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## A Review on Uses of *Selenicereus Undatus*, *Santalum*, *Curcuma Longa*

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### Abstract

*This review explores the medicinal and therapeutic uses of Selenicereus undatus (dragon fruit), Santalum (sandalwood), and Curcuma longa (turmeric). Selenicereus undatus is known for its antioxidant-rich fruit, which supports digestive health, boosts the immune system, and has potential anticancer properties. Santalum, widely recognized for its essential oils, has been placed into effect in traditional medication because of its anti-inflammatory effects, antiseptic, and sedative effects, beneficial in skin disorders, anxiety, and respiratory conditions. Curcuma longa is renowned for its bioactive compound curcumin, which possesses anti-tumor, anti-inflammatory, and antioxidant benefits, making it valuable in managing arthritis, digestive issues, and chronic diseases. This review highlights the phytochemical composition, traditional uses, and modern therapeutic applications of these plants, emphasizing their significance in integrative medicine and potential for future pharmaceutical development.*

**Keywords** - Anti-tumor, anti-inflammatory, antioxidant, Santalum

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### INTRODUCTION

#### Selenicereus Undatus

One significant factor in the prevention of chronic disease is diet. Foods such as fresh fruit and vegetables are said to be able to prevent a number of ailments. *Dragon fruit*, for instance, is among the fresh fruit which people eat a lot. According to taxonomy, dragon fruit, sometimes referred to as pitaya or pitahaya, is a member of the Cactaceae group of fruits and is still within the genus *Hylocereus*. This fruit skin layer, which has “scales,” is another name for it: dragon fruit. Aside from the skin surface that develops “scales,” what makes it special is this during the evolution of it, a phrase “moon flower or mistress of the night” refers to the fruit of dragon blooms that just blossom at midnight. Bats are responsible for pollination at night.<sup>[1]</sup>

#### Santalum

Sandalwood is connected to the goddess Lakshmi in Hinduism. Sandalwood is revered as a sacred wood in Buddhism. Sandalwood oil, or the *sandalwood* sheet fluid, was developed and used in traditional Chinese and herbal medicine for roughly 1250 years. Fewer than twelve components are present in amounts larger than 1% by weight, out of the related chemicals found in the oil is extracted by the *Santalum* tree's heart wood.

Because SAO is a widely traded commodity and is a component of many fragrances and personal care items, it has an international standard (ISO 3518:2002). The Australian Goods TGA, or therapeutic management, includes designated SAO For a Medication on the Schedule, making it accessible as a functioning component in numerous over-the-counter medicines. The FDA, the Food and Drug Administration of the USA lists SAO in that Food Chemicals Codex as a natural flavouring ingredient. There are more than 12 sandalwood species in the world, and most of them have been used to produce essential oils. However, only two species *Santalum album* The Worldwide Organization for Standards and Technology (ISO) has established requirements for *Santalum spicatum*, additionally referred to as West Australian sandal wood. Out *S. album* is an organism that generates oils having significantly larger amounts to beta- and also alpha-santalol. Before, the SAO in order was made to the nation's wild trees as yet poaching and overharvesting have driven *Santalum* record belonging surrounding the verge of death on the verge natural setting. The Worldwide Environment Protection Organization had categorized the trees designated At Risk until 1998, and there are tight restrictions on the harvesting and export of Indian trees which are grown in the wild. The trees that are in use at the moment. For more than 4,000 years, Ayurvedic medicine and other ancient Indian traditions have used sandalwood.

### **Advantages for Health**

Known for its anti-inflammatory and antioxidant qualities. - Traditionally used to treat digestive, respiratory and skin disorders. - May help lower stress and anxiety.

Sandalwood trees require well-drained soil and thirty to sixty inches of annual rainfall. Hawaii, Indonesia, Australia and India are the primary producers

Harvesting: After 60 to 80 years, heartwood is usually taken.

### **Standard and Cultural Significance**

Sandalwood paste is used in Hindu rites and rituals. Buddhism: meditation with oil that comes from sandalwood.

