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# Natural Colourants Revising Factory Sources

**Raji M K[1], Abida K S[2], Aleena Mary Joy[3], Alfiya Jalal[4], Ameena Shamsudeen[5]**

[1,2,3,4,5]Chemists College of Pharmaceutical Sciences and Research, Varikoli, Ernakulam, Kerala, India
Kerala University of Health Sciences, Thrissur, Kerala, India

**ABSTRACT**

Natural colourants include colors or colorings attained from natural sources like shops, creatures, minerals, microbes. etc. This study provides a terse overview about the natural colors and it's sources. A detailed review was done for the factory color and it's sources with diagrammatic representation. Plant colors are natural composites responsible for the different colors set up in leaves, flowers, fruits, and roots. These colors, including chlorophyll, carotenoids, anthocyanins, and betalains, serve pivotal places in factory physiology, similar as photosynthesis, pollination, and protection against environmental stress. deduced from colorful botanical sources, they've been extensively employed in diligence like food, fabrics, and cosmetics as natural colorings. With growing enterprises over synthetic colorings and their environmental impact, factory-grounded colors are gaining attention for their sustainability, safety, and bioactive parcels. This composition explores the different types of factory colors, their natural sources, and their operations, pressing their significance in both nature and mortal use.

**Keywords:** Colorants, Natural colours, Carotenoids, Anthocyanins, Factory sources

## INTRODUCTION

Natural colourants, also known as natural colorings or colors, are substances deduced from natural sources, similar as shops, creatures, and minerals, that are used to conduct color to accoutrements. These colourants have been used by humans for thousands of times, preexisting the synthetic colorings that became popular in the 19th and 20th centuries. With growing enterprises over the environmental impact of synthetic chemicals, as well as health and safety issues associated with some synthetic colorings, there has been a rejuvenescence of interest in natural colourants. They're decreasingly being used in diligence similar as fabrics, food, cosmetics, and indeed in medicinals as safer, more eco-friendly druthers.

Natural colorings are colour conducting material deduced from nature without chemical processing or revision. Natural colourants come from natural sources and are generally safe for the terrain and do n't pose any issues. shops, bacteria, and other natural sources can be used to produce natural colors. The maturity of natural colourants are deduced from sustainable sources. Plant rudiments like stems, dinghy, leaves, fruits, flowers, and seeds, among others, are used to make natural colourants.

Natural colorings aren't only used on colouring fabrics but also on colouring food, cosmetics, wood, leather, plastics and medicinals. currently herbal powders are gaining fashionability because natural cosmetics are safe to use. Synthetic coloring agents may beget antipathetic responses and are set up to be carcinogenic. The coloring matter from natural sources similar as beetroot, grapes, blueberry, papaya, tomato, strawberry, watermelon, pomegranate, etc is salutary over synthetic colorings in the medication

of powders. Natural constituents similar as beeswax, carnauba wax, white soft paraffin, vanilla substance, castor oil painting, and vitamin E formulate herbal camo. Natural colorings are attained from factory corridor similar as fruits, flowers, stems, dinghy, leaves, seeds, etc. Henna, Teak, Annatto, Carrot, Red Cabbage, Turmeric, etc. are used as natural sources of color. The advantages of natural colorings include non-toxic, no side goods, non-carcinogenic, eco-friendly, causes reduced pollution, and it has health benefits similar as anti-cancer, anti-oxidant, vitamin A rich, and so on.

## SOURCES OF NATURAL COLOURANTS

### A. MICROBIAL COLORS

Microbes are the major source of producing natural- multicolored colors (red, green, or unheroic). Microbial colors are stable to heat and light. Microorganisms (algae, bacteria, fungi) are known as an implicit source for bio-pigment products due to its advantages over shops. Microorganisms are generally set up in the terrain and they grown in a suitable terrain to gain natural- multicolored colors. These colors produced have parcels like anticancer parcels, etc. colors like zeaxanthin, astaxanthin, canthaxanthin, β-carotene, etc are produced by a variety of microorganisms. The color, beta- carotene is attained from some microalgae and cyanobacteria.

