Irreversible Color Expressions

Åland 2013 _ report no. 1

Preamble

During winter 2012 I visited Rudolf Steiners garden in Järna, Sweden daily for almost a month, it was most brownish and I was thinking for my self that it was a petty that I didn't have the chance to be in the garden during another time of year. Walking around I was trying to sort out what did grow where by looking at the dry seeds, empty straws and stepping on crunchy leaves. Later I found an illustration with the flowers names telling me what plants that was sleeping where, down in the earth under the black brownish soil. Soon I changed perspective and started to crawl down on my knees in the sleeping flower beds. It was amazing how much color and shapes that appeared to me in this perspective. Still I did wonder where the colors had gone. Amongst the information about the Rudolf Steiner garden some of his experiments were presented; he collected a handful of acorn and dig a hole for planting. In the bottom he placed one pile with sand that had been exposed to sunlight during the summer months and the other pile was without exposure to sun. He shared the acorn and planted equal amount in each pile in the bottom of the hole. He poured water and covered, not with soil, but left empty with a lid blocking out the light. After some time the lid were removed and the result showed that acorns exposed to sun light, had developer a greenish color while the other acorn had not. The experiment was described as an example of how the sun energy (needed to create the green chlorophyll) had been stored in the silicon in the sand and adapted by the plant in the darkness from the sun-exposed pile. Steiner explains his view on silicon in relation to living organisms for a farming perspective in his lectures Landwirtschaftkicher Kursus during 1924 (Steiner, R., 2005).

For many years I have been interested to learn how to dye with plants but, for the last decade I have been experimenting with smart textiles, material and pigments with the ability to sense and react to environmental stimuli with a visible color change due to light and temperature conditions etc. But now in Steiners garden, I could not resist investigate the hidden colors in nature, and did try it for the first time in spring 2012. We where some colleagues from Smart Textile Design Lab (STDL) that decided to do a plant dye workshop at THS (The Swedish School of Textiles) and to dye with local plants and without any mordant (meaning no added chemical or salts) in the dye process (just using plants and seeds etc. together with water). I got hooked and after a year experimenting with colors from my garden and kitchen, I spent the summer as an artist in residence at Åland in the Finnish archipelago investigating their local plants and water combinations. Here, I continued to dye textiles and yarn without any mordant, because I wanted to investigate and see if it were possible to capture a dynamic color expression, could the colors be crafted to show a changing expression evolving over time and from that perspective also show a textile expressions by nature, rather than to picture nature.

Introduction

Contemporary preconception of color within textile design is more or less seen as a static and measurable phenomena, but in this project will the opposite be investigated, textile colors are crafted to investigate expressions that is evolving over time. This practice based design research project presents a series of textile color samples that will give guidance to a number of plant dyed expressions. Textiles are dyed without any mordant, meaning no added chemical or salts that will influence on the color or color fastness. The objective in this project is to investigate and visualize color changing textile expressions from plant dye, and to verify the changing process within the color samples. This will be documented and fulfilled in two phases:

Åland 2013 - Report no.1 (this report) plant dyed samples are documented and presented as visual scanned color samples with foundational information like; materials, plants, dyeing methods etc. Evaluation of first phase in the project covering what visual color you get from different combination of textile materials/fibres and plants etc.

Åland 2013 - Report no.2 (to be presented) same samples will be juxtaposed and presented a second time, after being exposed to light etc. in x time. Evaluation and comparison between the scanned samples presented in report no. 1 and in report no. 2 with respect to visual color changes.

