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Review Article

An Update on Biological Activities of Medicinal Plant *Ipomoea Quamoclit* Linn

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ABSTRACT

Ipomoea quamoclit is originally American plant and reached Europe by the 1550s. It is commonly known as cypress vine, cardinal creeper, is a species of vine in the family convolvulaceae and the vines are recorded from both Europe and India in the 1500s and were taken to both places for its medical uses. It is a medicinal plant traditionally used to treat haemorrhoid's, ulcers, diabetes, cancer, inflammation and microbial disease. Recent studies have renewed scientific interest in this species due to its rich phytochemical composition, including alkaloids, flavonoids, glycosides, saponins, and phenolic compounds. This review provides a comprehensive update on the documented biological activities of *I. quamoclit*

INTRODUCTION

The exploration of medicinal plants for therapeutic purposes has been an integral part of traditional and modern medicine. Among these, *Ipomoea quamoclit* Linn., commonly known as cypress vine, is a fast-growing annual climber belonging to the family Convolvulaceae. Traditionally used in various folk medicinal systems, this plant is noted for its attractive foliage and bright red flowers, as well as its rich pharmacological profile. *Ipomoea quamoclit* has drawn scientific attention due to its

diverse biological activities, which include antioxidant, antimicrobial, anti-inflammatory, hepatoprotective, and antiparasitic properties. The presence of phytoconstituents such as flavonoids, alkaloids, tannins, saponins, and phenolic compounds is believed to contribute to its broad therapeutic potential. Despite its long-standing traditional use, comprehensive scientific studies on its pharmacological actions are still emerging. This review aims to provide an updated overview of the biological activities of *Ipomoea quamoclit*, highlighting recent findings on its

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pharmacological properties, phytochemical composition, and potential applications in modern medicine. The objective is to support further research and development of this plant as a valuable source for novel therapeutic agents.

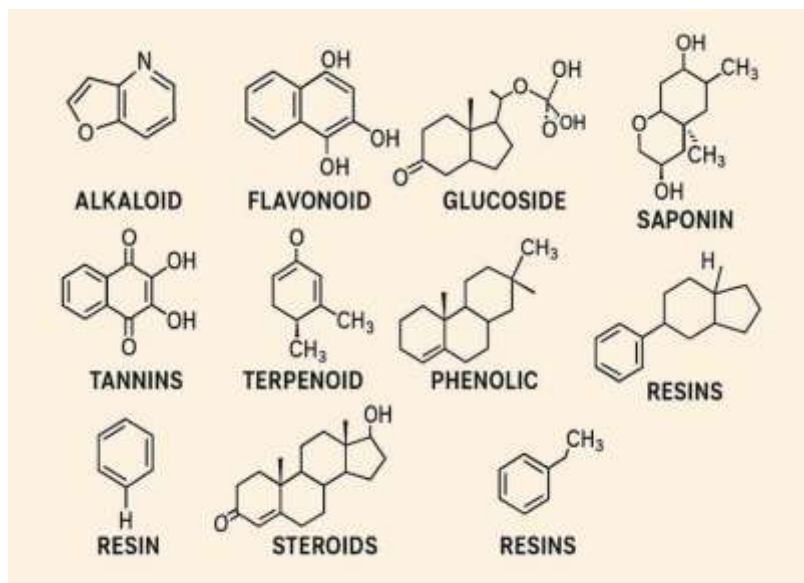
a) Synonyms: Ipomoea quamoclit, Quamoclit pennata, star glory, Indian pink, cardinal creeper, and hummingbird vine.

b) Family: Convolvulaceae

c) Chemical constituents:

Ipomoea quamoclit Linn., commonly known as cypress vine, contains a variety of phytochemicals that contribute to its medicinal potential.

