

The Making and Knowing Project

Intersections of Craft Making and Scientific Knowing

Dyeing Residency 2024

with

Bertha Estrada Huipe and
Mateo Rodriguez Estrada



In fall 2024, the Making and Knowing Project hosted dyer-weaver Bertha Estrada Huipe and her son and assistant Mateo Estrada Rodriguez from Ahuirán, Mexico. Over 10 days, students worked alongside Bertha and Mateo, making natural dyes from marigold flowers, coconut husks, pomegranate peels, oak bark, and cochineal, and learning about the many forms of knowledge (environmental, cultural, and tacit) that are embedded in Purépecha dyeing techniques. Through public events, student dyeing sessions, and site visits, participants engaged with Purépecha dyeing and weaving traditions and a number of related topics, including sustainability, colonial extraction, and forms of embodied knowledge. See the [video overview](#).

This slideshow provides an account of their dyeing sessions in the Making and Knowing Lab.











Making and Knowing Lab

Preparing the Dye Baths

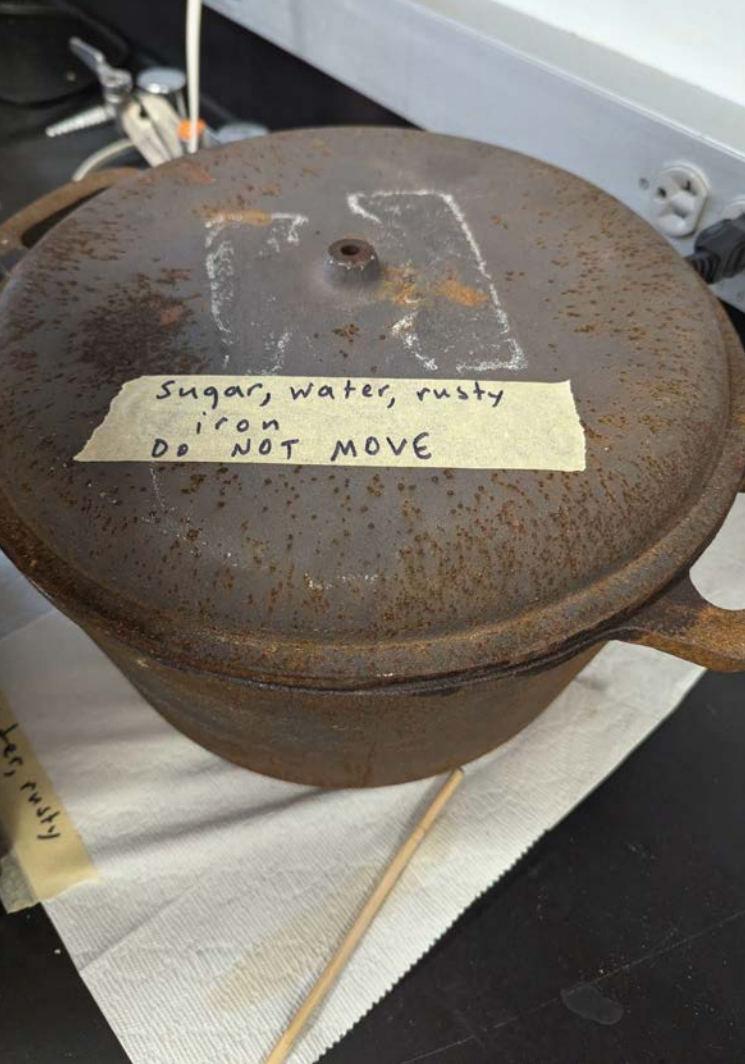
July - September 2024



7/25/2024 - prepared rusty sugar water for dyers

Notes from the dyers - 5-10 L water, 1 kg. Rusty nails, 1 piloncillo

We combined in a rusty cast iron pot
6 L Water
1 Piloncillo cone
A small length of rusty wire



Two months
later: Rusty
sugar water
9/20/24
Fermenting
happily!



Dye bath preparation, Sept. 20, 2024

Amanda Althoff, Ninive Vargas, Lucia Delaini, Pamela Smith, Madi Whitman

MATERIALS

Flor de Xempasuchil: Mexican marigolds (tagetes erecta) 226g

Cascara de granada: Pomegranate peels 2.2kg

Cascara de coco: Coconut husks .85 kg (very dry)

Cascara de arbol Tecojote: Mexican Hawthorn bark (not available – using cochineal instead): Cochineal 500g (Maiwa) (of which we used 250g on 9/20/24) (20 L for 500g, bring just to a boil)

Cascara de arbol encino: Oak bark 3kg (from Etsy)

PROCESS (instructions from Bertha and Mateo Estrada): 10 liters of water for every 5 kilograms of each material (2:1), except cochineal. (NB: we had to add more water to cover materials in pots.) Boil for 40 mins., leave to soak.



Pomegranate peel

Cáscara de granada

Flor de Xempasuchil

Tagetes erecta (Aztec marigold)