Keywords: plant dye, irreversible color, color change, textile color samples

A pair of blue jeans shows traces from being worn, what you had in your pockets for a long time and if you have been crawling on your knees. Time and circumstances leave traces that reveals by the white dyed yarn in blue denim. One big issue within in plant dye is the discussion around color fastness. Can a color really be mentioned color if it got a bad light fastness? In the prologue to ECO COLOUR botanic dyes for beautiful textiles Flint (2008) writes: *The instructions and suggestions offered here may not always lead to permanent colours…If a colour doesn´t last forever, the cloth can simply be dyed again. After all, our bodies change with time as well; our skins wrinkle and our hair goes grey. Faded cloth is far more easily restored*. The openness to colors not being permanent in Flints approach is missing in most Swedish plant dye literature from 1900s. For example a common picture is given due to bleaching of colors, expressed by (Hoppe, E., Edberg. R 1973 p. 62) *From most plants can be extracted dyes, preferably yellowish, but many bleached very rapidly away completely or partly. You will have to select the best and to get the color to draw as permanent as possible on the fiber* (*translation)*. Compare to this example Flint looks at the changeability within colors with the possibility to be "restored", but one could say that knowing how to dye color that stick to the fibre is implicit in the traditional craft of dying as well as for the field of textile design.

When it comes to temporal aspects, within existing traditional plant dyed textile expressions (Larsson, B., 1952 p.9) gives this reflection; *A faded colored plant tissue has the advantage that any color is bleached approximately equal. This means that the original denomination scale is still there, even on the brighter, and the fabric is thus not by bleaching lost its artistic content* (translation*)*. In 2012 I was visiting Maj Lindberg at Bergö, Åland to look at a hand woven floss with plant dyed yarn, made from her relatives at Bergö and to be kept and used at the same place. It showed an even expression in color and forms when looking at, and when we open and looked down in the floss another color landscape appeared.

As a contemporary designer you work with both visual color appearance, as well as measurable and reproductive color values in the design of an object. By using for example NCS (natural color system) you communicate color without influences from subjective or environmental influences (like light conditions, reflection from other external objects, bleaching etc.) Some companies do also develop their own color maps and systems for their specific color range and requirements. For car industries for example, designers request colors that stand high numbers of hours in sunlight and high temperatures without being influenced of it color wise. They also want guarantees that the same care model will have the same color of all seats (if that now is the intention), and in this cases is the right color communication system/tool of cause useful.
In the research report *colour and light, concepts and confusions* (Arnkil et al., 2012) both a philosophical perspective and contemporary methods for describing colour and light is described. In one way you could say that they bring up the complexity by describing the changing nature of color (and light), still they describe the color as something static that changes /are influencing temporarily by environmental conditions like due to different light, reflections, view angle etc. They do point out the eventual misunderstanding in describing, measuring and perceiving colours. *In the field of colour and light, visual/perceptual phenomena are too often described and analysed with the use of physically based concepts, which can give the false impression that physical measurements also measure what we see. This is not only a question of simplification. Using physically based concepts to describe perception of colour and light may be both misleading and incorrect*. (Arnkil et al., 2012 p.29) Later they suggest to be clear about that colour and light can mean so many different things, and that it is wise to be clear about what instrument/method we use for what and why. For example is a photometric instruments needed for describing human colour perception and a colorimetric instruments is measuring the wavelength of the light. They state that it is important to realise that sometimes it just fit better using colour samples as visual standards or just trust what we see. (Arnkil et al., 2012 p.65). But on the other hand, colorimetric instrument could be

useful if you were in an accident and need a new car door to blend in with the car's other color (which is perhaps ten years old). But all this is based on that we look at color as something more or less static. But what if we ought to understand color with a nature to constantly change, how would it operate, be designed and lived with?

Anusas & Ingold (2013) argue that western industrialized societies' emphasis on designed objects as discrete and finished entities that reduces humanity's ability to perceive the connections between such objects and the environment, suggesting that design should be understood as a more interdisciplinary activity that bind people, objects and their environments closer together. Hildur Bjarnadottir is an Icelandic artist that have been dying yarns with plants from her grandmothers garden (also for making pigments for paintings) and as a way to investigate her and her grandmothers relation and sharing of knowledge due to craft. In her work (Bjarnadóttir, H., Ketilson, G. 2011) she have visualised Reykjavik by picking plants in different locations and making a color map from that. Within art contexts like this, the awareness is raced to materials expressions in relation to environmental consequences of design/art projects/artefacts as (Anusas, M & Ingold, T, 2013 p. 58) demand, and Bjarnadottirs work give one perspective and segment of such.