Sandalwood incense (Byakudan) is used in tea rituals in Japanese culture. [2]

### **Curcuma Longa**

*Curcuma longa*, an Indian rhizomatous herbal plant belonging to the It is widely accepted that the *Zingiberaceae* family has medicinal properties. Turmeric's active ingredients have been referred to as turmeric compounds could be in control of its medicinal uses. Curcuminoids are the collective name for dimethoxy curcumin (DMC), bisdemethoxycurcumin (BDMC), and curcumin. They're referred to as curcuminoids. The rhizomes of the turmeric plant, *Curcuma longa* L., are the origin of these yellow curcuminoids that. Among the most attractive elements in curcuminoid is curcumin, which is a small polyphenolic compound that is liquid naturally insoluble in ethanol or alcohol but liquid in ethanol, dimethyl sulfate, and other organic solvents. Curcumin remains stable in the stomach's acidic pH range other parts consist of carbohydrates, resins and proteins along with volatile oils, including tumerone, Zingiberone and atlantone. Curcumin, an important ingredient in turmeric, is extracted *Curcuma longa* produces turmeric its colour. This bioactive ingredient It has been well studied. Documented evidence indicates that it has been utilized every day over at least 6000 years spent in the country as a spice, medicinal, cosmetic, and cooking ingredient. When Lord Ram Chandra walked around the world during India's solar age, it was undoubtedly used to worship the Sun. The Indian Atharv Veda has a mention of it. Turmeric has been used for at least two millennia by Buddhist monks to tint their robes. In an Assyrian herbal,

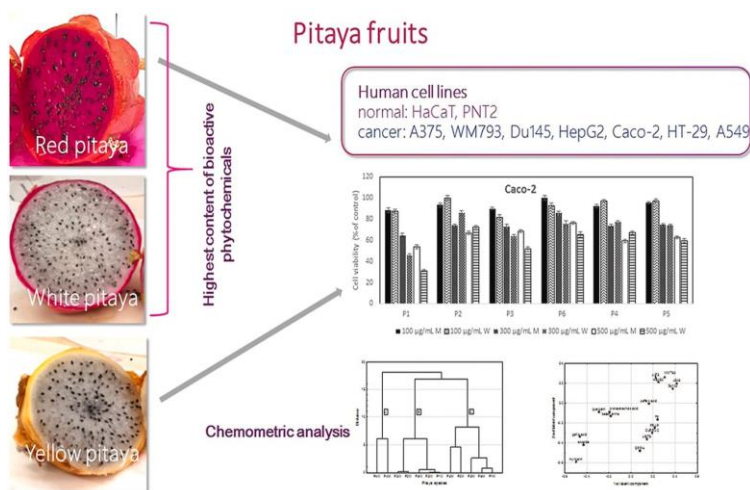
it was referenced. about Around 600 years ago, Dioscorides described the western herbal, which was the herbal rediscovered it through Marco Polo 700 years ago. It is used in traditional harmful poisoning. It is employed in the classic lethal poison of pit vipers. The seventh-century Pent- Sao in China made reference to it. Chinese have used turmeric as medicine for at least a thousand years, with particular applications for the liver, stomach, and spleen. They utilize it as an antiseptic, antiviral, stimulant, and purifier in addition to these uses. It is therefore employed to encourage India is the biggest producer in the world, exporter, user for turmeric. Most of that nation's formulation (eighty percent) is used at home with the rest being exported. Up to 25 states in India cultivate turmeric, with Andhra Pradesh, the Indian state of Tamil Karnataka, and Puri manufacturing the most of it. Maharashtra, Gujarat, West Bengal, as well as Assam, and Assam are among the other major producers of turmeric. Turmeric is grown on over 1.73 lakh kilometres in India, where 8.55 lakh kg are produced annually. In 2005–2006, Andhra Pradesh was the biggest state in terms of area and output, with 69990 kilometres (40.46%) and 518550 kg (60.60%), accordingly Tamil Nadu came in second with 25970 hectares (15.01%) of land and 143358 tons (16.7)<sup>[3]</sup>

**Plant Profile**

***Selenicereus Undatus***



**Figure 1: Pitaya**



**Figure 2: Part of Pitaya**

### Synonym of pitaya

Dragon fruit is a popular tropical fruit that goes by several names, including the pitahaya, strawberry pear, belle During the midnight, and the cereus which blossoms at midnight. It is most often called dragon fruit because of its vivid pink or yellow skin with green scales that give it a dragon-like look. The fruit is a common addition to salads, smoothies, and desserts because of its sweet, slightly acidic flesh, which can be either white or red with small black seeds. Its distinctive look and adaptable flavour have helped it become widely used and well- liked in a variety of culinary applications. [4,5]

### Biological source

*Selenicereus undatus*, commonly known as dragon fruit or pitaya, is a species of cactus. It is cultivated for its edible fruit, which is popular for its distinctive appearance and nutritional benefits. The stems of this plant are green, succulent, and are used in various traditional medicinal preparations.

