ISEND 2011 EUROPE

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La Rochelle - France

International Symposium and Exhibition on Natural Dyes

Proceedings

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UMR 5648 ciham

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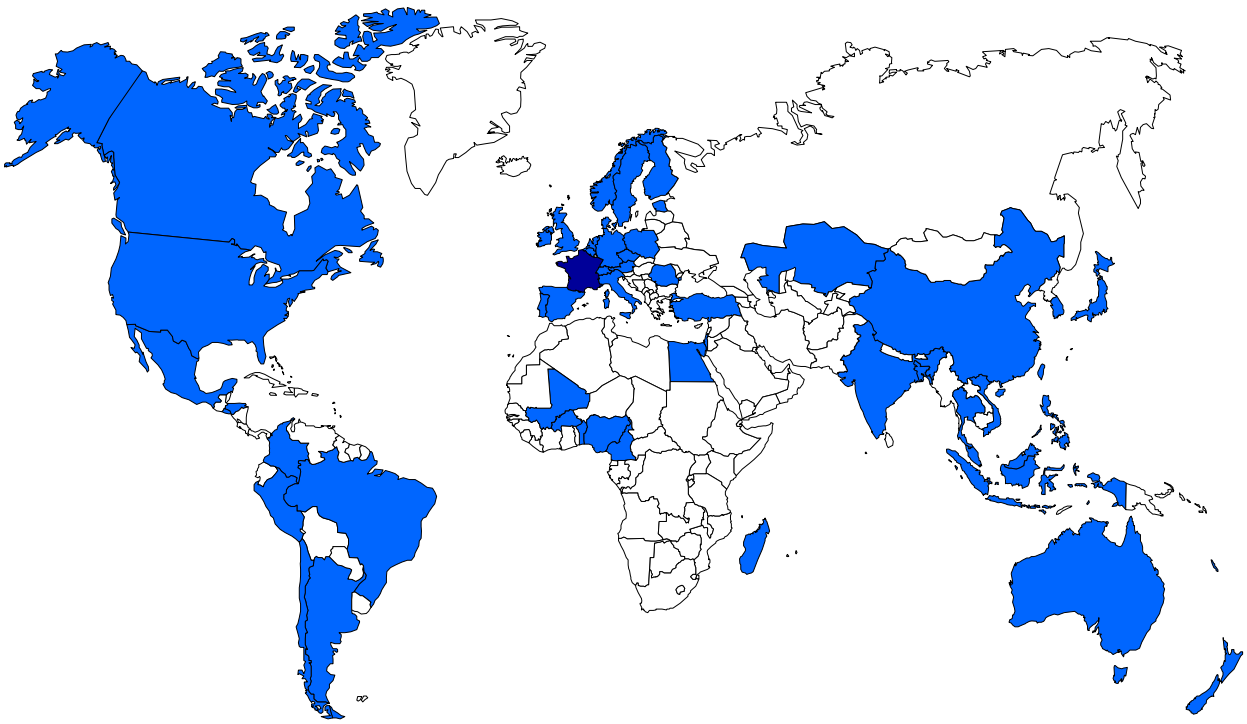
Participants

Download the list of the participants

Argentina	Czech Republic	Italy	Poland
Australia	Denmark	Japan	Portugal
Austria	Egypt	Jersey	Reunion
Bangladesh	England	Kazakhstan	Romania
Belgium	Estonia	Madagascar	El Salvador
Benin	Finland	Malaysia	Scotland
Brazil	France	Mali	Spain
Burkina Faso	Guadeloupe	Mexico	Sweden
Cameroon	Germany	Netherlands	Switzerland
Canada	Honduras	New Caledonia	Taiwan
Canary Islands	Hong Kong	New Zealand	Thailand
Chile	India	Nigeria	Turkey
China	Indonesia	Norway	United Kingdom
Colombia	Ireland	Peru	USA
Republic of Korea	Israël	Philippines	Viet Nam



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The Organizers

ARRDHOR – CRITT HORTICOLE
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The Regional Centre for Innovation and Technological Transfer in Horticulture (CRITT) has been active for 20 years in the field of ornamental horticulture and plant-derived colorants. Its members are engineers and scientists with higher degrees in agronomy, biochemistry, plant physiology and economy. Managed by Anne de la Sayette, CRITT provides a consultancy service to producers and an engineering service for glass house construction. It also conducts Research and Development projects in the areas of Green Roofs and Plant Colorants. CRITT's interdisciplinary approach has allowed it to build up a large plant collection, to develop state-of-the art cultivation processes and to produce plant colorant extracts and pigments on an industrial scale. CRITT is currently seeking funding for R and D contracts particularly in the areas of Textiles, Cosmetics and the Agro-Food industries. CRITT is supported by the Region Poitou–Charentes and by the Ministry of Higher Education and Research.

CIHAM
www.ciham.ish-lyon.cnrs.fr

CIHAM – UMR 5648 is one of the most important research centres in France for the history, literature and archaeology of the Middle Ages. Located in Lyon and Avignon, its members are medievalists from the universities of Lyon 2, Lyon 3 and Avignon, from ENSL, EHESS and CNRS (National Centre of Scientific Research). Dr Dominique Cardon is co-director of Team 1 « Territories – Populations – Material Culture », and is involved in interdisciplinary collaborative research into the history and archaeology of textile techniques and into methods of dyeing with natural dyes and possibilities for their modern application.

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- **FROM THE PAST TO THE FUTURE OF NATURAL DYES: THE CONTRIBUTION OF ARCHAEOLOGICAL AND ANTHROPOLOGICAL RESEARCH**

  Session 3 - Recent identifications of colorants in museum collections

  Session 4 - Natural Dyes of American Pre-Columbian civilizations

  Session 5 - Purple from Muricids and indirubins
- **SESSION 6A - ROUNDTABLE ON NATURAL INDIGOS AT THE AUDITORIUM**
- **SESSION 6B - BIOLOGICAL ACTIVITIES OF NATURAL COLORANTS, APPLICATIONS AS FOOD COLORANTS**
- **RECENT ADVANCES IN THE SELECTION, BIOCHEMICAL STUDY, PRODUCTION AND APPLICATIONS OF NATURAL COLORANTS**

  Session 7 - Cultivation of dye plants

  Session 8 - Identification and scientific studies of traditional and « new » sources of colorants; extraction of natural colorants from dye plants

  Session 9 - Applications in the textile industry

  Session 10 - Advances for applications in different crafts and industries (cosmetics, food colorants, paints and plastics)
- **ECONOMIC AND SOCIAL IMPACT OF THE DEVELOPMENT OF NATURAL DYES – CASE STUDIES**

  Session 11 - Gender and rural development

  Session 12 - Environmental and pedagogical issues, contributions of NGOs
- **SESSION 13 - VALORISATION OF NATURAL COLORANTS: DATABANKS, MARKETING, LABELS**

  Proposition of a computerized tool to collect and make globally available knowledge on natural colorants

  Marketing of natural colorants and of products dyed/coloured with them

  Label(s) for natural colorants

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SESSION 1

Kazuki YAMAZAKI
Tohoku University of Art and Design (Japan)

« Safflower Dye in History of Japan and its Application in Modern Education»

It is generally believed that safflower arrived in Japan at the end of 3rd century via the Silk Road. In Heian period, safflower dye became increasingly popular with the development of costume tradition among aristocrats. With the improvement of dyestuff production in mid Edo period, safflower-dyed clothing spread among both the upper class and the common people. Thus, it has been an essential dyestuff in natural dye history of Japan. In Yamagata prefecture where its cultivation and dyestuff production has been succeeded since the Edo period, the tradition is slowly diminishing because of its workload and the aging of the successors. As an attempt to improve such a situation, the Textile Course in Tohoku University of Art and Design, which I am a part of, started a new curriculum focused on safflower in 2008. Under the supervision of safflower farmers, students grow the plants by themselves. They make the dyestuff and hold dye workshops for people in local communities. Some of the outcomes can already be observed. Traditional dyestuff production and dye technique will be reported in the presentation.

Download the presentation

Download the paper

Riikka RÄISÄNEN
University of Helsinki (Finland)

« Local dye plants from the Northern hemisphere – tradition and new applications in Finland »

In Finland the tradition of natural dyeing has remained living because the society was long self-supporting. Textiles were mainly produced at homes and dyeing was an important part of that process. Nowadays natural dyeing is a popular hobby and also several designers utilize its characteristics in textile production and entrepreneurship. The scale for commercial applications is yet very small but could be expanded. In our studies we research what dye plants were traditionally used in Finland and what were the dyeing procedures. We do dyeing experiments and study the quality of the dyed textile pieces using standard color fastness tests. We want to develop environmentally-friendly dyeing processes without losing the high quality of the final products. It is known that many dye plants have also been used for medicinal purposes. Our aim is to study these properties and utilize them as adding value for natural dyed products. Recently we studied the cytotoxicity of several plant and fungal colorants, e. g. Tanacetum vulgare, Salix sp., Cortinarius sanguinea, C. semisanguinea *and* Paxillus atromentosus. *Our aim is to study also the antibacterial and UV-protective properties of local dye sources. We aim to enhance the knowledge of the local dye plants and fungi and their properties in order to promote their utilization in ecological textile production*.

Download the presentation

Anne DE LA SAYETTE

ARRDHOR – CRITT Horticole, Technology Resource Centre in Horticulture (France)

« An example of valorization of a plant dye source from marshes of the west of France for industry and design» : Film "Couleur Bourdaine"

The film shows the whole process of valorization of Alder buckthorn, Rhamnus frangula*. This invasive plant has been collected in a marshy area included in the « Natura 2000 » Program, through the work of the League of Bird Protection and the task force provided by a NGO for social reinsertion. After the development of colorant extraction procedures at CRITT Horticole, the extract obtained from all upper parts of this small tree has been used to colour three products presented at ISEND 2011 Europe. The first valorization consists of the brown printed colour in the symposium bags distributed to all participants. This product obtained by flat bed screen printing has been achieved through a partnership with a French company specialized in high quality textile printing (Tissus d'Avesnières at Laval). The second example of application of the colorant extracted from Alder buckthorn is the dye used by our friends from the Théâtre du Chatelet in Paris for the beautiful shades of the silk hangings decorating the Symposium Auditorium. Lastly, the film will show how students at the Lycée professionnel d'Art et de Mode Gilles-Jamain in Rochefort (secondary school offering professional training in Art and Fashion), have created fashion models using linen fabric dyed with Alder buckthorn extract at industrial scale, following optimized dyeing processes. Such valorization of Alder buckthorn very aptly illustrates the work of CRITT Horticole and the extensive partnerships that have been built up to promote the uses and industrial applications of plant colorants..*

Download the film

Maximilienne Ascension NYEGUE

University of Yaoundé I (Cameroon)

«Dye plants of Cameroon, from tradition to new research»

In collaboration with **C. NDOYE** and **F. X. ETOA**, Department of Biochemistry, University of Yaoundé I – **J. M. Onana**, Cameroon National Herbarium – **D. Cardon**, CIHAM/UMR 5648, CNRS (France)

*Cameroon is endowed with many plants whose traditional use has enabled Science to discover important sources of molecules which today are being used in pharmaceutical industries as active agents, in agrofood industries as spices etc. However, it should be pointed out that the field of natural colorants has not sufficiently been explored and remains yet to be developed. Several plants have been used traditionally for their colorant properties: Curcuma longa for cooking, hennah and Padouk (*Pterocarpus spp.*) for women's beauty, indigo for dyeing of clothes,* Annickia chlorantha *for dyeing of mats… Nevertheless, some old practices have given way to Chemistry which has made synthetic colorants widely popular throughout the country. In this paper, we intend to present the traditional uses of colour - producing plants of Cameroon in order to highlight new research areas for improved valorization.*

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Mabel Carmen LADAGA

AIDECA Fundación iberoamericana artesanías (Argentina)

« Natural dyes in textile productive chains in Argentina (A) »

(A) Examples of textile projects developed in different regions of Argentina are discussed: "Vías de Encuentro" (Roads of meeting) in the province of Jujuy, in the north west; pampas of Buenos Aires and La Pampa province etc. They use sheep and indigenous Camelid wool with the purpose of improving the quality of handicrafts products and their marketing. Studies of fibers and dye plants were conducted. The traditional knowledge of artisans who enrich this repertoire through experiments with new species has been recorded. The use of natural dyes and quality certification of the whole process increase the demand for these products and generate job sources for vulnerable groups.

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Luciana MARRONE

Aires Naturales, Federación Latino-americana de Químicos Textiles (Argentina)

« New roles for natural dyes in Argentinian textile production (B) »

(B) This research arises out of the interest to study and implement natural dyes for natural fibers, not only as part of the added value of products but also as the core of the project of revaluating ancient dyeing techniques, adapting them to our time and rediscovering those dyes that are still today at hand. The area of experimentation was confined to the Province of Buenos Aires. The first stage stands out as experimental research. A second stage includes courses in which traditional dyeing techniques are adapted to contemporary conditions and to the spaces and raw materials that designers, weaving artists and textile engineers have access to in the cities.

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India FLINT
Artist, writer (Australia)

« Colours of the red island – Australia: indigenous and immigrant use of dyes and stains derived from nature; history, actuality and prognosis»

The evidence of the use of naturally derived colour in Australia has been dated as being some 60,000 years old. However the application of dyes from the brightest and boldest of the country's flora, the genus Eucalyptus, was only discovered with the introduction of European textile techniques on settlement of the country some 200 years ago. Australia is home to an abundance of endemic dye plants, some traditionally used by the indigenous peoples, several only recently discovered; most of them still relatively unknown outside this island continent. "Colours of the red island: indigenous and immigrant use of dyes and stains derived from nature" discusses the history, actuality and a promising future for natural dyes from indigenous plants in Australia.

Download the presentation

Pierre CABALION
IRD and APPAM-NC
Association to promote Medicinal Plants of New-Caledonia (France)

«Dye plants of New Caledonia - Traditional practices to new applications perspectives»

In collaboration with :
- UNC, Noumea - **E. HNAWIA, N. LEBOUVIER, M. NOUR**
- CIHAM / UMR 5648-CNRS Lyon – **D. CARDON**
- Lycée Jean XXIII, Paita – **M. BOULANGER-PENDUFF**
- LRMH Champs-sur-Marne – **W. NOWIK**
- CRITT Horticole Rochefort - **A. DE LA SAYETTE**
- UMR 557-CNRS, Lyon - **M-G. DIJOUX-FRANCA**
- Museum of NC, Noumea – **M. TISSANDIER, F. CAYROL**

The South Pacific region proves to be a cultural continuum, where some dye plants are well known in the whole area (Zepernick 1967, Cardon et al. 2010), while other species are used only on a more local scale, especially in Melanesia. For example, a red purple dye is obtained in the north of Vanuatu from a Rhamnaceae, Ventilago sp.*, which was exchanged along traditional sea routes for ceremonial mat dyeing. This group of Ventilago was studied in Noumea (1 sp. from Vanuatu, 3 from New Caledonia) (Blanc 2008, memorandum & thesis). It was the occasion for the revision of a list formerly compiled by Rageau (~30 spp., 1957 unpubl.), completed with ethnobotanical data (preserved at IRD, Institute for Research and Development) and recent field enquiries (5e CIPAM, Noumea, 2008). Through another approach, we discovered colouring properties in selected species, collected on ethnobotanical grounds, but in the flora of dry forests (~50 spp. tested) ; this method opens new prospects when considering the Caledonian flora in general (~3300 native species with ~74% endemic, plus ~2000 introduced spp.). Our works were made possible by the help of Yves Rocher Foundation and the Program Dry Forests of NC, in relation with the Technical College Jean XXIII (Ms Boulanger-Penduff), the Museum of New-Caledonia (Ms Tissandier), CNRS (Ms Cardon, Ms Dijoux-Franca), the Historical Monuments of France (Mr Nowik) and the horticultural CRITT in Rochefort (Ms de la Sayette), with the aim of new developments for traditional know-how through scientific expertise.*

Download the presentation

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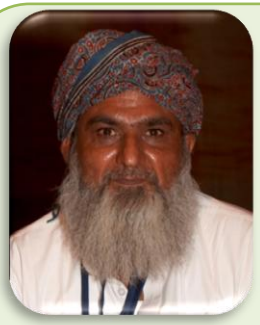
SESSION 2



Ismail Mohamed KHATRI

Master Dyer in Ajrakh, Seal of Excellence of UNESCO (India)

« Ajrakh a blockprinted textile from Kachchh»

In collaboration with **Juned Ismail KHATRI**

In this presentation we describe the process of making ajrakh, a double-sided, block-printed and resist-dyed cotton textile from Kachchh district, Gujarat. Our family has produced this cloth in the village of Dhamadka for ten generations. Our traditional customers were local communities of Muslim herders for whom it remains an important item of men's dress - the women wear mostly tie-dyed textiles. In the last 40 years our family has developed a range of new products, printing ajrakh designs on bedsheets, tablecloths, dupattas, stoles, scarves, saris and dress material, using cotton, silk and wool. All of our products are dyed with Abstract natural colours and we now have a national and international clientele and examples of our work are held at the Victoria and Albert Museum, London, the Ashmolean Museum, Oxford and the Prince of Wales Museum, Mumbai..

