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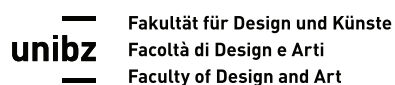
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Natural dyes in the contemporary fashion project

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Abstract

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The paper presents the results obtained during the thesis written by Elisa Marazzi, led by Prof. Giovanni Maria Conti; it derives from a research on the relationship between fashion and environment and on how this industry interacts with the idea of biodiversity. With this premise, we decided to investigate the variegated world of natural dyes, as they represent a true heritage of diversity on a local and cultural level. Keeping in mind the history of these ancient techniques, we contextualised them in the present world, with its flaws and its opportunities.

On this basis, Elisa Marazzi has designed the project of an online platform, where she virtually gathers all professionals linked to natural dyes on the local territory, who often have a great know-how to share but a poor visibility.

KEYWORDS:

| Sustainability
| Plant dyes
| Dyeing
| Territory

Introduction : sustainability and territory

In the present context of growing debate on the problems of global climate and environment, lack of energy and resources and ethical production, there is a new sensitivity according to which this unbridled consumption of faster fashion must slow down. It is widely recognized that fashion system is unsustainable, even though it is popular, among non-experts to refer unsustainability mostly to fibres and materials¹.

In the last decade the fashion system has become increasingly aware of the problems connected to fast consumption and obsolescence of products, and nowadays it is no longer possible to continue with the same pattern. In this context, there are many different solutions and, from cradle to grave, designers are finding more and more possibilities to address the hot spots of fashion production. Sustainability focuses on meeting the needs of the present without compromising the ability of future generations to do the same, by considering the three pillars of economic, environmental and social. For the subjects presented in this paper, the core principle of sustainable design is this interdependence of the different areas involved; therefore, design can be seen as a flow of actions, a process in which every actor is linked to the other and environment, culture and territory are all part the same design process.

The focus of this research

If sustainability means considering both planet and society, then what binds them together is territory. On one hand, of course any kind of industrial production impacts on the territory where the production takes place, in terms of emissions in the local environment, but on the other hand local territories are also a great resource. In fact, they also imply a network of knowledge and personal interactions between producers and consumers and a variety of different know-hows, especially for Italy which has established the success of the Made in Italy brand though the last decades on the base of this mosaic of different knowledges and virtuous examples of small businesses.

Having considered all the hot spots of the fashion process, this paper is focused in particular on the phase of colour, which is undoubtedly one of the most critical steps in the fashion supply chain. First of all, dyeing fabrics and garments implies considerable energy and water consumptions as well as emissions in water, air and land; secondly, since many chemical substances are employed, a truly modern and responsible design must assure the safety of the workers involved and that of the final product for all of its users. Actually, skin is not only the largest organ of the human body, but it is also sensible to the objects we decide to cover it with; in fact, there is a growing awareness on the possible risks of chemical residues on fabric, and some research suggests that garment dyes might be held responsible for the increase in skin problems such as contact dermatitis over the last years.

The focus of this paper is natural colour and the exploration of its potential for the contemporary fashion project; aim of this paper is not to propose natural dyes as a substitution to chemical dyes, which would also be quite unrealistic in such a complex fashion system, but nevertheless plant dyes can be an alternative to their synthetic counterpart and still be a useful project tool for designers. Natural colour can, under many aspects, be considered more sustainable and is certainly bounded to the territory, both physically and culturally, thanks to the traditions that have been passed on by natural dyers through the centuries.

Natural dyes: historical hints

Since the Stone Age men have always had the tendency to colour their bodies and objects; in ancient eras colour was a direct expression of what territories could offer, and therefore it would be possible to trace different civilisations and their traditions by looking at the colours they were represented by; ultimately though, colour was a rare and precious commodity, and was truly at the core of commerce and economies. Then in the Middle Ages there was a great development in the production of pigments, mainly for artistic uses, and therefore dyers became more organised: they started to join into cooperatives and dyeing became a proper occupation. This led to the first accurate written textbooks on the subject; despite having some deliberate omissions, in order to maintain some of the secrets of the profession, they are still nowadays valuable testimonies of the method that was already applied at the time².

