Notably, despite the presence of professional weaving workshop both in Val Mustair and in Valposchiavo, during these initiatives it was not possible linen yarns made with locally cultivated yarns, due to limited quantities and ongoing experimentation with right flax varieties for processing. Seen as a reachable goal, however, this set a vision for future initiatives.

One concrete outcome of this process was the consolidation of **Glin Alpin**, a cross-border initiative emerging from the pilot activities. Glin Alpin aims to provide a platform for continued exchange, coordination, and visibility around Alpine flax and linen.

**HOW-TO**
**Reconnect fragmented knowledge across territories**

**Problem**
No single Alpine territory today concentrates the full set of skills, resources, and infrastructures required for flax cultivation, processing, and contemporary textile development. Knowledge related to flax survives in **fragmented forms**, dispersed across regions and embedded in different practices, institutions, and rationales. The same might hold true for other Alpine heritage fibers, such as wool and hemp.

**What the AlpTextyles flax and linen pilot shows**
The pilot demonstrates that **cross-border exchanges and study visits** make it possible to reconnect these dispersed elements. Festive practices and demonstrations (notably in Slovenia), environmental and biodiversity-oriented cultivation initiatives (such as in Val Müstair), and existing textile competences (in Val Müstair and Valposchiavo) can be brought into dialogue, even when they no longer coexist within a single territory. This can create a cross-border and transnational community of practice, creating strong bonds amongs individuals, groups, and communities, and facilitating knowledge exchange and reciprocal inspiration.

**Concrete steps**

***1. Identify where knowledge still lives***

Map existing forms of relevant knowledge and its custodians across borders. In the pilot, these included festive events, professional processing practices, museum collections, oral histories, and small-scale cultivation experiments. These are **living heritage knowledge resources.**

***2. Bring together complementary actors through matchmaking***

Organize matchmaking between actors with **different but complementary roles**, such as:

- communities maintaining flax-related festive practices,
- farmers experimenting with flax for biodiversity or landscape management,
- textile cooperatives or workshops with contemporary processing skills,
- cultural institutions and intermediaries able to document and mediate knowledge.

Do not expect all competences to be present locally. Heritage skills are fragile, but what is forgotten somewhee can be remembered somewhere else.

**3. Organize reciprocal field visits and study tours**

**Reciprocal visits a**llow participants to observe practices in situ, compare tools and techniques, and discuss constraints openly. Use these moments to clarify what knowledge can be transferred, adapted, or combined, and what cannot

**4. Document and share knowledge collectively**
During exchanges, document practices, tools, gestures, and narratives using accessible formats (notes, photos, short videos, sketches). Share documentation among participants to support **collective learning** and avoid knowledge remaining confined to individual actors.

**5. Use modest experimentation to test feasibility**
Where conditions allow, encourage **small-scale, use-specific experimentation** (e.g. limited cultivation, symbolic or functional textile prototypes). Treat these experiments as learning tools, not as precursors to scaling.

**6. Build a community of practice rather than a value chain**
Prioritize the creation of a **community of practice** that meets regularly, exchanges knowledge, and reflects collectively on future possibilities. Over time, support the emergence of **light governance mechanisms** such as informal networks or associations (e.g. initiatives like Glin Alpin) to coordinate exchanges, articulate shared visions, and maintain momentum.


*Study visit and practice exchange of Slovenian flax/linen heritage communities in Val Mustair, organized by AlpTextyles partner [Rokodelski center Skofja Loka](), 2024.*

# 5 Natural Dye Plants

## 5.1 Context: from traditional dye plants to contemporary challenges

Natural dye plants have long played a central role in Alpine textile systems, where colouring practices were historically embedded in domestic economies, craft production, and early forms of organized manufacture. Knowledge of dye plants, extraction techniques, and fibre–colour interactions circulated within households and communities, often closely linked to local ecological conditions and seasonal rhythms. These practices formed an integral part of Alpine textile heritage, contributing not only to material aesthetics but also to the cultural meanings associated with colours, garments, and uses.

Over the course of the twentieth century, natural dyes were progressively displaced by synthetic alternatives. This shift was driven by the growing demands of industrial textile production for **speed, standardisation, and cost efficiency**, as well as by the ease with which synthetic dyes could deliver uniform and predictable results at scale. As a consequence, knowledge related to dye plants and natural colouring processes became increasingly marginalised, surviving primarily within **craft practices, artisanal experimentation, and niche cultural contexts**, rather than within mainstream industrial production.

Today, natural dyes remain relatively **present in craft and small-scale textile contexts**, where variability, local sourcing, and manual control can be accommodated and even valued. In contrast, their adoption at **industrial scale remains limited**, due to concerns related to reproducibility, colour fastness, process integration, and compatibility with existing production lines. For many industrial textile SMEs, natural dyes are technically risky.

