**Review on Pharmacongoceutical & Pharmacological Properties of Pyrostegia Venusta; An Ornamental Plant**

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**ABSTRACT:**

Herbal and natural folk medicine products have been used for centuries in every culture around the world. Plants, without a doubt, are a reservoir of potentially useful chemical compounds that serve as drugs, providing newer leads and clues for modern design by synthesis. Pyrostegia venusta, also known as flame vine or orange trumpet vine, is a plant species of the genus Pyrostegia in the Bignoniaceae family that was originally native to southern Brazil, Bolivia, north-eastern Argentina, and Paraguay; it is now a popular garden species. The plant prefers sunny, sheltered locations and is sensitive to cold winds. Venusta translates as "beautiful," "charming," or "graceful." Pyrostegia" comes from the Greek pyros, which means "fire" and refers to the colour of the flowers and the shape of the upper lip, and stegia, which means "covering." When flowers cover a structure, it may appear to be on fire.

John Miers described the species for the first time in 1863.

**KEYWORDS:**

Pyrostegia venusta, Flamevine, orange trumpet vine.

**INTRODUCTION:**

John Miers described the species for the first time in 1863.

Pyrostegia venusta, also known as flame vine (Flame vine, which was formerly known as

Pyrostegia ignea) or orange trumpet vine, is a plant species of the genus Pyrostegia in the Bignoniaceae family that was originally native to southern Brazil, Bolivia, north-eastern Argentina, and Paraguay; it is now a popular garden species.

It is an evergreen, vigorously growing climber, if left unattended, this vine grows quickly and can spread like wildfire. that can reach a height of 5 m. The foliage consists of opposite, pinnate leaves with two or three, 4 to 8 cm leaflets and a three-branched tendril that emerges from the end of the leaf petiole. The orange flowers are 5 to 9 cm long and densely clustered, appearing from winter to spring. Hummingbirds pollinate the plants. The fruits are brown capsules that are smooth and 3 cm long. The plant is sensitive to cold winds and prefers sun and shelter. It is frost hardy in USDA zones 9 to 11. It is tolerant of soil salinity. Forked tendrils on the plant hold on to any tough surface, including brick walls. Semi-hardwood cuttings taken in the summer, autumn, or winter can be used to grow it. It has spread to eastern Australia, eastern Africa, and the south-eastern United States.

Despite the fact that this plant produces bean-like seed pods, the pods rarely contain viable seeds. As a result, layering suckers is the best way to propagate flame vine.

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**PLANT DESCRIPTION:**

**Biological Source:** Pyrostegia venusta, also known as flame vine or orange trumpet vine, is a plant species in the Bignoniaceae family Pyrostegia.

Pyrostegia venusta

 “Fig. 1 – Whole Plant” “Fig 2 – Flower of the plant”



“Fig 3 – Different seeding phases” “Fig 4 – Aerial roots”



 “Fig 5- Pyrostegia venusta” “Fig 6- Pyrostegia venusta”

|  |  |
| --- | --- |
| Kingdom  | Plantae  |
| Clade  | Tracheophytes  |
| Clade   | Angiosperms |
|  Clade   | Eudicots |
| Clade   | Asterids |
| Order   | Lamiales |
| Family   | Bignoniaceae |
| Genus   | Pyrostegia |
| Species   | P. venusta |

Table 1.1

**Taxonomy of Pyrostegia venusta:**

**Synonyms:**

Flame flower, flame vine, flaming trumpet vine, orange creeper, orange trumpet vine, Flaming trumpet, Golden shower trumpet, Orange Bignonia, flame creeper, flame flower vine, golden shower, golden shower vine, golden showers, orange creeper vine, orange trumpet creeper, Chinese cracker flower, belas, Flame vine and Orange trumpet, Bignonia ignea Vell., Bignonia tecomiflora Rusby., Bignonia tubulosa Klotzsch., Bignonia venusta Ker Gawl. Jacaranda echinata Spreng., Pyrostegia amabilis Miers nom. inval., Pyrostegia dichotoma Miers ex K.Schum., Pyrostegia ignea (Vell.) C.Presl., Pyrostegia ornata Miers nom. inval., Pyrostegia pallida Miers nom. inval., Pyrostegia parvifolia Miers nom. inval., Pyrostegia puberula Miers nom. inval., Pyrostegia reticulata Miers nom. inval., Pyrostegia tecomiflora (Rusby) K.Schum. ex Urb., Pyrostegia tubulosa (Klotzsch) Bureau & K.Schum., Tecoma venusta (Ker Gawl.) Lem., Tynanthus igneus (Vell.) Barb.Rodr.