- **Zeaxanthin:** Zeaxanthin is an antioxidant carotenoid set up in the retina of the eye, guarding against dangerous blue light and oxidative stress. It's pivotal for eye health, precluding age- related macular degeneration and cataracts by filtering out damaging light and reducing retinal damage. Generally, set up in lush flora, sludge, egg thralldom, and various fruits, zeaxanthin is essential for maintaining good vision and overall eye function. It also offers implicit benefits for skin health by guarding against UV damage. It's frequently combined with lutein to enhance its defensive goods.
- **β- carotene:** β- carotene is a factory- grounded provitamin A carotenoid that converts into vitamin A, essential for vision, vulnerable function, and skin health. It's a important antioxidant that protects cells from oxidative stress and damage from free revolutionaries. Known for its part in eye health, it supports the vulnerable system by promoting white blood cell product and has been studied for its eventuality in reducing habitual conditions, including cancers. still, inordinate input, especially through supplements, can have adverse goods, especially in smokers, where it may increase the threat of lung cancer.
- **Prodigiosin:** It's a red color produced by bacteria and fungi that has numerous implicit uses. It's being studied as a medicine, and has shown antibacterial, anti-algal, and anticancer parcels. Prodigiosin is a secondary metabolite produced by numerous strains of the bacterium Serratia marcescens. It's also produced by other Gram-negative bacteria, including Vibrio psychroerythrus and Hahella chejuensis. It can also be uprooted from some types of fungi.
- **Monascus purpureus:** It's a species of earth that's purplish-red in color. It's also known by the names ang- khak rice earth, sludge silage earth, sludge silage earth, and rice kernel abrasion. Monascus species produce useful secondary metabolite, Monascus colors (MPs). They're extensively used in food assiduity as a color intensifier, food complements and nitrite cover in the meat product. MPs are also reported to have the eventuality for remedial use and used as a color in ornamental and textile diligence.

### B. ANIMAL COLORS

Creatures produce colors. These colors are produced to cover the beast from bloodsuckers, occasionally

produced to attract their mates. illustration for beast color is melanin. Melanin is responsible for the color of the hair, skin, and fur of creatures. The blood of the nonentity Cochineal beetle, present in the prickly pear factory is responsible for the product of red colour. This color is used in powders.

- **Melanin:** Melanin is a natural color set up in numerous creatures, responsible for the achromatism of skin, hair, feathers, scales, and eyes. It protects cells from dangerous UV radiation, precluding DNA damage and skin cancers. Melanin also aids in disguise, lovemaking displays, and species identification. There are several types of melanin, with eumelanin producing black and brown colors and pheomelanin producing unheroic and red tinges. The distribution and attention of melanin in creatures greatly impact the diversity of colors and patterns, similar as zebra stripes and raspberry plumage. inheritable regulation of melanin product also influences adaption to surroundings, similar as heat regulation and environmental stress resistance.
- **Psittacofulvin:** Also nominated as psittacins, are responsible for the bright-red, orange, and unheroic colors specific to parrots. In parrots, psittacofulvins are synthesized by a polyketide synthase enzyme that's expressed in growing feathers. They correspond of direct polyenes terminated by an aldehyde group. There are five given psittacofulvin colors tetradecahexenal, hexadecaheptenal, octadecaoctenal and eicosanonenal, in addition to a fifth, presently-unidentified color set up in the feathers of scarlet macaws. various feathers with high situations of psittacofulvin repel feather- demeaning Bacillus licheniformis better than white bones.

## C. PLANT COLORS

Shops produce phytochemicals (secondary metabolites). These phytochemicals have medicinal property and are used in the pharmaceutical assiduity. The colors are produced in different corridor of the shops including stem, dinghy, leaves, and flowers. shops roughly produce composites and many composites are colored. Major factory colors are Anthocyanins, Carotenoids, Betalains, Flavones, Chlorophylls, Lycopene, etc.