At the same time, interest in natural dyes has re-emerged across both craft and industrial milieus, driven by a combination of environmental, health, and differentiation concerns. Natural dyes are increasingly associated with **non-toxic processes, reduced reliance on petrochemical inputs, and bio-based value chains**, as well as with narratives of authenticity and territorial anchoring. However, this renewed interest often confronts a persistent gap between **heritage knowledge and contemporary technical feasibility**.

In the Alpine context, this gap is particularly striking. Dye plants are widely available across Alpine landscapes, and many of them have long histories of use in textile colouring. Yet the knowledge required to translate these resources into **reliable, repeatable, and transferable dyeing practices** has largely been lost or fragmented. As a result, natural dyes tend to circulate either as isolated craft experiments or as symbolic references, rather than as components of structured textile value chains.

The AlpTextyles pilot on natural dye plants addressed this situation by positioning natural dyes as a **field of heritage-sensitive and circularity-informed innovation**. By combining heritage knowledge with scientific testing and technical experimentation with lead users, the pilot sought to clarify under what conditions natural dyes can be mobilized today by both craft practitioners and textile SMEs. Rather than opposing tradition and innovation, this approach reframes natural dyes as a **strategic resource**, locally available and in some cases resulting from the use of by-products, as capable of contributing to differentiated, circular, and territorially anchored textile value chains and end products.

### 5.2 The AlpTextyles pilot on natural dye plants: from ethnobotanical heritage to innovation-oriented experimentation

The AlpTextyles pilot on natural dye plants was designed to address a specific and recurring bottleneck identified across Alpine textile ecosystems: while dye plants are abundant and historically well documented, **their contemporary use is constrained by the lack of reliable, transferable, and scalable practices**. The pilot therefore focused on translating ethnobotanical heritage into **innovation-oriented experimentation** capable of serving both craft practices and industrial textile SMEs.

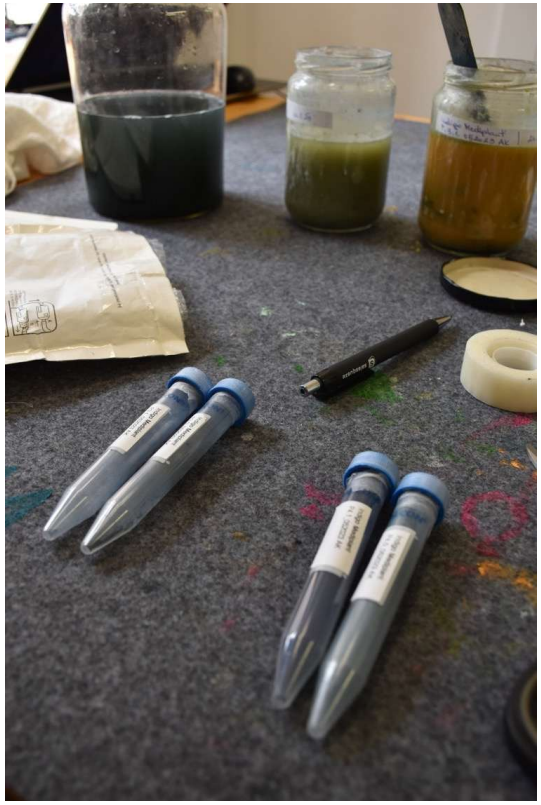
The pilot was coordinated by **Mediplant**, a Swiss research and innovation centre specialized in **medicinal, aromatic, and functional plants**, with long-standing expertise in applied research at the interface between agriculture, science, and market-oriented innovation. Mediplant acted as a **scientific and technological intermediary** between heritage knowledge and contemporary textile applications. Building on ethnobotanical research and documented traditional uses of dye plants, Mediplant combined experimental cultivation and sourcing, laboratory-based extraction and dyeing tests, and pre-industrial trials. This approach ensured that traditional knowledge was not merely recorded or safeguarded, but **translated into operational practices** that could be assessed in terms of reproducibility, feasibility, and transferability. This intermediary role was crucial in bridging the gap between **tacit, place-based practices** and the technical and organizational requirements of contemporary textile production.

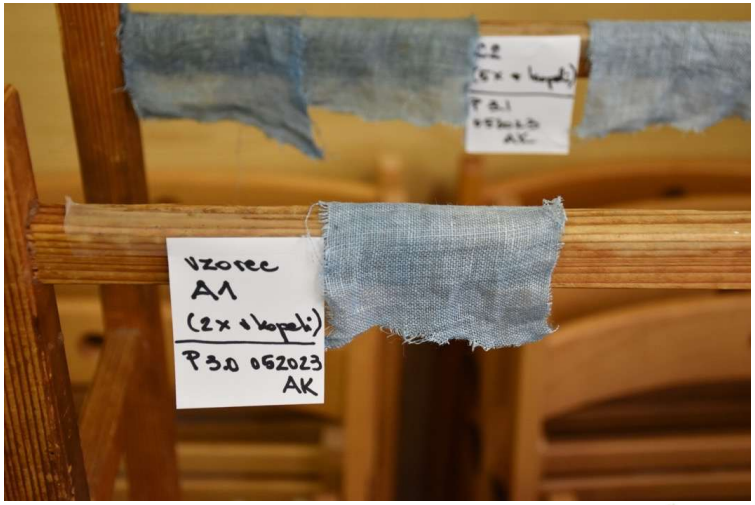
A defining characteristic of this pilot was its **explicitly dual orientation**. On the one hand, the work responded to the needs of **craft practitioners and artisanal communities**, for whom natural dyes remain a meaningful and viable practice that can be supported by clearer protocols and labour-saving practices. On the other hand, the pilot addressed the concerns of **industrial textile SMEs**, for whom natural dyes often appear attractive but technically uncertain. Rather than privileging one scale over the other, the pilot explored how the same plant resources and dyeing processes could be adapted to **different production logics**.