cáscara de coco

Coconut shell

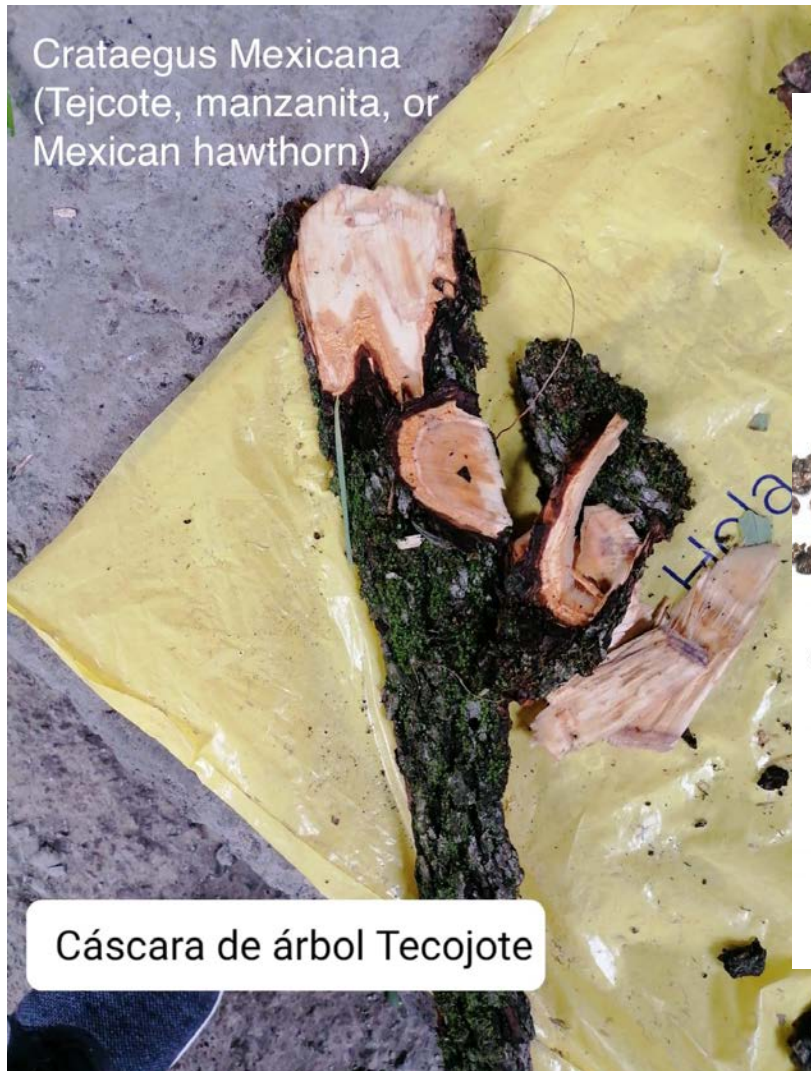


Cáscara de árbol encino

oak tree shell



Crataegus Mexicana
(Tejocote, manzanita, or
Mexican hawthorn)



Cáscara de árbol Tecojote

Substitute: Cochineal (Tecojoote
was impossible to source in NYC)





Dyestuff
preparation.

