45 minutes Steeped 24 hours Rinsed thoroughly	pH 5
	Step 2	15% Potassium Aluminum Sulfate AlK(SO4)2 . 12H2O 5.5% soda ash (Sodium Carbonate NA2CO3) 87.8C/190F 45 minutes Steeped 24 hours Rinsed thoroughly	pH 5
Aluminum Acetate	Step 1	5.5% Scour 37.8C/100F 2 % soda ash (Sodium Carbonate NA2CO3)	pH 9
	Step 2	82.2C/180F 30 minutes Rinsed thoroughly 5% Aluminum acetate Al(C2H3O2)2OH	pH 4
		37.8C/100F 1 hour Rested 24 hours Rinsed thoroughly	

Cellulose Scouring Experiment Results

The Soda Soak method made little difference in color take-up compared to No Scour, but the color take-up was visibly improved with industrial scour for both corn and bamboo.

Cellulose Mordanting Experiment Results

Tannin /Alum mordanting produced acceptable results, but showed a predictable yellow color influence from Myrobalan. The dyed color was deeper and tending more accurately toward Madder orange with rose overtones on both corn and bamboo fiber treated with industrial scour.

Cellulose Mordanting Conclusion

In accordance with these findings, all corn and bamboo fibers were scoured using 5.5% industrial scour agent with the addition of 2% soda ash (NA2CO3), and mordanted using 5% Aluminum Acetate (Al(C2H3O2)2OH).

Soy and Milk Protein Fiber Mordanting

Potassium Aluminum Sulfate	Step 1 Step 2	Pre-washed fiber with mild soap, rinsed thoroughly 10% Potassium Aluminum Sulfate AlK(SO4)2 . 12H2O 7% Cream of Tartar (Potassium Bitartrate KC4H5O6) 87.8C/190F 1 hour Steeped 3 days Rinsed thoroughly	pH 5

Dyeing Experiments

Three variations were dyed using each of the dyestuffs (except for Indigo, which was dipped for three shades, light to dark):

1. Initial dyeing of all samples (sample retained with no modification)
2. Post dyeing color modification with 1% Iron (Ferrous Sulfate FeSO4)
3. Indigo overdye

Initial Dyebath for All Samples for Each of 4 Fibers

MYROBALAN *Terminalia chebula*	10% extract (powder)	65.6C/150F 1 hour Steeped 24 hours Washed with mild soap	pH 5
WELD *Reseda luteola*	15% extract (paste)	65.6C/150F 1 hour Steeped 24 hours Washed with mild soap	pH 5
OSAGE ORANGE *Maclura pomifera*	6% extract (liquid)	65.6C/150F 1 hour Steeped 24 hours Washed with mild soap	pH 5
FUSTIC *Chlorophora tinctoria*	8% extract (liquid)	65.6C/150F 1 hour Steeped 24 hours Washed with mild soap	pH 5
CUTCH *Acacia catechu*	15% extract (chunk resin)	65.6C/150F 1 hour Steeped 24 hours Washed with mild soap	pH 5
COCHINEAL *Dactylopius coccus Costa*	10% whole bug 5% Cream of Tartar (Potassium Bitartrate KC4H5O6	Bugs boiled in small amount of water (acetic acid added to initial boil), strained, new water added and process repeated until color exhausted; decantings combined 82..2C/180F 2 hours Steeped 24 hours Washed with mild soap	pH 3
MADDER *Rubia tinctorum*	100% ground .1% Chalk (Calcium Carbonate CaCO3)	Soaked madder overnight in double layer mesh bag Bag kneaded for 15 minutes initially to release color Bag retained in dyebath with fiber for 3 days and then: Heated (54.4C/130F) morning and evening daily, Bag kneaded to release color , Dyebath wrapped in blanket to cool slowly Washed with mild soap	pH 6

Iron Modification on a Set of Samples for Each of 4 Fibers

IRON	1% Ferrous Sulfate FeSO4	Crystals dissolved in water, strained before use. 40:1 Water to Fiber Ratio 37.8C/100F 15 minutes Fiber immersed and kept in constant movement to prevent streaking until saddening occurred	pH 7

Indigo Dyeing on a Set of Samples for Each of 4 Fibers and Indigo Overdye on a Set of Previously Dyed Samples for Each of 4 Fibers

INDIGO *Indigofera tinctoria*	Chunk concentrate	Began with measurement of water at working level of liquid in vat divided by 60 for 60:1 water to fiber ratio Use this number as fiber weight for calculations Add 1.8% Lye (Sodium Hydroxide NaOH) (can vary with water pH) for pH10 Heat to 46.1-48.9C /115-120F Add 4% (or less) natural Indigo, ground to finest powder, mixed to smooth paste with water Add 2% Thiourea Dioxide (CH4N2O2S) to reduce indigo. Care taken not to introduce air into vat by stirring/rapid movement Began use when vat became green and color changed from green to blue in air after test sample is dipped. Dip fully wet out fiber 1-2 minutes (at least 2 times for pale color) Repeat dippings for short amounts of time to prevent crocking Oxidize at least 20 minutes or overnight but fiber must not dry may oxidize in water between dippings Thereafter, balance 5 factors/replenish ingredients to keep working: amount of water/vat level alkaline vat pH10 (Lye) 46.1-48.9C /115-120F indigo reduction of indigo (Thiourea Dioxide) Desired color was reached: neutralized fiber in weak vinegar bath Rinsed and washed with mild soap	pH 10

Conclusions

Scouring and Mordanting	Initial scouring and mordanting experiments indicated the importance of scouring cellulose fibers deeply prior to mordanting
Color Results	*Bamboo* *Excellent color absorption; brilliant saturated colors* Corn Poor color absorption; pastel hues only Soy Good color absorption; saturated colors Milk Good color absorption; saturated colors (slightly more saturated than on soy protein)
Dyeing Similarities to Other Fibers	Bamboo, Soy and Milk Protein dye somewhat like tussah silk: -paler cochineal hues exhibit bluer red influence -some paler yellows show a small amount of blue influence. -indigo blues tend toward teal Deeper hues, such as those obtained on bamboo, show less of this influence (except for cochineal, which is more fuchsia than red).
pH and Temperature	Most natural dyeing procedures fall within the recommended guidelines for Ph and temperature. In some cases these were exceeded to test fiber reaction. It appears that the fibers can stand minor deviations for limited periods of time without apparent damage to the fibers.

Recommendations

BAMBOO	Dyes all colors beautifully. Highly recommended
CORN	Clearly performs more like a synthetic fiber. Does not seem worthwhile if a full deep spectrum of colors is desired with natural dyes.
MILK	Takes color well. Worthwhile fiber for natural dyes.
SOY	Takes color well. Worthwhile fiber for natural dyes.

This was an initial survey only, leaving many more variables to be explored in future.
Further experiments could be carried out for both mordanting and dyeing at different percentage levels, at different temperatures and for different lengths of cooking and steeping times.

Comments

This is a time of global exploration for alternatives to traditional methods, with fierce competition in the textile industry. Motives are complex for producing and using these fibers. Green is in these days, as we all become more aware of the hazards facing us. But green and sustainable or not, consumers are becoming accustomed to paying low prices for products that are made and shipped around the globe, utilizing the cheapest labor pools and manufacturing costs available, and consumers' spending habits drive these markets.

We cannot know if these fibers will be available in the future if they do not catch hold with the buying public. If they are not cost effective, or if their marketing value is superseded by the producer's need for ever greater profits, they may sink back into history, and others will surely take their place. Fibers from crustaceans, peanuts, rapeseed, sugar beets and perhaps many other sources are also under investigation.

I believe that as natural dyers we face a future in which we may need to adapt our traditional methodologies to this changing array of materials over which we have so little control. In a world where such intense labor based on historical practices is becoming increasingly rare, we continue our work as caretakers of ancient knowledge and culture. The individual dyer, as ever, must think through how to draw color from the environment and fix it deeply in these fibers, always adhering to the highest standards.

We are still needed: we provide the rich colors of our heritage that are so valued. Ours is the gift of beauty in harmony with the circle of sustainability.

Notes and References

Little information is available about these new fibers at the retail level. Specific information about fiber characteristics was gleaned from the following textile industry supplier and informational websites:

Bamboo

http://www.bambrotex.com
http://www.jonano.com/
http://www.swicofil.com/products/

Corn

http://www.fibersource.com/f-info/More_News/ingeo-043003.htm
http://www.ingeofibers.com/ingeo/home.asp
http://www.natureworksllc.com/corporate/nw_pack_home.asp
http://www.utexas.edu/centers/nfic/natnews/archives/2003/Sep.2003.nat.htm

Milk Protein

http://www.cyarn.com/
http://www.swicofil.com/products/212milk_fiber_casein.html
http://www.texindex.com/Sell/Detail/63781.html
http://euroflax.com/products_imports%20of_textiles.htm

Soy Protein

http://cnchanglong.en.alibaba.com/product/50001856/50022012/Special_Polyester_Fiber/Soybean_Protein_Fiber.html
http://empireeurope.en.alibaba.com/product/50176678/51008155/Quilts/Soybean_Fiber_Quilt.html
http://euroflax.com/products_imports%20of_textiles.htm
http://joyballoon.en.alibaba.com/product/50068251/50311154/Soybean_Fibre_Yarn/Soybean_Fibre_Yarn.html
http://saite.en.alibaba.com/product/50089516/50413527/Soybean_Fiber_Home_Textile
http://www.soysilk.com/
http://technology2i.com/

Chitosan

http://bofine.en.alibaba.com/offerdetail/51456075/Sell_Chitosan_Fiber_Yarn.html

General fiber information

http://fabrics.net/

Additional uses for these fibers and additonal Trademarked products may also exist.

SESSION / SÉANCE / SESIÓN 6
FROM THE PAST TO THE FUTURE OF NATURAL DYES:
THE CONTRIBUTION OF ARCHAEOLOGICAL AND ANTHROPOLOGICAL RESEARCH
DU PASSÉ AU FUTUR : LA CONTRIBUTION DE LA RECHERCHE ARCHÉOLOGIQUE ET ANTHROPOLOGIQUE
DEL PASADO AL FUTURO: CONTRIBUCIÓN DE LA INVESTIGACIÓN ARQUEOLÓGICA Y ANTROPOLÓGICA
08.11.2006

Chairperson / Présidente / Presidenta :
Ms Joan Fisher (United Kingdom)

- Ms Mabel Ladaga (Argentina) and Ms Verónica Selame (Chile), "Joint case studies on natural dyes from Argentina and Chile" / "Etudes conjointes de l'Argentine et du Chili sur les teintures naturelles" / "Estudio conjunto de casos sobre tintes naturales en Argentina y Chile"

- Dr (Ms) Beatriz Devia Castillo (Columbia), "Arrabidea chica in the tropical and Andean regions of the Americas from pre-Columbian times until the present" / "Arrabidea chica dans les régions tropicales et andines d'Amérique de la période précolombienne jusqu'à nos jours" /), "El uso de los colorantes de la *Arrabidaea chica* H.B.K. en las regiones tropicales y Andinas, desde la época precolombina hasta el presente: aspectos arqueológicos, etnobotánicos y etnográficos"

- Ms Ana Roquero Caparros (Spain), "Pre-Columbian and colonial traces in nowadays dye practice in Mexico" / "Influences précolombienne et coloniale dans les pratiques tinctoriales actuelles au Mexique" / "Influencia precolombina y colonial en las prácticas tintoreras actuales en México"

- Dr (Ms) Rosella Cilano (Italy), "Traditional Italian dyes. Spontaneous or cultivated plants used on popular textiles of various Italian regions" / "Teintures italiennes traditionnelles. Plantes sauvages ou cultivées utilisées dans les tissus populaires des régions italiennes" / "Tintes italianos tradicionales. Plantas salvajas o cultivadas utilizadas en los tejidos populares de las regiones italianas"

- Dr (Ms) Bettina Zorn (Germany), "Traditional natural dyeing techniques in ancient China (until Tang dynasty)" / "Techniques traditionnelles de teinture naturelle dans la Chine ancienne (jusqu'à la dynastie Tang)" / "Técnicas tradicionales de teñido natural en la China antigua (hasta la dinastía Tang)"

- Dr Jui-tsung Lee (China), "Myth of indigo – a vanished ethno plant industry of Taiwan" / "Mythe de l'indigo – une industrie liée à l'utilisation des plantes en voie de disparition à Taiwan" / "Mito del índigo – una industria ligada a la utilización de plantas que era en vías de extinción en Taiwán"

Due to the very ancient and glorious heritage of natural dyes, it would have been inconceivable in this symposium/workshop not to dedicate a sixth session to the contributions of human sciences - anthropology, history and archaeology – to current knowledge on the evolution of dyeing techniques. These researches bring new light into the rich textile heritage of the different civilisations of all parts of the world. They are currently allowing a better knowledge and recuperation of lost knowledge and know how, and tracing the long progress of the human mind and of science, from the traditional dyers' acute empiric intuition, to the dawn of modern chemistry that ultimately led to the invention of synthetic dyes. They also help to focus researches into the chemical composition of dye plants selected by different civilisations in their particular natural environment; the approach here is quite similar to that of current research into medicinal plants and traditional systems of medicine.

Étant donné le très long et glorieux passé des teintures naturelles, ce symposium n'aurait pu se concevoir sans une sixième session consacrée à l'apport des sciences de l'homme - anthropologie, histoire et archéologie - à notre connaissance de l'évolution des techniques tinctoriales. Ces recherches éclairent d'un jour nouveau le riche patrimoine textile des différentes civilisations du globe et permettent de mieux en mieux de retrouver des savoirs et savoir-faire perdus, et de mesurer le long cheminement parcouru par l'esprit humain et par la science, de l'étonnante intuition empirique des teinturiers à la naissance de la chimie moderne qui a conduit à l'invention des colorants synthétiques. Elles permettent d'orienter les recherches sur la chimie des plantes tinctoriales sélectionnées par chaque civilisation dans son environnement, dans une démarche très proche des recherches actuelles sur les plantes médicinales et les savoirs populaires les concernant.

Dado el muy largo y glorioso pasado de los tintes naturales, este congreso no hubiera podido concebirse sin una sexta sesión consagrada al aporte de las ciencias del hombre - antropología, historia y arqueología – a nuestro conocimiento de la evolución de las técnicas del tinte. Estas investigaciones aclaran de nuevo la riqueza del patrimonio textil de las diferentes civilizaciones del globo y permiten cada vez más encontrar conocimientos y técnicas perdidas, y medir el largo camino recorrido por el espíritu humano y por la ciencia, la admirable intuición empírica de los tintoreros al nacimiento de la química moderna que ha conducido a la invención de los colorantes sintéticos. Ellas permiten orientar las investigaciones sobre la química de las plantas para tinte, seleccionadas por cada civilización en su medio, a través de un proceso muy próximo de las actuales investigaciones sobre las plantas medicinales y el conocimiento popular que se relaciona con ellas.

NATURAL DYES: ARGENTINE-CHILEAN COMPARATIVE STUDIES

by Ms Mabel Ladaga (Argentina) – Docente de Arte Plásticas/Arte textil
and Ms Verónica Selamé Marchant (Chile) – Profesor in Folklore Science*

Introducción

La dimensión cultural de nuestros países, debería interpretarse como: proyecto compartido de los hombres, red simbólica de significados, autorreflexión de una sociedad global, y como expresiones de las formas de vivir de individuos, grupos y sociedades. Pensamos que no habrá integración política, ni económica, ni democracia; si no se intenta correlativamente la integración en el conocimiento de las culturas. Reconocer y practicar la igualdad, la diversidad, el acercamiento, la participación en comprensión y solidaridad es el camino que hemos entendido como posible, en esta presentación conjunta de nuestros países.

Las fronteras establecidas por los estados, dividieron regiones que en épocas prehispánicas, y a lo largo del período colonial, mantuvieron fuertes vínculos culturales, económicos, políticos e institucionales.
El área cultural que hemos tomado entre Chile y Argentina ha tenido correspondencia y contactos permanentes, los tintes naturales, bienes antiguos, que realzan los colores, y los diseños; de tejidos, cueros, cortezas, papeles, etc). pasaban de un país a otro. Los elementos arqueológicos y los tejidos más antiguos marcan la firmeza, brillo y permanencia de los tintes usados, justificando los estudios, revalorizaciones y trabajos de estímulos.

Mapa

Zona Mapuche Chilena y Argentina

Chile	Argentina
Región del Bio bio	Provincia de Mendoza
Región de la Araucanía	Provincia de La Pampa
Región de los Lagos	Provincia de Río Negro
	Provincia del Neuquén

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* **María Verónica Selamé Marchant** es licenciada en Artes Plásticas en la especialidad de Arte Textil de la Universidad de Chile. Desde 1990 ejerce como docente en universidades, academias e institutos profesionales. A partir de 1998 trabaja en la capacitación técnica para agrupaciones de artesanos, en distintas regiones del país, rescatando el tejido tradicional, tejido indígena y teñido con tintes naturales. Junto con ello, participa constantemente en seminarios, talleres y ferias internacionales de artesanía organizadas por UNESCO.
Para este seminario cuenta con el patrocinio de la Dirección de Asuntos Culturales del Ministerio de Relaciones Exteriores de Chile**.**
Mabel Ladaga
Graduated in Ethnography, she is a professor in Folklore Sciences.
Her degrees support her knowledge to work on Applied Anthropology.
She was a scholar at the National Fund for the Arts, the OES, the Spanish Government and International Cooperation (AECI).
She performed a thorough search for craftsmen in La Pampa province, where she started a crafts market, thus continuing her task of leading and supporting work teams.
She was the founder and first Director of both the Buenos Aires Market and the projects for the permanent participation of children and elderly people to safeguard the knowledge and memories so as to generate the continuity of crafts practice and form an identity in children.
In 1990 she received a Prize from the Sociedad Rural Argentina on her work for the recovery of natural dyes in the Province of Buenos Aires.
She is a researcher, field worker, teacher and project creator for local and regional development, who has published and still publishes her experiences. At present she is coordinating Ecosociety and she is also the secretary of the Association for the development of primitive communities. She has received several prizes for her cultural work in generating productivity.

Introducción a la Historia de Los Tintes

La interrelación de nuestro pueblo, establecido a ambos lados de la cordillera, provocó trueques de bienes, que consolidaron la permanencia de ellos y de sus saberes empíricos. Permitieron así construir unidades económicas autosuficientes. Los procesos de migraciones, corrimientos, desplazamientos y establecimientos en zonas alejadas, conformaron esta realidad que hoy analizamos.

Materias primas
En los trabajos de aplicación se ven las coincidencias, en el uso de las materias primas de procedencia animal: Lana de oveja, guanaco, llama, alpaca, crines y cueros.

Formaciones Bióticas
Existen en los países: bosques, selvas, matorrales, totorales, carrizales, juncales, cañaverales.
Por la extensión geográfica, en la Argentina aparecen además: cardonales, desiertos, estepas herbáceas, sabanas y selvas marginales de reserva

Plantas Sapóniferas
Los Mapuches conocían los secretos de las utilidades de las plantas desengrasantes y blanqueadores. Algunas de ellas continúan vigentes, en uso por parte de las abuelas. Recientemente se trabaja en la recuperación de estas tradiciones en ambos países.
El Quillay (jabón en mapuche), *quillaja soponaria*, rica en saponinas. Originaria de Chile, introducida e incorporada a Argentina desde hace muchos años. arraigada en La Pampa y Neuquén
En la Argentina se han registrado cincuenta y ocho plantas, que crecen en terrenos secos de la Pampa, ricas en Saponinas, y en los húmedos de la Provincia de Buenos Aires. Citamos como ejemplo El agave, cuya infrutescensia da una espuma muy consistente.

Plantas tintóreas
Se considera la flora regional autóctona u originaria, y exótica o introducida, en este caso adaptada desde hace muchos años.
En la investigación se han tenido en cuenta las creencias tradicionales sobre la importancia de la luna en los momentos del corte. Las partes usadas son: raíces, tallos, ramas, hojas, frutos, etc. Los mordientes más usados en ambos países son: alumbre, el orín, el jume y sal.
Se han registrado alrededor de doscientas cincuenta especies en cada país, estos datos han sido recogidos durante sucesivos viajes de investigación a todas las comunidades rurales, alejadas de los centros urbanos, con nombre vulgar y de lengua indígena propio de cada país, formalizando en laboratorio el nombre científico.
Las experiencias son realizadas en conjunto con los artesanos, recogiendo su memoria tradicional, e incentivándolos para su resguardo y vigencia.
Estadísticamente este proceso de recopilación se viene realizando en Argentina desde 1971, siendo en Chile más reciente.

En este marco comparativo hemos establecido estudios y acciones profundas y autosustentables en los espacios locales y regionales, logrando registrar plantas específicas de cada país, otras que se han perdido en algunas localidades de uno y otro lado. En algunas comunidades indígenas han tomado la acertada iniciativa de recuperar esta especies de uso tradicional, por ejemplo el **Relbún** *Gallium chilense,* en Chile del que se extraía el color rojo, y el **Retortuño** *Prosopis strombulifera* , rojo, en la Argentina.

Determinamos coincidencias en el uso de la misma especie, por ejemplo:

Roble: *Nothofagus oblicua* **Corteza / Rojo / Rosado**

Molle o pimiento: *Schinus molle* **Hojas y corteza / Amarillo**

Algarrobo Blanco: *Prosopis alba* **Corteza / Marrón oscuro**

China: *Calendula officinalis* **Corteza / Marrones**

Quintral: *Loranthus tetrandus* **Corteza y hojas / Verde**

Relbún: *Galium chilense* **Raíz / Rojo/ rosado**
Relbunium richardiarum **Raíz / Rojo/ rosado**

Ulmo: *Eucryphia cordifolia* **Corteza / Ladrillo/ marrón**

Eucaliptus: *Eucalyptus globulus* **Corteza / Marrón claro**

Laurel: *Laurus nobilis* **Hojas y corteza / Amarillo / Verde**

Nalca, Depe o Pangue: *Gunnera tinctorea* **Raiz y corteza / Anaranjado/ Grises**

Aromo: *Acacia cavenia* **Raiz y flores Amarillo / Grises**

Sanguinaria :*Hymenoglossum croentum* **Corteza / Tabaco Rojizo**

Boldo: *Peumus Boldus* **Corteza y hojas / Amarillo/ verde**

Quillay: *Quillaja saponaria* **Corteza / Marrón**

Hollín de diferentes maderas: Marrones oscuros y tonalidades en la gama

Si bien el uso es común, la diferencia de coloración obtenida depende de la composición del suelo, clima y hábitos de corte y recolección en cada uno de los países.

Técnica de teñido y Tejido

En esta región mapuche, entre las técnicas de tejidos, las de teñido con tintes naturales, que requieren mayor destreza y creatividad es la del Ikat (teñido por reserva) para los chilenos (lista atada o atadura) para los argentinos. La técnica de Plangi, atadura sobre tela en telar, llamada comúnmente “ojo de buey”, o poncho de argollas, usada por los caciques antiguos de nuestro pueblo mapuche, fueron realizadas con el añil nativo de Chile, llevado por trueque a la Argentina a provincias como La Pampa y Buenos Aires, existía en forma de crecimiento natural; al sur de Mendoza, Neuquén y Río Negro. Actualmente desaparece en Chile la materia prima y el proceso de elaboración, En Argentina si bien el añil fue escaso en relación a la producción, la magia de esta técnica permaneció vigente entre grupos que representan un espacio cultural del Azul (Villa Fidelidad) en Buenos Aires.

Las imágenes que vemos son del Museo de Arte Popular Américano Chileno, Tomás Lago, piezas sin clasificar, rectoras de diseños y técnicas, y las de Argentina, antiguas, de colecciones privadas.

Actuales, con artesanos trabajando en total vigencia.

En este trabajo hemos revisado la historia en su proceso dinámico. maravilladas con el contacto e interrelación de estos pueblos, separados políticamente, pero que reconocemos como uno, hoy a través de este ejemplo nos comprometemos con nuestra identidad, plasmando en investigaciones, trabajos de talleres y publicaciones ; el cumplimiento de nuestro objetivo común. Planificamos para sostenerlo, anexar un equipo de trabajo, con iguales sueños y sentido de paz para tener continuidad en el futuro.

BIBLIOGRAFÍA

Biogeografía de América Latina / Cabrera Ángel / Monografía Nº 13/ Secretaria General de los Estados Americanos / Washington/ 1973.

Artesanias Tradicionales Pampeanas/ Ladaga Mabel /Serie Nº3
Gobierno de la Provincia de La Pampa /1983/ Argentina.

La Larga y la Corta Historia de la Artesanía Bonaerense/ Ladaga Mabel / Octavo Congreso Historia de los pueblos de la Provincia de Buenos Aires / Subsecretaria de Cultura Gobierno de la Provincia de Buenos Aires /2001.

Tintes Pampásicos Argentinos / Ladaga Mabel/
(1972-2005) Combessies Olavarría / Buenos Aires /Argentina.

En anales del **Taller de Regional : Uso de Tintes Naturales en los Textiles de América Latina** / Ladaga Mabel / ASUR -Sucre / Bolivia / 2003.

Plantas de la Costa / Lahitte-Hurrell /CIC Y CONICET/Comisiones de Invesigaciones Científicas de Buenos Aires y Nación de la Republica Argentina.

Lenguas Mapuche y Ranquel /Varios Autores/ en estudios publicados en la Provincia de La Pampa
Recopilaciones de campo en **Flora de la Isla Martín García** / San Cristóbal Javier / Provincia de Buenos Aires /Argentina.

Textilería Mapuche Arte de Mujeres /Angélica Wilson / Ediciones CEDEM / Chile.

Tejido a Telar en las Tierras del Sur / Programa de rescate y difusión de Artesanía Huilliche de la Sociedad Munko Kvsoukien Ltda./ Chile /1998.

Colores de América / Pedro Mege / Museo Chileno de Arte Precolombino / 1992-1993.

Artesanías de Chile, un reencuentro con las tradiciones / Carlos Peters Barrera- Sobé Núñez Gallardo/ 1999.

El Huaso, **Ensayo de Antropología Social** / Tomás Lago / Ediciones de la Universidad de Chile / 1953.

Mujeres Mapuches / Sonia Montecino- Ana Conejeros/ CEDEM / 1985/ Chile.

The Craft of Natural Dyeing / Jenny Dean / Search Press Limited /1994/ England.

Flora Silvestre de Chile/ Adriana Hoffmann / Fundación Claudio Gay / 1999.

Tintes y Tintoreros de América / Ana Roquero Caparrós / Editado por:
Secretaría General Técnica del Ministerio de Cultura / España / 2006.

Plantas Tintóreas del Sur y Extremo Sur de Chile / Verónica Selamé / Taller de Regional: Uso de Tintes Naturales en los Textiles de América Latina / ASUR -Sucre /Bolivia/ 2003.

Sitios Web

www.cholchol.org
www.relmuwitral.cl
www.geocities.com/aukanawel
www.serindigena.cl
www.cedem.cl
www.mapa.uchile.cl
www.artelana.cl
www.mapuche.cl
www.chilebosque.cl

Informantes y Colaboradores:

Argentina:
Acosta María Luisa, Olavarría, Bs. As. 1991.
Brown, Gladys. Olavarría, Bs. As. 1990, 2004.
Cabral Veneranda. Emilio Mitre, La Pampa. 1972.
Elbey, Olavarría, Bs. As. 1990, 2004.
Maldonado Rosa. Puelches, La Pampa. 1973.
Mardores Delia. Olavarría, Bs. As. 2001

Rodríguez María Esther. Olavarría, Bs. As. 2001, 2004.
Sosa Iris. Olavarría, Bs. As. 2002, 2004.
Pallero Selva, Olavarría, Bs. As. 1990 (fallecida).
Pintueque Martina, Taller de Mujeres Indígenas (Claudina, Catalina, Josefa, Luisa, Mercedes, Viviana, Clorinda, Rosaria, Máxima, Agustina y Florinda) Carmen de Patagones, Bs. As. 1995.
Piris de Rodríguez Esther Élida, Tornquinst, Bs. As. 1992.
Taller de Hilanderas de Leandro N. Alem, Bs. As. 1996.
Taller del Triunfo, Lincoln, Bs. As. 1995.
Maya, María. Emilio Mitre, La Pampa, 1974.
Cabral Luisa. La Pampa, 1978.
Urruti Josefina. Olavaria 2003.
Larralde Maruca. Olavarria, 1990 (fallecida).
Torneos Juveniles Bonaerenses, Rauch, (varios) desde 1993 a 1995.
Torneos Abuelos Bonaerenses, Trenque Lauquen, Patagones, etc desde 1996 a 2000 (varios)
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www.bmi2.bmt.tue.nl/.../araucania/page.html
www.mtshasta.com
www.nuestrosparques.cl/blog/21232
www.chilebosque.cl

Fotografías piezas MAPA y Dirección de Arte:
Hugo Robles Lama.

Diseño Gráfico y Presentación Flash:
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Introduction

The culture of both our countries should be a joint project of men, a symbolic need of meaning, a global society's self analysis, and the expression of the way of living of individuals, groups and societies. We believe there cannot be a political or economic integration - not even a democracy- if integration of the cultures is not intended at the same time. The aim of this joint presentation of our countries is to recognize and practice equality, diversity and nearness, participation in understanding and solidarity.