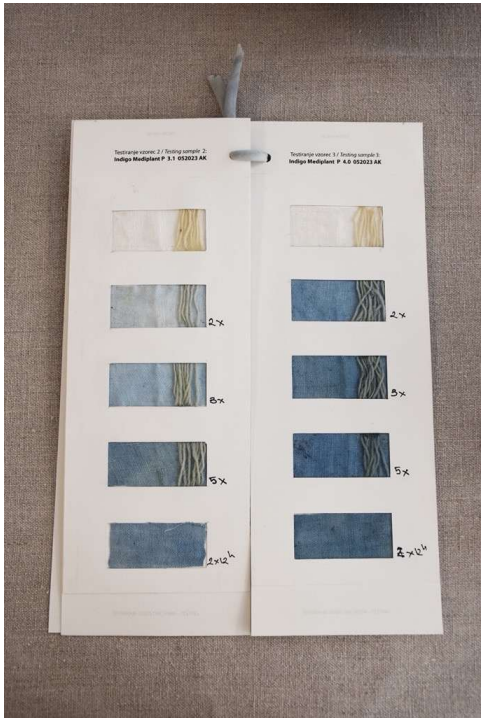
To ensure diffusion beyond the immediate pilot sites, results were actively shared with textile SMEs through **Techtera** and **Confindustria Moda**, which played a key role in connecting the pilot's outputs to broader professional networks in France, Italy, and elsewhere. This dissemination made it possible to confront experimental results with real industrial constraints and to position natural dyes not as niche curiosities, but as **potential components of differentiated production strategies**.

At the same time, the pilot maintained strong links with **heritage and craft-oriented contexts**, notably in **Valposchiavo, Val Camonica, and Slovenia**, where knowledge of dye plants survives in different forms. Workshops, demonstrations, and exchanges with local practitioners allowed the pilot to remain grounded in living practices, while also testing how these practices could be adapted or complemented by scientific and technical inputs.

Across these different contexts, the pilot did not aim to reinstate historical dyeing systems as they once existed. Instead, it sought to identify **points of articulation** between heritage knowledge, contemporary science, and market realities. By doing so, it demonstrated that natural dye plants can serve as **shared resources** across craft and industrial settings, provided that appropriate mediation, testing, and documentation are in place.





*Testing of Mediplant-developed indigo dyes (Satis Tinctoria) in Slovenia (craft practitioners).*
*Pictures courtesy of AlpTextyles partner [Rokodelski center Skofja Loka](), 2024.*


*Testing of Mediplant-developed larch bark dyes (Satis Tinctoria) in Slovenia (craft practitioners). Pictures courtesy of AlpTextyles partner [Rokodelski center Skofja Loka](), 2024.*

In this sense, the natural dye pilot illustrates a broader principle central to this AlpTextyles output: heritage-sensitive innovation does not require choosing between tradition and industry. It requires **designing interfaces** that allow knowledge, materials, and practices to circulate meaningfully and respectfully across scales, territories, and professional cultures.

### 5.3 Emblematic Alpine natural dye resources: plants, trees, and by-products

The AlpTextyles pilot on natural dyes worked with a **diverse set of bio-based resources**, reflecting both the ecological richness of Alpine territories and the plurality of ways in which natural dyes can be sourced today. The pilot deliberately explored **multiple sourcing logics**, including foraging, farming, and the use of forestry and agro-industrial by-products. This diversity was central to understanding how natural dyes might realistically be reintegrated into contemporary craft and SME textile practices.

Among the resources explored, several emblematic cases illustrate different configurations of heritage knowledge, material properties, and innovation potential.

**Indigo (Isatis tinctoria)** was investigated as a historically documented dye plant with a long-standing presence in European and Alpine contexts. While largely displaced by imported indigo and later by synthetic dyes, indigo remains a powerful reference point for both craft and industrial actors. Within the pilot, indigo was sourced through **both experimental cultivation and controlled foraging**, allowing comparison between different origins and extraction conditions. This work highlighted indigo's strong symbolic and aesthetic appeal, but also its technical demands, particularly in relation to fermentation, reduction processes, and colour consistency. As such, indigo exemplifies a dye resource with high value potential, but also high requirements in terms of skills, equipment, and process control.

