



**INTERNATIONAL JOURNAL OF
PHARMACEUTICAL SCIENCES**
[ISSN: 0975-4725; CODEN(USA):IJPS00]
Journal Homepage: <https://www.ijpsjournal.com>



Review Article

Review On Bryophyllum Pinnatum

**Mahendra Siddheshwar Shendkar^{*1}, Lahoo Palve², Leena Parkhi³, Lalit Ambhore⁴,
Manish Bhosale⁵, Snehal D. Kothavale⁶, K. V. Otari⁷**

¹⁻⁵Navsahyadri Institute of Pharmacy S. No. 69-71, Naigaon (Nasrapur Tal. Bhor, Dist, Maharashtra 412213

⁶Professor, Navsahyadri Institute of Pharmacy S. No. 69-71, Naigaon (Nasrapur Tal. Bhor, Dist, Maharashtra 412213

⁷Principal, Navsahyadri Institute of Pharmacy S. No. 69-71, Naigaon (Nasrapur Tal. Bhor, Dist, Maharashtra 412213

ARTICLE INFO

Received: 30 March 2024

Accepted: 03 April 2024

Published: 06 April 2024

Keywords:

Bryophyllum pinnatum

DOI:

10.5281/zenodo.10935311

ABSTRACT

Bryophyllum pinnatum is widely used in Ayurvedic system of the medicine as astringent. The plant is widely use in traditional medicine for treatment of various ailments and well known for its haemostatic and wound healing properties. It is an indigenous and exotic plant. plant is found naturally through the country. It is succulent, herb, leaves are variable size and leaflets are elliptic. The leaf extract of Bryophyllum pinnatum has been reported to possess antihypertensive, antiulcer properties. Herbal leaves of Bryophyllum pinnatum, family Crassulaceae possesses antioxidant, antimicrobial, antitumor, anti-inflammatory, antiviral and antiulcer properties.

INTRODUCTION

The major use of herbal medicines is for health Promotion and therapy for chronic, as opposed to life-Threatening, conditions. However, usage of traditional Remedies increases when conventional medicine is Ineffective in the treatment of disease, such as in Advanced cancer and in the face of new infectious Diseases. Traditional systems of medicine continue to be widely practised on many accounts. Population rises, inadequate supply of drugs, prohibitive cost of treatments, side effects

of several synthetic drugs and development of resistance to currently used drugs for infectious diseases have led to increased emphasis on the use of plant materials as a source of medicines for a wide variety of human ailments. The leaves of B. pinnatum have a variety of uses in the traditional system of medicine in India. They are eaten for diabetes, diuresis, dissolving kidney stones, respiratory tract infections, as well as applied to wounds, boils, and insect bites. It is useful for

***Corresponding Author:** Mahendra Siddheshwar Shendkar

Address: Navsahyadri Institute of Pharmacy S. No. 69-71, Naigaon (Nasrapur Tal. Bhor, Dist, Maharashtra 412213

Email ✉: mahendrashendkar19@gmail.com

Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.



preventing alcoholic, viral and toxic liver damages.



Fig no 1 Bryophyllum pinnatum

OFFICIAL NAMES OF BRYOPHYLLUM PINNATUM:

- English: Kalanchoe pinnata, Bryophyllum pinnatum, Life Plant, Mother of Thousands, Miracle Leaf.
- Hindi: Jakh Me Hayat, Panfuti.
- Sanskrit: Parnabija.
- Gujarati: Ghaymaari.
- Telgu: Simahmudu.
- Tamil: Ranakalli.

BIOLOGICAL SOURCE:

Bryophyllum pinnatum (syn. Kalanchoe pinnata) is a succulent perennial plant native to Madagascar that was introduced in anthroposophic medicine in the early 20th century.

GEOGRAPHICAL SOURCE:

Bryophyllum pinnatum is native to Madagascar and has become naturalized in tropical and subtropical areas, inhabiting warm and temperate climates from sea level to 2,600 m (8,500 ft.), occupying sites on rock in tropical evergreen and dry deciduous forests, as well as montane forests. It is found in parts of Asia, Africa, Australia, New Zealand, the West Indies, Bermuda, Macaronesia, the Mascarenes, Brazil, Suriname, the Galapagos Islands, Melanesia, Polynesia, and Hawaii.

CHEMICAL CONSTITUTENTS:

Bufadienolide compounds isolated from Bryophyllum pinnatum include bryophillin A, bersaldegenin-3-acetate, and bryophillin C. Bryophillin C also showed insecticidal properties. Phytochemical studies of Kalanchoe pinnata have identified the presence of triterpenes, steroid, phenanthrene, flavonoid, flavones, chalcones, taraxasterol, auronones, phenolic acid, caffeic acid, syringic acid, malic, oxalic and ferulic acid.

CULTIVATION, COLLECTION AND MARKETING OF CRUDE DRUG:

In temperate regions, Kalanchoe pinnata is grown as an indoor ornamental plant. Like most succulents, it cannot survive hard frost and will not thrive in environments in which the temperature drops below 10 °C (50 °F). It favours well-drained soil, the roots being otherwise susceptible to rot. In the tropics, K. pinnata is grown outdoors in gardens, from which it may escape to become naturalised - often as an invasive weed.