Phytochemical screening of different parts of the plant has revealed the presence of alkaloids, flavonoids, glycosides, saponins, terpenoids, phenolic compounds, and resins. The leaves are particularly rich in flavonoids and tannins, which are known for their antioxidant and anti-inflammatory properties. Quamocliteine, a unique alkaloid, has been isolated from the plant, along with several glycosidic compounds. The presence of steroids and triterpenoids further supports its traditional use in managing various ailments. These constituents collectively contribute to the pharmacological activities exhibited by the plant, such as antimicrobial, anti-inflammatory, and antioxidant effects.



2.MATERIAL & METHOD

a) Collection of plant material

The aerial parts and roots of *Ipomoea quamoclit* Linn., commonly known as cypress vine, were collected from local botanical gardens and wild habitats in their natural growing season. Plant identification was confirmed by a qualified taxonomist, and a voucher specimen was deposited in a recognized herbarium for future reference. The collected plant material was

thoroughly washed with distilled water to remove soil and other foreign particles, then shade-dried at room temperature for 7–10 days to preserve phytochemical integrity. The dried material was then coarsely powdered using a mechanical grinder and stored in airtight containers under dry, cool conditions until further use for phytochemical and pharmacological studies

b) Extraction



The aerial parts (leaves, stems, and flowers) of *Ipomoea quamoclit* Linn were collected, cleaned, and shade-dried to preserve phytoconstituents. The dried material was then coarsely powdered using a mechanical grinder and stored in an airtight container. Extraction was carried out using the soxhlet apparatus. About 100 g of the powdered plant material was extracted successively with solvents of increasing polarity such as petroleum ether, chloroform, ethanol, and water, each for 6–8 hours. The solvents were selected based on their ability to extract different classes of phytochemicals. Each extract was filtered and concentrated under reduced pressure using a rotary evaporator and then dried in a desiccator. The dried extracts were stored at 4°C in airtight containers until further phytochemical and biological activity evaluation

3. Ethnomedicinal Use

Ipomoea quamoclit Linn, commonly known as Cypress vine in traditional Indian systems, has been widely used in ethnomedicine across various cultures. Traditionally, different parts of the plant, including the leaves, flowers, and roots, are employed in the treatment of several ailments. In folk medicine, the leaves are used as a poultice for treating hemorrhoids, skin infections, and inflammation. Decoctions prepared from the plant are administered orally for the treatment of fever, worm infestations, and gastrointestinal disturbances. In tribal communities of India, the plant is also used for treating respiratory ailments like asthma and bronchitis due to its soothing and anti-inflammatory properties. The seeds are considered purgative and are occasionally used in traditional remedies for constipation and abdominal pain. Moreover, in some cultures, the plant is applied externally for treating insect bites and wounds due to its antiseptic potential.



4. Biological Activity

a) Anti-cancer activity

The ethanolic extract of *Ipomoea quamoclit* has significant cytotoxic activity. anti-proliferative effect of the dichloromethane, methanol, hexane and ethyl acetate extracts of leaves of *Ipomoea quamoclit* on HeLa (cervix adenocarcinoma), MCF-7 (breast adenocarcinoma), CNE-1 (nasopharyngeal carcinoma), 3T3 (normal mouse fibroblast) and HT-29 (colorectal adenocarcinoma) cell lines. Among different solvent, the methanol extract of *Ipomoea quamoclit* leaf against the tested cell lines was shown to possess the highest anti-proliferative activity.

b) Anti- oxidant activity

Antioxidant Activity of *Ipomoea quamoclit* Linn., a medicinal plant from the Convolvulaceae family, has shown significant antioxidant potential in various studies. The antioxidant activity is attributed primarily to the presence of phenolic compounds, flavonoids, alkaloids, and other phytochemicals known for scavenging free radicals and reducing oxidative stress for the DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging assay has been used to evaluate the antioxidant activity of plant extracts. Methanolic and ethanolic extracts of *I. quamoclit* showed strong antioxidant potential in a dose-dependent manner. The presence of bioactive

phytoconstituents like flavonoids, tannins, and phenolic acids plays a major role in neutralizing free radicals. These antioxidants help prevent lipid peroxidation, DNA damage, and cellular oxidative stress, making the plant promising for therapeutic use in oxidative stress-related disorder.