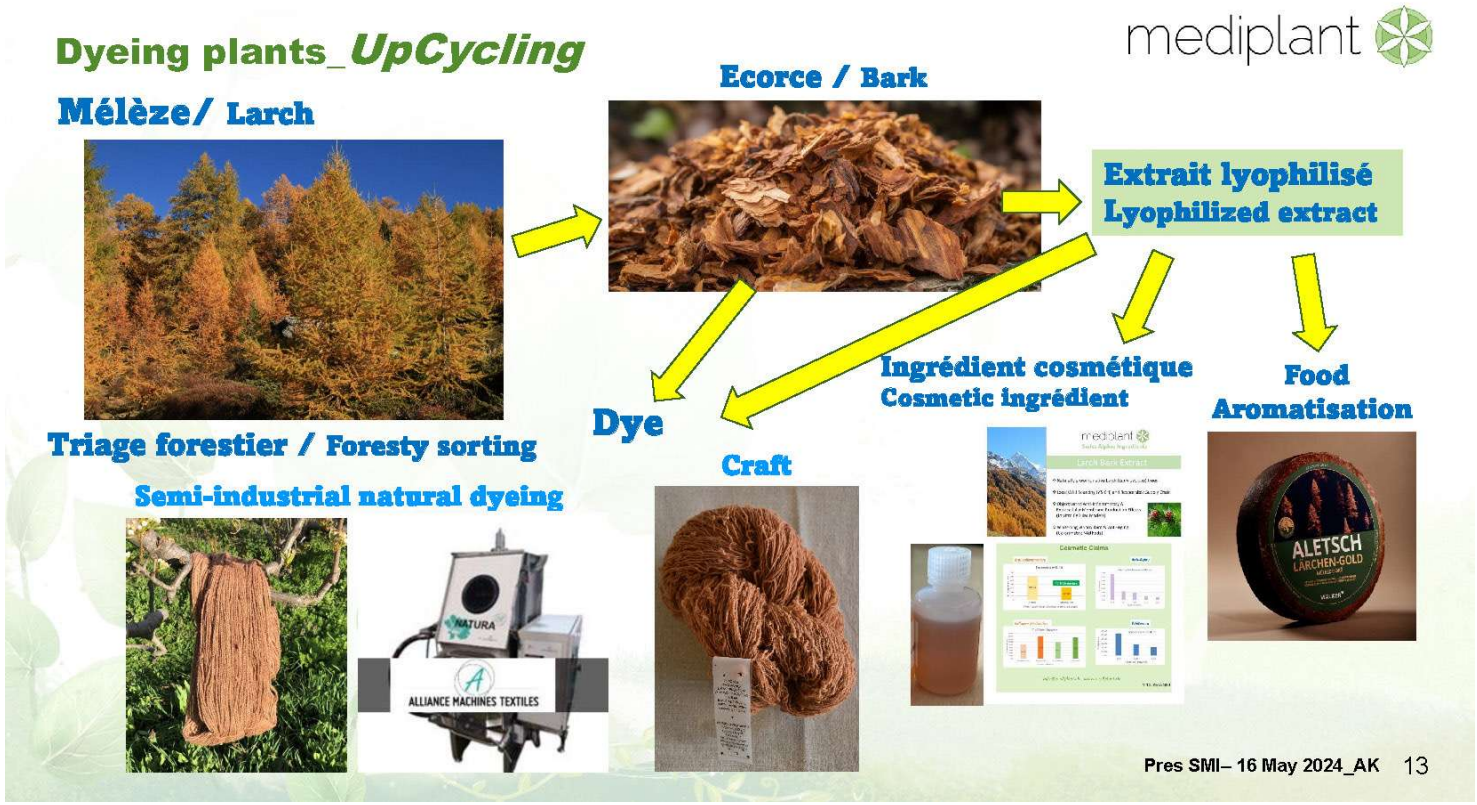
**Lady's mantle (Alchemilla spp.)**, a widely available Alpine plant with deep ethnobotanical roots, offered a contrasting profile. Traditionally used for medicinal and domestic purposes, it also holds documented dyeing properties. In the pilot, lady's mantle was primarily explored through **foraging-based sourcing**, reflecting its spontaneous presence in Alpine landscapes. This made it accessible to craft practitioners and small-scale experimentation, while also revealing limits in terms of yield, colour variability, and seasonal dependency. The pilot's testing showed that while such plants can produce valuable chromatic results, their integration into more structured production requires careful documentation and realistic expectations regarding reproducibility.

