

VARNABHAM

A garden of dye yielding plants



The first in the state

Information Bulletin – 4

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(The first in the state)

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Green Ahalia

Green Ahalia

Striving for better environment

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Preface

India is endowed with rich biodiversity, reflected in its diverse vegetation. These natural resources have long supported communities by sustaining their livelihoods and fulfilling everyday needs. Among these, medicinal and aromatic plants form a significant component, much of which is sourced from the wild. An important subgroup within this category is dye-yielding plants, which provide natural dyes used in handicrafts, textiles, food, and traditional medicine.

It is estimated that over 450 plant species in India serve as sources of natural dyes, producing a wide spectrum of colours. Their use and preference vary across regions, depending on availability, traditional knowledge, and local demand. Kerala, in particular, has a strong heritage in handloom and handicrafts, where dyes play a vital role. Within this context, around 40 to 50 species are commonly used to meet most dyeing requirements.

Dyes are broadly classified as synthetic or natural. Natural dyes are derived from plant, animal, or mineral sources, though plants constitute the primary source. Over time, synthetic dyes gained popularity due to their ease of use, cost-effectiveness, and durability. However, growing awareness of their environmental impact and potential health concerns has led to a renewed interest in eco-friendly natural dyes.

Despite this shift, plant-based dyes face challenges related to availability, processing, and application. Many dye-yielding plants also serve



multiple purposes—as sources of food, medicine, fodder, or timber—which increases demand and can lead to overexploitation. This, in turn, may threaten the survival of certain species. Additionally, the plant part used for dye extraction—whether root, bark, leaf, flower, fruit, or seed has implications for conservation. Harvesting roots or bark, for instance, can be particularly destructive and may endanger the plant. These concerns highlight the need for awareness and responsible harvesting practices.

Green Ahalia has been actively engaged in developing a comprehensive bioresource centre at the Ahalia campus, with a focus on thematic gardens that showcase biodiversity and its cultural connections. These gardens are designed around community needs and usage patterns, featuring groups such as medicinal, edible, and aromatic plants. They also include conservation-focused collections, aquatic species, bamboos, and gymnosperms. Beyond their educational value, these gardens function as repositories of germplasm and serve as effective tools for conservation.

One such initiative is **VARNABHAM**, a dedicated garden of dye-yielding plants. Currently housing 41 species, the garden represents some of the most commonly used and significant dye sources. While agro-climatic limitations restrict cultivation to tropical species, the collection offers a comprehensive overview of natural dye plants. Each species is supported by informative labels detailing its scientific name, common name, dye-yielding part, colour produced, and uses. To the best of our knowledge, this is the first dedicated dye-yielding plant garden of its kind in the district, and possibly in the state.

Drawing from our experience in establishing thematic gardens, this information bulletin has been developed to promote awareness about dye yielding plants and to support institutions interested in creating similar initiatives. The publication presents general features along with species descriptions and photographs to aid identification.

The project owes its successful realization to the visionary support



of Dr. V. S. Gopal, Chairman, and the Ahalia Group Management, along with guidance from Dr. U.M. Chandrashekara and Dr. P. Sujanapal, Senior Scientists at KFRI. The Green Ahalia team, guided by its Advisory Board, worked coherently to overcome the early challenges of establishment and bring this project to fruition.

We hope this work proves useful to readers. While every effort has been made to ensure accuracy, there may be unintentional errors or omissions. We welcome feedback and suggestions, which will help us improve future editions.

Green Ahalia





Foreword

Colour has always held a special appeal for the human eye, and dyes play a vital role in imparting colour to objects of everyday use. Broadly, dyes are classified into natural (organic) and synthetic types. Synthetic dyes have gained widespread acceptance due to their easy availability, cost-effectiveness, durability, and ease of application. However, their environmental impacts and associated pollution concerns have become increasingly evident.

In recent years, there has been a noticeable shift among stakeholders toward natural alternatives, much like the growing preference for natural products in food, medicine, and aromatics. Most natural dyes are derived from plants, making their availability closely linked to plant resources. Any decline in plant populations can therefore affect dye availability, a situation further intensified by competing demands for the same plants for food, medicine, and other uses. This underscores the need for systematic cultivation and resource augmentation.

India is home to over 450 dye-yielding plant species, many of which are found in the Western Ghats, including Kerala. Despite this rich diversity, awareness about even the most common dye-yielding plants remains limited. There is a pressing need to promote knowledge of these species, particularly those prioritised within the state, to encourage ecosystem-specific cultivation and sustainable use. Establishing specialised



gardens dedicated to dye-yielding plants is an effective approach to educate and engage the public.

In this context, it is encouraging to note that Green Ahalia has taken significant strides in developing thematic gardens that showcase bioresources for both conservation and community development. The initiative to establish a garden dedicated to dye-yielding

Plants is particularly noteworthy, as this is a relatively underrepresented resource area. The garden presently includes 41 commonly available species from the region, highlighting some of the most important dye sources in the country. It serves as an excellent platform for education, extension, and outreach.

An added strength of this garden is that many of the species included have multiple uses beyond dye extraction. For instance, turmeric is widely valued as a medicinal and culinary plant; Adhatoda for its medicinal properties; Punica (pomegranate) and Annona for their fruits; and Tectona (teak) for timber. This multifunctional value enhances the relevance and utility of the garden. To the best of available knowledge, this appears to be the first initiative of its kind in the state.

I extend my sincere congratulations to the Ahalia Group and the Green Ahalia team for establishing this unique garden and for bringing out this informative bulletin based on their experience. This publication will be of immense value to institutions and individuals interested in developing thematic gardens, as well as to those engaged in research biodiversity conservation, and sustainable utilisation. It also has the potential to serve as an important source of germplasm for propagation.

I am confident that this effort will inspire further research and contribute meaningfully to the field of natural dyes.



Dr. U. M. Chandrashekara



Message

Environmental conservation remains a core priority for the Ahalia Group, which has consistently explored innovative approaches in renewable energy and water harvesting. A key area of focus has been plantation development and biodiversity conservation, aimed at creating a healthier and more sustainable habitat.