Examples of dynamic color expressions created from plant dye is found in Sigrid Holmwood paintings, she creates her own pigments made from for example birch leaf, Lady´s bedstraw and mushroom pigments etc. Those colors/paintings show different expressions in different lights, she use a combination of artificial UV-light and daylight conditions (Holmström, A., 2013) and from that achieves a kind of hidden, added color expressions in her work. A description of fluorescent mushroom pigments for textile dye can be found in (Sundström, E., 2002 p. 71). Further the artist Jeanette Schäring´s work deals with plant dye processes where she visualises color changing processes for example in water installations, that can be seen in the online gallery at Nordic Textile Art. Her work focuses much on processes, and the method that she uses is described as *slow fermenting processes and experimental methods to create color* (Schäring, J., 2013).

Plant dye

Most recipes in literature on plant dye use different mordant, this is added chemicals and salt used in plant dye for making the dye stuff to better stick to the fibre, to show a better light fastness and/or for achieving a variety of colors, for example making a permanent color change from one color to another (Langlet, A., 1987 p. 102). There are also some plants that have chemicals that act as mordant in them selves, for example some moss. So there is a gap in the documentation on color samples without any mordant on a very basic level, that is of cause because a contemporary western understanding of colors to be more or less permanent. So, colors have not been valued (nor designed with) depending on their dynamic nature. Light fastness on colored textile is described on a scale, from 1-8. If a color is graded with number 1 it means that the color can start to change in an indoor environment within a year. From a grading 2, the light fastness is estimated to the double and so on up to 8 that can stand 100-200 times as long/intensive lightning as the colors in grading 1. This system describes the "fading" of a color, from bright to more light, but there are also plants where you can achieve color that turns to a darker color when exposed to sunlight, and after that starts to fade. Different plants contains a range of pigments/ chemicals that can have different light fastness, and thus the fading will be hard to predict, because different pigment change in different speed. In some case it is recommended to keep the textile/yarn outdoor in the sun to achieve this first darkening of the color, so you would have a more stabile color/material to create/design with. In general are darker (blue, red and green) plant dyed colors found higher in the grading system than lighter colors (yellow, yellow-red and yellow green) that show less color fastness due to light exposure. There are also other aspects that influence on the colors fastness except from the light fastness grading system, and that is due to environmental conditions like pollution and humidity. (Sandberg, G., Sisefsky, J., 1978 p. 47-49). Nielsen writes about the color fastness from imported *curcuma longa* (gurkmeja/turmeric) as comparable with *anthemis/cota tinctoria* (färgkulla/ golden marguerite) that we can find in our Nordic fauna, but when dye the similar color with the *curcuma longa*, it is described to disappear in a week when outdoors (Nielsen, E., 1976 p. 38).

The method for dye with plants presented here, is to be seen as a general guidance, because when using plant dye the result will never be exactly the same from time to time, also depending on varieties between different plants and different spices, location for picking, water qualities, time of the year, dye method etc. The term *plant dyed* is used to describe colors extracted directly from plants, seed, fruit, moss and lichens etc. There is a lot of literature on plant dye methods and what color that can be achieved I has had guidance from (Von Linné, C., 2010. Lundgren, A-G., 1986. Hansson, G-A., Ryd, A-M., 1976. Hoppe, E., Edberg., R 1973. Nielsen, E., 1976 & Råberg, H., 1981) still most of the recipes are presenting plants together with mordant, as well as some groups of plants that are mentioned to no need any mordant to give color and, to stay/stick to the fibre. The literature above bring mainly up plant dye recipes related to a Scandinavian nature and flora, to get a international perspective I have used *Natural dyes, sources, tradition, technology and science* (Cardon, D., 2007).