*Left: Isatis Tinctoria (woad), source: Stefan.lefnaeir, CC BY-SA 4.0*
*Right: Alchemilla (Lady's Mantle), source Rasbak, CC BY-Sa 3.0*

The use of **larch bark (Larix decidua)**, a **forestry by-product**, did not rely on plant cultivation or foraging, but on existing forest management and timber processing activities. Its use as a dye resource exemplifies a strong circular logic, transforming residual material into added-value inputs for textile applications. Within the pilot, larch bark proved particularly relevant for semi-industrial and industrial contexts, where access to stable quantities and integration into existing value chains are critical. Its inclusion underscores how natural dyes need not be limited to herbaceous plants, but can draw on broader bio-based systems embedded in Alpine economies.

Beyond these core cases, the pilot also explored **agro-food by-products**, notably residues from wine production such as grape skins and pomace. While not central to the pilot's experimentation, these resources also served as illustrative examples of how natural dye strategies can intersect with other Alpine sectors. Their inclusion reinforced the idea that dye innovation can emerge from **cross-sectoral linkages**, rather than from textile systems alone.

Across these different resources, the pilot highlighted a key distinction between **foraging-based and farming-based sourcing**. Foraging relies on intimate ecological knowledge, seasonal awareness, and local stewardship, and tends to be associated with craft practices and small-scale experimentation. Farming, by contrast, requires agronomic expertise, investment, and coordination, but offers greater control over quantities and qualities.




*Lach bark dyes extraction process and application. Courtesy of Mediplant.*

Importantly, the pilot showed that both approaches can coexist and complement each other, and that **farmed dye plants may represent an opportunity for farmers** seeking added-value crops, provided that downstream processing and market pathways are clarified.

The comparison between foraged and farmed resources also revealed differences in **variability and standardisation**. Foraged plants tend to exhibit greater variability in colour outcomes, influenced by microclimates, soil conditions, and harvesting times. Farmed plants, while requiring more upfront organisation, offer greater potential for consistency. Rather than framing this as a problem to be eliminated, the pilot treated variability as a **design and positioning parameter**, to be managed differently depending on whether the target context is craft, niche production, or larger-scale manufacturing.

Overall, this diversity of natural dye resources demonstrates that heritage-sensitive innovation does not rely on a single model of sourcing or production. Instead, it depends on the ability to **mobilise appropriate competences and networks** for each resource, aligning ecological conditions, knowledge systems, and production logics. By making these differences explicit, the AlpTextyles pilot provides a foundation for SMEs and craft actors to identify which natural dye pathways are compatible with their capacities, ambitions, and territorial contexts.

### 5.4 From traditional knowledge to usable protocols: Making natural dyes workable for craft and SME contexts

One of the central challenges addressed by the AlpTextyles natural dye pilot was not the absence of knowledge, but its **form and circulation**. Knowledge related to dye plants has long existed in Alpine regions, embedded in domestic practices, craft traditions, and ethnobotanical repertoires. However, this knowledge is often **tacit, localised, and experiential**, transmitted through practice rather than through formalised instructions. While this mode of transmission is well suited to small-scale craft contexts, it poses significant limitations when natural dyes are considered for broader use by textile SMEs.

The pilot therefore focused on a crucial operation: the **translation of traditional ethnobotanical knowledge into usable, shareable, and testable protocols**. This did not involve replacing heritage practices with scientific ones, but rather creating interfaces between different knowledge systems. Ethnobotanical insights and historical uses provided orientation, while laboratory testing and technical experimentation allowed these practices to be assessed in terms of reproducibility, variability, and technical feasibility.

A key contribution of the pilot was to make explicit parameters that are often implicit in traditional dyeing practices. These include quantities of raw material, extraction ratios, temperatures, processing times, and interactions with different fibres. By formalising these elements, the pilot made it possible to **compare outcomes across batches, seasons, and sourcing modes** (foraged versus farmed plants), and to identify where variability could be managed, tolerated, or even valorised.

This work was particularly important for bridging craft and industrial perspectives. For craft practitioners, the protocols function as **supportive tools**, helping to stabilise practices without eliminating flexibility or sensitivity to materials. For SMEs and industrial actors, they act as **risk-reduction devices**, clarifying what can realistically be expected from natural dyes in terms of consistency, yields, and integration into existing production processes.

Importantly, the pilot did not aim to produce universal recipes applicable in all contexts. Instead, it demonstrated the value of **situated protocols**, which remain open to adaptation while providing a shared reference framework. This approach acknowledges that natural dyes are inherently sensitive to ecological conditions, plant variability, and processing choices, and that their successful use depends on informed decision-making rather than full standardisation.