Green Ahalia has been entrusted with the responsibility of greening the campus, and the team has executed this mission with commendable dedication and precision. Their systematic efforts have led to remarkable progress through the establishment of thematic gardens and the development of cultivation models. In addition to creating over 50 distinct garden themes, they have also established germplasm banks, conservatories, and various cultivation systems, including the farming of important medicinal plants.

I am pleased to note that, continuing their tradition, the team is bringing out yet another informative bulletin based on their experiences this time focusing on dye-yielding plants. Notably, two dedicated dye-yielding plant gardens have been developed within the campus, showcasing a diverse range of species from herbs to trees. These gardens serve as valuable models and are likely to inspire similar initiatives by other organizations.

I am confident that these efforts will make a meaningful contribution to biodiversity conservation and the sustainable use of plant resources.

As in previous years, Green Ahalia is also publishing its annual report and information bulletin this year, both of which reflect a significant improvement in quality. I sincerely appreciate the team's commitment and efforts in bringing out such valuable publications.



Dr. V. S. Gopal

Introduction

Green Ahalia has been establishing various thematic gardens to enhance the greenery and biodiversity of the campus, focusing on diversity, utilization, conservation, and community outreach. Among these themes is the *Dye-Yielding Plants Garden*, recognizing the importance of natural dyes as a major bioresource traditionally used in medicine, food, textiles, and crafts. Despite their long history, natural dyes have lost prominence due to the widespread use of synthetic dyes, which are popular for their low cost, convenience, and colour fastness but are often environmentally harmful and sometimes pose health risks. Increasing awareness of these issues has rekindled global interest in natural dyes, creating a growing demand for dye-yielding plants.

To promote awareness and preserve this valuable biodiversity, Green Ahalia established its first dye-yielding plant garden named *Chayakootu* in 2019 near the Heritage Museum, known for its traditional mural paintings that employ natural dyes. The success of this garden inspired the creation of another similar garden, *Varnabham*, in 2024 at the Star Forest Complex. Both gardens showcase a curated collection of plant species known for their dye properties, supported by well-designed signages for easy identification and public education.

The establishment of these gardens followed an extensive process: consulting literature on dye-yielding plants, identifying their distribution, surveying availability, and developing a detailed action plan. Each species was selected considering its habitat preferences and site suitability, ensuring proper spacing, care, and survival. Currently, the combined collection represents around 41 species, making it among the most comprehensive of its kind in the region.

While India's natural dye flora is estimated at around 450 species, focused studies usually highlight 30–60 prominent ones, with some comprehensive checklists such as Debajit Mahanta et al. (2005) documenting more. Through site-specific planning, Green Ahalia has successfully grown a representative selection adapted to local conditions. This initiative is likely among the first dedicated dye-yielding plant gardens in the district, and possibly in the state, serving both as a *living repository* and a *model* for replicating similar gardens elsewhere.

This compilation is a reflection of our journey from conception to creation and aims to share insights from our experience in developing the dye-yielding plant theme gardens *Chayakootu* and *Varnabham*. We welcome suggestions and information from readers to enrich our collection and knowledge base, as we continue to expand and refine this living tribute to India's natural dye heritage.

Team Green Ahalia

CONTENTS

1. Dye – definition	14
2. History of dyes	14
3. The Process	15
4. Enumeration	17
5. Phenology	38
6. Growth data	40
7. Conclusion	42
8. Reference	46

Dye – definition

Dyes are coloured substances that are soluble and bind to a substrate to impart a colour. The dye molecules are small enough to enter the pores of the material in which they impart the colour

History of dyes

Up to the middle of nineteenth century, the raw materials used for textiles were obtained from natural sources like from the sources like vegetables, animal and mineral. In 1856 a British Chemist named William Henry Perkin, produced a brilliant mauve dyes from coal tar which was the first synthetic dye. This led to an understanding of the chemistry of dyes and a number of synthetic dyes were developed with the result that by the end of the nineteenth century, the natural dyes were almost completely replaced by synthetic dyes.

Types of Dye

Natural dye: These dyes are obtained from natural sources like plants, animals, and minerals from nature. These have the advantage of time-tested proof and ecofriendly.

Synthetic dye: Synthetic dyes are artificially made by man through Chemical and industrial process which are economical and easy to apply and long lasting. However they may have some pollution possibilities.

Natural dye in community

These natural dyes were used by ancient people to dye fabrics, decoration and even used as source of colour to create beautiful paintings. Natural dyes were not only used for their beauty but also for their medicinal and symbolic properties. Even today, natural dyes are important in our daily lives. They are eco-friendly, biodegradable and non-toxic, making them a safer alternative to harmful chemical dyes. Beyond dyeing textiles, food, and crafts, many dye yielding plants also provide medicinal benefits, nutrition and cultural significance. By exploring these plants, we reconnect with a sustainable and colourful tradition that has been part of human life for centuries.

Even in today's world of synthetic colours, natural dyes from plants are making a comeback because people are becoming more aware of their health and protection of the environment. Unlike chemical dyes, natural dyes are non-toxic, biodegradable, and eco-friendly, which makes them safer for both humans and the planet. Now a day's people are preferring colouring fabrics like cotton, silk and wool for eco-friendly clothing. Adding natural colours to candies, drinks and spices. When it comes to cosmetics and skin products, people are preferring eco-friendly, toxic free products for hair dyes, soaps and skincare. People are promoting painting, pottery and traditional crafts as a part of modern art and for the conservation of mother earth. Some plants provide both colour and medicinal benefits so people are going back to the Ayurvedic medicines, naturopathy and toxic free natural products usage.

The Process:

The *Varnabham* is a unique garden that needs meticulous planning and execution to ensure success in establishment of the garden. However, the process involved in setting up follows standard practices in horticulture and gardening.