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Antoinette RAST-EICHER

Laboratory ArcheoTex (Switzerland)

« Archives of 19th c. cotton printers in the canton of Glarus, Switzerland »

The canton of Glarus, a valley in the Alps 60 km from Zurich, had an important cotton printing industry during the 19th century. In 1850, there were 22 printing factories in a valley with about 33,000 inhabitants! While in other parts of the country such as Geneva or Neuchâtel printing industries had stopped existing already around the 1840ties, in Glarus the summit of production took place around 1860. Archives, which are still owned by the same families as in the 19th century, give a fascinating insight in the printing history: documents, prints, colour recipes have been saved – and all partly in the rooms of the 19th century – they contain more than 100 years of local economic and technical history. New projects start to consider this part of the history of colours, especially as the chemists of these small family-run factories were the central developers of colours and processes until the chemical industries appeared in the last quarter of the 19th century..

Download the presentation

Grégoire FEINTE
Company Tissus d'Avesnières (France)

« Development of an industrial range of frame-printed textiles in cellulosic fibers using natural colorants extracts»

Our company, Tissus d'Avesnières, is a family business born in 1876. We produce printed and piece-dyed fabrics for furnishing wholesalers, luxury industry and decorators. Our main customers are located in Western Europe and the USA. We print and dye about 600,000 meters each year. For printed fabrics, we mainly use traditional techniques like flat bed screen or "impression à la lyonnaise" (printing Lyonnaise style on tables) with "conventional" colorants like reactive and vat dyes or pigments. About two years ago, we started an industrial partnership with ARRDHOR/CRITT Horticole of Rochefort in order to make a study of feasibility for employing natural colorants in both dyeing and printing of cellulosic fibers textiles. This experimentation allowed us to revive forgotten recipes: technological now rhymes with traditional!

Download the presentation

Leentje VAN HENGEL
Company Tinctoria (The Netherlands)

« Colour discharge printing with natural dye-extracts with lighfastness results»

Leentje van Hengel started the studio annex shop with natural dyes in Amsterdam in 1991. With her process of colour discharge printing, an average lightfastness of 4-5 is obtained with a discharge paste consisting of alum, citric acid and ureum. Colorant extracts of Rhamnus, Solidago and Rubia are added into this paste to produce colours on wool and silk dyed with cochineal and on linen dyed with madder. Alum is the mordant for wool and silk and gallnuts are used as an extra mordant for linen. The parameters for dyeing the background are fully explained and the lighfastness results are given. Screen- and blockprinting and application by brush are described. They are followed by atmospheric steam fixation for 60 minutes to fix the printing colours. Washing is done at 60° C. Washfastness tests for linen give good results. A rich and lively range of colours is achieved by this technique.

Download the presentation

Kamaldeep KAUR
Company Neelgar
(India)

« Satara printing -The story of the survival of natural dyes»

Many ancient tribes have accepted cheaper mill made, synthetic versions of their original handcrafted costumes in various parts of the world. But wearers of Abu Satara thankfully are still adhering to their tradition in nearly the same fashion. The reason could be the temperature of the area they live in or a hibernated lifestyle. The beautiful shawls called Abu Satara are worn by the Yemeni women in Sana. But Abu Satara is printed in Ahmedabad in Gujarat and nowhere else. It is a very unusual technique of resist dyeing and printing using natural dyes. The process is very complicated, each piece of cotton fabric passes through about sixty hands. A piece of white fabric takes about two to three months to transform into a striking Abu Satara shawl..

Download the presentation

Ivy Maile ANDRADE
University of Hawai'i
Manoa, Honolulu,
Hawai'i (USA)

« Hawaiian Natural Dyes in Kapa Cloth»

Kapa is the general Hawaiian term for barkcloth, which was found extensively in Polynesia. Made from the bark of wauke, a paper mulberry plant, it is a time-consuming, labor-intensive process. Watermarking, an embossed pattern beaten into the kapa with a carved mallet, is considered unique to Hawaiian kapa. After the cloth was beaten, kapa was dyed in a rich assortment of traditional natural dyes from flowers, stems, leaves, roots, charcoal and soil. This presentation will cover the basic process of kapamaking, traditional plant dyes and how they were used and examples of Hawaiian Kapa Cloth from Museums around the world.

Download the presentation

Isabel BROUILLET
Anthropologue (France)

Patricia GERIMONT
Author of Teinturières à Bamako, independent researcher (Belgium)

« Dyeing in Mali, rural and urban customs, the paradoxes of tradition»

By observing the dyers working in the city of Bamako and on the cliff of Bandiagara in the Dogon Country, one soon realizes that the antagonism, so often pointed out, between urban techniques using chemical products and the traditional indigo-based dye does not always correspond to reality. A closer analysis of the production and distribution methods, the reciprocal influences, the patterns and the resist-dyeing techniques and the impact on the market, reveal that the borders between tradition and modernity are blurred. It is no longer relevant to oppose conservatory usage to modern – often questionable - habits but one should rather focus on the mutual influence between these two worlds. The first part of the contribution focuses on the heritage of the indigo-dyeing technique, updated by the women dyers of damask. The second part focuses on the production of indigo-dyed loincloths in the Dogon Country and how it is inspired by outside influences, notably by the damask of Bamako..

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SESSION 3

Roman JASHENKO
Research Institute for Humanity and Nature (Japan) and Institute of Zoology (Kazakhstan)

« Carmine scale insects in Central Asia, historical uses, new identifications »

*According to ancient documents Porphyrophora species have been the source of the red dye (carmine) since ancient times; two species (*P.polonica *and* P.hamelii*) greatly influenced the culture and history of Middle East and Europe. The world fauna of these insects consists of 52 species inhabiting mostly Palaearctic area (46 species, more than 30 species in Central Asia). Historical and etymological analyses imply that the carmine industry originated in ancient Central Asia. In China, red carmine dyestuff was widely used. This could happen if a huge carmine centre was located near China that exported dyestuff in large amounts. In Central Asia Porphyrophora reserves are abundant. The majority of the known species occur here which form the basis for genetic selection to improve quality and production. The most promising species are* P.polonica *and* P. sophorae*. The technology for methods of carmine scale cultivation can be developed by three different methods: in the open field, in covered areas in large cages, and in tissue cultures. Species of the genus Porphyrophora can be used not only in the carmine dye industry but also in medicine.*

Download the presentation

Elena PHIPPS
Formerly Metropolitan Museum of Art, New York and Textile Society of America (USA)

« Cochineal Red: the art history of a color »

The paper will present an art historical and technical perspective on the subject of cochineal red dyes through a study of selected textiles belonging to the Metropolitan Museum of Art. The results of scientific testing of over one hundred samples forms the building blocks for the paper, that traces the use of cochineal dyestuff in the Americas from around the 2nd century B.C. to its use and export by the Spanish in the 16th century to Europe. It will also examine textiles from the Middle East, Asia and Southeast Asia to form a broader view of the process of global interchange of dye technology and materials, as the American cochineal dye becomes available through international trade routes of the 17th and 18th centuries.

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Tristan YVON

Direction of Cultural Affairs of Guadeloupe, Department of Archeology, UMR 8096 « Archéologie des Amériques » (France)

« Indigo production in Guadeloupe and Martinique, 17th-19th centuries »

The indigo plant is a tall bush the cultivation of which has been one of the first to be developed by European settlers in the West Indies so as to produce the blue dyestuff famous under the name of indigo. The French isles, Guadeloupe and Martinique, are no exception. This production has been active there mainly during the 17th and 18th centuries, with noticeable differences between the two isles. During the 19th Century several attempts will be made to relaunch the production. The recent development of the archaeology of historical periods in Guadeloupe and in Martinique has allowed the identification of numerous industrial installations for the production of indigo. This consequent corpus has allowed the study of the spatial distribution of the archaeological remains and the establishment of their typology. Research into the local archives, held in parallel with field studies, have cast a new light upon this production of indigo which has not been much studied for the region, in comparison with the production of sugar.

Download the presentation

Download the paper

Irina PETROVICIU

National Museum of Romanian History and Faculty of Chemistry, University of Bucharest (Romania)

« A discussion on the biological dye-sources identified in Romanian historic textiles »

In collaboration with **Ileana CREŢU**, National Art Museum of Romania – **Ina VANDEN BERGHE**, Royal Institute for Cultural Heritage, Belgium (KIK/IRPA) – **Andrei MEDVEDOVICI**, University of Bucharest, Faculty of Chemistry, Department of Analytical Chemistry and **Florin ALBU**, LaborMed Pharma (Roumanie).

A large number of dye analysis was performed on textiles from Romanian collections since 1997, either by HPLC-DAD, within a joint research between Romanian institutions and KIK/IRPA in Brussels, Belgium, or by LC-MS, according to a new analytical protocol recently developed in Romania. Several biological sources - such as Mexican, Armenian and Polish Cohineal, lac dye, kermes, redwood, madder, weld, dyer's broom, young fustic, berries, bastard hemp and buckthorn - were detected in various types of textiles. The contribution discusses the biological sources detection, based on the progressive use of the MS and MS/MS features, as well as their presence in 15th-20th c. textiles from Romanian collections - including religious embroideries, brocaded velvets, Oriental carpets Romanian ethnographical textiles, sumak, kilims and knot carpets from Minor Asia - according to period, technique and provenience.

Download the presentation

Recep KARADAG

Natural Dye R&D Laboratory of the Turkish Cultural Foundation and Faculty of Fine Arts, Marmara University, Istanbul (Turkey)

« Analysis of some 16th century ottoman silk brocades and their reproductions »

The 16th Ottoman silk brocades samples were provided from Topkapi Palace Museum in Istanbul, Sadberk Hanim Museum in Istanbul and private collection. In this study, before all colour measurements were achieved using Minolta 3600D (D65) spectrophotometer on original brocades. Dyestuffs analyses were done by HPLC-DAD. Analyses of historical samples were compared with analyses of different unmordanted silk, different mordanted silk, biologic sources (dye plant, dye insect, ect.), silk dyed according to historical recipes and pure standard dyestuffs. Golden strips and metal analysis were performed in the historical silk brocades by SEM/EDX. Weaving and technical analyses were performed. According to the results of colour measurements, dye analysis, metal analysis and technical analysis, silk yarn of the new brocades were dyed used with same dye sources, same silk yarns, same mordant metals under the same conditions. Same quantity of golden strip and same weaving technique were used for new silk brocades. New produced brocades were compared with 16th Ottoman silk brocades. Both of the new production and 16th century Ottoman silk brocades are same characteristically. The new brocades were produced by the Turkish Cultural Foundation and the Armaggan Company.

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Harby Ezzeldeen AHMED

Faculty of Archaeology, Cairo University (Egypt)

« Identification of dyes in Islamic Textile Collection in Museum of Faculty of Archeology, Cairo University Egypt »

In collaboration with **Omar ABDEL-KAREEM**, Conservation Dept., Faculty of Archeology, Cairo University and **Khaled ELNAGAR** Chemical Metrology Department, National Institute for Standards

This study represents both a study case about identifying the dyes in historical textiles in Museum of Faculty of Archeology, and an evaluation of the efficacy of an improved extraction method using two solvents compared with the conventional hydrolysis method. Representative dyed textile samples collected from the studied museum were identified with a High Performance Liquid Chromatographic method coupled to a Diode-Array-Detector (HPLC-DAD). Results indicated that mixtures of organic dyes were used in dying the studied objects to produce different colours. Various natural dyes such as indigo, madder, saffron, safflower, etc were identified. Dyes identification can be very helpful in dating these archeological textiles depending upon the kind of dye and its manufacturing or discovery date. Furthermore the identification of dyes used for historical textiles can help in elucidating their place of origin and time of production. Also dyes identification will be used in establishing a plan for conservation and restoration of the valuable textile collection in this museum.

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SESSION 4

Ana ROQUERO
Instituto del Patrimonio Histórico Español
Estrella SANZ RODRIGUEZ
Complutense University of Madrid, Spanish Cultural Heritage Institute (Spain)

« Analysis of constituents of a Reference collection for American dyestuff belonging to the Spanish Institute for Cultural Heritage (IPCE) using LC-QTOF »

Investigation on dyestuff generally suffers from limited availability of suitable Reference Materials, matching a matrix dyed with the corresponding natural product and following the original procedures. The IPCE holds a Reference Collection of about three hundred fibers of different nature, dyed with approximately two hundred American dyestuffs, several mordants and auxiliary products. Actually, the IPCE and the Complutense University of Madrid (UCM), collaborate within the frame of a project aiming to provide the IPCE's laboratories with a validated methodology for analysis of natural dyes, making use of a Liquid Chromatography coupled to a Diode array and Quadrupole Time-of-Flight detectors (LC-DAD-QTOF). This system allows the separation of the compounds present in each dye and its characterization. The accurate mass measurement allows a QTOF detector to generate formulas from exact mass of unknown components. In addition, MS/MS combined with accurate mass can be used to confirm ion identity and structure. The full characterization of components present in each American dyestuff from this collection will allow creating a specific database and consequently, a more efficient and precise identification of natural dyes from historical American textiles.

Download the presentation

Beatriz DEVIA
Universidad Distrital Francisco José de Caldas (Colombia)

« Colorants present in Pre-Columbian textiles from southern Colombia and northern Ecuador and their contribution to our knowledge of the range of local species of Rubiaceae employed »

In collaboration with **Rocio CORTES**, Department of Forestry Engineering, Universidad Distrital Francisco José de Caldas and **Marianne CARDALE DE SCHRIMPFF**, Foundation Pro Calima. Bogota

The results of a comparative analysis of the colorants in reference samples from several different species of the Galium genus has extended the information available on the chemical composition of traditional vegetable dyes. 63 samples of Galium were collected, all native to the department of Nariño in the southern Colombian Andes and five were identified: Galium aschenbornii, Galium canescens, Galium corymbosum, Galium hypocarpium, Galium pseudotriflorum. *The mild extraction methods and the analysis used (HPLC-DAD and LC-MS) in this study on micro samples of fibers dyed with these species, provided information on the content of anthraquinones and their glycosides, extending the possibility of identifying the sources of the colorants in the archaeological material. The application of this new information to the analysis of pre-Colombian textiles from Nariño and northern Ecuador confirms that species of Galium were used as colorants in both regions. At least two different species can be detected, based on the presence or absence of alizarin among the group of anthraquinones studied.*

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Soledad HOCES DE LA GUARDIA CHELLEW
Pontificia Universidad Católica (Chile)

« Colors in pre-Columbian textiles from northern Chile: Approaches to dyeing materials identification »

In Andean pre-Columbian cultures, dyeing had a outstanding role in the development of textile traditions and represented a technology that required specialists dedicated to gather in dyeing materials; to prepare the textile material, to adjust and to perfect dyeing processes, to standardize, memorize and transmit color recipes to respond to cultural preferences and their chromatic requirements. The search of color precision on each culture and pattern repetition tells us about a repertoire choice that contributed to differentiate and reinforce the identities of the different cultures in the Andean area. This work presents an approach to identification of the used natural colorings, dyeing treatments and processes used in some textile pieces from Northern Chile that belong to the Museo Chileno de Arte Precolombino, in the framework of an research project about color in Andean pre-Columbian cultures as elements of representation and identity.

