

UNVEILING THE POTENTIAL OF EPIPHYLLUM OXYPETALUM: A COMPREHENSIVE REVIEW

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ABSTRACT

Among the most frequently grown type of genus of ho, the epiphyllum oxypetalum (D C) of ho belongs to the cactus family. There are several traditional therapeutic use for this kind of night-blooming cereus. Traditional uses for plants include treating bloody mucus, coughing, uterine bleeding, no respiratory pathway, neutralizing blood clots and symptoms. Several types of chemicals, primarily glycosides as components saponins, steroid medications, phenols, proteins, resins, tannins, and terpenoids, have been documented to be present in the plant. Few pharmacological characteristics of this plant, including as antibacterial, anti-inflammatory, and antioxidant activity, have been.

KEYWORDS

- *Epiphyllum oxypetalum*
- Plant profile
- Pharmacological properties

INTRODUCTION

Nearly all civilizations employ medicinal herbs as a form of treatment. The Indian monument boasts an extensive range of ecosystems with a despicably developed plant species diversity. The base of traditional medicine is medicinal plants, which indicates that over 3.3 billion individuals frequently use them in less developed countries.^[1] Based on the latest estimates, a considerable part of the population in many developing countries largely depends on traditional healers and medicinal herbs to address their basic health needs. Besides that, the harvesting and production of a number of drugs have followed industrialized society's increasing reliance on the employment of medicinal herbs.^[2]

The Dutch Rollcactus, a Mexican and from Nicaragua, is commonly referred to as the Princess of the Dead or Queen of the Night, but is epiphyllum oxypetalum.^[3] It flowers in the night, and its flowers wilt before the daybreak. Although referred to as a night-blooming cereus sometimes, it is not the same as any of the other Cereaeae tribe genera more commonly referred to as night-blooming cereus, such as Selenicereus. All Cereus species are ground plants with night-blooming flowers, whereas Epiphyllum species tend to be epiphytic.^{[4][5]}

Pharmacognostic Characteristics

Epiphyllum oxypetalum is considered a decorative plant. It becomes a large white flower that blooms only one night. It is called night blooming cereus as a result.



Figure no: 1



Figure no: 2.

Table no. 1: Plant profile.

Growth Form	Perennial shrub. In the wild, this epiphytic cactus can reach a height of 6 meters and has many branches.
Habitat	Mostly found in temperate and tropical rain forests.
Morphological	Foliage - There are no takes off on this species. Or maybe, they create changed stems that take after clears out and have comparable purposes.
Characteristics	Stems - The broad, spherical stems that have been flattened are encircled by fleshy wings with a scalloped edge. The stems are ascending, branching, and upright. Primary stems are ligneous at the roots, flattened laterally, and terete up to 6 meters long. Secondary stems are dark green, oval, azarin, flat, strongly branched, extending up to 15-50×5-12 cm. ^[6]
	Flowers - The fragrant, star-shaped blooms, which measure 28 cm in length and 13 cm in width, are made up of 25–30 white, linear petals and are aromatic at night. The flowers open between 8 and 10 PM, are at their fullest between 12 and 3 AM, and close before daybreak. Infrequent flowering takes place. At the end of modified stems that resemble leaves, flower buds grow. Before flowering later in the evening, they enlarge gradually over a few hours ^[7]
	Flowering season - June-October
	Fruits - The rectangular, purplish-red fruits, which measure 16 between 5.7 cm and with seeds that measure 2 and 2.5 x 1.5 mm, seem to be uncommon.
Organoleptic Characteristics	The leaves have an ald texture, dark, light green, stringy taste and clear smell. Dry powder looks yellowish.
Microscopy	Thick mesophyll tissue, which isn't isolated into the sense of taste and wipe, shows up to be the cross area of the leaf. The epidermis shapes two to three layers of uniform cells. The stomata is parasite and now and then trichotomy, but the epidermis is nearly smooth with a few entertainers. Bodily fluid and bodily fluid channels fill the tissue of the takes off. The center bundle comprises of a center tissue comprising of a healing sheath, the lower eye zone, the internal layer interior, and expansive lean walled cells pressed with starch granules within the center of the vessel. Chlorophyll colors are accessible in mesophyll cells close the epidermis, but star-shaped cyspore precious stones (500 to 750 microns) happen in musophyll cells. Moreover, a few cells have lean precious stones that take after staff. The subcutaneous skin zone contains a few little bodily fluid tubes. A stomatic file of 1.582 has been found.
Cultivation	Epiphyllum oxypetalum is a fast-growing, easily-cultivated epiphyllum. Large specimens can yield many flower harvests in a single season, with blooms blooming from late spring to late summer. This kind of Epiphyllum is commonly grown.
Uses	Many Asian societies, especially those in Malaysia, Vietnam, and India, are aware of its therapeutic qualities. In traditional medicine, plants are often used to treat bleeding disorders, respiratory diseases, and pain and reduction in inflammation.