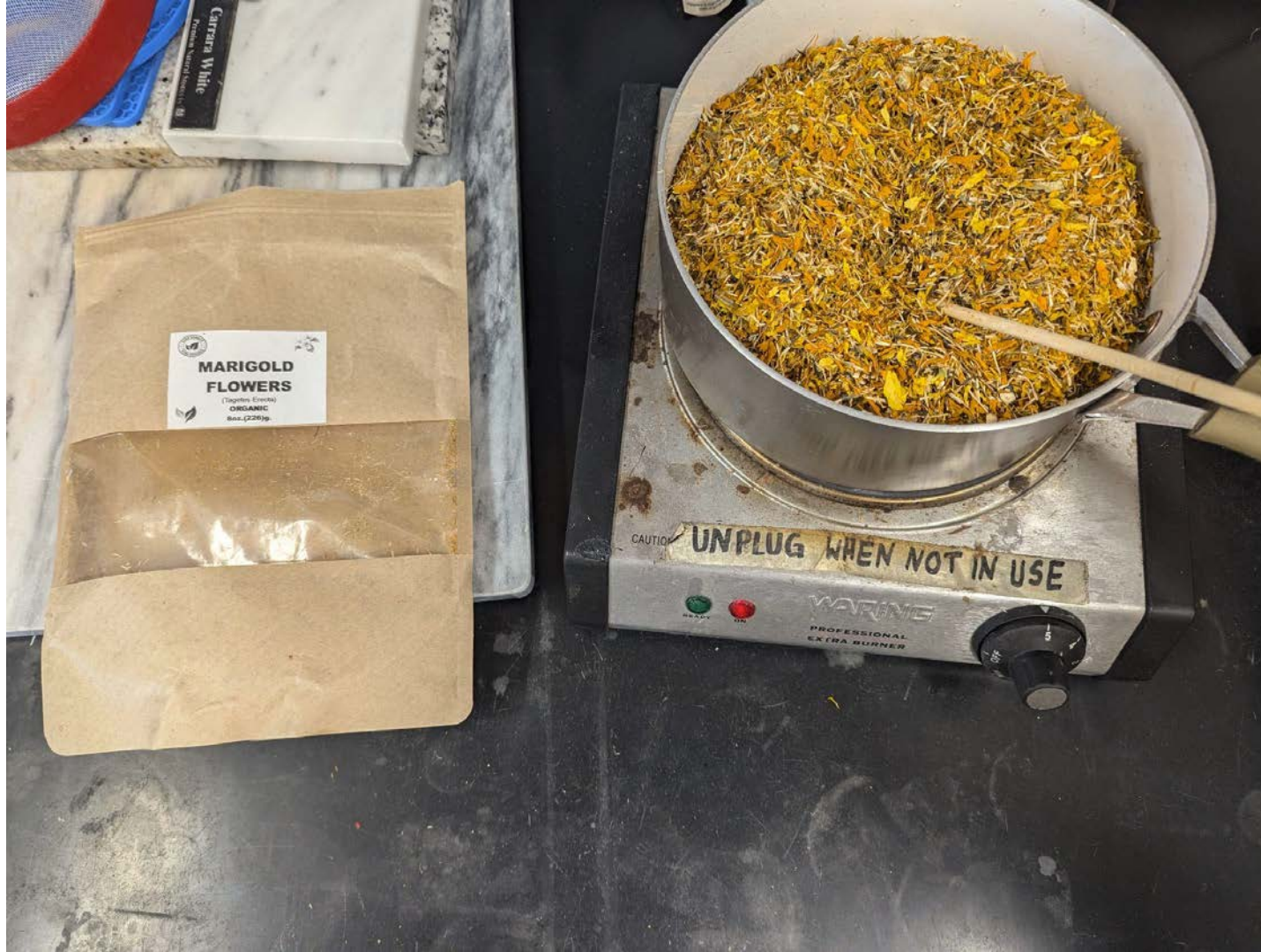
Pomegranate
peel



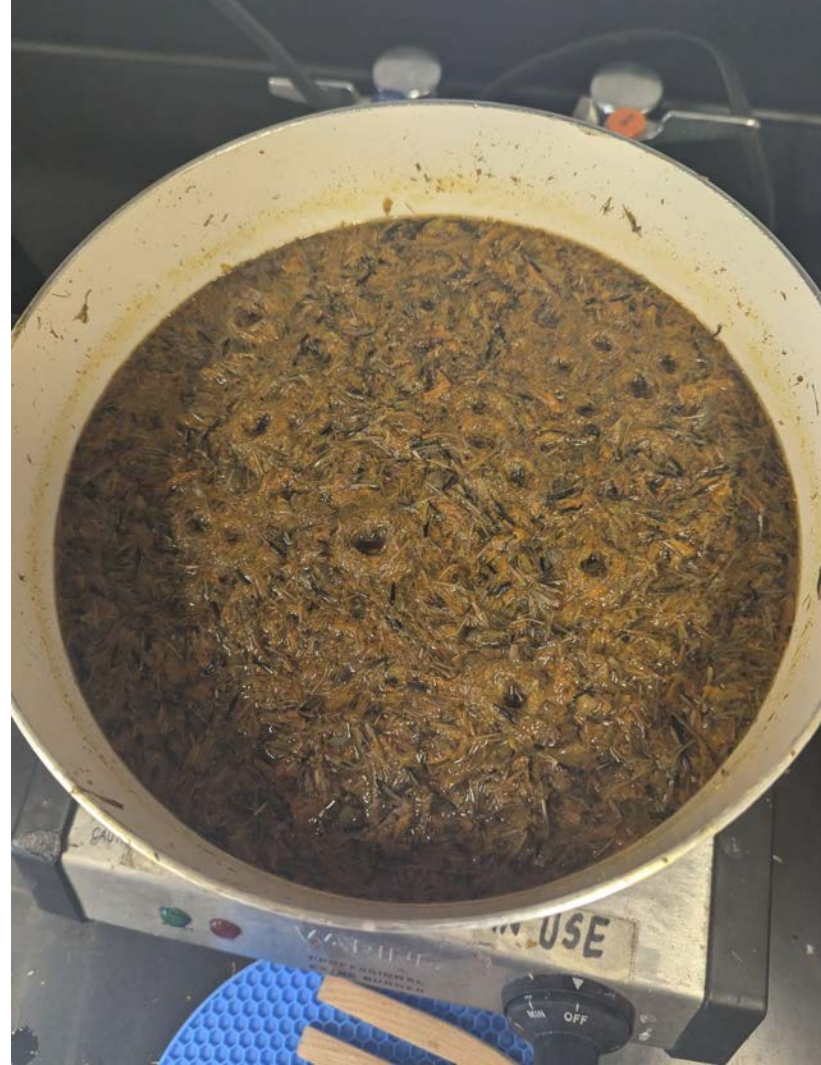


Pomegranate peel - 2.2 kg

- Split between two pots because of the volume
- **2.2L** added to each
- Pot 1: 4:12ish pm start boil - off at 4:47 pm
- Pot 2: 4:15ish pm start boil - off at 4:53 pm



Flor de
Xempasuchil
226g very dry
flowers
Added total of
3.4 L of water to
cover flowers

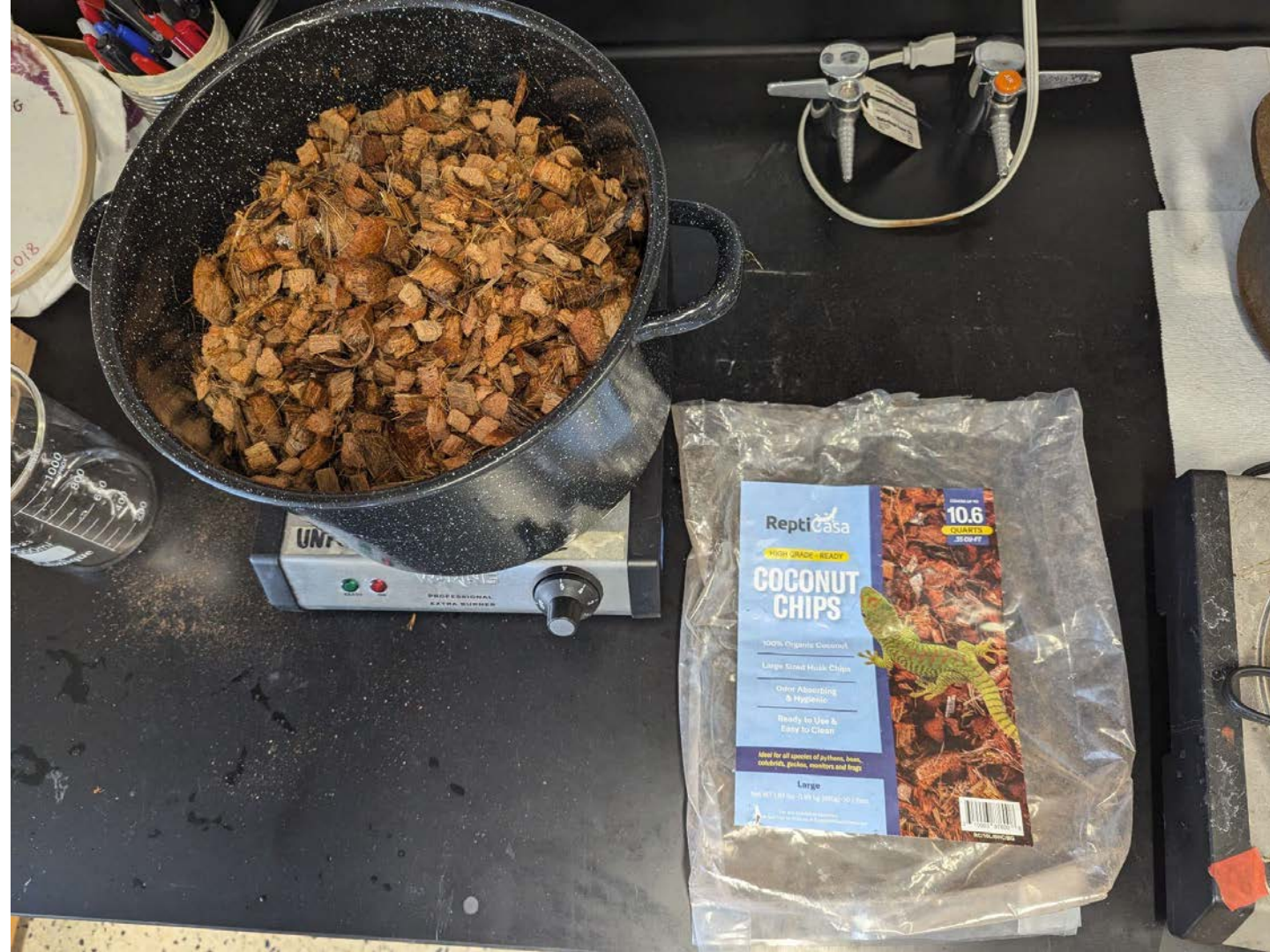




9/26/24:

Another 1 L of water added and brought to a boil again.