### Chemical constituent

#### Antioxidants

The use of pant (50 µg), (25 µg) of K1 vitamin <sup>3</sup>, 6 milligrams for C-vitamin per 100 grams, and vitamin E (150 µg). Chemicals: Zinc (0.20-0.40 mg), iron (0.70-1.5 mg), calcium (20-45 mg), magnesium (30-45 mg), potassium (120-200 mg), and phosphorus (20-35 mg) per 100g.

#### Botanical chemicals

Phenolic compounds, polysaccharides, terpenoids, and betacyanins; these have pharmacological advantages.

#### Fat-containing Compounds

1-tetracosanol, stigmast-4-en-3-one, octacosane,  $\gamma$ -sitosterol, octadecane,  $\beta$ -amyrin,  $\alpha$ -amyrin, and campesterol; these compounds contribute to cytotoxic and antioxidant properties.

### Taxonomical classification

<b>Kingdom</b>	<b>Plantae</b>
Division	Magnoliophyta
Subdivision	Magnoliophytina
Class	Rosopsida
Sub class	Dilleniidae
Super order	Primulanae
Order	Ericales
Sub order	Ebenineae

*Table 1: Taxonomical Classification*

**Develop sources**

This name undatus: endemic to south and central America, the pitaya has white flesh.

This name polyrhizus: red-fleshed pitaya, found in southeast Asia.

selenicereus spp.: previously categorized, currently regarded as a synonym for *Hylocereus*.

Pitaya fruit roja, or this name *Caesariensis*, is a native of Costa Rica.

This name megalanthus: yellow pitaya is native to south America.

Morphology

**External morphology**

The fruit's measurements vary between 4 and 8 cm in length and between 6 and 12 cm in breadth, giving it an oval, elliptical, or spherical appearance. Its thin, edible skin, which becomes yellow as it ripens, is covered with tiny scales and spines. The scales, consisting of modified leaves, form a crown-like structure on the fruit by covering it in an imbricate pattern. It has a short, robust stem that is 1-2 cm thick and 2-3 cm long, which connects it to the plant.

**Internal morphology**

The fruit's internal structure consists of luscious pulp that can be white, red, or yellow, as well as a lot of small black seeds. The fruit's nutritional worth is enhanced by the hyaline cells that make up its flesh, which are abundant in minerals, vitamins, and antioxidants. The grains are tiny, black, and range in length from 0.5 to 1 mm. [6]

**Plant morphology**

The species is climbing and epiphytic, with a growing point that can grow to a height of one to three meters. It has modified leaves that resemble spines without the usual leaves. Areoles are modified branches of the plant that produce fruits and flowers. The fragrant, white, nocturnal bloom are between 10 and 15 cm long. The plant also possesses aerial adventitious roots.

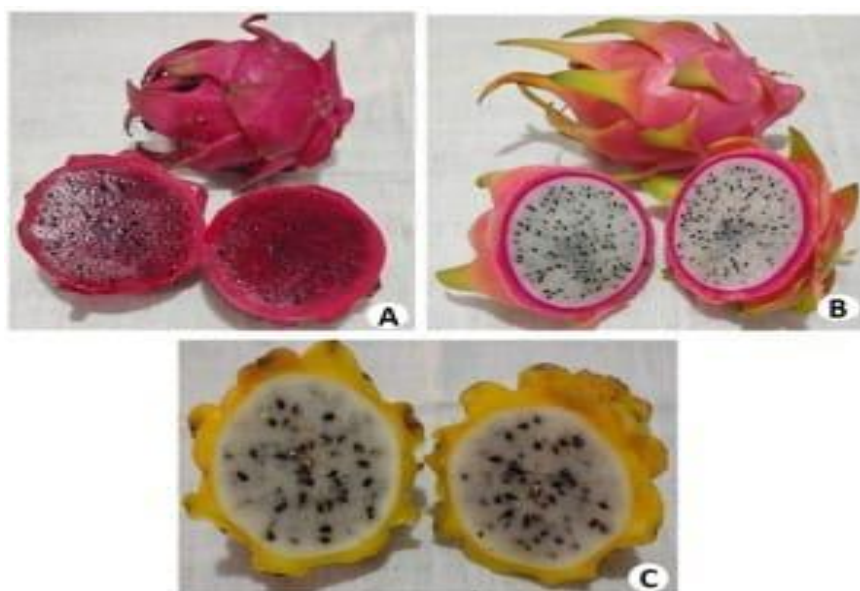
**The methodology of the History, Origin, and Pitaya hybridization**