Taxonomic Classification**Table no. 2.**

Kingdom	Plantae
Sub Kingdom	Tracheobionta
Superdivison	Spermatophyta
Divison	Magnoliophyta
Class	Magnoliopsida
Order	Caryophyllales
Family	Cactaceae
Genus	Epiphyllum
Species	E.oxypetalum
Binomial name	Epiphyllum oxypetalum Haworth

Pharmacological study**Antioxidant activity**

Mahmad A et al.,(2022) study to antioxidant in methanolic extract of leaf E. oxypetalum showed the most marked antioxidant activity, with IC₅₀ value 14 µg/ml and percentage DPPH free radical inhibition of 56.09-73.11% at concentrations 16.5-1000 µg/ml. The extract also showed high Total Phenolic Content (TPC) of 179.86 ± 0.17 mg GAE/g and Total Flavonoid Content (TFC) of 75.07 ± 0.17 mg QE/g. These results indicate that the methanolic extract of E. oxypetalum leaf is a strong antioxidant, which is most probably due to its high content of phenolic and flavonoid compounds, and thus a good natural source for antioxidant use.^[8]

Rucha Dandekar et al., (2015) the study showed that the Epiphyllum oxypetalum leaves extract had considerable antioxidant activity. In the DPPH free radical scavenging assay, alcohol extract had maximum inhibition of 60.37±1.67% at 2000µg/ml and the aqueous extract had maximum inhibition of 34.23±0.88% at 2000µg/ml. For comparison, the reference drug ascorbic acid had maximum inhibition of 95.26±0.43% at 80µg/ml. In the hydrogen peroxide scavenging assay, the maximum inhibition of 43.76±0.97% was exhibited by the alcohol extract at 500µg/ml, whereas the aqueous extract exhibited maximum inhibition of 27.07±0.16% at the same concentration. The maximum inhibition of 90.64±1.15% was exhibited by ascorbic acid at 100µg/ml. Overall, from the study, it is evident that Epiphyllum oxypetalum leaves extract exhibits considerable antioxidant activity and that the activity of the alcohol extract is higher compared to the aqueous extract.^[15]

Antimicrobial activity

S. A. Baba et al.,(2012) The experiments were performed with the antibacterial activity of methanolic extracts of E. oxypetalum leaves, which had high antibacterial activity against grump-positive and gram-negative bacteria. The extract had a 1.5-3.6 mm zone of inhibition (ZOI) for a variety of microorganisms with maximum activity of 300 mg/ml. In particular, ZOI values were 2.8 mm for Staphylococcus aureus, 3.5 mm for Klebsiella pneumoniae, 3.3 mm for E. coli, and 1.8 mm for Candida albicans. These results are E. E. Methanol extract from Oxypetalam leaves can be a potential source

of broadband antibacterial measures.^[9]

Anti-inflammatory activity

Rucha Dandekar et al.,(2015) the research assessed the anti-inflammatory efficacy of Epiphyllum oxypetalum leaves extract in carrageenan-induced rat paw edema and in vitro. The findings indicated that alcohol and aqueous extracts of E. oxypetalum leaves have remarkable anti-inflammatory activity, with percentage inhibition of rat paw edema between 14.89% and 89.28% at varying doses (200-600 mg/kg). The highest percentage inhibition was seen at 600 mg/kg with 75.44% inhibition for the alcohol extract and 82.14% inhibition for the aqueous extract. In vitro analysis with membrane stabilization and protein denaturation assays indicated that both the extracts were efficient in stabilizing RBC membrane and preventing protein denaturation with maximum inhibition of 41.12% and 55.70% respectively at 300 µg/ml. The control drug, aspirin, had maximum inhibition of 77.55% and 72.10% respectively. The results indicate that E. oxypetalum leaves extract has high anti-inflammatory activity, which could be due to its capacity to stabilize membranes and prevent protein denaturation.^[10]

Nanoparticle biosynthesis and antibacterial activity

Paralika P et al.,(2014) the research carried out to silver nanoparticles (AgNPs) prepared from Epiphyllum oxypetalum leaves extract had strong antibacterial activity against P. acne, P. aeruginosa, and K. pneumoniae. Zone of inhibition was in the range of 12-12.66 mm for AgNPs alone, while it rose to 20.66-21.33 mm when in combination with vancomycin. The fold area increase was determined to be 0.184 for P. acne, 0.178 for K. pneumoniae, and 0.153 for P. aeruginosa. The findings show that AgNPs possess strong antibacterial activity, which is enhanced further when in combination with commercial drugs such as vancomycin, with the percentage increase in activity being 18.4%, 17.8%, and 15.3% respectively.^[11]

