

# Botanical Hues: Exploring historical dyes found in lichens, plants and trees at Cambridge University Botanic Garden.

## Authors:

Nabil Ali\*<sup>1</sup>, Ester van Zwanenberg<sup>2</sup>, Hannah Migliari<sup>2</sup>, Oya Yersu<sup>2</sup>, Amber Plett<sup>2</sup>, Gareth Rees<sup>3</sup>, Sam Brockington<sup>4</sup>

## Affiliations:

<sup>1</sup>Cambridge University Botanic Garden / Herbarium, University of Cambridge, Cambridge, United Kingdom,<sup>2</sup> Cambridge Community Arts, Cambridge, United Kingdom,<sup>3</sup>Scott Polar Research Institute and Christ's College, University of Cambridge, Cambridge, United Kingdom,<sup>4</sup>Department of Plant Sciences, University of Cambridge, Cambridge, United Kingdom

\*Corresponding Author: Nabil Ali – [na668@cam.ac.uk](mailto:na668@cam.ac.uk)

Funded by Collections Connections Communities Strategic Research Initiative Participatory Research Grant 2024 - The University of Cambridge.

## Abstract

The research project, *Botanical Hues*, is a collaborative effort led by artist Nabil Ali and creative members of Cambridge Community Arts. The extensive fieldwork at the Cambridge University Botanic Garden concentrated on site-specific lichens and plants growing in the 40-acre site, utilising Jonathan Graham's 2011 Bryophyte & Lichen Survey (BLS) as a reference whilst employing established dye processing frameworks. Seven lichen species from the BLS survey were investigated for their dye colour properties. These included: *Candelariella vitellina*; *Evelina prunastri*, *Parmelia sulcata*, *Physcia adscendens*, *Physcia tenella*, *Ramolina faszgiata* and *Xanthoria parietina* (Casselmann 2001); (Bolton 1991); (Dean 1999); (Grierson 1986).

Continuing our investigation, we are delving into the processes outlined in previous studies, as evidenced by ten individual collection samples held at Cambridge University Herbarium, dating back to c.1856. These samples were assembled by the esteemed Scottish botanist *William Lauder Lindsay*. Notably, Lindsay documented the extraction of dyes from common plants, including *Filago vulgaris* (Cudweed), *Rumex acetosa* (Dock), *Alnus glutinosa* (Alder Bark), *Calluna vulgaris* (Red Heather), *Rubus fruticosus* (Blackberries), and *Typha latifolia* (Bulrush Root).

His work also involved utilising the *Roccella* lichen species found abundant in regions of the world, showcasing examples from *cudbear* to the rock-inhabited *Gyrophora* lichen with others. Lindsay emphasised the importance of creating purple dyes from lichen species using water, air, and liquid ammonia through oxidation processes that react with each species' acids and chemical compounds (Lindsay 1856). He also explained dye-fixing techniques onto powdered substrates, which resonates with the Roman architect *Vitruvius* in his *Ten Books on Architecture* – adding plant dyes to chalk, creating a loose pigment to develop into an organic paint (Rowland & Howe 2001).

Therefore, creating a dye from plants and fungi-algae can be the midway point for developing an organic paint, so mixing lichen dyes with an inert substrate is investigated.