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SESSION 5

Christophe MOULHERAT
Quai Branly Museum, Paris (France)

« New testimony for the use of purple-dye in ancient Greece »

The textile heritage of ancient Greece is quite important, as shown by the exceptional pieces found at Lefkandi and Eretria on the island of Euvoia, at Eleusis, Trachones and Koropi in Attica and more recently in Vergina in Macedonia. This group has grown over the last years due to many excavations undertaken during the construction works for the Olympic Games in Athens and also due to the creation of a Research Centre specialized in the study of archaeological textiles in Athens (ARTEX- Hellenic Centre for Research and Conservation of Archaeological Textiles). Among the most recent discoveries figure identifications of purple-dye. Liquid chromatography analyses done in LRMH (by Witold Nowik, Analyses Department, Laboratory of Research of Historical Monuments, Champs-sur-Marne, France) on the weft threads of the Kalyvia (Attica) starting border and on one of the Maroussi (Attica) textiles have shown the use of the real purple-dye. On the other hand, analyses with Raman spectrometry in the C2RMF (Elsa van Eslande, Centre of Research and Restauration of French Museums, Paris, France) have also shown the presence of purple-dye on textiles from two metallic urns found on the island of Corfou. The recent discovery of a dyeing workshop in proximity of the Athens Acropolis with thousands of Murex shells also contributes to enhance the importance of the fabrication and use of purple-dye in the ancient Greek world.

Download the presentation

Takako TERADA
Kwassui Women's University, Nagasaki (Japan)

« Dyeing properties of shellfish purple obtained from Ocenebra inornata »

Shellfish purple, also known as Tyrian purple or Royal purple, obtained from the hypobranchial glands of mollusks of the Muricidae family, is the pigment used for dyeing yarn and textiles. Ocenebra inornata (Récluz, 1851) [= Ocinebrellus inornatus = Ocenebra japonica *(Dunker, 1860)] belongs to the Muricidae family, feeds mainly on bivalve mollusks, and is causing significant damage to oyster aquaculture worldwide. The purpose of this research being to clarify the dyeing properties of the shellfish purple obtained from Ocenebra inornata collected in Hokkaido, Japan, color tests on JIS multifiber test fabrics, and HPLC analyses to identify the kind of pigment, were performed. As the results of experiments, I found that the direct dyeing method gave reddish purple hues on all eight kinds of fibers, with excellent washing and light-fastness; the chemical vat-dyeing method gave a wide range of hues from reddish purple to purple on a variety of fibers with practical color fastness, and 6,6'-dibromoindigo was the main component of the pigment. Dyeing properties of the shellfish purple obtained from Ocenebra inornata are similar to that of the typical Japanese purple snail Akanishi (*Rapana venosa*). It would be useful to use Ocenebra inornata as source of purple dyeing.*

Download the presentation

Valérie THIERY
CNRS LIENSs / University of La Rochelle (France)

« Characterisation of dye precursors from gastropods of Ocenebra erinaceus and Ocenebra inornata present on the Island of Ré on the Atlantic coast of France »

In collaboration with **Sonia Olivet**, **Marie Long, Kim Géraudel, Jean-René Chérouvrier, Jacques Pigeot, Denis Fichet, Sylvain Lamare, Witold Nowik, Dominique Cardon, Anne de La Sayette**

Product with a high added value, purple from marine molluscs is a natural colorant of potential interest for luxury applications. Many natural dyes extracted from animal species are derived from the hypobranchial glands of Muricidae gastropods. When the mollusk dies and when its hypobranchial gland is exposed to the light of day, the purple color appears. In his lifetime, the mollusk produces only precursors of pigment in its hypobranchial gland. Since 1995, marine snails Ocenebra inornata, in addition to the local species Ocenebra erinaceus, have been noticed for their predation on cultured oysters along the Charente-Maritime coast. They feed in high tide on oysters cultivated in parks, producing damages with strong economic impact. As few studies deal with the exact nature of the purple precursors and purple dye derived from glandular secretions of Ocenebra erinaceus and Ocenebra inornata from the Atlantic coast, the composition of the indigoid dyes and precursors from the two species was determined by high-resolution mass spectrometry and high-performance liquid chromatographic analysis, in the prospect of a potential valorization.

Download the presentation

Dominique CARDON
UMR 5648 CNRS
Et Nicolas GARNIER
Laboratory Nicolas Garnier (France)

« True purple in Roman Egypt: new identifications, new analytical processes »

A program of archaeological excavations in the Eastern Desert of Egypt has provided large quantities of textiles. It concerns small Roman fortresses occupied during the three first centuries CE. They are scattered along two caravan roads leading from Koptos (now Quft) on the Nile, respectively to Myos Hormos (Quseir), and to Berenike, on the Red Sea Coast. As a result of three previous series of dye analyses, true purple was identified in textiles from three sites (1). Our research on purple benefits from improved analytical methods, first developed in a collaborative international research programme on indigoids from purple-producing Muricids (2); other methods are being tested, on reference samples and on archaeological textiles: - the non-invasive method SERS, well adapted to precious objects, where sampling is not allowed ; - DART-MS, adapted to the specific research of markers. Detection of traces of indigotin and mono- and dibromoindigotin allowed to discriminate indigo from purple from Muricids; - structural analysis has been conducted by thermochemolysis coupled with gas chromatography-mass spectrometry. The use of soft reagents of hydrolysis/methylation allows to detect indigoid markers directly from a fibre, without any extraction and preparation of the sample. As a result, new identifications of true purple in textiles from a recently excavated site can be reported in this paper.

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Download the paper

Younsook SHIN
Chonnam National University,
Dept. of Clothing and Textiles -
(Republic of Korea)

« Application of Biotechnology for Natural Indirubin Production »

In collaboration with **Jin-Yong LEE**, **Geun-Joong KIM**, Department of Biological Science and **Dong Il YOO**, Department of Polymer and Textile System Engineering, Chonnam National University

Indirubin is a purplish colorant and isomeric byproduct produced during the formation of indigo from indican. It gives a unique purplish blue color to natural indigo dyed textiles. It has not only be found medically effective in treating leukemia and inflammatory affections, but also used in management of the disease psoriasis and skin eruption. Additionally, indirubin has potentials to be used in textile and food industry. The aim of this research is to provide a novel process for the preparation of indirubin in high yield and purity using non-recombinant cells. For this purpose, we presented a new approach mimicking a traditional production method of the typical indigo, instead of previously known ways which used indole as a starting substrate and recombination cell as a whole cell enzyme. We here reported a novel method using the natural indican from Polygonum tinctorium *and the wild type E. coli cells to produce indirubin in a single step. It was confirmed by HPLC and NMR analysis. And dyeing tests were carried out to compare with indirubin extracted from natural indigo paste produced by Korean traditional process.*

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SESSION 6 A

Herimala RAHARITSIADIANA
University of Antananarivo (Madagascar)

« Tradition and science, a synergy for the development of natural dyes: case of indigo dye for silk in Madagascar »

In collaboration with **Marta ANDRIANTSIFERANA**, Laboratory of Natural Products Chemistry and Biotechnology

Silk is of high importance according to the Malagasy tradition. For a long time, the indigo dye also called "the queen of natural dyes" was the most valuable of the dyestuffs. So, it was appropriate to put them together into the program "Indigo dye on silk", divided into two parts: 1. The phytochemistry of Indigofera arrecta collected in the Ambositra region, including the extraction of the indigo past, the isolation and purification of the Indigotin, followed by spectroscopic characterization of the later The UV-Vis spectrum showed two absorption regions previously described, characteristic of the Indigotin. The 1H NMR and the HMQC-HMBC experiments, recorded for the first time, were in agreement with the Indigotin structure. 2. Indigo dyeing experiments carried out in close collaboration with craftsmen. Two different methods to produce the indigo past from the two Indigofera species I. arrecta *and* I. tinctoria *are presented. The first method was based on the literature data, the second reported for the first time. Indigo dyeing vats experiments performed on landikely, the silk obtained from* Bombyx mori*, and on landibe, "wild silk", from* Boroceras cajani*, endemic to Madagascar, were successful. The training of about 200 craftsmen on the above items has also been programmed for the year 2010. Last, the edition of a guideline on the indigo dye is in progress.*

Download the presentation

Monoleena BANERJEE
Company Weaver's Studio, Kolkata (India)

« Indigo, diversified use in traditional and contemporary textiles »

The presentation is a bridge between the past and present during the journey of this magnificent natural blue hue with its different vat process explaining the most interesting way of acceptance of this traditional dye in different parts of the world such as Indian subcontinent, south East Asia, Japan and Africa in their tradition. The presentation show how these heritage methods and application still can create marvelous contemporary textiles applying textile decoration techniques both traditional and contemporary to create numerous mix-match ranges of Art textiles as well as wearable textiles which is still in practice at our units in India using indigo and other natural dyes – 1] Printing- ajrakh [both by hand and screen], batik, discharge on indigo. 2] Tie and dye- Indian technique of badhni and laheria, different techniques of hand stitch, machine stitch, clamp Arashi shibori of Japan and African process of tie and dye. 3] Weaving- Ikat, three layer inlay and woven shibori.

Download the presentation

Jesus CIRIZA LARRAONA
Company The Colours of Nature, Auroville (India)

« Natural indigo for the today indigo dyer »

*For the indigo dyer, what is of utmost importance is to have an agreement with the indigo farmers to pay the raw material on the basis of the indigotin content found by laboratory tests, and not for impurities also contained in natural indigo. In the process of dissolution of natural indigo by means of any traditional method or chemical agents, there is no dissolution of the impurities of natural indigo as they precipitated to the vat's bottom, where they can be easily siphoned or isolated from the dye operations. Therefore, for the indigo dyer it is not a problem to purchase any quality of natural indigo provided that he always pays the same price based on indigotin percentage. Today, natural indigo from different plants (*Indigofera tinctoria, I. suffruticosa, I. guatemalensis, I. arrecta, Isatis tinctoria, Polygonum tinctorium, etc*) is not easily available on any continent. But if one day we have a wider natural indigo market, the contents of indirubin also need to be assessed in order to produce more different shades of blue. The proper way to purchase natural indigo today is first, to test the actual indigotin percentage in the raw material, and second to pay on basis of percentage unit of indigotin. A fair price today in India for small orders could be around US$ 0.95 for each 1% of indigotin content in natural indigo. For instance, to calculate the cost of one kilogram of natural indigo with 30% of indigotin , we multiply 0.95 for 30 and the cost is equal to US$ 28.5.*

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Rhina REHMANN
Association AZULES - Hacienda Los Nacimientos (El Salvador)

"The improved results of indigo extraction by using higher water temperature"

The aim of the process is to reduce the time needed for the extraction and at the same time the increase of Indigo output and the improved results of quality of the product, in regard to the percentage of Indigotine.

The extraction of the indigo, under normal temperature conditions, takes 16 - 21 hours, using only the leaves of the plant. The leaves are used, because that is where the pigment precursors are. This also minimizes the content of ashes, whose presence is not desired because it reduces the quality of the indigo powder.

With 3000 lbs of Biomass, at a water temperature of 45°C using an industrial water boiler the process was accelerated and the obtained content of Indigotine increased from 35% at ambient temperature to 50% The extraction process of the indigo using a water temperature of 45°C, gives the following results :

- *Reduces the extraction time from 16 h to 4 h*
- *Increases the weight per charge from 0.3% to 1.2% of the indigo powder*
- *Indigotine content increased from 35% to 50%*
- *Two more extractions a day , because of the time saving involved*

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Anowarul HAQ
CARE Bangladesh
Compagny Nijera
Cottage and Village
Industries (Bangladesh)

« 'Swadheen Neel' (Free Indigo): Revival of Bengal Indigo »

Even in present times, the past indigo story of Bengal and the tyranny associated with the cultivation and extraction – the death of 15 million people through starvation – has a social and cultural stigma. It is known as a 'black chapter' in the history of Bengal. However, the indigo plant has survived due to its intrinsic value, known to local cultivators. In the absence of irrigation facilities in the medium and upland conditions of the Northwest of Bangladesh, the post tobacco / potato fallow period (90 days) is utilized by farmers to cultivate the leguminous indigo plant which replenishes soil fertility through addition of nitrogen and humus, and yields valuable fuel biomass (stems). Thus it has been possible to expand and integrate indigo production into the agricultural cycle without replacing food production, complementing existing cropping patterns and contributing to increased yields with reduced input costs. Indigo production of NCVI, a social enterprise, is about tapping the value of a renewable resource in the existing micro-ecology and taking advantage of the ever-growing demand for natural dyes that contributes to more environmentally conscientious production systems, as well as sustainable local communities.

Download the presentation

Ian HOWARD
Company Woad-inc,
Dereham
(United-Kingdom)

« The Agricultural production of woad and the derivation of indigo »

*Ian and Bernadette Howard have established a company called Woad-inc. They were involved with EU-funded project as growers of woad (*Isatis tinctoria*) in the UK. They were involved in growing the woad crop, i.e. planting the seed, taking care of the agronomy, harvesting the leaves and providing accommodation for laboratory-trials, water and electricity. When the trails finished in 2003, Woad-inc started their own research work to establish a higher yield of indigotin and enriching the purity of the pigment to establish a saleable market product. Ian will explain the agronomy, outline the extraction process and give purity results. Today, Woad-inc has moved on to provide quality products from natural fibres and toiletries free from chemical preservatives and colourants which are not tested on animals. He will demonstrate the market potential for natural pigments and the use of pharmaceutical and personal care products from woad.*

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Denise LAMBERT
Company Bleu de Pastel de Lectoure (Belgium-USA)

« An example of industrial scale cultivation of a dye plant woad – problems, results, development »

This presentation will deal on the industrial prospects for Woad, in textiles as well as in building and interior decoration (wood treatment, fireproof properties) and it will mention on-going research in Austria on its medicinal uses (skin care etc).

Download the presentation

Elias-Jaime MATADAMAS-ORTIZ
Agronomy and Agroresources Laboratory. Autonomous University of Chapingo (Mexico)

« New alkaline extraction method for indigo from Indigofera suffruticosa »

Indican is the indigo precursor present in the leaves of Indigofera suffruticosa. This is a glycoside containing an indolic aglycone joined to the glucose. The indigo traditional extraction in Mexico is by enzymatic action of a β-glucosidase that attacks the indican at ambient temperature. However, when this precursor is subject to a temperature of about 70ºC, undergoes a transformation into a form ester which we call indican B. This behavior of the indican allowed to develop an experimental extraction method that produces a higher yield than the enzymatic method. This new method is by alkaline hydrolysis of indican B. This new form of precursor has not yet been characterized by our part and could be isatan B. This last is the majority precursor of Woad (Isatis tinctoria) whose extraction method also involves an alkaline hydrolysis. Leaves woad contain various precursors such as indican, isatan B or isatan C. It would not be strange that leaves of Indigofera species also contain isatan B. A hypothesis suggests that all indigo plants have a single precursor that is the indican which is affected by oxidative processes generated by thermal stress and transformed to isatan B.

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Mary LANCE

New Deal Films (USA)

"Blue Alchemy : stories of Indigo"

Produced & Directed by Mary Lance
Length: 79 minutes
Released: 2011

What is indigo? It is a blue dye that has been in use worldwide for millennia; a vibrant color laden with symbolic meaning; a commodity that was once central to international trade and colonial economies; and the reason blue jeans are blue.

BLUE ALCHEMY is a feature length documentary that explores the history and reveals the beauty and importance of indigo, weaving together stories about textiles and culture and interviews with artists, artisans, and historians.

BLUE ALCHEMY is also about remarkable people around the globe who are using indigo in projects that are intended to improve life in their communities, preserve cultural integrity, and bring beauty to the world. The processes of making indigo dye from plants and of dyeing with indigo are described.