Pitaya is an agricultural product of tropical fruits, that climbs and is perennial. It is a member of the Caryophyllales order and belongs to the Cactaceae genera *Selenicereus*. This Latin term "cereus," it indicates "waxen," as well as the Greek term "hyle," it indicates "woody," were the beginnings of cacti such as a prior genus of pitaya cultivation. On the other hand, the Greek term "Selene," and this describes nocturnal flowers, is the source of the new genus *Selenicereus*. The word "wavy edges" in the species name, "undatus," refers to the rib-like shape of the stem. Because of the fruit's peel leather-like texture, other names for pitaya include the dragon fruit in the nation of Vietnam, pitaya rosa in South America, and pitahaya in Mexico. This name "pitaya" in the earlier literature refers to scaly fruit in Haiti. While "pitaya" as well as "pitahaya" carry comparable connotations throughout South America as well as Central America, "pitahaya" refers to epiphytic organisms' cacti like cacti such as in the nation of Mexico, but "pitaya" describes the edible parts of cacti that resemble pyramids. [7]

Nutritional Foundation to the world's tropical and subtropical climates, *Hylocereus* is grown in a variety of species and cultivars according to the needs of the population, compatibility, acclimatization, and nutritional value. There may be variations in the nutritional makeup of various species, geographical regions, and determination techniques. Many natural substances, including flavonoids, which are fat-soluble aromatic compounds, polyphenol acid, betalains, which are polyphenols, and steroids, are abundant in pitaya. In addition, it contains high levels of carotenoids, dietary fiber, fats, proteins, glucose, and phytoalbumin, as well as minerals like the

mineral's phosphorus, calcium, sodium, potassium, as well as copper. Phytochemicals of the name plant Dragon fruit is containing a variety of phytochemicals, the most common of which are Tocopherol in fats, sterols and flavonoids that are and phenol compounds. Picking just a few of the many bioactive substances present in the pulp and peel, some of these include minerals such as Betacyanin, which  $\beta$ -carotene, vitamin C, p-coumaric acid, protocatechuic acid, acid vanillic, the acid gallic, syringic acid, magnesium, potassium, calcium, phosphorus as well as phydroxybenzoic compound. Table 3 displays that characteristic of the phytochemicals.<sup>[8]</sup>

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*Figure 3: Pitaya*

### **Santalum**



*Figure 4: Sandalwood*

### Synonym of Sandalwood

Sandalwood is known by various synonyms across different languages and contexts. In Sanskrit, it is referred to as Chandana, while in Hindi, it is called Sandal. The Latin term for it is Santalum. Additionally, it is commonly identified as White Sandalwood, Yellow Sandalwood, East Indian Sandalwood, and Mysore Sandalwood, reflecting its diverse types and origins.

### Chemical constituents

Essential oil

Terpenoids

Phenolic compound

Flavonoids

Biological source

White sandalwood, or *Santalum album*, is native to Southeast Asia, Australia, and India.

*Santalum orientale*, additionally referred to as yellow sandalwood, is endemic to the Philippines, Indonesia, and China.

The Australian sandalwood, or *Santalum spicatum*, is endemic to Western Australia.

Northern Sandalwood, or *Santalum lanceolatum*, is indigenous to Northern Australia.

Food and Agriculture Organization (FAO) of the United Nations. (2013). Sandalwood.

Taxonomical Classification

<b>Kingdom</b>	<b>Plantae</b>
Phylum	Tracheophyta
Class	Magnoliopsida
Order	Caryophyllales
Family	Polygonaceae
Genus	<i>Polygonum</i>
Species	<i>Glabrum</i>

**Table 2:** Taxonomical

### Classification Condition, Cultivation, Collection

#### Cultivation

##### Climate

Tropical and subtropical areas with moderate humidity (60–80%) and temperatures (20–30°C/68–86°F).

##### Soil

Sandy loam clay with a pH level of 6.0 to 7.0 and good permeability.

