

# Living Colour

**Anthocyanins**

**Ecoprinting i.e. botanical contact printing**

# Recap: dyeing processes

## Extraction

## Dyeing

### Indigoids

pH  
temperature  
time

pH  
temperature  
time

### Anthraquinones

pH  
temperature  
time

pH  
temperature  
time

### Flavonoids

pH  
temperature  
time

pH  
temperature  
time

# Recap: dyeing processes

	Extraction	Dyeing
<b>Indigoids</b>	pH: 10-11 40-50°C about 40 mins	pH 8-9 55°C 1-10 mins / dip
<b>Anthraquinones</b>	pH: no need to adjust < 70°C, 90°C for cochineal extract: immediate dyeing Fungi, roots: 1 hour <ul style="list-style-type: none"><li>• If dried roots, soak for 24 hours before starting the process</li></ul>	pH: cochineal pH 6-7 according to target colour 65°C (< 70°C), 90°C 1 hour, or cold dyeing for minimum overnight
<b>Flavonoids</b>	pH: no need to adjust Boiling 1 hour	pH: no need to adjust 80°C 1 hour

## Living Colour - August 1-17, 2023 UPDATED 2023-07-31

	Date	Lecture	Dye Lab	Topic	Key learnings
				Pre-reading & sourcing materials	<i>Natural textile materials, common dye sources in your country of origin.</i>
WEEK 31	Aug 1 Tue	9.30-11.30	12-16.30	Preparing the fibres, mordanting	<i>Origin of natural dyes. Dye safety. Pre-dyeing preparations: material selection, washing &amp; scouring, mordanting. Coloured mordants. Colour fastness, sustainability.</i>
	Aug 2 Wed	9.30-11.30	12-16.30	Historical dyes, indoles, indigoids	<i>Brief history of natural dyes. Imperial purple. Vat dyeing with woad blue. Dyer's safety</i>
	Aug 3 Thu	9.30-11.30	*	Dye portfolio design *independent work	<i>Planning the dye sample portfolio. Preparing a dye plan. Recipes. Marking your samples before dyeing. Recording your process. Cooperating in the dye kitchen.</i>
	Aug 4 Fri	9.30-11.30	12-16.30	Anthraquinones, red and orange dyes	<i>Dyeing reds, low energy &amp; cooking methods. Preparing dye extracts. Effects of temperature, time, pH.</i>
WEEK 32	Aug 7 Mon	*	-	<i>*9.30-12.30 Excursion to recycling centre 12.30-16.30 Excursion to a supermarket, restaurant &amp; nature</i>	<i>Finding pre-loved textile materials from re-cycling centre. Recognizing and sustainably collecting plants from nature and/or side-stream dye materials from super-markets / restaurants.</i>
	Aug 8 Tue	9.30-11.30	12-16.30	Anthochlors, flavones, flavonols, Yellows, golden colours	<i>Dyeing yellow. Medicinal dye plants. Preparing dye extracts, printing paste, watercolours, inks and pigments. Mordanting more material (e.g. pre-loved) if needed. Local dye plants.</i>
	Aug 9 Wed	9.30-11.30	12-16.30	Anthocyanins, ecoprinting <b>Samples to lightfastness test.</b>	<i>Ecoprinting i.e. botanical contact printing with fresh and dried plants, flowers, and mushrooms. Dyes from food side-streams.</i>
	Aug 10 Thu	9.30-11.30	12-16.30	Combinations, experimental techniques	<i>Oxidation, photo-oxidation, water-solubility. Combining different types dyes, experimental techniques. Monochromatic cyanoprinting. Printing, painting, dyeing pre-loved materials</i>
	Aug 11 Fri	-	*	*Independent work	<i>Sample dyeing for your portfolio/continue favourite technique</i>
WEEK 33	Aug 14 Mon	<b>Return the learning diaries</b>	*	*Independent work <b>Pick up samples from lightfastness test.</b>	<i>Sample dyeing for your portfolio/continue favourite technique (dye kitchen/3D lab)</i>
	Aug 15 Tue	-	*	*9.30-15.30 3D-printing lab, PLA, indigo	<i>Natural dyes applied in 3D-printing with PLA</i>
	Aug 16 Wed	-	*	*Independent work	<i>Sample dyeing for your portfolio/continue favourite technique (dye kitchen/3D lab)</i>
	Aug 17 Thu	9.30-11.30 <b>Return the portfolio</b>	-	Portfolio presentations and evaluation	<i>Sharing dyeing experiences and results. Discussions and evaluation. Exhibition planning (if applicable).</i>