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SESSION 6B

« The uniqueness and multidimensional usage of some natural dyes of Tropical Africa »

Abayomi ADETUYI
Department of Chemistry, Federal University of Technology, Akure (Nigeria)

In collaboration with **Toyin L. AKOMOLAFE**, Stephen **A. ADEFEGHA** and **Ganiyu OBOH**, Department of Biochemistry – **Charity S. ODEYEMI**, Department of Electrical Electronics Engineering – Federal University of Technology, Akure

Colouring matters -dyes and pigments- have been exploited by humankind for their aesthetic values and used to embellish various articles and the environment in which man lived over the centuries. Some natural dyes have some inherent useful chemical compounds that are medicinal, as well as improving the aesthetic value of the product1. Natural dyes are biodegradable. This article presented the potentiality of a wide range of dyeing plants of Africa as good dye-sensitizers (they are easily excited to release electrons) 2, phytotherapeutic agents and value additives to industrial products 3,4 (such as cosmetics, beverages, paints and lacquers, writing inks). Some of these unique plants are Zanthoxylum zanthoxyloides *(stem),* Parkia filicoidea *(fruit husk),* Pterocarpus erinaceus *(heartwood) and* Harungana madagascariensis *(bark); study on photovoltaic properties concerned* Bixa orellana, Pterocarpus erinaceus, Sorghum bicolor, and Zingiber officinale*. A majority contained phytochemical compounds that act as antioxidants, reducing the mortality of cardiovascular and cerebrovascular diseases, as studied in the dietary inclusion of these dyes in Wistar strain albino rats 5, 6. A dose dependent significant (P<0.05) decrease in the rat's brain malondialdehyde content, serum activities of aspartate aminotransferase, alanine amino-transferase, alkaline phosphatase and total bilirubin content were observed.*

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Download the paper

« Evaluation of a selection of natural colorants extracts in various food matrices: colour results, taste, fastness. Industrial interest »

Emilie DORE
CRITT Agro-alimentaire
Christine BRUNET
ARRDHOR, CRITT Horticole (France)

CRITT Horticole from Rochefort, in association with the CRITT Agro-Alimentaire from La Rochelle, realized a feasibility study concerning the incorporation of a range of coloring plant extracts in foodstuffs. Firstly, in laboratory, coloring plant extracts were blended in food basic phases like water, milk and vegetable oil. This technical study allowed to select plant extracts for the manufacturing of foodstuffs at the stage of industrial pilot. Results show that selected coloring extracts are compatible with manufacturing processes of foodstuffs: aqueous food like fruit drinks or fizzy or emulsions food like sauces and creams. Control of filtration, pH and temperature parameters is important for the final appearance of the product. Results of tasting, light fastness and temperature stability of the colored foodstuff products, vary according to the plant extract blended and to the aqueous or emulsion food phases. The development of the use of coloring plant extracts in food industry is dependent on technical aspects, but also on the evolution of the food regulations.

Download the presentation

Ngoc Anh LUU DAM

Institute of Ecology and Biological Resources, Vietnam Academy of Science and Technology (Vietnam)

« Indigenous knowledge of utilization of colorant plants for food in some ethnic groups in the North of Vietnam »

In collaboration with : **Anh Thu TRUONG** et **Thi Phuong Thao NGUYEN**, Institute of Ecology and Biological Resources, Vietnam Academia of science and Technology – **Dam Cu LUU**, National Museum of Nature – **Yoshinori SUMIMURA**, Global Collaboration Centre, University of Osaka, Japan

Vietnam is a tropical country, which includes 12,000 flowering plant species in its flora. And Vietnam has 54 ethnic minorities with a broad range of experience in using plants for dyeing, especially for food. However, most dyes and pigments in Vietnam still are imported from abroad. Thus, we carry out scientific investigations and surveys in many places in northern Vietnam, such as Lao Cai, Son La, Hoa Binh, where there is a high density of communities of minorities. As a result 47 species belonging to 27 families giving a dye for food were identified. There were 16 species giving a red color, 14 used for green, 10 for yellow, 7 for black, and 6 for purple. Ethnic people have abundant knowledge in using plants for dyeing food such as processing, preparation, mixing plants for purpose of color. They can make new color that do not have in material before with their traditional knowledge. However, It is a matter of concern that indigenous knowledge of extraction, preparation, processing and use of natural dye is becoming invisible for lack of documentation and assessment, and in the face of competition from synthetic dyes.

Download the presentation

Nathalie PAULEAU-LARREY

Company David Michael Europe, Bourg-les-Valence (France)

« The use of natural colorants in the food industry – trends and innovations »

At the end of 2007, The Lancet published the results of a study that lead to one of the major projects of reformulation in the food industry in recent years. To avoid having their products labeled as «likely to cause attention deficit and hyper-activity in children», European industrialists in the agrofood industry who were using the yellow, orange and red synthetic colorants mentioned in the Southampton paper (E102, E104, E110, E122, E124, E129) rushed to convert to natural pigments. In spite of some sourcing problems and escalation of prices, a whole industrial sector is fast developing for the benefit of consumers' health. More than ever, innovation is at the heart of developments of natural food colorants: research on new sources of pigments (green, blue, red), improvement of stabilities, increasingly more natural formulations with the aim of achieving organic colorants extracts.

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SESSION 7

Isabelle CLONIER
ARRDHOR, CRITT Horticole, Rochefort (France)

« Antioxydative activity of some dye plant extracts – Example of a cosmetic application »

CRITT Horticole, in association with the laboratory Bioreds of the Faculty of Pharmaceutical and Biological Sciences of Lille, evaluated the antioxidative and anti-radicals activities of seven dye plant extracts. These antioxidative properties were studied by the test DPPH and the method of the reduction of both biological references H2O2 and O2- , and quantified by determination of CI 50. All extracts revealed an anti-radicals activity with low CI 50 for logwood, sorghum bicolor*, weld and* coreopsis tinctoria*. The effect of sorgho's extract on the control of both enzymatic species Coxs and Lox involved during the inflammatory phenomenon also revealed a soothing property of this extract. An example of incorporation of these new antioxidant natural matters in make-up is also presented.*

Download the presentation

Polycarpe KAYODE
University of Abomey (Benin)

« Development of the cultivation and extraction of dye-sorghum in Benin »

The effects of N, P and K fertilization on some agronomic characteristics of dye sorghum landraces of Benin were evaluated. The objective was to prospect the possibility of improving the productivity of the different landraces of dye-sorghum in Benin. Two dye sorghum landraces and 8 fertilizer treatments were investigated. The application of NP and NPK fertilizer significantly affected the total leaf sheaths production compared to treatments N, K, PK and the control. An application of these fertilizers induces a production of 2.8 t DM ha-1 of leaf sheaths while the unfertilized plot produces 1.5 t DM ha-1. The treatments NP and NPK have also induced high grain production (about 1.4 t DM ha-1). We observed that the sequential harvesting of the leaf sheaths does not affect significantly the grain yield. Furthermore, about 16 t DM ha-1 of straw which is especially constituted of stem are produced under these fertilizers application. However, no clear differentiation was observed between the two cultivars with regards to the leaf sheaths length and width and leaf sheaths yield. Cultivar from Boukoumbé has performed better than that from Banikoara in terms of grain yield. Extraction and quantification of the pigments content of the leaf sheath revealed the presence of anthocyanins in the plant extract with apigeninidin and luteolinidin as the major components.

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Dhanraj DHANASEKARAN

Department of Horticulture, Faculty of Agriculture, Annamalai University, Tamil Nadu (India)

« Effect of organic nutrients on dye quality of indigo »

Nature has gifted India with more than 500 dye yielding plants. Among them, Indigo blue from Indigofera tinctoria is in great demand. Though this crop is not new to India, the traditional knowledge on the cultivation has almost disappeared due to the introduction of synthetic dyestuff. Indigofera, being a leguminous crop, well known for nitrogen fixation, responds well to the application of nutrients. The quantity and source of nutrients are the major concern for higher dye recovery with superior quality. The quality of the dye also depends on the source of nutrients. Preliminary studies conducted in the traditional pockets of cultivation in Tamil Nadu (India) revealed that the crop is cultivated with minimal organic inputs (FYM alone) both for green manure and for dye crop and there is no standard recommendation at present for its cultivation. Hence, we studied the influence of organic manures on dye yield, glucoside content and indigo content with various organic manures viz., Farm yard manure, vermicompost, neem cake, bio-dynamic compost, bio-fertilizer consortium and humic acid. Evaluation of treatments using glucoside content and indigo content as criteria revealed that application of vermicompost @ 5 t ha-1 + Biofertilizer consortium @ 5 kg ha-1 (T7) exhibited the highest glucoside content (0.79 %) and highest indigo content (2.79 %) with a dye yield of 146.6 kg ha-1 followed by (T9) Bio-dynamic compost @ 5 t ha-1 + Bio-fertilizer consortium @ 5 kg ha-1 with 0.76 percent and 2.76 per cent respectively.

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Luciana ANGELINI

Dipartimento di Agronomia e Gestione dell'Agroecosistema, University of Pisa (Italia)

« Control of natural dyes. Analysis and case studies »

New dye crops offer farmers opportunities for diversification and can provide industry with new raw materials. However, farmers have little incentive to grow the crops unless a market exists, while industry requires a reliable supply in terms of both quantity and quality before it will invest in new process technology. To encourage such development a series of R&D projects have been started in central Italy in order to establish a complete production chain for historical dye species that will meet the sustainable fabric industry needs. A series of research efforts with an interdisciplinary approach, have been carried out including small agronomic experiments, large field trials, laboratory and pilot-scale extraction, application at dyeing lines and integrated quality control. The main results obtained from ongoing projects and case studies will be presented.

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SESSION 8

Eber LOPES FERREIRA

Company Etno Botanica Research and Technological Innovation (Brazil)

« Natural dyes from cultivation or sustainable extraction from the local communities living in areas of Extractive Reserves in Brazil – South America »

The program ETNO BOTANICA – Natural Dyes aims to contribute to the economic sustainability of the native communities in the Amazonian rainforest and to family organic farming, preserving the local culture, protecting their rights over their knowledge, maintaining the existing biodiversity in their territories, as legitimate cultural heritage for future generations. The entire line of products and services ETNO BOTANICA is based on principles of social and environmental responsibility. The plant colorant extracts come from farming or extractive activities sustained among local communities. The clean production process doesn't generate toxic waste, provides improved quality of life for producers and creates an alternative for the conscious consumer. ETNO BOTANICA brings innovation to the textile industry, with "Eco-friendly Processes" using natural dyes, organic cotton, and plant textile auxiliaries from butter and oil seeds, resins and vegetable saps. ETNO BOTANICA trades Brazilian natural dyes: annatto, genipa, red and yellow timbers from the Amazon Rainforest; cultivated turmeric and native colour plants from the central plateau; alfalfa and acacia from the South. ETNO BOTANICA has been founded by Eber Lopes Ferreira, author of Natural Dyes from Brazilian Flora - A Practical Guide to Dyeing with Plants, the result of 23 years of R and D projects allowing identification and testing of 180+ plant species from the Amazon Rainforest, Atlantic Forest, Caatinga, Cerrado and Pantanal, with potential for various industrial applications: textiles, cosmetics, special inks, paper and leather.

Download the presentation

Subhash Chandra TIWARI

Department of Forestry, Guru Ghasidas Vishwavidyalaya University, Bilaspur (India)

« Eco-friendly natural dyes from forests: extraction and dyeing of cotton, silk and wool with dye extracts »

In collaboration with : **Debajit MAHANTA**, State Council of Science and Technology – **Padma VANKAR**, Indian Institute of Technology

A survey of forest areas in north-eastern and central region of India has resulted in identification of about 50 plants belonging to more than 35 families having natural dyes in their different plant parts. Among these 50 plants we have selected seven plant species for the extraction of dyes and to develop dyeing procedures for different types of fabric. The selection of seven species is based on the indigenous knowledge of dye extraction and dye preparation by local communities living in forest villages of study areas who have been using natural dyes from ancient times. The species which we have used are Rubia cordifolia, Symplocos spicata, Mahonia napaulensis, Bischofia javanica, Acer pectinatum, Beilschmiedia fagifolia *and* Daphne papyracea*. The work on another three important species namely:* Woodfordia fruticosa, Pyrush pashia *and* Colquhounia coccinea *are also in progress. We have standardized extraction procedures for these species. We have also used various sophisticated techniques such as sonicator dyeing for dyeing Indian silk, cotton and wool. We have also developed beautiful colour shades using natural dyes with biomordants. The results on such topics will be presented and discussed in ISEND 2011.*

Download the presentation

June NGO SIOK KHENG
University of Malaysia Sarawak (Malaysia)

« Soluble Powder Natural Dyes from Malaysia »

In collaboration with : **Ong Wan Fen**, Faculty of Applied and Creative Arts – **Fasihuddin Badruddin Ahmad**, Faculty of Resource Science and Technology and **Kopli Bujang**, Centre of Excellence for Sago Research, University of Malaysia Sarawak

*In recent years, the number of textile craft practitioners in Malaysia using natural dyes in their work has dwindled drastically due to to the tedious process of extracting the colours. Besides, some of the plants and fruit used for natural dyeing are seasonal. Thus, in order to reduce the processes involved in dyeing using natural dyes and have the natural dyes readily available, it has to be converted into powder form. This paper highlights an on-going research on producing soluble powder natural dyes extracts from the Sebangki bark (*Neesia sp.*), Engkerabai leaves (*Psychotria viridiflora*) and Mengkudu root (*Morinda citrifolia*). These three natural colorants are typically used by the local Iban community in Sarawak to dye the silk and cotton threads for Pua Kumbu weaving. The two primary objectives of this research are to convert the extract of the natural dyes into soluble powder form using solvent extraction method and formulate textile dyeing recipes with good colorfastness and lightfastness using the powder natural dyes extracts.*

Download the presentation

Download the paper

Patrick BRENAC
Company Couleurs de Plantes, Rochefort-sur-Mer (France)

« Natural colors for green products – advances on industrial production, quality, markets »

Couleurs de Plantes is a manufacturer of natural colors (dye extracts, pigments, specialties) for industries, crafts or private applications. An overview of our activities was presented at ISEND 2008. Based on our experience and requirements to develop the use of natural dyes, this conference will focus on related topics including raw materials, quality & color control, standardization, tracking, market evolutions…

Download the presentation

Debanjali BANERJEE

National Institute of Fashion Technology, Ministry of Textiles (India)

« Extraction and Application of Eco–friendly Floral Dyes »

The present study is an attempt to provide an eco-friendly substitute for synthetic dyes from an unconventional but natural source. Flowers are highly colourful but deciduous, thus their collection will not harm the parent source. Colours obtained from nature have been part of our life from centuries. Today also craftsmen in various parts of world use natural dyes in limited way mainly because they are eco-friendly, non-toxic and have attractive shades. It was found that most flowers are highly coloured (specially the corolla) because they contain colouring matter, mainly anthocyanins or other flavonoids, which may be in free or glycosidic form. Most of the colouring matters present in the flowers are soluble in hot water, which also is an eco-friendly process. Thus, they can be applied on suitable substrates like textile fibres, paper, etc. Thus to get an alternative source to synthetic colorants, substantivity of colouring matter obtained from flowers was tested on different natural fibres. Improvement of the shades was achieved from fair to very good by use of different eco-friendly chemicals. The results obtained can be considered as almost equivalent to synthetic dyes.

Download the presentation

Zvi KOREN

The Edelstein Centre for the Analysis of Ancient Artefacts (Israël)

« New findings of the biblical purple dyes at Masada »

Nearly 2,000 years ago, the Jewish-Roman historian Josephus Flavius described the tragic events that befell those rebels fighting against the Roman occupation of Judea atop the fortified palace of Masada built a century earlier by King Herod. The fantastic palace remnants and Masada's last stand against Rome has catapulted this site to be one of the most important in ancient Israel. Consequently, artifacts discovered from that site have not only historical and archaeological significance, but also convey personal and emotional ties to that time in history. This talk will highlight the latest discoveries pertaining to the use of real molluskan purple dyes found in a number of Masada textiles. Based on the multi-component chemical fingerprinting of the dyes by means of HPLC analyses, the Muricidae source for all the dyes investigated was the Hexaplex trunculus *sea snail species. The various purple colors of these ancient textiles were red-purple Argaman dyeings, and, for the first time ever, the blue-purple Tekhelet was identified, as recently written up in The New York Times: www.nytimes.com/2011/02/28/world/middleeast/28blue.html?emc=eta1*

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SESSION 9

Julius LEAÑO
Philippine Textile Research Institute, Department of Science and Technology (The Philippine)

« Functional and bacterial properties of naturally-dyed Philippine textiles »

Natural dyes have recently been used in textiles not solely for aesthetic purposes. Requirements including satisfactory colorfastness, reproducible shades and visually diverse colors were initially complied with by naturally-dyed textiles. The Philippine textiles that include ligno-cellulosic fibers have been proven compatible with natural dyes and have made it to mainstream high-end markets. Water extraction of the pigments from various plant parts, inevitably co-extracts other potent and bioactive exudates that together with the inherent biocidal properties of the pigment reinforce the potency of the dye extracts as a functional textile finish. Mostly tannin-based although some also with carotenoids, flavonoids and other secondary metabolites, crude aqueous natural dyes are applied to textile test substrates using previously established natural dyeing technologies. Their activities were assessed against Staphyllococcos aureus *and* Klebisiella pneumonia *using AATCC Test Methods. Results revealed excellent inhibitory properties of naturally-dyed textiles up to 99.9% reduction by quantitative analysis. Prototype development of naturally-dyed antimicrobial* Ananas comosus *(pineapple)-cotton knitwear was done with a private partner. It aims to jumpstart the commercialization of this functional and anti-microbial natural dye textile finishing technology. Results extends the value and functionality of naturally-dyed Philippine textiles from being naturally-dyed, trendy, eco-friendly and wearable to having proven its inherent anti-bacterial properties thus offering more than just color but added function.*

Download the presentation

Christian PLADERER
Company Farben der Natur
Thomas BECHTOLD
Research Institute for Textile Chemistry and Textile Physics, Univ. Innsbruck (Austria)

« Colours of Nature – sustainable dyeing processes with dyestuffs based on renewable resources for the textile industry »

In textile industry growing interest to apply sustainable natural colorants is observed. Careful process adaptation and raw material selection is required to achieve acceptable quality of the dyed product, standardization of the plant material and process reproducibility. The demand for standardized plant sources led to the development of powdered plant dyes. The natural dyestuff of Colors of Nature (CoNa) Ltd. can be used on the machinery of the textile dyeing industry and fulfils its quality criteria. On the basis of ten year's research work the production process has been optimized over the whole life cycle. Secondary raw materials are the main resource, the used dyeing plants are obtained from organic cultivation only. The dyestuff of CoNa has been successfully tested and used within Austrian dyeing companies with international distribution (Schoeller Spinning Group, JM Fussenegger, Leinenweberei Vieboeck). For an introduction of natural colorants into commercial dyehouses strict calculation of resources balances and comparison to the best available technology is required. The market for organic textiles is growing as an increasing number of people realize the importance of sustainable production.