The borders established by states divided regions that had strong cultural, economic, political and institutional bonds in pre-hispanic and colonial times.
The cultural area- Chile and Argentina- we have been working on has had a correspondence and permanent contact. The old natural dyes enhancing colours and designs+ (of textiles, leather, cortexes, paper, etc) have always passed from one country to the other.+ Archaeological elements, as well as the oldest textiles, show the firmness, brightness and permanence of the dyes used, +which justifies our studies and the revaluation and stimuli work we perform.+

Mapa
Sector

Correspondence between Chile and Argentina

Chile	Argentina
Bio bio Region	Mendoza province
Araucanía Region	La Pampa province
Lakes Region	Río Negro province
	Neuquén province

Introduction to Dyes History

The interrelation between our peoples, on both sides of the "Cordillera", brought about goods barter, which consolidated their permanence and that of their empirical knowledge. This allowed them to build self sufficient economic units. The processes of migrations, moving and settlements in fareway lands conformed this reality we are analyzing today.

Raw materials
When dying wools, coincidences can be seen in the use of raw materials of animal origin: sheep, guanaco, llama and alpaca wool, mane and leather.

Foto lana
Fotos husos y rueca

Biotic formations
In both our countries there are woods, jungles, thickets and different kinds of reed maces (totorales, carrizales, juncales, cañaverales).
Due to its great extension, Argentina is also rich in thistles, deserts, herbal steppes, savanna and peripheral jungle reservations.

Foto ambiente para dar idea de desierto está en el material que copiaste de el power viejta mirando lana en una camioneta…..
Foto ambiente Mabel y abuela
Foto arqueológicas
Foto abuelas y chicos

ARGENTINA

Soapy plants

The Mapuches know the secrets about the use of whitening and grease-removing plants. Some of these are still being used- mainly grandmothers. We have been working on recovering these traditions in both countries.

Quillay (soap in Mapuche language),*quillaja soponaria*, is rich in soapy substance. It comes from Chile and was introduced in Argentina long time ago, where it has long been used in La Pampa and Neuquén.

Fifty eight plants have been registered in Argentina. These grow both in dry pampean lands and in humid lands of the Buenos Aires Province, and are rich in soapy substance. As an example, we can quote the agave, whose fruit gives out some very consistent foam.

Foto phyta
FOTO fruto

Dye Plants

Both the indigenous or native flora and the exotic one -or introduced- are considered. The latter has been adapted for many years.

Traditional beliefs on the importance of the moon at cutting time have been taken into account for this research. Roots, stems, leaves, fruits, etc have been used and the most frequently used fixing elements in both cases are: alum, urine, "jume"(a native plant) and salt.

About two hundred and fifty species have been registered in each country. These data have been collected on consecutive research trips into all rural communities, a long way from urban centres, which have their own popular name name in the indigenous language of each country. Their scientific name has been turned formal in the laboratory.

All experiences have been performed together with craftspeople, collecting their traditional memory and encouraging them to their preservation and validity.

According to statistics, this compilation process has been done in Argentina since 1971 and is more recent in Chile.

In this comparative chart we have carried out deep studies and self-supporting actions in local and regional spaces, thus achieving specific plant registers in each country. Some have got lost in some localities on both sides. Some indigenous communities have become determined to recover some species from the traditional use, such as the **Relbún** *Gallium chilense** in Chile, to extract Red and the **Retortuño** *Prosopis strombulifera** Red in Argentina.

Fotos Plantas

We have found coincidences in the use of the same species in both countries, for example :
(Retama, *AYMARA plant –is in the north, not in mapuche land in CHILE* no se si la traen ¿?acá es comun busca un junco o algo que tengamos las dos + para mi es muy común +)*

Oak: *Nothofagus oblicua* **Red / Pink * cortex**

Molle or chilli: *Schinus molle* **Leaves and cortex / Yellow ***

It is not known by the name chilli but molle in Argentina

White Oak: Prosopis Alba cortex / Dark brown *+

China: *Calendula officinalis* **Cortex / Brown colours *+**

Quintral: *Loranthus tetrandrus* **Cortex and leaves / Green *+**

Relbún: *Galium chilense* **Root / Red/ pink***
Relbunium richardiarum **Root / Red/ pink + Arg**

Ulmo: *Eucryphia cordifolia* **Cortex / Brick colour, brown *+**

Eucaliptus: *Eucalyptus globulus* **Cortexes / Light brown *+**

Laurel: *Laurus nobilis* **Leaves and cortex / Yellow / Green *+**

Nalca, Depe or Pangue: *Gunnera tinctorea* **Root and cortex / Orange/ Grey colours *only known in Argentina as pangue or pangui (it is one of the components to obtain black +**

Aromo: *Acacia cavenia* **Roots and flowers / Yellow / Grey colours *+**

(aromo de sapos)Mimosa pelulifera + appears in Brasil, Uruguay and Argentina. Another species is the "aromo criollo" (Acacia cava) which we have in common. +

Sanguinaria :*Hymenoglossum croentum* **(native from Chile) Cortex / Reddish Tobacco *+**

"Sanguinaria" or "siete sangrias" (seven bloods) due to its high medicinal action.
Poligogonum aviculari (its root produces an intense red colour) is present in the south of America and is found in this variation in Argentinian costs. +

Boldo: *Peumus Boldus* **Cortex and leaves / Yellow/ green*+**

Quillay: *Quillaja saponaria* **Cortex / Brown +**

Soot from different kinds of wood: Dark browns * and different shades of the same colour. +
Although the use is the same,+ the different shade of colour obtained depends on the soil composition, climate, and cutting habits as well as the collection in each country.

***COFFEE BROWN: * for family use, generally by using the waste from filtres after making coffee + , in Argentina in plantations in the littoral.**

Weaving - Dye Technique
Among weaving techniques+ and natural dying techniques –requiring greater skill and creativity- in this mapuche region, is that of Ikat ("dying by reserving" for the Chilean and "tied list" or "tying" for Argentinians). It is Plangi's technique, consisting of tying the cloth or woven material, usually called "ox's eye" or "poncho de argollas", worn by old times "caciques" in our mapuche communities. They were made with Chilean indigo, bartered into Argentina in provinces like La Pampa and Buenos Aires, It did exist +in the wild in the South of Mendoza, Neuquén and Rio Negro. At present the raw material as well as the ellaboration process is becoming extinct in Chile (– as Vero says++). In Argentina, although indigo was scarce in relation to the production, the magic of this technique has stayed and is still valid among groups representing a cultural space in Azul (Villa Fidelidad) Bs As+

These images come from the American Chilean Popular Art Museum, Tomás Lago. These are non classiffied species, of guiding design and technique, as well as old Argentinian ones. And others from private collections.

FOTOS Verónica: CHILE
Fotos Mabel: ARGENTINA

These are present photographs, with craftsmen working now.
Throughout this work we have tried to revise history in its dynamic process. We were overwhelmed by the contact and interrelationship of these peoples, politically separated but recognised as one. Today, through this example, we make a compromise with our identity joining our research, workshop and papers in one common objective. We have plans to sustain it, add a work team, with the same dreams and the same sense of peace to have continuity in the future ++

LAURA SOLO HSTA ACA SIN LAS CORRECCIONES
Logo árbol

Bibliografía Mabel (ver tintes pampásicos completos) y ponerl la que esta ahí agregar Pantas de la costa Lahittee-Hurrell C.I.C. Y C.O.N.IC.ET Comsiones de investigaciones cientificas de Bs As y Rca argentina
Recopilaciones de campo isla Martin Garcia Javier San cristóbal
Tintes pampasicos argentinos (recopilaciones de campo (1972-2002) Combessies Olavarria – Mabel Ladaga Y Tintes pampasicos Mabel Ladaga En anales del taller regional Uso de los tintes en textiles de America latina ASUR Sucre Bolivia 2003
Colaboradores agregar a paula (a la lista que tengo en el trabajo grande)

Poné las plantas que te deje si las pudiste acomodar o no se si las dejas para el grande ….y tambien todo lo de tejido que es un montón de acuerdo a las necesidades
Si me das un calculo de cantidad de hojas veo el tiempo de exposiciones
Pudiste sacar algo de musica?
Bueno contame como vamos a hacer para que vya viendo el material ¿ los archivos son pesados si querés mandar cd decime el monto con anticipación y te los mando…hay ahora micros a chile desde La Plata y si es por correo o a pagar en el destino

EL USO DE LOS COLORANTES DE LA *ARRABIDAEA CHICA* H.B.K. EN LAS REGIONES TROPICALES Y ANDINAS, DESDE LA EPOCA PRECOLOMBINA HASTA EL PRESENTE: ASPECTOS ARQUEOLOGICOS, ETNOBOTANICOS Y ETNOGRAFICOS

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Introducción

La Arrabidaea chica H. B. K (Chica) *Bignoniácea*, originaria del tropico americano, ha sido conocida principalmente como una especie empleada en la pintura corporal. Las hojas y el colorante extraído de ellas han sido también utilizados en la medicina indígena, en el teñido de fibras y en la pintura de objetos. Como resultado de los estudios realizados sobre textiles Muisca, Guane y U'wa, de la parte norte de la cordillera oriental colombiana y sobre colorantes de uso tradicional, hemos determinado que esta especie es la principal fuente de los colorantes rojos presentes en los textiles y que estos colorantes se encuentran en muestras Guane con fechas de radiocarbono del siglo X al XVI d.C. Los aspectos químicos de estos estudios nos han permitido establecer los principales colorantes de la *Arrabidaea chica* y su proporción en la planta, herramienta analítica que en la práctica nos permite acercarnos a las tecnologías de la tintorería precolombina y a seguir la huella del empleo de la especie en otras colecciones de textiles precolombinos.

Habitat y distribución.

Arrabidaea chica H.B.K ; Verlot. Sin. Bignonia chica H.B.K, familia Bignoniáceas.
Se encuentra principalmente como liana trepadora, que se adhiere a los árboles más elevados por medio de zarcillejos. Los nombres que recibe la A. chica sirven como indicio de su distribución geográfica y de los pueblos que la utilizan: Carajurú, Cipó cruz (Brasil: Amazonas); Chica, Piranga, Bija (Colombia); Puca-panga, Barqui (Perú) entre muchos otros. En Cariniaco, lengua Caribe, Chica significa “rojo”. La *Arrabidaea chica* se encuentra distribuida desde México, en los estados de Oaxaca, de Veracruz y de Chiapas, hasta Argentina, en los departamentos de Corrientes y Misiones. En general, puede crecer entre 0 y 1500 m. Es una especie que se desarrolla principalmente en las selvas tropicales, pero también se cultiva en las fincas como en la Hacha, sobre el río Putumayo, en Colombia, en el estado de Napo, en el Perú[26] y en alto Orinoco de Venezuela[27] .
El botánico colombiano M. Triana, registró la localización de la especie al borde de los ríos Atrato, San Juan y Patia en la costa del océano Pacífico, en el río Meta y Magdalena de la costa Atlántica y en los lugares áridos y rocosos de las cordilleras. Esta adaptación a diferentes terrenos y climas condujeron a M. Triana a observar que la A. chica debió ser objeto de un cultivo especial y arraigado en las poblaciones aborígenes[28]. Hipótesis que sigue teniendo vigencia como lo hemos confirmado durante nuestra investigación.

Métodos tradicionales de extracción de los colorantes de la *Arrabidaea chica*

La extracción del colorante se realiza por un proceso de maceración, colocando las hojas secas por exposición al sol y molidas, en el agua durante algunos días. Durante este proceso se forma un precipitado rojo que se separa por decantación. En algunos casos la precipitación se ayuda calentando la maceración y agregando pequeños pedazos de corteza de algunos árboles con alto contenido en taninos. La pasta roja resultante es algunas veces lavada y secada o directamente

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[26] Gentry: http://www.mobot.org/MOBOT/research/gentry/bignonzip.shtml
[27] F. S. Gilij : Ensayo de historia americana. Biblioteca de la Academia Nacional de la Historia. Vol 71, Caracas 1965, 200.
[28] M. TRIANA, Plantes usuelles de la Nouvelle-Grenade, *Chicà.- Bignonia Chica H.B.K.; Bixa orellana L ; Eleagia utilis Wedd*, *Bulletin de la Société botanique de France*, 5, 1858, p. 86-91

prensada en bolas o en especies de galletas redondas, con o sin adición de aceite. Este producto puede ser utilizado para la pintura corporal, para el teñido de fibras o para la preparación de un barniz.

Composición del colorante. Con la reproducción de los métodos artesanales en el laboratorio determinamos que el producto total de la maceración esta constituido principalmente por flavonoides (amarillos) y antocianos (rojos y violetas)[29] El precipitado rojo esta formado por antocianos. El manejo selectivo bien sea del extracto total, del precipitado o del líquido separado, multiplica las posibilidades en la gama de colores obtenidos durante el teñido y los diversos tipos de aplicaciones que pueden tener estos colorantes. Entre estos su aplicación en barnices vegetales y el más conocido, la pintura corporal. El conocimiento de las particularidades en la extracción del pigmento rojo hace que algunos pueblos se hayan destacado en su preparación como los Salivas, los Guipunaves, los Caveres y los Piaroas, tal como lo observó Humboldt y que designo este colorante como *précieuse matière*[30].

Empleo

El documento más antiguo que disponemos sobre el empleo de la *Arrabidaea chica* para dar color a las fibras textiles, es un texto del religioso dominicano Alonso de Zamora, que vivió en Cundinamarca y Boyacá a finales del siglo XVII y comienzos del siglo XVIII[31] , quién menciona su empleo para pintar las mantas 'que llaman de pincel'

A mediados del siglo XIX la *A. chica* era empleada por los indígenas de Pasto y Timaná para darle color rojo al barniz de Pasto o *mopa-mopa* (resina de la *Elaeagia sp.)*[32]. En 1960, Uscategui Mendoza observó que las tribus de las regiones de la Orinoquía empleaban la pintura de la *Arrabidaea chica* para fines mágicos y estéticos, como también para ceremonias curativas y antes de expediciones de casa y pesca[33]. Los pueblos Yagua y Tikuna del noroeste de la selva amazónica (en la frontera actual entre Colombia, Perú y Brasil) utilizan la *Arrabidaea chica* para teñir de rojo-púrpura las fibras vegetales (*Astrocaryum tucuma*, *A. chambira*), empleados en la elaboración de tejidos como hamacas y para pintar objetos de caracter sagrado[34]. Para los Bribri de Costa Rica, los tintes rojos obtenidos con la *A. chica* son muy apreciados para el teñido de las fibras en la elaboración de canastos y otros productos artesanales[35].

Teñido de Fibras

La utilización directa de las hojas en decocción, para teñir las fibras es una práctica bastante común entre diversos grupos indígenas, método utilizado por los indígenas del área de Penonomé, Panamá[36], como también por los artesanos colombianos de los departamentos Córdoba y Sucre que tiñen la *caña flecha*[37]*,* para la fabricación del sombrero *vueltiao*. La obtención de tonos más o menos intensos se logra con el tiempo de cocción de las hojas secas y la concentración del tinte. Para hacer virar el colorante a rojo-púrpura y negro, las fibras deben someterse a un tratamiento posteríor con una tierra rica en hierro (arcillas ferruginosas) y en contacto con ciertas especies ricas en taninos. Métodos similares, con variantes en cuanto a la fuente vegetal de taninos y a las tierras ricas en hierro, se siguen empleando por los artesanos en lugares diferentes del país como en el departamento de Nariño y en la isla Mompox departamento de Magdalena.

---

[29] Devia, B., Llabres, G., Wouters, J., Dupont, L., Escribano-Bailon, M. T., Pascual, T S. de, Angenot, L., Tits, M., (2002). *Journal of Phytochemical Analysis,* 13, New 3-deoxyanthocyanidins from *Arrabidaea chica* leaves, pag. 114-120.

[30] A. De Humboldt y A Bonpland (1808);PLANTES ÉQUINOXIALES.VOYAGE DE HUMBOLD ET BONPLAND. TOME PREMIER. A PARÍS.P. 97-99

[31] Fray A. DE ZAMORA, [1701], *Historia de la Provincia de San Antonino del Nuevo Reyno de Granada*. Instituto Colombiano de Cultura Hispánica. Bogotá, 1980, 1, p. 124.

[32] J.TRIANA, *Plantes usuelles* [n. 3], p.86- 91.

[33] M. N. USCATEGUI, *Algunos colorantes vegetales usados por las tribus indígenas de Colombia*, en *Revista Colombiana de Antropología,* 10, 1961, p. 333-339.

[34] A. M. SEILER-BALDINGER, *"Hängematten-Kunst: textile Ausdrucksform bei Yagua- und Ticuna-Indianern Nordwest-amazoniens*, Bâle, 1979, p.72 et 78.

[35] Groome, Sarah, "*Arrabidaea chica* (Bignoniaceae): an ethnobotanical study of its biology, domestication potential and uses by two indigenous groups, the Bribri and Cabécar of Costa Rica." Adv. Rafael Ocampo. Colorado. 1998. 29pp.

[36] D. E. Pérez. Colorantes Vegetales en la Artesanía Panameña,13 pags.
http://www.up.ac.pa/direccionadministrativa/institutos/inestec/colorantes_vegetales_en_la_artes.htm p. 7.

[37] *Gynerium sagittatum*

Comercio.

La forma de obtención del colorante y el hecho que se extraiga de las hojas secas, ha facilitado su transporte y por ello su intercambio, en el siglo XVIII ya existía un intercambio muy extendido de la Chica elaborada por los Guahibos, Guaipuinaves (Puinaves), Caveres y Piaroa, con los indígenas de los llanos occidentales, como con los del Río Negro[38], a mediados del siglo XIX Humboldt describe este comercio entre las tribus del bajo Orinoco, indicando que en él también participaban los misioneros de la región[39]. De acuerdo a Mell en 1922 el colorante obtenido de la chica en el Orinoco y en el Río Negro, fue exportado a Europa y utilizado en Inglaterra para teñir el algodón de color anaranjado, pero las plantas se agotaron al no ser cultivadas y con ello el comercio regular del colorante[40].

La *A.chica* se encuentra catalogada entre las especies de la amazonía que ofrecen perspectivas alentadoras en su explotación para fines medicinales**.** En Iquitos, es una especie silvestre que también se cultiva con el fin de aprovechar sus cualidades anti-inflamatorias y sus efectos contra las enfermedades de la piel. Se vende en los mercados en hojas frescas y secas y algunos productos como tintura se venden en las farmacias[41]. Sus propiedades en cosmetología comienzan también a explotarse en productos para el tratamiento y limpieza de la piel

La *Arrabidaea chica* en los textiles precolombinos

Las primeras evidencias de la utilización de la A. chica en la época precolombina fueron suministrados en 1879 por el botánico francés, A. Trémeau de Rochebrune, quién identifico las hojas de la *Arrabidaea chica,* entre los residuos de plantas descubiertas como ofrendas en tumbas de la necrópolis de Ancón, pertenecientes a la civilización de Tiahuanaco (500-1000 AD)[42]. Con nuestra investigación sobre los colorantes en los textiles arqueológicos colombianos hemos podido comprobar la importancia del colorante extraído de la A. chica para las culturas Muisca, Guane y U'wa en el norte de cordillera oriental[43] colombiana. Cincuenta y ocho textiles con fechas de radiocarbono de finales del siglo X hasta comienzos del XVI d. C, fueron analizados por cromatografía HPLC-DAD y LC-MS. De las 80 muestras analizadas, los colorantes de la A. chica fueron identificados en el 73 % de los casos. Ellos aparecen como la fuente de un amplio rango de colores desde anaranjado hasta rojo oscuro, *Rojo Guane*, desde tonos claros, marrones hasta marrones oscuros[44].

Estos análisis permitieron determinar la presencia de taninos al lado de los colorantes de la A. chica en el 95 % de los casos. La correspondencia de los resultados de estos análisis con el realizado sobre muestras actuales etnográficas nos confirman que el procedimiento del teñido de las fibras con adición de sustancias tánicas es ancestral. En la mayoría de los casos, el análisis de las fibras oscuras procedentes de las muestras etnográficas y de los textiles arqueológicos indicó un alto contenido de hierro, esto nos conduce a suponer que en los textiles arqueológicos se utilizó un método para oscurecer los colores similar al que se sigue utilizando para las fibras de celulosa.

Hasta nuestra investigación, solo dos fuentes de colorantes rojos habían sido identificadas en los textiles arqueológicos precolombinos: la cochinilla (*Coccus cacti,* Costa) y las especies *Relbunium (*Sin. *Galium).* La identificación y determinación de las 3-deoxiantocianidinas de la *Arrabidaea chica* en los textiles arqueológicos colombianos adiciona una nueva fuente de colorantes rojos a la paleta de los rojos precolombinos. Nuestra hipótesis sobre que la distribución de la especie y el conocimiento que los grupos indígenas tienen sobre su empleo[45] nos permitían esperar la

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[38] J. Gumilla: El Orinoco ilustrado y defendido. Biblioteca de la Academia Nacional de la Historia. Vol. 68, Caracas 1975, p. 117 f.
Ver tambien R.V. y N. C. Morey : Relaciones comerciales en el pasado en los Llanos de Colombia y Venezuela. Andres Bello, Caracas 1975 ; A. Mansutti Rodriguez : Hierro, barro cocido, curare y cerbatanas : el comercio intra e interétnico entre los Uwotjuja. Antropológica 65, Caracas 1986, p. 3-76.

[39] A. De Humboldt et A Bonpland {n 4], p. 99

[40] C.D. MELL, 1922, Chica Vermillon Americanum, en *Textile Colorist*, 24, p. 383

[41] Tomado del documento realizado por Eduardo Estrella « Biodiversidad y salud en las poblaciones indígenas de la Amazonia : situación actual y perspectivas » , publicado en : www.ucv.ve/cenamb/siamaz/SPT-TCA-PER-28.pdf.

[42] A. TREMEAU DE ROCHEBRUNE*, Recherches d'ethnographie botanique sur la flore des sépultures péruviennes* dans *Actes de la Societe linnéenne de Bordeaux*, 1879, 3, p. 343-358.

[43] Estos textiles pertenecen a las coleciones del Museo casa de Bolivar en Bucaramanga, museo del Oro, en Bogotá, instituto colombiano de antropología y historia y al Museo arqueológico de Sogamoso, Sogamoso.

[44] B. DEVIA, M. CARDALE DE SCHRIMPFF et J. WOUTERS, *The Red Mantles*: Arrabidaea chica *in Archaeological Colombian Textiles*, en *Strengthening the Bond: Science and Textiles*. Preprints*. North American Textile Conservation Conference*, Philadelphia, PA, 2002, J. WELHAN (éd.), Philadelphie, 2002, p. 35-46

[45] Devia, B., Cardale de Schrimpff, M., Wouters, *The red mantles*…{n 20], p-44

presencia de sus colorantes en otros textiles precolombinos, ha comenzado a tener certitud. Los análisis de los colorantes presentes en muestras de textiles de Chachapoyas fechados entre 1400-1570 d.C[46], localizados en el nororiente Peruano, han indicado la presencia de componentes con características cromatográficas y espectrales que permiten suponer el empleo de la *Arrabidaea chica*.

Proyección de la investigación sobre los colorantes de la *Arrabidaea chica*

Como parte de nuestra investigación, hemos mejorado y sistematizado los métodos de teñido del algodón con especies nativas, experiencia que ha sido puesta en práctica por Colectivo *La Corporación de Recuperación Comunera del Lienzo*-CRL, de Charalá, Santander, herederos del oficio de sus antepasados Guane.

Esta investigación ha contribuido en el desarrollo de técnicas de análisis para determinar el empleo de antocianos en materiales antiguos en el Instituto Real de Patrimonio Artístico, IRPA, en Bruselas.

Los métodos de extracción y purificación de los colorantes de la *Arrabidaea chica*, que desarrollamos con nuestro estudio[47], han sido utilizados en investigaciones que buscan identificar otros compuestos en la especie y sus propiedades medicinales, como es el caso del Laboratorio de principios activos del Amazonas, del Instituto Nacional de investigaciones de la Amazonia – INPA. Manaos-Amazonas-Brasil.

En la actualidad se esta implementando un proyecto de colaboración entre la Universidad de Antioquia en Colombia y la Universidad de Lieja en Bélgica con miras a la valorización de los flavonoides y antocianos de esta especie y de otras del genero *Arrabidaea*.

The use of colorants obtained from *Arrabidaea chica* H.B.K. in the tropical and Andean regions of the Americas from pre-Columbian Columbian times until the present: archaeological, ethnobotanical and ethnographical aspects.

By Beatriz Devia Castillo

To appreciate the dyeing properties of *Arrabidaea chica*, one only has to take a stroll through any of the large Colombian craft fairs. There is an amazing variety of basketwork and mats with patterns in red, yellow, orange and black, all colours obtained from *Arrabidaea chica.* These products are made by craftsmen and indigenous peoples from the remote areas of the Amazon and Orinoco and the valley of the Magdalena river as well from as the Atlantic and Pacific coasts. *Arrabidaea chica* H.B.K belongs to the family of the *Bignoniaceae,* the *c*ommon name is chica. The first taxonomic description of this species was made by Humboldt in 1808. It is a species native to the tropical areas of the Americas, from Mexico to northern Argentina and is mainly found in the form of a liana. *Arrabidaea chica* is renowned as the species traditionally used by indigenous groups for body painting. Both the leaves and the colorant extracted from the dried leaves are used in indigenous medicine.

In 1858, the Colombian botanist, Jose Triana observed that *Arrabidaea chica* was used in a similar fashion by native peoples in widely separated regions of the country such as the *Cunas* and *Noanamas* of the Pacific jungles as well as the *Jirameyas* and *Apiayes* on the banks of the river *Meta* in eastern Colombia. Communication between these distant groups of people would have been difficult and this circumstance, together with the way in which the plant is now found in regions with different climates, led Triana to conclude that this plant had probably been cultivated by indigenous populations. The results of our research prove that *Arrabidaea chica* was used abundantly as a colorant for cotton fibres from the central to the northern part of the Eastern Cordillera by the Guane, Muisca and U'wa (also known as Tunebo). These textiles are radiocarbon dated to between A.D. 1.000 and 1.700.

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[46] Bjerrgaard L. y Unger A. 2003. Farstoffanalys der Chachapoyas – Textilien (Perú) Jahrestagung Archäometrie und Denkmalpflege, Berlin, 12.-14. 2003, p. 158-163

[47] Devia, B.et. al, New 3-deoxyanthocyanidins from *Arrabidaea* …{n 5], p-114

The structure of the main dye constituent, *carajurin,* was proposed in 1927. In the course of our research two new 3-deoxyanthocyanidins were isolated from the dried leaves of *Arrabidaea chica* and their structure described. There is little information available on anthocyanins as dyestuffs. No information is presently available on the study of their degradation products when used as textile dyes. Therefore, the presence of anthocyanins of *Arrabidaea chica* in archaeological textiles between 500 and 1.000 years old offers exceptional conditions to begin studies in this field.

As a result of our research, a rural group of weavers « *La Corporación de Recuperación Comunera del Lienzo*-CRL » in Charalá, Santander, Colombia, descendants of the Guane Indians, are now using this plant to dye their products. The methods used for separating the 3-deoxyanthocyanids, established in the course of this research, are now being employed by other research groups who are interested in the medicinal properties of *A. chica.* In Colombia work is being carried out on the possibility of setting up interdisciplinary projects to establish the optimum conditions for the rational exploitation on an industrial scale of the colorants obtained from this species.

HUELLAS PRECOLOMBINAS Y COLONIALES EN LA TINTORERÍA MEXICANA ACTUAL
by Ms Ana Roquero Caparros (Spain)

"Agua de Simiente" Tintoreras de Añil (Hueyapan, Estado de Puebla)
y
"Rebozo de Olor" Tinte en Negro con Taninos (Tenencingo, Estado de México)

Dedicado a Doña Manuela Cecilia Lino
Y a la memoria de Don Federico Rodríguez Mejía

Desde mediados del siglo XVI, las técnicas de tintorería europeas comenzaron a incorporarse a la práctica de los tintoreros amerindios. Así se desprende de las descripciones recogidas en las primeras crónicas escritas por los españoles. En la descripción de los oficios de los mexicanos que hace Bernardino de Sahagún en 1557, dice que *el que es tintorero tiene por oficio el teñir lana con diversos colores*[48]. Puesto que la lana era una fibra desconocida hasta entonces para los artesanos aztecas, es lícito suponer que para teñirla siguieran en alguna medida instrucciones difundidas por los peritos españoles llegados a América para dirigir los obrajes. Hoy día, todavía puede observarse en México el sincretismo de elementos técnicos de herencia colonial y rasgos culturales precolombinos. Se puede ver cómo, aunque determinados procedimientos sean de introducción europea, las materias tintóreas y los productos auxiliares que se emplean son en su mayoría autóctonos.