## Agenda today

- Ecoprinting i.e., botanical contact printing
- Fresh and dried plants, flowers, and dye fungi.
- Dyes from food side-streams; onion & red onion, tea, coffee....
- Anthocyanins.
- Coloured tannins.
- Plant leaf tannins.
- **Samples to lightfastness test.**

# Natural dye

Source

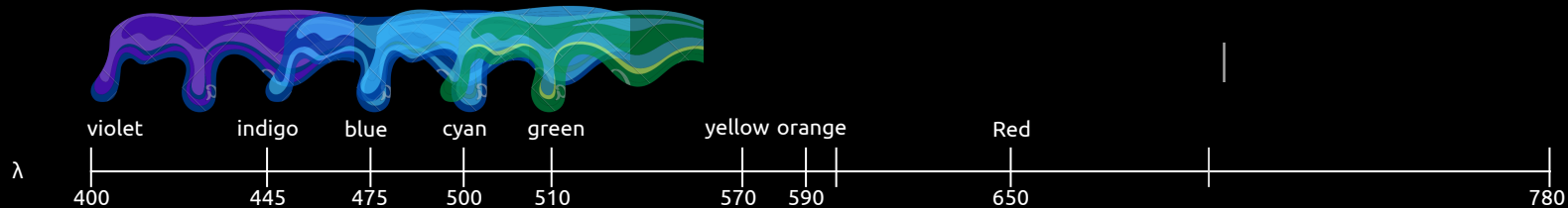


Chemical structure

Anthocyanins

Colour

Wavelength  $\lambda$



# Vantaa-neuleen kuvioiden proveniensi

Suunnittelija Kirsi Mantua-Kommonen

Vantaa-paita,  
islantilaisyyllinen  
kaarrokepaita



Vantaa-sukat,  
lahkeiden päälle  
puettavat  
kirjoneulesukat  
briossiterällä.

Helsingin pitäjän  
kirkko eli  
Vantaan Pyhän  
Laurin kirkko

Kirkko on yhdistelmä keskiaikaa ja uusgotikkaa, sillä kirkon tulipalossa 1893 säilyivät vain kivseinät. Muutoin kirkko rakennettiin uudelleen Theodor Höjjerin suunnitelman mukaan uusgotilaiseen tyyliin. Pääsisäkkäynnin yläpuolella on kaunit, metallikehyksiset ikkunat, joita reunustaa punatällinen suippokaari. Suippokaaren musto ja ikkunajako sopivat neulekuviiksi.



Kuva: Rina Korhonen



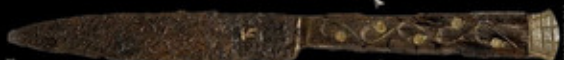
II-III  
Kirkonkylän arkeologisissa  
kaivauksissa löytyneet  
koristeelliset pöytäveitset

II  
Lilja-aihe ja ajatus goottilaishenkisestä tekstistä ovat peräisin hopea-  
helaiteista pöytäveitsetstä. Sen luukava löytyi kahteen osaan hajonneena.  
Konservoinnissa veitsen helan päältä paljastuivat parrakkaan miehen kasvot.  
Lilja-aiheensa ja kirjaintyylinsä perusteella veitsi ajoittunee 1400-luvulle.

Löydöt on dokumentoinut  
Riikka Väisänen kirjassa  
Kolme kylää.