- ❖ The first step obviously is preparing a lay out as per the objective, to be followed by procuring and pooling the shortlisted species and stocking them in the nursery.
- ❖ Next is site selection and preparation of land for the garden. The points to be cared are soil type, availability water, and light conditions and so on.
- ❖ After the site development a design/ lay out of the garden need to be prepared and pitting to be done accordingly.
- ❖ The pits should be worked with soil, manure and spacing. In these pits planting of saplings can be done as per the lay out. Which can have subthemes dispersed as per original need
- ❖ Inspection paths, hedges, garden features and landscape needs like waterbodies, streams, rockery etc.
- ❖ Irrigation facilities are an essential part of the garden for survival of the species. Weeding of the plots periodically need to be ensured for better health of the plants.
- ❖ Each plant should be provided with a self-explanatory label, signage and board.
- ❖ Further in the garden there could be chance of insect pest attack in few species periodically or sometimes diseases. Depending upon the severity one can manually remove the problem or could apply organic remediation.
- ❖ Finally Herbal gardens are not out of bound for visitors. They should be encouraged to try the plants liberally taking care not to destroy the plants and ensuring continuity.
- ❖ Ideally there should be a journal for the garden where data on growth and phenology and other aspects be recorded.

Enumeration

1. *Acacia catechu* Wild.

Common name: Khair, Kutch tree, Karingali

Family: Mimosaceae

Description: small to medium sized trees, thorny. Bark dark brown, rough.



Leaves bi- pinnate, with dark gland on rachis, leaflets very small. Flowers minute in spikes creamy or yellow. Pods blackish flat. Seeds shining brown flat, hard coated.

The tree yield catechu used in paan, yields gum, medicinal too.

Useful part for dye: Heartwood

Colour of dye: Red – Brown



2. *Adenanthera pavonina* L.

Common name: Manchadi,

Family: Fabaceae

Description: Middle sized trees with lanky branches. Bark light brown,



Leaves large bi-pinnate, opposite, Inflorescence spicate racemes, flowers creamy white or yellow. Fruits twisted pods with red seeds inside. Seeds hard bulged at middle.

The tree is ornamental, nitrogen fixing and medicinal

Useful part for dye: Wood

Colour of dye: Red

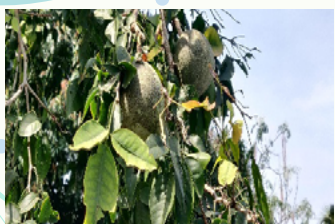


3. *Aegle marmelos* (L.) Correa

Common name: Bael, Villwam, Koovalam

Family: Rutaceae

Description: Deciduous tree with thorny branches. Leaves alternate,



trifoliate and aromatic. Flowers in clustered cymes, pale greenish-yellow or creamy white, fragrant. The fruits globose, woody hard shelled with sweet, aromatic pulp inside yellowish when mature. Seeds many.

Unripe fruits are used to treat diarrhoea and traditionally used for wound healing. Leaves and root extracts help in improving digestion and cure intestinal infections. The leaves are used in Ayurveda as a blood purifier.

Useful part for dye: Unripe Fruit

Colour of dye: Yellow to pale orange

4. *Alpinia calcarata* (Haw.) Roscoe

Common name: Snap ginger, Chittaratha, aratta, Kolinchi

Family: Zingiberaceae

Description: Rhizomatous perennial herbaceous tufted plants. Leaves elongate lanceolate with pointed tips. Inflorescence terminal spicate racemes flowers white striped lips orange. Fruits globose many seeded.



The herbs are medicinal.

Useful part for dye: flower

Colour of dye: Brown

5. *Anacardium occidentale* L.

Common name: Cashew, Kasuvandi, Cherum Pazham,

Family: Anacardiaceae

Description: Evergreen tree much branched with simple, alternate, usually towards branch tips. Leathery, oval-shaped leaves with smooth margins. Flowers small, pale green red tinged to pinkish in colour arranged as terminal panicles. Fruits are fleshy and juicy and of yellow/red colour. The true fruit is the kidney-shaped nut attached externally at the bottom of the false fruit. The cashew nut inside the hard shell.



Traditionally, the bark and leaf are used medicinally. The nuts are widely consumed as a nutritional food and widely traded.

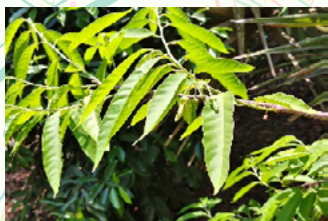
Useful part for dye: Nut shell extract

Colour of dye: Dark brown to black dye

6. *Annona reticulata* L.

Common name: Rama pazham, Aatha, Ram phal.

Family: Annonaceae.



Description: Small deciduous trees sparsely branched leaves alternate with recurved flowers having long petals and ovoid fruits with white sweet pulp and black shining seeds.

Useful part for dye: unripe fruits and leaves.

Colour of Dye: Natural black or blue

7. *Annona squamosa* L.

Common name: Seethapazham, Sharifa, Ata, Custard apple

Family: Annonaceae

Description: *Annona squamosa* is a small, laxly branched tree with reddish brown bark. Leaves are simple, alternate, lanceolate and aromatic. Stems of young branchlets zig zag in appearance. Flowers usually solitary or as small clusters, elongate drooping three angled, greenish-yellow. The fruits ovoid, fleshy and edible with scaly surface. The pulp is white, sweet and creamy with shiny black, hard seeds inside. The Leaves are medicinal and traditionally used to cure ulcers and wounds. Fruits are delicious and sold in markets.



Useful part for dye-yielding: Leaves and bark

Colour of dye: Yellowish-green & brown

8. *Bauhinia purpurea* L.

Common name: Kachnar, Mandharam,

Family: Fabaceae (Caesalpinaceae)

Description: Densely branched Middle sized trees with alternate bilobed leaves. Flowers large showy in terminal racemes pink or pinkish red. Fruits drooping pods with many flat brown seeds.



The tree is very ornamental and medicinal too.

Useful part for dye: Flowers.

Colour of dye: Purple, violet Pink.

9. *Bixa orellana* L.

Common name: Lipstick Tree, Arnato, Sindoor, Kurangu Manjal.

Family: Bixaceae

Description: Small evergreen tree with simple with dense foliage, Leaves alternate broad and heart-shaped. The flowers in panicles at branch tips usually pink but white can also seen. Stamens numerous prominent. Fruits are heart-shaped stout capsules densely prickly, usually reddish-brown with numerous red small, triangular seeds. Seeds are densely covered with red dust imparting colour even when touched.