c) Anti-fungal activity

Ipomoea quamoclit Linn has demonstrated significant antifungal potential in several preliminary studies. Various extracts of the plant, particularly the methanolic and ethanolic leaf and stem extracts, have been evaluated against common pathogenic fungi such as *Candida albicans*, *Aspergillus niger*, and *Trichophyton rubrum*. These studies revealed dose-dependent zones of inhibition, indicating that the plant contains bioactive constituents capable of impeding fungal growth. The antifungal efficacy is primarily attributed to the presence of secondary metabolites such as flavonoids, alkaloids, tannins, phenolics, and glycosides. These phytoconstituents are known to disrupt fungal cell membranes, inhibit ergosterol synthesis, and impair fungal respiration, thereby leading to cell death. Overall, the results suggest that *Ipomoea quamoclit* holds promise as a natural antifungal agent and may serve as a lead for the development of novel phytotherapeutics in the treatment of fungal infections. However, further in-depth pharmacological and toxicological investigations are needed to validate its clinical applicability.

d) Anti-inflammatory activity

Studies on *Ipomoea quamoclit* Linn have demonstrated significant anti-inflammatory activity, attributed to its rich phytochemical composition including flavonoids, alkaloids, and phenolic compounds. Experimental models such as carrageenan-induced paw edema in rats showed that extracts of *I. quamoclit* effectively reduced

inflammation in a dose-dependent manner. This suggests the plant's potential to inhibit the release or activity of inflammatory mediators like prostaglandins and cytokines. These findings support its traditional use in managing inflammatory conditions and warrant further pharmacological and clinical investigations.

e) Anti-diabetics activity

Ipomoea quamoclit Linn. has demonstrated significant antidiabetic potential in various preclinical studies. The plant's extracts, particularly ethanolic and methanolic leaf extracts, have shown a marked reduction in blood glucose levels in streptozotocin (STZ)-induced diabetic animal models. The hypoglycemic effect is attributed to the presence of bioactive compounds such as flavonoids, alkaloids, and phenolic compounds, which are known to improve insulin sensitivity and enhance glucose uptake by peripheral tissues. Additionally, the antioxidant properties of these phytochemicals may protect pancreatic β -cells from oxidative stress, thereby contributing to better glycemic control. These findings suggest that *Ipomoea quamoclit* could be a promising natural source for the development of antidiabetic therapeutics.

f) Insecticidal activity

Ipomoea quamoclit Linn has demonstrated promising insecticidal properties, making it a potential candidate for botanical pest control. Various parts of the plant, particularly its leaves and seeds, contain phytoconstituents such as flavonoids, alkaloids, and saponins that are believed to exert toxic effects on a range of insect pests. Extracts of *I. quamoclit* have shown significant larvicidal activity against mosquito larvae, particularly *Aedes aegypti* and *Culex quinquefasciatus*, indicating its utility in vector control. Additionally, the plants bioactive



compounds may disrupt insect development or feeding behavior, suggesting its broader application in agricultural pest management.

CONCLUSION

Ipomoea quamoclit Linn, a traditionally valued medicinal plant, exhibits a broad spectrum of pharmacological properties including antioxidant, antimicrobial, anti-inflammatory, hepatoprotective, and anthelmintic activities. The diverse therapeutic potential of this plant is attributed to the presence of various phytoconstituents such as flavonoids, alkaloids, tannins, and glycosides. Despite its widespread use in folk medicine, scientific validation and clinical trials remain limited. Therefore, further in-depth studies focusing on isolation of active compounds, mechanism of action, safety evaluation, and formulation development are essential to harness its full medicinal potential. This review reinforces the importance of *Ipomoea quamoclit* as a promising candidate in the development of plant-based therapeutic agents.



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