The big turning point was the XVII century, when chemistry had a real boom. At first the new synthetic pigments were for art, until in 1856 William Perkin synthesized the first chemical colour, a tone of mauve. The new colour soon became the symbol of the most innovative fashion of its time, and gave birth to a new age of colour and opened up to a different approach to garment design. By the end of the 1880's all the main tones, with more or less 40 artificial colours, had been synthesized³; since then, of course chemistry has never ceased to progress and nowadays it is possible to identify a variety of almost 9000 substances involved in the dyeing of fibers or fabrics or garments that are listed in the volumes of "Colour Index International", the reference guide for colorists and dyers.⁴

Are plant dyes still a valuable resource for contemporary fashion?

Given this centuries-long rich history, the aim of this research was to find out whether natural dyes can still be considered a valuable resource for contemporary fashion and specifically not only for the aspect of research but also for a more practical approach.

"Fashion is a hybrid industry, that joins immaterial and immaterial values [...] It is set half-way between creative and manufacturing industries" (Ricchetti, 2017, p. 10)⁵

The strength of natural colour is its hybrid nature: it can put in contact the most different fields, like physics and biology of colour perception, chemistry, art and psychology, and each of these disciplines can contribute to it with its specific insight. For the purposes of this paper, the main focus shall be on natural colour as a material

resource able to define both aesthetic qualities and immaterial cultural backgrounds of objects.

- *The current uses of plant dyes*

On the Italian territory, over the last decades there has been policy by institutions for a more polifunctional agriculture, which therefore may include officinal plants and also the reintroduction of dye plants on the territory. In spite of the lack of official data on the quantity and quality of plant dyes cultivated, it is possible to estimate roughly 70000 hectares of land being used for officinal plants, of which 30000 on dye plants⁶. Considering plant dyes as a new sector of the fashion industry implies gathering all the possible information on the composition of the market at present time. The main uses of plant dyes nowadays include:

- Food industry: natural colours can be processed into pigments and used to colour food. They are widely used and in general this kind of food colouring has a good public consensus given their biological origin. Two examples are cochineal for red and turmeric for yellow. The food industry is particularly promising for natural dyes: the fact that this kind of commodities are actually consumed enhances the awareness on possible effects on the body by chemicals. In 2011 a study conducted by Leatherhead Food Research reported that the use of natural food colourings has surpassed that of synthetic ones on an international level.
- Cosmetics: there are many cosmetics in the market, of different types and brands, ranging from fragrances to make up products, that utilise natural pigments; they also have the double potential of taking advantage of both colouring and possibly pharmaceutical effects of officinal plants.
- Textile and fashion industries: the use of plant dyes is all but an extinct practice, and in fact in many parts of the world it is still used nowadays; it is doubtlessly an enrichment for local craft and mingles with the artistic and cultural value that these objects embody. What is more, the growing attention towards the problems connected to the threats to health and environment by chemical dyes, opens new opportunities of development for textile and fashion manufacturing. In addition, plant dyes also represent an opportunity to produce dyeing material locally, which might have positive effects on economy and occupation. Nowadays, even though natural dyes haven't disappeared, their use is in general limited to small production or artisanal products, or in cultural/educational activities, such as amateur workshops or professional and semi-professional classes. On the Italian territory it is possible to track many small business and activities of this kind, ranging from artisanal production and craftsmanship to small industrial level (Fig. 3); however this very specific supply chain still remains quite a hidden resource and not well known to the public, due to the small dimensions, the diversification and the irregular geographical distribution.
- Fine arts: natural pigments have been for centuries the only way for artists to produce art supplies, and this fact gives quite a good insight on how many possible uses in the artistic field they could have. To name a few examples, there is a market for very interesting and high quality art supplies made from natural pigments such as watercolours and gouache. Despite having a limited colour palette if compared to chemical chromatic range, they represent an alternative with no synthetic substances or heavy metals.
- Construction industry: in the construction industry specific regulation were introduced a few years ago about the use of possibly toxic substances; for example, there are paints or varnishes obtained from natural pigments with very good colour fastness that avoid the use of petrochemical substances or heavy metals.

- *Contemporary approach to natural dyes*

The first example are the studies carried out by Studio Formafantasma for the Textile Museum of Tilburg, in the Netherlands, for the exhibition "Turkish Red & More"; the research was supported by the archives and historical collections of the museum that include a variety of books and samples on "turkish reds", or madder reds. The project took inspiration from the rich history of this color, one of the most precious in the past, that embodied a symbolic, economic and social value; the output of this

complex research was a series of 17 silk fabric panels dyed in red with madder root, as a testimony of the value of this colour in the past and at the same time the sure visual impact it can have today.