Total of 226g of flowers in 4.4 L water



.85 kg coconut husks
Added a total of **8.9L**
water to cover it

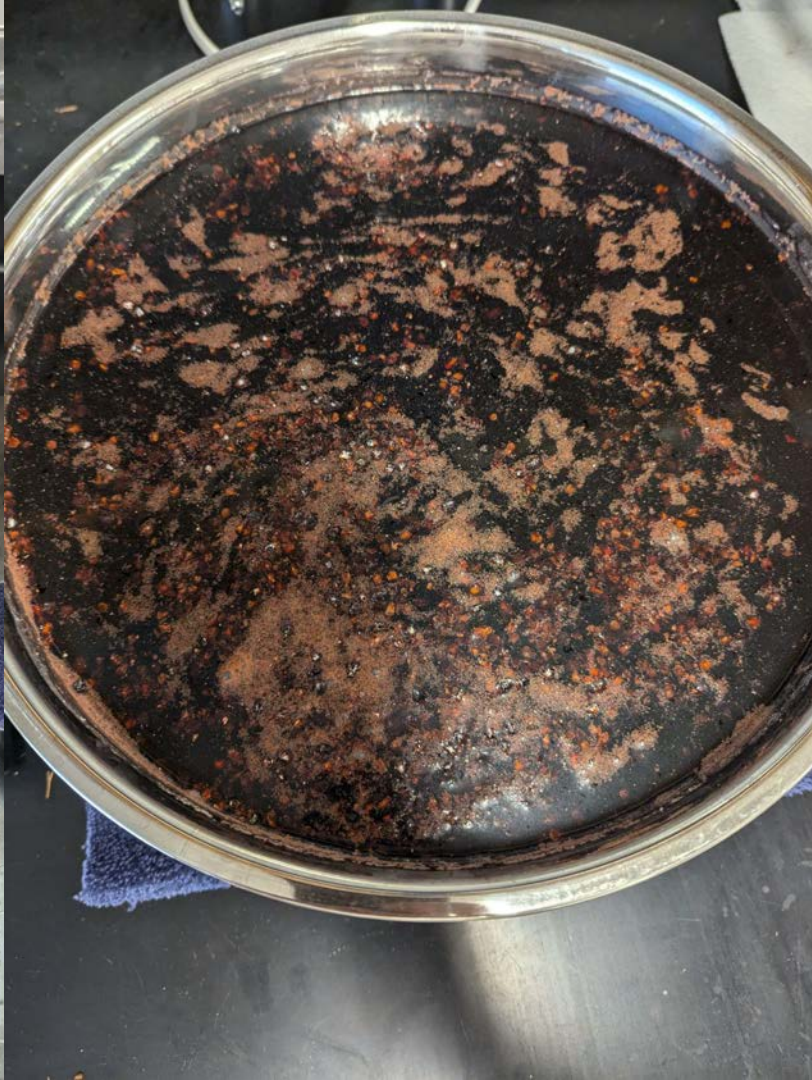
Started simmer at
3:38 pm
done at 4:18 pm