- **Anthocyanins:** Anthocyanins, set up in colorful forms depending on the pH of a result, are responsible for achromatism in leaves, fruits, tubers, and flowers. They're present in blue grapes, blueberries, red cabbage, jamun, pearl, and grandiloquent sludge. They're extensively used as pH pointers and natural colorings in the food assiduity. At low pH it gives rise to red, pink and grandiloquent colors and as the pH increases it give rise to dark purple, blue and black colors. Anthocyanins also retain parcels similar as anticancer, antioxidant, anti-obesity, anti-inflammatory, and anti-diabetic.
- **Chlorophyll:** Chlorophyll, a vital element of skin, is rich in antioxidant and anti-inflammatory parcels, abetting in the form of damaged cells. It contains vitamins A, C, E, and K, all pivotal for a immature, radiant complexion. Chlorophyll can reduce the appearance of fine lines, dark spots, and wrinkles, frequently caused by sun damage. Magnesium, a crucial element in chlorophyll, helps in storing oxygen in skin cells, furnishing aliment and reducing inflammation and itching.
- **Carotenoids:** Carotenoids are lipid secondary metabolites responsible for colorful colors like orange, unheroic, and red. They're set up in over 700 types, including α- carotene, β- carotene, Astaxanthin, Zeaxanthin, Antheraxanthin, Violaxanthin, and Neoxanthin. They're also set up in vegetables and fruits like carrots, rubbish, and grains. Carotenoids are also responsible for the vitamin A content in some vegetables and fruits, and are used as salutary supplements. They retainanti-oxidant and free radical scavenging and destroying conditioning, making them potentially anticancer agents.
- **Betalain:** Betalain, a color containing betacyanins and betaxanthin, has a high antioxidant exertion,

ten times advanced than tocopherol and three times advanced than catechin. Betalains, particularly betacyanin, are pivotal for mortal health due to their antioxidant, anti-cancer, anti-inflammatory, hepatoprotective, anti-lipidemic, and antimicrobial parcels. In vitro, betalain can inhibit cervical ovarian and bladder cancer cells and mortal excrescence proliferation. Consumption of red beetroot reduces excrescence prevalence in colorful organs. Betalains are also used in food and cosmetics due to their natural color parcels, high solubility, and toxin.

- **Lycopene:** Lycopene is a fat-answerable color set up in fruits and vegetables, producing a bright red color. It's also present in microbes and is set up in red carrots, watermelons, tomatoes, papayas, asparagus, and parsley. Despite not enjoying Vitamin A exertion, lycopene has implicit goods on cardiovascular conditions and prostate cancer. Research is ongoing to determine the adverse goods of lycopene on mortal health.

### D. MINERAL COLORS

Mineral colorings come from essence oxides, essence mariners, and other inorganic composites. They're frequently used as colors in maquillages and fabrics. Mineral colorings are frequently used in greasepaint or demitasse form. They're uprooted from jewels and soils around the world. Different combinations of minerals produce vibrant colors. Mineral colorings are also used in fabrics.

- **Iron oxides:** Red colors that have been used in maquillages for thousands of times
- **Hydro silicates:** Green colors that contain iron, magnesium, aluminum, and potassium
- **Azurite:** A vibrant azure blue bobby carbonate mineral that's used as a color in maquillages
- **Essence carbonates:** White colors that include calcium carbonate, lead carbonate, and gypsum.