##### Irrigation

Water frequently, but don't let it become too wet.

##### Planting

Two to three meters between seedlings or trees.

##### Pruning

Consistent pruning helps preserve shape and encourage the growth of

heartwood.

**Condition**

68–86°F (20–30°C)

Humidity: 60–80%

Light is a type Full sun to partial shade

The presence of water Sufficient moisture

Soil: sand-covered loam soil that drains well

**Collection**

For the most effective oil amount and effectiveness, harvest between the ages of 40 and 60.

Harvest method: Cutting down, then the heart wood extraction.

Harvesting of heartwood: motorized or manual.

Oil extractor: solvent extraction or steam distillation for oil extraction.<sup>[10]</sup>

**Morphology****Features of Trees**

Height: 33–66 feet (10–20 meters)

The width for the trunk is between one and two meters (3-6 feet).

Bark: Scaly, effortless, and greyish-brown

Ovate-lanceolate leaves that are 3-6 cm in long and 1-2 cm in breadth.

Leaf position: decussate, opposite.

**Morphology of Leaves**

Ovate-lanceolate leaf form

Strong leaf apex

Compact for the leaf base

Total leaf margin

Venation of leaves

Morphology of Flowers

Type the blossoms: very little, a yellow-green.

Grouped together terminal floral arrangement

Fused Sepals

The petals have: free

Developing stamen

**Fruit morphology**

Fruit and vegetable consumption: Drupe; width: 1 to 2 cm

Rectangular fruit form

Black or purple fruit color

One seed, 1-2 cm in length<sup>[11]</sup>

**Curcuma Longa**





**Figure 5:** *Curcuma*

**Synonym**

Other possibilities: Indian turmeric, curcuma

**Biological source**

The rhizome of the species *Curcuma longa*, which is a member of the *Zingiberaceae* family, is the source of turmeric.

**Characters at the microscale**

Turmeric's microscopic characteristics include cork cells, trichomes, gelatinized starch clumps, oil droplets, and pieces of parenchymatous cells.

**Color**

Powder that is golden-yellow.

**Odor**

Pleasant and fragrant.

**Taste**

Strong and fragrant.

**Dimensions**

up to 4 cm, 3 cm in thickness

**Chemical constituent**

Curcuminoids

Volatile oil

Polysaccharides

Proteins

Enzymes

Minerals [12]

**Scientific Classification**

<b>Kingdom Plantae</b>	<b>Plants</b>
Sub kingdom	Tracheobionta
Superdivision	Spermatophyte
Division	Magnoliophyta
Class	Liliopsida
Sub class	Zingiberidae
Order	Zingiberales
Family	Zingiberaceae
Genus	Curcuma

*Table 3: Scientific Classification***Typical Names**

Mustard

Garlic, yellow

Almonds from India

Glucosamine

Indian Haldi

**Culturation**

It is possible to grow turmeric in a variety of tropical climates, including those up to 1600 meters are above sea level, when temperatures vary between 20 to 40 degrees Celsius and more than 1500 mm of rainfall. The crop is planted in July and harvested in April over a nine-month period. Black, red, or silt loams that are sandy, fertile, well-drained, high in humus, and have a homogeneous texture are ideal for the growth of turmeric. The ideal soils are rich loamy soils with built-in irrigation and natural drainage. The pH level or retention of water are unpleasant to turmeric.

**Harvesting And Curing**

Depending on when they are sown, the crops can be harvested in seven to nine months. The harvesting season runs from January to March. It needs nine months to reach maturity. The month of February through May is marketing season. Good turmeric yields are indicated by the crop reaching a height of 1.5 feet after full growth, with a maximum of 8–10 branches and the development of soil fissures. The crop's leaves turn dry and turn light brown or yellowish in colour as they mature. After the ground has been tilled, the rhizomes are gently removed with a spade. The rhizomes that have been harvested are cleared of any dirt or debris that may have stuck to them. After boiling the water-soaked greenish rhizomes spread on a spotless surface additionally given time the.<sup>[13]</sup>

after effects, numerous Research have shown curcumin's anticancer effects either from its own or in conjunction with traditional chemotherapy medications.<sup>[14]</sup>

## **Therapeutic Use**

### **Selenicereus Undatus**

Antioxidant and beneficial: Packed with polyphenols, Vitamins C and E are antioxidants, which fight inflammation, free radicals.

