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Espace vert, a link to life through experimentation

Anouk Daguin, Jean Marc Chomaz

Affiliation : Ecole Polytechnique, CentralSupelec et CNRS

Location,Country : Paris ,France

Contact Email : anouk.daguin@ladhyx.polytechnique.fr

Contact Email : Jean-marc.chomaz@ladhyx.polytechnique.fr

Abstract

Espace vert is an installation-workshop that develops as it is presented and participated in. In a space resembling a chemistry laboratory, entirely lit with green light at 550 nanometers, participants are invited to experience the extraction process, crushing with a pestle, decantation with alcohol, filtration, evaporation, all in order to create the chlorophyll ink of a plant that they will have previously picked in the area. Under this green light, the participants create a set of botanical drawings of each plant, using the chlorophyll extracted from the plant itself as the only pigment. This green dye decomposes under white light, as chlorophyll is photosensitive to red and blue light. Only green light can preserve its color. A work on the nomenclature of colors is carried out collectively and the colors are listed. The participants are asked to share their personal connection to plants around a 'chat table'. This installation on the vulnerability of plants aims to provide an immersive space in which to come up with new narratives on the common imagination and trans-species relations, as well as relocating human-plant encounters to this new, green-lit environment, where memories can be shared, and new experiences had.

Keywords

Plants, chlorophyll, herbariums, botany, color spectrum, chemistry, cooking, participative installation, detour of the extraction process, colors, fragility, nuance, degradation, conservation, analysis, envelopment in the color, invisible presence, trans-species relation.

Plants produce sugars and oxygen thanks to the chlorophyll contained in their photosynthetic cells by absorbing the red and blue light spectrum. Only the green light is not absorbed by the chlorophyll, it is diffused, giving the plants their color. Chlorophyll is therefore a photosensitive pigment that degrades and oxidizes quickly when left in the sun or lit by white light.

For the installation and the *Espace vert* workshop, we invented a device that allows botanical illustrations to be made using the chlorophyll extracted from the plant as the only pigment. This green dye decomposes in visible light, so showing the drawings under normal light would gradually destroy them, unless, as with the black & white photographs that are not photosensitive to red light, these plant drawings were presented in green rather than red light, a light to which chlorophyll is not

photosensitive. To exhibit these illustrations, we designed a specific installation entirely lit with green light at 550 nanometers.

The public and the participants are invited to enter the sensitive universe of plants, and immerse themselves in their color.

Espace vert is a participatory art project where each citizen is taught and shares their work and experience. The extraction of chlorophyll pigment ink in chemistry follows an extremely polluting process. We have reworked this process to make it harmless, ecological and collaborative.

During this workshop, participants are invited to extract the chlorophyll ink from the plant they picked beforehand, to then make a drawing of it in the manner of botanical illustrations. They can bring home the ink they created afterwards, if they wish. This is a shared experience during which participants will utilize their senses in this specific context – touch, sight and smell.

The exhibition displaying the productions and creations of previous workshop attendants is open to the public. Upon entering the workshop, visitors enter a space that is always lit with green light. Thus immersed, the eye of the visitor becomes accustomed. They have just entered a space designed for the preservation of plants and their depiction in green ink.

Green light is also used at the entrance of conservation rooms at the herbarium of the Museum of Natural History in Paris, although for another reason – attracting insects and avoiding contamination. Here, it allows the preservation of the chlorophyll pigment ink.

The viewing of the participative color chart and the botanical illustrations take place under 550 nm green light, which forces the eye to distinguish tone on tone drawings. The visitor must adapt to a universe made to preserve a memorial trace of the plants. It is not the plants that become accustomed to us but the human being who becomes accustomed to the plants' space. The plant drawings convey a certain fragility.

On aluminum tables are arranged a series of objects that previous visitors used and left their mark on, such as a filtration funnel, filters, glassware, a participatory color chart, and outlines of plants to be colored by children.

It is like a fragile, sensory laboratory where the visitor's sight is reduced to the delicate color of

plants and their ink, which is impossible to see except under this green light.

Espace vert is a collaborative work between a physicist/artist focusing on Time and Space, light, the relationship between color and living beings' sense of sight. Sometimes he becomes an alien or a plant to seek a non-anthropocentric point of view. He joins forces with a 'gossip artist' who is interested in the possibilities that plants have to offer us to find our role as roommates on Earth. In her sociological, anthropological and botanical work, she seeks to create relationships between humans who are often marginalized (elderly people, recipients of social assistance or food aid) and certain lesser-known plants, which are often discredited.