PROPAGATION:

- Bryophyllum can be replicated using either a portion of its stem or its leaves by vegetative propagation.
- In their margins, the leaves of a bryophyllum plant have unique kinds of buds, or these terms can be distinguished from the leaves that fall to the ground and then go to grow new plants of bryophyllum.

- Along with the leaf, the birds can also drop to the ground and then go to grow new plants. Sometimes we can see new plants right before a leaf drops off from a biofilm plant. If such a mature leaf of the bryophyllum plant falls on the ground, then each plantlet can develop into a new plant.

MORPHOLOGY AND MACROSCOPY:

Bryophyllum pinnatum is a succulent glabrous herb with a height of 0.3-1.2m.

Stem:

The younger stems of Bryophyllum pinnatum are reddish speckled with white and older one are light coloured, the stems are obtusely four angled. The stems are upright, fleshy, and hairless.

Leaves:

Lower leaves are simple or compound in nature and the upper leaves are 3-5/7 foliolate with long petioled. The petioles are united by a ridge around the stem. The leaflets are ovate or elliptic with crenate or serrate margin. The leaves are green and yellowish-green in colour. The flowers are borne on a stalk, about 10-25 mm long. The plantlets are produced mainly when the leaves become detached from the stem.

Flower:

The flowers are pendent in large spreading panicles with opposite stout branches, pedicles are slender. Flowers are mainly bell-shaped, drooping and are arranged in branched clusters at the tip of the stem. The flowers are yellowish green or pale green coloured prominent sepals. Flowers are mainly produced during winter and spring.

AYURVEDIC PROPERTIES:

Rasa : Kashaya, Amla

Guna : Laghu

Virya : Sheeta

Vipaka : Madhura

Doshagnata : Vatakaphahara

Karma : Ashmarighna, Vranaropaka, Mootrala, Shonita

PHARMACOLOGICAL USES:

Bryophyllum pinnatum leaves are used in complementary medicine to treat intestinal issues, ulcers, arthritis, inflammation, conjunctivitis, menstrual disorders, migraines, wounds, and dysenter as well as kidney and urinary bladder stones. The leaves are somewhat poisonous to insects, according to Ayurveda. However, the bark of this plant is poisonous, alexipharmic, and bowel-mordant in Unani. This plant's leaves are also used to treat a variety of microbiological illnesses. Below are a few of the key pharmacological characteristics of Bryophyllum pinnatum.

Antimicrobial activity:

The antimicrobial activity of Bryophyllum pinnatum leaves due to the presence of these two compounds may contribute to wound healing, eliminate infections, and there by resulting to cell proliferation.

Anti-ulcer activity:

The studies on the methanolic extract of B.pinnatum leaves shows inhibition in the development of variety of types of acute ulcers induced in the stomach and duodenum of rats and guinea pigs.

Antileishmanial activity:

Bryophyllum pinnatum consist of flavonoids like quercetin, leuteolin was recently described as antileishmanial drug with low toxicity. Presence of quercetin aglycon type structure and a rhamnosyl unit linked at C-3 is important for antileishmanial activity.

Antihelmintic activity:

Helminthic infection is one of the most common infections in man, affecting a large population. The tannins present in the Bryophyllum pinnatum shows antihelmintic activity.

Anticancer activity:

The ethanolic extract of Bryophyllum pinnatum shows anticancer activity. Various studies show that the bufadienolides present in B.pinnatum is a



potent chemopreventive agents. Through MTT assay on the highly metastatic human HT-1080 fibrosarcoma cell line showed that the methanolic, aqueous, and methanolic-aqueous extracts have mild antiproliferative activity.

Wound healing activity:

The wound healing property of *Bryophyllum pinnatum* leaf extracts in petroleum ether, water, and alcohol in the dose of 400mg/kg orally on healing of excision wound, re-sutured incision and dead space wound models in Albino rats for 10 consecutive days.

Uterine Contractility:

The studies using *Bryophyllum pinnatum* shows that it increases contraction frequency by 91% at constant amplitude and inhibited oxytocin stimulated contraction by 20% at constant amplitude with slightly decreased frequency.

Hepatoprotective activity:

It was determined by in-vivo and in-vitro histopathological study of rat by oral route of administration. The ethanolic extract of *Bryophyllum pinnatum* also shows the hepatoprotective activity.

Immunosuppressive effect:

The aqueous extract of leaves of *Bryophyllum pinnatum* shows significant inhibition of cell-mediated and humoral immune response in mice.

Neuroprotective activity:

The aqueous leaf extract of *Bryophyllum pinnatum* shows neuropharmacological activities in mice.. The *Bryophyllum pinnatum* extract also showed a marked sedative effect as evidenced by a significant reduction in gross behaviour and potentiation of pentobarbitone-induced sleeping time.

Antihypertensive activity:

The aqueous and methanolic leaf extract of *Bryophyllum pinnatum* shows antihypertensive activity in arterial blood pressure and heart rates of

normotensive and spontaneously hypertensive rats.