Con ocasión del Simposio Internacional de Tintes Naturales (Hyderabad 2006) hemos tenido ocasión de percibir este sincretismo en el trabajo de dos destacados tintoreros tradicionales mexicanos: Cecilia Jaime Lino y Luis Rodríguez Martínez. Ambos aprendieron el oficio de sus padres y se sienten orgullosos de ello.

Lo que se recoge en este texto es una descripción resumida de su trabajo y del contexto en el cual lo llevan a cabo.

"Agua de simiente"
Teñido en azul con añil en tina de fermentación
Tintorera: Cecilia Jaime Lino

Cecilia Jaime Lino es hija de Doña Manuela Lino, la más emprendedora del grupo de tintoreras que, habiendo aprendido el oficio de niñas, mantienen la tradición del teñido con añil en la pequeña localidad de Hueyapan, en el estado mexicano de Puebla.

Hueyapan significa en lengua náhuatl "sobre el agua grande" y, efectivamente, este municipio de la vertiente septentrional del Estado de Puebla está ubicado dentro de la cuenca del río Tecolutla y es recorrido por sus afluentes, ríos con numerosas cascadas, y surcado por incontables arroyos. Aunque buena parte de la vegetación original se ha perdido, el clima templado y húmedo, con lluvias todo el año, favorece la conservación de grandes zonas de bosque en las montañas circundantes así como de matorral húmedo de sotobosque donde se encuentran especies arbustivas y herbáceas muchas de las cuales se han utilizado localmente para teñir desde la antigüedad. En los patios de las casas se cultivan, además, numerosas plantas útiles: medicinales, tintóreas, y las llamadas *amoles*, plantas saponíferas que fueron un recurso natural para lavar la ropa desde la época prehispánica.

Los primeros asentamientos en la zona se produjeron entre los siglos X-XI por pobladores de origen totonaco y otomí. El sitio quedó sometido por los españoles en 1522. En la actualidad existen en el municipio de Hueyapan familias del grupo náhua y otomí, aunque predomina la población mestiza. Cecilia utiliza normalmente tanto la lengua náhuatl como el castellano, tiene el título de maestra, e imparte las clases en ambas lenguas en la escuela donde ejerce.

[48] Sahagún (1985:569)

Contexto social e indumentaria

La economía de Hueyapan se sustentó tradicionalmente en el cultivo de las milpas de maíz, la madera de sus bosques, la caza, y la cría de animales de granja así como de pequeños rebaños de ovejas.

Con la lana de las ovejas, muy adecuada para el clima de la sierra, tejían las mujeres en telar de cintura la mayor parte de la vestimenta, tanto de diario como de gala. Hoy día los hombres han abandonado la indumentaria tradicional y las mujeres han optado por usar para diario faldas, delantales y chompas de confección industrial, aunque conservan la preciosa blusa, bordada por ellas mismas, derivada del *huipil*[49] precolombino. Para los días de fiesta, sin embargo, siguen luciendo una impresionante indumentaria compuesta de falda, chal y *tojmicotón*. Es en esta última prenda donde mejor se resume el sincretismo del atuendo femenino de Hueyapan.

El *tojmicotón* es una prenda que cubre el torso y los brazos. Su denominación procede probablemente del nombre de la fibra con la cual se tejía en la época precolombina. Para crear tejidos cálidos y suaves, los aztecas hilaban pelo de conejo junto con fibra de algodón y este tipo de hilatura recibía el nombre de *tochomitl.* Por otra parte, en México reciben el nombre de *cotón* diversas prendas (generalmente masculinas) que varían entre la forma de camisa, chaqueta o chaleco. La palabra *tojmicotón* es seguramente una contracción de ambos términos: *tochomitl* + *cotón* = *tojmicotón*. Sus rasgos claramente precolombinos se manifiestan en el hecho de estar tejido en telar de cintura y en que las piezas que lo componen son de forma rectangular y tienen cuatro orillos, como corresponde al sistema de confección precolombino en el cual nunca se cortaba tela. Se observan como rasgos europeos las mangas, confeccionadas aparte y cosidas al cuerpo, y el bordado a punto de cruz que adorna la pechera y mangas. Entre los motivos decorativos de reminiscencia española, como flores y pájaros, llama especialmente la atención el "árbol de la vida" un símbolo de origen oriental adoptado en la Edad Media por los judíos europeos como uno de los signos de la Cábala.

Las prendas que hemos descrito están siempre teñidas de azul con añil. Suelen ir bordadas en blanco o bien, ocasionalmente, en otros colores obtenidos con tintes naturales. También se realizan chales de fondo blanco siempre bordados en azul. Aunque las tintoreras de Hueyapan son expertas en el teñido con diversas plantas locales y con grana cochinilla, su especial habilidad la muestran en el teñido con añil. El color azul de su vestimenta es invariablemente de un tono profundo casi negro, en tanto que para los bordados emplean a veces un tono casi pastel. Al preguntar en una ocasión a la tintorera Manuela Lino cual era el tono que más le agradaba, contestó sin dudar: "el Azul de Rey es el más hermoso". Esta denominación, en boca de una mujer con raíces náhuatl, remite sorprendentemente a los tratados de tintorería europeos de los siglos XVII y XVIII donde el nombre "Azul de Rey" define un particular matiz de azul que solía llevar en su composición una pequeña proporción de tinte púrpura de orchilla[50] junto con el añil. Es decir, un azul especial, con un toque de grandeza.

Ingredientes empleados en el proceso de teñido

El añil que han utilizado tradicionalmente estas tintoreras procede, tal como indicaba Bernardino de Sahagún en 1547, de *una yerba de tierras calientes que se llama xiuhquílitl, la majan... y exprimen el zumo y échanlo en unos vasos, allí se seca o se cuaja: con este color se tiñe lo azul oscuro y resplandeciente y es color preciado*[51]*.* La planta a que se refiere el cronista es presumiblemente la especie autóctona *Indigofera suffruticosa* Miller, que actualmente todavía se cultiva y procesa en la pequeña localidad de Niltepec (Estado de Oaxaca, México) así como en El Salvador.

[49] Huipil: del náhuatl *huipilli.* Prenda femenina a modo de túnica recta y suelta que puede llegar hasta la cintura o casi hasta los pies. Generalmente es de algodón, raramente de otras fibras vegetales, y en las zonas frías de lana. Se compone de uno, dos, tres, o hasta cinco lienzos rectangulares, cosidos longitudinalmente que se doblan luego por la mitad y se cosen lateralmente dejando un espacio abierto más o menos largo para sacar los brazos. En el centro se crea una abertura para pasar la cabeza.

[50] Orchillas: líquenes, del género *Roccella* que proporcionan un colorante púrpura.

[51] Sahagún (1985:699)

Como es sabido, el añil o índigo, tal como se presenta una vez extraído de la planta, en estado sólido y de color azul, es un producto insoluble en agua. Para aplicarlo como tinte es preciso someterlo a un proceso de reducción que lo transforma temporalmente en su forma soluble e incolora. Tradicionalmente esto se logra en la práctica provocando la fermentación de la tina de añil y regulando el grado de acidez mediante un producto alcalino. En Hueyapan, para provocar la fermentación en la tina de añil se utilizan tres plantas locales: palmilla (*Yucca* sp.), tepozan (*Buddleja cordata* Kunth) y saúco (S*ambucus mexicana* C. Presl. ex A. DC.) Junto a los agentes fermentadores, las tintoreras usan nitrato potásico como producto alcalino para disolver el tinte y mantener el grado de alcalinidad adecuado en la tina. Esta sustancia recibe en náhuatl el nombre de *tequesquitl.* El tequesquite se ha empleado sobre todo, desde la época precolombina*,* para hervir y ablandar el maíz con que se preparan las "tortillas", el alimento básico en Mesoamérica.

Merece una mención aparte el ingrediente esencial que estas tintoreras utilizan, para potenciar la fermentación en la tina de añil: el "agua de simiente". La expresión "agua de simiente"[52], que encabeza este texto, se refiere al sobrante de cada tintada, que nunca se tira porque servirá como caldo de cultivo para "alimentar" nuevas tinas. Antiguamente se guardaba en una olla de barro que se enterraba junto a la casa, hoy día utilizan una garrafita de plástico. El "agua de simiente" se transmite en herencia de madres a hijas, generación tras generación, y si alguna niña quiere ser tintorera de añil pero no tiene familiares que le transmitan ese legado, su madre puede comprarlo para ella a alguna vecina tintorera.

Rituales y creencias

Por último hay que señalar que en Hueyapan, al igual que tantos lugares del mundo, el acto de teñir con añil, por lo que tiene de complejo y aparentemente mágico, está rodeado de rituales, algunos de los cuales pueden interpretarse como medidas higiénicas, otros como precaución para preservar el grado de alcalinidad del tinte y otros, en fin, como mera superstición. Algunas de las medidas que se han de observar rigurosamente son:

- La tintorera debe lavarse las manos antes de comenzar a teñir
- No debe tocar "cascarita de naranja o limón"
- Si la tintorera ve "un muertito" debe bañarse entera antes de volver a su trabajo
- En el suelo, junto a la tina, y sobre la tapa de ésta, hay que dibujar cruces con cal para alejar a los malos espíritus
- Nunca debe una mujer embarazada aproximarse a la tina de añil, la criatura podría nacer con una mancha azul y, además, su proximidad estropeará la tina
- En el caso de que una embarazada se acerque a la tina de añil se debe poner una muñeca de trapo en la olla como conjuro

Proceso de teñido

Aunque no hay duda de que los tintoreros de la América precolombina utilizaron el añil, no existen referencias claras acerca de los procedimientos que pudieron emplear para teñir con este tinte de características tan peculiares. El procedimiento que utilizan actualmente las tintoreras de Hueyapan coincide en lo esencial con el empleado en la Europa medieval y renacentista para teñir con hierba pastel, (*Isatis tinctoria* L.)*,* la planta europea productora de índigo.

Descripción del proceso de teñido con añil tal como se practica hoy día en Hueyapan

1. La tintorera muele el añil para obtener un polvo fino.
2. Con un poco de agua caliente amasa el polvo de añil hasta formar una pasta.
3. Vierte esta emulsión en el agua de la tina donde va a teñir.
4. Tiene preparadas las plantas que servirán de fermentadores: hojas de palmilla (*Yucca* sp.), hojas de saúco (*Sambucus mexicana*) y tepozán (*Buddleja* sp.).
5. Todas estas plantas las pone en la tina con el añil hasta llenarla.
6. Prende el fuego de leña y se comienza a calentar el tinte.

[52] En otra localidad mexicana, también llamada Hueyapan (Estado de Morelos), se utiliza la expresión "agua podrida".

7. En un cubo de plástico lleno de agua (aproximadamente 20 litros), pone 1 kilo de tequesquite (nitrato potásico), y lo remueve bien. (El tequesquite, ayudará a disolver el añil).
8. Deja que los residuos de tequesquite se decanten y vierte en la tina de añil el agua clara que queda en la superficie.
9. Por último, vierte en la tina el "agua de simiente", que acelera el proceso de fermentación.
10. Además, la tintorera pone una pizca de cal "para ahuyentar a los malos espíritus" y un muñequito de trapo para evitar el "mal de ojo".
11. A partir de este momento calienta la tina cada seis horas durante tres días consecutivos.
12. La temperatura debe mantenerse constante entre 40 – 50º C. Para comprobar la temperatura utiliza siempre el dedo meñique, el que tiene mayor sensibilidad.
13. Para comprobar si es correcto el grado de alcalinidad de la tina prueba con los dedos si el tacto es suave, o bien los chupa para verificar si tiene el sabor salado que indica que ha puesto la cantidad correcta de tequesquite.
14. Cuando la superficie de la tina aparece de color azul intenso con reflejos metálicos la tintorera sabe que está lista para teñir.
15. La tintorera ha lavado previamente la lana frotándola con tequesquite.
16. Sumerge entonces en el tinte las madejas escurridas pero húmedas.
17. Mantiene las madejas de lana cinco horas dentro de la tina.
18. Al cabo de ese tiempo saca las madejas. Éstas presentan un color verdoso que se vuelve azul en pocos minutos al oxidarse el añil en contacto con el aire.

"Rebozo de Olor"

Tinte negro con "cascalote" y "agua de fierro", y posterior perfumado
Tintorero: Luis Rodríguez Martínez

Luis Rodríguez es hijo de Don Federico Rodríguez Mejía, ya fallecido. Don Federico ejerció toda su vida como tejedor y tintorero en la localidad de Tenancingo, en el Estado de México. Tenancingo está situado en el centro del altiplano mexicano y su nombre, que procede del tiempo en que formaba parte del Imperio Azteca, significa "dentro de la pequeña muralla". Actualmente es una atractiva población de traza colonial. La lengua común es el español.

El taller de Don Federico, hoy dirigido por su hijo Luis, está equipado con telares de bajo lizo, urdidores y redinas de herencia colonial. En él se manufacturan primorosos rebozos, en técnica de *ikat*, que Doña Ceferina, madre de Luis, se encarga de vender en un pequeño local familiar. Pero sobre todo, Don Federico era depositario de una vasta cultura en todo lo relativo a procedimientos de tintorería. Una de sus especialidades era el teñido en negro de los llamados "rebozos de olor".

El rebozo es una pieza de indumentaria, en forma de chal, que llegó constituir una seña de identidad de la mujer mexicana. No está bien definido el origen del rebozo, si bien las mujeres mesoamericanas siempre utilizaron, desde el periodo precolombino, telas rectangulares para cubrir la cabeza, transportar a sus hijos, o acarrear productos. La prenda alcanzó una gran sofisticación entre las clases altas durante la colonia. Hoy día sigue cumpliendo las mismas funciones: práctica entre las mujeres campesinas y como de prenda de lujo entre la burguesía. Existen numerosas variantes en el diseño de *ikat* que adorna el rebozo y cada una posee un nombre propio: "calandrio, caramelo, de bolita…" y muchos más. Sin embargo había un rebozo, hoy en desuso, que se llevaba durante el luto y era por tanto de color negro, se conocía como "rebozo de olor" o "de aroma".

Para obtener el color negro, los tintoreros de Tenancingo han utilizado tradicionalmente el procedimiento universal de combinar taninos[53] con hierro. Pero esta clase de tinte tiene, entre otros inconvenientes[54], el de dejar impregnado el tejido de un olor nauseabundo. En los tratados europeos de tintorería del siglo XVIII, se indicaba que era preciso "endulzar y suavizar" el negro,

[53] Los taninos son sustancias vegetales solubles en agua, de carácter ácido y fuerte poder astringente. Su característica más destacable, desde el punto de vista de la tintorería, es la de precipitar al ser combinados con hierro dando coloraciones pardo-verdosas, azul pizarra o negro. Numerosas especies vegetales contienen sustancias tánicas, y estas pueden encontrarse en las raíces, tubérculos, tallos, madera, corteza, o frutos.
[54] El principal de ellos es el de ser altamente corrosivo para las fibras.

porque *quando la seda sale de esta tintura tiene una aspereza que de ningún modo debe causar admiración en vista de la cantidad de drogas accidas, y corrosivas que entran en la composición*[55]*.* El suavizante se preparaba con jabón disuelto en agua hirviendo al que se agregaba un puñado de anís o de otras plantas aromáticas en el cual se introducían, una vez frío, las sedas. O, en el caso de los paños de lana, sumergiéndolos en un baño de *simiente de linaza y el jabón… y el espliego herbido con la gualda* (que) *quita el olor de la tinta*[56]*.* El "rebozo de olor" debe pues su nombre a este tipo de acabado.

Encontramos pocos rasgos precolombinos en el "rebozo de olor", si no es el uso del cascalote (*Caesalpinia coriaria* Willd.) como materia prima para obtener tanino. Según las crónicas del siglo XVI, los frutos de este árbol de la familia de las Leguminosas, que los aztecas llamaban *nacascólotl*, ya eran empleados para teñir de negro en el México prehispánico. Sin embargo el hierro se obtenía entonces de la *tierra que se llama palli, para teñir de negro*[57]*.* Es decir, de arcillas con un alto contenido en este metal, que se recogían en depósitos naturales.

Por el contrario, son muchos los rasgos coloniales que se observan en la fabricación de los rebozos de Tenancingo. El primero es que están tejidos en serie, y en telares de bajo lizo (horizontales y accionados por cárcolas). En cuanto a la técnica de teñido por reserva (*ikat*)*,* con que se decora la tela no está claro en que momento se adoptó en México. Al ser una técnica de origen asiático pudo ser introducida durante la época colonial a través del comercio con ese continente. Los rapacejos (franja de encaje que adorna ambos extremos del rebozo) van trabajados en técnica de macramé, una labor que solían realizar los marineros, lo cual propiciaba su fácil difusión universal.

También se aprecia la influencia europea en el proceso de teñido. Para obtener el hierro que combinan con el tanino, no utilizan arcillas ferruginosas al modo precolombino[58], sino que fabrican acetato de hierro a partir de hierros oxidados (llaves, clavos, herraduras, etc.). Tras el teñido, el "endulzado" para eliminar el mal olor consiste en un doble proceso: primero se "amarra" (extrae) el mal olor de las fibras mediante un baño de *paxtle* (líquenes, en lengua náhuatl), y a continuación se pasan a un baño de hierbas aromáticas, denominado "refino", donde se produce el perfumado propiamente dicho. La utilización de líquenes es una práctica que procede de la industria de la perfumería. Los líquenes tienen la propiedad de absorber los aromas volátiles. En el caso de la perfumería los líquenes son útiles para retener aromas agradables, en el caso del tinte negro lo que absorben es el olor desagradable, y después son desechados. Finalmente, para preparar el baño perfumado o "refino" las plantas aromáticas que entran en su composición fueron, en su mayor parte, introducidas por los españoles en el siglo XVI: naranjo, laurel, romero, o rosa de Castilla, entre otras.

<u>Descripción del proceso de teñido en negro, con taninos y hierro, tal como se practica hoy día en Tenancingo</u>

<u>Tareas previas</u>

1. El tintorero prepara con un mes de antelación el acetato de hierro (llamado "agua de fierro" en México). Para ello hace lo siguiente:
    a) Reúne hierros oxidados (llaves, clavos, herraduras, etc.)
    b) Los coloca en un recipiente con agua
    c) Agrega vinagre y piloncillo (azúcar sin refinar)
    d) Lo deja reposar
2. Compra legumbres de cascalote (*Caesalpinia coriaria*) en una tenería de la localidad, donde las utilizan para curtir las pieles por su alto contenido en tanino. (El cascalote que se compra en Tenancingo procede del Estado de Guerrero).

[55] Macquer, P.J. (1771:252-260)
[56] Real Cédula de Orden de la Real Junta de Comercio, 10 de Noviembre 1757, Archivo Municipal de Granada, Sección Fomento, legajo 1866.
[57] Sahagún (1985:703)
[58] Utilizando el sistema precolombino no sería necesario el proceso posterior de perfumado ya que el tinte negro obtenido con taninos y arcilla ferruginosa no tiene mal olor.

Teñido

3. Pone los frutos de cascalote a hervir, justo el tiempo necesario para que se ablanden y poder desmenuzarlos.
4. Cuela este cocimiento y pone el tinte en un cubo de plástico, donde lo deja enfriar.
5. Llena otro cubo de plástico con "agua de fierro" (acetato de hierro), también en frío.
6. Coloca los dos cubos uno junto a otro.
7. Lava las madejas de algodón blanco y, aún mojadas, las encrespa (golpea) sobre una losa de piedra para facilitar la penetración del tinte.
8. Sumerge una madeja de algodón, húmeda, en el cubo que contiene el tanino (cocimiento de cascalote). La voltea varias veces y la saca. El color que toma el hilo es marrón claro.
9. La misma madeja la sumerge a continuación en el cubo que contiene el acetato de hierro. La voltea varias veces y la saca. El color marrón se ha transformado en negro.
10. Tiende la madeja a secar al sol.
11. Repite varias veces estos pasos hasta que el negro es muy intenso.

El olor del hilo así teñido es sumamente desagradable. Para eliminar el mal olor procede como sigue:

Tratamiento de perfumado

Primera fase: "amarrado del mal olor mediante un baño de *paxtle*[59]

12. Hierve los líquenes con poca agua y después los saca del agua y los muele hasta formar una pasta.
13. Esta pasta la vuelve a echar en el agua donde se hirvieron los líquenes y se sumerge en ella la madeja de algodón ya teñida y seca, pero sin enjuagar.
14. Pone esta olla a hervir media hora.
15. Apaga el fuego y deja el hilo dentro de la olla toda la noche.

Segunda fase: "refino" o baño de perfumado

16. Reúne varias plantas aromáticas (no siempre usa las mismas, sino las que tiene disponibles). Las plantas más usuales son: hojas de naranjo, corteza de canela, hojas de laurel, flor de pericón, ramas de romero, rosas de Castilla y hojas de salvia.
17. Pone las hierbas en un recipiente con agua fría y después las hierve.
18. Saca las hierbas y, en el agua donde se han hervido, mete las madejas que estuvieron toda la noche en el baño de líquenes, a continuación vuelve a poner las hierbas en la olla cubriendo la madeja.
19. Tapa la olla herméticamente y deja el hilo en este baño toda la noche.
20. Al día siguiente las saca y las deja secar sin enjuagarlas.

Bibliografía consultada

Arnold, Dean: "The evidence of precolumbian indigo in the New World", *Antropología y técnica,* nº 2, pp. 53-83, Universidad Nacional de México, México 1987.

Hellot, Jean: *Arte de la tintura de las lanas y de sus tejidos*, Imprenta de los Herederos de Francisco del Hierro, Madrid, 1752.

Macquer, Pierre Joseph: *Arte de la tintura de sedas*, Madrid 1771.

Mociño, José Mariano: *Tratado del Xiquilite y Añil de Guatemala* (1ª edición Guatemala 1797), Colección Antropología e Historia, nº 5, Administración del Patrimonio Cultural, San Salvador 1976.

Roquero, Ana: "Materias tintóreas de Centroamérica; conocimiento y uso entre los antiguos

[59] Los líquenes que se emplean en Tenancingo son del tipo crustáceo (crecen pegados a las piedras). Se trata de dos o tres especies diferentes que no hemos podido identificar.

mayas", *Historia y desarrollo del traje Maya*, pp. 39-50, Museo Ixchel, Guatemala 1992.

Roquero, Ana: "Swartz und Ziegelrot", *Kultur und Technik, Zeitschrift des Deutsches Museum*, 2/1997, pp. 50-57, München 1997.

Roquero, Ana: "The scented *rebozo* from Tenancingo. Rescue of an old Mexican dyeing technique", *Tetilforum,* 4, pp. 36-38, Hannover 1999.

Roquero, Ana: "Tintorería mexicana", *El color en el arte mexicano* (coordinador George Roque), pp.35 – 49, Instituto de Investigaciones Estéticas, Universidad Nacional Autónoma de México 2003.

Roquero, Ana: *Tintes y Tintoreros de América - Catálogo de materias primas y registro etnográfico de México, Centro América, Andes Centrales y Selva Amazónica*, Instituto del patrimonio Histórico Español, Ministerio de Cultura, Madrid 2006.

Sahagún, Bernardino de: *Historia General de las Cosas de Nueva España* (ms. 1557, 1ª edición 1829), Ed. Porrúa, México 1985.

Yagüe Gil, A., Gaviña, M. de, Torner, J.: *Los taninos vegetales*, Ministerio de Agricultura, Madrid 1969.

TEINTURES ITALIENNES TRADITIONNELLES. PLANTES SAUVAGES ET CULTIVEES UTILISEES DANS LES TISSUS POPULAIRES DES REGIONS ITALIENNES

par Dr. (Mme) Rosella Cilano[*] (Italie)
Directeur ASSOCIAZIONE TINTURA NATURALE MARIA ELDA SALICE - Milan

PRÉSENTATION DE L'ASSOCIATION TEINTURE NATURELLE « M.E. SALICE »

L'Association est née à Milan en 1986, dans l'intention de poursuivre l'activité d'étude et de recherche de la maîtresse teinturière Maria Elda Salice.
Élève de Wolf Guttman, elle fréquente l'École nationale d'artisanat de Karaj, Téhéran et publie en 1979 le premier manuel italien sur la teinture naturelle. À partir de 1972, elle effectue des études, des recherches et des expérimentations et elle enseigne dans son laboratoire-atelier – siège actuel de l'association – jusqu'en 1985, quand suite à sa disparition prématurée l'association est créée pour en poursuivre le travail.

L'Association – que j'ai l'honneur de représenter ici en tant que membre fondateur et directrice – opère en Italie depuis vingt ans. Sans but lucratif, elle développe son activité de recherche et d'expérimentation des techniques de teinture végétale sur les fibres textiles, en la diffusant à travers la publication et la formation.
L'activité est basée sur la contribution des membres : chercheurs et experts de la couleur, de l'histoire du tissu et du costume, teinturiers et artisans-artistes.
S'occupant principalement de la récupération et du maintien du patrimoine culturel relatif à l'art de la teinture naturelle et de sa pratique artisanale, elle met à disposition un Centre de documentation qui comprend du matériel bibliographique et des échantillons expérimentaux concernant les couleurs naturelles, leur histoire et leurs applications.
Elle organise des échanges et participe à des congrès. Elle offre sa collaboration et des conseils aux particuliers, aux organismes publics, aux écoles et aux musées.

L'ART DE LA TEINTURE DANS LE BASSIN MÉDITERRANÉEN

Le rapport homme-couleur-nature apparaît dans le bassin Méditerranéen dès la préhistoire mais ce n'est qu'à l'époque classique (600 av. J.-C.- 400 ap. J.-C.) que l'art de la teinture atteint son apogée, avec le développement des civilisations grecque et romaine.
C'est aux romains que revient le mérite d'avoir réuni – y compris en ce qui concerne l'art de la teinture – les savoirs méditerranéens et ceux de l'Europe du Nord et Centrale, qui furent conservés ensuite au Moyen Âge, jusqu'à la conquête de nouvelles ouvertures, représentées par les grandes explorations et l'invention de l'imprimerie.
C'est dans ce terrain que la tradition tinctoriale méditerranéenne enfonce ses racines pour se développer ensuite dans deux directions : celle de la teinture commerciale, liée aux cultures locales et aux importations et celle de la teinture botanique, liée aux ressources du patrimoine végétal local, qui sont destinées à évoluer parallèlement, mais souvent aussi à se croiser pour des raisons historiques et économiques.

La mise au point des colorants de synthèse en Europe à la fin du XIX^{e} siècle a marqué le déclin de la teinture naturelle, au point qu'ils l'ont complètement remplacée dans le secteur textile tant dans la production artisanale que dans la production industrielle.
Cependant, la coloration naturelle a continué à résister assez longuement en Italie, parallèlement aux colorants de synthèse, jusqu'aux premières décennies du XX^{e} siècle, du fait de l'industrialisation tardive et peu homogène du pays.

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[*] Disciple of Pupa Salice and manageress/headmistress of the Associazione Tintura Naturale M. E. Salice, operative in Italy since 1986, ROSELLA CILANO has been responsible for consulting, education, research and documentation on natural color for 25 years. She runs regular courses on natural dyeing in the laboratory of the studies and research centre in Milan, across Italy and abroad. Specialist in spontaneous dye color plants linked to the traditional dyeing of local popular fabrics, she is a freelance journalist and wrote several essays on this subject.

C'est la raison pour laquelle on peut encore trouver dans de nombreuses régions italiennes, surtout dans le centre et le sud du pays, des subsistances et des témoignages directs concernant l'utilisation de plantes tinctoriales sauvages, la culture d'autres plantes et la pratique de la teinture végétale.
La caractéristique insulaire ou d'isolement montagnard de certains territoires a favorisé la survivance du patrimoine végétal ainsi que le souvenir et, dans certains cas, le maintien de son utilisation tinctoriale.

PLANTES SAUVAGES ET PLANTES CULTIVÉES

Le nombre des plantes tinctoriales sauvages connues est très vaste, tout comme l'est la quantité de pigments qui s'y trouvent sous forme associée ; mais seul un nombre relativement modeste d'entre elles a été étudié et classé du point de vue chimique, et elles appartiennent en particulier aux espèces utilisées en médecine ou à des fins industrielles.

Nous savons que les colorations qu'elles permettent d'obtenir correspondent à des substances pigmentantes classées par familles, qui se trouvent associées dans les végétaux suivant des pourcentages divers, pas toujours prévisibles de manière précise.
Dans tous les cas, le processus de teinture avec des plantes sauvages est moins défini et moins contrôlable qu'avec des espèces cultivées.
Nous pouvons donc qualifier la teinture avec des plantes sauvages de teinture d'amateur, dont les résultats sont proportionnels au degré de syntonie qui s'établit entre le teinturier et la plante, entre la population d'un lieu et la végétation environnante.

C'est un rapport qui possède une histoire et une épaisseur considérable : il suffit de penser qu'au XIX^{e} siècle déjà, le Manuscrit d'Innsbruck contenait une liste de 1300 recettes de teintures à base de plantes sauvages connues et utilisées en Europe centrale.
Il ne faut pas oublier non plus l'importance de nombreuses publications parues au début du XIX^{e} siècle dans un grand nombre de pays d'Europe suite au blocus commercial imposé par Napoléon qui empêchait l'importation d'espèces objet de cultures étendues qui étaient déjà largement utilisées comme Haematoxylon Campechianum, Dacthylopius Coccus Cacthi, Sophora Japonica, Indigophera tinctoria.