Plant dye method

This survey show plant dye color samples from Åland in the Finnish archipelago, and to type plants at Åland have I either been in contact with the property owner or I have used the botanic lexicon *Ålands flora* (Hæggström, C-A. Hæggström, E., 2010). The choice of plants has been dependent on what spices that have been available at the specific time and location. Also, what plants that has got a decent amount of leaf etc. so the stocks wouldn't be damaged (of cause also what is legal and recommended to pick or not).

Choice of textile material
In the beginning of this investigation several different qualities were used, and later to be some specific wool qualities and silk that have been used in all different dye baths. Still, some potential materials have been added during the dye process.

Preparations of textile/yarn
The textile or the yarns that shall be dyed have first been washed, either in washing machine (if larger pieces of fabric) or by hand when smaller samples and yarn. I have used a detergent for fragile wool and silk material. It is also preferable to have a wet textile/yarn (to achieve a more even color) when you put it in the dye pot, but of cause you may experiment here, depending on what you are looking for.

Boiling of plants
The method use for plant/seed/fruit dyeing is to boil plant/seed/fruit with water for approximately one hour, and then put in the textile and do a cold or hot dye bath. If using branches or other hard parts from plants then boil for 2-3 hour.

Dyeing of textile/yarn
After the boiling of the plants etc. you can either directly put in the textile/yarn that you want to dye or you can percolate to remove the boiled left overs from the plant etc. If you put in the textile/yarn directly in a hot dye and keep it hot (under boiling temperature). Materials have different tolerance to temperatures for example wool are sensitive for fast temperature changing, then you may hold back and wait for the dye bath to cold down, or gradually prepare the wool in a hot bath before putting it into the dye pot.
- *Hot bath*: keep under boiling temperature for approximately one hour.
- *Cold bath*: put in the dye bath and leave for 2-7 days, or longer.

After the dye bath
The textile has been washed in either washing machine (if larger fabrics) or by hand using detergent for fragile wool and silk material (the same as for preparation). In some dye experiments have the textiles also been left to dry first, without washing or by washing in sea or rainwater. Then, let to dry.

Specific information about the plants and colors achieved in this survey will be given to each individual textile sample in the next chapter, accordingly;

Plant	part_location_date
Water	quality_location_date
Dye bath	dye vessel_date_bath no.

Spices used for plant dye

Birch leave	*Betula folia*
Bladderwrack	*Fucus vesiculosus*
Buckthorn	*Rhamnus*
Fern	*Pteridophyta*
Fishbone beard lichen	*Usnea filipendula*
Hill mustard	*Bunias orientalis*
Horsetail	*Equisetum*
Lady´s bedstraw	*Galium verum*
Lichen	*Lasallia pustulata*
Lilac	*Syringa vulgaris*
Meadowsweet	*Filipendula ulmaria*
Red clover	*Trifolium pratense*
Reed	*Phragmites australis*
Reed + flower	*Phragmites australis*
Rhubarb	*Rheum rhabarbarum*
Rosebay willowherb	*Chamerion angustifolium*
Salted shield lichen	*Parmelia saxatilis*
Sea buckthorn	*Hippophae*
Sea buckthorn, no 2	*Hippophae*
Sorrel	*Rumex acetosa*
Tansy	*Tanacetum vulgare*
Valerian	*Valeriana officinalis*