TESTIRANJE/BARVANJE Z MACESNOVIM LUBJEM, november 2023—*TESTING WITH LARCH BARK, November 2023*

| št. vzorca/*sample No.* | material | priprava/*preparations* | proces barvanja/*dyeing proces* | rezultati/*results* | obstojnost/*durability* |
|---|---|---|---|---|---|
| **vzorec 1/*sample 1*** | **barvilo/*dye*:**<br>liofilizirano macesnovo lubje/*Larch bark/Lyophilized dry extract*<br>***tkanina/fabric:***<br>*100% lan - 1 kom. prtič 30x30 cm*<br>*100% linen - 1 pcs. napkin 30x30 cm*<br>***preja/yarn:***<br>*100% ovčja volna (neposukana)*<br>*100% sheep wool (untwisted)* | **barvilna kopel/*dye* bath:**<br>Raztapljanje pigmenta v vroči vodi in priprava barvilne kopeli.<br>*Dissolving pigment powder in hot water and preparation of the dye bath.*<br>***tkanina/fabric:***<br>Laneno tkanino sem predhodno strojno oprala (95°C) in čez noč namočila v vodi; pred barvanjem sem jo dobro ožela.<br>*I have previously machine-washed linen fabric (95°C) and soaked in water over night; before dyeing I rinsed it well.*<br>***preja/yarn:***<br>Volno sem predhodno ročno oprala in čez noč namakala v vodi; pred barvanjem sem jo dobro ožela.<br>*I have previously hand-washed wool and soaked it in water over night; before dyeing process I rinsed it well.* | **Proces barvanja/*dyeing* process:**<br>V mlačno barvilno kopel sem potopila pripravljeno volno in laneno tkanino in počasi segrevala do vrenja; pri najmanjši temperaturi sem materiale barvala 2 uri in jih potem pustila v kopeli, da se je le-ta ohladila na sobno temperaturo. Potem sem jih dobro ožela in oprala v mlačni vodi.<br>*I dipped the prepared wool and linen fabric into a lukewarm dye bath and slowly heated it to boiling; I dyed the materials at the lowest temperature for 2 hours and then left them in the bath to cool down to room temperature. Then I rinsed them well and washed them in lukewarm water.* | **Rezultati/*Results*:**<br>Rezultati barvanja so dobri, tako na volni kot na laneni tkanini.<br>*Dyeing results are good, both on wool and linen fabric.* | **Rezultati/*Results*:**<br>Rezultati po pranju so zadovoljivi tako pri volni kot laneni tkanini ob upoštevanju navodil (ročno pranje pri 40°C, tekoči detergent za občutljive tkanine).<br>*The results after washing are good for both wool and linen fabrics if the instructions are followed (hand wash at 40°C, liquid detergent for delicate fabrics).* |
| **vzorec 2/*sample 2*** | **barvilo/*dye*:**<br>liofilizirano macesnovo lubje/*Larch bark/Lyophilized dry extract*<br>***tkanina/fabric:***<br>*100% lan - 3 kom. prtič 30x30 cm*<br>*100% linen - 3 pcs. napkin 30x30 cm*<br>***preja/yarn:***<br>*100% ovčja volna (neposukana in sukana)*<br>*100% sheep wool (untwisted and twisted)* | **barvilna kopel/*dye* bath:**<br>Raztapljanje pigmenta v vroči vodi in priprava barvilne kopeli.<br>*Dissolving pigment powder in hot water and preparation of the dye bath.*<br>***tkanina/fabric:***<br>Laneno tkanino sem predhodno strojno oprala (95°C) in čez noč namočila v vodi; pred barvanjem sem jo dobro ožela.<br>*I have previously machine-washed linen fabric (95°C) and soaked in water over night; before dyeing I rinsed it well.*<br>***preja/yarn:***<br>Volno sem predhodno ročno oprala in čez noč namakala v vodi; pred barvanjem sem jo dobro ožela.<br>*I have previously hand-washed wool and soaked it in water over night; before dyeing process I rinsed it well.* | **Proces barvanja/*dyeing* process:**<br>V mlačno barvilno kopel sem potopila pripravljeno volno in laneno tkanino in počasi segrevala do vrenja; pri najmanjši temperaturi sem materiale barvala 2 uri in jih potem pustila v kopeli 2 dni, da se je le-ta ohladila na sobno temperaturo. Potem sem jih dobro ožela in oprala v mlačni vodi.<br>*I dipped the prepared wool and linen fabric into a lukewarm dye bath and slowly heated it to boiling; I dyed the materials at the lowest temperature for 2 hours and then left them for 2 days in the bath to cool down to room temperature. Then I rinsed them well and washed them in lukewarm water.* | **Rezultati/*Results*:**<br>Rezultati barvanja so dobri, tako na volni kot na laneni tkanini. Med 1. in 2. vzorcem v barvi ni bistvene razlike.<br>*Dyeing results are good, both on wool and linen fabric. There is no significant difference in color between the 1st and 2nd samples.* | **Rezultati/*Results*:**<br>Rezultati po pranju so zadovoljivi tako pri volni kot laneni tkanini ob upoštevanju navodil (ročno pranje pri 40°C, tekoči detergent za občutljive tkanine).<br>*The results after washing are good for both wool and linen fabrics if the instructions are followed (hand wash at 40°C, liquid detergent for delicate fabrics).* |

*Larch bark dye testing report.*
*Courtesy of AlpTextyles partner [Rokodelski center Skofja Loka](), 2023.*