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Ji-Hee KIM
Museum of Natural Dye Arts and Catholic University of Daegu (Republic of Korea)

« Textile Decoration Using Natural Dyes from Tradition to Innovation and Traditional Fermentation Dyes in Korea »

This study purposed to contribute to the ultimate goal of ISEND by introducing traditional dyeing processes handed down in Korea and decorative and aesthetic formative works. And it is focused on the modernization from tradition, artistic decoration and translate into art of ISEND object that is histories of natural dyes from each countries, the characteristics cultural assets, dye materials, traditional dye methods and techniques, marketing, industrialize, modernization from tradition, artistic decoration, innovation techniques and translate into art. And this study is tried to be coincided with ISEND object. That is, we attempted to describe Korean traditional dying and fermentation dyeing processes and to present decorative textiles and art works using textiles colored with natural dyes by different techniques from tradition to innovative ones. As to the scope of this study, we covered Korean traditional materials, dyeing tools, and dyeing processes only for Obangsaek (the five basic colors), which is a Korean traditional concept of color. In the main body, we described the Obangsaek colors and Yin-Yang and Five Agents related to the colors, and introduced cultural, decorative and artistic works made with textiles of Obangsaek (five primary colors) including textiles, accessories, purses, handbags, bedclothes, interior decorations, and clothes, and lastly, I like to introduce presented the author's art works using natural dyes.

Download the presentation

Jenq-Renn CHEN
National Kaohsiung First University of Science & Technology,, République de Chine (Taiwan)

« Progresses in the Large Scale Production of Natural Dyed Fabrics »

In collaboration with: **Harch HONG, Maggie YOU, Tony LIN, Jason CHEN**, Company BeBe Cotton Knitting Co.

BeBe Cotton has been developing natural dyed fabrics since 2008 as one type of eco-friendly and healthy fabrics for underwear. With the advance of modern extraction and purification technologies, natural dyes are now more assessable and easier to quantify and control when applying to the dyeing process. Four different natural dyes from Couleurs de Plantes, France, have been used: madder, logwood, cochineal, and cutch. Different fabrics have been used including cotton, wool, silk, and nylon. The development processes initiated from a small scale of 10 g, to a medium scale of 1 kg, and then finally to a large scale of 20 kg. It is found that the dyeing processes strongly affect the final color on the fabrics. Various controlling factors have been identified in order to achieve a dyed fabric with good uniformity and wash fastness. These factors include but not limited to water quality, temperature, pH, and contaminations. With careful process control, it is possible to obtain natural dyed fabrics with properties matching those of synthetic dyed fabrics. This presentation summarizes the major findings in the scale-up of dyeing processes with natural dyes.

Download the presentation

Arun BAID
Company Aura Herbal Textiles Ltd., Ahmedabad (India)

« Developing standards for industrial plant dyeing process in textiles and resulting products »

Appx 10,000 garments were made in last 10 second and 20,50,0000 lts of water was used in same. 8000 various toxic chemical are known to be in use for processing textiles. This patented Herbal dyeing technology uses medicinally rich herbs with unique age old Ayurvedic techniques without limitations to Quantities, Qualities and Colors required in today's textiles (Prints, Yarn-dyed, Silk, Wool, Knits, canvass etc). More than ever a process such as this required to take over the chemical dyeing in bulk as soon as possible. The problem is we see lots of Natural dyeing processes happening around the world but a clear cut standards are missing to identify the true process and its impact on environment. The Objectives of these standards is to describe the true organic natures of Textiles, from harvesting of the cotton, its conversion from fiber to finished fabric, by employing natural material through out the dyeing / printing processes which will generate only biocompatible residues. These standards help in keeping the social commitment of preserving the ecology and also provide proper guidance to the consumer by confirming the quality.

Download the presentation

Marie-Paule NOUGARET
Scientific journalist (France)

« Chimie verte, chimie grise, épuration par les végétaux »

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SESSION 10

Francisco M. MARTINEZ-VERDU

Colour & Vision Group, Department of Optics, University of Alicante (Spain)

« Design, synthesis and characterization of natural nano-pigments – challenges and opportunities for many industrial applications »

In collaboration with : **E. BAENA, B. MICÓ et V. MARCHANTE**, Colour & Vision Group, University of Alicante - **A. ROQUERO,** Instituto del Patrimonio Histórico

The increasing preference by present consumers of natural products instead of synthetic ones is a leading force in the research and innovation on coloration of paints, inks, textiles and cosmetics. Natural dyeing reflects a sustainable relationship with the ecosystem, but on the other hand, industrial production of natural dyes demands considerable amounts of water and could contribute to the reduction of biodiversity due to the imposed prevalence of determined species. Therefore, a massive effort of interdisciplinary study is needed to optimize the performance of natural colorants if they are going to play a more important role than at present. From the University of Alicante (Spain) the Colour & Vision Group is currently involved in the articulation of a spin-off (knowledge-intensive small/medium enterprise) company focused on the integral RTD management of nano-pigments based on nano-clays and natural dyes. This work will show the progresses developed for reaching this initial scope also marking some challenges and opportunities for many industrial applications, such as for potential partners as customers for this new company born from a Spanish University.

Download the presentation

Frédérique BARBOSA

Company Alban Muller International (France)

« Developing a range of tinctorial plant extracts for the international cosmetic market – the Tinctamis® »

Alban Muller International Company has been accumulating expertise in plant extraction for more than thirty years. Among its different ranges of plant extracts we focus today on the Tinctamis®, which have the unique feature of being extracted from traditional dye plants. These not only contain colouring principles but also active molecules able to beautify the skin, which is less well known. For instance, madder offers softening properties whereas dyer's broom displays an anti-ageing activity and Genipa a soothing effect. We started from the beginning with an eco-responsible approach using natural-derived solvents and energy-saving processes. The maceration solvent adapted to the solubility of the molecules to be extracted is a water/wheat-origin ethanol. A concentration phase under vacuum is then necessary to eliminate ethanol, which is recycled. The remaining extract is then dried by zeodration. This technique is based on water adsorption on zeolites under vacuum and at low temperature to preserve the quality of the active principles. Finally, the extracts obtained called native extracts are placed in a carrier of water, ethanol, and rapeseed origin glycerine.

Download the presentation

Hélène DE CLERMONT GALLERANDE

Laboratoire R&D Maquillage, Company Chanel (France)

« Selection and formulation of a vegetal coloured extract in make-up cosmetics products »

In collaboration with **Christine DACRUZ**, R & D Laboratory Maquillage Chanel

The introduction of vegetable coloured extracts in cosmetic products has been studied to reduce the use of Cochineal Carmine. The vegetable extracts are mainly colorants but for make-up applications, pigments are required. It becomes necessary to fix the coloured extract onto a substrate. Chanel collaborated with the CRITT Horticole of Rochefort to select the best plant and to determine the right support. A list of vegetable species well known to give a red coloration was established. Sappan Wood was selected as well as kaolin as mineral support. The criteria of selection were based on toxicological data, spectrocolorimetric measurements, color strength and uniformity of the application, wettability in lipophilic medium, dispersability in a powder medium. Additional tests were done like light and heat stabilities, anti-oxidative and anti-aging properties evaluation. Finally, the Sappan wood extract onto kaolin substrate is a nice red pigment for make-up with anti-aging properties as it inhibits MMP-1, MMP-2, MMP-9 activities. It can be easily introduced into lipsticks, glosses, blushes and eye-shadows.

Perumal RAVICHANDRAN

Manonmaniam Sundaram University

Venugopal MANIMEKALAI

Sri Parasakthi Women's College e, Tamil Nadu (India)

« New standardized application methods of natural dyes from south india on plant fibres used in handicrafts and cottage industries »

*New application methods were standardized for dyeing of six different plant fibres such as banana sheath (*Musa paradisiaca*), Agave (*Agave americana*) and Bowstring hemp leaf fibres (*Sansevieria roxburghiana*), coconut coir (*Cocos nucifera*), bamboo strips (*Bambusa arundinacea*) and Palmyra palm leaf strands (*Borasus flabellifer*). The dry and split fibres and strands are widely used in handicrafts and cottage industries for making baskets, hand bags, hats, toys, dolls, ropes, carpets, wall hangings, doormats and table mats in India and more commonly in the southern India. Natural dyes such as annatto (*Bixa orellana*), sappan (*Caesalpinia sappan*), nyctanthes (*Nyctanthes arbortristis*), madder (*Rubia cordifolia*), turmeric (*Curcuma longa*), ventilago (*Ventilago madraspatana*), henna (*Lawsonia inermis*), were extracted in water and applied with or without mordants to give dye fast colors of yellow, orange, maroon, red and grey at specific pH and temperature. Sappan dyed red fibres were transformed in to dark brown and black dye fast by treating with clay and ash. Pre treating the fibres, water extraction of natural dyes and dye bath procedures are simple and quick protocol for dyeing natural fibres. As most of these fibres are rich in cellulose, lignin and epicuticular waxes the natural dyes strongly bind to them compared to the rest of the cells and tissues. The reasons for binding water extracts of natural dyes with lignin, pectin and cellulose rich fibres and colour transformations are explained scientifically using light and fluorescent microscopic studies.*

Download the presentation

Pajaera PATANATHABUTR
Department of Materials Science and Engineering, Faculty of Engineering and Industrial Technology, Silpakorn University (Thailand)

« Natural colorants in Thailand: from traditional textiles to dyed polylactic acid composites for environmental–friendly packaging »

In collaboration with **Supanee CHAYABUTRA**, Research Centre for Art and Design Materials, Silpakorn University

There has been an interest manifested towards the application of natural dyes due to their bio-degradability and environmental-friendly production. Natural dyed textiles were part of Thai way of living; from religious textiles such as weaving jackfruit-dyed cotton into robes for monks in the annual Chula Kathin ceremony to traditional textiles such as tied-dyeing to create unique ikat design, pattern weaving to create intricate supplementary weft motifs and multi-filament spinning to create two-tone reflected fabrics. In recent years, large amounts of non-degradable waste plastics from packaging have caused environmental problem. Therefore, the development of biodegradable plastics from bio resource such as polylactic acid (PLA) are now of interests for packaging application. Natural colorants have many advantages over synthetic dyes with respect to the production and higher compatibility with the environment. The current research is on melt blending of natural dyed silica powder to improve appearance and mechanical properties of PLA composites. Moreover, silica powder was extracted from rice husk ash which is an agricultural waste material, abundantly available in Thailand and the silica powder was natural dyed with non-toxic alum mordant.

Download the presentation

Gerda HANSBERG
Company Tlapalli (Mexico)

« The Use of natural colorants and pigments in Tlapalli, colours for painting »

As an artist, I have long been interested in the origin of natural colours. In fact it has been a pursuit of my entire professional life. Colours are a fundamental aspect of human communication and as such form a foundation of civilization. Understanding the colours used by ancient cultures, how they were produced and used, can reveal much about how the people lived and interacted with nature. TLAPALLI is my investigation of the use of colours in Mexico' Mesoamerican times. It is an investigation of the medium they used to paint the Codices (painted sheets of paper, representing their social issues); it is also a way to use ancient colours in modern art. The final formula of TLAPALLI COLORS is a combination of natural colouring used in old tradition and similar products processed with modern technology that have the same purpose in producing water color base, like water colors are produced now. The result is a palette of particularly beautiful natural tones, sought after by artists for their luminosity, texture. TLAPALLI COLORS are natural and environmentally responsible, made by hand using a solar drying system.

Download the presentation

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« Tendances et colorants naturels »
Présentation audiovisuelle : EARTH MATTERS"

Cécile POIGNANT
Company Trend Union
(France)

She is talking loud and clear.
she is protesting violently with frontal attacks.
the earth is hurt and emptied.
we have taken it all and it is still not enough;
we have taken it all and transformed it into waste
which we give back to the earth
as a poisonous present and
as an unsolvable mass of matter.
this century is bringing a moment of reflection and radical change,
making up for a century of abuse, greed and violence.
for the first time a post fossil society is emerging,
giving man much hope and faith in the future.
resetting attitude and mentality towards
more respect for the earth and each other.
therefore fashion will be mining mental matter;
taking inspiration from earth and trying to give back its beauty and strength;
restoring her self-respect and reflecting on the huge gift
this planet was, and still will be for us humans.
our entente with nature will be re-written and re-invented;
we will try to live together in a more harmonious way,
giving and taking, and caring for each other.
a more intimate and intuitive relationship will be the result,
based on primitive emotions and ancient rituals and archaic systems,
re-inventing animism.

Lidewij Edelkoort
Trend Union

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SESSION 11

Alfonsa HORENG
Women Weavers and Natural Tyed-dyeing Cooperative of Flores (Indonesia)

« The magic of natural-dyed ikats in Flores culture and integrity – development in women weavers' cooperatives »

Flores Island is an area renowned for its magnificent textiles of natural "ikat" (tie-dye) weaving. The composition of the natural color is come from many plants in Flores Island. Rural women who are weavers and dyers are familiar with a good skill of traditional knowledge to apply the natural tie-dye in the weaving process. Magic of the natural dye: during the process of the natural dye, dyers women start to take the plants by a short ritual for their ancestors and keep the sustainable of the plants resources. Specially, how to make the material of dye, we have h a ceremonial and a requirement to get a good colour result. A master cloth with a good natural dye is to make a preserved for their ancestors during a festival for an ancestral temple. Economic circumstances for some weavers or dyers who concentrate primally on the production of the cloth or dyeing, the proceeds are used to buy basic supplies for their families. The social meaning of natural tie-dye in the textiles: most fully express social relationship among the groups who make up the community.

Download the presentation

Sentila T. YANGER
Craft Revivalist & Naga Textile Specialist (India)

« Indigo Stories of the Naga »

One of the mountainous north-eastern frontier states of India is Nagaland, inhabited by ethnic communities living contiguous to one another, sharing certain cultural affinities in dress and ornaments but distinct from each other in language, customary laws and practices, folklore, etc. Before the introduction of synthetic dyes and chemically colored yarns around the 1930s-40s, natural dyes were extracted from species of indigenous plants peculiar to each Naga tribe for application to woven textiles and adornments. Indigo from the Strobilanthes flaccidifolius *is the common blue source for many of the Naga tribes. An exclusive gender craft taboo to men, the practice is steeped in 'gennas' (taboos/ restrictions/purifications) on female practitioners, who abide the craft's rigid demands on the self while engaging and nurturing the indigo pot. Good or bad dye results were powerful and visible command of the self in adhering to the craft 'gennas' and therefore, powerful testimonies according respectful status to those with the 'hand'. Today the craft practice is either lost or in a languishing status among the Naga communities due to passing away of the older practitioners. Through the intervention of Tribal Weave founded by this author, there are now encouraging signs of revival of Osak (indigo) among the Ao-Naga and other Naga tribes.*

Download the presentation

Serife ATLIHAN
Marmara University of Istanbul (Turquish)

« Production of Traditional Textiles with Natural Dyes Following the DOBAG project »

The DOBAG project (Natural Dyes Research and Development Project), is the first example in the world which has systematically organized the revival of natural dyes primarily on Turkish traditional carpets and rugs since the year 1981 and which still continues to do so. DOBAG project is still administrated by Marmara University in Istanbul. As a result of increased demand for the natural dyed carpets produced within the scope of the DOBAG project, use of natural dyes has been started in other regions of in Turkey and in some foreign countries. This has brought forward the use of natural dyes in Iran, Pakistan, India, Morocco, and many other places of the world. The DOBAG project is being carried out are using the natural dyes not only on the carpets and rugs for selling, but also on the textiles for peoples own needs. This project eventually has created competitors for itself in the carpet market. Today, Natural dye research works are being carried out in many of the universities in Turkey and in other country.