A different perspective is given by the project “Algaemy” by Blond&Bieber studio⁸; this German designer duo developed a system to dye fabric using microalgae as pigment for printing. They decided to use microalgae that is considered as an “unwanted plant” on most of Europe territory, and it has a lot of potential that is being researched by science but that is still quite unexplored on the creative side. Algaemy, like other natural dyes, takes advantage of biodiversity using different species present in Europe to obtain a variety of colours ranging from green, to oranges and blues.

These experiences show how contemporary natural dyes can create a boundary with the territory and demonstrate how this link between colour and culture can be interpreted and developed into different creative directions through research.

● *Sample book*

In order to explore the possibilities of plant colours, several tones have been tested on three different types of plant fibers (cotton, linen and hemp) with three different types of mordants (i.e. pretreating of the fabric in order to obtain the best colour fastness possible). This step of the research was carried out in collaboration with the Association “Maria Elda Salice”⁹, an association set in Milano, that studies, preserves and transmits the knowledge on natural colours since the ‘80s. The result of this preliminary testing was a sample book containing different shades that could be obtained with different combinations of fabric and mordants but using the same plant colour. The aim of the sample book was not to try innovative plants, and in fact all the colours were chosen according to the experience the Association gained over decades.

Instead, the main point was to learn and establish a method: every colour obtained can be connected to a specific recipe and every step of the process is carefully recorded (including weight of fabric and colouring material, temperatures and timing) in order to keep track of all the possible variables and assure that the final result is as reproducible as possible by repeating the same recipe.

Target audience

Industrial production and fast fashion pose a huge obstacle to smaller niche sectors like this, but nonetheless there is a more “cultured” audience who shows interest on products with a high immaterial value, despite a possible premium price.

The three main categories identified in this paper as a possible target of a project related to natural dyes are:

- Fashion professionals. Fashion is becoming an increasingly saturated market, and many brands struggle to find the right niche for their product. It might be the case of young designers who need to approach the market for the first time, or even more mature professionals who are looking for a different kind of audience.
- Craftivists & creatives (not necessarily from a fashion background). Craftivists are those who appreciate the value of craftsmanship and handmade, often are also into DIY and sometimes even integrate social or environmental causes in their approach. They are ready to question unlimited consumption, and instead they reconsider the importance of producing your own objects; ultimately, they are more open to the immaterial value embodied by fashion products. Despite being quite a small percentage of the whole audience of fashion, it is nonetheless a meaningful group especially because they may be perceived as a “social and cultural avantguard”. In addition, natural dyes combine an artistic aspect with a careful planning of the project and this hybrid approach make it a very interesting area for those who come from a background other than fashion, but are willing to experiment on a more practical type of creativity.
- Virtuous consumers. Potentially the so called LOHAS (“Lifestyles of Health and Sustainability”) consumers, a young and flexible kind of audience particularly sensitive to sustainable lifestyles and environmental initiatives, are the most interesting for natural dyes.

Envisioning a supply chain

The demand of organic and natural products is probably the biggest trend of the last years, and seems to be in constant growth; however, it can be difficult to enter this sector of the market which is already quite crowded and complex. With this premise, the main point of this research is to study the best way to connect this pool of knowledge that comes from the niche sector of natural dyes with the rest of the design world. Modern technologies and the online world provide a network of relationships that will certainly will be more and more vital for fashion in the future, and become the medium through which natural dyes may gain, or get back, a position as a valid alternative to the current dyeing methods.

“Opening up to a contamination of taste is part of the commitment to which the contemporary artisan is called.” (Micelli, 2016, p. 84) ¹⁰

The output of this paper is the project of an online platform called “Attingo” whose purpose is bringing natural colour into the contemporary online world, by using the diversified actors that take part in it and bringing them into a new virtual meta-district of natural dyes.

The target are first of all designers, who can explore new directions for their projects and hence use all the knowledge on the subject that is present on the territory but that is sometimes difficult to track for those who are not into that particulate niche; secondly, those who are already using natural dyes, including both brands and suppliers, can connect with new creative possibilities and refresh their brand identity in order to be more competitive on the market.

The main pillars of the platform are focused on:

- 1) interaction: with a map to track and divide into categories all the companies and people involved in the production and promotion of natural colour
- 2) sharing the knowledge: as mentioned before, the rich cultural heritage of dyeing deserves to be preserved and passed on, and the Internet can be considered as the perfect platform to narrate it.