PROJET DE TEINTURE BOTANIQUE SUR LE TERRITOIRE NATIONAL (1998-2006....)

Depuis 1998, l'Association Teinture Naturelle M.E.Salice a mis en place un projet de recherche encore en cours pour l'étude des plantes tinctoriales sauvages et leur emploi dans la coloration du tissu populaire régional en Italie.

Objectifs de la recherche :

Documenter l'existence et la diffusion des plantes tinctoriales dans des zones significatives du territoire italien
Approfondir les connaissances sur la teinture du tissu populaire au XIX^{e} siècle
Créer avec le territoire un rapport fructueux d'échange de compétences et de savoirs
Projeter, proposer et faciliter des parcours de connaissance des plantes tinctoriales pour leur éventuelle réutilisation dans le présent

Finalités :

Maintenir intacte la tradition et la culture de la couleur naturelle
Sauvegarder les savoirs et les valeurs liés à la conservation du patrimoine végétal et artisanal national
Créer de nouvelles ressources économiques et en matière d'emplois, à travers une production régulière et durable

Zone d'étude sur le territoire italien :

SARDAIGNE – Gennargentu – zone de basse montagne insulaire de la Méditerranée occidentale
FRIOUL – Valcellina – zone de basse montagne du nord-est
ABRUZZES - Parc naturel du Gran Sasso et Monts de la Laga - zone de montagne du centre des Apennins

Méthode de travail :

Lecture géologique et botanique du territoire
Examen chromatologique de tissus du XIX siècle
Recherche ethnographique basée sur des témoignages oraux et des documents d'archives
Participation d'organismes, instituts de recherche et chercheurs locaux

Documentation produite :

Détermination des espèces tinctoriales présentes dans le territoire
Création d'un herbier d'environ 60 espèces pour chaque zone étudiée
Réalisation d'échantillons du rendement chromatique des espèces sélectionnées
Collecte d'observations systématiques sur la relation végétaux – sol – territoire
Documentation de techniques locales traditionnelles de teinture
Reconnaissance des plantes tinctoriales utilisées pour la coloration sur les tissus locaux

L'analyse du matériel met en évidence :

Un savoir et une utilisation considérables de plantes tinctoriales locales
L'utilisation de certaines espèces cultivées jadis sur place et leur permanence à l'état sauvage
L'utilisation de colorants exotiques importés d'Inde, d'Amérique, du Moyen-Orient et de l'Extrême-Orient
La nature des supports textiles utilisés
L'utilisation de substances purgatives, mordançantes et d'additifs liés à l'approvisionnement local
La mise au point de techniques de culture et teinture particulières
L'appropriation de techniques de teintures exotiques
La permanence de la coloration naturelle dans les manufactures textiles des premières décennies du XX^{e} siècle
La profonde influence de facteurs historiques, économiques et sociaux dans l'emploi de la coloration naturelle sur le tissu populaire régional

Relation avec le territoire :

La recherche a vu la participation d'organismes, d'instituts de recherche et de musées locaux.
Des chercheurs en botanique, ethnobotanique et histoire du costume ont contribué dans le cadre de leurs compétences spécifiques.
Deux mémoires de maîtrise ont été faits sur le sujet.
Les cours de formation sur le territoire ont permis la naissance d'activités artisanales et industrielles.

Documentation :

Le travail de recherche a été documenté par une publication pour chaque territoire, accompagnée d'une description botanique et d'échantillons sur tissu pour les principales plantes étudiées.
Les publications sont disponibles ici, ou peuvent être demandées à l'Association par e-mail.

TRADITIONAL ITALIAN DYES. SPONTANEOUS AND CULTIVATED PLANTS USED FOR THE DYEING OF POPULAR, REGIONAL ITALIAN FABRICS

by Dr. (Ms) Rosella Cilano (Italy)
Director ASSOCIAZIONE TINTURA NATURALE MARIA ELDA SALICE – Milano

Abstract

Mankind's relationship with nature and colors originated in the Mediterranean basin in prehistoric times but it was not until the classical period (600 BC - 400 AD) that the dyers art reached its maximum expression with the development of Greek and Roman civilization. The Romans are credited with having combined Mediterranean and Northern European knowledge and this is also true for the art of dyeing, which was then maintained through Middle Ages until it found new outlets in the voyages of exploration and the invention of printing. The Mediterranean dyeing tradition spread its roots in this rich soil before expanding in two different directions: that of commercial dyeing, linked to the cultivation and importation, and that of botanical dyes, linked to local resources, to paths that were destined to develop in parallel, but which also often crossed, for historical and economic reasons.

Since 1998, the Associazione Tintura Naturale M.E. Salice has been conducting a research project, which is still underway, on spontaneous dyeing plants and their use in coloring regional popular fabrics. We have examined the plants still used in the following Italian regions:
- FRIULI, an alpine foothill and mountain area in Valcellina
- LAZIO, the Pontine archipelago and the Mediterranean Tyrrhenian sea
- SARDINIA, an area in the foothills of the Gennargentu mountain range
- ABRUZZO, a mountain area in the Gran Sasso e Monti della Laga Nature Preserve

The PROJECT'S GOAL: To preserve the tradition and culture of natural color, expand knowledge of its use in the dyeing of ancient textiles, document the existence and diffusion of dye color plants in Italy and to design, propose and facilitate itineraries linked to dye color plants, their historic and cultural tradition and their possible use in the present.
We have identified the value of this research in terms of the preservation of knowledge and values linked to handcrafted production, placed at risk by current processes of globalization and the possibility of creating new economic and employment resources that respect the environment.
The research is conducted through geologic and botanical surveys of the territory (measuring the presence of spontaneous and wild-cultivated dye color plants), surveys of textile products (dated between the early 17th and 18th centuries) and ethnographic research based on oral testimony and archive documentation.

RESULTS ACHIEVED: A mapping of the existing dye color species in Italy, the collection of systematic observations on the relationship between territory, plants and terrain, surveying the chromatic yield of selected species, the reacquisition of dyeing processes and the chromatic analysis of the ancient textile finds discovered in each area. The results have shed light on the importance of local species in the use of natural dyes in traditional clothing and fabric objects for festive use (ornaments for livestock, wall tapestries), together with a selection of several spontaneous species for cultivation (Rubia tinctorum, Reseda luteola, Isatis tinctoria) and the use of imported products (Haematoxylum campechianum, Caesalpinia Sappan, Dactylpius Coccus cacthi). The refinement of dyeing techniques in relation to local plants (such as the tannin-rich plants of Sardinia), as well as the acquisition of exotic dyeing techniques (such as printing with the "indiennes" technique on Friuli products) to enhance local textiles.
In any case, it is obvious that the use of natural dyes in local popular fabrics has been profoundly influenced by historical, economic, political, social and cultural factors everywhere.

TRADITIONAL NATURAL DYEING TECHNIQUES IN ANCIENT CHINA (until Tang dynasty 618-907)

by Dr (Ms) Bettina Zorn*, Ph D (Germany)
Curator and coordinator of the
Sino-German archaeological project at the
Roemisch-Germanisches Zentralmuseum Mainz

Little is known about ancient dyeing techniques of early historic Chinese periods and before, that means the time around unification in the 3.rd century B.C. (Qin and Han Dynasties). Direct sources like prescriptions and receipts are missing as well as indirect historical description of handicraftsmen or artisans' life.
But texts on historical records, e.g. on the capital of East Han Dynasty (25-220 A.D.), Luoyang, portray hidden social criticism by describing fields like a blue sea as far as the eye could see meaning that instead of growing cereals people planted blue dye for the bureaucrats's robes .
Commentaries on medical advices reveal that herbal medicine beside their therapeutical effect was a common used dye. Philosophical texts either of Taoist, Confucian or Buddhist nature show the preference of special colours and their symbolic meaning.
Scientific analysis on archaeological textiles and their approximately used dye in China started to be done recently and I like to focus on samples from the Famen Temple's Pagoda foundry (dating Tang dynasty 618- 907).

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* Bettina Zorn, Ph.D. studied prehistoric archaeology, sinology, biology and ethnology at the Albert-Ludwigs University, Germany, Basel University, Switzerland and Chinese Archaeology at the Peking University, PR China. She was teaching courses on Chinese Archaeology at Albert-Ludwigs University, on Chinese Anthropology at Vienna University, Austria. She is curator of the East Asian Department at the Museum of Ethnology Vienna, Austria and at the moment coordinator of the Sino-German archaeological project at the Roemisch-Germanisches Zentralmuseum Mainz.

THE MYTH OF INDIGO – A VANISHED ETHNOPLANT INDUSTRY OF TAIWAN

by Dr Jui-Tsung LEE*, Ph.D of Science (Taiwan, China)
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Abstract

In the mid-19th century indigo production was a prevailing industry in the Yangmingshan area of Taiwan. However, the industry soon died out as tea plantations flourished and took its place. The once prosperous cultivation of the indigo plant Strobilanthes flaccidifolius dwindled drastically, gradually shrinking in scale from north and northeast to south, being eventually cornered at Datun of the Peitou district. It was altogether abandoned about eighty years ago, leaving behind names of places of indigo production, such as Dingchinxue, Chonchinxue and Siachinxue, for us to catch a glimpse of its glory of the past.

Despite the extinction of indigo production, the plant has never really disappeared. It has slipped into oblivion for almost a century, though the plant is still growing along streams and brooks where it used to be planted, gently waiting to be rediscovered. Perhaps, with our efforts for more information and knowledge about this natural dyestuff, we can be sure that the story of indigo will be passed on, not only in the Yangmingshan area, but all over Taiwan.

Chin Xue is the name for the stone tanks used in northern Taiwan. It was usually set up in a set of two to four round tanks and a square tank. The former was for steeping leaves and the latter for draining water off. Because lots of water was needed in processing indigo, they were always built near brooks in the mountains. Today, a few sets of Chin Xue can still be found in the Yangmingshan area, though the production of natural indigo had stopped as synthetic indigo became popular in the early 20th century.

I began researching in the indigo industry of Taiwan in 1996. With the help of the Yangmingshan National park, a set of Chin Xue was restored in Datun natural park in July 2004, and a demonstration of the old method to produce indigo was performed. This unusual contact between the new generation and the old one has helped us understand more about the lives of our ancestors, and through it, we hope, we can sense the significance of the continuity of human cultures as well as our responsibility to keep them and pass them down into the future.

Key words: Ethnoplant industry, Assam indigo, indigo tanks, restoration of Chin Xue

I. Indigo dye stuff production and indigo dyeing industry

In the first half of the 17th century, Taiwan, under the Dutch rule, had had the Indigo plant introduced for producing the indigo dye stuff to be exported to Jakarta, Indonesia. Thereafter, through the shift of political regimes from Koxinga of the Ming dynasty to the Qing dynasty, the indigo dyeing industry had prospered steadfastly. Particularly so was in the late 19th century of 1874 to 1894, when the exports of mud indigo dye stuff to China's Xiamen, Fuzhou, Ningpo, Shanghai and so forth were many a time over 10 thousand tons. Indigo dye was ranked as the most important export as rice, sugar, and tea.

In 1895, Taiwan was ceded to Japan. During the Meiji rein under the Japanese rule, from 1895 to 1912, Taiwan boasted a total of around 4,000 to 5,000 indigo dye stuff factories.

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* Jui-tsung Lee, Ph. D of Science - Associate Professor of Chung Yuan Christian University (Taiwan)
1994 starting the research on the old indigo industry of Taiwan, which came to an end about 80 years ago
1999 making public the traditional method of producing indigo dying stuff and natural fermentation vats
2000 publishing " The Myth of Indigo — A Vanished Ethnoplant Industry of Taiwan"
2003 responsible for the rebuilding of the traditional stone tanks for making indigo dye stuff
2005 being the editor in chief of "The Proceeding of the International Symposium on Indigo Dyeing Culture " and publishing " The Indigo Tanks of Taiwan "
2006 establishing Taiwan Indigo Dyeing Society (TIDS), working on an educational project to help make indigo dying culture take root again in Taiwan
Now, being the Director-general of TIDS and Planning for the first exhibition of indigo dying as fine art in Taiwan

During the Taisho rein, from 1912 to 1925, the number was around 3,000. From the Showa rein onward, the indigo dye stuff industry began to dwindle. On the first year of Showa reign, or 1926, there were 2,950, by the fourth year of the Showa reign, only 456 remained, and by the ninth year of the Showa reign, the number dropped to 257, the twelfth year of the Showa reign 75, and the 15th year of the Showa reign, or 1940, only 10 indigo dye stuff factories remained in Taiwan.

During the Meiji period, there were roughly 400 indigo dyeing works. During the Taisho period, there was still a scale of around 300 works. From the Showa period on, the indigo dyeing industry began to diminish. By the third year of the Showa reign, or 1928, it was reported a total of 201 works, which dropped down to a total of mere 73 by the 15th year of the Showa reign, or 1940.

The large and important indigo works were mainly located in the coastal cities of the western planes, such as Wanhwa, Dadaocheng, Lugang, Changhwa Yenshui, Tainan and so forth. As the cities were accessible to the update information and the residents there responded more swiftly to fashion and trend, the dyeing works located in these areas were sensitive to the foreign trade. They rose quickly but sometimes fell just as quickly. On the contrary, the dyeing works in the villages and townships located inland, such as Sansia, Shuangshi, Miaoli, Neipu, Meinong, though lacking the scale when compared to the seaport cities, were hindered by slower information reach, and less susceptible to the impact of foreign trade and trend. The dye stuff was still in production nearby, and demands of indigo dyed cotton cloth from the Hakka people were maintaining. Those minor indigo dyeing works were able to keep running until the every end. Nevertheless, it was unavoidable that Taiwan's natural indigo dyeing industry could not escape the eventual demise toward the end of World War Two.

II. The plants and the dyes

Taiwan's indigo plants are of three major kinds: one being the genius of *Strobilanthes*, classified under the scientific name of *Strobilanthes cusia* (Nees) Kuntze, or commonly referred to as Assam indigo, and the two being the genus of *Indigofera*, classified under the scientific names of *Indigofera tinctoria* L. and *Indigofera suffruticosa* Mill. *(= Indigofera anil* L.*),* which are referred to as wood indigo in Taiwanese. The wood indigo *I. tinctoria* L. was introducing during the period of the Dutch rule, which was commonly known as Ben-chin (the original indigo), whereas *I. suffruticosa* L. was introduced during the period of the Japanese rule, which was commonly known as Fang-chin (the foreign indigo). In addition, the synthetic dye also became commercially available in 1897.

The famous synthetic indigo dye produced by BASF was so well accepted by the dyeing works in the 20th century that it smashed almost the whole natural indigo dye market of Taiwan. The dye was sold under the label of "Indigo Pure", but the emblem of a black horse and a red lion of the brand earned it the name of "Horse and Lion Mark " among the dye merchants.

During the Taisho period, the BASF synthetic indigo dye was sold in three forms, powder, granule and cream. The powder synthetic dye commonly referred to as indigo powder was packed in iron cans. Each weighed 120lb. The granule synthetic indigo dye was called indigo resin, which was also held in cans, weighing differently 15kg, 30kg and 60kg. The dye in cream form was indigo cream, which was contained in wooden boxes, weighing 30kg each. Indigo powder is the least expensive and most widely used.

As to the natural indigo dye, that produced locally in Taiwan, Assam indigo dye and Wild indigo dye, was packed in bamboo baskets. Two baskets were carried a time by a man They weighed a total of 60kg.When the locally-produced indigo dye stuff was not enough for the market, and the price went up, the cheaper china-made dye stuff would be imported to meet the need. The Chinese indigo dye stuff was put in wooden barrels, each of which weighed 240kg. In the Japanese ruling time, a small amount of Japanese indigo dye was also imported, and the dye works tended to mix natural dye with synthetic one in various proportions to

prepare vats.

III. Mud indigo and Chin-xue

Da-chin is the local name for Assam indigo and Chin-xue is the stone tank built for processing the indigo plant to make dye. Chin-xue usually came in a set of huge stone-staked pools round or square in shape. The round one was for soaking and the square one was for precipitation. In Taiwan, stone tanks were often built along the small creeks in the northern mountainous areas. Today, remnants of indigo stone tanks can still be found upstream of the Pinglinkeng creek, Datonghu creek and Balien creek in the Yangmingshan National Park located in northern Taiwan.

Stone tanks were mostly intended for processing subtropical and tropical indigo plants. They could roughly be divided into two types. In type one, soaking and precipitation shared the same tank. In the other, they were done separately in different tanks. The former was adopted in China and Taiwan, and the latter was adopted in India, Bangladesh, and the West Indies Islands, the tanks of which were all square. What is special of Okinawa is that its traditional stone tanks fell under the type one, but now it has shifted its production method by adopting the other. As a whole, type one stone tanks were more suitable for operating in mountainous regions, but the amount of dye production was smaller The other type was more suitable for operating in plains, and the dye stuff produced was in quite a large amount. In Taiwan, only Assam indigo was processed in stone tanks. The other indigo was processed in wood barrels, and only one barrel was used for the whole procession.

(I) The locales of the stone tanks

1. A majority of the stone tanks are located in Taiwan's northern mountainous regions, with some in Puli of central Taiwan, and Meishan, Jiayi and Baihe, Tainan in southern Taiwan.
2. They tend to be situated in upstream of rivers and creeks with ample volumes of water running year-round.
3. There are clusters of the indigo plant cultivated nearby.
4. Running down from the origin of creeks and rivers, the stone tanks often scatter in a number of groups.

(II) The dimensions of the stone tanks

The tanks for soaking and agitation are round in shape, measuring 2.7-3m in diameter with a depth of around 90 ~ 120cm. Precipitation tanks are elongated, measuring approx. 3-5m in length, 2-3.6m in width and 150-165cm in depth. In short, precipitation tanks vary in size, but have to at least withstand the blended liquid poured from the soaking tanks.

(III) The variety of the stone tank set:

1. The Datonghu creek type --four rounds and one square
   This is the largest in scale, and only seen at the Datonghu creek (upstream of the Datun river).
2. The Balien creek type -- two rounds and one square
   This is the next in scale, which can be seen frequently along the Balien creek, Pinglinkeng creek, Beishih river Jingmei river and Keelung River.
3. The Ping Shih type -- one round and one square
   This is the smallest in scale, which is largely found scattering around the areas of Pingshi, Shihfen, Nuannuan and so on.

Generally speaking, the scale of the stone tank set was inextricably tied to that of the cultivation. The greater the cultivation was, the larger set of stone tanks was used. As a whole, the Balien creek type was most common. One hector of Assam indigo could be processed a time with this type of Chin-xue

(IV) The process of dye making

The indigo dye making process in Chin-xue can be sequentially divided into 9 stages: preparing, water injection, leaf removal, limestone adding, agitating, beating, water draining, pile removal, and scooping, in which agitating and beating are deemed most important. .

- 1.Preparing

A wooden block wrapped with cloth is used to block the soaking tank's outlet, and sticky clay is applied to seal off leakage before fresh indigo leaves are placed into the tank.

- 2.Water injection

Indigo leaves are held with stones or bamboo sticks and water is injected until it slightly immerses the twigs and leaves. During soaking time, the leaves need to be turned around once or twice so that they are evenly soaked.

- 3.Leaf removal

In roughly two days, the indigo plant leaves are scooped up, and tiny bits of indigo leaves are filtered. The surface of the liquid appears in a blue-green color.

- 4.Limestone adding

Limestone solution is poured into the tank, and the surface of the liquid will begin to change colors.

- 5.Agitating

All workers will join force in agitating the liquid. Upon adding the limestone solution, the liquid initially turns yellow green, which will undergo a series of color changes through constant agitation and eventually settle in a light brown hue. The liquid surface is first covered with bluish foams, which will gradually turn into white suds when the indigo pigments set.

- 6.Beating

A small amount of table oil is sprinkled onto the liquid surface which is then beaten with a bamboo broom. This removes the last indigo suds and foams from the liquid surface.

- 7.Water draining

Once the beating is complete, a stick is used to poke through the outlet from the outside of the soaking tank, and the mixed liquid will flow out quickly, gushing down through the water duct, and gathering in the precipitation tank. The color is first blue-white, and soon turns light blue, deep blue, and traces of indigo mud can be seen in the flowing liquid.

- 8.Block removal

Left to set for 12 hours to a day, the mud indigo has sunk down at the bottom of the tank, and the liquid above appears in light brown to dark brown. At this time, the first wood block is knocked off and removed from the hole for the upper clear liquid to flow out quickly. Sequentially, the blocks are removed, and all the water is drained. The mud indigo dye deposited can now be scooped out

- 9.Mud indigo scooping

The mud indigo at the bottom of the tank is scooped out using a long-handled scope, and placed into an indigo basket lined with coarse paper. Hung for a day and covered with taro leaves, the baskets are picked up, transported, and sold to indigo merchants.

(V) The Restoration of the Stone Tanks

In July 2004, The Yangmingshan National Park Management Office carried out a stone tank restoration plan at the Datun Natural Park. A set of stone tanks, comprised of two soaking tanks and one precipitation tank was rebuilt. The event was of great historic and humanity significance. From September to October, four "Stone tank restoration" activities were held, manifesting the traditional method of processing Assam indigo. With this restoration project, it is sure that this extraordinary skill of our ancestors will be passed down generation to generation. It will never again disappear from Taiwan.

Ⅳ. Indigo dyeing and the traditional dyeing works

Taiwan's traditional dyeing works often had a storefront, followed by kitchen and dining room, and in the rear was the factory for fabric dyeing and polishing. The upstairs were the bedrooms. Smaller dyeing works often owned two to three vats, one to two arc-shaped stones, and was with a staff of three to four. Whereas larger dyeing works often had up to six vats, four arc-shaped stones, and was with a staff of 10 to 20.

A dyeing works, after purchasing the dye, had to set up its own vats. The barrels used for indigo vats were made of camphor, measuring roughly the height of a person, which were raised about 10cm above the ground with stones put under the bottom to prevent it from being rotted by water. Each vat required 900 kg of water, and 90 kg of mud indigo dye, mixed with sugar solution and ash water according to the experience of the master dyer. The vat was deemed usable when there was blue flower appearing on the liquid surface. The fabric could then be dyed. The dyeing should be repeated until a dark blue color was achieved. The fabric was then starched, waxed, waiting for being polished.

Dyed fabric was usually favored with sheen on the surface. So, the most extraordinary scene in a dyeing works was the polishing of the dyed cotton cloth. To do the work, a special piece of equipment was needed, which contained an enormous arc-shaped stone, a roller and a stone plate. The arc-shaped stone was call footstone, the roller footstone heart and the plate footstone plate. Most dyeing works owned only one footstone with a small one weighing 120kg, or a larger one up to 180kg. The roller was made of wood, shaped something similar to a dough pin, measuring approx. 30cm in diameter, roughly 90cm in length, with a single handle of a bulging end for firm grips, and was most often fashioned out of mahogany for sustaining the pressure. The stone plate was made of either wood or stone, measuring approx. 120cm in length, over 90cm in width, with the center slightly recessed.

Dyed fabric polishing required two persons working together. The fabric was first wound around the roller, put upon the stone plate and the footstone was placed on top of it. One person, both hands holding the wood frame in front of him and the feet stepping on the two ears of the footstone, tilted his body side to side and rocked the roller to polish the fabric. The other person sat on a small stool with both hands holding onto the footstone to give an aid.

Generally speaking, one roll of fabric, roughly 8.1meters, requires 30 rounds of rocking. Each lasted 30-second, and 90cm of the fabric was polished a time. When the tilting person paused, the helper would apply an adequate amount of bee wax to the bottom of the footstone, and then both continued with the previous motion. The dyed fabric processed in this way felt strong and smooth with special sheen. Two persons worked together. Four rolls of fabric were polished per hour, or roughly thirty to forty rolls of fabric per day. On the contrary, If only one person did the job, only 7 rolls of fabric could be polished in a day. Inexpensive indigo dyed fabric was often polished just in the center part of the fabric, whereas quality goods are polished evenly and completely.

Ⅴ. The revival of Taiwan's indigo dyeing

In 1995, the National Taiwan Handicraft Research Center has pioneered cultivating the indigo plants of the genus *indigofera* and *Strobilanthes*, started reviving the traditional indigo dye production technique. However, only very few people were involved. In 1999, the Yangmingshan National Park staged an indigo dyeing workshop titled "The "Journey of indigo dyeing", which is considered the first indigo dyeing activity open to the public. It declared that the dying craft of indigo has finally been revived after disappearing for nearly a century. At the workshop, the dynamic power of the media has helped to unveil to all the people in Taiwan the mystic process of indigo soaking, agitating and precipitating. Between 1999 and 2002, the Yangmingshan National Park Management Office has successively staged quite a few indigo dyeing workshops, a two-day introductory program catering to the general public.

Starting in 2000, the Taiwan Handicraft Research Institute has begun offering an indigo dyeing course, which entails a 12-week, 300-hour learning, a long-term study course for those keen on becoming professionals. The participants come from local communities, hand-dyeing workshops, and faculty of relevant departments and schools. The trainees, upon concluding the program, have moved to form local organizations and community associations. Some community associates have been awarded with grants and encouraged to stage a 120-hour indigo dye study camp to train more indigo dyers. From 2002, there have been several farms and workshops that begin to cultivate the indigo plant, which bring about a stable source of small lot of indigo dye. From April to August 2005, an advanced indigo dyeing workshop has been given, totaling 560 hours, spanning over a five-month period. Indigo dyeing is gradually becoming part of the cultural activities in a number of villages and towns, a new category in community learning and basic teaching course at a few elementary schools. Furthermore, it is a new medium to the dyeing and weaving artists. It has made a new form of handicraft in Taiwan of infinite development potential.

Since 2002, an indigo dyeing festival has been held in Sansia every year. In August 2005, invitations have been extended to experts and scholars living abroad. The guests from Japan, Korea, the United States, Thailand, India, Bangladesh and those from Taiwan joined in Sansia to present their studies on indigo. In December 2005, the proceedings of that indigo dye international cultural symposium were published. In August 2006 at Sansia indigo dyeing festival, several indigo dyers of Japan were invited to demonstrate their wonderful skills. Most important of all, the renowned indigo scholar Jenny Balfour-Paul came to give a lecture on the world indigo. This was regarded generally as a great help to the development of local indigo dyeing industry and art. In the same year, the TIDS, the Taiwan Indigo Dyeing Society was established. It has aimed not only to promote the indigo dyeing culture in Taiwan but join the world in the effort of preserving and reviving this extraordinary human achievement.

As many industries fell into oblivion without being noticed, so was Taiwan's traditional indigo dyeing industry. The longer it has disappeared from us, the more efforts are required to bring it back. Since the revival of Taiwan's indigo dyeing industry that began in the late 1990s, there have been failures and successes. .Some have insisted on staying with the tradition, and others trying to explore the new possibilities In spite that the output of indigo plant cultivation in Taiwan remains limited, and those in the indigo dyeing trade are less experienced and mostly not professional enough, none of the difficulties will stop us. We are on the way to our aim, and are confident that the indigo dyeing culture of Taiwan will forever stay with us and the generations to come.

References

Balfour-Paul, Jenny

1998. Indigo, British Museum Press, London.

Blusse, L., M.E. van Opstall en Ts,ao Yung-ho (eds.)

1986. De Dagregisters van het kastell Zeelandia, Taiwan 1629-1622, "s-Gravenhage: M. Nijhoff.

Campbell, William

1987 (1903) . Formosa under the Dutch: Described from Contemporary Sources. London: Kegan Paul, Trench, Trubner&Co., Taipei. : SMC Publishing Inc.

Davidson, James W.

1903. The Island of Formosa, Past and Present. London: New York : Macmillan ; Yokohama : Kelly & Walsh.

Dodd, John

1888. Journal of A blockaded Resident in North Formosa 1884-1885, Hong Kong, Daily Press.

Jarman, Robert L. (ed.)

1997. Taiwan Political and Economic Reports 1861-1960, UK: Archive Editions Limited.

Lee, Jui-tsung, and Ling-hsiang Chen

2000. The Myth of Indigo-A Vanished Ethnoplant Industry of Taiwan, Yangmingshan National Park Press, Taipei.

Lee, Jui-tsung

2005. The Indigo Tanks of Taiwan, in Jui-tsung Lee (ed.) , *Proceedings of the International Symposium on Indigo Dyeing Culture*, pp.90-109. SMC Publishing Inc. Taipei.

Lee, Jui-tsung

2006.Traditional Dyeing Mills of Taiwan, Taiwan Natural Science 90 : 20-31.

Ma, Fen-mei

1999. The Making of Indigo–Taiwan's Indigo Dyeing Technique's System Spectrums and the Beauty of the Indigo Dyeing Craft, Taiwan Provincial Handicraft Industry Research Center.

Morse, Hosea Ballou

1910-18. International Relations of the Chinese Empire. 3 volumes. London and New York: by Longman and Green.

Morse, Hosea Ballou

1926-1929. The chronicles of the East India Company trading to China, 1635-1834. v.1–v. 5. Oxford :. Clarendon Press.