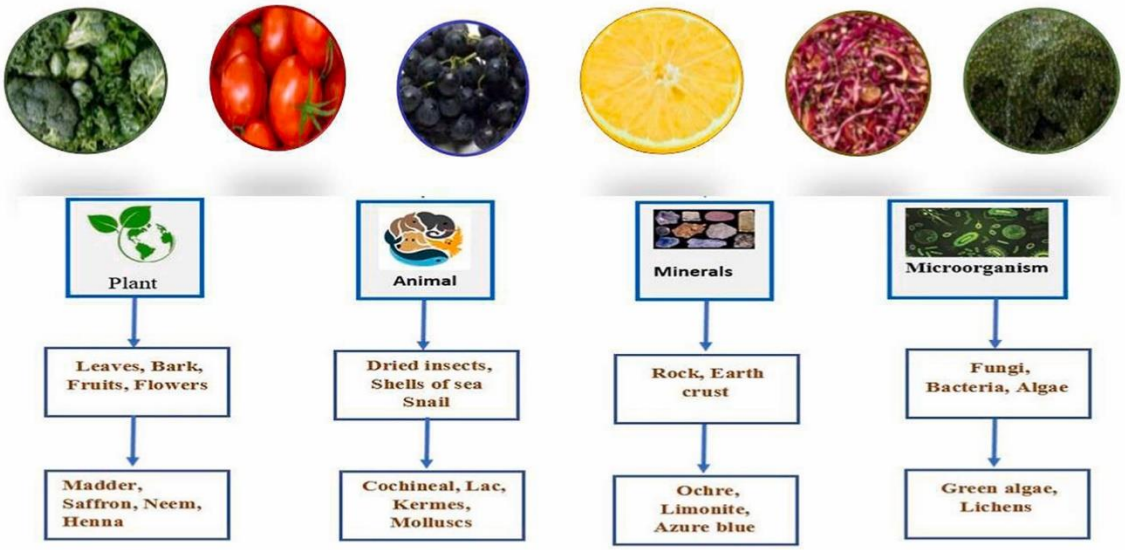


**Fig.1: Natural colourants & its sources**

## GENERALLY USED NATURAL COLOURS & ITS SOURCES

### 1. TURMERIC

Turmeric, also known as Indian saffron, is a spice made from Curcuma longa factory rhizomes. It has been used for thousands of times as a spice, drug, and color. Curcumin, a natural color, gives turmeric its unheroic tinge. About 5 of the unpredictable oil painting, resin, and unheroic colouring agents in turmeric are called curcuminoids. Curcumin makes up 50- 60 of the spice's chemical composition.

- **SYNONYM:** Curcuma, Curcuma aromatica, Curcuma domestica, Curcumae longa, Curcumin, Curcumine.
- **NATURAL SOURCE:** Turmeric is a product of Curcuma longa, a rhizomatous herbaceous imperishable factory belonging to the gusto family Zingiberaceae.
- **CHEMICAL CONSTITUENTS:** Three curcuminoids Curcumin, demethoxycurcumin, and bisdemethoxycurcumin, unpredictable canvases (tumerone, atlantone, and zingiberone), sugars, proteins, and resins.
- **COLOURING MATTER:** Curcumin (vibrant unheroic colour).
- **USES:** Acne, Psoriasis, Dull skin, Injuries, Scabies, Eczema, Treat dark lips, used to be paint hair, silk, and cotton, natural food color and seasoning.

**2. BEETROOT**

Beetroot is a popular natural color for water- grounded cosmetics, with betanin breaking down when exposed to light, heat, and oxygen. Mix beetroot greasepaint with glycerin to produce a vibrant pink or sanguine glycerite for mixes, gels, and mixers, but not oil painting macerations due to its water-answerable nature.

- SYNONYM: Beta vulgaris rubra, Beet.
- NATURAL SOURCE: Beetroot is a member of the Beta vulgaris, Chenopodiaceae family.
- CHEMICAL CONSTITUENTS: Betalains, Inorganic nitrates, Polyphenols, Flavonoids, Saponins, Minerals, Oxalic acid.
- COLOURING MATTER: Betalains (color red- violet betacyanins and unheroic betaxanthins).
- USES: Make lips doused, tinted, give indeed tone to lips, ameliorate skin pliantness,

**3. CARROT**

Carrot roots, particularly the roots of Dacus carota, are rich in carotenoids, which are essential colors set up in numerous shops. Beta- carotene is the predominant color in carrot roots, and soddened carrot root in oil painting, with an orange tinge, is generally used in organic skincare products. Carotenoids make up the maturity of naturally being oil painting-answerable colors, piecemeal from chlorophylls.

- SYNONYM: Daucus carota sativa, Cultivated carrot.
- NATURAL SOURCE: Carrot is a member of Daucus carota belonging to the family Apiaceae.
- CHEMICAL CONSTITUENTS: Minerals (calcium, phosphorus, potassium, magnesium, manganese, iron, and sodium), Vitamins (Vitamin C, D, E, K, B1, B6, and biotin), Organic acids (ascorbic acid, benzoic acid, hydroxycinnamic acid, and gallic acid), Sugars (sucrose, glucose, fructose, and sorbitol), Phytochemicals, Fiber, humidity.
- COLOURING MATTER: Carotenoids – Beta Carotene (bright orange colour).
- USES: Moisturize lips and help to get relieve of saturation, skin cheering, ameliorate skin tone and texture.

**4. TOMATO**

Lycopene, a vital nutrient set up in tomatoes, is set up in red fruits and vegetables like carrots, watermelons, and papayas. This color, undoable in water, is set up in tomato- grounded gravies and accounts for 80- 90 of the carotenoid content in red, ripe tomatoes. Beta- carotene, an isomer of lycopene, is set up in carrots' unheroic color.