Digestive health: Gut health has been backed by prebiotic fibre.

Booster of the immune system: Vitamin C promotes immunity.

Preventing cancer: Flavonoids and antioxidants have anti-cancer qualities.

Cardiovascular health: Fiber and potassium maintain the heart healthy.

Collagen synthesis is encouraged by vitamin C, allowing in wound healing.

Antiviral and antibacterial: Flavonoids exhibit antimicrobial properties.

Anti-cancer properties: Inhibits the growth of tumours.

Neuroprotective effects: may mitigate Parkinson's and Alzheimer's disease

### **Santalum**

Antimicrobial: acts well against bacteria, viruses, and bacteria.

Anti-inflammatory: decreases pain and swelling.

Antioxidant: protects cells from damage.

### **Curcuma Longa**

#### **Anti-viral activity**

A type of coxsackie the disease human norovirus (HuNoV), the virus that causes respiratory infections (RSV), the simplex virus 1 (HSV-1), papillomavirus viral (Hepatitis B viruses (HBV), the virus that causes hepatitis C (HCV), influenza virus, or HPV and curcumin, a plant derivative, has been shown to have a large range of antiviral activity against various viruses. A combination antiviral activity against a respiratory virus infection has been shown by graphene oxide functionalized with curcumin.<sup>[15]</sup>

#### **Anti-inflammatory properties**

Both when it pertains to both chronic and acute inflammation, turmeric shows strong anti-inflammatory properties. In an acute oedema test, it is just half as effective as phenylbutazone, but it is equally effective in chronic tests. In six human trials, curcumin has shown to be safe and to have anti-inflammatory properties. It may work as an anti-inflammatory drug involves the blocking of many molecules that cause inflammation A number of enzymes cytokines, protein kinases, molecules that bind, redox nations, and transcription factors connected to inflammation All of them were demonstrated that regulated by curcumin.<sup>[16]</sup>

#### **Antioxidant**

Studies has shown that curcumin improves warning signs oxidative stress throughout the organism by that affect The action of enzymes catalase, GSH, as well as SOD, which are involved in the reduction of free radicals. Superoxide dismutase (SOD) and other antioxidants' blood activity have been shown to be increased by it. Additionally, that ability to inhibit enzymes that cause ROS, include lipoxygenase/cyclooxygenase and a substance called hydrogenase/oxidase. Turmeric is also thought of as an antioxidant which breaks bonds, Like vitamin E, due to its lipophilic nature, which enables it to effectively scavenge peroxy radicals.<sup>[17]</sup>

#### **Anti-cancer**

Different forms of cancer account for one-fifth of all deaths that occur global each year. Cancer is the outcome of several changes in DNA and genetics that cause angiogenesis, uncontrolled

growth of cells, metastasis, and death. Curcumin's anticancer effect has been thoroughly studied recently, and significant changes have been observed in lung, breast, genitourinary, gastrointestinal, and melanoma cancers. In the treatment of cancer and its aftereffects, numerous Research have shown curcumin's anticancer effects either from its own or in conjunction with traditional chemotherapy medications.<sup>[18]</sup>

### **Other Uses**

#### **Selenicereus Undatus**

##### **Benefits to Aromatherapy**

Encourages serene and reduces tension. Improves the quality of sleep.

Improves concentration and mental clarity

Benefits to Aromatherapy

Encourages serene and reduces tension. Improves the quality of sleep.

Improves concentration and mental clarity

Dental health: reduces tartar and bad breath.

Conservation Activities:

Sustainable techniques for harvesting. The process of re initiatives.

Protection against excessive exploitation.

##### **Industrial Patterns**

Growth in the essential oil market.

Increased curiosity in skincare products that are natural.

Benefits to Aromatherapy

Encourages serene and reduces tension. Improves the quality of sleep.

Improves concentration and mental Clarrie. <sup>[19,20]</sup>

#### **Santalum**

Skin Health

Respiratory Health

Urinary Health

Digestive Health

Fever Management

#### **Curcuma Longa**

Conventional Applications

##### **Medical Sciences**

Treats respiratory issues, wounds, and skin conditions.

##### **Perfumery**

The application of essential oils in aromatherapy and fragrances.

Religious Traditions

Invoked in Buddhist, Jain, and Hindu ceremonies.

Wood Carvings

Valued for its scent and longevity.