Useful part for dye: Seeds

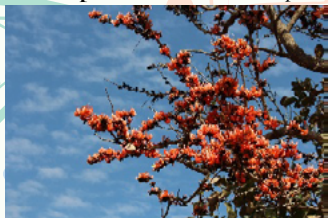
Colour of dye: Orange to reddish-orange

10. *Butea monosperma* (Lam.) Taub.

Common name: Palashu, Flame of the Forest

Family: Fabaceae

Description: *Butea monosperma* is a medium sized tree found in tropical deciduous forests. The tree has leathery trifoliate leaves with profuse bloom. The flowers are bright orange-red arranged in dense clusters. Fruits are flat, pods containing a single seed at the distal end.



Seeds are flat, kidney-shaped, and brown in colour.

Useful part for dye-yielding: Flowers

Colour of dye: Orange to reddish-orange colour

11. *Caesalpinia sapan* (L.) Tod.

Common name: Pathimugam, Chappangam

Family: Fabaceae

Description: Tropical tree with rough bark and thorny trunk and branches. The leaves are bi pinnate compound and feathery with small leaflets. The tree produces bright yellow flowers in terminal panicles. Fruits flat, hard pod containing discoid brown seeds. The heartwood is reddish in colour.



The heartwood pieces and shrivels are boiled in water that is consumed commonly in Kerala to quench thirst.

Useful part for dye-yielding: Heartwood

Colour of dye: Red

12. *Cassia fistula* L.

Common name: Kani konna, Amaltas, Indian labournam, golden shower

Family: Fabaceae (Caesalpinaceae)

Description: Deciduous small trees laxly branched, leaves pinnate clustered at branch tips, alternate. Leaflets pale beneath, flowers very showy, bright yellow, profuse in drooping panicles while tree is leafless. Fruits drooping cylindric black.



Tree is medicinal

Useful part for dye: Bark, fruits

Colour of dye: Brown.

13. *Curcuma longa* L.

Common name: Turmeric, Manjal, Haldi

Family: Zingiberaceae



Description: Annual herbs, rhizomatus, leaves broad, flowers in spikes with prominent bracts, flowers creamy white to pinkish. Tuber horizontal yellow when cut. Highly traded medicinal plants

Useful part for dye: Rhizome

Colour of dye: Yellow.

14. *Eclipta prostrata* (L.) L.

Common name: Kayyunni, Bringharaj, False Daisy

Family: Asteraceae.



Description: Prostrate annual herbs often suberect often in wet and marshy or moist areas. Leaves opposite obscurely dentate, Flowers white minute in small heads. Fruits black.

Useful part in dye: Leaves and whole plant.

Other uses: Used medicinally and as hair oil.

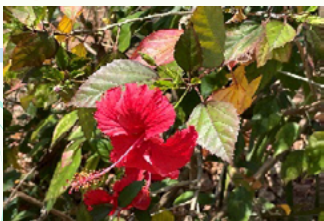
Colour of dye: Deep black or bluish black.

15. *Hibiscus rosa-sinensis* L

Common name: Chembarathi, China rose, Shoe flower, Gurhal, Jaba phool

Family: Malvaceae

Description: Shrubs Usually thick and bushy with greyish brown bark, alternate prominently petioled leaves that are broad ovate and dentate. Flowers solitary showy, usually red with prominent staminal tube, many stamens and 5 stigmas.



The plant is ornamental, medicinal and detergent.

Useful part for dye: Flowers

Colour of dye: Purple

16. *Impatiens balsamina* L.

Common name: Garden balsam, Gul Mehandi, Kasithumba

Family: Balsaminaceae



Description: annual herbs upto 1 mtr high, stout and soft stem, leave spirally arrange, elongate elliptic, dentate, flowers axillary, clusters, showy pink, red or white. Prominently spurred. Fruits a dehiscent capsule, seeds many black.

Very ornamental herb, It is also used in traditional medicine

Useful part for dye: Flowers and leaves

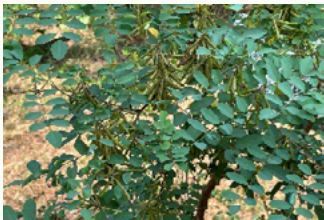
Colour of dye: Red, brown Orange

17. *Indigofera tinctoria* L.

Common name: Indigo, Neelamari, Amari

Family: Fabaceae

Description: Erect shrubs 1 to 2m high, much branched. Branches slender archig. Leaves pinnate with small leaflets. Inflorescence axillary erect racemes. Flowers pink or red Papilionaceous, standard petal broader. Fruits deflexed linear pods brown when ripe. Seeds blackish.



Medicinal shrub cultivated as crop

Useful part for dye: Leaved, whole plant

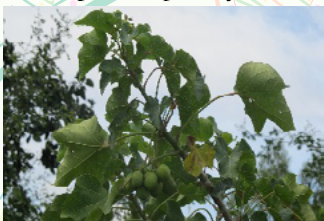
Colour of dye: Blue, Indigo

18. *Jatropha curcas* L.

Common name: Kotta Kadalavanakku, Physic Nut, Purging Nut, or Barbados Nut.

Family: Euphorbiaceae.

Description: Sparsely branched tall shrubs with thick branches, alternate lobed palmate leaves with colourless latex. Flowers unisexual, on stout peduncles greenish yellow, Fruits obscurely trigonous green turning yellow at maturity, seeds 3 large black.



Useful part for dye: Leaves

Other use: Seeds are used to extract oil.

Colour of dye: Brown

19. *Justicia adhatoda* L.

Common name: Adalodakam, Malabar nut, Vasa, Vasaka.

Family: Acanthaceae

Description: shrubs with swollen nodes, leave green lanceolate with pointed tips. Inflorescence axillary spike-like racemes, with prominent bracts and bracteoles. Flowers are white, bi-lipped and profuse.



Medicinal shrub.

Useful part for dye: leaves

Colour of dye: Yellow green.

20. *Kaempferia galanga* L.

Common name: Kacholam, Poolankizhangu

Family: Zingiberaceae



Description: Annual tuberous herbs with rosetted leaves. Flowers single showy white with pink mark, pinkish.