- SYNONYM: Lycopersicon esculentum, Love apple, Tomato factory.
- NATIRAL SOURCE: The cultivated tomato is a member of the genus Solanum lycopersicum within the
- family Solanaceae.
  CHEMICAL CONSTITUENTS: Carotenoids (lycopene, beta- carotene, gamma- carotene), Phenolic composites, Vitamins (Vitamin C, A), Glycoalkaloids (tomatine), Minerals.
  COLOURING MATTER: Carotenoid- Lycopene (red colour).
- USES: cover from sun damage, moisturize, nourish, slip the lips, treat damaged skin cells.

**5. PAPAYA**

Papaya, a tropical fruit with high nutritive and medicinal value, is cultivated in South Mexico and Costa Rica, with an estimated periodic product of 6 million tonnes.

- SYNONYM: Carica posoposa, Carica carica, and Carica peltate.
- NATURAL SOURCE Papain is the dried and purified latex of the green fruits and leaves of Carica papaya L. belonging to the family Caricaceae.
- CHEMICAL CONSTITUENTS: Vitamins, Minerals, Organic acids, Phytochemicals, Papain Prunasin, Adipose acids and Sucrose.
- COLOURING MATTER: The colour of papaya fruit meat is determined largely by the presence of carotenoid colors. Red- dilate papaya fruit contain lycopene, whilst this color is absent from unheroic-fleshed fruit.
- USES: Moisturize, nourish and cover lips.

**6. GRAPES**

Grapes are evanescent woody vines from the Vitis genus, anon-climacteric fruit set up in clusters. civilization began around 8,000 times agone and has been used as mortal food for over a renaissance.

- SYNONYM: Berry, Vine Fruit.
- NATURAL SOURCE Grape is the flowering factory genus Vitis vinifera in the botanical family Vitaceae.
- CHEMICAL CONSTITUENTS: Phenolic acids, Flavonoids, Anthocyanins, Stilbenes, and Lipids.
- COLOURING MATTER: Anthocyanins (grandiloquent colour).
- USES: Ameliorate blood rotation in lips, antioxidant, anti-inflammatory.

**7. MULBERRY**

Mulberries are evanescent shops with toothed, occasionally lobed leaves arranged alternatively along stems. They can be monoecious or dioecious, with nanosecond flowers in tight catkin clusters.

- SYNONYM: Mulberry tree.
- NATURAL SOURCE: Mulberry is the rubric of a flowering factory of Morus spp. belonging to the Moraceae family.
- •CHEMICAL CONSTITUENTS: Protocatechuic acid, Caffeic acid, Gallic acid, Protocatechuic acid, Vanillic acid, p- coumaric acid, and Ferulic acid, Vitamins, Minerals.
- COLOURING MATTER: Anthocyanins (magenta colour).
- USES: Help smooth and soften lips, and remove blankness, give violent moisturization

**8. INDIAN BLACK BERRY**

Indian blackberry fruit, Jamun or Java pearl, is a rich source of vitamins C and A, antioxidants, and minerals, abetting digestion, impunity, blood sugar control, and heart health.

- SYNONYMS: Java pearl, Malabar pearl, Black pearl, Jambul, Jambufalam, Mahaphala, Naavar pazham.
- NATURAL SOURCE: The Indian Black Berry is a flowering factory that belongs to the rubric Syzygium cumini and Family Myrtaceae.
- CHEMICAL CONSTITUENTS: Phenolic composites, Organic acids, Phytochemicals, Adipose acids.
- COLOURING MATTER: Anthocyanins (This color gives blackberries their color and may help decelerate or help aging- related conditions).
- USES: Moisturizing, produces shade.

**9. DRAGON FRUIT**

Dragon fruit is a low- calorie tropical fruit with high fiber and antioxidants, suggesting a pear and kiwi taste. It can be eaten raw, paired with yogurt, or mixed into smoothies or salads.

- SYNONYM: Acanthocereus tetragonus. Pitahaya/ Pitaya.
- NATURAL SOURCE: Dragon Fruit is a climbing vine cactus species Selenicereus undatus of the family Cactaceae.
- CHEMICAL CONSTITUENTS: betacyanin, lycopene, vitamins (vitamin C substantially), salutary fiber, flavonoids, amino acids, phenolic acids, sugars and organic acids.
- COLOURING MATTER: Betacyanins (pink colour).
- USES: lip moisturizer, overcome dry skin, lip mite, skin balance.