Anti-cancer activity

Naik SA et al.,(2021) investigation of Epiphyllum oxypetalum (DC.) absolute ethanol extract reported significant anticancer activity against COLO205 cell line with an IC₅₀ of 165.61 µg/ml. The extract exhibited

dose-dependent decrease in viable cell count with a maximum of 32.19% inhibition at a concentration of 100 µg/ml. The extract in in-vivo experiment significantly reduced number of aberrant crypt foci (ACF) and increased hematological values, viz., RBC (6.133 million/cu mm), WBC (10083/cu mm), and hemoglobin (14.13 gm/dl) level. The extract exhibited antioxidant activity in the form of increased superoxide dismutase (19.88 U/mg of protein), catalase (13.83 U/mg of protein), and reduced glutathione (12.13 nmol/mg) levels. The histopathological results supported anticancer activity and exhibited nearly normal mucosa with reduced hyperplastic cells and ACF count. The present study concludes that Epiphyllum oxypetalum (DC.) absolute ethanol extract is a good candidate to treat colon cancer with a proposed dose of 200mg/kg.^[12]

Antidiabetic activity

The anti-labeling activity of methanol extracts from E. oxypetalum showed α- amylase inhibition. α- Amylase is advantageous as a hypoglycemia, particularly in the treatment of hyperglycemia in patients with type 2 diabetes. The enzymes slow carbohydrates, slow carbohydrate digestion time, cause delays in glucose absorption rates, and thus reduce post-meal increases in plasma-Glucose⁴⁵. Secondary metabolite compounds such as phenols, flavonoids, alkaloids, and steroids are anti-labeled.^{[13][14]}

Upendra R S et al.,(2012) study revealed that leaves of Epiphyllum oxypetalum have high nutritive values, i.e., 14 mg/g protein, 4.6 mg/g fatty acids, and 0.18 mg/g vitamin niacin, without the presence of carbohydrates. Phytochemical screening revealed the existence of saponins, phenolic compounds, steroids, glycosides, tannins, terpenoids, and resins, and lack of reducing sugars, alkaloids, flavonoids, sterols, phlobatanins, and acidic compounds. Leaf extracts exhibited broad-spectrum antibacterial activity with maximum zone of inhibition of 14mm against Escherichia coli, Staphylococcus aureus, and Klebsiella pneumonia, and 12mm against Bacillus subtilis. The extracts did not inhibit fungal pathogens. The study concludes that leaves of Epiphyllum oxypetalum can be a good source as a biotherapeutic agent, with application as a diet supplement for diabetic patients and as a natural antibacterial agent.^[16]

Wound healing activity

Dwita LP et al., (2019) study showed that topical application of Wijaya Kusuma extract enhanced wound healing in diabetic mice. The WE10 and WE20 groups exhibited significant wound contraction ($p < 0.05$) when compared with the diabetic control (DC) group, with wound contraction percentages at day 10 being 25.03% (WE10) and 30.16% (WE20), and at day 14 being 53.50% (WE10) and 68.86% (WE20). The WE20 group exhibited equal wound contraction with the non-diabetic control (N-DC) group. Histological examination revealed increased macrophage density in WE10 and WE20

groups on day 3, with significant macrophage density loss on day 7 in WE20 group. Fibroblast density was also greater in WE10 and WE20 groups with peak on day 10. The study shows that Wijaya Kusuma extract enhances wound healing in diabetics by enhancing inflammation and proliferation phases, with the best activity being with the 20% concentration of the extract.^[17]

CONCLUSION

Epiphyllum oxypetalum or Wijaya Kusuma is a pharmacologically important plant with multi-potential pharmacological activities, ranging from antioxidant, antimicrobial, to anti-inflammatory, anti-cancer, and antidiabetic. High flavonoid and phenolic contents are responsible for its antioxidant activities, and it has exhibited antimicrobial activity against a variety of microorganisms. The plant has also exhibited anti-inflammatory, anti-cancer, and antidiabetic activities, which suggest it has the potential as a natural drug for diabetes and cancer. Carbohydrate-rich, with protein, amino acids, and other constituents, Epiphyllum oxypetalum is a non-toxic, safe plant of immense therapeutic importance. Its impressive profile demands a closer look at its full potential to benefit society.

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