Medicinal herbs

Useful part for dye: Rhizome

Colour of dye: Brown.

21. *Kaempferia rotunda* L.

Common name: Peacock ginger, Chengazhineerkizhangu, Bhmi champa

Family: Zingiberaceae

Description: Rhizomatous stemless herbs with pseudostem, leaves erect with male purple marking. Flowers when leafless clustered. Flowers are bluish or pinkish showy few petals white, tubers on long stalks swollen.



The herbs are medicinal too

Useful part for dye: Rhizome

Colour of dye: Red

22. *Lawsonia inermis* L.

Common name: Henna, Mylanchi, Mehendi, Goranti

Family: Lythraceae

Description: Small tropical tree or Shrubby plant with small thorny branches. Leaves opposite small, smooth, and ellipsoid-shaped. Flowers small creamy white fragrant in terminal panicle clusters. Fruits small brown capsules.



The plant is best known for its leaves, which are used to make henna for colouring hair, skin and nails.

Useful part for dye: Leaves

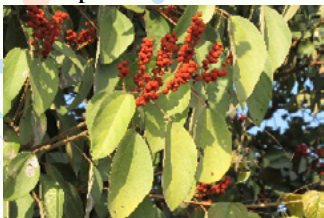
Colour of dye: Reddish-brown

23. *Mallotus philippensis* Muell. Arg.

Common name: Sindhur. Kurnagu Manjal

Family: Euphorbiaceae

Description: Middle sized deciduous trees with compact crown. Leaves 3 nered from base, grey beneath long petiole. Inflorescence racemes, Flowers yellow, fruits trigonous grey. Fruits mature with red covering of dust capsule, seeds black.



The tree is medicinal too.

Useful part for dye: Fruit.

Colour of dye: Orange.

24. *Morinda citrifolia* L.

Common name: Noni

Family: Rubiaceae

Description: *Morinda citrifolia* is small tree with smooth, greyish bark and a shallow root system. Leaves clustered at the branch apex, opposite large, elliptic, dark green and glossy. The flowers are small, white in colour, tubular shaped flowers fragrant arranged in globose heads. Fruits are syncarpous, ovoid, green turning yellowish-white when mature with a strong characteristic odour. Seeds numerous, triangular brown.



Useful part for dye-yielding: Roots

Other uses: Medicinal, Fruits edible

Colour of dye: Red to reddish-brown colour.

25. *Nyctanthes arbortristis* L.

Common name: Pavizha malli, Night jasmine, Parijatham, Harsingar

Family: Oleaceae

Description: Small deciduous tree with opposite, elliptic, rough and hairy leaves with slightly toothed margins. Flowers are fragrant, white with a bright orange corolla tube that bloom at night and fall by morning. This gives the peculiar name 'Night Jasmine'. Fruits are flat, heart-shaped capsule with one seed.



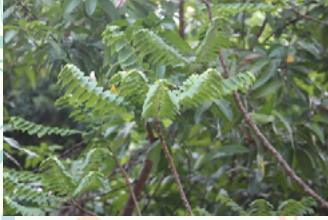
Useful part for dye-yielding: Orange corolla tube of flowers

Colour of dye: Yellow – orange

26. *Phyllanthus acidus* (L.) Skeels

Common name: Ari Nelli, Star Goose berry

Family: Phyllanthaceae



Description: Small trees, laxly branched. Leaves on very thin branched that looks like leaves alternate. Flowers minute in slender spiked racemes. Fruits globose angled fleshy, angled. Sour.

Useful part for dye: Leaves.

Colour of dye: Brown.

27. *Phyllanthus emblica* L.

Common name: Nelli, Amla. Gooseberry

Family: Euphorbiaceae

Description: A medium-sized deciduous laxly branched tree with small, narrow, and closely arranged leaves along the branches. The flowers are small and greenish-yellow and unisexual. The fruit is round, shining light green and has young ones slightly bitters mature ones has sour taste. The hard fruits are obscurely trigonous hard covered. Seeds black.



The amla fruits are natural source of Vitamin C and boosts immunity and acts as a powerful antioxidant. The fruits are consumed as raw, cooked, pickled or made into different sweets.

Useful part for dye: Fruits and Bark

Colour of dye: Yellow, light brown

28. *Plumbago indica* L.

Common: Chittrak, Indian leadwort, Chethi Koduveli,

Family: Plumbaginaceae

Description: Perennial Shrubs. Much branched. Leaves alternate ovoid, with wavy margin. Flowers in long spike like racemes, red, tubular with spreading limbs. Calyx densely glandular. Fruits brownish black.



A highly medicinal shrub. Ornamental too. (Photo credit Dr. Sujanapal)

Useful part for dye: Roots

Colour of dye: Orange.

29. *Pterocarpus marsupium* Roxb.

Common name: Indian Keno, Venga.

Family: Fabaceae

Description: Large trees with fissured bark, leaves pinnate, leaflets 5 – 7, ovate oblong. Flowers in panicles yellow, fruits single seeded pods, winged.



The tree is an important timber, medicinal.

Useful part for dye: Bark.

Colour of dye: Brown.

30. *Punica granatum* L.

Common name: Anar, Mathalam, Pomegranate

Family: Punicaceae (Lythraceae)

Description: Shrubs or small trees. Branchlets thorny. Leaves opposite or subopposite elongate oblong, flowers attractive red with five to several petals. Fruits ovoid with hard rind reddish, or pinkish pulpy embedded with seeds. Seeds coated with sweet pulp.



Ornamental and fruit tree, Medicinal.

Useful part for dye: Flowers and fruit rind

Colour of dye: Yellowish brown, light red.

31. *Senna auriculata* (L.) Roxb. = *Cassia auriculata* L

Common name: Avaaram, Tanners Cassia, Ponnavaara,

Family: Fabaceae, sub family: Caesalpiniaceae



Description: Branched shrubs leaves prominently stipuled, pinnately compound. Flowers bright yellow showy in racemes at upper axils appearing like terminal panicles. Fruits flat dark brown pods with 15 to 20 flat seeds.

Useful part for dye: Flowers

Colour of dye: Yellow.