In the installation and the *Espace vert* workshop, the observation of botanical drawings under a 550 nm light forces the eye to distinguish tone-on-tone drawings, the visitor adapting to a color-shifted universe designed for preservation.

How does being immersed in the plant's light affect emotions and social interactions ?

To answer this question, we will discuss the importance of "learning to see" living beings by relying on the work of Estelle Zhong Mengual and by putting it in parallel with the methodology of discussion and meeting of our *Espace vert* workshop. We will conclude with the last step of the workshop: the 'chat table', where we will talk about unlikely human and plant encounters through various testimonies. This part will allow us to connect to the micro and macroscopic worlds of higher plants and to immerse ourselves in the fragility of their universe to shift our gaze and imagine a possibility of doing things together.

This installation-workshop we are going to present deals with many themes, including togetherness, the collective, practical work, transformation, microcosms, vulnerability... All these concepts merge together and allow us to journey towards new imaginary worlds.

The workshop - Connecting through color

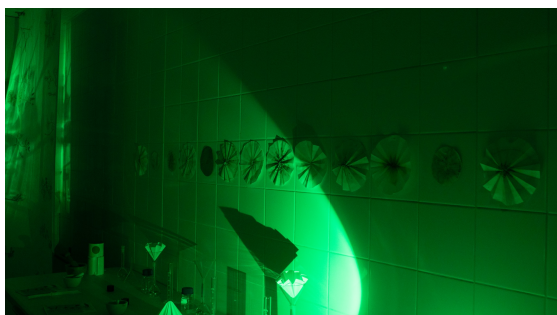


Figure 1. Photograph taken during EXPERIMENTA the biennial in October 2022 in Grenoble. It shows the

extraction device made available to participants. ©Anouk Daguin

First, the participants are taken on a botanical walk in the Minatec garden, where the exhibition takes place as part of the biennial Arts & Science EXPERIMENTA. The participant becomes a gatherer, they observe and harvest. Once back in the studio, the participant draws on the veins, contours and texture of the chosen leaf or leaves (Figure 2). It is a silent moment where everyone takes the time to observe carefully. This drawing is made on handmade paper that we have sown with plant seeds. It can be given back to the earth and germinated when the drawing participant decides to do so.



Figure 2. Photos taken during the EXPERIMENTA Biennial in October 2022 during the *Espace Vert* workshop, first part: drawing. ©Anouk Daguin

The rest of the workshop becomes scientific. The process is simple, using a mortar and pestle we crush the selected leaves with 10 ml of absolute alcohol. Then the contents of the mortar are poured into a pleated filter in a volumetric flask topped with a funnel. Gradually, the drops fall down the tube of the volumetric flask. A green liquid flows out whose shades reveal which plant was selected.

Once the ink is created, the apprentice chemist will then register its color in the participatory chlorophyll ink chart. They note in the upper right corner the place where the ink was created, in the upper left corner the date of creation, in the middle on the left side his or her name and in the lower right corner the name of the color they have just created. This name must be personal to them and evoke a memory, a connection to the plants that they have just made or that they already felt before the workshop. Some of the inks join the carousel of previously-created inks, which will be used by anyone wishing to color (Figure 3). The inks created are decanted into a small jar that everyone can take with them at the end of the workshop).



Figure 3: Carousel of multiple inks, presented in the *Espace vert* exhibition workshop. Anouk Daguin

The participant is then invited to join the plant chat table.

Sensory writing, divergence

To make this privileged relationship a reality, one must first "learn to see". However, as Estelle Zhong Mengual points out, we are currently in a crisis of sensitivity. She defines this notion by the loss of attention to the non-human. There's been a decrease in the number of words used to describe humans' relationships to other living beings¹. Baptiste Morizot becomes a wolf, a tree, a forest... He practices the tracking of these animals which reveals one very small part of the multitude of interactions which exist on our planet. Becoming a wolf involves observation, waiting, imitation.

In *Espace vert*, it's not about imitating plants, just paying attention to them. "I never knew that there were so many different species on the lawn," said one of the workshop participants.

Identifying plant species helps to understand the complexity of interactions that can exist and the diversity of species.

Unlikely encounters

During the *Espace vert* workshop, a discussion table on which a large frieze depicting a multitude of plants is placed in the center of the room, with the extraction benches on either side. Once the extraction is done, the participants register their ink in the participative color chart of chlorophyll inks. They are invited to come and color with it the long paper frieze made by the artist's hand. Around this chat table, only one rule, we only talk about plants... Our connection to plants, which is born in spite of us, is discussed between all the participants. The Nettle put on the table by Bernadette, who fell in their midst as a child when she was learning to ride a bike. Annie's advice on avoiding arthritis by

¹ "By crisis of sensibility, we mean an impoverishment of what we can feel, perceive, understand, and weave as relationships with respect to the living. A reduction of the range of affects, of percepts and of concepts connecting

rubbing her hands with nettles. Tips for making nettle soup... These are a few examples of discussions prompted by one of the many plants put on the table. By connecting with the plant, the people present connect with one another.

