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Review on *Bryophyllum Pinnatum*

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Abstract: ***Bryophyllumpinnatum is perennial herb growing widely and used in folkloric medicine in China, India &Australia. The local people of southern India and Bengal use this plant for the treatment of kidneystones diseases as a source of Pashanabheda, which is usually referred to as parnabeeja, a member of Crassulaceae. Mostly, this plant is one meter in height, with opposite glabrous leaves (with 3 - 5 deeply crenulated, fleshy leaflet). The leaves are frequently used for an array of human disorder including hypetension, dysentery, vomiting. Acute inflammation. The leaves are also used for ear disease. Bryophyllumpinnatum springs from greek word Bryo means to sprout and phyllon means leaf. The physicochemical study shows presence of alkaloid, flavonoid, lipids, phenols, glycoside, steroids, bufadienolide and organic acid are reported. It is widely used in treatment of hemostatic and wound healing. [11]The previous pharmacological studies showed that it exerted many pharmacological effects including anticancer, antibacterial, anthelmintic, antiprotozoal, neurologica (sedative and anticonvulsant), anti - inflammatory, analgesis, diuresis, anti - peptic ulcer and other pharmacological effects. The present review is designed to highlight the chemical constituents and pharmacological effects of Bryophyllumpinnatum.***

Keywords: *Bryophyllumpinnatum*, secondary metabolites, pharmacological studies

1. Introduction

Plants have the property to synthesize a good sort of chemical compounds that are wont to perform important biological functions. Globally, about 60% of the healthcare products available in markets are known to be derived from plant origin. In India, medicinal plants are widely used by the people as: folk remedies pharmaceutical preparations and also in different indigenous system of medicine like siddha, Unani and Ayurveda for the treatment of various diseases. About 80% of the planet population relies on plants and their products for primary health care. Awareness of plant based medications and increasing worldwide and hence there are high acceptance and demand.

The secondary metabolites which are obtained from different parts of *B. pinnatum* plant such as alkaloid, flavonoid, tannin, glycoside, phenolic compounds, which have therapeutic value. The pharmacological studies are reviewed and discussed, that specialize in that different extracts from *B. pinnatum* plant are found to posses pharmacological activities as CNS [1] depressant, immunomodulator, antimicrobial, Analgesic, antiviral, muscle relaxant sedative. [6]

1) Plant description: -
Plant name: *Bryophyllumpinnatum*
Synonym: KalanchoePinnata
Family: Crassulaceae

2) Common name: Love plant, Pife plant, Canterberry bells, Cathedral bells, Parnabeeja etc.

3) Vernacular name
Sanskrit: Pashanabheda
English: Air plant
Hindi: Zakhmhaiyat, Patharchoor
Kannada: Gandukalinga
Tamil: Malaikalli, Ranakalli
Telugu: Ranapaluka
Marathi: Gayamari (Panphuti)

4) Taxonomical Classification [2]
Kingdom: Plantae - Plants
Sub kingdom: Tracheobionta - Vascular plants
Division: Spermatophyta - seed plants
Subdivision: - Magnoliopsida – Dicotyledons
Subclass: Rosales
Family: Crassulaceae – stonecrop
Order: Saxifragels
Genus: *Bryophyllum*

5) AyurvedicProperties [14]: -
Guna (Quality): Laghu, Ruksha
Rasa (Taste): Kshay, Amal
Vipak (Metabolism): Madhur
Virya (Potency): Sheet
Prabhav (Impact): Rakt - stambhan

6) Geographical indication: -
It is perennial herb growing widely and used in folkoric medicine in tropical Africa, Tropical America, India China Australia New Zealand Philippines the plant growth all over India in hot and moist areas especially in Bengal and Uttarakhand.

7) Microscopical character [6]: -
It is generally 1 – 1.5 m in height and having the stem is hollow for angled and usually branched. Leaves are opposite in direction 10 - 20 cm long. The lower leaves are simple whereas the upper ones 3 - 7 foliate and are long petiole. The leaves are furnished with rooting vegetative birds inflorescence terminal paniculate 10 - 40 cm. Flowers are mainly bell like pendulous. Root was 6 - 9 cm in length, Calyx tubular, 13 cm; base sparsely ciliate; nectar scales oblong, lobes ovate lanceolate; stamens inserted basally on corolla; follicles included in calyx and corolla tube.

Bryophyllumpinnatum

8) Pharmacological activities

- **Herbal Tonic: -** The plant is good sources of vitamin C riboflavin, thiamine and niacin. Natural vitamin C is significant for the body performance that it normal for formation of matrix throughout the body including collagen matrix and tooth dentine. The function of vitamin C accounts for its normal wound healing property as a result the plant is employed in herbal medicine for the treatment of cold and other diseases like prostate cancer. [3] According to the callus of B. pinnatum plant contain malic acid, tocopherol and Quinones [4].
- **Anti - bacterial activity: -** The presence of phenolic compounds in Bryophyllumpinnatum as confirmed by suggest that the plant has antibacterial potential against bacterial pathogens. Bryophyllumpinnatum extract are able to kill bacteria are generally referred as antibiotics they can be applied on skin, taken intravenously or taken in orally (through the mouth) [5]
- **Anti - cancer activity: -** Bryophyllumcompound was isolated from B. pinnatum has anticancer activity against cancer cells.
- **Nephrotoxicity activity: -** The nephroprotective activity was studied by gentamicin induced nephrotoxicity in rats. The antioxidant and oxidative free radical scavenging activity was responsible for this activity. The renal calculi was also treated with the extract of leaves of B. pinnatum, as compared with standard compound. [6]
- **Anti - fungal and anti - inflammatory activity: -** The partially roasted leaves are used externally for skin fungal infections and inflammations.
- **Anti - viral activity: -** The leaf infusion is an internal remedy for mild viral fever.
- **Hepato protective activity: -** The plant has hepatoprotective activity and is also used to increased vascular integrity. Leaf juice is employed within the treatment of chronic coughs, bronchial affections, dysentery, jaundice and gout problem. [7]

9) Chemical constituent

The plant leaves contain alkaloid, flavonoid, phenolic compound saponin, glycosides, macro elements like magnesium, calcium potassium, sodium, phosphorus, micro elements like iron and zinc, vitamin, ascorbic acid, riboflavin, thiamine. It also containssyringic acid caffeic acid, 4 - hydroxy 3 - methoxycinnamic acid, 4 - hydroxybenzoic acid, protocatechuic acid.