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Download the paper

Fabiana MENNA
Gran Chaco Foundation (Italy/Argentina)

« The colors of the forest: women's empowerment trough the rediscovery of colors »

In the Gran Chaco region, live many indigenous people who are fighting against deforestation and poverty, trying to maintain their culture and way of life. In this context, 1000 women are organizing themselves to improve their handicrafts in quality and in market strategy. They founded 8 associations and one cooperative which dedicate themselves to sell their production and to train women. The rediscovery of natural dyes is emblematic of this process because after decades of colonization, also handicraft worsen their quality and variety of colors of the textiles. The organization process determinated the increase of women self-esteem which was reflected in the improvement of craftsmanship, winning the "Craft Excellence Award" of UNESCO, in 2008. Women began to use again many colours, learning from oldest artisans and rediscovering the richness of their cultures and of the forest which offers such a variety of roots, barks, fruit. Nowadays indigenous women utilize 30 natural dyestuffs, with traditional recipes, and dedicate themselves to teach them to younger women.

Download the presentation

Katarzyna SCHMIDT-PRZEWOZNA
Institute of Natural Fibres and Medicinal Plants (Poland)e

« Natural Dyeing Plants in History of Polish Artistic Workshops »

The history of using natural dyestuffs on the Polish territory dates back to the neolithic period. The artistic fabrics such as tapestries, gobelins, 'kontusz' sashes were inspired by the Eastern and Western cultures, both in terms of design and colours. The 'kontusz' sashes were characteristic of Polish culture. The first manufactures called „Persjarnie", which produced even signed fabrics, were established in 16th century and reached their heyday in 17th and 18th centuries. The weaving workshops were often located near dyeing mills. Some dyestuffs were usually imported from abroad. Plantations of dyeing plants, where woad, madder, weld and other plants grew, were established in the vicinity of weaving manufactories. Tapestries in Poland reached high artistic value irrespective of the manufacturing place, whether at courts or in smaller artistic workshops. The fabrics produced at the Cracow Workshops between 1913 and 1926 were exceptionally good. That workshop gathered numerous designers who restored traditional techniques of natural dyeing and developed about 100 formulas for dyeing. As a result of their efforts, they were presented with 205 awards at the World's Fair in Paris (1925).

Download the presentation

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SESSION 12

Luz MEDINA BONTA
Delta State University
(Honduras)

« Indigenous community involvement in the revival and sustainability of natural dyes and fibers in Honduras »

Honduras has long been an important source of natural dyes and fibers, particularly among indigenous groups and specifically the Miskito communities located on the Mosquito Coast in the Gracias a Dios department. This project set out to study the viability of co-producing eco-fashion attire with the involvement of local Miskita women artisans in two communities, and from there to demonstrate a way that communities isolated and marginalized both by tradition and modernity can benefit financially from their natural resources in a sustainable and eco-friendly manner. During July and August 2010, the author gave two workshops to the communities of Mocoron and Wampusirpi, where traditional dye and fiber knowledge combined with an artist's expertise to create bark cloth, silk, and cotton garments. To finalize our work, we showcased the Madreselva (=Mother Forest) Collection during Fashion Week Honduras in October 2010. This presentation describes the results of the effort, then analyzes the role of development agencies in enabling or constraining communities such as these that seek to create sustainable, environmentally-friendly, and income-generating natural dye and fiber projects.

Download the presentation

Juan CAZORLA GODOY
Association Milana
Canaries (Spain)

« Cochineal in education in Lanzarote Island »

At ISEND 2011 Europe, we present our experience with students of schools and institutes of the island of Lanzarote (Canary Islands. Spain) since 2005, where we have used the Cochineal dye-insect of Lanzarote as a local natural resource to explain different subjects and motivate students to study. Applying our understanding of cochineal (history, culture, technology, agriculture, environment, biochemistry, etc) we worked to develop teaching units on each of the core competencies of education and promote the conservation of biological diversity, creativity and entrepreneurship.

Download the presentation

Martine BOULANGER-PENDUFF
Lycée professionnel Jean-XXIII, Paita - Nouvelle-Calédonie (France)

« Fashion and environment in New-Caledonia – valorization of plant wastes for natural dyeing by a class preparing for the Professional Baccalauréat on Fashion and Apparel »

In collaboration with : **Stan TOKARSKI, Patricia BLADINIERES, Sarah HOURCOURIGARAY, Tom TROLUE, Claudine MARCHAL** and **Kenji SAKOUMORY**

In our approach to make the students sensitive to sustainable development, we have chosen to dedicate our project in 2010-2011, to the use of plant wastes - abundant raw materials which are easily salvaged in New-Caledonia - as natural colour sources for fashion design and clothing. Origins of the natural dyestuffs : Family garbage, plant wastes coming from gardens' cleaning (windfalls, flowers, branches, cut uprooted trees, intrusive plants…) and residues from craft- or semi-industrial natural production. In addition to concerning different disciplines and bringing a learning motivation for the students, natural dyes are a great support to develop curiosity, to communicate with different publics, to organize and to program activities, to increase imagination: clothes designing and producing in an environmental respect, contributing to the economical and sustainable development.

Download the presentation

Sandy HEFFERNAN
Massey University (Nouvelle-Zélande)

« Future fabric: natural dyeing in New Zealand »

Fashion and textile designers face many changes in the shift to sustainability. In New Zealand a natural dye tradition exists amongst Maori who extract vibrant colours from indigenous plants and apply them to fibre for decoration. In the early 1900s experiments using lichen from Antarctica on wool were undertaken and since then several publications have promoted local natural dyeing. Today it regains significance and a revival of interest towards the production of sustainable coloured textiles in the textile design programme at Massey University where students explore natural dye, stitch and clamp resist techniques to achieve colour layering and 3D effects. Carefully managed experimentation, crocking, light and wash fast testing determines which dye sources are more successful. This paper will report methods, results and conclude with information that will contribute to natural dye discourse. This is an opportunity to reveal some of the unique and interesting aspects of this broad array of natural dye research.

Download the paper

Karen URBANEK
(USA)

« A Colourbox for Art Explorers »

The initial phase of what is hoped will be a long term community project focuses upon creating a working box of tools for artmaking from natural colourants for Art Explorers, a creative arts program founded to serve artists with developmental and other disabilities on the northern California coast of the United States. The artists are accustomed to using student grade poster, watercolor and acrylic paints, colored pencils, markers and oil pastels to draw and paint on papers and wooden objects which are exhibited and sold to provide income for the artists. Since the use of natural materials is new to the artists; changes in palette and working methods required adjustments in pace and process. Colourant sources started with generally available natural dyes and pigments; in future, locally grown and processed colourants could provide additional community income opportunities. This is the illustrated story of developing the right tools for an amazingly free and talented group of artists, their adaptation and artistic response to them, and the difference a natural palette can make.

Download the presentation

Victoria MYRTAL
Company Aranya Naturals, Tata Global Beverages Ltd., Munnar (India)

« Looking beyond with confidence »

*"Aranya Natural" a natural dye unit is a welfare project of Tata Global Beverages Limited (TGBL), established in 1994, and is completely manned by physically challenged young adults. The genesis of "Aranya Natural" came with the aim to revitalize the ancient art of natural dyeing and thus rehabilitate the physically challenged young adults of our employee's families at Munnar Tea gardens. We included appropriate technologies and promoted crafts related to natural dyes, to give livelihood to them. Local availability of raw materials like tea waste, Eupatorium [*Chromolaena odorata*], eucalyptus, lemon grass (*Cymbopogon citratus*) and marigold gave us confidence. Harvesting the wild and waste plants without affecting the eco system and availability of Natural spring water added our strength. Shibori, Block printing, and Batik with natural dyes yielded promising results, meeting international standards. Regular training, imparting mechanizing techniques, quality assurance, makes "Aranya Natural" to remain economically sustainable, simultaneously providing a quality life with dignity for the physically challenged.*

Download the presentation

Rosella CILANO
Association Tintura Naturale M.E. Salice (Italy)

« The Natural Dye Association Maria Elda Salice – Italy »

It is a documentation, research, consulting and training centre on natural dye based in Milan, where it was founded in 1986 to continue and widen the experience of the Master Dyer to whom it is dedicated. The purpose of the association is to promote natural dyes, by documenting its characteristics and peculiarities and its potential application within the textile sector and in pictorial activities, ensuring a high level of excellence. More in detail: it provides consultancy to craftsmen, textile restorers, private companies; it promotes training courses, seminars and exhibitions and contributes to conferences both in Italy and abroad; it carries out research on dyeing plants in specific geographical areas and on the potential use of natural dyes on a small to large scale publishing the results in its series "Quaderni di Tintura Naturale"; it contributes as a consultant to projects addressing territorial development and youth employment. It cooperates with artists, craftsmen, fashion designers, landscape architects, public institutions, schools and universities, museums, botanical gardens, associations. President: Fernanda Salice; Managing director: Rosella Cilano.

Download the presentation

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SESSION 13

Barbara BIGLER
Dyer - Suisse
et Marie MARQUET
CIHAM/ Lyon II
University (France)

« The Rainbow Project: A collaborative Platform and Online database on natural dyes and textile fibres »

The Rainbow Project aims at contributing to research into natural dyes and textile history by providing a new tool for enlarged collaborations and worldwide sharing of information. All of us know the importance of exchanges between all the fields concerned by natural dyes research and practice, and this symposium attests it. All of us can see how important a web site can be for connecting people, discussing and highlighting researches and publications. We wish to build a virtual space where all researchers, craftspersons, dyers can share data, publish information relying on all fields linked with naturals dyes: botanic, chemistry, textile history, archaeology and ethnography, museum conservation, recipes and knowhow. During this meeting, we will exchange about the creation of this collaborative web platform. We will present our reflexions for the construction of this project, and the web tools chosen for programming it. It will be the occasion for discussing the needs and ideas of the symposium participants, and to define priorities for its construction. We will set up a group of persons who wish to contribute to the creation of this web platform. We will ensure the continuation of these exchanges by connecting all participants to an online working space for sharing documents for a collective work.

Download the presentations

Charllotte KWON
Company Maiwa
Handprints Ltd. (Canada)

« Three Paradoxes of Marketing Natural Dyes »

Are the qualities of natural dyes advantages or disadvantages? The answer will depend upon the values we seek to convey when we begin marketing them. From the viewpoint of those engaged in commerce in an industrial, consumer society; natural dyes require standardization, certification and regulation. These steps provide assurance that products, be they extracts, raw materials, or finished textiles, are uniform and will behave as expected. There is, however, a paradox associated with each step. Standardization may eliminate diversity. Certification may not be an option for traditional artisans (often the same artisans who have kept natural dye knowledge intact for hundreds of years), and regulation may significantly change the viability of working with natural dyes for many groups. Charllotte Kwon, through her experience as owner of Maiwa Handprints, has encouraged, researched, and taught natural dye use in both industrial and artisan contexts. Maiwa has marketed natural dyes, extracts, and naturally-dyed textiles for over 20 years.

Download the presentation

Stefano PANCONESI
Textile consultant (Italy)

« Guidelines for the production and marketing of natural dyes for the European textile industry »

The growing interest in recent years for natural dyes in the textile industry and elsewhere is due to increased consumer awareness of environmental issues and a desire to promote local production. Natural dyes should be seen as not just a new way of colouring, but as the most correct phase in the production of sustainable and organic textiles, since organically certified natural dyes are now available. Because lots of colours and nuances can be obtained from dye plants used singly or as a mixture, lots of palettes are possible, catering for the demands of fashion stylists. The textile industry is showing an interest in natural dyes, particularly in extract form, because they are easy to stock and use. Producers of natural dye extracts are moving towards standardized results, and performances have improved thanks to new recipes. Several European stylists have created small lines of naturally dyed garments, and important textile industries are producing eco-friendly and organic natural colours which are GOTS certified. Product marketing is becoming key to good communication and success in sales.

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Edric ONG
Company Atelier Sarawak, Seal of Excellence of UNESCO (Malaysia)

« Natural Dyes in Textiles and Fashion: Niche or Mass? »

The global concern for the Environment has made «Green» a catch- word; and many producers of textiles and fashion are riding the tide and making what they call «Eco-Fashion». Is this merely a passing trend; a marketing strategy (for some); or is this really a movement to be reckoned with? Drawing from my experience and observation, this paper examines in particular the Asian scenario of natural dye textiles and fashion and asks whether it is only for the niche market; and can there be a mass market.

Download the presentation

Gabriela NIRINO

Faculty of Architecture, Design and Urbanism, University of Buenos Aires; Department of Textile Engineering, National Technological University (Argentina)

« The Added Value of Natural Dyes in Product Design »

In the current context of concern for the environment, the use of renewable resources, clean technologies, and production processes that are both sustainable and socially just has aroused everyone's interest. In Argentina, going back to craft and community production techniques in line with our cultural tradition has also been an answer tending to dynamize the micro regional community production systems. In the textile design and clothing fields, craft dyeing with natural dyes has gained ground, both among designers and among a still reduced market of users interested in eco design. Since 2009, we have been developing a program at university whose main goal is not only to introduce design students to the study of natural dyes but also to impart knowledge that can contribute to the improvement of the use of natural dyes as added value in textile products. The presentation will deal with the actions performed : bibliographic survey, dyeing formulas and samplers, comparison among various dyeing methods, productive processes accessible to small units, color reproducibility, surveys to potential consumers of products dyed with natural colorants.

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Luiven RIVAS-SANCHEZ

Fashion and Textile designer (United-Kingdom)

« Natural dyes in contemporary fashion and textiles »

*As a fashion textile designer, I work with colour to define images that lend themselves to a suitable garment. In Haute-Couture, designers find unique forms of expression to deliver garments to an exclusive clientele by using expensive materials and labour intensive techniques. I chose silk organza due to transparency and dyeing suitability. Through historical, scientific and empirical data, I have learned that natural bearing dyes work well with protein fibres and fabrics. The yielding of warm shades associated with scarlet and crimson naturally obtained from "*Rubia Tinctorium*" and insect bearing colour "*Dactylopius Coccus*" both play a fundamental role in my choice of palette. Sections of the garments have been hand quilted using sustainable materials for embellishment. By working with natural dyes and fabrics, I promote awareness in sustainable fashion and textiles.*

Download the presentation

Kathelyn TOTH-FEJEL
Permacouture Institute (United-Kibngdom)
et Sasha DUERR
Permacouture Institute and California College of the Arts (USA)

« Slow Textiles, Ecoliteracy and Natural Colorants »

Ecoliteracy: a term coined by environmentalist Fritjof Capra, meaning education for sustainable living. The reasoning behind ecoliteracy is that if we learn to understand our environment emotionally and deeply rather than through lecturing or abstract fact-based knowledge, we will be motivated to care for it. Much of what has become problematic in our modern lives is related to having forgotten how to connect with simple rhythms of nature. In contemporary culture we are often out of sync with the seasons, what plants grow in our bio-regions, and how to recognize them by name. Learning to identify plants of this world, the pleasure of growing one's own food, or how to create a color palette from «soil to studio» are concepts directly related to ecoliteracy. From Slow Food to Slow Fashion and Textiles, a culture is being reborn of stewardship and connection to the source of our materials. Sasha Duerr and Katelyn Toth-Fejel, of Permacouture Institute, will highlight inspiring examples of how "Slow Textiles, Ecoliteracy, and Natural Colorants" are intrinsically informing a burgeoning movement.

Download the presentation

Barbara BLIN BARROIS

« Natural colorants and pigments: stakes for new deals »

En collaboration avec **Anne VARICHON**

For this new subject about valorization and marketing, we will study a comparison between natural pigments and natural colorants, bringing light, on one hand, on global and common stakes (technological quality of processes, ethical level of production and commercial means, consistency of both reality and sincere vocabulary, certifications and labels, production and circulation scales…) and, on the other hand, on differential natures (for an example, specificities in approaching textile or beauty professional markets, versus art or home decoration mass markets) which lead to choose suitable methods to meet each market. We will conclude about the meaning of how far or not we should go on developing natural dyes markets, and what a true sustainable ambition could be.