Shanghai Chinese Maritime Customs

1860-1945. Chinese Maritime Customs Publications.

The Taiwan Governor Office's Agricultural Test Site

1906. Crucial Taiwan Agriculture Survey Vol.2.

Tsai, Cheng-hao

2002. Development and Transformation : Indigo Industry in Taiwan, 17th to 19th Century., A Master Thesis of Department of History, National JIh Nan International University.

Yang, Han-lung

1916. A Survey on the Development of Local Indigo Dyeing Sites under the Taipei Prefectural Administration, Taiwan Agriculture Journal 110 : 48-62.

SESSION / SÉANCE / SESIÓN 7
ECONOMIC DEVELOPMENT AND MARKETING OF NATURAL DYES – CASE STUDIES
DÉVELOPPEMENT ÉCONOMIQUE ET COMMERCIALISATION DES TEINTURES NATURELLES – ÉTUDES DE CAS
DESARROLLO ECONÓMICO Y COMERCIALIZACIÓN DE TINTES NATURALES – ESTUDIO DE CASOS
09.11.2006

Chairperson / Présidente / Presidente : Ms Charllotte Kwon (Canada)

- Dr (Ms) Serife Atlihan (Turkey) and Dr Harald Böhmer (Germany), "Dobag – a natural dye project from Turkey (since 1981)" - "Dobag – un programme de développement des teintures naturelles en Turquie (depuis 1981)" - "Dobag – un programa sobre el desarrollo de los tintes naturales en Turquía (desde 1981)"

- Mr Eber Lopes Ferreira (Brazil), "Dyes production in Brazil" - "Production de teintures au Brésil" - "Producción de tintes en Brasil"

- Dr Kazuki Yamazaki (Japan), "Traditional dyeing techniques in Japan" - "Techniques de teinture traditionnelle au Japon" - "Técnicas de teñido tradicional en Japón"

- Ms Michele Wipplinger (USA), "20 years of development of natural dyes in the USA" - "20 ans de développement des teintures naturelles aux Etats-Unis" - "20 años de desarrollo de los tintes naturales en los Estados Unidos"

- Dr Stefano Panconesi (Italy), "Natural dyeing : trends in textile, Italy and Europe" / "Teintures naturelles : tendances de l'industrie textile, Italie et Europe" / "Tintes naturales : tendencias en textiles, Italia y Europa"

- Ms Noorjehan Bilgrami (Pakistan), "From the seeds of Sindh to the shores of Japan - the story of the indigo dye" - "Des graines de Sindh aux rivages du Japon – l'histoire de la teinture indigo" - "Desde la semilla en Sindh a las orillas del Japón – la historia del teñido al índigo"

The seventh session provided the elements for a discussion on the development of a branch of economy based on the production and uses of natural dyes. A series of "success stories", has been presented, each one with its own different scope and with its particular environment; they also served to illustrate some of the issues addressed in the last session.

La septième session était destinée à nourrir une discussion sur les facteurs du développement d'une future économie fondée sur la production et l'utilisation des teintures naturelles. Une série de "success stories", chacune à son échelle et dans son environnement propre, ont été présentées et ont mis en perspective certains des points abordés dans la dernière session.

La séptima sesión fue destinada a alimentar una discusión sobre los factores de una futura economía basada en la producción y utilización de los tintes naturales. Una serie de "experiencias exitosas", cada una en su escala y medio-ambiente propios, fue presentada y servía a poner en perspectiva algunos de los puntos abordados durante la última sesión.

THE DOBAG PROJECT IN TURKEY (SINCE 1981)

by Dr Harald Böhmer and Prof. Dr. Serife Atlihan
(Marmara University Istanbul, Faculty of Fine Arts)

The text is about the carpet weaving tradition in two specific areas in Turkey. You see in this map Istanbul, the Marmara see and Canakkale. Maybe some of you visited this area as tourists. But what you didn't see in there was Ayvacik and Yuntdag (Ill.1). When the people in those areas was full nomad, they moved up in the high mountains Turkish (Yayla) in May with their herds and come back to lower place in October for winter Turkish (Kishla). Last nomads settled about 60 to 70 years ago.

The people in those areas were full nomads. These people don't have any land for agriculture. The people in this village call themselves nomads, but don't migrate with camels, or live in tents anymore. They have houses. The older houses have only one room about 4x4 meters large (Ill.2). This room organized like a tent. It functions as living, working and sleeping space as well as kitchen (Ill.3).

They have sheep and goat herds. Their income is from their herds of sheep and goats. Even today some village shepherds still take their herds to the summer poster in the spring, but without their families (Ill.4).The life of the villagers is still very much formed by their nomadic tradition. First of all textiles, the weaving and the usage of textiles are very important to this tradition. The meaning of textiles is very effectively to the status of women in these areas. The women mostly weave carpets and kilims and are still using different kinds of their woven products in their daily household. This weaving tradition has been in existence for many centuries. They still keep the other traditions in their costume, in the kitchen, in wedding ceremony too. They use in their weaving, their traditional designs and learn to weave them, from their mothers (Ill.5). All girls have to weave their dowry pieces before their wedding. Certainly two elaborately -decorated sacks are most important dowry pieces of a dowry. Every girl must weave them in pairs by herself, without help a type of a marriage exam (Ill.6).

At the wedding all the dowry pieces and gifts are displayed in the house of the brides family. Gifts of clothing come from the grooms parents. The flat-weaves and rugs woven by the bride are displayed from the roof or piled on the two painted chests. The guests come to inspect the bride's dowry (Ill.7). Women's status in the villages is determined by their skills in spinning, weaving and knotting: and their status as weavers is also takes a high priority in stricter Islamic societies. This large quantity of carpets and flat-weaves will remain barely used, in the couple's house. They are reserved to be sold in case of need. Once a year in this area there is a big market, a fair, called Panayir. There, the women sell their carpets. There is also a small weekly market in the nearby small towns of those areas.

The people put their traditional designs on their textiles. One of the traditional designs on the carpets is in (Ill.8). This design is limited only to the Ayvacik region.The same design we can see on the embroidery on the traditional apron (Ill.9). I am personally not sure whether this is a transition from embroidered to carpet or visa versa. One of the traditional designs is called "turnali" in Ayvacik area. But Dr. Thompson called it "lotus design" (Ill. 10). The same design is on painting by the Italian Ghirlandio, there can be seen part of a lotus design detail of a 15th Century. This design has remained essentially the same over 500 years.

Some type designs in our area, which exists since 16th Century. They are placed in paintings of the German painter Hans Holbein.

The carpet in illustration 11 is 140 years old. But its design is from 16th Century and it is one of the so called Holbein designs. Girls are weaving carpets with the same design for their dowry (Ill.12).
The carpets, which are older than 100 years are mostly made with natural dyes. Their appearance is very tempting because they are made of natural dyes. The carpet in illustration 13 has very pale

colors. You can see on this carpet, only the blue, because the blue is indigo. The other colors are synthetic. The synthetic colors have totally faded; this carpet was made about 85 years ago. Synthetic dyes were discovered about 140 years ago, that means, 4 generations ago. These cheap dyes were exported from Europe to the whole world and replaced the natural dyes very rapidly, even in the most isolated villages in Turkey. Natural dyes had slowly disappeared from that time until very recently. At the same time, for various reasons, the carpet market was destroyed at the beginning of the 20th Century.

The carpet in illustration 14 is made with synthetic colors. In the upper left corner the red has run into the white because of water or moisture. Before 25 years ago the carpets were coarsely woven, vastly over simplified, and the color palette was very limited. In that time there were mobile dyers, who dyed the wool yarn with aniline dyes for carpets in the areas (Ill.15). These colors don't last in the sun or in water. But the designs were and are very traditional; the women have been weaving this pattern for more than 200 years for their own household.
The carpet in illustration 16 is woven with natural dyed wool. The colors are very harmonic each other. Until today the people did not give up using their traditional designs, materials and techniques. But using synthetic colors destroyed the quality of carpets. Their appearance was very appealing.

This use of synthetic colors has been stopped in the DOBAG Project in Yuntdag and Ayvacik since 1981. DOBAG is a acronym of "Dogal Boya Arastirma Gelistirme Projesi" in English "Natural Dyes Research and Development Project". The purpose of the DOBAG project is **to revitalize Anatolian village carpet weaving by reestablishing the earlier craft of using natural dyes and using original local designs** (Ill. 10.11.16). That means the DOBAG Project brought the renewal of textile tradition.

The DOBAG project was establish in 1981 and began to work in two pilot projects with different cooperatives, with a total membership of 300 families. The project is in the direct responsibility of the Faculty of Fine Arts of the Marmara University, Istanbul. Most of weavers had forgotten how to use natural colors for a long time before the DOBAG project started. How could recipes be found for natural dyeing? The dyed wool from old carpets
and other textiles were analyzed by the process of thin-layer chromatography. It allowed particles of fibers from antique textiles to be examined without damaging the fabric. You can read more about this in June Anderson's book. Titled: Return To tradition: The revitalization of Turkish Village Carpets and in the book KOEKBOYA written by Dr. Boehmer. There is a laboratory in the Faculty of fine Arts of the Marmara University in Istanbul. Dr. Boehmer and two colleagues are analyzing the colors of old and new carpets and other textiles. Dr. Boehmer is a biologist and chemist. His two colleagues Prof. Dr. Nevin Enez and Lecturer Dr. recap Karadag in the laboratory are chemical engineers. Before 1981 Dr. Boehmer discovered which dye plants gave the long lasting colors in antique carpets and kilims. With this knowledge he and his colleagues started to give dye courses to weavers in the villages in Ayvacik and Yuntdag areas.

After DOBAG started the young boys are collecting chamomile (Ill.17). The yellow here is dyed with chamomile (Ill.18). The weavers in the DOBAG project can dye the wool themselves for carpet weaving.

The madder root is used for the red color and its variations (Ill. 19). It can be grow about one cm. thick. You can find it in nature as a wild plant. With madder dyed wool in illustration 20.
The madder must be ground with a home made stone mill before using.
The weavers like the natural colored yarns and made balls and put them in baskets before to start for weaving (Ill.21).

The carpet weaving does not start with natural dying. First of all it starts with shearing wool from sheep, sorting and washing. After washing wool fibers are opened by hand to make combing easier. Carding or combing is done by hand with simple local made wool comb. The spinning is also done by hand with a drop-spindle. The hand drove spinning wheel is also used for spinning

and twisting as well (Ill.22). Because the wheel can spin four times more wool than the drop-spindle, in same amount of time. Wool carding and spinning are mostly the work for elderly women. After the spinning and dying process the weaver can start to weave. Some time for large carpets essentially many weavers must work together and help each other to make the work easy. All of the women in the DOBAG project weave their carpets at home. There is no fixed time for working and they will be paid for each knot. After finishing the carpet will be washed with cold water and without using chemicals.

The weavers in the DOBAG project are very proud of their carpets and like to show them like in the picture (Ill.23). This carpet in the illustration 23 was woven for the British Museum of London in 1989. It measures 27 square meters (14 x 22 feet). It took 8 weavers, 4 months to weave it. After carpets are washed and dried the fringes must be braided. The women braid the fringes to make the carpets last longer.

The University staff does the quality control and registers all the rugs that have attained the pre-established standards (Ill.24). DOBAG carpets are made using local, traditional designs.
It is important at this point to record the details of completion, of the finished carpet. From the Faculty of Fine Arts each carpet gets information (Ill.25). We register district, village, and weaver, number of knots, dimensions, and guarantee number. Each woman weaves her initials into the carpet like Asiye Aktas on the picture. She has woven this carpet and has written her initials ‘A A’. The price of a carpet depends on the number of knots in the whole carpet. Maybe you can try to count them yourself. The woman who has made a carpet is paid per knot. From the Faculty all rugs which have leather guarantee tag authenticates its origin. On this tag is said “A traditional hand woven Turkish village rug dyed with natural dyes”. Each registered piece is also photographed.

We from the University make known this project to other countries at conferences, in magazines and through lectures. On various occasions we invite people to the villages, who include Academies to carpet dealers. We serve them food like in the picture 26. We had an exhibition of DOBAG carpets in 1987 in the World Bank in Washington DC. We organize DOBAG Symposiums every 5 years since starting the project.

Me (Serife Atlihan) as a faculty member of the Fine Arts Department at Marmara University, I have worked on this project since January 1983 in the Ayvacik and Yuntdag areas.

As an adviser I have witnessed the success of the Project in bringing the standards of the rug production to increasingly higher levels. This success can be attributed to many aspects which include the weavers’ talents and hard work; constant input and support from the University: and good relationships between the cooperatives and the international buyers.

All the DOBAG weavers are member of their own cooperative. Once a year there are general meetings of the cooperatives (Ill.27). At this meeting the members discuss their problems and their future. The guests are selecting the best carpets. Cooperatives give a prize to the best weavers. At the meeting the weaver can give her idea and ask questions. Before DOBAG Project these view could only be a dream. Because the women did not have self confidence before the DOBAG started. In the framework of the DOBAG PROJECT THE WEAVERS FEEL THEY ARE IMPORTANT AND THEY HAVE GAINED MORE SELF CONFIDENCE AND A MORE COMFORTABLE LIFE THAN BEFORE. Most of the weavers in those areas who are used to weaving carpets want to become members of the cooperatives and the DOBAG Projects.

A family is happy when a baby daughter is born, unlike before the DOBAG project, when they always wished to get a baby son. Many of the girls may become well respected carpet producers when they grow up.

Weaving is generally women’s work in those areas. Some times a few boys try to learn it (Ill.28). The men have also their business. They are building houses, bringing firewood, looking after the animals, and helping weavers to prepare material for the weaving. They all are better off than before DOBAG, because they have market for their productions. In last two years DOBAG market is

getting slower because of economic problems all over the world and changing fashions of furniture etc. Existing of most projects is depending on the market. Market affects the economy, economy affects the weavers. Otherwise there is no problem find material and persons. I wish them success in their work.

DYES PRODUCTION IN BRAZIL

by Mr Eber Lopes Ferreira[*] (Brazil)
Textile designer

1. Abstract of presentation

Brazilian traditional Native Indians hold a vast knowledge in the use of natural dyes and pigments. These substances are used in many ways, on the body as decoration, as a way of discerning between social groups, sex & age, and universal ordination.

In Brazil, many dye plants are a part of the day to day of our communities, such as, urucu, jenipapo, saffron, nil and açaí.

The daily use of these natural dyes expresses the population´s ability to handle nature and extract from it, a multitude of colors applicable to all sorts of materials.

As result, the development of natural dyes extracted from Brazilian native flora, garners historical importance to the social, cultural and economic context of our country.

Natural dyes are used in the coloring of yarns, woven and knits, aligning fashion with ecology.

Brazilian Natural Dyes: Information and concept

Brazilian flora has a great variety of native plants rich in natural dyestuff. As we know, Brazil is very rich in tropical timber with colored heartwood. A significant part of this country timber stocks has been devastated without seizing the opportunity of generating knowledge about the use of this residues from disordered extractives. All over Amazon rainforest, in timber cutting areas, remains a huge quantity of discarded parts of trees; moreover, in sawmills, timber dust is burned instead of being used in the production of dyestuff for food, cosmetics, paper and textile industries.

Among native Brazilians, urucum and jenipapo natural dyes, when applied on the skin, reinforce identities and adorn ritual and everyday life artifacts. Many natural dyes used by traditional people, when extracted and applied in a industrial process, can be an important source of money to the communities involved, adding, at the same time, an environmental concept to the products in which they are applied.

In our society, handmade natural dyestuff was substituted by pollutant synthetic dyes produced in large scale. Recently, the industry, taking into account the increasing interest of civil society and non-governmental organizations in environmental questions and trying to keep pace with this new demand, is searching for new sources of color with low environmental impact that do not affect producers and consumers health.

ETNO Brazil trades Brazilian flora natural dyes produced from cultivated, reforested and sustainable extractive plants such as urucu, jenipapo and murici from Amazon Rainforest, turmeric and faveira from central plateau, alfafa, nil and acacia from South. They result from a clean extracting process, without pollutant metals or toxic residues, contributing to a better life quality to producers involved and creating a new alternative to consumers concerned with the preservation of the bio-cultural diversity of this country, an inherit age for future generations. ETNO Brazil Natural Dyes are based in principles of environmental and social responsibility towards rainforest traditional people and small family croppers from this country, providing economical sustainability and praising their cultures.

ETNO Brazil is an enterprise created to promote and trade Brazilian handicraft and popular art, seen as rich expressions of national cultural patrimony. ETNO contributes to the diffusion and valorization of popular traditions and customs that constitute the essence of artisan work. Provides consultancy in projects that produce, organize,

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[*] Eber Ferreira is a Textile Designer, Brazilian natural dyes specialist, botanical researcher and writer of the book " Brazilian Natural Dyes: a practical guide to plants dyeing". And currently works Research & Development Director to Coexis Project in Brazil.

qualify and trade handicraft and natural dyes, developing this work with many national institutions and production groups all over the country. One important project that is under course is the production and application of natural dyestuff with Brazilian rural communities that is under the responsibility of Eber Lopes Ferreira, research and development director and writer of the book " Brazilian Natural Dyes: a practical guide to plants dyeing".

THE COEXIS PROJECT

Through this project, COEXIS has developed a number of partnerships with producers of organic cotton and vegetable dye extracts in Brazil.

Small Brazilian producers and rural communities are offered the possibility of a sustainable business model by developing innovative applications in the use of environmentally friendly materials in the textile industry.

Aligning environmental awareness with technology, (and social responsibility) the project is contributing to the construction of a new concept in the use of dyeing stuff involved in the production of organic textiles. It is creating room for a new posture of responsible consumption, where waste and degradation yield to the sustainable use of biodiversity and quality of life (for both producers and consumers).

The practical result is a home and apparel line of cotton products made of organic cotton dyed with vegetable dyeing stuff in a totally environmentally friendly process.

Once production is in course, recycling fabric waste will be the next step in order to offer consumers 100% Ecological, Organic and Recycled products.

THE PRODUCT

This project supports the creation of a 100% ecological, natural and organic product. The product is intended to provide comfort, pleasure and environmental awareness along with a better quality of life for both consumers and producers. The products will be produced with 100% organic Brazilian cotton, naturally dyed with vegetable dye extracts and treated with fabric softeners derived from vegetable oils and fats. Keeping in line with our concept and complementing our chain of activities, we will offer the best recycled cotton based on an innovative transformational concept created to maintain the original quality of the cotton plant.

Natural Dyes

Brazil´s traditional Native Indians hold a vast knowledge in the use of natural dyes and pigments. These substances are used in many ways, on the body as decoration, as a way of discerning between social groups, sex & age, and universal ordination.

In Brazil, many dye plants are a part of the day to day of our communities, such as, urucu, jenipapo, saffron, nil and açaí.

The daily use of these natural dyes expresses the population´s ability to handle nature and extract from it, a multitude of colors applicable to all sorts of materials.

As result, the development of natural dyes extracted from Brazil´s native flora, garners historical importance to the social, cultural and economic context of our country.

Natural dyes are used in the coloring of yarns, woven and knit, aligning fashion with ecology.

Organic Cotton

Cotton has long been a native plant of Brazil. In the beginning of the century, it was grown in the Northeast and Southeast regions of the country. With the onset of plagues and the development of other markets, the cultivation of pesticides free, handpicked cotton in a small scale became practically extinct, and was replaced by large scale, mechanical cultivation using agro-toxic products and defoliating agents such as, Agent Orange.

This initiative has partnered with small organic producers & associations in the northeast region of Paraná, in an attempt to motivate and bring added value to small properties and handpicking, resulting in an ecologically correct product.

Organic cotton is used in the production of yarns, knit and woven, aligning organic agriculture with consumer needs.

Recycled Fabrics

Another goal of this project is to minimize textile residue created throughout the production chain. With this in mind, we are developing recuperation and maximization techniques, and innovating in the creation of textile products and graphic materials, building a line of products where at least 50% of its origin comes from the use of these processes.

All our recycling projects promote better distribution of income through environmental education geared to generate productivity within sewing and apprentice/trade groups and/or cooperatives, resulting in social inclusion.

Technical Details

All treatments, natural dyes and processes used in our production were developed with the use of biodegradable products with very low environmental impact, eliminating the use of chlorine, and other harmful chemical products.

Furthermore, the identification of the recyclable quality of all of these solid materials, throughout the production chain, has generated the implementation of a recycling program for industrial solid waste in this area, reducing its effect on the environment.

TRADITIONAL PLANT-DYE TECHNIQUES OF JAPAN

by Dr Kazuki Yamazaki*, PhD (Japan)
Dyer, lecturer
Director, Kusaki Craft Studio

As you might imagine, in Japan we live with many industrial products made available to us through advanced technologies. But what is less known is that each region of Japan still passes down their traditional handicrafts such as textiles, woodworking, ceramics, and blacksmithing, furthermore, these handworks and handmade items have not lost their culture-based value in contemporary society. It thus follows that, from the perspectives of both technique and marketing, natural dye has great potential. In this presentation, I would like to first of all provide a quick overview of the Japanese textile history; introduce myself and what I have inherited as a lifework from my family; followed by explanation on typical Japanese plant dyes.

Looking back on the textile history of Japan, silk weaving began around the third century AD. In 603, a new class system, *The Twelve Level Cap and Rank System,* was established that indicated ranks by the color of silk caps worn by officials. The colors were assigned in the order of higher to lower ranks, purple (the highest and second), blue (third and fourth), red (fifth and sixth), yellow (seventh and eighth), white (ninth and tenth) and black (eleventh and twelfth).The dye techniques made it possible were brought to Japan from China and Korea. By the Nara period (710-784), highly advanced techniques were already available using *Lithospermum erythrorhizon*, *Polygonum tinctorium*, *Rubia akane*, *Carthamus tinctorius*, *Caesalpinia sappan, Phellodendron amurense* and *Miscanthus tinctorius*. These techniques were passed down and further developed in the Edo period (1603-1867), and various colors were produced by over-dyeing. There is an expression remaining from that period, *shiju haccha hyaku nezu* meaning there are as much as forty-eight browns and a hundred greys.

However, such customary and practical applications of natural dyeing declined drastically in the twentieth century, swept aside by synthetic dyes introduced from abroad. In 1929, my now-deceased grandfather, Akira Yamazaki made an effort to revive the tradition of hand-woven textiles using naturally dyed silk yarn with the aim of supporting the silk-raising farmers. He coined the term *kusaki-zome* -- literally meaning "plant-dye" -- to refer to the works and techniques of naturally dyed textiles. The results of his accomplishments were later published as a series of books in limited editions with photographs of the dye plants and the actual dye samples. The techniques of *kusaki-zome* were handed down to my father, Seiju Yamazaki, and he continued producing textiles for kimonos and *obi* sashes and presented them to the general public by means of exhibitions. His achievements were organized into books, some with actual dye samples. The distribution of his books greatly helped *kusaki-zome* gain general recognition.

I succeeded this family work in 1982, when the demand for traditional kimono was in a serious decline. In 1985, I started teaching in order to keep up the tradition, in hopes that I would be able to promote the understanding of different aspects of natural dyes and natural dyed products. I use traditional dye plants such as indigo and madder as well as seasonal plants such as plum or chestnut on yarn and fabric. I gain more and more students every year. It is fortunate to have such an abundance of interested individuals in Japan in order to allow us natural dye teachers to make a living.

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* Dyer. Lecturer. Holds seminars and workshops on plant dyes and its dye techniques. His artistic production includes *katazome* (resist-print) works and yarn dyeing for woven works. As the third-generation successor of the traditional dye revival movement initiated by his grandfather since 1929, he is aspired to promote the splendor of natural dyes. Holds a Ph.D in *Textile Technology* and continues to research the dye techniques of Japan from antiquity to modern times.

As for the market for natural dyed items, we have highly priced traditional items from different regions of Japan and everyday items such as silk shawls or cotton T-shirts. The practice of natural dyeing is also popular as a hobby, often incorporated in educational curricula for science and fine arts classes, not only for children but also in lifelong learning programs. I often considered the reasons why Japanese still prefer these colors amongst the endless variety of colors produced by synthetic dyes. It seems the four distinct seasons of our country with a diversity of colors plays a crucial part in such preference. By studying the traditional names given to specific colors, one can get an idea of the traditionally sensitive appreciation of colors in Japan.

For example, the names applied to certain shades of green include *moegi*, which means "newly grown leaves"; *hiwa-iro*, the color of the bird siskin *(Carduelis spinus); nae-iro,* the color of rice seedlings; *koke-iro,* the color of moss; *aodake-iro*, the color of young bamboo; *matsuba-iro*, the color of pine needles; and *uraha-yanagi*, the back side of willow leaves, which is pale whitish green. The color green covers a wide range: some are yellowish, some bluish, others are brownish, or whitish, and thus plant names are very suitable for making such distinctions. To expand, I will list a few names that have been given to various shades of blue. We have, in order of light to dark, *kamenozoki*, which means a quick look at the vat, referring to a very short dip in an indigo vat; *asagi*, onion sprout; *hana-iro*, the color of the *commelina* flower, which is a common flower in Japan; *chikusa-iro*, which refers to another name for the *commelina* flower; *hanada, yet* another name for the *commelina*; *fukaki hanada* (deep *commelina*); *kon*, a name that comes from China; *kachi-iro*, “pounded color”, which comes from the action of pounding the fabric before dyeing to achieve deep shades from indigo.

The following are some of the Japanese dye techniques:

Polygonum tinctorium (Indigo): Dried fermented leaves are used to prepare the vat. Within a week the vat is ready. The yarn is dipped and taken out to oxidize and then this process is repeated.

Caesalpinia sappan: The dyestuff is boiled and drained. The yarn and mordant is then soaked in the alum mordant bath.

Gardenia jasminoides: The dyestuff is boiled and the dye solution is strained. Mordant can be used if desired.

Carthamus tinctorius (safflower): The yellow pigment is washed off by soaking the flower petals overnight. Soak them in an alkaline solution to extract the red pigments. The petals are then removed and the solution neutralized. The yarn is immersed in this solution for dyeing.

Lithospermum erythrorhizon: Dyestuff is pounded gently after soaking overnight. Warm water is added and strained. The yarn is immersed in the dye bath, taken out and then soaked in a camellia ash bath; this process is repeated.

Now we will examine the plant dyed colors on the CIELAB chart. These dyed samples were made for the publication of my father’s book, *Kusaki-zome Shikimei jiten* (Encyclopedia of natural-dyed color names). A total of 432 sample fabrics (woven spun silk) were tested using a spectrophotometer. I grouped the colors into nine categories: purple, red, green, blue, yellow, and three categories of browns: alum mordanted, copper mordanted, and iron mordanted. And the last group covers grey to black. The chart depicts the resulted color range: the negative values of a* indicate green while positive values indicate magenta. Negative values of b* indicate blue and positive values indicate yellow. The higher value signifies that the chroma value is higher. The following are noteworthy remarks:

a) In *Lithospermum erythrorhizon* (murasaki) dyeing, Camellia ash mordant, which has been traditionally used in Japan, results in a bluer purple than one produced with an alum mordant. Another way of dyeing purple is by over-dyeing of indigo *(Polygonum Tinctorium)* and safflower *(Carthamus tinctorius)*.
b) Both *Curcuma longa* (turmeric) and *Phellodendron amurense* dye yellows which have high chroma values.
c) The bright orange was obtained by over-dyeing safflower *(Carthamus tinctorius)* and *Gardenia jasminoides.*

d) Different shades of blue can be obtained from the fermentation indigo vat *(Polygonum Tinctorium)*. The medium shade is the highest in the chroma value.
e) Various greens can be obtained from over-dyeing yellow on different shades of indigo.
f) Dark black can be obtained from over-dyeing with a mixture of dyestuff on indigo.

We can produce a wide range of different colors through plant dyeing. In addition to the traditional colors, we can continue to add new plants to the list of dyestuff and create countless over-dyeing combinations. The modern adaptations of traditional dye techniques are now being recognized in consideration of our health and for the natural environment. To list a few examples, the hair-dye products using a combination of domestically available plants have already been commercialized for beauty salons; and house paints made from natural dyes or pigments are once again being recognized.

As we have seen, natural dye still has much potential. Especially in this century when we are obliged to go forward while preserving the natural environment, natural dyes could play an important role. I am confident that natural dyes which have survived the long history in various parts of the world harmonizing with nature will be re-evaluated and popularized as commercial items.

20 YEARS OF DEVELOPMENT OF NATURAL DYES IN THE USA: INSPIRATIONS, INNOVATIONS AND TRENDS

The Revival of Natural Dyes in North America

by Ms Michele Wipplinger (USA), Earthues

Natural dyes in North America have their roots in the Native American culture from east to west, as well as the wealth of knowledge that the early settlers brought to this continent. As time progressed a healthy handcraft market developed among the middle class in the United States and Canada as a means of personal expression and as a livelihood supported through regional craft organizations; this strength of handmade/craft making in a modern context is unique to North America.

The following factors precipitated the growth in natural dyes in North America in the last few decades of the twentieth century and continue to inspire their longevity well into the 21st century in ever expanding sectors of the American economy including agriculture, medicine, food, textiles, culture, art, color and design.