TESTIRANJE/BARVANJE S SILINO, julij 2023—*TESTING WITH WOAD/INDIGO, July 2023*

| št. vzorca/*sample No.* | material | priprava/*preparations* | proces barvanja/*dyeing proces* | rezultati/*results* |
|---|---|---|---|---|
| **vzorec 1/*sample 1:*** | **barvilo/*dye*:**<br>**Indigo Mediplant P 3.0 052023 AK**<br>- naravni izvleček silne v prahu (Isatis Tinctoria)<br>- apno/*lime*<br>- fruktoza/*fructose*<br>Razmerje/*ratio:*<br>***1*** *(barvilo/dye powder)* **: *2*** *(baza/base)* **: *3*** *(sladkor/sugar)*<br>***tkanina/fabric:***<br>100% lan/*linen*<br>***preja/yarn:***<br>100% ovčja volna (neposukana)/<br>*100% sheep wool (untwisted)* | **barvilna kopel/*dye bath*:**<br>Priprava barvilne kopeli v razmerju: **1** (barvilo) **: 2** (baza) **: 3** (sladkor).<br>Potopi v barvilni kopeli: cca. 30 min.<br>- 2x, 3x, 5x. Oksidacija med posameznimi potopi: cca. 30 min..<br>*Preparation of dye bath in the ratio:* ***1*** *(dye)* **: *2*** *(base)* **: *3*** *(sugar). Dips in a dye bath approx. 30 min. - 2x, 3x, 5x. Oxidation between individual dives: 30 min..*<br>***tkanina/fabric:***<br>Laneno tkanino sem predhodno strojno oprala brez detergenta pri 95°C. Pred barvanjem sem jo vsaj 12 ur namakala v vodi.<br>*I have previously machine-washed the linen fabric without detergent at 95°C. Before dyeing, I soaked it in water for at least 12 hours.*<br>***preja/yarn:***<br>Surovo neposukano volneno prejo sem predhodno tretirala v galunu. Pred barvanjem sem jo vsaj 12 ur namakala v vodi.<br>Surovo sukano volneno prejo sem uporabila neoprano in suho, brez namakanja.<br>*I previously treated the raw untwisted wool yarn in alum. Before dyeing, I soaked it in water for at least 12 hours.*<br>*I used raw spun wool yarn, unwashed and dry, without soaking.* | **Proces barvanja/dyeing process:**<br>Potopi v barvilni kopeli cca. 30 min.<br>- 1x, 3x, 5x, 7x - barvilna kopel je bazična (pH 12), T= cca. 40°C. Oksidacija med posameznimi potopi: 30 min.. Po končanem barvanju in oksidaciji sem vse vzorce namočila v vodo s kisom in dobro splahnila in pošušila na zraku.<br>*Dips in a dye bath approx. 30 min. - 1x, 3x, 5x, 7x -- the dye bath is basic (pH 12), T= approx. 40°C. Oxidation between individual dives: 30 min..*<br>*After finishing the dyeing and oxidation, I soaked all the samples in water with vinegar and rinsed them well and dried them in the air.* | **Rezultati/*Results*:**<br>Volna, predhodno tretirana v galunu, ne sprejema dobro barvila.<br>*Wool previously treated in alum does not accept dye well.* |

*Woad/indigo dye testing report.*
*Courtesy of AlpTextyles partner [Rokodelski center Skofja Loka](), 2023.*

**HOW-TO**

**Use tested extraction and dyeing protocols as a basis for replication and adaptation**

Rather than proposing generic guidance on natural dyeing, the AlpTextyles pilot produced a set of **tested extraction and dyeing protocols**, documenting how specific Alpine bio-based resources can be transformed into usable dyes under controlled conditions.

The following examples show how such protocols are structured and how they can be mobilized by craft practitioners and textile SMEs. *See the AlpTextyles website for other resources and tests, also covering other natural resources.*

ALPTEXTYLES · CASE STUDIES ·

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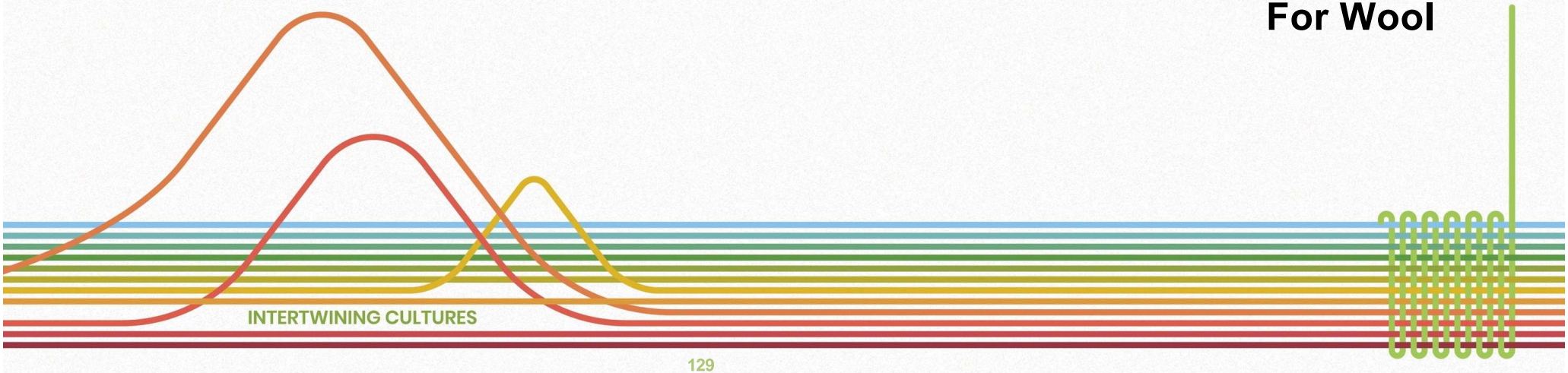
mediplant