Textile materials and qualities used for plant dye

Raw silk	*unbleached weave, re-used fabric from an old silk dress*
Raw silk	*brownish weave, private, from Marina Fränke*
Silk crep de chine	*medium white weave, supplier: Whaleys*
Wool	*wool delaine natural weave, supplier: Whaleys*
Wool	*voltaire wool weave, supplier: Whaleys*
Milk	*protein fiber weave, supplier: private*
Wool artic wool	gauze natural weave, supplier: Whaleys
Wool single tricot (nm 7/1)	knitting department THS
Wool feed tricot (nm 32/2)	knitting department THS
Wool flat knit	knitting department THS
Lyocell single tricot (ne 30/1)	knitting department THS
Trevira 85%/microsafe 15%single tricot (nm 50/1)	knitting department THS
Bamboo viscose, interlock knit (ne 30/1)	knitting department THS
Cotton (carded yarn), single tricot (ne 30/1)	knitting department THS
Micromodal single tricot (ne 30/1)	knitting department THS
Linen	raw color, left over from the company IRE furniture
Linen	weave, old draw sheets, private, from Marina Fränke
Linen	weave, supplier: Åhlens
Cotton	old woven sheets, private, from Siv Melin

Textile material presented in the same order as seen on the pictures

Birch leave / Betula folia

Plant	fresh birch leaves_Björkö, Åland_130627
Water	sea water_Eckerö, Åland_130629
Dye bath	stainless steel_ 130701

Birch leaves have first been kept in a plastic bag, after that put in the dye vessel with water for some days before the boiling, also the textile samples have been left in the dye bath over night (from 130701 to 130702). This is because if the dye bath looks like it still keep lot of color in it, the textile samples can then be left to let more color get to the textile.


BJÖRKLÖV
kokat 1-2/7
Bergö/Åland
Havsvatten

Bladderwrack no1 /Fucus vesiculosus

Plant	Dry bladderwrack_Eckerö, Åland_130623
Water	sea water_Eckerö, Åland_130623
Dye bath	stainless steel_ 130623_bath no 1

Dry bladderwrack have been picked on the beach.


TÅNG
23/6 - -13
Åland
Post & Tullhuset
Havsvatten

Bladderwrack no 2 /Fucus vesiculosus

Plant Dry bladderwrack_Eckerö, Åland_130623
Water sea water_Eckerö, Åland_130623
Dye bath stainless steel_ 130705_bath no 2

This is bath no. 2 (the leftover from the bath no 1), it´s been stored for some days (indoor temperature), then have textile samples been added, boiled and left in a cold bath for some days (from 130705-130707).

Compared to the samples made in the first dye bath (no 1) gives this second (no 2) bath more greyish color and the yellowish on the wool samples.


Tänq
(bad 2. kokat
upp gammal rom
kokad) 5-7/2
Eckerö PET
Hausvatten

Plant	Buckthorn_Eckerö, Åland_130616
Water	Tap water_Eckerö, Åland_130616
Dye bath	stainless steel_ 130616

It have been hard to type the exact plant in this family.


Brakved (?)
16/6 - 13
Åland
Post:o Tullhuset
Kranvatten

Fern / Pteridophyta

Plant	Fern_Eckerö, Åland_130628
Water	Sea water_Eckerö, Åland_130628
Dye bath	stainless steel_ 130628

It has been hard to type the exact plant in this plant family.
The textiles have been left in the dye pot after the heating,
and then left in a cold bath for days (130628-130702).


ORMBUNKE
28/6 - 2/7
Eckerö PoT
ÅLAND
Havsvatten

Fishbone beard lichen / Usnea filipendula

Plant	Fishbone beard lichen_Eckerö, Åland_130628
Water	Seawater_Eckerö, Åland_130719
Dye bath	aluminium pot_ 130719

The textiles have been left in the dye pot after the heating,
and then left in a cold bath for another day (130719-130720).


SKÅGGLAV
19-20/2-13
Berg/Åland
Alv-gryta
Havsvatten

Hill mustard /Bunias orientalis

Plant	Hill mustard_Kastelholmslott, Åland_130617
Water	Tap water_Eckerö, Åland_130617
Dye bath	aluminium pot_ 130617


Ryssgubbe
17/6 - 13
Åland
Kastelholmsett
Kranvatten

Horsetail / Equisetum

Plant	Horsetail_Eckerö, Åland_130619
Water	Tap water_Eckerö, Åland_130619
Dye bath	Stainless steel pot_ 130619

It have been hard to type exact what plant in this family.