Download the presentation

Esther REWITZ
IMO Institute for Marketecology (Switzerland)

« GOTS Global Organic Textile Standard with approval procedure of natural colorants »

The Global Organic Textile Standard is the most developed industrial standard for organic textiles and the current number of 2800 certified companies worldwide shows its importance and recognition. However, natural colorants are still rarely used in industrial textile processing. IMO as a certification body provides both GOTS approval for colorants and auxiliaries, (natural and synthetic) as well as GOTS certification of processing companies all along the textile supply chain. The conformity of naturally dyed textiles with the Global Organic Textile Standard and the IMO procedure of approval of colorants are important aspects and a first step to promote sustainable dye plant cultivation and sustainable textile processing with natural colorants. You may wonder why there is a need of approval of natural colorants as their usage may represent less risk for humans and environment than certain synthetic dyes. Learn more about the requirements for sustainable processing with natural dyes and the approval of natural colorants to ensure the non-toxic character in the final textile article!

Download the presentation

Bina RAO
Company Creative Bee (India)

« Natural Dye label: Modalities and Criteria of Implementation »

As we all gather at ISEND2011, to further intensify our quest to strengthen all aspects connecting to Natural and truly organic dyes and colorants, my topic, though last in the session, is of prime importance. Years ago the standards were set for natural dyes &colorants in Europe, but with compromise to incorporate also the least harmful of the chemical dyes. Can there be two different labels? Example of Hand loom Mark and Silk Mark: Time has really come to create a label [Truly Natural] and work towards creating a logo, certification, and implementation and promote the use of Truly Natural world wide. How to go about it? What truly defines Natural? What all natural ingredients are permissible and considered as natural? We need to create an index as well as user manual they have to comply with. Criteria of approval and license /certification? Dye source? Process? Lab certification? Implementing Agency: more than one statutory agencies/Boards, region wise such as IMO, GOTS,IIT,TCI and many more from other countries like Japan, Australia, USA. We can collectively work towards it and design the logo as well as finalize the modalities.

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Sayyda Ruby GHUZNAVI

Company Aranya
(Bangladesh)

« Organic Colours: commitment to a Shared Future »

Through the ages, human beings have extracted colours from a wide variety of renewable resources to adorn themselves and their environs. Museum collections across the world show that these colours have retained their beauty and excellence over centuries. Yet the discovery of aniline dyes in 1856 all but destroyed the tradition in a matter of decades. The movement for the revival of natural dyes began in the '70's and has attained some success through national and international conferences, establishing commercial production and the marketing of natural dye products in quite a few countries. Ecological concerns worldwide and the growing interest of fashion designers have also assisted in putting natural dyes on the international agenda. In order to build on to the success of the last three decades it is essential for like minded organizations to undertake the holistic programmes and strategies necessary to take natural dyes forward. Firstly, there is an urgent need to document traditional and contemporary natural dye techniques and to disseminate this information. It is essential to develop a mechanism for sharing expertise and undertaking extensive transfer of technology to ensure that limited resources are not wasted on reinventing the wheel. There is a need to lobby policy makers about the economic and social benefits of natural dyes and educate the general public about the ecological merits, range and colourfastness of natural dyes.

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1	**Atsuko ABE, Hisako SUMI, Kana YAMAGUCHI** NPO Earth Network (Japan)	Dyeing with the Cork tree *(Phellodendron amurense Rupr.),* a dye and medicinal plant. A yellow dye for both paper and fabric.	
4	**Luciana G. ANGELINI, Silvia TAVARINI, Silvia ZUBLENA,** University of Pisa (Italy)	Relationship between colouring power and antioxidant properties of different weld *Reseda luteola L*.) extracts.	N.c.
5	**Luciana G. ANGELINI, Paola CICUTA, Silvia TAVARINI, et al.** University of Pisa (Italy)	Preparation and dyeing with orchil, a lichen-based dye from the Tuscan islands.	N.c.
6	**Arun BAID** Company Aura Herbal Textiles (India)	GO organic, GET Herbal & SAVE environment.	
7	**Nilia ROHNER BANARES** Association of Dye Mycology (Spain)	Mushrooms also for dyes.	
8	**Paola BARZANO et al.** University of Florence (Italy)	The red shirts of Garibaldi's thousands.	
10 11	**Magali BONTOUX** Natural colours, L'Herbier à couleur (France)	Poster 1: Vegetable dyes and efforts to maximize benefits to the environment: colours obtained from co-valuation of plants. Poster 2: Vegetable dyes obtained from plant waste recycling: a benefit to the environment, an original way to produce new colour dyes.	
12	**Nathalie BOUCHERIE** University of Lyon 2, CIHAM (France)	Observation notes about natural dyes in Peru: between conservation and innovation.	
13	**Martine BOULANGER-PENDUFF et al.** Vocational High School and Catering College Jean XXIII, Païta (New-Caledonia)	Fashion and environment: the natural dyes at the high school.	
14	**Silvia Sissi CASTELLANO** Association Casa Clementina (Italy)	North Italian tinctorial lichens.	
15	**Marie-Thérèse CHAUPIN** Atelier laines d'Europe (France)	Naturally colored animal fibers.	

16	**Min CHOI, Younsook SHIN** Chonnam National University (Republic of Korea)	Preparation of pulverized colorants from Gromwell (*Lithospermum erythrorhizon*).
17	**Rosella CILANO** Natural Dye Association M.E. Salice (Italy)	Natural dye association Maria Elda Salice – Milan.
18	**Monica CORNEJO LACROIX, Marinella BUSTAMANTE M., Ana María IGLESIAS DAVEGGIO** University of Valparaiso (Chile)	Native colors for designing: appraisable rescue of natural dyeing in native plants of the Valparaiso region - Chile, for fiber protean wool.
19	**Christopher COWLES** With the Australian Government, Regional Arts Fund (Australia)	Natural dyeing for a greener world. Six Tasmanian artists who use eco-friendly colour.
20	**Susana DEL VAL, Cristina ZUNINO, Mariana MURANO et al.** National Institute of Industrial Technology (Argentina)	Natural dyes from waste.
21	**Christel DESJARDIN, Sylvie AYRAULT** Corpus Thalis (France)	Corpus Thalis: costume creation with natural dyes.
24	**Jenny FIGARI** Yachay Wasi Preservation and Restoration Institute (Peru)	Program for the Recuperation of Andean Technology.
26	**Funda GÖKSEL, F.Filiz YILDIRIM, Seref GÜÇER** Tubitak Butal, Bursa Test and Analysis Laboratory (Turkish)	A study on the comparing of textile performances of natural dyeing process of silk fabric.
27	**Sherry HAAR, Erica SCHRADER** Kansas state University (USA)	Comparison of aluminium mordants for colorfastness of natural dyes on cotton and bamboo fabrics.
28	**Judy HARDMAN, Sally PINHEY** Hampshire Guild of Weavers Spinners and Dyers (UK)	English Dyer's Garden.
29	**Anna HARTL et al.** University for Natural Resources and Life Sciences (Austria)	The colours of the 3000 years old Hallstatt - Textiles: analysis, experiments and inspiration for contemporary application.
30	**Alfonsa HORENG** Women Weavers and Natural Tyed Dyeing Cooperative of Flores (Indonesia)	Women Weavers and Natural Tyed Dyeing Cooperative of Flores – Indonesia.
31	**Ian and Bernadette HOWARD** Woad-inc (UK)	British woad.

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34	**Chaeyeon KIM, Younsook SHIN** Chonnam National University (Republic of Korea)	Eco-printing using natural pigments and chitosan binder.	
35	**Ferdinand KOUOH ELOMBO, Christine BRUNET et al.** Faculty of Pharmaceutical and Biological Sciences of Lille (France)	Biological activities of a tinctorial extract of Pernambouc (*Caesalpinia echinata Lam.*) on oxidative metabolism and inflammatory phenomenon.	
37	**Marion LACRONIQUE and CRITT Horticole** L'île Marion (La Réunion (France)	Presentation of colors dyed textiles from the flora of the Reunion island with emphasis on invasive species.	
39	**Djamila BOUCHAKOUR** Association of rural women of Kabylia (Algeria)	Training course on natural dye at Timimoun.	
41	**Luciana MARRONE** Aires Naturales, Latin-American Federation of Textile Chemistry (Argentina)	Latin America's natural dyes.	
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45	**Thibaut DEVIESE, Christophe MOULHERAT et al.** British Museum, UK and Quai Branly Museum (France)	Analytical study of Andean textiles in the British Museum and quai Branly Museum Collections.	
46	**Mohammed NOUR, Pierre CABALION, Dominique CARDON, Anne DE LA SAYETTE, Martine BOULENGER-PENDUFF et al.** New-Caledonia University (France)	Study of dye plants from the biodiversity of the dry forest of New Caledonia.	
47	**Toshiaki and Naoko OIWAKE, Kazuko K. KOBAYASHI** Taisei Corporation, ltd (Japan)	Japanese antique RAG carpet / tapestry. Ako-Dantsu renovation project.	
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49	**Trudi POLLARD** Pollard Designs (Australia)	Natural Dyes Using Australian Plants.	

50	**David and Margaret REDPATH** Dyers (UK)	History reborn.	
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55	**Katarzyna SCHMIDT-PRZEWOZNA, Jakub KOWALINSKI** Institute of Natural Fibers & Medicinal Plants (Poland)	Eco-friendly naturally dyed linen and silk fabrics - Colour of nature.	
56	**Kazumi SHIBUTA**, **Leona SUMI** NPO Earth Network and Kyusyu University (Japan)	Local history and Indigo dyeing in Tsuyasaki.	
57	**Younsook SHIN, Min CHOI, Dong-Il YOO** Chonnam National University (Republic of Korea)	New source of natural dyes: Marine algae.	
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61	**Yukiko TOGO, Fumiyuki MAEHARA, Yukutoshi SATO** Oita University (Japan)	Cultivation of Murasaki in Taketa city and mordant dyeing with Murasaki.	
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63	**Satoshi USHIDA** Mukogawa Women's University (Japan)	Color change in Indigo dyed fabric.	
65	**Sofia VINCENTE-PALOMINO, Dolores Julia YUSA-MARCO et al.** Institute for the Heritage Restoration, Polytecnic University of Valencia (Spain)	Dyeing methodology and chemical characterization of natural dyes in the Spanish silks from the 18th century.	
66	**Isabella WHITWORTH** Textile Artist (UK)	The Orchil Trade.	
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69	**Homare YAMASHITA** Kihachijo MEYU Studio (Japan)	Kihachijo : dyeing and weaving.
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71	**Dong-Il YOO, Younsook SHIN, Geun-Joong KIM** Chonnam National University (Republic of Korea)	Microbial community analysis of indigo fermenting vat from *Polygonum tinctorium*.
72 73	**Dolores Julia YUSA-MARCO, Sofia VINCENTE-PALOMINO et al.** Institute for the Heritage Restoration, Polytecnic University of Valencia (Spain)	Changes induced in the mechanical properties of direct dyed cochineal unaged silk an cotton textiles. The effects of mordants in the chemical and mechanical behavior of the silk fabrics.
75	**Mariama SYLLA, Jean Bosco DIBOULONI** APA Association (Burkina Faso)	Africa all in use – Natural dyes in tradition and innovation.
76	**Maria Joao MELO, A. Jorge PAROLA, J. C. LIMA** New University of Lisbon (Portugal)	Anthocyanes blues: a blue become green.
77	**Vittorio CAVANI et al.** Company Alvit (Italy)	The use of natural dyes in the productive process: a methodological proposal.
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Kihachijo Meyu Studio (Japan)

MP4

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Isabelle CLONIER
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Ornella COFFI, Cécile GAY and Isabelle RODIER
Ecole Nationale Supérieure des Arts Décoratifs (France)

MP4

Hair dyeing in different colours with natural colorants

Jerome DORNY
Company NJD Cosmetics (France)

Sylvie BUTTIGIEG
Et Elyse BONNEAU
Company Clin d'Œil coiffure (France)

COLORING THE UNEXPECTED ; DYEING FELT

Coloring the unexpected: dyeing wood, feathers, nuts with natural dyes

Sandra LOEFFELMANN
Company Vermilio (USA)

MP4

Felting and then dyeing with dye-extracts

Andie LUIJK
Company Renaissance Dyeing (United-Kingdom/France)

MP4

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Ajrakh: indigo, madder and iron acetate resist print

Ismail Mohamed KHATRI
Master Dyer in Ajrakh (India)

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Silkscreen printing with natural dye-extracts

Emily HALVORSEN
Company Kolør (Norway)

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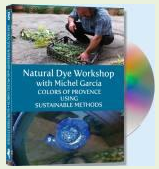
OTHER TECHNIQUES OF TEXTILE DECORATION

Rice-paste resist-dyeing (katazome) with persimmon tannin (shibu kaki) on fabric and paper

Yoshiko WADA
World Shibori Network (USA)



www.naturaldyeworkshop.com

Lost and forgotten shades of brilliant yellow using the technique of baandhani

Kamaldeep KAUR
Company Neelgar (India)

Katazome and natural dyes

Reiho SHIBATA
Atelier of natural dyeing Shikari (Japan)

The traditional Yoruba technique of Adire

Gasali ADEYEMO
Artist (Nigeria)

The Basilan and the Bogolan

Boubacar DOUMBIA
Le NDOMO (Mali)

DYEING WITH NATURAL INDIGO

Dyeing with natural indigo from Tamil Nadu, India, using the European starframe

Axel BECKER
Indigo Dye (Norway)

MP4

Bio-organic indigo vat

Vivien PRIDEAUX
Craftswoman (United-Kingdom)

MP4

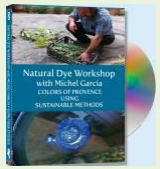
Painting silk in blue with natural indigo

Jesus CIRIZA-LARRAONA
Company The Colours of Nature (Spain/India)

MP4

Organic indigo vat

Michel GARCIA
Company Plantes et Couleurs (France)



www.naturaldyeworkshop.com

NATURAL DYE OF INDONESIA

Making brown dye by bola uta and reo

Alfonsa HORENG
Women Weavers and Natural Tyed-dyeing Cooperative of Flores (Flores, Indonesia)

MP4

DYEING WITH COCHINEAL

Dyeing with cochineal from Oaxaca, Mexico

Karin DELAUNAY
Textile artist (France)

MP4

DYEING WITH SAFFLOWER

Safflower dyeing

Ji-Hee KIM
Museum of Natural Dye Arts, Daegu (Republic of Korea)

MP4

Traditional safflower dyeing in Japan

Kazuki YAMAZAKI
Tohoku University of Art and Design (Japan)

MP4

DYEING WITH TRUE PURPLE

Vat dyeing with shellfish purple obtained from Rapana venosa

Takako TERADA
Kwassui Women's University,
Nagasaki (Japan)

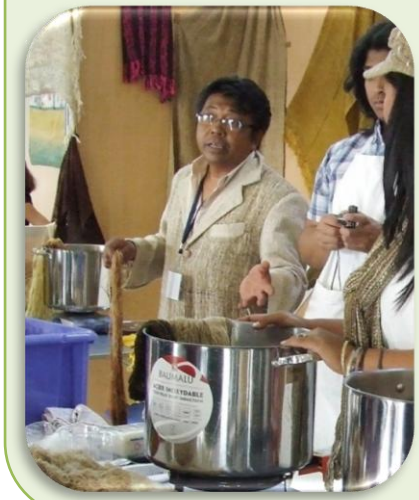
Dyeing with purple pigment

Inge BOESKEN KANOLD
Artist (Germany/France)

Dyeing japanese silk and making ointment with Lithospermum erythrorhiron Sie et Zucc

Hisako SUMI
NPO Earth Network/ North-Indigo
Art Studio (Japan)

NATURAL DYES OF MADAGASCAR



Dyeing plant fibers (rafia, sisal, cotton) and proteic fibers (wild and domestic silks, wool) with taikininina, Pisolithus arhizus (Scop:Fr.) Rauschert

Jocelyn-Aimé RAKOTOMALALA
Rakotomalala et fils Lambamena (Madagascar)

MP4

NATURAL DYES OF AMERICA

Dyes of North America

Patricia MARTIN
Color Me Wild (USA)