1. Kohnstamm was the last company in the United States to complete testing on human subjects using a natural dye. The natural colorant was carmine (cochineal). After the testing demonstrated the safety of carmine (CI Natural Red #4 or Carmine # 40), it was recommended for use in food, drugs and cosmetics throughout the United States, Europe, Japan, etc. This dramatically increased the usage of cochineal globally beyond the indigenous textile market.

2. The peace movement of the 1960's-70's in North America inspired a desire to return to self sufficiency. This ushered in a return to a simpler lifestyle, including wild foraging, community gardening and the growing of natural dye plants for crafts.

3. A resurgence in hand weaving, spinning and dyeing in the United States supported the development of craft guilds: there are currently 1,100 weaving guilds registered by HGA (Handweavers Guild of America) and an estimated 40,000 weavers, many of whom dye their own fiber.

4. Increased social and political awareness of Native American conditions was followed by documentation of their traditional cultures including their medicinal plant knowledge, dye methods, craft processes and design motifs (The Denver Art Museum, Department of Indian Art). This inspired scholarly independent study of the Navajo, Plains Indians (e.g. Cree and Blackfoot) and the Pacific Coast first peoples (Chilkat, Tlingit and Tsimsian), et al.

5. Widespread travel and the collecting of cultural artifacts increased anecdotal information as well as formal documentation of the natural dyes of the Americas. Museum curators and scientists analyzed textiles that were being collected adding scientific knowledge and a new body of research regarding the chemistry of fibers and plant dyes (i.e. Max Saltzman, UCLA).

6. The market for organic herbal treatments developed in the late 1980's, continued through the 90's and into the 21st century inspired by ancient practices including Ayervedic and shamanistic treatments. This renewed interest in natural pigments and dyes in North America led to the development of organic body care products and the growth of such ecological companies as AVEDA, Origins and Esprit.

7. The development of organic cotton and wool, as well as the reseeding of colored cotton varieties in the 1990's supported the growth of natural dyes (the Organic Cotton Association originated during this period). This led to the development of natural dye extracts as a non-toxic alternative for small scale clothing production.

8. Improvements in application technology followed the development of natural dye extracts including non-toxic scouring agents that were substrate specific. Potassium aluminum sulfate was identified as the primary mordant for natural dyeing protein fibers and the combination of tannin and alum acetate as treatments for cotton. There was no need for the use of the more toxic metals copper, chrome or tin as color changers since the natural dye extracts could be mixed to achieve any color desired.

9. The color aesthetic and aromatic qualities that natural dyes imbue cloth, and the traditional cultural techniques and stories associated with natural dye processes became as important as the colors themselves.

10. Natural dyes, both plant materials and extracts, have a permanent place in our future as evidenced by the continued and diverse application in medicine, manufacturing, the leather industry, cosmetics, the craft market and within the organic trade association network. As well, the expanding growth of dye plants as a cash crop for industrial applications can ultimately support rural development projects globally.

Natural Colors of First Nations

The Northwest Coast Chilkat, Tlingit and Tsimsian Natural Dye Traditions

The tradition of spinning, natural dyeing and weaving among the Chilkat, Tlingit and Tsimsian Indians of the Pacific Northwest Coast were an inspiration for scholars and collectors of the early 1970's, especially Cheryl Samuel who has spent over 35 years researching and reviving the art of the Chilkat Dancing Blanket. She has written two books on the topic and was adopted into a Klukwan family of Chilkat Tlingit.

Cheryl, through her dedicated research, has shed light on the natural dye colors used in the Chilkat blankets and proposed possibilities for the dark green blue found in the newer blankets. Now she continues to educate women and the younger generations of the Chilkat tribe to continue their traditions.

Traditional natural dyes used in the original Chilkat dancing blankets included the following:

1. **Black:** an initial infusion of hemlock bark and iron overdyed in a copper-urine solution.
2. **Blue-green:** an initial simmer in a bath of copper and urine followed by an overdye in Letharia vulpina ("wolf moss" lichen).
3. **Yellow:** Letharia vulpina is added to a water-urine bath, then simmered until the color develops a luminescent yellow caste.

New colors began to appear in the Chilkat dancing blankets as exposure to trade goods from Europe entered the new world. As early as the middle of the 19th century we began to see these changes. The traditional *blue-green* (indicated previously) became a distinctive *green-blue*.

Green-blue: this color has been reproduced by soaking blue European trade cloth in a boiling solution of urine and water until the blue dye seeps out into the solution. Then white wool is added to this bath and simmered (many hours) until it is dyed the characteristic Chilkat *green-blue*.

Among the Tlingit of the Northwest Coast there was the distinctive *dancing blanket* style as well as unique accessories such as the *"octopus"* bag, both of which were often naturally dyed if collected during the early 1800's. They were made from commercially woven broadcloth or worsted wool trade cloth imported from England, initially by the Jesuits and later by the fur traders. The Crow tribes of the Great Plains as well as the Metis tribes of Quebec used this European cloth. It is

referred to at different times as "*Stroud cloth*", "*saved list cloth*", *red Stroud*" or simply "*trade cloth*". Depending on the date of the cloth it could have been dyed red with madder, alizarin, or cochineal, and if blue, it could have been indigo or a synthetic dye.

One of the identifying characteristics of "*Stroud or trade cloth"* is the white selvedge on a red ground (or perhaps a blue ground depending on the dye). The selvedges were always kept white during the dyeing process. Since the edges of this trade cloth were discarded after dyeing (a style preference in Europe), it was much too expensive to waste the dye on the selvedges, so the weavers resisted them securely prior to dyeing. However, when this cloth was shipped to the Hudson Bay Company for sale to Native Americans the selvedges remained untrimmed and the woolen cloth was sold as is with the white selvedges used as a distinctive design element in dancing blankets, robes and other traditional textiles.

Plains Indians of the Yakima Plateau
Among the accoutrement that was part of the Plains Indians' daily gear was the *par fleche* (hide) storage bag. The geometric patterning was distinctively colored with a variety of pigments. It has become a highly valued trade item that has been collected and is well documented.

The colors and design of the *par fleche* bags have always been vibrant. There is an even distribution of yellow, green, red and blue colors which define the patterns on the bag. Although there are some variations in typical color variety some of the most commonly used colors are: ***Yellow:*** dried and ground animal gall bladders; ***Green:*** *Letharia vulpina* ("wolf moss") soaked in urine water infused with copper bits; ***Red:*** Chinese vermillion (imported from Europe in chunks or powder) mixed with hide glue; ***Blue:*** powdered *glauconite* or *celadonite* mixed with hide glue. If a ***black*** color was used it typically was made from *charred bones* with or without the addition of iron powder. Both the ***black*** **and** ***red*** colors were also used by the Haida Indians of the Northwest coast to paint cedar wood panels for storage boxes and totems.

Case study: Sara Natani, Navajo Weaver
During an interview with Sara Natani, renowned natural dyer, weaver and educator from the Navajo Nation, I recorded some of her natural dye recipes and words of advice. Sara shared the traditional methods of natural dyeing wool that she learned from her mother. She raises sheep ***(churro-merino cross)*** on her land and uses only this fiber in her rugs. Because the style of her weaving requires subtle colors (Two Grey Hills designs) she doesn't use a broad range of colors/dyes: ***black walnut***, ***Navajo tea, onion skins, rabbit brush*** and ***wild cherry bark*** all of which she gathers from the Navajo reservation. She takes advantage of simple variables to alter the final color of her dyed wool by collecting her plants from different places on the reservation (e.g. desert and mountains). The color results are subtle yet distinctive and work well for the Two Grey Hills style of rug weaving for which she is known.

Although ***cochineal*** and ***indigo*** are evident in Navajo weaving, it is traditionally reserved for chief's blankets as both of these dyes are quite expensive and not easily accessible to the Navajo craftswomen.

Among many things Sarah discussed the importance of the water source and its affect on the final color of her plant dyes. For example when she dyes with ***wild cherry bark*** using local spring water it typically yields a desaturated ***brown yellow*** (the mineral content of the spring water is changing the chemistry of both the mordant and the dye bath); however, when purified city water is used, vibrant ***mustard yellow*** is possible.

As well, she uses both ***crude alum*** which she finds around natural artesian wells on Navajo land, and ***pure alum*** she buys from commercial sources. She cites that ***onion skins*** will yield more of a greenish color with ***crude alum*** and a reddish- brown color with ***pure alum***.

Sometimes Sara increases the alkalinity of her dye bath to encourage the development of a desired color. She also takes advantage of variations in types of dye kettles: ***copper, aluminum or enameled*** to create different colors with the same dye (changing the value, brightness and hue).

She remains committed to the traditional Navajo way which she teaches throughout the United States and to the young Navajo on the reservation.

Yellow, Blue and Red…the North American Story

Osage
One of the Osage tribes made their homeland along the Red River Valley in southern Oklahoma and northern Texas where they reside to this day with more than 10,000 members. It is also the natural distribution of the Osage orange tree (*Maclura pomifera; family: Moraceae*) whose name was designated by early settlers based on their abundance in Osage tribal territory. The Osage crafted their bows and arrows from the heartwood of this tree: the wood is strong yet pliable and resistant to rot. It has a bright yellow bark and inner heartwood, and large furrowed fruit pods which color the ground with a gold tincture wherever they drop.

During the dust bowl era (19th and early 20th centuries) Osage trees were transplanted as windbreaks throughout the Midwestern United States to protect the farmland from erosion. They are relatively fast growing (12-14 years to reach maturity) with an invasive root system that extends well beyond 20 feet destroying the crops they originally were planted to protect. As a result they are either being culled in agricultural areas or selectively cut in traditional growing regions and used as a source of wood for turning art pieces, flooring and building. The sawdust from these processes is the source of the raw material for hand dyeing. Osage yields a strong golden color and is the most abundant yellow dye in the United States. It is lightfast on protein fibers but only moderately lightfast on cellulose.

Quercitron
Black Oak Bark (*Quercitron: Quercus velutina*) is the only other historically significant indigenous yellow dye of the United States. It has a high lightfast rating, significantly more than Osage, and yields a robust range of yellows from brilliant green-based to orange depending on the preparation. Quercitron has just recently become available with the growth in hand dyeing across all textile art forms, increasing the demand for strong lightfast plant-based yellow dyes. It is currently being selectively and sustainably hand collected from tree farms, then processed in small batches for this market.

A Perfect Blue
The story of blue is the story of modern American culture. Blue jeans are synonymous with Levi Strauss and the hardy work pants that were dyed with indigo during the California gold rush (1849), which was the beginning of the era of the bluing of the world. Generations of Americans, including miners, cowboys, James Dean and hip hop artists have adopted this work cloth as their distinctive uniform. Blue jeans have become a luxury item now selling for hundreds of dollars a pair depending on the design house, the type of indigo and the novelty dye processes used, including such outrageous features as the “bling” of rhinestones incorporated into the design.

During colonial times indigo plantations flourished in South Carolina. However, the modern story of indigo blue in the Americas has moved south to Oaxaca, Mexico where the re-establishment of traditional indigo *obrajes* in Juchitan was funded by Paul Hawken of Smith & Hawken (1995-1998). The making of indigo (*Indigofera tinctoria)* in Southern Mexico continues to this day providing a livelihood for artisans of this region.

The return of indigo to Oaxaca inspired the re-development of the traditional indigo culture in El Salvador (1999-2003) where it also flourished in colonial times**.** The current resurgence of indigo in this region is now providing us with traditional varieties of indigo that are unique in color and strength (*Indigofera guatemalensis*), as well as supporting income generation in extremely poor regions of Central America (now including Guatemala).

However, the ability to sustain indigo as a cash crop is in peril in these pockets of the world as the global price for indigo has plunged with the entrance of China as the major manufacturing country in the world. China can produce synthetic indigo for $0.50 per pound compared to the $40.00 per

pound that *Indigofera guatemalensis* sells for in El Salvador.

The price of natural indigo grown in the Americas will need to adjust according to the demands of dye houses in Europe and Japan, their primary markets. However, the vertical integration of localized creative product development with a high perceived value that is dyed with regional specialty indigo crops (i.e. *Indigofera guatemalensis*) by artisans has the potential to sustain itself.

Aztec Red: Cochineal (Carmine)
The story of cochineal is the history of Mexico from as early as 1000 BC; one of the earliest documented applications of cochineal in Oaxaca. When the Spanish invaded Mexico in 1519 Cortez was amazed at the brilliant red color he saw on the clothing and in the body decoration of the local people. In the Badeanus Manuscript the abundance of this scarlet red dye was symbolized as if weeping off of nopal cactus pads. Immediately it became an important export commodity. The Oaxaca valley and the Mixteca Alta regions of Oaxaca were the ancient growing sites for cochineal; with its re-introduction, cochineal production once again returns to one of its traditional sites, centered in the village of Santa Maria Coyotepec.

The ban in North America of synthetic red dyes as a food colorant energized the demand for cochineal globally. Once again Mexico, even with its small scale growing capacity, has access to these expanded markets. At its commercial height during the colonial era, cochineal plantations had no less than 50,000 cactus plants seeded per hectare of land. Their current production is modest compared to their past, yet vigorous under the guidance of Signor Ignacio Maria Coyotepec who pioneered the modern resurgence in cochineal growing. The carmine realized from this production is reserved for Mexican consumption primarily, and is used in foods, local drinks, drugs and cosmetics. As well, this increased production of cochineal has led to the re-establishment of artisan natural dye facilities in Teotitlan del Valle for handwoven tapestries and rugs.

Due to the FDA regulations, indigenous cochineal cooperatives have begun to flourish throughout the Americas, including Mexico, Ecuador, Guatemala and Peru. As a result of the increased demand for cochineal, Earthues has documented the social and economic conditions of the cochineal growers, including their standard of living and wages; parity is rare through the chain of growing, harvesting and production. However, some large scale producers create fair wage opportunities and healthful living conditions. More research needs to be conducted regarding the social and ecological ramifications of cochineal production as the demand increases worldwide.

Three cochineal congresses have been held in Mexico over the past decade. The most recent one was held November 13-17, 2006 in Morelia, Michoacan. There was a call for papers around the following themes: **1**. the history and culture of cochineal, its uses in art and artisan endeavors; **2**. agronomic methodology; **3**. further study of biology and taxonomy; **4**. advances in technology and industrialization; **5.** past, present and future markets; and **6.** legislative and regulatory standards.

For more information contact:
The organizing committee president: D.P. Rafael Leon G. Villacorta
Email: rleoncongreso@yahoo.com or congresograna2006@yahoo.com.mx
Website: http://es.geocities.com/congressograna2006

A Brief History of the Development and Application of Natural Dye Extracts in North America

The inspiration for the development of plant dye extracts at Earthues was born from the mentoring of Jean Dufor, the retired master dyer of the *Manufacture national des Gobelins,* Paris who shared his knowledge on making these extracts from garden plants. He encouraged this method as another creative design path for color mixing when immersion dyeing and for painting and printing on cloth.

In an effort to increase agricultural production in India, a Natural Products Development

Conference was held in Hyderabad in the early 1990's. The discussions that ensued contributed to the technological innovation that led to the creation of plant extracts for medicinal, commercial and cottage industry application. Earthues also participated in this discussion and tested many of the natural dye extracts that developed out of this conference, especially those from India.

During the 1990's commercial applications for natural dyes were developed including several fashion lines which featured colored cottons and natural dyes: Esprit, Aveda, Dosa & LL Bean. However, dye houses in the United States could not scale up economically and they encountered technical problems with depth of shade, light fastness and quality. As well, the mechanized processes in their earliest stages of development did not yield a suitable product: the type of yarns was not always appropriate and the color palette at that time was not extensive enough to sustain even a niche market.

The US consumer was unwilling to pay a premium price for an ecological, naturally dyed product in the 1990's; an omen for the future of the textile industry in North America which was a leading textile manufacturer in the 1980's. Currently most US textile and dye facilitates have moved to other countries.

In hindsight, this natural dye project was premature for the US market in the 1990's. Now in the 21st century the market is growing and natural dye extracts are being used in eco-certified dye facilities world wide whether in the arid landscape of Kenya or the European Union. Although the US large dye house model was not a success, it opened up opportunities for natural dye extract applications in European dye houses which have been successful on a large scale.

Plant extracts are now very successful. They offer an efficient ecological alternative to synthetic dyes. Plant-based extracts add product value in the hands of small-scale ecologically responsible dyers, ateliers and studios that embrace natural color variations and the mark of the hand. As well, the use of non-toxic mordanting methods and plant extracts is decreasing the toxic effects of large-scale leather producers. Finally, plant extracts are more cost effective than shipping large volumes of plant material for those who do not live where the dyestuff can be grown.

Finally, the introduction of plant dye extracts in secondary educational settings provides an alternative color model that is creative, non-toxic and integrative. Natural dyes have become part of the chemistry curriculum in the United States.

Conclusion

There is a renaissance in North America of designers using natural dyes, new substrates (organic cotton, bamboo, soy and corn), and artistic methods to create specialty clothing, accessories and yarns. These processes are time intensive using unique techniques that speak to nature and traditional memory.

The development of natural dyes in the modern Western world would not have been possible without the wisdom and generosity of the indigenous people who have shared their traditions and dedication to the craft of plant dyeing.

Please reference the websites at the end of this document for a partial listing of some of the individuals and cottage industries devoted to natural dyes in the United States and Canada.

Frank Connet www.connetart.com
Jane Porter www.alextex.com
Joan Morris www.dartmouth.edu
Jody McKenzie 877-625-9492
John Marshall www.johnmarshall.to

La Lana Wools www.lalanawools.com
Ocelot Clothing Company www.ocelotclothing.com
Pamela Feldman www.pamelafeldman.com
Rowland Ricketts www.rickettsindigo.com
Sarah Swett www.sarah-swett.com
Michele Wipplinger and Kathy Hattori, Earthues (info@earthues.com - www.earthues.com)

NATURAL DYING: TRENDS IN TEXTILE, ITALY AND EUROPE

by Dr Stefano Panconesi[*] (Italy)
Consultant in Natural Dyes and Ecological Textile

The textile industry in Italy and in Europe, in this last century, has seen more and more to grow the field of chemistry of dyeing and the fibres.

The crisis that for several reasons has invested the textile market, especially of the garments, from 2000 (two thousand) until now, had strike Europe and so the field of natural , become in tendency and have a great evolution

The natural and ecological textile were diffused at the beginning of the **years ' 70**, especially in some countries of the North Europe , and in the Hippy culture, characteristic of those years; then the tendency is remained, like chosen of life and not like fashion.

It has a stop until **years ' 90**, when a greater ecological conscience particularly in Europe, towards echo-compatible consumptions, has influenced also the textile industry and the fashion, after to have interested food and health fields. In the **years 2000** it become a really trend

During these years, it was born several private labels of ecological certification, that guarantee not only the product, but also the process with which they have been realizes the garments**.**

These labels and greater controls from part of the legislators, have made that , they were prohibits the heavy metals and the residual in drainage waters, even if natural dyes, in their regulation does not come very studied

Thanks to European financings and collaborations between University, Associations, Industries, etc are developed some plans, which they have tried to introduce cultivations of dyes plants**,** the rendered search of the better one and the quality of dyeing. We see some examples:

PRISCA 1992- 1997 CILESTRE 1996 - 2000
PIANTE TINTORIE 1997 – 2001 ARSIAL 1998 - 2000
ACTIVA 2004 CNA Prato CIA CNR-IBIMET NATURAL TEX 2006
IENICA 2000 - 2005 SPINDIGO 2001 – 2004
CEE AIR-CT-940981

Plants and therefore dyes , that in recent years have been mainly analyzed, transformed and commercialized in Europe , also for their hystorical value are: Reseda Luteola (Weld) for yellow, Robbia (Madder), for red , Indaco (Indigofera tinc) and Woad (Guado) (Isatis tinc) for blue.

During the years the European and Italian dyes plants **were used in many ways**: **until ’70** in whole type, especially spontaneous; **from ’90** was beginning the cultivation of these plants ; and in **the years 2000** when it used directly the dying as extract shape
Some firms cultivate to them for produced

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[*] Studied and degreed in Economy and Commerce, in Florence; he works from 1982 in the field of Natural Dyes as Consultant in technical application and Consultant in marketing about ecological textile and clothes. Collaboration with study and planning with Institutions and Universities in the field of Natural Dyes and Ecological, and with Eco Tex, Oeko-Tex Aiab about certification.

There are also others natural dyes that are used in other industrial fields like food or cosmetic, as for example: Walnut, Bixa, Logwood, Sandalwood, Cochineal, Spinach, Tannins etc
We haven't info about the quantity of natural dyes commercialized , that are sell or buy in Italy or in Europe because in the value is inside many raw material and some way to use . Also the legislation doesn't do a line to confine between natural and syntetic dyes

The TRENDS of the textile market regards two large traditions: **hi- tech,** supertechnological and the natural one. **The natural one**, is what it interests to us, and regards the fibres, the dyeing and the transformation. Initially many crude garments have been proposals, then, also under the push of the market, with the greater demand for dyes garment, an increase of the demand for echo-compatible dyes and natural dyes has been taken place

Some fields of the textile industry are interested in the use of the chemical dyes, like **underwear**, that being to contact with the skin and it provokes allergies; or the **apparel child,** or **the interior**, species for sheet or towels.

The Fashion instead is being interested to the natural one, for **a greater ecological conscience** of the consumers that were much more oriented to the use of natural products born from processes with less pollution
Also the **crisis of the textile market** that take to try alternatives and to change with high velocity in order to attract always new purchasers. Currently we are in a moment of great increasing interesting for the textile industries.

In this more and more difficult context, a fundamental point, is to make clarity on the natural dye and on dyeing , about theirs use, is towards the textile industry that towards the final consumer

For the textile industry:
- it does not pollute, ecological techniques and products are used , and it is easy the depuration
- dyes is and will be, available on the market, thanks to the plans and programs of cultivation of the dyes plants
- the fastness parameters must be interpret to you under a positive aspect that characterize the final manufactured article .
- the cost of dyeing will less with the increase of the production of this dyes and therefore it is not more a factor refraining

For the final consumer:
- to place label on the dyed article indicating the track and the "positive" property that characterize it
- introduce the article in the stores in an image context so as to value it
- to have a garment who lives with who wears it, and they reflect the philosophy of life

Just for the seen reasons, an important argument to face is also the "**MARKETING" of the product that** often is not sufficiently valued.
The first thing that an industrial, but also a craftsman, must do it is to define with precision, the market to which propose. Then the requirements of the customer must be interpreted, what it was trying. And finally, to join the product with a label, for the track of the product and in order to make to appreciate especially the natural dyes; they must be enriched with more possible information.

Examples of Italian companies are several that have produced echo collections with natural dyes, as the Superga shoes or the Malerba stockings, and then dresses and knitwear dyeing in pieces, in yarns or in garments and of which it is possible to see the photos in the poster that I have prepared.

Today new fibres like the **bamboo or nettle** are being experienced also, but the fibre that becomes very much important is the **bio cotton**. It is change the use of traditional one in high percentage
These fibres were dyed with natural colours.

Moreover a great interest cover the **hi- tech in the natural dye**, that is the possibility to be ecological, eco – friendly and at the some time, to use new mordants, new applicative technologies in order to give more use of natural colours in textile industry

Natural dyes do not want and it does not have to be substitutive of the chemical dye, but it must exist as alternative; it must however recover crafts and quality of the product that too much industrialization and globalization have cancelled

"the man not only thinks to cure itself and to feed itself with natural products, but he wants also to dress and living in a less and less polluted atmosphere"

FROM THE SEEDS OF SINDH TO THE SHORES OF JAPAN: THE STORY OF THE INDIGO DYE

by Ms Noorjehan Bilgrami (Pakistan)
Artist / Designer

Abstract

Indigo, *Nir*, the fabled dye of the subcontinent was known to the people of the Indus Valley Civilization, 5000 years ago. It grew abundantly along the banks of the River Indus. Its use has been documented, as has its status as one of the main commodities of export from Sindh to various parts of the world.

With the entry of the British into the subcontinent and the stranglehold established on trade and commerce by the colonizers, patterns of cultivation began to change. Soon, imported synthetic dyes began to take the place of natural dyes, and the cultivation of indigo dwindled by late 19th century.

When I began my research into natural dyes it was hard to find any trace of indigo cultivation. Eventually, in 1987, a farmer was located in a remote village near Multan who grew limited quantities of indigo. The process of dyeing with natural indigo was later initiated at my workshop, Koel, in Karachi.

This find eventually led to the introduction of a pilot project at Miani forest, Sindh, in 1998. This was an attempt to grow the natural indigo from scratch, and it proved successful. The Sindh Forest Department was a partner in this attempt to cultivate *Indigoferra Tinctoria* and extract the indigo dye through traditional means.

My research into the growth and use of natural indigo led me to Japan on a Japan Foundation Research Fellowship in 2001-02, led me to do a comparative study on the indigo, its cultivation and dyeing. This provided an opportunity to work with Jurgen Lehl, a renowned designer sensitive to the world of natural dyes and handloom textiles. Its integration and importance in the lives of Japanese people has led to a perfect balance between ‘the Grower’, ‘the Maker’ and ‘the User’.

Upon my return to the country, a line of handloom fabrics utilising natural dyes was developed in collaboration with Jurgen Lehl and this export initiative has continued to date. At the same time Koel continues to market natural dyes within the country and there is an increasing demand for these fabrics, which is providing an incentive to growers to revive the centuries old cultivation of Indigoferra Tinctoria.

The roles of the Grower, the Maker, the User and the Market are all inter-dependant, links in a chain that needs to be nurtured and strengthened.

SESSION / SÉANCE / SESIÓN 8
SYNERGIES FOR THE DEVELOPMENT OF NATURAL DYES:
THE ROLE OF GOVERNMENTS, NGOs, PRODUCERS, CONSUMERS
SYNERGIES POUR LE DÉVELOPPEMENT DES TEINTURES NATURELLES :
LE RÔLE DES GOUVERNEMENTS, DES ONGs,
DES PRODUCTEURS ET DES CONSOMMATEURS
SINERGIAS PARA EL DESARROLLO DE LOS TINTES NATURALES :
EL ROL DE LOS GOBIERNOS, LAS ONGs, LOS PRODUCTORES Y LOS CONSUMIDORES
09.11.2006

Chairperson / Président / Presidente :
Mr Edric Ong (Malaysia)

- Ms Annapurna Mamidipudi (India), "Locating the practice of Natural Dyes in new institutional frameworks: Producers *vis a vis* State and Market"- "Regroupement des pratiques de teinture naturelle dans de nouveaux cadres institutionnels : les producteurs face à l'Etat et au marché" - "Clasificación de las practicas de teñido natural en el nuevo marco institucional: los productores frente al estado y al mercado"

- Ms Anne de la Sayette (France), "*Couleurs de Plantes*: a company and a network for dyes and vegetable pigments in France " - "Couleurs de Plantes: une société et une filière de colorants et pigments végétaux en France" - "Colores de Plantas: una sociedad y una filial de colorantes y pigmentos vegetales en Francia"

- Ms Hisako Sumi (Japan) – "Protecting natural dye-plants and the traditional dyeing-technique in Japan" - "Protection des plantes tinctoriales et techniques traditionnelles de teinture au Japon" - "Protección de las plantas tintóreas y técnicas tradicionales de teñido en Japón"

- Ms Claudine Randriambololona (Madagascar), "Vegetable dyes in Madagascar", and presentation of a film by Ms Jacqueline Razaiarimanana (Madagascar) and Ms Andrée Éthève (France) : "Development of the natural dye network on two endangered richnesses : Lay Masaka and rafia fibre" / "La teinture végétale à Madagascar", et présentation d'un film par Mme Jacqueline Razaiarimanana (Madagascar) et Mme Andrée Éthève (France) : "Le développement de la filière teinture naturelle autour de deux richesses menacées : les Lay Masaka et la fibre raphia" – "Los tintes vegetales en Madagascar". Presentación de una película por la Sra. Jacqueline Razaiarimanana (Madagascar) Y la Sra. Andrée Éthève (Francia): El desarrollo del red del tinte natural acerca de dos riquezas amenazadas: los Lay Masaka y el rafia"

- Ms Cheryl Kolander (USA), "Standards and certification"- "Standards et certificats" - "Estándares y certificados »

The aims and prospects of the last session of the symposium have been clearly defined in the first lecture, presented by the Indian association Dastkar Andhra, with a widely acknowledged experience in the field. Several major actors in the development of various sectors of the production and uses of natural dyes contributed to this session, which leaded to the final discussion on the steps to be taken in order to protect natural dyes from falsifications and frauds and to their valorisation within the global market of consumers, since natural colorants undoubtedly constitute an emerging branch of the textile crafts and industries within the future economy of the 21st century, an economy that will inevitably be based on a new, responsible approach of the exploitation of natural renewable resources.