- *Seasonal palettes*

Design with natural dyes also means knowing the raw material and using it to design through colour itself: every territory has, of course, its own flora and therefore its own colour palette. According to the seasonality of local plants, it is possible to picture a colour wheel of the most widespread colouring plants for Italy (Fig. 1-2); this is a visually simple tool, but it allows users and designer to spot quickly what the creative possibilities of that particular place and moment might be. Of course the colour wheel could be potentially expanded with more types of plants and might be created also for other areas or countries with different flora.



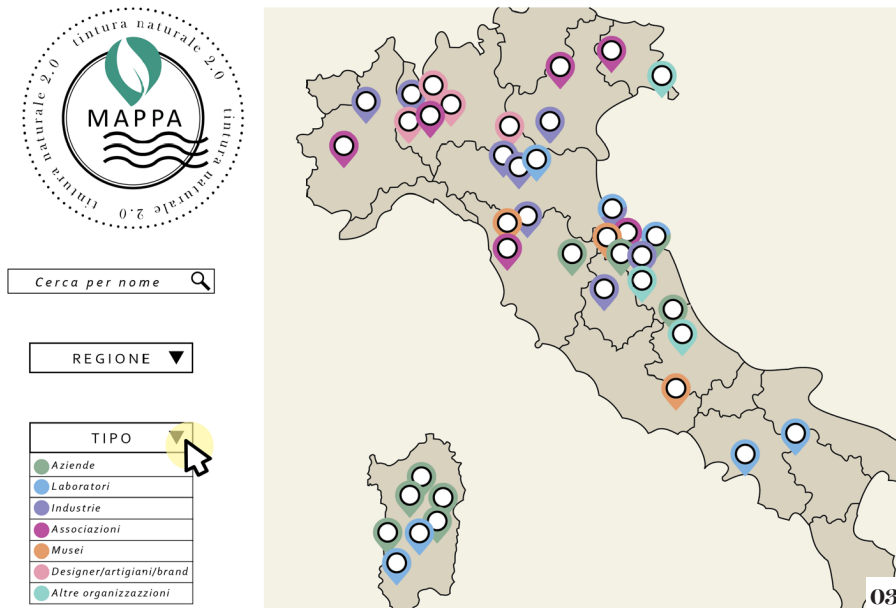
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An overview of the most common dye plants that can be found in Italy and their colours, related to their availability during the year



• Mapping

The core of the project is a mapping system of all the actors involved in natural dyeing categorised into sections: industries, farmers, laboratories, cultural associations, museums, brand and designers (Fig. 3). In this way, designers can find the resources they need in order to carry out research or develop a project. The principle at the base is that every actor of the fashion production chain is never working alone, because in fact everyone has a network of co-workers, suppliers or simple acquaintances who can, over time, join the map too and improve it. The more designers use this tool, the more natural colour can become a feasible direction for fashion projects and eventually separate from the DIY niche it has long been associated with.



Conclusions

This article was inspired by a research on the relationship between fashion and environment and in particular on how the concept of diversity, both cultural and natural, could interact with the contemporary fashion scenario. For a designer today is very important to follow 'clean' and responsible processes for the purposes of environmental and social sustainability¹¹.

The project output is the final step of a research aimed at connecting artisanal crafts and modern technology; it embodies a virtual space where all the professionals of dyeing on the territory would be reunited, and therefore is to be considered as a possibility for more exposure for the many professionals who already operate into this niche sector, but who do not have enough visibility in the crowded fashion scenarios of today.

Clothing and fashion items in general are not merely functional objects, they also embody intangible meanings, and therefore it is the perfect segment of the market to pick up the long and rich cultural history of natural dyes. Networking and connections, both virtual and physically based on local supply chains, will be the future of the market; reintegrating natural dyes into the fashion system means envisioning a possible reintroduction of plant dyes in the fashion supply chain, in order to promote and support their wide possibilities for creativity, communication and promotion of local territories.

03

This map is a visual tool to highlight the different professionals involved in natural dyeing on the Italian territory; it is the output of the research carried out by Elisa Marazzi during her thesis

Notes

1. In Azzi B., Vezzoli C., Conti G.M., "Design for Sustainable Fashion: a Sustainable Product-Service System Scenario for Fashion", proceedings of 2nd International Textile Design Conference 2019, Lisbon 19/21-06-2019, p. 2
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