**Distribution:**

Argentina Northeast, Bolivia, Brazil North, Brazil Northeast, Brazil South, Brazil Southeast,

Brazil West-Central, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Mexico Central, Mexico Gulf, Mexico Northwest, Mexico Southeast, Mexico Southwest, Panamá, Paraguay, Peru, Suriname, Venezuela.

**Macroscopic Description:**

Pyrostegia venusta Foliage:

P venusta palmately compound leaves on the stem are opposite. The margins of the leaves are entire, ovate with pinnate venation, and evergreen. Leaf blade length ranges from 2 to 4 inches.

Pyrostegia venusta Flower:

P venusta orange tubular flowers had dichasial cymes inflorescence, winter flowering, and autumn flowering. The style and long orange stamens extend beyond the tube.

Pyrostegia venusta Fruit:

Found in an elongated shape with a dry or hard cover, inconspicuous and not showy.

**Phytochemical and Pharmacological activities:**

The Pyrostegia genus of the Bignoniaceae family. This genus contains four species that are native to South America. This genus' plants are used for traditional purposes in Brazil. According to a literature review, the Pyrostegia genus has been used traditionally to treat diarrhoea, coughing, vitiligo, jaundice, and respiratory system-related diseases such as colds, coughs, and bronchitis. Flavonoids, phenolic compounds, phenylpropanoids, phenylethanoid glycosides, triterpenes, and sterols have been found in phytochemical compounds from the Pyrostegia genus. Pyrostegia genus extract has a wide range of pharmacology actions, including antioxidant, antimicrobial, antifungal, anti-inflammatory, wound healing activities, antinociceptive, analgesic, vasorelaxant activities, antitumor, cytotoxic, hepatoprotective, antitussive, anthelmintic, hyperpigmented, treatment of sickness behaviour, estrogenic, antihypertensive, and immunomodulatory. The Pyrostegia genus is widely used in traditional medicine and has a wide range of pharmacological activities. However, most Pyrostegia species require additional research into their chemical constituents and pharmacological activities.

Pyrostegia venusta is a plant that contains phytochemicals. Terpenoids, alkaloids, tannins, steroids, and saponins have been discovered in flower and root extracts.

According to the Avnish Kumar literature review, flowers of P. venusta, from which the compounds β-sitosterol, n-hentriacontane, acacetin-7-O- β-glucopyranoside and mesoinositol have been isolated. Other studies have indicated the presence of carotenoids in the flowers and rutin in the leaves. GCMS analysis of flower extract has showed the presence of Acetophenone; alpha.-l-Mannopyranoside, methyl 6-deoxy-2,3,4- tris-O-(trimethylsilyl)-;3H-

3a,7-Methanoazulene, 2,4,5,6,7,8- hexahydro-1,4,9,9-tetramethyl-, (3aR (3a.alpha.,4.beta.,7.alpha.))- (Synonym Cyperene); trans-3-Hexenedioic acid, bis(trimethylsilyl) ester; beta.-DL-Arabino pyranose, 1,2,3,4-tetrakis- O- (trimethylsilyl)- (Synonym- B Arabipyranos); Ethyl malonate, ethyl trimethylsilyl ester; Propionic acid, pentamethyldidilanyl ester; Glycoside, .alpha.-methyl-trtrakis-O-(trimethylsilyl);Hexadecenoic acid, methyl ester (Synonym-Palmitic Acid; D-Xylose, tetrakis(trimethylsilyl)-;Glycoside,. Alpha.-methyl-trtrakis-O- (trimethylsilyl)-;Gluconic acid, 2-methoxime, tetra(trimethylsilyl)-, trimethylsilyl ester; 12-Octadecadienoic acid, methyl ester (Synonym Linoleic acid); 9-Octadecenoic acid (Z)-, methyl ester (Synonym Oleic Acid) ;Myo-Inositol, 1, 2, 3, 4, 5, 6-hexakis-O- (trimethylsilyl)-; Docosanoic acid, methyl ester