Les buts et perspectives de la dernière session du symposium, ont été très clairement définis dès le premier exposé, présenté par l'association indienne Dastkar Andhra, qui a une grande expérience dans ce domaine. Plusieurs acteurs importants du développement de différents secteurs de la filière des teintures naturelles étaient réunis dans cette session, qui a mené à une discussion finale sur les mesures à prendre pour protéger des fraudes et contrefaçons et valoriser auprès du marché global des consommateurs ce qui se présente comme une branche émergente de l'artisanat et de l'industrie textile dans l'économie - actuellement en devenir - du 21^{e} siècle ; économie qui sera inéluctablement fondée sur l'exploitation repensée des ressources naturelles renouvelables.

Los objetivos y perspectivas de la última sesión del congreso estaban claramente definidos a partir de la primera exposición, presentada por la asociación india Dastkar Andhra, que tiene una gran experiencia en este campo. Varios actores importantes del desarrollo de diferentes sectores de la rama de los tintes naturales fueron reunidos en esta sesión, la cual conducía a una discusión final en relación con las medidas a tomar para protegerse de fraudes e imitaciones y valorizar, en el mercado global de consumidores, lo que se presenta como una rama emergente de de la artesanía y de la industria textil en la economía del siglo 21 (actualmente en devenir), economía que ineluctablemente estará basada en una nueva manera de concebir la explotación de los recursos naturales renovables.

LOCATING THE PRACTICE OF NATURAL DYES IN NEW INSTITUTIONAL FRAMEWORKS: PRODUCERS VIS-À-VIS STATE AND MARKET

by Ms Annapurna Mamidipudi[*], Engineering graduate – Trustee of Dastkar Andhra and Ms Seemanthini Niranjana (Dastkar Andhra) (India)

Abstract

Natural Dyes – as technique and as knowledge form – assumes different significances depending on the contexts in which they are invoked. This paper is an attempt to examine the practice of natural dyeing in the contemporary world, tracing the breaks, continuities and reinventions that this has entailed. It will argue that traditionally, natural dyeing was a form of local knowledge, drawing on locally available resources, producers' skills that evolved in relation to the specificities of the region, and was firmly embedded in a market or a user context that was familiar to the producer. This changed dramatically over the last century. The devaluing of this knowledge system in the name of modern technologies saw a huge swing towards chemical dyeing. Not only did the practice and its local context die out, there were also major transformations in the markets and a huge gap between producer and final user.

There have been efforts to revive this skill over the last several decades, not only as technical knowledge but also by creating new products and contexts for their use. This paper will focus on two aspects crucial to this effort:

(a) Behind efforts at revival has been a concern with the loss of traditions and knowledge forms. Documentation and training have been immediate responses to this, but have we subjected the process and politics of these activities to any kind of scrutiny? For instance, how does an oral tradition [or tacit knowledge] get converted into textual knowledge and then reconverted into "practice"? Who are the 'agents' bearing this knowledge at each step? What happens at each level of translation, which knowledge and practice get legitimized and whose marginalized?

(b) How does the 'market' figure in this revival? There is a resurgence of natural dyes in the market and high premium is placed on such goods. How much of this is a passing fad for novelty, how much does the market know how to value the producer and the process? And how much of it is driven by a convoluted sense of adopting environment-friendly practices, without really seeing what it means in the context of production and the producer? Caught between market pulls and global environmental concerns, where do the specific contexts of the natural-dyes practitioner stand?

Given the breakdown of a number of linkages (between producer-user-knowledge-value), several intermediate spaces have been created where these functions will have to be done by different agents. Research, training, marketing, promotional activities, etc. are only some of these functions. A successful natural dyes practice today will require the building of a different kind of holistic context, one based on different kinds of partnerships between producer groups, researchers, NGOs, the state, the market and others. The paper will explore some of these innovative initiatives.

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[*] Ms Annapurna Mamidipudi: an Engineering graduate is a trustee of Dastkar Andhra, an NGO working with strengthening the handloom industry in Andhra Pradesh, established in 1988. Has co-ordinated the technical training program in natural dyes for craft groups in India and abroad since 1990. Her work with Dastkar Andhra has included setting up production delivery and market linkages for producer groups and co-operatives, and setting up of DAMA, the marketing wing of Dastkar Andhra which provides design, product development and marketing services to handloom weavers. Has worked as consultant in setting up the Indian School of Livelihood Promotion, a Ford Foundation supported educational institute for Livelihood Promotion of the poor.

COULEURS DE PLANTES : UNE SOCIÉTÉ ET UNE FILIÈRE DE COLORANTS ET PIGMENTS VÉGÉTAUX EN FRANCE

par Mme Anne Saby de la Sayette[*] (France)
Agronomist engineer, commercial manager of the French company « Couleurs de plantes »

La société Couleurs de Plantes créée en 2005 est issue des travaux de Recherche menée depuis 12 ans par un Centre de Recherche et Innovation.

GENESE DU PROJET

Le projet a tenu compte de trois points
Une demande du marché industriel français et européen a été identifiée dans des secteurs variés : cosmétique, textile, peinture qui manifestent un intérêt pour des produits naturels
D'autre part, des questions se posent sur la diversification de l'agriculture française et la production de cultures industrielles autres que alimentaires.
Enfin la culture de plantes tinctoriales a disparu en Europe. Certaines plantes et des savoirs faires ancestraux sont en cours de disparition. C'est une perte culturelle.

MISE EN PLACE D'UNE FILIERE AGRICOLE

Sélection et mise en culture expérimentale d'environ 150 plantes de climat tempéré. Un gros travail de recherche bibliographique a été effectué (beaucoup de documents du Moyen - âge notamment)
Expérimentations pour remettre au point les paramètres de culture (type d'implantation, opérations culturales notamment désherbages, mécanisation des opérations …)
Sélections des meilleurs provenances géographiques (ex : Réséda, Garance)
Mise au point de cahier des charges pour la production sur de grandes surfaces et mise en culture auprès d'un groupe d'une dizaine d'agriculteur en France Ouest.

MISE AU POINT DES TECHNIQUES D'EXTRACTIONS ET DE PRODUCTIONS

Mise au point en laboratoire puis transfert industriel auprès de deux sociétés. Trois gammes de produits ont été mises au point : des colorants pour la teinture (textile, papier, cheveux...) des pigments pour le secteur cosmétique, des pâtes pigmentaires pour la peinture et l'impression textile.
Pour un développement industriel, les difficultés sont

- La mise en place de productions agricoles mécanisées à coût modéré et respectueuses de l'environnement
- la reproductibilité des coloris d'où la mise en place de contrôle qualité.
- La réponse à des cahiers des charges industriels (solidités lumière, lavage …)
- Les aspects réglementaires et toxicologiques. Les colorants n'ont pas tous de code EINECS ou CAS. Certains n'ont jamais été testés sur le plan toxicologique.

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* A French agronomist engineer. She also did graduate in economy.
She has created a research center for horticulture crops and greenhouses production techniques (CRITT horticole). This center is recognized by the French ministry of research. She managed this center since 1989.
In 1997 she has initiated a Research and Development project on production of plant dyes and pigments. The objective at the origin was to produce natural pigments for the restoration of Middle-Age churches in France.
She is one of the joint holders of a new company: "Couleurs de Plantes". She now assumes both the general management of the research center and the commercial direction of Couleurs de Plantes on the west coast of France.

PRODUCTION INDUSTRIELLE DE COLORANTS ET PIGEMENTS VEGETAUX

La societé produit
- des extraits colorants sous forme de poudre, pour la teinture (soie, coton, lin, laine, bambou..), la cosmétique - 21 références
- des pigments finement broyés pour la peinture, les beaux arts, la cosmétique…. – 17 références
- des pâtes pigmentaires – 6 références

Nous mettons au point et produisons également des produits à façon pour des demandes spécifiques

Anne de la Sayette – agronomist engineer – commercial manager of the french company « Couleurs de Plantes ».
adlsayette@couleurs-de-plantes.com
www.couleurs-de-plantes.com

PRESENTATION ET RESUME EN ANGLAIS

Anne de la Sayette is a French agronomist engineer. She also did graduate in economy.
She has created a research center for horticulture crops and greenhouses production techniques (CRITT horticole). This center is recognized by the French ministry of research. She managed this center since 1989.
In 1997 she has initiated a Research and Development project on production of plant dyes and pigments. The objective at the origin was to produce natural pigments for the restoration of Middle-Age churches in France.
She is one of the joint holders of a new company: “Couleurs de Plantes”. She now assumes both the general management of the research center and the commercial direction of Couleurs de Plantes.

Résumé de la présentation en anglais

Couleurs de Plantes was born in 2005 after a 12-year R&D project managed by a Research and Innovation Center in Horticulture in Rochefort (17 - France).

In background of the project were three main reasons: demand of the European markets of cosmetics, textile, paintings; diversification of French agriculture; preservation of traditional know-how on natural dyes.
Almost ten years of field experiment were necessary to select plants adapted to our conditions and to define specifications for their cultivation. Our crops are now produced by our own network of farmers in the Western Coast of France.
Improved processes for the production of dye-extracts and plant pigments were carried-out at laboratory scale and transferred to our specialized industrial partners.
Our main customers and development projects are now in cosmetics, for natural make-up; textiles and paintings.
Works are in progress to fit industrial requirements on costs, reproducibility and specification of products, adaptation to processes (especially for the dye industry), international regulations, toxicology and environment.

PROTECTING NATURAL DYE-PLANTS AND THE TRADITIONAL DYEING-TECHNIQUE IN JAPAN: PROMOTION OF NATURAL DYES AS THE SUSTAINABLE NATURAL RESOURCES THROUGH EXPERT-NETWORKS

by Ms Hisako Sumi[*] (Japan)
Artist, President of NGO Earth Network,
General Secretary of Natural Dyes and Pigments Conference

Abstract

1. Japan has had a long history of natural dyes and pigments and their related techniques in her culture. We find ma variety of examples around us: fabrics of Japanese traditional Kimono dyed with indigo, madder etc.; the traditional pictures on scrolls and screens painted using natural pigments. However our lifestyles today has been changing rapidly in Japan, these natural dye and pigments were replaced so much by synthetic chemical dyes and paints produced in chemical industries. Then the natural resources of dyes and pigments such as native plants and shells and etc. have been exhausted and the relevant traditional techniques have become in dangers of extinction despite of tremendous efforts of a number of experts, craftsmen and artists.
Synthetic chemical dyes have been used around our life: dyeing clothes, painting building walls, cars, ships and many industrial constructs. However recent findings have shown that synthetic chemical dyes and paints have sometimes caused asthma or allergy to many people and organic chemicals containing in paints for interior-uses have polluted indoor air to make residential people sick as is called sick house syndrome. The traditional natural dyes and pigments have a potential of the alternatives.

2. I organized Earth Network to promote natural dyeing as NGO in 1994 and started Natural Dyes Conference for Environment from 1997. Earth Network consists of professional and non-professional members with a variety of talents, skills and backgrounds including chemists, dyers, painters, teachers, industrial designers and others. We work with Natural Dyes and Pigments Conference and hold a meeting every year, and learn scientific knowledge.

3. Making these dyes and pigments is an effective use of our natural resources. They also help in reducing the toxic effects of synthetic colours by avoiding allergy-inducing toxics, hormone

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[*]
1975 Studied Yuzenzome dyeing in Kyoto
1982 Learned sketching at Hiroshima Art Institute - Studied indigo dyeing in Hiroshima
2006 Enroll at Communicators in Science & Tecnology Education Program, Hokkaido University
Major Exhibitions
1984 First Exhibition in Sapporo, Japan
1991 [LA TERRE] , ESPACE JAPON in PARIS
1994 [L'Art De L'Indigo] , GALLERY KOUKI in PARIS, BENIYA Gallery in Tokyo
1999 [The Journey of Wind and Icon] , OKHRA in Roussillon, Provence FRANCE
Group Exhibitions
2000 [Natural Dyes] , OKHRA in Roussillon, Provence France
2001 ~ 2003 [Natural Dyes and Pigments and Paints] , GEIC in TOKYO JAPAN.
Plenary Lecture
1999 [Apt en Coulour] , in APT FRANCE
2006 [Natural color for children] in Tokyo/GEIC - [Natural Dyes in Hokkaido] in Sapporo, Otaru , Shyoudai-seminar
Awards
1983 Hokkaido Art Association Award
Hokkaido Foundation for The Promotion of Scientific and Industrial Technology
Grants
1989 Hokkaido Government Northern Life / Culture Promotional Scholarship
2000 Work Shop in France 1999 [The Journey of Wind and Icon]

disrupting chemicals and residual heavy metals waste. They are also a sustainable resource.

Earth Network aims to popularise the use of natural dyes and pigments though the following activities:

- Conservation of dye plants, shells and fibres throughout Japan.
- Workshops to demonstrate the cultivation and extraction of natural dyes and pigments.
- Formulating a database of native dye plants, shells and dyeing techniques.
- Producing natural paints and textbooks outlining the processes involved may reduce hypersensitivity problems with synthetic colours.

We received large subsidies for our activity from Japan Fund for Global Environment and Hokkaido Foundation for Cultural Activities in early activity from 1997 to 2003.

4. NGO Earth Network consists of eight regional offices with 40 members. Now, each office act to have many workshops for studying traditional dyeing in their area and making network for promoting natural dyes from north to south in Japan. The educational tool using natural dyes and pigments that we developed purchase by children and schools. It's increasing yearly. At least, my some photo-data will be published in science textbook for high schools approved by government for the 2008 school year.

5. I believe that our activities can be expanded to an international level. Research on natural dye plants, shells and insects should be continued world･wide.

I hope that this symposium will be the beginning of such an international movement.

LA TEINTURE VÉGÉTALE A MADAGASCAR

par Mme Claudine Randriambololona[*] (Madagascar)
Directeur de l'artisanat

Mesdames et Messieurs,

C'est un réel plaisir pour la délégation malgache de participer à ce Symposium sur les teintures naturelles.

Cette délégation est composée de 05 personnes dont 01 expert en teinture naturelle,01 technicienne en environnement ,02 artisans et de moi-même Directeur de l'artisanat au MICDSP.
Madagascar est un état insulaire dans l'Océan indien dont la surface est de 587 000 km carre et la population est 17 millions.

Il y a 1 800 000 d'artisans dont % dans la filière fibres végétales.

La richesse de la biodiversité à Madagascar génère des ressources naturelles exploitables pour l'artisanat, aussi bien d'origine végétale, qu'animale et minérale.

A- PROGRAMME GENERAL DE L'ETAT EN MATIERE D'ARTISANAT

Promouvoir le Partenariat entre l'Etat et le Secteur Privé dans les secteurs artisanat et industries manufacturières :
Organisation et structuration du secteur de l'Artisanat : Appui et renforcement des Chambres de Métiers, missions de sensibilisation et de formation des artisans à s'organiser, élaboration de la Politique de l'Artisanat, mise en place du registre des Métiers, missions de recensement et inventaire (progressif) . Promouvoir des vitrines de l'Artisanat : label de qualité : Informer les opérateurs sur les manifestations, informer les opérateurs sur les opportunités, former les opérateurs artisanaux sur les techniques et pratiques du commerce international, mener des actions de mise en relations commerciales et de partenariat, former le personnel d'encadrement
Prolongement de l'économie rurale vers l'économie industrielle :
Favoriser l'installation de producteurs de matières premières à des prix concurrentiel
Organiser l'artisanat comme complément de revenu : « un village, un produit »
Renforcer les systèmes de collecte et de regroupement et de stockage des produits

B- MADAGASCAR ACTION PLAN

Lancé à l'initiative du Président de la République, le MAP sert à faire un saut qualitatif grâce à un plan innovant sur cinq ans qui mobilisera le peuple Malgache ainsi que les partenaires internationaux.

Le pari est de doter de Madagascar d'une économie émergente avec une compétitivité maximisée vers 2020.

OBJECTIFS :
- Éradiquer la pauvreté extrême et la famine.
- Atteindre l'éducation primaire universelle.
- Promouvoir l'égalité des sexes et donner du pouvoir aux femmes.
- Réduire la mortalité infantile.
- Améliorer la santé maternelle
- Combattre le VIH/SIDA, la malaria, ainsi que d'autres maladies.

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[*] Formations : Management CBI Rotterdam - Gestion et Entreprenariat Madagascar
Directeur de l'artisanat depuis Octobre 2002, Ministère de l'Industrie, du Commerce et du Développement du Secteur Privé - Manager de l'entreprise Maison ID Art-Mony, Exportateur de broderies Haut de gamme jusqu'en Octobre 2002

- Assurer la durabilité environnementale
- Développer un partenariat global pour le développement.

ENGAGEMENTS
- BONNE GOUVERNANCE
  - TRANSFORMATION DE L'EDUCATION
  - SANTE ET PLANNING FAMILIAL
  - INFRASTRUCTURES
  - DEVELOPPEMENT RURAL
  - L'ECONOMIE ET LE SECTEUR PRIVE
  - L'ENVIRONNEMENT
  - LA SOLIDARITE NATIONALE

C- FIBRES VEGETALES ET ENVIRONNEMENT

Les fibres végétales, à l'exclusion du raphia (considéré comme « produit principal » des forêts), sont classées parmi les « produits accessoires » des espèces de flore des forêts. Il est obligatoire d'avoir un permis appelé « convention de ramassage » pour être autorisé a les ramasser.
La conformité à la législation en vigueur depuis la collecte à l'exportation doit être observée par tout exportateur afin qu'il obtienne « l'autorisation d'exportation » délivrée par la direction de la valorisation des ressources forestières du Ministère des Eaux et Forêts.
Madagascar a en effet ratifié la Convention sur le Commerce International des Espèces de Faune et de Flore Sauvages menacées d'extinction (CITES) en 1975. La dernière version a été signée le 15 novembre 2002 à Santiago du Chili.
Quant à l'exportation des espèces de flore non menacées d'extinction ou des produits de ces espèces, elle est réglementée hors CITES.
Toutefois, une demande d'autorisation de sortie doit être déposée auprès du Ministère des Eaux et Forêts.
Toute personne voulant exporter, réexporter ou importer les espèces réglementées sous CITES ou hors CITES, que ce soit à des fins scientifiques ou commerciales, doit appuyer son dossier par la facture
(d'achat) de ces produits et dans les 48 heures qui suivent, l'autorisation lui sera accordée à condition qu'elle soit agréée par ledit Ministère et que le produit en question ne présente aucune anomalie.

D- SITUATION DE LA FILIERE

Certaines filières comme la vannerie ont l'avantage d'avoir des circuits d'approvisionnement structurés qui pourraient faciliter la mise en place d'un système de gestion intégrée des ressources naturelles : à chaque fibre végétale correspondant à des localités où sont vendues les matières brutes, directement aux artisans ou aux intermédiaires. A tel point que des localités qui disposent d'une matière mais qui ne sont pas traditionnellement connue comme fournisseurs se retrouvent en dehors des circuits d'approvisionnement actuels.

Notons que parmi les principales filières de production de l'artisanat malgache la vannerie en constitue un taux de 23.1% et occupe 11% de l'ensemble de toutes les filières confondues

Les principaux pays de destination en exportation :
- Union Européenne
- Amérique
- Asie
- Océan Indien
- Afrique subsaharienne
- Europe hors UE
- Océanie
- Moyen Orient
- Afrique du Nord

Les fibres végétales, la soie ,le mohair sont vraisemblablement les matières premières utilisées dans un secteur séculaire de l'artisanat malgache car les produits servaient, en premier lieu, à la protection de l'homme contre les intempéries et à lui assurer un certain confort : des chapeaux pour se protéger du soleil, pour la décoration, des pièces tissés ou tressées pour se couvrir le corps en toute saison avant l'utilisation d'étoffes de fabrication étrangère. Ainsi, les fibres végétales sont présentes dans tout le pays car les plantes à fibres y poussent partout mais varient suivant les régions en fonction des conditions climatiques.

Quelques fibres utilisées traditionnellement en tant que matières de tissage

- Le raphia : qui pousse dans les provinces Nord, Nord Ouest, Est et Sud Est de Madagascar

. Le tissage des fibres sans mélange permet d'obtenir de la rabane pure. Le tissage mélangé avec du fil de soie donne un tissu appelé « JABO ». Le mélange des fibres de raphia avec des filaments d'étoffes donne une pièce de tissu aux trames de coton

- La fibre de Bananier, « SARIKA », renferme dans son écorce une fibre à tisser. Les fibres sont teintes
- Les écorces d'arbre
- Les Chanvre ou rongony
- Le Bambou est une matière végétale qui ne nécessite pas detraitement pour être utilisé.

LOCALISATION

- RAPHIA : Province de Mahajanga (Nord Ouest de Madagascar), Province de Toamasina (Côte Est de Madagascar)
- ZOZORO : Zone des hauts plateaux
- PENJY, SATRANA ou BADIKA, DARA, MANGARANA : Côte Est
- HAREFO, RATIN'AKONDRO : Hauts plateaux et Côte Est
- VERO, HAZONDRANO, AHIBANO : Hauts plateaux
- ARAVOLA, PAILLE de BLE : Antsirabe et sa Région
- ROSEAU : Fianarantsoa et Antananarivo

Concernant l'approvisionnement, 5% des artisans de la capitale s'approvisionnent en matières premières au marché, 17% auprès des producteurs et 3% chez les petits collecteurs.
Dans les provinces, ces taux sont de 38% (pour l'approvisionnement au marché), 38% auprès des producteurs et 6% chez les petits collecteurs.

Au niveau du stockage de matières premières seules 29% des artisans de la Capitale disposent d'un magasin de stockage contre 44% dans les provinces

Vue donc l'importance de l'existence et l'utilisation des fibres végétales dans notre pays il est d'une necessite absolue d'apporter de la valeur ajoutee entre autres la maitrise de la teinture naturelle

Conclusion

Notre environnement sera protégé et utilisé à bon escient. Notre croissance sera basée sur nos ressources naturelles uniques et sur la transformation de nos produits naturels.

Le peuple Malgache, tant en milieu rural qu'urbain, sera en bonne santé et bien éduqué. Ils seront des participants actifs au processus de développement.

En tant que Nation, nous allons honorer la multitude de cultures et de tradition de tout le Peuple de Madagascar. Nous serons fiers de notre pays et serons unis dans la Solidarité Nationale.

Mesdames et Messieurs, je vous remercie

LE DEVELOPPEMENT DE LA FILIERE TEINTURE NATURELLE AUTOUR DE DEUX RICHESSES MENACEES : LES LAY MASAKA ET LA FIBRE RAPHIA PAR DES ASSOCIATIONS ET ONG DONT LES PARCS NATIONAUX MADAGASCAR

par Mme Andrée Mathilde Ethève (France)
et Mme Jacqueline Razaiarimanana (Madagascar) *

Richesses naturelles et culturelles de Madagascar

Originalité et richesse naturelle de Madagascar :

L'île de Madagascar avec ses 594 000 Km^2 constitue un véritable microcontinent en raison de sa taille, de son climat et sa géologie, séparé de l'Afrique par le Canal de Mozambique. Cette séparation du continent africain et des autres fragments du Gondwana il y a près de 165 millions d'années a conduit à une biodiversité remarquable et permis un développement exceptionnel des formes endémiques de la faune et de la flore malgaches. En effet, dés la dislocation du Gondwana, la faune et la flore ont pu s'y développer sans encombre à l'abri de l'invasion des formes étrangères , en outre cet isolement insulaire a permis l'instauration d'un équilibre faunistique et floristique où la pression naturelle reste faible. Ainsi sur les 4 220 espèces d'arbres et de grands arbustes, présents à Madagascar, 96% sont endémiques, taux inégalé dans le monde. Une fois l'île isolée, sa faune et sa flore primitive ont pu évoluer en « vase clos » tout en se dispersant dans des niches écologiques très variées.

Malgré des conditions climatiques très variées, l'île présentait jadis un couvert forestier très important de l'ordre de 90%. Malheureusement cette couverture forestière a diminué progressivement et ne représente plus qu'environ 10% de la surface initiale, les 90% restant étant occupés par des formations secondaires comme les Savoka, les steppes et les savanes.

Par ailleurs la population malgache augmente rapidement, elle a doublé entre 1966 et 1993. Elle est avant tout rurale et a comme activité principale l'agriculture. Le taux de croissance de cette population rurale conjugué à une stagnation du pouvoir d'achat entraîne des pressions sur les terres et les forêts où le défrichement, les incendies de forêt et les feux de brousse visant à faire croître de jeunes repousses d'herbe pour le bétail sont des pratiques ancestrales pour l'occupation des sols à des fins agronomiques. Ces pratiques, bien que prohibées ou sévèrement règlementées sont encore largement répandues.

Dans ce contexte, la gestion d'une biodiversité particulièrement riche mais tout aussi menacée s'est imposée depuis longtemps déjà comme une préoccupation nationale qui nécessite une sensibilisation et une éducation de tous les acteurs concernés.

Dans la société traditionnelle, les valeurs sont transmises de génération en génération et les habitants des forêts entretiennent des relations quasi religieuses avec la nature avec des règles sociales contribuant ou non à la conservation de la biodiversité.

En accompagnement de ces valeurs traditionnelles et dans la perspective de valoriser la biodiversité, de nouvelles méthodes sont utilisées pour intégrer les communautés locales dans les actions entreprises. Des formes de sensibilisation sont élaborées qui intègrent les valeurs culturelles, condition de réussite des innovations à apporter. Les grands axes de ces actions de sensibilisation qui vont dans le sens des actions entreprises en faveur de la teinture naturelle sont :

- Un appui sur les associations de femmes, facteur de dynamisation.
- Un appui sur les valeurs culturelles avec des collectes de mémoire au niveau des procédés et plantes utilisées.

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Andrée Mathilde ETHEVE - Actionnaire de la société «TERRE- LA S.A.R.L. » - Présidente de la commission « Fibres végétales » de l'association Femmes Entrepreneurs de Mahajanga. Madagascar - Experte Textile Internationale (G.R.E.T. Fond Européen de Développement, O.N.U.D.I.)

Jacqueline RAZAIARIMANANA - Chercheuse pour le P.N.A.A.N.G.A.P. (Parc National Ankarafantsika-Association Nationale de Gestion des Aires Protégées.) - Chargée du suivi pour le Ministère de l'Environnement de Madagascar du projet « Raphia et teintures naturelles dans la région de Mahajanga »

- Pour la province de Majunga, un appui sur une fibre dont l'existence est menacée par une surexploitation : le raphia qui est une des richesses locales et est exporté brut à des prix très bas pour l'agriculteur récoltant.

Les plantes tinctoriales de madagascar :
Dés 1946, Raymond DECARY dans son Fascicule sur les Plantes et Animaux Utiles de Madagascar dressait une liste non exhaustive de végétaux susceptibles de donner des teintures solides sur différentes fibres .Cette liste était accompagnée de quelques annotations de teinture .De cette époque subsistent quelques tissus aux motifs complexes et raffinés qui témoignent d'un grand savoir-faire artisanal et d'une connaissance étendue des plantes utilisées. On y voit par exemple des tons de rouge qui vont disparaître de la palette par la suite et que nous n'avons pas encore réussi à refaire à ce jour.

Données culturelles et historiques
Il est difficile de dater la période où cette pratique de la teinture a commencé à péricliter , mais en 1981 alors que je faisais une recherche pour le Musée de l'Homme (Paris) sur les linceuls de soie sauvage que l'on nomme « lambamena » c'est à dire « tissus rouges », même loin dans les villages de brousse, la teinture naturelle n'était plus destinée qu'à ces tissus funéraires et pratiquée surtout au sud de la capitale à partir de Ambositra alors qu'aux environs de Antananarivo les lambamena étaient la plupart du temps de la couleur naturelle de la soie ou de la soie sauvage.
Cet usage funéraire faisait qu'il n'était pas utile de mordancer les coloris et qu'au contraire, les fibres étaient saturées de tanins ce qui pouvait avoir un effet d'embaumement sur les corps qu'ils enveloppaient.Les coloris que l'on voyait étaient en majorité des rouges marron tirés des écorces de « nato » (nom vernaculaire qui désigne une vingtaine au moins d'espèces différentes d'arbres), du noir obtenu avec de l'eucalyptus et de la boue ferrugineuse , des orangés provenant des racines de rubiacées et des verts qui déjà étaient chimiques..En milieu rural, l'usage de teintures naturelles pour la soie des linceuls (*lamba mena*) était encore vivant mais les coloris ne subissaient pas de mordançage ni de rinçage et n'avaient souvent aucune solidité au lavage.
Il semble cependant que la tradition de tissage d'ikat de raphia ait subsisté plus longtemps dans les régions reculées de l'Ambongo et du Boina, régions de la province de Mahajanga difficiles d'accés, surtout en saison des pluies .