Åker(?) fraiken
19/6 -13
ÅLAND
Post & Tullhuset
Havsvatten

Lady´s bedstraw/ Galium verum

Plant Lady´s bedstraw_Eckerö, Åland_130705
Water Seawater_Eckerö, Åland_130705
Dye bath Stainless steel pot_ 130705

The textiles have been left in the dye pot after the heating, and then left in a cold bath for two days (130705-130707).

Additional observations; The dye bath have after some days turned from brownish to black (130707).


GULMÅRA
Eckerö 5-7/7
Havsvatten

Lichen / Lasallia pustulata

Plant	Fresh lichen_Bergö, Åland_130627
Water	Seawater_Eckerö, Åland_130701
Dye bath	Stainless steel pot_ 130705

During the night of the 27th of June it had rained terribly, providing excellent conditions for picking lichen.

Additional treatment; lichen have been yeasts in urine in three days. This was probably a bit to short time to get a maximum color, several weeks or month are mentioned in older prescriptions.


TUSCHLAV
kokat 1/2-15
Jäst i mrin
Bergö Åland
Havsvatten

Lilac/ Syringa vulgaris

Plant	Lilac fresh leaves_Eckerö, Åland_130620
Water	Seawater_Eckerö, Åland_130620
Dye bath	Stainless steel pot_ 130620


SYREN
20/6 – 13
Bland
Post a Tullhuset
Havsvatten

Meadowsweet Filipendula ulmaria

Plant	Meadowsweet _Eckerö, Åland_130628
Water	Seawater_Eckerö, Åland_130628
Dye bath	Stainless steel pot_ 130628

Flower with straw and leaf have been used.
The textile samples have been left in the dye pot after the heating, and then left in a cold bath for 3 days (130628-130701).


ALGÖRT
28/6 - 1/7-13
Åland
Eckerö
Havsvatten

Red clover / Trifolium pratense

Plant	Fresh red clover (flower with straw)_Eckerö, Åland_130620
Water	Seawater_Eckerö, Åland_130620
Dye bath	Stainless steel pot_ 130620


RÖDKLÖVER
20/6 -13
Åland
Post & Tullhuset
Havsvatten

Reed / Phragmites australis

Plant	Fresh reed (no flowers)_Eckerö, Åland_130621
Water	Seawater_Eckerö, Åland_130621
Dye bath	Stainless steel pot_ 130621


VASS
21/6 -13
BLAND
Post o Tullhuset
Havsvatten

Reed with flower // Phragmites australis

Plant	Fresh reed with flowers_Eckerö, Åland_130715
Water	Seawater_Eckerö, Åland_130715
Dye bath	Stainless steel pot_ 130715

When comparing the samples dyed with reed and reed with flower, the last show a much brighter and yellow-greenish color in general, it is also three weeks different in time between the two dye-baths and occasion for picking.


Vass + vippor
15/7 - 13
P&T Åland
Havsvatten

Rhubarb / Rheum rhabarbarum

Plant	Rhubarb fresh leaf_Hammarland, Åland_130628
Water	Seawater_Eckerö, Åland_130628
Dye bath	Stainless steel pot_ 130628

Poison leaf, so keep good ventilation when boiling.
The textile samples have been left in the dye pot after the heating, and then left in a cold bath for 3 days (130628-130701).