(Synonym Hysterene); 1,2-Benzenedicarboxylic acid, mono(2-ethylhexyl) ester (Synonym Phthalic Acid); Methyl 10-methyl-undecanoate; (1,2,4)Triazolo(1,5-a)pyrimidine-6carboxylic acid, 4, 7-dihydro-7- imino-, ethyl ester; Dotriacontane; Silicic acid, diethyl bis(trimethylsilyl) ester; Tetracosanoic acid, methyl ester; Di-ndecylsulfone;

Dodecahydropyrido(1,2-b)isoquinolin-6-one; Heptacosane; Tetra siloxane, decamethyl-;

Tetra decanoic acid, 12- methyl-, methyl ester; Stigmasteryltosylate; 2-p-

Nitrophenyloxadiazol-1, 3, 4-one-5; 2-Methyl-6-(5-methyl-2-thiazolin-2- ylamino)pyridine; Diazo progesterone; 1, 6-Dibromo-2- cyclohexyl pentane; Cyclotrisiloxane, hexamethyl-; cis2-Hexen-1- ol, trimethylsilyl ether.

 It has been demonstrated that the compounds acacetin-7-O-β glucopyranoside and βsitosterol showed anti-inflammatory activity. The Dr. Dukes phytochemical and ethnobotanical database has mentioned some of these compounds to be useful in various medicinal complications. Database has mentioned that Acetophenone are useful Antibacterial, fungicide, pesticide, hypnotic, perfumery, soporific; 3H-3a,7-Methanoazulene, 2, 4, 5, 6, 7, 8hexahydro-1, 4, 9, 9-tetramethyl-, (3aR-(3a.alpha.,4.beta., 7.alpha.))-(Cyperene) is an Antimalarial and Anti-plasmodial; Hexadecenoic acid, methyl ester (Synonym-Palmitic Acid) is an Antioxidant, hypo-cholesterolemic-nematicide, pesticide, antiandrogenic flavour, haemolytic, 5- Alpha reductase inhibitor; 9, 12- Octadecadienoic acid, methyl ester (Synonym - Linoleic acid) is an Anti-inflammatory, hypo-cholesterolemic cancer preventive, hepatoprotective, nematicide, insectifuge, anti-histaminic antieczemic, anti-acne, 5-Alpha reductase inhibitor, anti-androgenic, anti-arthritic, anti-coronary, insectifuge; 1,2-

Benzenedicarboxylic acid, mono (2-ethylhexyl) ester (Synonym - Phthalic acid) is useful in preparation of perfumes and cosmetics, and as plasticized vinyl seats on furniture and in cars, and clothing including jackets, raincoats and boots, as well as in textiles, as dye stuffs, cosmetics and glass making; Myo-Inositol, 1, 2, 3, 4, 5, 6-hexakis-O- (trimethylsilyl)- is useful in anti-depression, liver problems, panic disorders and diabetes; 9-Octadecenoic acid (Z)-, methyl ester is a 5-alpha-reductase-inhibitor, allergenic, alpha-reductase-inhibitor, anemiagenic, anti-alopecic, anti-androgenic, anti-inflammatory, anti-leukotriene-D4 (antiplatelet activating factor), dermatitigenic, insectifuge, perfumery, propecic cancer-preventive, choleretic, flavour, hypocholesterolaemia, irritant, percutaneostimulant; Stigmasteryltosylate is used as anti-hepatotoxic, anti-inflammatory, anti-ophidic, anti-oxidant, artemecide, estrogenic, sedative.

**Chemical constituents & structures**

|  |  |
| --- | --- |
| Acetophenone; alpha.-lMannopyranoside |  |
| Diethyl malonate  |  |
| Docosanoic acid  |  |
| octadecadienoic acid  |   |
| Benzenedicarboxylic acid  |  |
| Tetracosanoic acid |  |
| Tetra decanoic acid |  |
| Stigmasteryl Tosylate  |  |
| Di-n decylsulfone  |  |
| *myo*-inositol  |  |
| Nitrophenyloxadiazol  |  |
| Cyclotrisiloxane  |  |
| Linoleic acid   |  |
| Ethyl malonate  |   |
| DL-Arabinose pyranose  |   |

Table 1.2

**TRADITIONAL USE:**

Pyrostegia venusta aerial parts are used as an infusion or decoction in traditional Brazilian medicine as a general tonic, and also as a therapy for diarrhoea, vitiligo, cough, and common respiratory system infections such as bronchitis, flu, and cold.