-



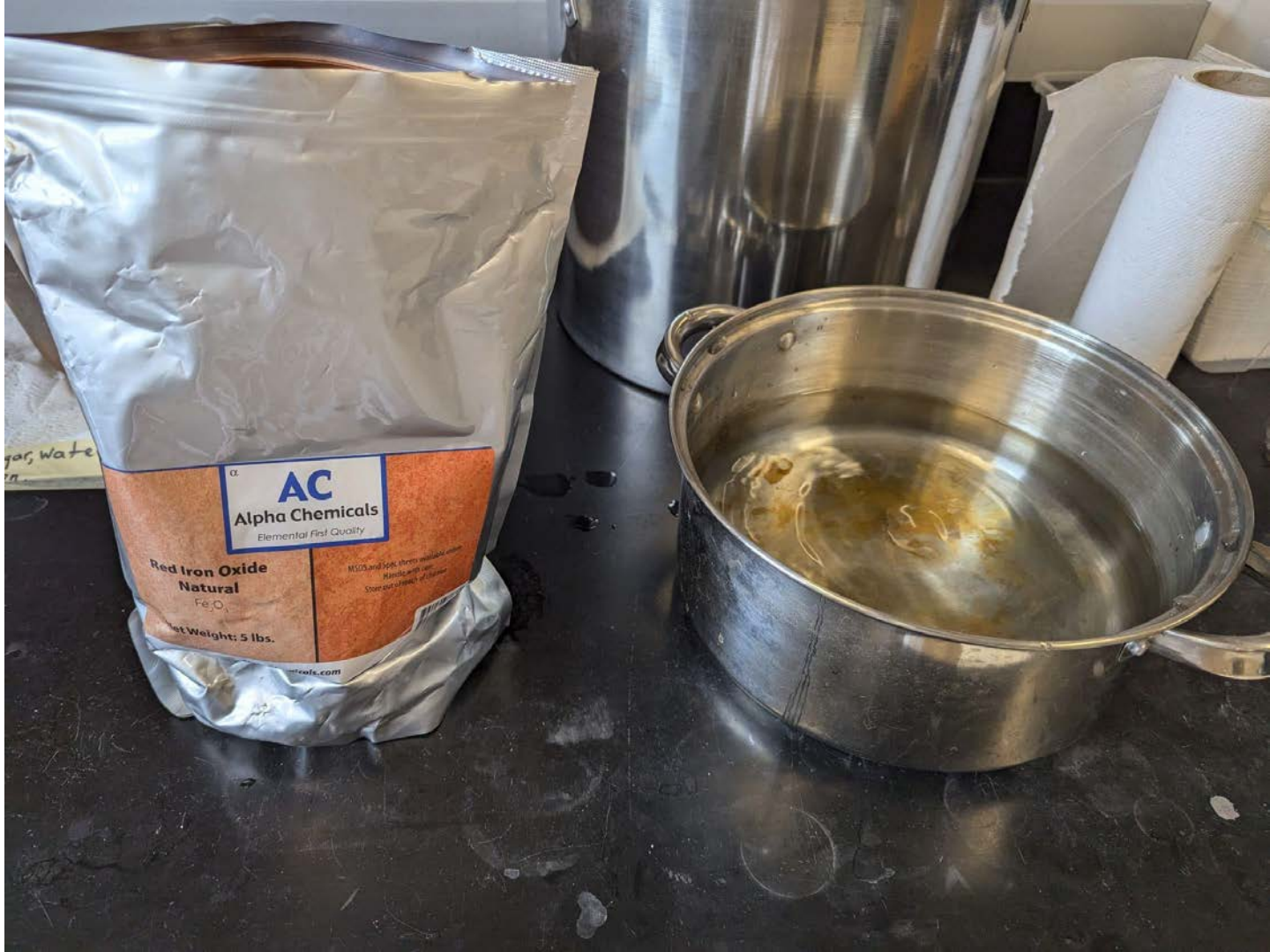


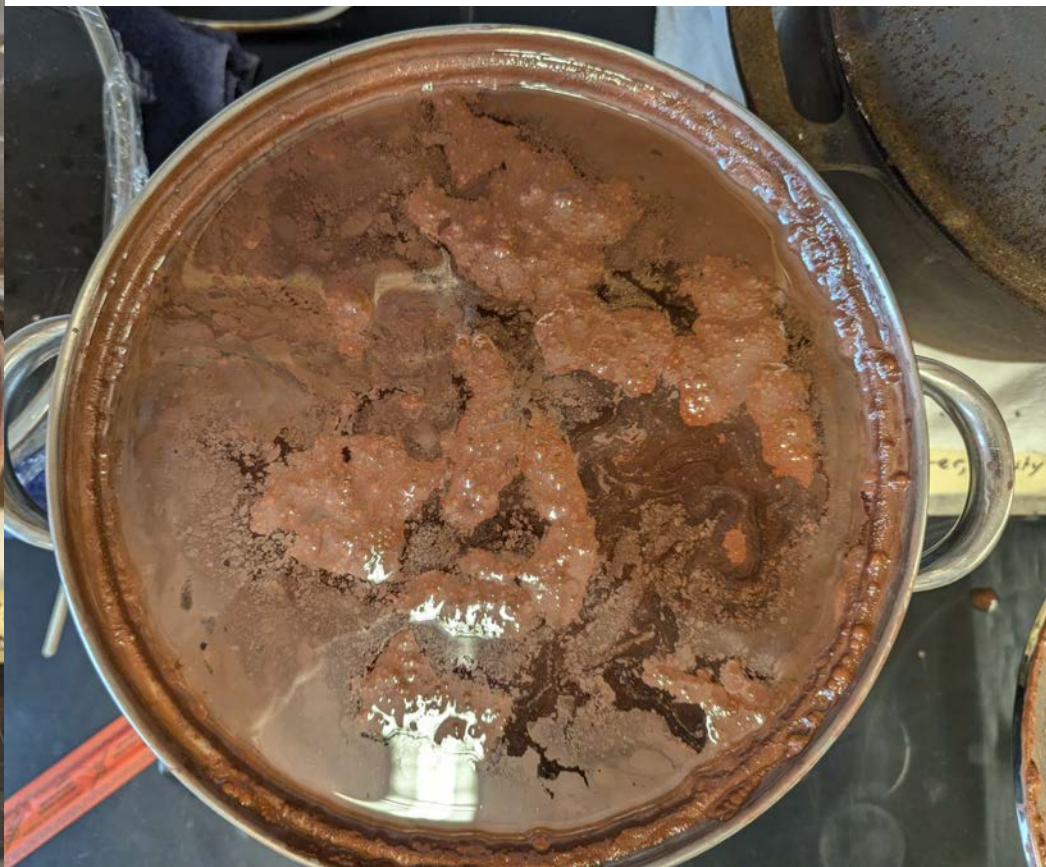
- Oak bark - 3 kg with **10 L total** to cover bark
- Bark done at 4:25 pm
 - **Another 2 L water added** on 9/25/24



COCHINEAL
2 pots, each
with 125 g and
5 L of water.
Brought to a
boil and turned
off.

Iron oxide
2.27 kg in
4.54L
water.
Boiled for
40 mins.





2.27 kg of iron oxide powder in 4.54 L water. Boiled for 40 mins.



Iron oxide and
water on 9/26/24

Komodo

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COCONUT COIR REPTILE BEDDING

Coconut Fiber Expandable Reptile Substrate

6 PACK FITS UP TO A

60 GALLON TANK!

Chemical Free •

Holds Optimum Humidity •

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Komodo® Coconut Coir Reptile Bedding Bricks give your pets a healthy, comfortable, and natural environment to live in. Our products are 100% natural and any foreign materials are removed through the Maxwashed process. Combine with our chip brick for the best combination of terrarium floor for your reptile!

PACKAGE AND PRODUCT ARE COMPOSTABLE AFTER USE!

EACH BRICK FILLS ABOUT 10 GALLONS

1 BRICK = 10 GALLON TANK FLOOR
2 BRICKS = 20 GALLON TANK FLOOR
4 BRICKS = 40 GALLON TANK FLOOR
6 BRICKS = 60 GALLON TANK FLOOR

HOW TO USE:

Remove the bricks from the HDPE bag, and add water to the compressed hard block. It will immediately start to expand and turn to a rich, golden color with fully moisture-absorbed particles.

www.komodoreptile.com
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More coconut husk: each block 264g



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T COIR REPTILE BEDDING

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750g compressed coconut husk to 16
L water
40 mins at boil.



325g flor de
Xempasuchil in
8.8 L water

Boiled for 40
mins

900 mg flowers to 16 L water. Boiled for 40 mins.