##### **Turmeric applications in dental**

The following are some ways that using turmeric can help with dental issues. tooth pain Turmeric that has been ground and roasted is used for massaging painful teeth to relieve pain and discomfort. Problems related to teeth Application topically the two conditions can be treated

using a paste that is applied. It is made of one drop turmeric, one drop salt, and one drop mustard oil. Applying Two times per day for applying toothpaste to the teeth.<sup>[21, 22]</sup>

### Cosmetic Uses<sup>[23]</sup>

#### *Selenicereus Undatus*

Property	Cosmetic Application	Benefits
Antioxidant	Used in anti-aging Creams, Serum, and Masks.	Protects skin from Oxidative stress.
Hydration	Added to Moisturizers and hydrating masks.	Keep the skin hydrated, pump and soft
Vitamin C	Incorporated into brightening Products Like serums	Promotes Skin radiance and reduces dark Spots.
Antibacterial	Included in acne Treatment and Cleansers.	Prevent acne breakouts and reduces bacterial growth on the skin.

**Table 4:** *Cosmetic Uses of Selenicereus Undatus*

#### *Santalum*

Category	Uses	Benefits
Cosmetics	Soothing Creams, Anti-inflammatory	Calms irritated skin, Reduces wrinkles
Beauty Products	Hair care Products like shampoos	Lessens dandruff, Stimulates hair growth.

**Table 5:** *Cosmetic Uses of Santalum*

#### *Curcuma Longa*

Cosmetic Application	Properties	Benefits	Common use
Moisturizing	Enhances hydration and skin barrier function	Keeps skin soft supple and well-hydrated	Incorporate in moisturizers and body lotion
Wound healing	Speeds up woundhealing and skin repair	Promotes faster skin regen ration	Found in ointments for cuts and burns
Skin Brightening	Natural skin lightening properties	Reduces hyperpigmentati on evens skin tone	Turmeric masks serums for dark spots and pigmentation
Antimicrobial	Antibacterial and antifungal properties	Help in treating acne control is oily skin	Used in cleans ear acne treatment and spot gel

Anti-inflammatory	Curcumin (active compound)	Reduces skin inflammation calms irritated skin	Used in face masks and creams for sensitive skin
Antioxidant	High in antioxidants	Fights free radicals slows signs of aging	Used in face masks and creams for sensitive skin

**Table 6: Cosmetic Uses of Curcuma Longa**

### Marketed Formulation <sup>[24]</sup>

#### Selenicereus Undatus



**Figure 6: Dragon Fruit**

### Medicinal Items

#### Tablets

Dragon Fruit Capsules (China), Pitaya Extraction Tablets (India).

#### Powder

Dragon Fruit, which was Powder (Australia) and Pitaya Powder (USA).

#### Soft gels

Dragon Fruit Soft gels (the country of Malaysia) and Pitaya Soft gels (USA).

### Consumption of food and Items

#### Juices

Dragon Fruit was Juice (China) and Pitaya Plus Juice (USA).

#### Supplements

NOW Foods Pitaya Powder (USA), the Environment's Bounty Pitaya Capsules (USA).

#### Energy Drinks

Dragon Fruit was Energy Drink (Thailand) and Pitaya Energy Drink (USA).

#### Yogurt

Dragon Fruit is a Yogurt (Malaysia) and Pitaya Yogurt (USA).

#### Smoothie bowls

Dragon Fruit Smoothie Bowl (Australia) and Pitaya Plus Smoothie Bowl (USA).

### Santalum

Skincare

Haircare

Perfumes And Fragrance

Pharmaceutical



*Figure 7: Sandalwood Formulation*

## Curcuma Longa



*Figure 8: Curcuma Formulation*

## CONCLUSION

Depending on both present scientific research and traditional applications, the review of *Selenicereus undatus*, *Santalum*, and *Curcuma longa* shows their considerable medicinal and therapeutic potential. *Selenicereus undatus* helps with immune system function, digestion, and maybe cancer prevention. Its antioxidant-rich fruit is the main source of its health benefits. With its relaxing and anti-inflammatory properties, *Santalum*'s essential oils can help with respiratory, anxiety, and skin disorders. *Curcuma longa* is unique because of curcumin's strong anti-inflammatory, antioxidant, and anticancer qualities, which help treat a number of chronic illnesses. The efficacy of natural medications in integrative medicine is demonstrated by these plants collectively, and they merit additional study and development for future pharmaceutical uses.

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