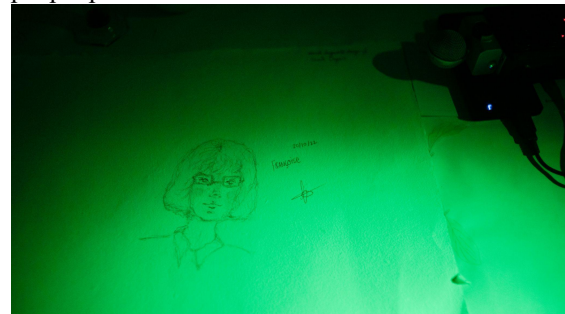


Figure 4. Portrait of Françoise made by Julia during their 'plant gossip'. ©Anouk Daguin

Julia, the illustrator:

Julia is a student in Design. She met Françoise during the Espace Vert workshop. Both of them had a conversation about plants and Julia drew her portrait (figure 4). Here is what the student shared : "My grandmother was always attracted to plants and flowers. I have very powerful memories with her where every year we would go to collect the wild cyclamen in the fall before the frosts. It is something I enjoy very much. At Easter my grandmother always took me to buy a new plant..."

Françoise :

"My relationship with plants is very, very intimate, I have a doctorate in plant physiology, which is to say that it is one of my passions. Plants produce oxygen and oxygen is life. Without plants, we would not be alive and we would not live, aesthetically speaking. It is the happiness of plants. In the Alps, there is a mineral world at the Lautaret pass, 100 kilometers from Grenoble, in June. On this rock grow a lot of flowers and plants of extremely bright colors, intense blue, intense yellow, intense red ... For me, that is truly a marvelous moment. It is the result of chance, but it's an experience you should have at least once in your life."

At another time, four little girls from the MJC (Youth Cultural Center) of Grenoble came to create their ink. They had previously invented a plant story based on a machine that uses the difference of potential between the roots of plants and their leaves to give life to a pre-recorded music, the "lie detector".

Aina, 5 years old:

"I made a plant story, for that we took a lie detector. I, for example, made a theater. There was Sharon-

us to it. We have a multitude of words, types of relations, types of affects to qualify relations between humans, with artifacts or with works of art, but much less for our relations to the living."

Rose with me. I was the unknown plant and Sharon-Rose was the gardener.

In this story, I learned how to communicate with plants and to communicate with the plant, you have to say nice words to it...

The experiment that I did was that we took a plant and we put something on it so that we could hear its music. When you talk to a plant nicely, it reacts, it makes music. But when we did it, it didn't manage to make music, it was because of the elevator, it was afraid. We did all that with the lie detector."

Sharone-Rose, 7 years old :

"When we went into the garden, we saw plants and I felt joy. Once we got inside, we tried to think of stories about plants. We tied our stories in the tree. It was my best day because we learned how to look at plants. I learned how plants react and how to be comfortable with them. My favorite plant is mint because it smells good."

Conclusion : constructing new perspectives

This immersion in the color of plants is an environment that enables the genesis of new narratives. Many connections were forged during this workshop. Françoise had a conversation with Julia that lasted over an hour. The latter offered her drawing as a thank you. This highlights the importance of place and time in building stories. In *Espace vert* this feeling of being out of time allows an imaginary world to emerge around plants and our relationship with them. It can be said that conversations give birth to new perspectives and that it is certainly in understanding our bond to other cohabitants of the Earth that we can rethink our common world.

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Authors Biographyes

Anouk Daguin is an artist and has been a doctoral student for three years at the Arts & Sciences Chair of the Ecole Polytechnique de Paris-Saclay in co-direction with the Biotechnology Chair of CentraleSupélec. As an artist of encounters and gossip, she is inspired by scientific protocols and tools that become mediators of the encounter. She explores, through participative projects, the way exchanges between humans, plants and microorganisms are woven in a defined setting, nursing home, agricultural environments, institutional places to give birth to new narratives on the porosity of the world.

Jean-Marc Chomaz is a physical artist at Ladhys, CNRS-Ecole Polytechnique, University Paris Saclay, France, Jean-Marc's work explores the invisible space of colors, the spectrum of electromagnetic waves that travel in Time-space and connect us to the past, to the cosmos but also to the living world, plants, animals, men, Aliens.