32. *Strychnos nux-vomica*. L.

Common name: Kanjiram, Kuchala, Poison nut, Snake wood.

Family: Loganiaceae

Description: Middle sized trees, with compact crown and dense foliage.



Bark dark grey. Leaves opposite three nerved from base. Dark shining green above. Inflorescence axillary, peduncled clusters, flowers tubular greenish. Fruits with hard rind yellow when ripe, fleshy

inside with discoid seeds which are shining silvery grey.

The tree is known for its medicinal properties. Homoeopathic medicine nux vomica is popular.

Useful part for dye: Seeds

Colour of dye: Brown -black

33. *Syzygium cumini* (L.) Skeels

Common name: Njaval, Jamun, Malabar Plum

Family: Myrtaceae

Description: Large, evergreen tree, bark pale grey with opposite, simple, leathery aromatic leaves, Flowers in stout Compound Cymes, creamy yellow, Stamens prominent. Fruits berry in clusters, deep purple to black when ripe, juicy and with single big seed.



Fruits improves digestion and blood purification. Seeds, pulp, and juice contain compounds that improve insulin sensitivity, consumption of fruits and seeds help to reduce blood sugar levels.

Useful part for dye-yielding: Fruit

Colour of dye: Purple to violet

34. *Tectona grandis* L.f.

Common name: Teak

Family: Lamiaceae



Description: Large deciduous tree, buttressed, bark greyish scaly with simple, opposite, leaves. The leaves are rough hairy beneath. Flowers in large terminal panicles on branches. Small, white, with spreading petals, fragrant. The fruits

accrescent small, globose, hard drupe covered with stiff hairs. Enclosed in a papery covering.

The teak trees are mainly preferred for their durable and high quality timber, used for making furniture, shipbuilding, and construction. Wood is rich in natural oils therefore teak resists pest attacks and decay. Its leaves are also used for preparation of traditional medicines and dyeing purposes.

Useful part for dye: Leaves

Colour of dye: Yellow to brown shades

35. *Terminalia arjuna* (Roxb.) Wight & Arn.

Common name: Arjun tree, Neermaruthu

Family: Combretaceae

Description: Large, deciduous tree with thick buttressed trunk having



smooth, greenish grey bark peeling off in large flakes. Leaves simple, opposite, oblong with a glossy upper surface and dentate margin. Flowers small, creamy greenish in colour arranged in terminal

spikes. Fruits are drupe with wing like ridges. Traditionally the plant are widely used to treat heart diseases.

Useful part: Bark

Colour of dye: Reddish-brown dye

36. *Terminalia bellirica* (Roxb.) Gaertn.

Common name: Thanni, Behera.

Family: Combretaceae



Description: Tall deciduous trees. Leaves clustered at branch tips, broad elliptic. Flowers creamy yellowish minute in spike like inflorescence. Fruits oval brownish.

An important medicinal tree. One of the ingredient of Triphala.

Useful part for dye: Fruit.

Colour of dye: Blue.

37. *Terminalia chebula* Retz.

Common name: Kaduka, Harad, Haritaki, chebulic Myrobalan.

Family: Combretaceae



Description: Middle sized deciduous trees with opposite leaves and terminal panicle spicate inflorescence with pale yellow to dull white flowers. Fruits spindle shaped angular hard fruits brownish green when ripe.

The fruits are medicinal too.

Useful part for dye: Fruits

Colour of dye: Light yellow and buff to greenish-grey and olive

38. *Thespesia populnea* Soland ex Correa

Common name: Poovarsu, Indian Tulip tree

Family: Malvaceae



Description: Medium sized trees with dense crown, Leave thick heart shaped. Flowers large, bright yellow with maroon blotches at base, turning pink. Fruits globose capsules.

The tree is often planted in parks and avenue for its ornamental value

Useful part for dye: Bark, wood, leaves and flowers

Colour of dye: Orange, yellow, Brown, green.

39. *Woodfordia fruticosa* (L.) Kurz

Common name: Thathiri, Fire Flame Bush

Family: Lythraceae

Description: *Woodfordia fruticosa* is a deciduous small tree or shrub with profuse branching. Branches usually arching downwards. Leaves opposite on slender branches without visible petioles, elongate lanceolate with cordate base. Juvenile leaves red tinged silky wooly. Flowers tubular in axillary cymose clusters, bright red with protruding stamens and style. Fruits dry capsules.



It is used medicinally in ayurveda. Traditionally the flowers are traded in local markets. The plant is also often planted as garden plant.

Useful part for dye-yielding: Flower

Colour of dye: Red.

40. *Wrightia tinctoria* R. Br.

Common name: Pala, Dhantha pala.

Family: Apocyanaceae



Description: Middle sized trees. Densely branched slender branches bark whitish grey. Leaves opposite shining green spreading. Flowers white in cymose axillary inflorescence. Fruits slender drooping elongate. Seeds black with comose hairy at tip.

The tree is medicinal.

Useful part for dye: Leaves.

Colour of dye: Blue.

41. *Zizipus jujuba* Mill.

Common name: Bher, Elantha pazham,

Family: Rhamnaceae.

Description: Usually small thorny trees with oval crown and lanky branches. Leaves alternate crenate, dark green above, flowers in axillary cymose clusters, yellowish, creamy. Small. Fruits red when ripe globose with a hard store inside pulp sweet and sour. Seed hard globose.



Useful part for dye: fruits

Colour of dye: Red – pink

Phenology

Phenology plays significant role in crop management and resource pooling. An understanding of the phenophases can help plan the calendar of operations for better management of the plant resources. It will also help us in getting the propagation material and raw materials for optimising the output. We have documented the record of flowering fruiting of individual species in our conditions. As far as possible the leaf shedding and flushing could also be noted. The table below provides available date on the matter.