The Making and Knowing Lab

Sept. 30: Before
Bertha Estrada
Huipé and Mateo
Estrada arrived



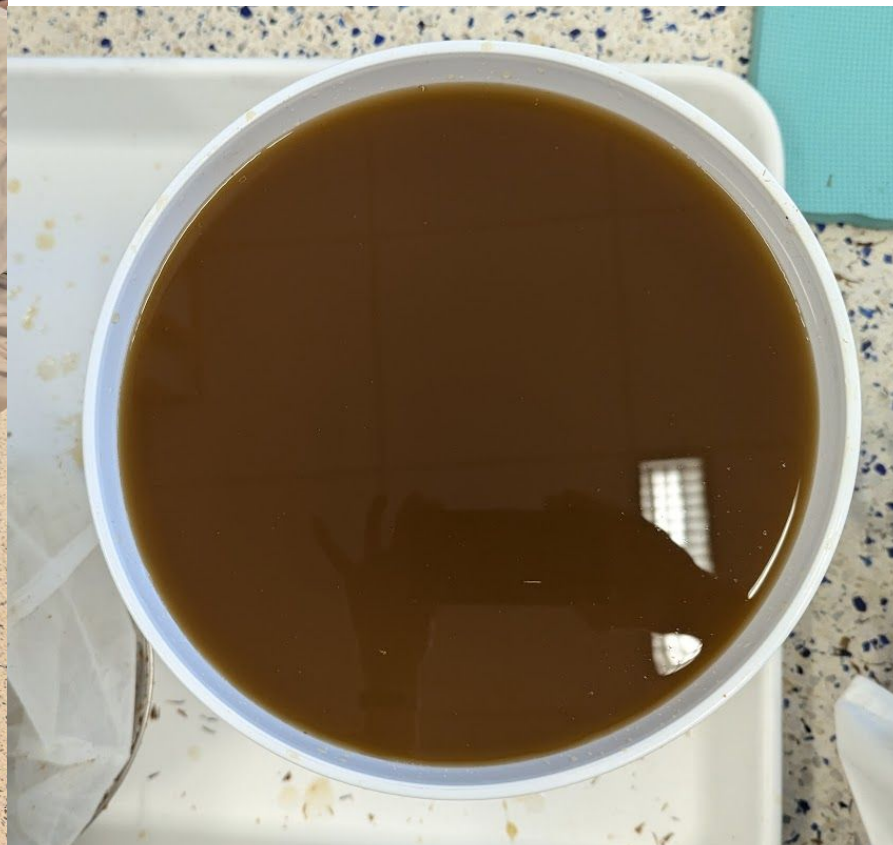


**Flor de
Xempa-
suchil
dyebath**









Oak Bark Dye bath





Coconut Husk Dye bath



Pomegranate rind







Pomegranate rinds: very slimy!



Cochineal dye bath

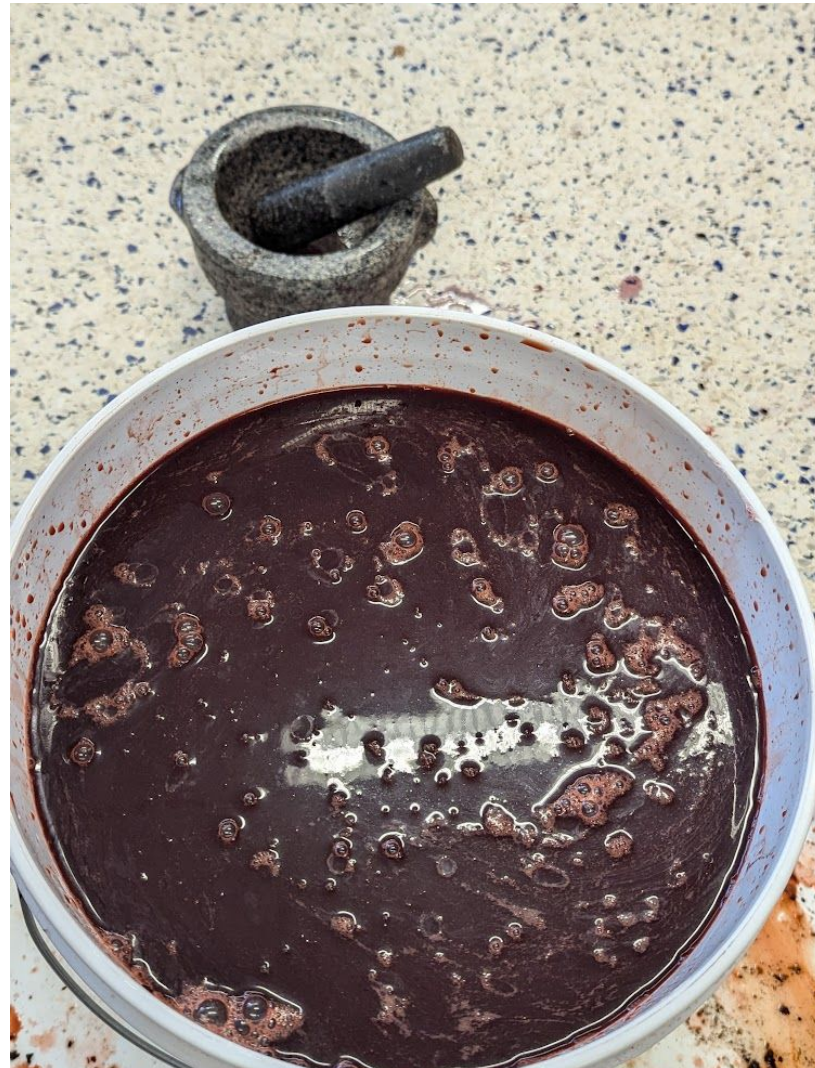








Cochineal dye bath



Iron oxide (mordant/colorant)
combined with the rusty sugar
water





The 5 dye baths,
ready for Wed.
dyeing session

- coconut husk
- flor de xempasuchil
- oak bark
- pomegranate rind
- cochineal

Soaking the cotton
textiles in water





Flor de Xempasuchil
Cloth (with water wrung
out) is added when the
dyebath is at boiling.
Must be stirred
vigorously and brought
back to a boil (ca. 10
mins or more)
We did not stir nor boil
vigorously enough.