**10. MANGO**

Mangoes, a tropical regenerating tree in the Anacardiaceae family, belong to the rubric Mangifera and have colorful medicinal parcels, according to Ayurveda, making them one of the most popular tropical fruits.

- SYNONYM: Mangifera indica.
- NATURAL SOURCE: Mangoes belong to rubric Mangifera indica which consists of tropical fruiting trees in the flowering factory family Anacardiaceae.
- CHEMICAL CONSTITUENTS: Carotenoids, Phenolic acids, Polyphenols, Flavonoids.
- COLOURING MATTER: Carotenoids (These substances give mangoes their unheroic colour).
- USES: Moisturizing, hydrate, soften, and cover lips.

**11. POMEGRANATE**

Pomegranate juice is primarily colored by water soluble colors called anthocyanins, including punicalagin, punicalin, gallagic, and ellagic acids, along with alkaloids like isopelletierine. The juice's red/ grandiloquent color is due to the presence of tannins, making punica granatum color and other natural colorings important antibacterial agents.

- SYNONYM: Punica granatum, Pomegranate tree.
- NATURAL SOURCE: Fruit- bearing evanescent shrub of Punica granatum in the family Lythraceae.
- CHEMICAL CONSTITUENTS: Water, Sugars, Pectin, Organic acid (Ascorbic acid, Citric acid, and Malic acid), Flavonoids, Anthocyanins.

- COLOURING MATTER: Anthocyanins (red colour).
- USES: Soften the lips, gives a delicate luster, ameliorate skin texture, remove wrinkles, and treat acne and pustules.

**12. BANANA**

Banana is a popular fruit due to its low price and high nutritive value. Consumed fresh or cooked, it's a rich source of carbohydrates, vitamins, particularly vitamin B, potassium, phosphorus, calcium, and magnesium, making it a precious addition to any diet.

- SYNONYM: Musa acuminata Colla, Musa balbisiana Colla, Musa paradisiaca L.
- NATURAL SOURCE: The banana is herbaceous flowering factory in the rubric Musa acuminata and the family Musaceae.
- CHEMICAL CONSTITUENTS: Minerals Carotenoids, Biogenic amine, Carbohydrates, Phenolic composites, Phytosterols, Amino acid, Resistant bounce.
- COLOURING MATTER: Red banana fruit contained carotenoid, anthocyanin, and flavonol colors. Red banana peel color was determined by some rutinoside derivations of anthocyanins. Lutein, α-carotene, and β- carotene were main carotenoids in banana fruit. Carotenoids are more important than flavonoids in furnishing unheroic color.
- USES: Moisturize, form and rotund lips.

**13. ROSE APPLE**

The Rose Apple, native to the East Indies and Malaya, was discovered in 1762 and is nearly related to the Guava. It's cultivated and naturalized in India, Southeast Asia, and the Pacific islets.

- SYNONYM: Wax apple, Plum apple, Rose apple, and Malabar catches, Plum rose.
- NATURAL SOURCE: Rose apples, scientifically called as Syzygium jambos belonging to the family Myrtaceae.
- CHEMICAL CONSTITUENTS: Phenolic composites, Flavonoids, Tannins, Terpenoids, Ellagitannins, Catechin, Phloroglucinols, Phenolic acids, and, vitamin C.
- COLOURING MATTER: Carotenoids The primary color responsible for the unheroic color of rose apples. Anthocyanins A admixture of carotenoids and anthocyanins produces orange colors.
- USES: Anti-aging, moisturizing, guarding against UV shafts, treating acne, soothing skin vexation, reducing greenishness.

**14. WATERMELON**

The fruit, deep red to pink with black seeds, can be eaten raw or pickled, with comestible rind after cuisine, and can also be used as a juice or mixed libation component.

- SYNONYM: Citrullus lanatus, Citrullus vulgaris.
- NATURAL SOURCE: The natural source of watermelon is the Citrullus lanatus factory, which is a flowering vine in the Cucurbitaceae family.
- CHEMICAL CONSTITUENTS: Carbohydrates, Phenol, Alkaloids, Amino acids, Phytosterols, Adipose acids, Cucurbitacins.
- COLOURING MATTER: Lycopene (A factory chemical that gives watermelon its red colour).
- USES: Hydration, exfoliation, reduces lip saturation.