Phenological information: VARNABHAM

Sl.No	Scientific Name	Flowering and Fruiting
9.	<i>Acacia catechu</i>	March - September
10.	<i>Adenanthera pavonina</i>	March - August
11.	<i>Adhatoda zeylanica</i>	Throughout the Year
12.	<i>Aegle marmelos</i>	March - October
13.	<i>Alpinia calcarata</i>	September - April
14.	<i>Anacardium occidentale</i>	November - April
15.	<i>Annona reticulata</i>	May - January
16.	<i>Annona squamosa</i>	June - October
17.	<i>Bauhinia purpurea</i>	September - December
18.	<i>Bixa orellana</i>	August - February
19.	<i>Butea monosperma</i>	March - April
20.	<i>Caesalpinia sappan</i>	August - December
21.	<i>Cassia fistula</i>	February - September
22.	<i>Curcuma longa</i>	September - October
23.	<i>Eclipta prostrata</i>	Throughout the year
24.	<i>Emblica officinalis</i>	July - February
25.	<i>Hibiscus rosa sinensis</i>	Throughout the Year
26.	<i>Impatiens balsamina</i>	March - October
27.	<i>Indigofera tinctoria</i>	August - December
28.	<i>Jatropha curcas</i>	May - August
29.	<i>Kaempferia galanga</i>	June - July
30.	<i>Kaempferia rotunda</i>	March - May
31.	<i>Lawsonia inermis</i>	December - May
32.	<i>Mallotus philippensis</i>	October - March
33.	<i>Morinda citrifolia</i>	January - November

34.	<i>Nyctanthus arbortri-stis</i>	September - April
35.	<i>Phyllanthus acidus</i>	Throughout the year
36.	<i>Plumbago indica</i>	September - March
37.	<i>Pterocarpus marsupium</i>	September - October
38.	<i>Punica granatum</i>	Throughout the year
39.	<i>Senna auriculata</i>	Throughout the year
40.	<i>Strychnos nux-vomica</i>	March - December
41.	<i>Syzigium cumini</i>	December - April
42.	<i>Tectona grandis</i>	February - November
43.	<i>Terminalia arjuna</i>	November - June
44.	<i>Terminalia bellirica</i>	December - January
45.	<i>Terminalia chebula</i>	February - August
46.	<i>Thespesia populnea</i>	March - June
47.	<i>Woodfordia fruticosa</i>	January - April
48.	<i>Wrightia tinctoria</i>	February - November
49.	<i>Ziziphus mauritiana</i>	February - April

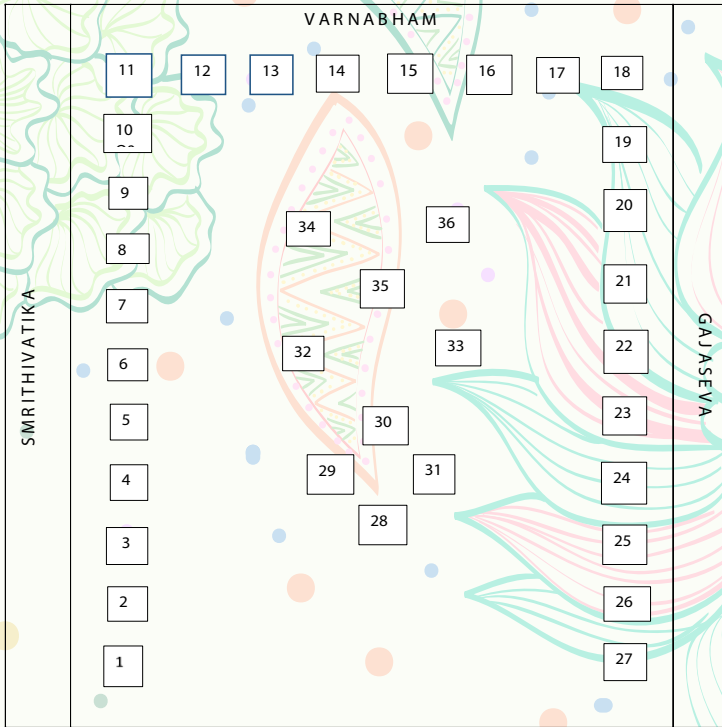
GROWTH DATA- 2025

S L . No.	Botanical Name	Common Name	Family	Height	Girth
1	<i>Butea monosperma</i>	Plashu	Fabaceae	250	10
2	<i>Morinda citrifolia</i>	Noni/Manjapavatta	Rubiaceae	48	-
3	<i>Nyctanthus arbortristis</i>	Pavizhamalli	Nyctanthaceae	280	15
4	<i>Annona squamosa</i>	Seethapazham	Annonaceae	260	10
5	<i>Woodfordia fruticosa</i>	Thathiri	Lytheraceae	310	10
6	<i>Caesalpinia sapan</i>	Chappangam	Fabaceae	620	21
7	<i>Lawsonia inermis</i>	Henna	Lytheraceae	280	-
8	<i>Phyllanthus emblica</i>	Nelli	Phyllanthaceae	330	17