RABARBERBLAD
28/6 - 1/7-13
Öland
Tessas trädgård
Hammarland

Rosebay willowherb / Chamerion angustifolium

Plant	Rosebay willowherb (flower and leaf) _Eckerö, Åland_130716
Water	Seawater_Eckerö, Åland_130717
Dye bath	Stainless steel pot_ 130717


MJÖLKORT
16-17/7-13
Åland
Post & Tullhuset
Havsvatten

Salted shield lichen / Parmelia saxatilis

Plant Salted shield lichen_Bergö, Åland_130627
Water Seawater_Eckerö, Åland_130702
Dye bath Iron pot_ 130702

In this dye bath have the lichen been boiled in 4 hour (instead of "ordinary" 2 hour in this survey)


FÄRGLAV
kokat 2/7
3-4 tim. + 1 dygn
Berrö / Åland
Havsvatten

Sea buckthorn no 1 / Hippophae

Plant Sea buckthorn (fresh leaf and young stem)_Eckerö Åland_130614
Water Seawater_Eckerö, Åland_130614
Dye bath Stainless steel_ 130614

Sea buckthorn have been used in four different manners;

Female and male plant, in seawater
Female plant, in tap water
Male plant, in tap water
Female and male plant, in rain water


HAVTORN
14/6 -13
ÅLAND
Post- o Tullhuset
Havsvatten

Sea buckthorn no 2 / Hippophae

Plant Sea buckthorn (fresh leaf and young stem)_Eckerö Åland_130614
Water Rain water_Eckerö, Åland_130614
Dye bath Stainless steel_ 130614

Sea buckthorn have been used in four different manners;

Female and male plant, in seawater
Female plant, in tap water
Male plant, in tap water
Female and male plant, in rain water


HAVTORN
14/6 - 13
ÅLAND
Post & Tullhuset
Regnvatten

Sea buckthorn no 3 / Hippophae

Plant Sea buckthorn (fresh leaf and young stem) female plant_Eckerö Åland_130612
Water Tap water_Eckerö, Åland_130612
Dye bath Stainless steel_ 130612

Sea buckthorn have been used in four different manners;

Female and male plant, in seawater
Female plant, in tap water
Male plant, in tap water
Female and male plant, in rain water


HAVTORN 2
12/6 -13
ÅLAND
Post & Tullhuset
kranvatten

Plant Sea buckthorn (fresh leaf and young stem) male plant_Eckerö Åland_130612
Water Tap water_Eckerö, Åland_130612
Dye bath Stainless steel_ 130612

Sea buckthorn have been used in four different manners;

Female and male plant, in seawater
Female plant, in tap water
Male plant, in tap water
Female and male plant, in rain water


HAVTORN ♂
13/6 - 13
ÅLAND
Post o Tullhuset
Kranvatten

Sorrel / Rumex acetosa

Plant	Fresh sorrel flower with straw_Eckerö, Åland_130619
Water	Seawater_Eckerö, Åland_130619
Dye bath	Stainless steel pot_ 130619

This plant have been hard to type in its family.


Ångs(?) Syra
19/6 -13
Åland
Post & Tullhuset
Hamnvatten

Tansy / Tanacetum vulgare

Plant	Fresh sorrel flower with straw_Eckerö, Åland_130716
Water	Seawater_Eckerö, Åland_130716
Dye bath	Stainless steel pot_ 130716

The textiles have been left in the dye pot after the heating, and then left in a cold bath for another day (130716-130717).


RENFANA
16-17/7-13
Åland
Post o Tullhuset
Havsvatten

Valerian / Valeriana officinalis

Plant	Valeriana fresh flower with straw_Eckerö, Åland_130716
Water	Seawater_Eckerö, Åland_130716
Dye bath	Stainless steel pot_ 130716

The textiles have been left in the dye pot after the heating, and then left in a cold bath for another day (130716-130717).