**15. ANNATTO**

Annatto, a popular carotenoid source with norbixin and bixin, is a popular colourant used in colorful diligence, including culinary, fabrics, medicinals, and cosmetics. It's frequently set up in dairy products and can be used as a water-answerable excerpt, oil painting-answerable excerpt, or oil painting suspense. The pH affects the color.

- SYNONYM: Achiote, Achiotillo, Bija, Urucum, and Atsuete.
- NATURAL SOURCE: Annatto comes from the seeds of the Bixa orellana tree, which is part of the Bixaceae family.
- CHEMICAL CONSTITUENTS: Bixin and norbixin, Polyphenol composites, Terpenoids.
- COLOURING MATTER: Bixin and norbixin These carotenoids are the main factors of annatto's colour, which can range from red to unheroic.
- USES: Lip and impertinence shade, lip gel.

**16. HIBISCUS**

Anthocyanins, red colors set up in Hibiscus flowers, are generally used as colorings. Cyanidin-3-sophoroside is the primary chemical color set up in Hibiscus rosa- sinensis petals. Excerpts from Rosalis (Hibiscus sabdariffa), an indigenous species in West Africa, are also used, with cyanidin-3-sambubioside and delphinidin3sambubioside being the most current.

- SYNONYM: Jamaica sorrel, red sorrel, roselle, rozelle, sorrel.
- NATURAL SOURCE: Hibiscus is a flowering factory of Hibiscus rosa sinensis belongs to the Malvaceae family, also known as the mallow family.
- CHEMICAL CONSTITUENTS: Organic acids (citric acid, hibiscus acid, malic acid, hydroxycitric acid, and tartaric acids), Anthocyanins, Flavonoids, Tannins, Terpenoids, Vitamins, Alkaloids, Amino acids, Lipids, Sesquiterpene, Quinones, Naphthalene groups.
- COLOURING MATTER: Anthocyanins (colour from white to pink, red, blue, orange, peach, unheroic or grandiloquent).
- USES: Moisturizing, colorant,anti-inflammatory, antimicrobial.

**17. BUTTERFLY PEA**

Blue-multicolored butterfly pea petals are used in natural cosmetics and organic gel diminutives. They contain anthocyanins, p- coumaric acid, and ferulic acid, along with flavonoid substances like p- coumaric acid and ferulic acid. These petals also contain anthocyanins from delphinidin, an anthocyanidin type, which are used as coloring in the flowers.

- SYNONYM: Asian pigeonwings, Blue pea, Darwin pea.
- NATURAL SOURCE: Butterfly pea is a imperishable herbaceous factory of Clitoria ternatea from the Fabaceae family.
- CHEMICAL CONSTITUENTS: Flavonol glycosides, Anthocyanins, Flavones, Flavonols, Phenolic acids, and Cyclotides.
- COLOURING MATTER: Anthocyanins (red, orange, blue, grandiloquent, and pink colours).
- USES: Reduce greenishness, vexation, moisturizing and invigorating the skin.

**18. GULMOHAR FLOWER**

Gulmohar, a honey tree or cosmetic factory, is known for its beautiful flowers and medicinal parcels sim-

ilar as anti-diabetic, anti-bacterial, anti-diarrheal, hepatoprotective/ cytotoxic, anti-microbial, and anti-inflammatory parcels.

- SYNONYM: Flame tree, Flamboyant.
- NATURAL SOURCE: Gulmohar flower is the Delonix regia tree, a member of the bean family Fabaceae.
- CHEMICAL CONSTITUENTS: Alkaloids, Flavonoids, Proteins, Tannins, Carbohydrates, Phenols, Triterpenes and Steroids.
- COLOURING MATTER: Flavanoids (fiery red, pink, and orange colours).
- USES: Anti-bacterial, anti-inflammatory, anti-diabetic, mouth ulcers.

**19. HENNA**

Henna, a sanguine- orange color set up in water hyacinth flowers and leaves, has been used for centuries to color silk, hair, leather, mortal skin, hair, and fingernails, with the substance Lawsone, also known as hennotannic acid, playing a significant part in its achromatism.