The isolation of oleanolic acid from Pyrostegia venusta aerial parts and flowers is documented in the literature. Oleanolic acid has proven to be extremely important in biology. It has antimicrobial, hepatoprotective, anti-inflammatory, antipruritic, spasmolytic, antiangiogenic, antiallergic, antiviral, and immunomodulatory properties. Acacetin7-Oglucopyranoside and -sitosterol, which were isolated from the flowers, roots, and aerial parts of Pyrostegia venusta, also demonstrated anti-inflammatory activity. These findings highlight Pyrostegia potentially fruitful activities.

**BIOLOGICAL STUDIES:**

**Antioxidant activity:**

The antioxidant capacity of Pyrostegia venusta flowers and roots was assessed using 1,1diphenyl-2-picrylhydrazyl (DPPH), 2,2'-azinobis-3-ethylbenzothiazoline-6-sulfonic acid (ABTS), and ferric reducing antioxidant power (FRAP) assays.

**Treatment of sickness behaviour:**

A study was carried out to assess the effects of a hydroethanolic extract of Pyrostegia venusta flowers on sickness behaviours induced by lipopolysaccharide in mice. Lipopolysaccharideinduced depressive-like and exploratory behaviours were reduced by Pyrostegia venusta extract. These findings back up previous claims about the usefulness of these plants in traditional therapies and suggest that they may be useful in the treatment of disorders that cause sickness behaviour, such as the flu and cold.

**Estrogenic activity:**

In recent years, tea made from the plant Pyrostegia venusta has been used to alleviate menopausal symptoms. The active ingredients in this extract, however, are in relatively low concentrations. Plant tissue culture is an option for producing plant extracts with higher metabolite concentrations.

**Genotoxic activity:**

Pyrostegia venusta extracts were tested for genotoxicity in mice using the micronucleus (MN) and chromosome aberration (CA) tests. Different concentrations (50, 100, and 200 mg/kg body weight) were administered orally to the experimental groups. When compared to the negative control group receiving water, the frequency of micro nucleated polychromatic erythrocytes (MNPCE) in the experimental controls was significantly lower, and it was statistically lower than that of the positive control group receiving Cyclophosphamide.

Pyrostegia venusta exhibited no genotoxicity activity.

**Antimicrobial activity:**

The flower extract was tested for antimicrobial activity against twelve microorganisms. The extract of Pyrostegia venusta exhibited moderate antimicrobial activity against the following organisms: Bacillus subtilis is a type of bacteria. Staphylococcus epidermidis,

Staphylococcus pyogenes, Staphylococcus aureus, Escherichia coli, Micrococcus luteus,

Enterobacter aerogenes, Salmonella typhi, Pseudomonas aeruginosa, Candida albicans, Aspergillus niger, and Candida tropicana are among the bacteria that have been identified.

**Melanogenic activity:**

The melanogenic activity of hydroalcoholic extracts of Pyrostegia venusta leaves and flowers on murine B16F10 melanoma cells was recently investigated; both extracts, leaves (0.1; 0.3; 1 and 3 g/mL) and flowers (0.03 and 0.1 g/mL), increased melanin content in a concentration dependent manner after 4 days incubation on melanoma cells. Cell viability was also tested in murine B16F10 cells using the MTT (3-(4,5-dimethythiazol-2-yl)-2,5-diphenyl tetrazolium bromide) assay, which revealed that no cell death was detected at the same tested concentrations of both extracts. Both extracts were also tested in vitro for mushroom tyrosinase activity. Actually, neither extract was able to change the tyrosinase activity.

**CONCLUSION:**

Plants have tremendous therapeutic and economic value throughout the world. Pyrostegia venusta has numerous pharmacological effects, which are discussed in this review. Studies on this plant have revealed that it has a wide range of pharmacological properties with high medicinal value. It has been observed that almost all parts of the plants have been widely used as traditional or folk medicine for centuries. The study about Pyrostegia Venusta is still going on & will be published soon.

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