MP4

NATURAL DYES OF AUSTRALIA

The extraction of dyes from Australian native plants and the use of shibori techniques to decorate cotton, silk and wool textiles

Diane MCPHERSON
Handweavers Spinners and Dyers Guild,Tasmanian Regional Arts (Australia)

MP4

Shibori on silk and wool using Sandalwood, Haemadorum spicatum *and* Eucalyptus cinerea

Trudi POLLARD
Pollard Designs (Australia)

MP4

RECENTLY DEVELOPED PROCESSES FOR DYEING WITH NATURAL COLORANTS

Application of cationic tannin before the mordant to improve the fixing of vegetable dyes on cellulosic fibers

Eber LOPES FERREIRA
Etno Botanica (Brazil)

MP4

Pressure dyeing with natural dyes

Brij Ballabh UDAIWAL
Company Weave-N-Print (Rajasthan, India)

MP4

Dyeing using Terminalia catappa *leaves*

Julius LEANO
Philippine Textile Research Institute (The Philippines)

MP4

Natural dyeing of plant fibres used in handicrafts

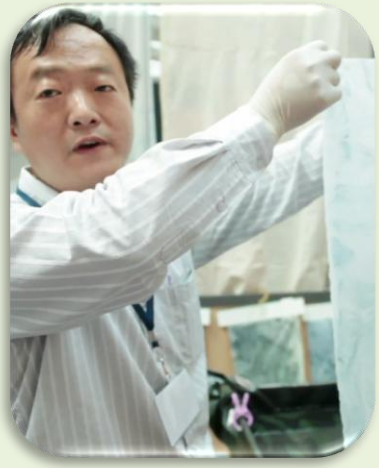
Perumal RAVICHANDRAN
Manonmaniam Sundaram University (India)

MP4

Multicoloured intricate Shibori dye using the natural colorants extracts and dye-baths of the other participants

Monoleena BANERJEE
Company Weaver's Studio, Kolkata (India)

MP4



The art of marbling with natural dyes

Chen LIANG-YUNN
Fu Jen Catholic University Dept.Textile & Clothing (China-Taiwan)

MP4

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FEEDBACK ON THE TECHNICAL OUTINGS

Visit 1 – Fouras

Dyeing with purple shells

Botanical visit (dye plants from the coastline)

and visit of an oyster farm

Visit 2 – St Symphorien

Visit at the dye plant grower's- madder field (*Rubia tinctorum*)

And the cattle farm

Visit 3 – La Rochelle

Collections of The Natural History Museum and its botanical garden

and visit of the old city of La Rochelle

Visit 4 – Rochefort

Visit of the CRITT Horticole laboratory

Visit of the “King’s garden” (“Jardin du Roy”) and dye plant collection of the CRITT Horticole

And visit of the collection of the former School of Naval Medecine

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International market

Adiv Exports/ India
Natural dyed scarves with hand created textures, garments made from the natural dyed fabrics all done by hand only

ARRDHOR - CRITT Horticole / France
The Symposium rainbow silk scarves, 4 colours of screen - printed bags and organic cotton yardages «Toile de Jouy» prepared by the organizers of ISEND 2011.

Artis Tinctoria/ Germany
Wool and silkscarves, blankets, garments

Ana Lisa Hedstrom/ USA
Hand dyed accessories, clothing, and hangings.

Ludovic de Valon / France
Special range of dyed and painted papers for ISEND

Association Milana / Spain
Cochineal extracts and various items dyed with it.

Association Couleur Garance/ France
Extracts and pigments, garments, Booklets. Presentation of the association and of Lauris garden

Aura Herbal Textiles LTD / India
Fabrics, scarves, t shirts, towels, napkins, shirts, undergarments.

Be Be Cotton KnittingCo., Ltd / Taiwan
Dyes of Garcinia. Hand-made natural pigment print fabrics

Bleu de Cendre/ France
Garments and plastic works dyed with natural dyes.

CARE Bangladesh et NCVI /Bangladesh
Indigo - Quilts, Shawls, Stoles, Scarf with natural indigo dyed, the local women of Bangladesh making these products with their traditional hand stitching skills

Cornblume/ Spain
Knitted hats, scarfs, gloves.

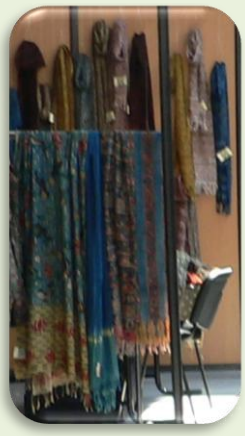
Couleurs de Plantes / France
Natural dyes extracts and pigments, mordants. Natural inks. Accessories.

Patrick Brenac's interview

Couleurs Naturelles/ France
Home works, Silk, cotton, wool textiles dyed or printed with natural dyes. Pigments. Kits for textile dyeing.

Creative Bee / India

Stoles, scarves,shawls and warps, IKKAT weaving. Woven fabrics in contemporary design.

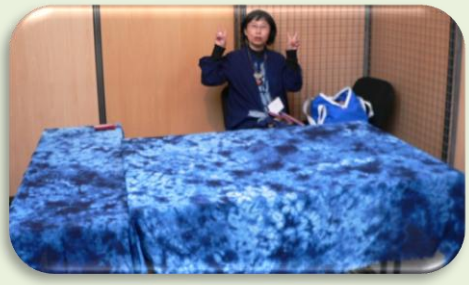


Damask / India

Silk Scarves, shawls and fabrics in various shibori techniques. Workshops in natural dyes and shibori, specialized textile tours in Gujarat

Da-Yeh University/ Taiwan

Living crafts of nature indigo



Ismail Mohamed Khatri/ India

Stoles, scarves, shawls, skirts, sarongs, cushion covers, and yardage.

Earth Network- KITTA / Japan

Katazome (a Japanese resist dye technique)-graphic Ramie-fibre tapestries. Silk screen-graphic post cards. Japanese silk scarves. Original journal and text books. Clothing and sundries made using natural materials and dyes.

Ethical Fashion Show/ France

Presentation of Ethical Fashion Show which will take place at the Carrousel du Louvre from 1st to 4th September 2011, a marvelous place that is very well-known for fashion events in central Paris.

Euiseong Honghwa Traditional Dyeing Institute/ South Korea

Wall decoration of safflower dyes. Scarf, handkerchief, clothes, handicraft. Safflower pigment

Hampshire Guild of Weavers Spinners and Dyers/ UK

Knitted hats, berets, gloves, scarves, waistcoats and pullovers. Natural Dye book and plant notelets

Hotwax Imagination Art / Nigeria

Batik tablecloth, wall hanging, batik dresses, batik bags , wine bags, batik towels ,duvee cover, batik quite, batik table runners, etc…

Iyola Musibau's interview

MP4

IVATEX / Burkina Faso

Fabrics, wall hanging, pillows…

Kokusai Kaimurasaki Kenkyu-kai / Japan

*Traditional Japanese garment kimono : obi sash, jackets, stoles, scarves, table centres, accessories, skeins of silk threads, books, powdered pigment from, Japanese shellfish of Akanishi (*Rapana venosa*)*

La librairie du Symposium/ France

Books on natural dyes and pigments, natural dyeing technics, trends…

Laine Couleur Nature/ France

Skeins of wool from Pyrénées naturally dyed. Various works in cotton, linen or felt.

Le Ndomo / Mali

Scarves, mouse mat dyed and decorated 100% cotton. Hanging, Books on basilan ,bogolan and gala

Les Ateliers Ersari - France Afghanistan

Knotted carpets, kilims, soumak with Afghanistan's wool and natural dyes

Maiwa Handprints Ltd / Canada

Naturally dyed, natural fiber garments and shawls. Maiwa DVD's.

Museum of Natural Dye Arts/ South Korea

Safflower, Indigo fermented, and persimmon powder. Various plant dyes. Natural Dye Text Book

N'énà For You - Soie de Madagascar

Fashion accessories from «N'énà for you » with silk from Madagascar. Various products for decoration in sisal, vetiver, raphia, nananas bark…

Renaissance Dyeing / France

Naturally dyed embroidery thread, woollen yarns, knitting, crochets kits. Small packs natural dye extracts and mordants. Some felt.

Sutra / India

Works by Bengal natural dye artist Ajit Kumar Das: paintings on cloth, Khadi cotton Stoles and Scarves hand painted, Kalams (bamboo pens) used as a tool in the application of natural dyes by the artist

Suzy Gallo / France

Eco, handmade creation. Women garments and accessories in silk and recycled cotton.

The Mulberry Dyer/ France

Naturally dyed yarn, fibre and cloth, natural dyes and extracts, small hand turned textile tools and related items.

Veda Commercial Pvt. Ltd. / India

Fabrics, stoles, scarves, shawls, patch scrolls, art textiles, sarees and garments. The textiles are all hand crafted, using varied techniques of hand block printing , screen printing, roller textures, stencils, sprays, hand paint, surface ornamentation, hand embroidery, hand weaving.

Vegepolys/ France

Presentation of Vegepolys: a cluster dedicated to specialized plants with 8 branches of plants fields.

Vivien Prideaux / UK

Scarves, stoles, small jackets, Coats caftans and felted hats. Fabrics used are fine wool gauze, merino wool, silk chiffon, habotai silk, antique French linen, cottons, hemp and antique Kimono silks.

Voyageur sans bagage/ France
Silk, wool, scarves stoles and shawls from «Avani» society –Kashmir

Woad-inc/ UK
Woad dyed textiles: ladies knitwear, denim jackets, scarves; children's dresses; men's shirts and knitted jumpers; and woven throws, cushions and tea towels. Hand-made, woad jewellery. Woad oil toiletries. Madder jumpers. Woad-inc's pigment. Woad-inc's chopped weld

Edric Ong et Alphonso Guinoo / Malaysia
Natural dyed scarves and textiles

Fra Joséphine / France
Accessories (cotton and linen scarves, woolen stoles). Shopping bags, collars. Tunique dresses, dressing gown. House hold.

Jocelyn-Aimé Rakotomalala et Université d'Antananarivo / Madagascar
Natural dyed scarves, fabrics, caps, garments and jewellery

The way to go Seoknam Temple (N&C) / South Korea
Tradition craft and clothing

Video « International Market »

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DOCUMENTARIES BROADCASTED

Masakazu AKIYAMA, (Japan)
Aya-no-tetsumugi Craft Studio
- ► *«Challenge of Masakazu AKIYAMA, purple»*, 1998 – 29 min
- ► *«Challenge of Masakazu AKIYAMA, Japanese traditional indigo dyeing»*, 2002 - 30 min

Olivier CARRERAS, (France)
Maison Carré Production- Taj Foundation
« Looking Beyond With Confidence », 2011 – 17 min

Le Collectif Ethnomedia, (France)
CRITT Horticole et Ethnomedia
« Alder Buckthorn's colors : variation around a natural dye », 2011 – 16 min

Ruby GHUZNAVI (Bangladesh)
Aranya – SW multimedia limited
« Rangeen : colours of Bangladesh » – 18 min

Elisabeth D. INANDIAK, (Indonesia)
Lokaloka - Mr Hendri SUPRAPTO
« A life in batik : from the sultan's palace to the villages of Java », 2008 – 15min

Angana JHAVERI, (India)
Illumine Films
« Aranya Natural » – 2011– 16 min

Kamruzzaman KAMU, (Bangladesh)
Nijera Cottage and Village Ind.- Private limited in Collaboration with CARE Bangladesh
« Living Blue », 2010 – 17 min

Marie-Claire KUO, (France)
Banque de données sur les cultures des populations Miao
« Batik drawing in Guizhou traditions », 2010 – 48 min

Tim McLAUGHLIN and Charllotte KWON, (Canada)
Maiwa Productions
« In Search of Lost Colour - The Story of Natural Dyes », 2008 - 92 min

Eugenio MONESMA, (Spain)
Pyrene, PV - Mr Fernando GUALLAR
« Dye with mushrooms», 2009 - 15 min

Pajaera PATANATHABUTR, (Thailand)
Silpakorn University and The SUPPORT Arts and Crafts International Centre of Thailand (SACICT)
« Natural Dyeing in Northern Thailand », 2008 – 16 min

Trudi and Helena POLLARD, (Australia)
Pollard Designs
« Earth Treasures », 2008 – 19 min

Ann RIQUIER, (India)
- ► Dolma Film - KMA Exports
  « Natural Indigo Dye In India », 2009 - 10 min
- ► Dolma Film - The Colours of Nature
  « The Eco Friendly Denim Jeans », 2010 – 13 min

Barbara TROTTNOW, (Germany)
bt-medienproduktion
- ► *« Purple at a snail rate »,* 2004 - 30 min
- ► *« Carpet secrets »,* 1999 – 43 min

Annie WALTER, (France)
Institut de Recherche pour le Développement
« Dyeing purple mats with stencil resist motifs in Vanuatu », 1970/80 - 18 min

Sou YAMASHITA, (Japan)
Kihachijo MEYU Studio
« Kihachijo – woven silk dyed with local plants in Hachijo island » – 2010 – 5 min

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PEDAGOGICAL PROJECT ASSOCIATING PROFESSIONAL HIGHSCHOOLS FROM ROCHEFORT, PAITA (NEW CALEDONIA) AND SARTROUVILLE, AND WITH THE PARTICIPATION OF L'ECOLE DES ARTS DÉCORATIFS, PARIS

Lycée Jean XXIII of Paita, New Caledonia

For two years, students have designed and made dresses dyed with plant wastes: avocado skin, turmeric, eucalyptus leaves, pomegranate skin…

Download the video

Lycée Jules Verne of Sartrouville, arts and crafts degree, costume designer diploma

Students have presented a collection of four costumes, each of them being the medium for a plant's colour range: weld, madder, woad and logwood. Each plant was associated with a period of French fashion during which the plant was used.

Download the video

Lycée Gilles Jamain of Rochefort

Students from the Embroidery and Fashion section have exhibited four dresses, one was entirely made with Alder Buckthorn dye.

Download the video

MP4

Ecole des Arts Décoratifs, Paris

3rd year students in Textile Design have worked around the global theme «Dream and territory» theme. They created fabrics specifically designed with natural plant-dyes. Their creations were printed on cotton during a demo workshop at the Symposium, hold by textile experts from CRITT Horticole (ARRDHOR) and two ENSAD students.

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Entertainment…

Allessandra Agostini, piano and **Laurent Barboux**, tight-wire artist
Costume and natural dyes : **Sandrine Rozier**

COMPAGNY DEMIMOLLE : Valérie Dubourg and Jacques Schneider

GROUP « COUP DE CHŒUR », 33 choristers
www.coupdechoeur.fr
Direction : **Nathalie Bouré**
Composer : **Julien Joubert**
Contrabass : **Albert Regeffe**
Piano : **Martine Ramseyer**

AKALE WUBE , www.akalewube.com - akale@free.fr
Paul Bouclier: trumpet, percussions
Etienne de la Sayette: tenor saxophone, flute
Loïc Réchard: guitar
Oliver Degabriele: electric bass
David Georgelet: drums

Adrian Brand, tenor
Julie Perruche, pianist.

TRES
www.myspace.com/tresmusique - tr3s@orange.fr
Marianne Evezard : singing
Basile Brémaud : fiddle
Hervé Capel : accordion
Jérôme Liogier : hurdy gurdy

Financials Partners

Our heartfelt thanks to our official or private partners who have contributed financial support

We are grateful to the departments of SGAR and DRRT who have supported this project and significantly helped with its funding by the European Regional Development Fund.

Our department was the first institution to support and finance the Symposium. We are confident that participants will enjoy the attractions of our Region and that this Symposium will help to develop local links with the production and application of natural colorants.

The urban syndicate and City of La Rochelle have facilitated connections and collaborations with local entrepreneurs and communication towards the public to share this beautiful event with our fellow citizens.

CNRS have generously contributed to the funding of the scientific aspects of ISEND 2011 Europe. The support of 3 of its Institutes, the Institute of Human and Social Sciences, The Institute of Chemistry and the Institute of Ecology and Environment, is due recognition of the interdisciplinary nature of the event.

The LVMH group has appreciated the universality of the project; it has enabled participants from several foreign countries to attend, and supported educational projects connected with the Symposium, though the participation of Schools and Colleges of Arts and Crafts.

Our large neighbour in the aeronautic industry has taken interst in the event and expressed its support for our smaller organization.

Environment is the main concern of the Poitou-Charentes Eco-industries Centre, which have naturally contributed to this event

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