10) Reproduction and Dispersal: - This plant reproduces by seed and also produces plantlets along the edges of it's leaves.

Discussion

The phytochemical screening revealed the Presence of steroids, terpenoids, flavonoids, Phenolics, tannins, alkaloids and glycosides, Carbohydrates, proteins. The petroleum ether and Chloroform extracts of the powdered leaves and Stems of*Bryophyllumpinnatum* showed the Presence of steroids and terpenoids. The ethyl Acetate extract responded positively to the tests for Steroids, terpenoids, phenolics and tannins. Ethanolic extract of the leaves produced positive Tests for flavonoids, steroids, terpenoids, Phenolics, tannins, alkaloids and glycosides. Aqueous extract showed presence of carbohydrate and protein. [8, 9]

The aqueous extract of *Bryophyllumcalycinum* Salisb leaves were showed anti - inflammatory and antidiabetic activity. [10] The saline leaf extract of Bryophyllumcalycinum Salisb was showed neuropharmacological activities in mice. [11] The roots of K. pinnata were subjected to Petroleum ether, chloroform, methanol and Aqueous solvent respectively for extraction And in vitro evaluation of antimicrobial Activity was done against StaphylococcusAureus, Escherichia coli, Pseudomonas Aeruginosa and Candida albicans. The extract of K. pinnata was evaluated for its wound healing activity by using excision wound model in animals (rats). Morales et al. suggested that quercetin has a marked protective effect on cadmium - induced nephrotoxicity. [12]

Juice of the fresh leaves is used very Effective for the treatment of jaundice in Folk medicines of Bundelkhanda, India. The juice of the leaves and the Ethanolic extract of juice were studied in rats Against hepatotoxicity. The Test material was found effective as Hepatoprotective as evidenced by in vitro, In vivo and histopathological studies. The Juice was found to be more effective than Ethanolic extract. [13]

Conclusion

Phytochemicals analysis of leaf showed presence of alkaloid, flavonoid, phenol, steroids, and saponins. This shows it's possible medicinal values. Antioxidant and free radical scavengers which prevents oxidative cells damage, have strong anticancer activity. Hence, this paper provides critical review on the recent advancements of the drug to authenticate its use as a multi - purpose medicinal plants.

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] Engler. Die naturrlichen Pflanzenfamiliennebstihren Gattugen and wichtigen Arten insbesondre der Nutpflanzen. Leipzig: W. Engelmann.402 - 412 (1926).

[4] Oliver - Bever. Medicinal plants in tropical west Africa III Antinfection therapy with higher plants. J. Ethnopharmacology.9: 1 - 83 (1983).
[5] L. S. Gill. Ethno - medical uses of plant in Nigeria: UNIBEN Press.46: (1992).
[6] P. Paranjpe. Indian Medicinal Plants forgotten Healers. Chaukhamba Sanskrit Pratisthan, Delhi.194 - 195 (2005).
[7] S. Jaiswal, and S. Sawhney. Correlation of epiphyllous bud differentiati on with foliar senescence in crassulacean succulent Kalanchoepinnata as revealed by thidiazuron and ethrel application. J. of Plant Physiology.163: 717 - 722 (2006).
[8] KambojAnjoo, Saluja Ajay Kumar. Microscopical and Preliminary Phytochemical Studies on Aerial Part (Leaves and Stem) of BryophyllumPinnatumKurz. PHCOG J.2010; 2 (9): 254 - 59.
[9] Jhon AO Ojewole. anti - inflammatory and antidiabetic effects of Bryophyllumpinnata leaf extract. Journal of Ethnopharmacology.2005; 99 (1): 13 - 19.
[10] Bergmann BR, Costa SS, Borges MBS, Silva SA, Noleto GR, Souza MLM, Moraes VLG. Immunosuppressive effect Of the aqueous extract of KalanchoePinnata in mice. Phytothera. Res.2006; 8: 399 - 402.
[11] 11.28. Cruz EA, Da - Silva SAG, Muzitano MF, Silva PMR, Costa SS, Bergmann BR. Immunomodulatory pretreatment with Kalanchoepinnata extract and its quercitrin flavonoid effectively protects mice against fatal anaphylactic shock. Int. Immunopharmacol.2008; 8 (12): 1616 - 1621.
[12] Nathalie Plangger, Lukas Rist, Roland Zimmermann, Ursula von Mandach. Intravenoustocolysis with Bryophyllumpinnatum is better tolerated than beta - agonist application. European Journal of Obstetrics & Gynecology and Reproductive Biology.2006; 124: 168 - 72.
[13] Debabrata Devbhuti, Jayanta Kumar Gupta, Pritesh Devbhuti and Anindya Bose. Phytochemical and Acute Toxicity Study on Bryophyllumcalycinum SALISB. Acta Poloniae Pharmaceutica - Drug Research.2008; 65 (4): 501 - 504.