Xempasuchil

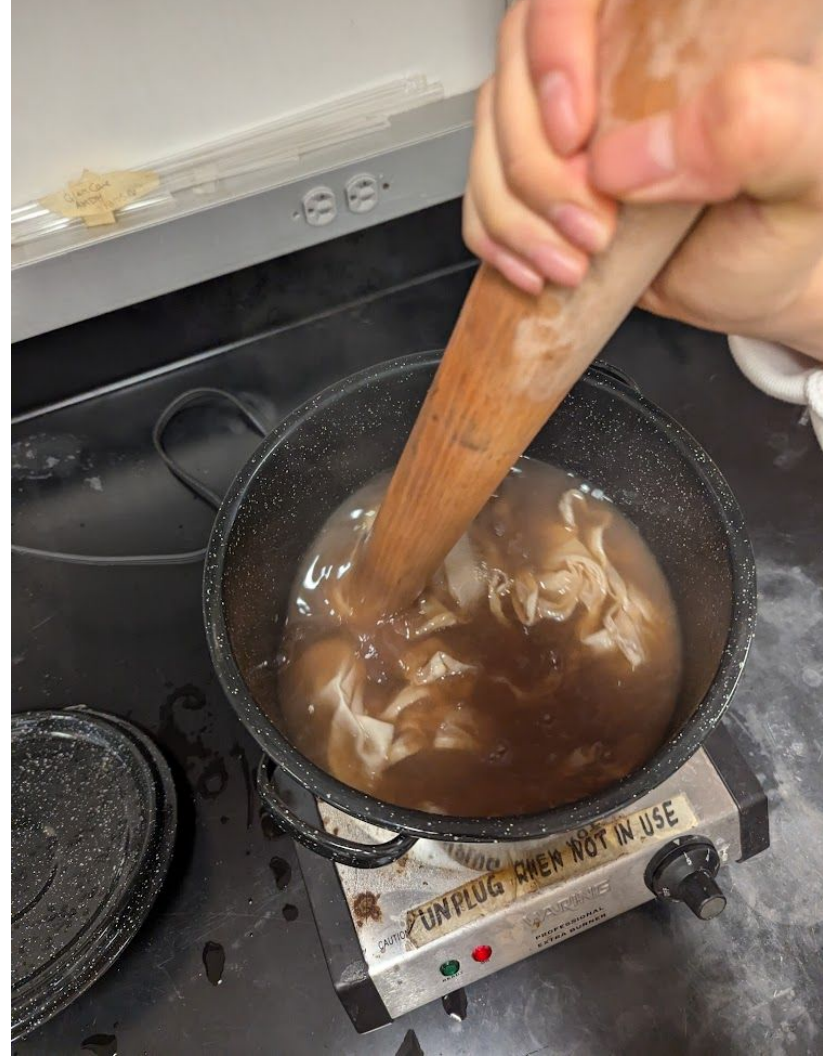


Oak bark





Pomegranate rind



Cochineal



Coconut husk



Removing cloths
from the
Xempasuchil
dyebath





Washing the Xempasuchil cloths



Cochineal - getting ready to wash the dyed textiles, which required a large quantity of water



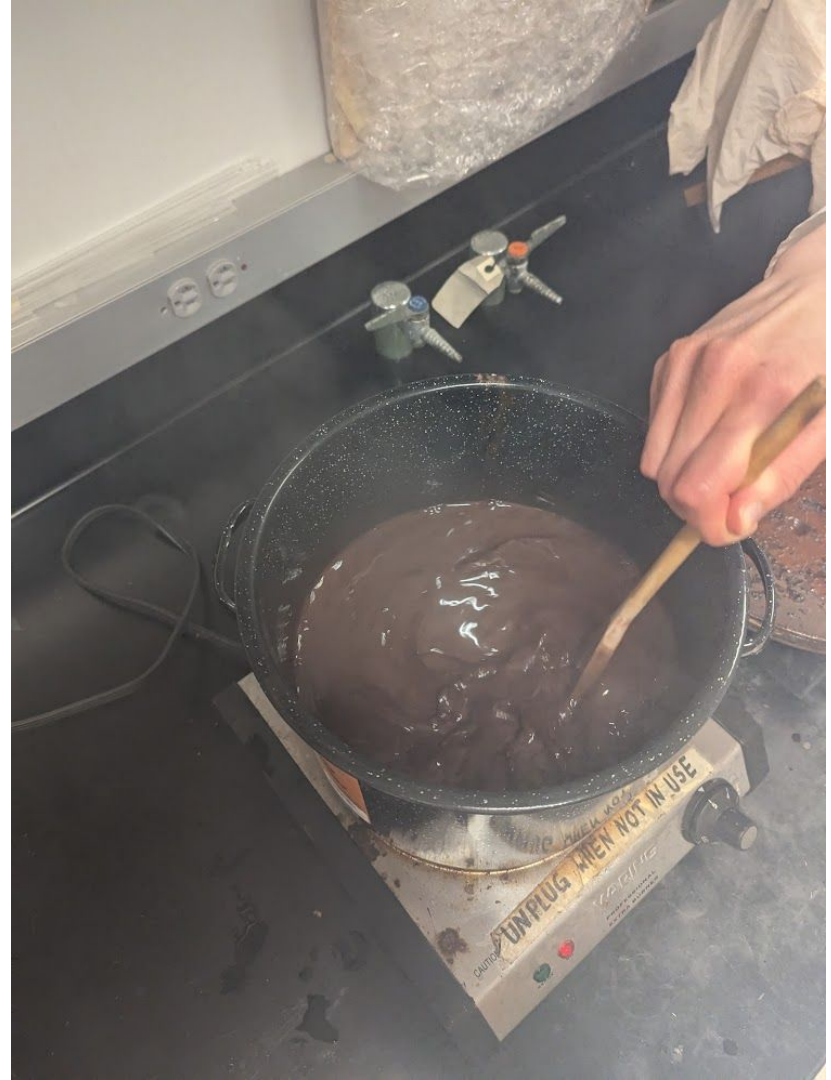
Adding mordants to
the dyebaths:
Adding iron oxide
to oak bark



Coconut and iron oxide



Pomegranate peel and
iron oxide - took a long time to
boil.



Photos missing because all actions had to be carried out very quickly once the iron oxide was put into the dyebaths – needed to add the cloths immediately and bring back to boiling. Pomegranate rind was very difficult to bring back to boiling.

Needed huge amounts of water in which to wash the iron oxide-dyed cloths. Wash in clean water repeatedly until no more dye washes out.

Oak bark

Left: no mordant

Right: with iron oxide mordant)



Cochineal

Left: mordanted with iron oxide

Right: no mordant



Coconut husk

Top: with iron
oxide mordant

Bottom: no
mordant



Flor de Xempasuchil

Left: with iron oxide mordant

Right: no mordant



Pomegranate rind

Left: no mordant

Right: iron oxide mordant









Public Event - Casa Hispanica



The many ways to wear
a *rebozo* (dyed and
woven by Bertha







Casa Hispanica

Prof. Alessandra Russo

- Comparison of color words in Nahuatl (Florentine Codex - 16th century) and Purépecha



Met Conservation Department



Student-led Colloquium for Latin American History, Columbia University



Dinner - students and dyers



Further dyeing experiments

with alum as the mordant
(produced brighter colors)











Sample Student Projects

Students engage with the themes of the course through a project of their own devising

Student Project

Lily Bunger, Cochineal Red

experiments with
different mordants for
cochineal dyeing to
produce different shades
of red





Student Project

**Sabina Diaz-Rimal and Kian
Hosseinnia**

**Patterning Techniques for Natural
Dyes**

An iterative approach to Making and
Knowing

Cerrina Lai, An Exploration of Natural Pigments

2.9 g of ground **saffron** was boiled in 4 g of potash with 300 ml of water for 18 min

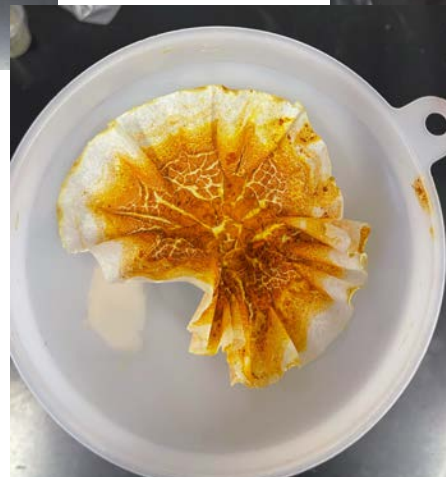
I mixed the 10 g alum with 50 g water solution into the dyestuff solution gradually.
An immediate reaction occurred (the most aggressive of all the colors).