- SYNONYM: Sanguine- orange, Sanguine- brown, Bepainted with henna, Russet.
- NATURAL SOURCE: The henna factory, Lawsonia inermis, is a member of the Lythraceae family.
- CHEMICAL CONSTITUENTS: Lawsone, Phenolic composites, Flavonoids, Alkaloids, Quinones, Carbohydrates, Proteins, Saponins, Terpenoids, Xanthones, Tannins.
- COLOURING MATTER: Lawsone (responsible for red orange colour).
- USES: Treatment of burn injuries, skin infections and injuries and ulcer mending, antibacterial and anti-inflammatory parcels.

**20. VIOLET SPINACH**

Spinach leaves contain beta- carotene, chlorophyll a, and b, with other colors like xanthophylls present in lower attention. Green chlorophylls are visible in green lush shops like spinach, covering the vibrant red, orange, and unheroic colors. Bleached spinach decreases chlorophyll content, making it a lipophile.

- SYNONYM: Spinacia oleracea, Prickly- seeded spinach, Spinach factory.
- NATURAL SOURCE: Spinach (Spinacia oleracea) is a lush green flowering factory belonging to family Amaranthaceae.
- CHEMICAL CONSTITUENTS: Lutein, Kaempferon, Glucosinolates, Flavanoids, Nitrate, Magnesium, Quercetin, Alpha- lipoic acid.
- COLOURING MATTER: Anthocyanins (red- grandiloquent colour).
- USES Helps your skin stay doused, which may reduce the appearance of fine lines and wrinkles.

**Table 1: List of common plant pigment sources & colour**

| PLANT | SOURCE | PIGMENT | COLOUR |
|---|---|---|---|
| Turmeric  | Curcuma longa | Curcumin | Yellow |

| | | | |
|---|---|---|---|
| Beetroot  | Beta vulgaris | Betalains | Red-violet |
| Carrot  | Daucus carota | Carotenoids | Orange |
| Tomato  | Solanum lycopersicum | Lycopene | Red |
| Papaya  | Carica papaya L. | Carotenoids | Yellow |
| Grapes  | Vitis vinifera | Anthocyanins | Purple |
| Mulberry  | Morus spp. | Anthocyanins | Magenta |
| Indian blackberry | Syzygium cumini | Anthocyanins | Purple |

| | | | |
|---|---|---|---|
|  | | | |
| Dragon fruit  | Selenicereus undatus | Betacyanins | Pink |
| Mango  | Mangifera indica | Carotenoids | Yellow |
| Pomegranate  | Punica granatum | Anthocyanins | Red |
| Banana  | Musa acuminata | Carotenoids | Yellow |
| Rose apple  | Syzygium jambos | Anthocyanins | Pink |

| | | | |
|---|---|---|---|
| Watermelon  | Citrullus lanatus | Lycopene | Red |
| Anatto  | Bixa orellana | Carotenoids | Red |
| Hibiscus  | Hibiscus rosa sinensis | Anthocyanins | Red |
| Butterfly pea  | Clitoria ternatea | Anthocyanins | Purple |
| Gulmohar flower  | Delonix rigea | Flavanoids | Red |
| Henna  | Lawsonia inermis | Lawsone | Red-orange |

| | | | |
|---|---|---|---|
| Violet spinach  | Spinacia oleracea | Anthocyanins | Red-purple |

## CONCLUSION

Natural colors have played a vital part in art, fabrics, cosmetics, and food for centuries, offering vibrant colors deduced from shops, minerals, and indeed insects. These colors not only give rich, organic tinges but also present eco-friendly and sustainable druthers to synthetic colorings. As interest in natural and non-toxic products continues to grow, the reanimation of traditional color sources highlights the significance of conserving biodiversity and indigenous knowledge. By embracing natural colors, we can celebrate both the beauty of nature and the artistic heritage tied to these remarkable color sources.

The use of factory colors over synthetic druthers offers multitudinous benefits, from environmental sustainability to health and safety. Unlike synthetic colorings, which frequently contain dangerous chemicals, factory-grounded colors are biodegradable, non-toxic, and deduced from renewable sources. They not only give vibrant, natural tinges for food, fabrics, and cosmetics but also offer fresh benefits, similar as antioxidant and antimicrobial parcels. As consumers and diligence seek eco-friendly results, factory colors present a promising volition that supports both mortal well-being and environmental conservation. Embracing these natural colorings is a step toward a more sustainable and responsible future.

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