Neuropharmacological action:

The aqueous extract of *Bryophyllum pinnatum* shows minor anticonvulsant effect by delaying seizure produced by strychnine and picrotoxin.

EXTRACTION OF BRYOPHYLLUM PINNATUM:

Procedure:

The extraction procedure was carried out in soxhlet apparatus with 50 grams of coarse powder of the leaves of *bryophyllum pinnatum* using hydro-alcohol (250ml), and distilled water (250ml) separately for 24 hrs and filter. The concentrated extract was then evaporated to dryness with the help of electronic water bath at temperature 60°C. The dried extract was stored at 4°C in air free sterile container in refrigerator for preliminary phytochemical analysis.



MARKETED PREPARATION:

Shampoo:

Procedure:

1. The herbal shampoo was formulated by simple mixing process.
2. Dried extract of Bryophyllum pinnatum were added methyl paraben.
3. Further glycerin and sodium lauryl sulfate is added and mixed.
4. At last the perfume and the water q. s. to make 100ml is added to the mixture.
5. The resulting liquid was mixed using mortar and pestle.
6. The resultant formulation was poured in container and stored.

Lozenges:

Procedure:

1. Combine sugar, corn syrup and water by heating
2. Addition of drug to this candy matrix
3. Addition of polymer, color, flavour etc.
4. Poured into mould of desired shape and size to forming a candy.
5. Sealing and wrapping of candy in polyethylene wrapping.

CONCLUSION:

The B. Pinnatum is widely used divine herb. Modern pharmacological studies have generally confirmed the traditional use of B. Pinnatum and their extracts in ailments: inflammations, ulcers, fungal, viral and microbial infections, an impaired immune system, diabetes mellitus, spasms and insecticidal properties. It is believed that detailed information as presented in this review on its phytochemical constituents and various biological properties of extracts and the constituents might provide incentive for evaluation of the use of the plant in medicine and in agriculture. Extracts and fractions tested on mice and rats showed significant analgesic, anti-allergic, anti-anaphylactic, anti-inflammatory, anti-leishmanial, anti-tumorous, anti-ulcerous, antibacterial,

antifungal, antihistamine, antiviral, CNS depressant, febrifuge, gastro protective, immunosuppressive, immunomodulator, insecticidal, muscle relaxant, sedative results without adverse side effects. Some small companies in India and Amazon are using B. Pinnatum as raw materials for phytochemicals.

REFERENCES

1. R.N. Chopra, S.L. Nayar, and I.L. Chopra. Glossary of Indian Medicinal Plants. NISCIR (CSIR). New Dehli. 42: (2002).
2. R.P. Rastogi, and B.N. Mehrotra. Compend. Indian Med. Plants. PID. New Dehli. 2: 112 (1991).
3. S.A. Da Silva, S.S. Costa, S.C. Mendonca, E.M. Silva, V.L. Moraes, and B. Rossi Bergmann. Therapeutic effect of oral Kalanchoe Pinnata leaf extract in murine leishmaniasis. Acta Tropica. 60 (3): 201-210(1995).
4. Mehta and J.U. Bhat. Studies on Indian Medicinal plant II, bryophyllin, a new antibacterial substance from leaves of Bryophyllum, Calycinum Salsib. J university Bombay. 21: 21-25(1952).
5. P. Siddharta, and A.K.N. Chaudhuri. Further studies on the Anti-inflammatory profile of the Methanolic Fraction of the fresh leaf extract of Bryophyllum Pinnatum. Fitoterapia. 63(5): 451-459 (1992).
6. Júlia M. Fernandes et al, 'Kalanchoe laciniata and Bryophyllum pinnatum: an updated review about ethnopharmacology, phytochemistry, pharmacology and toxicology; Revista Brasileira de Farmacognosia 29 (2019) 529–558.
7. Laure Brigitte Kouitcheu Mabeku et al, 'Treatment of Helicobacter pylori infected mice with Bryophyllum pinnatum, a medicinal plant with antioxidant and antimicrobial properties, reduces bacterial



- load,' *Pharmaceutical Biology*, 2017 Vol. 55, NO. 1, 603–610.
8. Reddy K.V., Ashish Yachawad, 'Overview on recent extraction techniques in bioanalysis' *Int. Res. J. Pharm.* 2016;7(2):15-24.
9. Farrukh Aqil et al, 'Broad-spectrum antibacterial and antifungal properties of certain traditionally used Indian medicinal plants', *World Journal of Microbiology and Biotechnology* August 2003, Volume 19, Issue 6, pp 653–657.
10. Sad, Sadman (12 September 2020). "Goethe plant: A Unique Medicinal Plant". *The Green Page*. Retrieved 16 November 2023.

HOW TO CITE: Mahendra Siddheshwar Shendkar, Lahoo Palve, Leena Parkhi, Lalit Ambhore, Manish Bhosale, Snehal D. Kothavale, K. V. Otari, Review On *Bryophyllum Pinnatum*, *Int. J. of Pharm. Sci.*, 2024, Vol 2, Issue 4, 380-385. <https://doi.org/10.5281/zenodo.10935311>