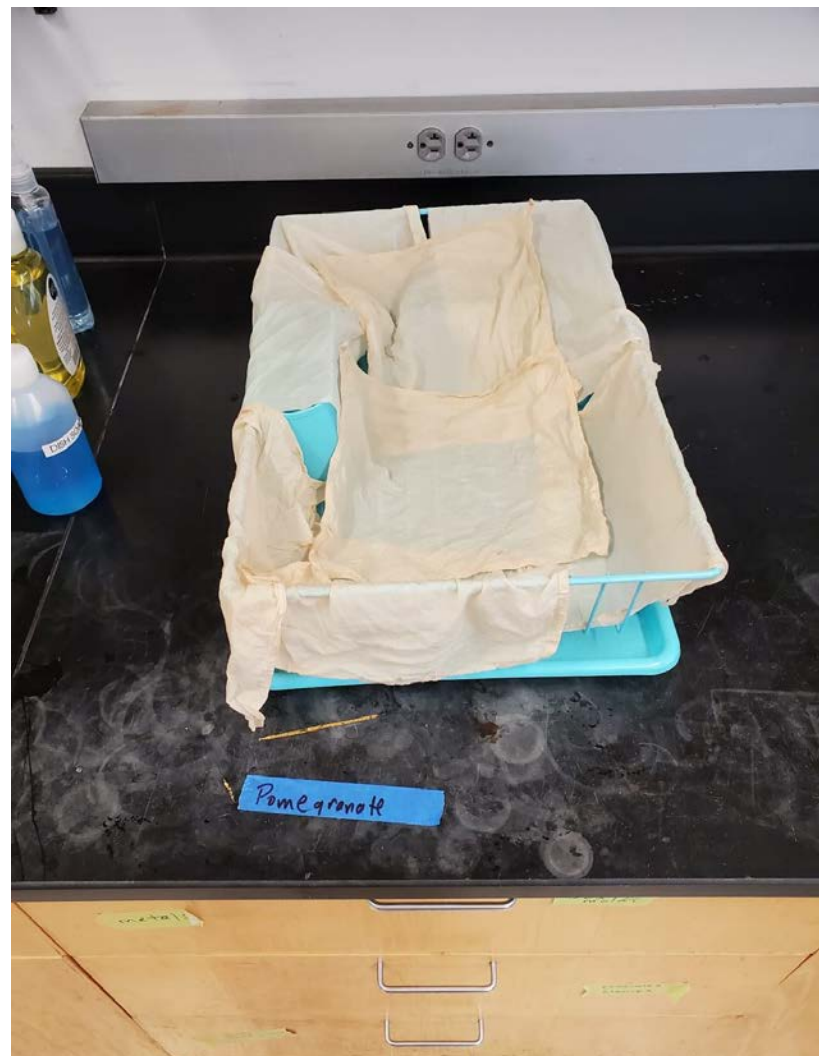
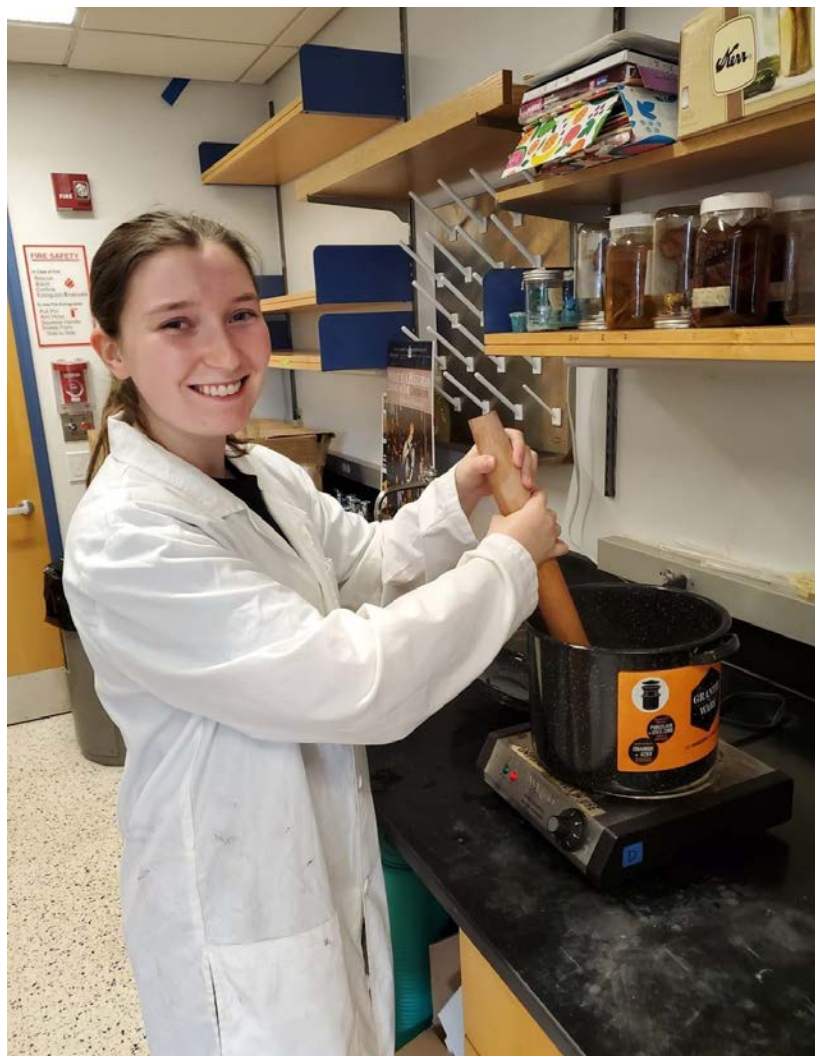
The top was a bright orange.



The next day, there was some separation in the solution (all the colors had a little separation; saffron separated the most).

2.9 g of saffron created 2.5 g of pigment.





Iron oxide mordant

Still happily fermenting at the end of the semester!



October 30

November 10