LÄKEVÄNDEROT
16-17/7-13
Åland
Post- o Tullhuset
Havsvatten

Textile color samples (evaluation of data)

The plant dyed textile samples is made for two reasons;

I) Plant dyed color scales in relation to different fibre and quality using a dye method without added mordant
II) The (eventual) color change / irreversibility

I) The color that is seen now
By making a number of plant dyed textile samples, the intention was to show a color scale with respect to; specific plants, textile fibres, location etc. The same dye stuff (chemicals extracted from the plant) show different color on different fiber, due to the combination of the fibres structure and the one of the dye bath/the plant dye. This is not so much a mystery, but chemistry, and something that can be more or less calculated in theory. Still, from a designer/artist perspective it is useful with color maps as a guideline for designers/artists in their choices regarding color. Also, Cardon (2007) reflects over natural dyed textiles and how it show a different color expression compared to a textile dyed with synthetic dye stuff, many natural dyed textiles and yarn show a tendency to fit well together and create a color harmony, and propose that it is some familiarity that makes a uniformity amongst different color expressions. She also describes one reason for this; synthetic color consist of one molecule while plant dye are composed by many more and will thus create a more nuanced color scale. So, to advantage the richness in color scales you could design a textile out of different textile materials and depending on how fiber and dye stuff are attracted to each other that will show a vide scale of color, so instead of having different samples, as presented here, one textile could be made out of different fibres and by using one bath, the same color bath will stick differently on the different fibres resulting in different shades/colors.
When it comes to observations on fibres and color relations in general (from plant, fibre and dye method used in this project) it shows that protein fiber like silk and wool give the most color intensity, so to say inherent the nature to attract color molecules, compared to flax and cotton that don't show such a strong tendency. During the dyeing of textile color samples some materials have therefore been added and some removed, by intention or by chance (by disappearing with the dye process).

The difference in dying a ready made textile to dye a yarn (and from that make a textile), will of cause show different expressions due to evenness of the color. When dying a textile or ready made garment the unevenness in the dye method will be more visible, and could be advantage as more than just a technique to give a color, rather as giving pattern (like batik) or "stained" like expression depending on how it is placed in the dye vessel and its contact to air. On the other hand if dying a yarn and later making a textile out of it (by knit or weave etc.) the natural color differences will show a more even expression in relation to the nature of the textile construction.

So, the samples presented in this report show that you can extract color from many different spices –even not mentioned before as used for plant dye. It also indicates what color you may get in relation to some different fibers and water qualities (rain, tap and sea water). Further on this investigation aim to investigate what this kind of colors will change into, to better understand how the colors may perform an irreversible color expression.

II) The color to be seen
In the next phase, to be presented in *Åland 2013- Report no.2*, will the same textile color samples be visual juxtaposed as scanned textile images. Then, it will be evaluate, and by comparison the eventual change in colors can be traced and understood. For the moment is the samples stored in a dark box, but are to be exposed to daylight (behind glass) during spring and summer 2016.

Summary

Today we see textile and their ability to show color fastness as something more or less implicit in textiles, an expression is aimed to maintain over time. The difference in a textile expression that has been aging over time (as a pair of jeans), compared to textiles that have been designed with the intention to change over time (and not towards threadbare) lies in how the designer emphasise different design methods, variables, techniques and material choices etc., but also with a strong preconception of the individual understanding of what a textile may preform. Of cause do every piece of textile change a bit time to time, depending of light, tearing, washing, stains etc. But what can it mean when textiles and garments intentionally show a different pattern over time? This is what is investigated by the making of color scales, and formulation new design examples to investigate irreversible textile color expressions.

The temporal perspective within textile color expressions do not only influences the design method and process, it also implies new expectations and understandings of color in general. The presented color samples should be seen as a first basic foundation for further investigations regarding irreversible textile color expressions. Some on going projects are as follows:

A light reservage technique
By making folding etc. on plant dyed textiles (dyed with no added mordant or salts) light, time and folding is used to investigate and develop a kind of design method for designing for temporal textile expressions using a “light reservage” technique.

Irreversible color on garments
To learn more about expectations and enlarge the understanding for irreversible temporal textile expressions, a collection of clothing are made from plant dyed textiles and yarns.

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Additional information: *Scanner; Epson V750 PRO*