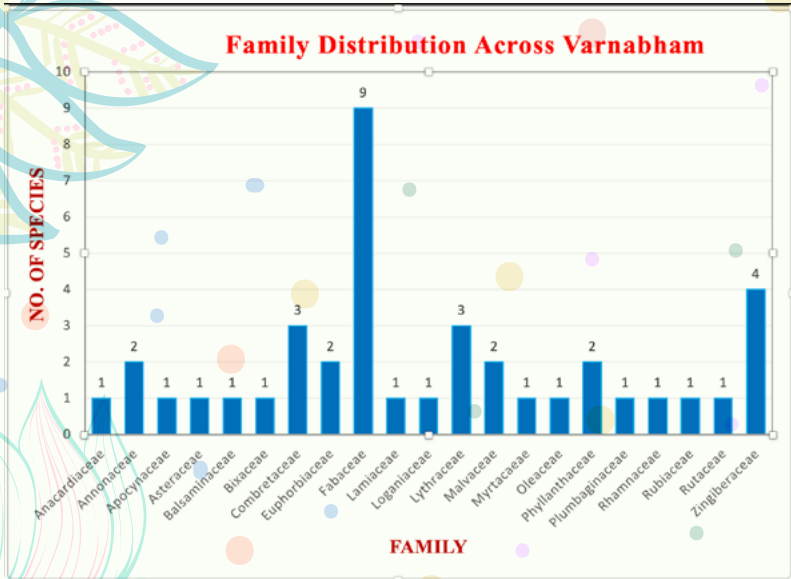
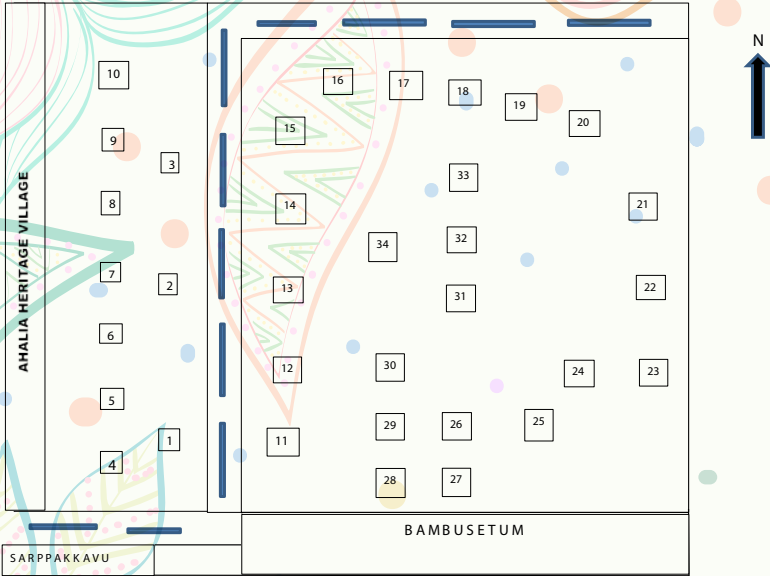
9	<i>Bixa orellana</i>	Kumkumapoo chedi	Bixaceae	380	24
9	<i>Tectona grandis</i>	Theku	Lytheraceae	230	-
10	<i>Aegle marmelos</i>	Koovalam	Rutaceae	350	19
11	<i>Syzygium cumini</i>	Njaval	Myrtaceae	360	30
12	<i>Anacardium occidentale</i>	Kashumaavu	Anacardaceae	390	20
13	<i>Terminalia arjuna</i>	Neermaruthu	Combretaceae	520	39
14	<i>Strychnos nux-vomica</i>	Kanjiram	Loganiaceae	230	9
15	<i>Adenanthera pavonina</i>	Manchadi	Fabaceae	510	19
16	<i>Zizipus jujuba</i>	Elantha	Rhamnaceae	-	-
17	<i>Acacia catechu</i>	Karingali	Fabaceae	320	19
18	<i>Thespesia populnea</i>	Poovarashu	Malvaceae	330	21
19	<i>Pterocarpus marsupium</i>	Venga	Fabaceae	450	27
20	<i>Terminalia bellirica</i>	Thannikka	Combretaceae	310	19
21	<i>Mallotus philippensis</i>	Chenkolli	Spurges	-	-
22	<i>Bauhinia purpurea</i>	Mandharam	Fabaceae	300	22
23	<i>Wrightia tinctoria</i>	Dhantapala	Apocynaceae	340	16
24	<i>Phyllanthus acidus</i>	Ari nelli	Phyllanthaceae	410	14
25	<i>Cassia fistula</i>	Kani konna	Fabaceae	130	-
26	<i>Curcuma longa</i>	Manjal	Zingiberaceae	-	-
27	<i>Kaemferia galanga</i>	Kacholam	Zingiberaceae	-	-
28	<i>Alpinia calcarata</i>	Chittaratha	Zingiberaceae	180	-
29	<i>Kaempferia rotunda</i>	Chengazhineer kizhangu	Zingiberaceae	-	-
30	<i>Justicia adhatoda</i>	Adalodakam	Acanthaceae	120	-
31	<i>Hibiscus rosa-sinensis</i>	Chembarathi	Malvaceae	300	10
32	<i>Impatiens balsamina</i>	Kashi thumba	Balsaminaceae	30	-
33	<i>Plumbago indica</i>	Chethikoduveli	Pumbaginaceae	100	-
34	<i>Indigofera tinctoria</i>	Neelayamari	Fabaceae	320	9
35	<i>Punica granatum</i>	Mathalam	Lytheraceae	120	-

Conclusion

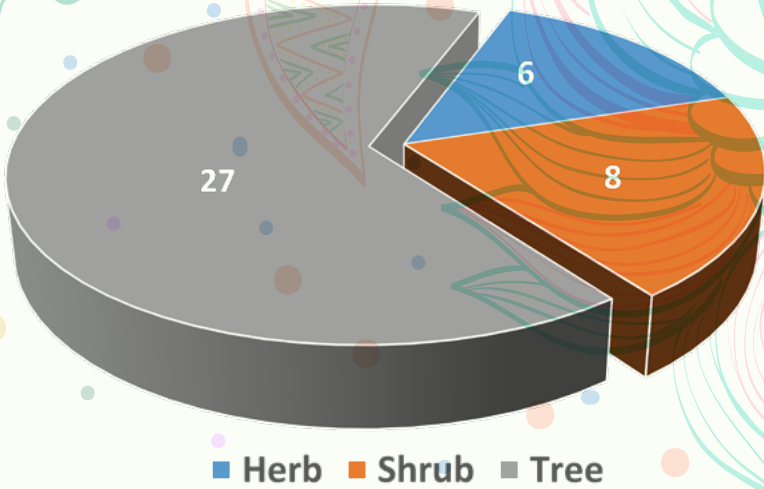
The dye yielding plants gardens at Ahalia campus are unique centres of knowledge dispensing. They offer complete life composition and aggregate of the specimens of natural dye yielding plants. Our collections are limited primarily because of the agroclimatic conditions prevailing over here. However we have tried our best to assemble the maximum possible species. There can be few more to be introduced. Thus we need to do more research into the ecology of such species and involve more collaborators to enlarge the scope. We find several species are multipurpose and are valuable to mankind. A deeper understanding of such utility will be rewarding. Researches into the productivity, biochemical properties and chemical screening will be valuable as a resource. This garden can be a centre for education and research for students in life science, organic chemistry, textile and handicraft industry etc. Replication of such gardens elsewhere will be an investment for future.



AHALIA CHILDRENS VILLAGE



Habitwise Distribution of PLants



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