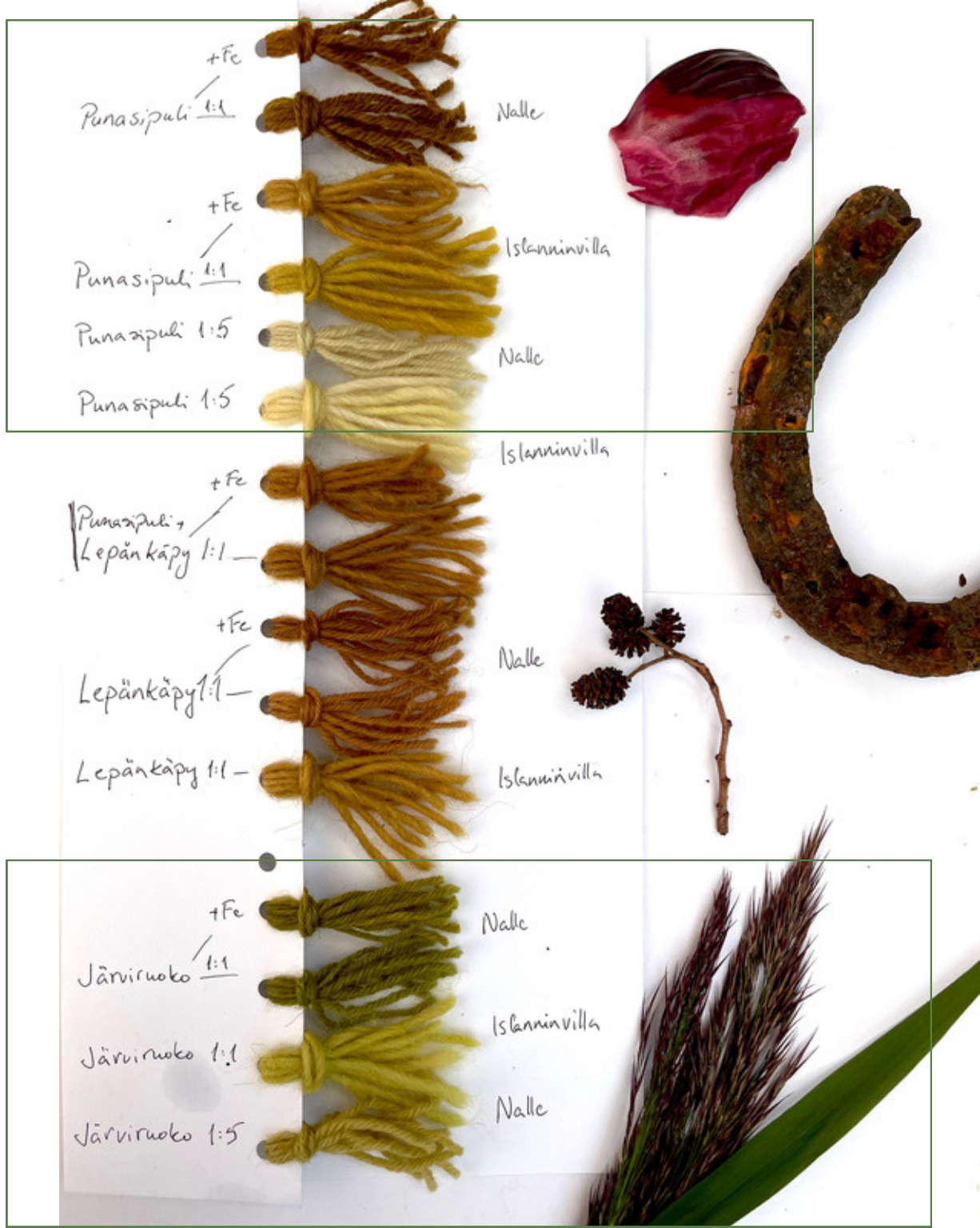


Kuvat Pekka J. Heriksen  
Vantaan kaupunginmuseo



III  
Neuleen köynnöskuvion lähtökohdانا olivat puuvartisen veitsen kahvaa  
koristavat, ohuista pronssivartaista taivutetut kaarevat lenkit. Pappilan  
tutkimuksissa löytyneen pöytäveitsen terässä on kupariseoksella terän pintaan  
uotettu valmistajan leima; yhä useammat neulojatkin merkitsevät omat työnsä.

Veitset ovat Suomen  
Kansallismuseon  
kokoelmassa



# Dyeing process

## Extraction

## Dyeing

### Anthocyanins

pH: no need to adjust

Boiling

1 hour

pH: no need to adjust

80°C

1 hour





Critical design perspectives:

Colour fastness

Colour, which lasts unchanged vs. living colour.

- Consumer perspective to purchasing a product with living colour – is it acceptable that the colour changes?
- Can we make it even desirable?
- Should colour last longer than the lifespan of the product?

- Anthocyanins are NOT great for textile dyeing, because their lightfastness is poor
- Anthocyanins also tend to change colour due to changes in acidity/alkalinity.
- However, they seem to have better lightfastness when applied in botanical contact printing, i.e. ecoprinting.
- Many anthocyanins are used as food and drink colourants and supplements, as they are stable in acidic conditions.



Chromic functionality



Antioxidant functionality



Critical design perspectives:

Colour molecules or compounds

'Pure' colourant vs. synergy of several compounds.

- copigmenting for colour tone
- functionality of phytochemical compounds

# Ecoprinting initiated by *India Flint*



wonderground

- Anthraquinones and tannins from *Eucalyptus* leaves
- Iron

1



2



3



4



5



6





















# Anthocyanins in ecoprinting