Le raphia
Dans cette région et dans toute la province de Mahajanga pousse une belle qualité de raphia (**rofia en malgache).**
Le ***Raphia farinifera*** de la famille des Aracaceae est une espèce introduite qui s'est largement développée dans toutes les zones humides chaudes de l'île au point que Madagascar est maintenant le principal exportateur de la fibre qui en est extraite. C'est un grand palmier monocarpique, sans rejet, au tronc couvert par les bases persitantes des gaines, atteignant 20 m de haut .Ses feuilles sont composées, alternes, grandes, sont regroupées au sommet. Ce sont ces feuilles qui vont être exploitées pour extraire la fibre. Le bourgeon est coupée avant qu'il ne s'épanouisse, les folioles sont dégagées et coupées puis la partie épidermique en est extraite, c'est le raphia. Il est mis à sêcher au soleil puis conditionné en bottes qui seront vendues aux collecteurs locaux.
L'éloignement et l'inaccessibilité des zones principales de raphiaires font que les paysans sont tributaires des collecteurs qui n'hésitent pas à pénétrer loin en brousse pour accéder au raphia. Ces collecteurs sont souvent des commerçants des petites villes proches et une des pratiques communes est de ne payer que la moitié du prix du raphia, le reste étant pour les paysans un avoir sur les marchandises proposées dans les boutiques du collecteur. La région de Mahajanga exporte environ 2500 tonnes de raphia par an. Chaque tonne rapporte au petit paysan récoltant la somme de 350 Euros en moyenne. Molitié en argent et moitié en avoir sur des marchandises qui les tente mais dont ils n'ont pas toujours l'usage. Les paysans n'ont pas le choix de leurs acheteurs lorsqu'ils vivent dans des zones reculées. Ils ont déjà fait plusieurs jours de marche ou de charrette pour accéder aux points de collecte.

Le raphia est menacé :

. Les données du Ministère des Eaux et Forêts prévoient qu'au rythme actuel de coupe et d'exportation le raphia aura disparu dans dix ans. Le problème qui est posé est le coût de cette matière première, sous-évaluée, qui ne rapporte pratiquement rien aux paysans de base, et qui enrichit les intermédiaires et les revendeurs tout au long de la filière. La pression sur les raphiaires est de ce fait très forte car il faut que le paysan vende beaucoup de raphia pour gagner un minimum d'argent. Pour acheter un sac de riz il faut couper 100 kilos de raphia. On pourrait résumer la situation en notant que la totalité du raphia exportée en un an par le port de Majunga permet aux paysans d'acheter 25 000 sacs de riz. Chaque famille consomme environ un sac et demi de riz par mois soit 18 sacs par an. Le riz est l'aliment quasiment exclusif des familles rurales; il pousse dans les bas-fonds humides où il partage l'habitat des raphiaires, ce qui pousse les paysans à regarder placidement une raphiaire brûler car la rentabilité à l'hectare du riz est bien supèrieure à celle du raphia et il est directement consommable.

La région se mobilise :

Pour ce gain ridiculement bas au regard du nombre de paysans concernés va sans doute disparaître l'espèce Raphia, sous-évaluée et surexploitée . C'est donc autour de cette fibre menacée à court terme que se sont mobilisés, dans la région de Mahajanga, plusieurs entités associatives, publiques, gouvernementales et privées, avec comme fil directeur la pratique des teintures naturelles sur la fibre raphia.

Richesses propres à la province de Mahajanga et compétences locales

Les plantes, la couleur et les graphismes dans la vie de tous les jours :

Les plantes sont très présentes dans la vie quotidienne des malgaches qui de ce fait savent bien les identifier. Outre l'alimentation, l'usage le plus répandu en est la médecine traditionnelle ; l'écorce de Adabo (Ficus cocculifolia) est ici surnommée « bétadine gasy » pour ses vertus désinfectantes et, par tradition mais aussi par faute de liquidités, les gens font appel aux plantes pour les soins de la vie quotidienne. Tous les marchés ont de vastes étals de plantes médicinales et ce sont souvent les mêmes qui ont des vertus tinctoriales.

Présentes dans l'hygiène de vie et dans les traitements, les plantes le sont aussi dans le domaine de la beauté. En effet, les femmes de la province de Majunga ont l'habitude de se faire des masques de beauté à base d'écorces et de bois rapés : **les masonjoany** qui sont posés sur la peau du visage le matin et servent à la protéger du soleil. Orange, rouge ou jaune, ces masques posés en couche unie dans le sud de la province sont dessinés et ciselés dans le nord à l'instar des dessins au hénné dont les femmes d'origine indienne perpétuent la tradition sur la peau des mains et des pieds lors des fêtes et des cérémonies.

Ces mêmes personnes sont vêtues de tissus aux graphismes colorés, tissus légers de coton, commercialisés dans la région.Ils sont portés par les femmes en tant que vêtement enveloppants: les **lambaoany**, pour attacher les bébés sur le dos et comme voile qui protège du soleil.

La province de Majunga est très riche en fibres végétales : raphia, jute, coton, sisal, papyrus, racines de vétyver et autres. Le climat y est très sec pendant six mois, ceux de la récolte du raphia, entre mai et novembre, et le raphia collecté dans cette partie de l'île reste donc très clair contrairement à celui de la côte est de Madagascar très pluvieuse où l'humidité ambiante empêche la fibre de sêcher correctement, tâche la fibre et la rend impropre à la teinture.

Entre novembre et la fin du mois d'avril la saison des pluies avec d'abondantes averses permet un essor important de la végétation et c'est le moment où les savanes se couvrent d'indigotiers.

Malgré cette richesse potentielle il y a peu de pratique d'artisanat d'art dans la province de Mahajanga. Peut-être faut-il voir là l'influence du mode de vie traditionnel du peuple Sakalava, habitants historiques de cette région, éleveurs et nomades de la mer. Ils avaient développé un art funéraire et textile riche mais peu d'artisanat car ils s'encombraient peu d'objets à cause de leur mode de vie. A l'heure actuelle, la province de Mahajanga est peuplée par diverses ethnies de l'île, dont les Betsiléo qui viennent des hauts plateaux du centre de l'île et sont présents un peu partout dans la province. Les communautés Betsiléo sont connues pour maîtriser des savoir-faire dans le domaine artisanal et c'est donc autour des femmes de ces ethnies que se structurent formations et ateliers de transformation.

De la même façon, ce quasi désert de production artisanale locale, loin d'être un handicap s'avère un atout d'importance car il permet de développer plus facilement des actions de formation car les bailleurs de fonds et les autorités sont très réceptifs aux propositions de formation dans ce sens.
Les routes qui se construisent et désenclavent les zones rurales , la richesse et l'abondance des matières premières et la volonté manifestée montrent qu'à terme la province de Mahajanga pourrait développer les zones rurales autour d'un bel artisanat d'art.
Cet artisanat se développe en ce moment autour des compétences de personnes implantées dans la région et qui s'impliquent dans le développement rural, épaulées par différentes institutions et confortées par la présence de jeunes artistes vivant là et qui travaillent de façon contemporaine à partir de ce contexte et de cette inspiration traditionnelle.

Les Lay Masaka :
Comme il est noté plus haut, le royaume Sakalava, qui couvrait tout l'ouest de Madagascar a laissé un art riche et reconnu mondialement avec ses statues funéraires et avec un travail d'ikat chaîne sur raphia. Ces tissus fins teints selon la technique désignée par le termes « ikat » sont nommés ici « Lay Masaka « soit « moustiquaire cuite » Cette technique de l'ikat est pratiquée sur tout le pourtour de l'Océan Indien et il est probable que le peuple Sakalava en ait hérité de son passé de peuple de navigateurs.
Après avoir ourdi une nappe de fils continue, l'ouvrière, avec un fil de raphia ligature la chaîne en spires serrées et positionnées selon le motif à créer. Parfois ces motifs sont dissiminés sur la totalité du tissu, avec un jeu de symétrie au quart ou à la moitié du panneau, et parfois ce ne sont que des bandes qui sont ainsi travaillées, en alternance avec des bandes unies. Les couleurs qui entrent dans la composition des Lay Masaka sont des teintures végétales et minérales avec des tons de bleu d'indigotiers, fréquents dans la région, des rouges sourds d'écorces de palétuviers ou de ficus, travaillés avec des cendres, des marrons et des noirs obtenus avec de la boue ferrugineuse et des bains d'Eucalyptus,de Mantaly ou de Samborimaintso, des jaunes dorés de Harungana madagascariensis ou de Jacquier. Les dessins formés sont soit figuratifs, crocodiles, personnages, zébus, soit géométriques, formant des zig-zag ou des pavés de couleur.
Dans la région de Besalampy (250 Km au sud de la ville de Mahajanga) , les anciennes savent encore teindre et tisser ces ikat et il en est de même au sud de la ville de Maevatanana à Kandreho ville où fut implantée une petite fabrique de Lay Masaka jusque dans les années soixante. Les guides touristiques continuent de noter « qu'à 6 km au sud de Maevatanana, à Kandreho, on tisse encore des Lay Masaka » or Kandreho est à 200 km de Maevatana au bout d'une piste difficile avec plus de soixante rivières à traverser en saison des pluies et au centre d'une région farouche réputée pour ses bandits, les « dahalo ». A l'heure actuelle six femmes de Kandreho seulement ont pratiqué cet art dans le passé. Richesse artistique traditionnelle menacée par le fait que les femmes qui savent encore faire ce travail se sentent investies d'une mission de protection et de secret qui rend difficile le renouveau avec les jeunes générations.

Traditionnellement ces Lay Masaka avaient deux fonctions essentielles : ils servaient de rideau de mariage aux jeunes femmes qui l'avaient teint et tissé et lors des funérailles. Dans ces régions les morts sont mis sur une sorte de lit surélevé en plein air pendant deux ou trois jours et ils sont isolés de la vue par des rideaux, en rabane simple aujourd'hui, et en Lay Masaka autrefois. Ils valaient alors l'équivalent du prix d'un zébu. Un zébu vaut aujourd'hui autour de six fois le Salaire Mensuel Minimum.

Cet art est en train de disparaître avec les dernières femmes qui ont soit teint et tissé elles-mêmes des lay Masaka dans le passé soit vu faire leurs mères car seules les femmes pratiquaient cet art.

Les compétences locales et le potentiel associatif :

A Majunga s'est développée une association F.E.M. (Femmes Entrepreneurs de Mahajanga) investie dans la vie économique locale. La mission première que s'est donnée cette association est la formation des femmes en brousse pour leur permettre de travailler et d'améliorer ainsi leurs revenus, en premier lieu, dans un cadre associatif puis en petites entreprises avec un soutien à la formalisation et à la gestion. Les Femmes chef d'entreprise de F.E.M. servent, dans un premier temps, de relais commercial en achetant les produits des femmes ayant bénéficié des formations à des prix calculés à partir d'une étude de prix faite par un spécialiste, prix nettement supérieurs à ceux pratiqués sur le marché national.

Toutes les actions de formation s'appuient sur des associations de femmes vivant en milieu rural, parfois loin de toute voie de communication rapide, dans des zones de culture de raphia. Ces associations sont nombreuses et bien organisées. A l'heure actuelle, prés de 500 femmes sont concernées par la filière dans toute la province de Mahajanga.

Le financement de ces actions provient de sources diverses que l'on peut schématiser ainsi :

- Les associations et O.N.G. œuvrant dans le secteur de la protection de l'environnement.
- De grosses entreprises ayant des obligations de développement de proximité autour de leurs bases.
- Des entités gouvernementales ou affiliées comme le Plan de Soutien au Développement Rural (P.S.D.R.) ou les Groupements de Travail pour le Développement Rural (G.T.D.R.) financés par la Banque Mondiale ou les Nations Unies.

L'association F.E.M. fonctionne sans financements propres ; elle ne tire pas de bénéfice des actions de formation, fait intervenir des formatrices locales et a très peu de frais de fonctionnement. Tout le financement est donc transformé en formation ou en équipement ce qui optimise les résultats.

Les Plans Régionaux de Développement font de la transformation du raphia un objectif prioritaire sur les zones rurales et la province de Mahajanga a été proposée « province du raphia » dans un concept alliant chaque région à une matière première.

Place et engagement des « Parcs Nationaux Madagascar - ANGAP ».

Visite du Président de la République d'Allemagne au P.N. Ankarafantsika

A Madagascar des aires protégées (y inclus des parcs nationaux) ont été créés depuis longtemps, des mesures de conservation in situ (dans ces aires protégées et dans les forêts naturelles) font l'objet d'une stratégie de gestion à l'échelle nationale. La première aire protégée a été créée en 1927 et on en compte à l'heure actuelle 46 couvrant une superficie estimée à près de 1 754 000 ha dont deux portent le label UNESCO. Avec plus ou moins 3% de la superficie totale du pays, on est encore loin des 10% généralement considérés comme la surface minimum nécessaire pour assurer le maintien de la diversité biologique d'un pays.

Actuellement les Parcs Nationaux Madagascar - ANGAP (Association Nationale pour la Gestion des Aires Protégées), association reconnue d'utilité publique coordonne les activités de gestion des 46 Aires protégées. Son rôle double est de protéger un ensemble représentatif du patrimoine malgache et de veiller à la valorisation et à la conservation durable de ce réseau. Le Plan de Gestion du Réseau National des Aires protégées (PLANGRAP) de Madagascar permet d'atteindre cet objectif. Il spécifie pour chaque aire protégée les priorités d'action dans la recherche, la conservation et le suivi écologique, le développement et l'éducation des populations riveraines.

Le Parc National Ankarafantsika se situe sur la RN 4 dans la partie nord-ouest de Madagascar à une centaine de kilomètres de Mahajanga. C'est le 15° Parc National institué à Madagascar
Le Parc National Ankarafantsika est cofinancé par la Coopération Allemagne – Madagascar à travers Banque Allemande pour le Developpement (KFW).
Dans ses programmes pour la conservation et la protection de l'environnement et la lutte contre la pauvreté des villages des Zones d'Occupation Contrôlées et des Zones Périphériques, le PNA a mis en œuvre le principe de la gestion participative avec les populations riveraines à travers un appui au développement économique de ces villages.
Pour la réalisation des programmes liés à la transformation du raphia notamment par la teinture naturelle et le tissage, le PNA travaille en étroite collaboration avec l'Association FEM (Femmes Entrepreneurs de Mahajanga) et avec le PSDR (Programme de Soutien au Développement Rural)
Des plantations de raphia ont été mises en place par le P.N.A. (plantules et graines) Ainsi depuis 2002 environ 9000 plantules et 1500 graines ont été plantées dans la perspective d'augmenter chaque année la surface des raphiaires.

Présentation des plantes tinctoriales de la région de Mahajanga

Le Parc National Ankarafantsika contient plusieurs écosystèmes représentatifs de la région de Mahajanga :

- Des forêts sèches semi caducifoliées semi denses de type épineuses, riches en lémuriens et en reptiles endémiques ;
- Des savanes ponctuées d'îlots de recolonisation forestière, plus humides et utilisées pour le pâturage des zébus ;
- Des zones et formations humides : raphiaires, marais, bas-fonds, rivières et lacs (sacrés de par la présence de crocodiles) ;
- Des steppes dunaires sur sable blancs éoliens où l'on retrouve des Pachypodium spp. endémiques.

Chacun de ces écosystèmes contient des plantes spécifiques pouvant produire des effets de couleurs naturelles différentes selon la quantité, la période de traitement et le mode de coloration et dont la liste est en annexe. Parmi ces plantes sont privilégiées celles qui, très répandues, ne seront pas mises en danger ou celles qui comme le teck sont une sorte de peste végétale pour les zones où elles se développent..

Rappel des résultats attendus lors du lancement du projet :

1. Diminution et valorisation de la production du raphia.
2. Augmentation du revenu des populations riveraines (zones d'occupation contrôlée et zones périphériques des parcs et zones de brousse)
3. Formation de la population pour une activité durable et rentable
4. Organisation d'ateliers de transformation dans les villages
5. Organisation de la commercialisation
6. Contrôle de l'exploitation et de la gestion durable des ressources naturelles avec la population du PNA
7. Elaboration de documents méthodologiques et pédagogiques sur la transformation du raphia par la teinture naturelle.
8. Mise à profit du savoir-faire du PNA en matière de replantation de raphiaires et de plantes tinctoriales en zone périphérique du parc
9. Organisation d' un référentiel des espèces tinctoriales de la région (identité, endémicité...) pouvant servir de base à des projets de développement économique respectueux de l'environnement.

Pour atteindre ces objectifs de base, il faudra, à terme, parvenir à transformer une quantité suffisante de raphia produite dans les Z.O.C. (Zones d'Occupation Contrôlées) Cette année la quantité de raphia absorbée par le projet a été de prés de 5 tonnes ce qui est une bonne amorce dans la mesure où ces cinq tonnes ont été vendues soit sous forme de raphia affiné et teint soit sous forme de raphia teint soit sous forme de rabane produite par les métiers installés dans deux villages. La vente de ces produits représente l'équivalent de 30 tonnes de raphia brut. Lorsque les villageois auront atteint un bon niveau de compétences en tissage, et que le raphia ne sera vendu que sous forme de produit fini, la transformation de 5 tonnes de raphia génèrera un chiffre d'affaire équivalent à la vente de plus de 300 tonnes de raphia avant tout intermédiaire.

Le marché des produits en raphia est vaste, l'objectif à cinq ans pourrait être de transformer et de commercialiser plus de 50 tonnes de raphia. Majunga deviendrait une place de transformation en produits hauts de gamme mais ce mouvement doit être accompagné pour instaurer et préserver la qualité du travail fini et la capacité de production.

Synergie entre le développement de la filière teinture, la préservation de l'environnement et l'accroissement des revenus des populations villageoises.

Le programme mis en place vise à mettre l'élément humain au cœur de tout le processus engagé.

La population malgache augmente rapidement, elle est avant tout rurale . Le taux d'accroissement de la population et la stagnation du pouvoir d'achat en milieu rural entraînent de fortes pressions sur les terres. A l'image de la filière raphia brut, l'essentiel des revenus de l'exploitation des terres échappe aux ruraux qui vivent bien en deçà du Salaire Minimum, lequel est très faible (de l'ordre de 28 dollars par mois). Ce salaire minimum ne permet pas de nourrir une famille car un sac de riz coûte plus de 28 dollars.

Afin de permettre aux villageois de travailler teinture et tissage pendant toute l'année, c'est à dire pendant la saison de récolte du raphia (1° mai au 31 octobre) et pendant la période où la récolte est interdite est. organisée avec chacune des associations une forme de « banque de matière première » ce qui évite d'avoir à racheter au prix fort le raphia qui a été vendu aux collecteurs. Cette « banque » est gérée par les associations elles-mêmes.

Le rôle des Parcs Nationaux Madagascar –A.N.G.A.P. est à ce stade essentiel : dans les zones d'occupation contrôlées, la récolte n'est possible que pour les habitants du Parc , lesquels sont soumis à des règles strictes et contrôlées qui ne permettent pas aux collecteurs de dicter leur loi et régulent le développement du programme. Par ailleurs, le Parc National Ankarafantsika a de vastes zones de raphiaires à protéger et a un rôle pilote de vitrine et d'échantillonnage en matière de teinture naturelle.

D'autres Parcs naturels comme le Parc de la baie de Baly plus au sud ont rejoint le programme et développent les mêmes objectifs.

Les gains substantiels des villageois leur permettront de résister aux pressions économiques ce qui fera évoluer le marché. Pour cela il faut résolument se tourner vers une production de produits se situant dans le haut de gamme.

Les autres partenaires engagés dans cette filière teinture naturelle

Le Parc National TSIMBAZAZA PBZT dont le rôle est de fournir des informations scientifiques sur les plantes tinctoriales collabore aux missions organisées sur le parc et dans la province.

Aqualma partenaire privé, a implanté une gigantesque base d'élevage de crevettes à l'embouchure d'un fleuve à 200 km au sud de Mahajanga. Comme toute société de ce type Aqualma a des obligations de suivi d'impact environnemental et de développement communautaire à proximité de ses bases .Cette société a entrepris depuis quatre ans maintenant de développer une association de femmes héritières de la technique du « Lay Masaka » en payant toutes les formations, en organisant une « banque de matières premières » et en aidant à la commercialisation des produits finis.

Durrell Wild Life : est une O.N.G. anglaise investie dans la préservation des espèces animales et végétales menacées (tortues dans la baie de Baly, canards vers le lac Alaotro, etc.) Une partie des revenus des aires concernées est destinée au développement communautaire.

Le **PSDR** Boina (Programme de soutien au Développement Rural soutenu par la banque mondiale) s'investit sur deux villages du P.N.Ankarafantsika.

Le **GTDR** Betsiboka (Groupe de travail pour le développement rural, dépendant de la Primature) organise et soutient financièrement le renouveau du Lay Masaka sur la commune rurale de Kandreho et le développement de la teinture naturelle dans la région Betsiboka.

Le **PNUD** Programme de développement des Nations Unies finance plusieurs projets liés au programme.

Malgré tous les efforts et les partenaires investis dans ce projet, l'ensemble reste fragile en raison des pressions diverses sur le secteur forestier et sur le secteur artisanal de transformation.

Quelques plantes présentes sur le Parc National ANKARAFANTSIKA
et dans les environssusceptibles de fournir des colorants ou des éléments entrant dans le processus de fixation de la teinture

Nom malgache	Nom scientifique	Famille
Vatofosa	Achiranthes aspera	AMARANTHACEAE
Anampatsa	Amaranthus spinosus	AMARANTHACEAE
Sakoanala	Pourpatia silvatica Perrier	ANACARDIACEAE
Mahabibo kirazy	Anacardium occidentale	ANACARDIACEAE
Sakoana	Sclerocaria birrea	ANACARDIACEAE
Azafo	Pistia stratoide	ARACEAE
Voanio	Cocos nucifera	ARECACEAE
Akondro	Musa paradisiaca	ASTERACEAE
Matambelona	Commiphora aprevalii (Baill) Guillaumin	BURCERACEAE
Arofy	Commiphora brevicalix H.Perrier	BURCERACEAE
Filao	Casuarina equisetifolia	CASUARINACEAE
Taimborotsiloza	Chenopodium ambrosioides	CHENOPODIACEAEA
Norovoka	Acalypha reticulata	COMBRETACEAE
Harongana	Harongana madagascariensis	COMBRETACEAE
Amaninomby	Terminalia boivini	COMBRETACEAE
Talinala	Terminalia tropophylla Perrier	COMBRETACEAE
Atafana	Terminalia catapa	COMBRETACEAE
Mantalia	Terminalia mantaly	COMBRETACEAE
Karepoka	Phyllanthus erythroxyloides Mull.Arg.	EUPHORBIACEAE
Volomborona	Albizzia gummifera (Gmel) Sm	FABACEAE
Tainakanga	Albizzia jambertiana	FABACEAE
Fany, Bonara	Albizzia lebbeck	FABACEAE
Tsitohizambadimalaina	Albizzia polyphylla	FABACEAE
Aika, netsy	Indigofera tinctoria	FABACEAE
Aika, netsy	Indigofera kirkii Olivier	FABACEAE
Aika, netsy	Indigofera leucoclada Baker	FABACEAE
Kily	Tamarinus indica	FABACEAE
Moina, henné	Lawsonia inermis	LYTHRACEAE
Tsimahamasatsokina	Tristema virusianum Comm ;	MELASTOMATACEAE
	Dichatantherea crassinodis	MELASTOMACEAEA
Mantalazy	Acridocarpus excelsus A Juss	MALPIGHIACEAE
Finesy	Artocarpus heterophyllus	MORACEAE
Nonoka	Ficus soroceoides Baker	MORACEAE
Aviavy	Ficus megapoda Baker	MORACEAE
Mandresy	Ficus pachyclada Baker	MORACEAE
Kinina	Eucalyptus sp	MYRTHACEAE
Rotra	Eugenia emirnensis	MYRTHACEAE
Boribotry	Ludwigia diffusa	ONAGRACEAE
Katrafay	Cedrelopsis grevei Baillon	PTAEROXYLACEAE
Lokomoty	Gardenia rutenbregiana	RUBIACEAE
Voangoridambo	Gardenia sqamifera	RUBIACEAE
Vahilengo	Mussaenda sp	RUBIACEAE
Laingomainbo	Paederia sp	RUBIACEAE
Sofikomba	Rothmania reniformis	RUBIACEAE
Rohavitra	Uncaria africana	RUBIACEAE
Toebaratra	Carphalea pervilleana Baillon	RUBIACEAE
Tambitska	Canthium barorum	RUBIACEAE
Kesika	Tectonia grandis	VERBENACEAE
Tamotamo	Curcuma longa	ZINZIBERACEAE

TYRIA: STANDARDS and CERTIFICATION

by Ms Cheryl Kolander[*] (USA)
Master Natural Dyer, Aurora Silk

Abstract

We are here to acknowledge the resurgence of a time honored industry: the creation of colours of beauty from natural dyestuffs, and their application in the textile arts and industry.

We must set standards for quality work, and have one or several channels for certification. Standards apply not just to colours, but also to the dyes used. Standards also apply to ethical and ecological factors of operation.

In the United States there are currently no "Organic" standards for textiles. There were standards for a short period, but they were fully skewed towards certifying environmentally unsound synthetic dyes as "Organic". Thankfully, these false standards were soon dropped. This fiasco taught us that standards and certification must be set by NGO's, and judged by natural dyers, not ignorant bureaucrats.

TYRIA is my response to this need. Founded in 1969, when I first began my professional career as a full time natural dyer in America, TYRIA is the International Guild of Professional Natural Dyers. Named after the first historical dyer, Lydia of Tyre, mentioned in the Bible as the protectress of Paul the Apostle. The need for a certification program was evident to me even way back then. Now, 37 years later, it is imperative!

Industry self policing is all ways preferable to government regulation. However, real self policing is needed. An NGO (non-profit) certifying agency must be both knowledgeable and transparent. In this case, as one of the senior natural dyers in the world, there is no question as to the knowledge of the certifier. As a not-for-profit, TYRIA operates under the US Federally registered 501©3 non-profit "MAMA D.O.C." Inc., devoted to natural health.

All students who take my professional level intensive workshops receive a certificate of completion in the Art of Permanent Colours with Natural Dyes, as well as dyeworks safety. All colours that are offered by Aurora Silk, my brand and done by me or my apprentices are certified by TYRIA as 100% Naturally Dyed. Anyone can apply to be certified by TYRIA: you send me examples of your work (to be returned) and describe to me, preferably in writing, but orally if necessary, how you dyed these colours. You sign our pledge to only use natural dyes, to observe safety in the workplace, to do the best dyework possible, to be ethical in one's business, and to make tithing donations of either time or money to a charity of one's choice.

TYRIA has created a certification emblem stating "TYRIA certified 100% Naturally Dyed Colours." Stickers are sold to registered, certified dyers or dyeworks as a fundraiser. At this time certification costs nothing and lasts ones lifetime, as long as the TYRIA pledge is followed.

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[*] Master natural dyer for 37 years. Business is Aurora Silk of Portland Oregon. Specializes in brilliant colours on silk, hemp and other natural fibres, both as yarn and fabric. Is formulating colours for industrial dye work and has produced many colours for young designers working on fashion lines. Has written three textile books: "A Silkworker's Notebook" 1979, 1985 and 1999; "Hemp! For Textile Artists" 1995; and "Brilliant Colours with Natural Dyes" 2002. Founder of the Logwood Project for sustainability in natural dyes, and Tyria, the International Guild of Professional Natural Dyers, to certify and promote quality, professional natural dye work.

TYRIA Standards for an industry

In response to artists' and designers' need to plan with Aurora Silk colours, TYRIA's system of colours fastness was devised. A number refers to fastness to light, and a letter refers to fastness to washing.

FASTNESS CODE:

LIGHT FAST
1- extremely fast. Shows no fading in a month's exposure to direct sunlight (at 45 degree north latitude, summer sun)
2 - quite fast
3 - some liability to fade over a period of time

WASH FAST
a- extremely fast. Hand washes fine.
b - quite fast. Hand wash separately; may show some colour in wash water.
c - liable to bleed on washing; dry cleaning is recommended.

In this way, an interior designer can avoid Brazil red for window curtains, as it rates a 3b, while a sportswear designer can plan a line around Cutch brown, Sage green and Steel blue grey, all rated as 1a.

TYRIA recently framed a "Personal Impact" and "Environmental Friendliness" scale of rating. These are also called "Ecological impact" and "Health benefits" of each dye-mordant-colour.

The five star rating of colours for their environmental impact includes considerations of sustainability, soil improvement, replanting efforts, harvesting methods, as regards dyes, and dye studio or dyeworks policies such as recycling, reuse of dyebaths and mordant baths, and/or on-site waste water treatments.

Indigo dyed with a Natural Fermentation vat rates a 5*, as indigo is an excellent soil building legume, is raised without chemicals and the producing industry is small, family farm friendly. Indigo produces income for low income communities. Indigo production can be increased easily, and has been increased world wide in response to the new interest in natural colours, so Indigo dyework is completely sustainable. The dye process uses no mordants or chemicals stronger than washing soda, soda ash or wood ash. There is nothing in the natural fermentation dye process that poses a potential health threat to the dyer or his environment.

Personally friendly or Health Benefits rating is also a five star system: Those dye-colours which have the best health benefit to the wearer and which are perfectly safe for infants to chew on rate a five star. Included would be "Therapeutic Gold" colours dyed with natural yellow dyes such as Fusticwood, turmeric, Quercitron, and using no mordants. Also Indigo, dyed in a natural fermentation vat. And any non-mordanted bark or leaf dyed colours.

More information on this system and its practical application can be seen on the posters for TYRIA, for the Logwood Project and at the Aurora Silk display.

"All good medicines. All good for the planet". Remember to replant! Especially the trees.
Om Mane Padme Hum. Saraswati: please bless us all. Thank you for being.