# Natural Indigo
# Dyeing protocol
## For Wool



**Step 1**

**Preparation of the wool**

- Washing in surfactant solution
- Flush with running water
- Soak in water

water quality: spring water, hardness 300 ppm

**Step 2**

**Preparation of the indigo bath**

Dissolve indigo powder + lime + fructose (quantities depending on the purity of indigo)

**Step 2**

**Separate leaves from stems**

**Step 3**

**Add demineralized water to a ratio 1/5**

(1 part plant for 5 parts water)

**Step 4**

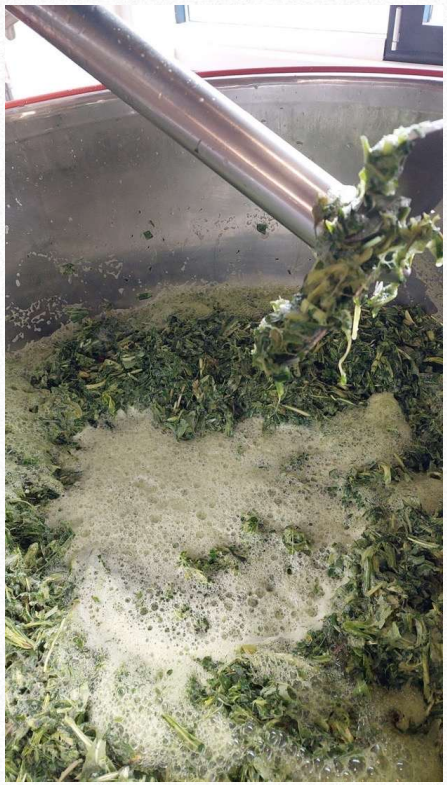
**Acidify with citric acid**

pH below 4.0

**Step 5**

**Overnight maceration**

at room temperature



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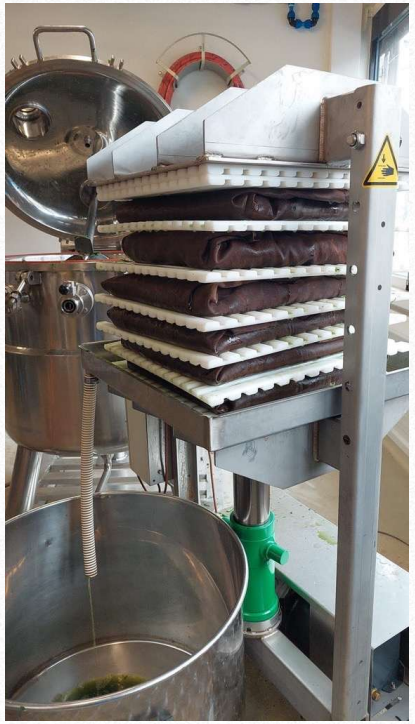
**Step 6**

**Pressing** (package press)



**Step 7**

**Filtration** (1µm)

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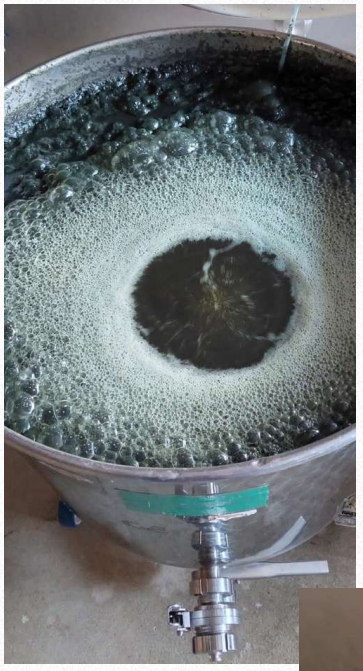
**Step 8**

Basify with soda (pH >10)

Aerate

Overnight settling



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**Step 9**

Recovery of precipitated indigo

Sedimentation

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**Step 10**

Büchner filtration

Washing with alcohol

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**Step 11**

Recovery of indigo paste

Drying

Grinding

Packaging


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# Larch bark natural dye
# Extraction protocol

**from *Larix decidua* Mill.**