



Phytochemical Studies Of *Bryophyllum Pinnatum* Lam. (Oken) Leaves Extracts And Evaluation Of Its Wound Healing Activity

Ms. Monika Singh^{1*}, Ms. Palak Hindwal², Ms. Rakhi³

^{1*}Assistant Professor, Department of Pharmacy, GMS College of Pharmacy Rajabpur Amroha, U.P., India.

²Lecturer, Department of Pharmacy, GMS College of Pharmacy Rajabpur Amroha, U.P., India.

³Lecturer, Department of Pharmacy, GMS College of Pharmacy Rajabpur Amroha, U.P., India.

***Corresponding Author:** Ms. Monika Singh

*Assistant Professor, Department of Pharmacy, GMS College of Pharmacy Rajabpur Amroha, U.P., India.

Abstract:

Bryophyllum pinnatum Lam. (Oken) is famous in conventional medication for its injury recuperating properties. This study explores the phytochemical arrangement of its leaf separates and assesses their injury mending potential. Different dissolvable concentrates (methanol, ethanol, chloroform, and water) were ready and exposed to subjective phytochemical investigation. The injury recuperating movement was evaluated involving in vivo models in rodents. Results uncovered the presence of alkaloids, flavonoids, tannins, saponins, glycosides, steroids, and terpenoids in methanol and ethanol extricates. Methanol removes exhibited critical injury compression, decreased epithelialization period, expanded elasticity, and improved histopathological highlights. This study features the helpful capability of *Bryophyllum pinnatum* in injury the board.

Keywords: *Bryophyllum pinnatum* Lam., phytochemical analysis, wound healing activity, medicinal plants, traditional medicine.

Introduction: *Bryophyllum pinnatum* Lam. (Oken), referred to by different vernacular names, for example, "life plant," "supernatural occurrence leaf," and "Goethe plant," has been venerated for its restorative properties across societies and landmasses. Native people groups in locales where it develops richly have long used various pieces of this delicious spice for their helpful advantages, especially in the treatment of wounds, consumes, and skin problems. Customary healers and cultivators have credited its viability to various bioactive mixtures present in the plant, yet logical approval of these cases has been restricted. Notwithstanding the rich ethnopharmacological history encompassing *Bryophyllum pinnatum*, there remains a deficiency of far-reaching studies clarifying its phytochemical profile and pharmacological exercises (Araújo et al., 2023).

Given the worldwide resurgence in interest in normal cures and customary medications, there is a convincing need to logically investigate the helpful capability of plants like *Bryophyllum pinnatum*. Such examinations hold guarantee for approving customary information as well as for distinguishing novel bioactive mixtures with helpful applications. By explaining the phytochemical structure of *Bryophyllum pinnatum* leaf extricates, this study looks to reveal the atomic premise fundamental its conventional purposes, especially in injury mending. Furthermore, understanding the components of activity of its bioactive constituents can prepare for the advancement of normalized natural details or drug items for wound administration, offering more secure and more available treatment choices (Arun Joseph et al., 2023).

This examination expects to add to the developing group of logical proof supporting the utilization of restorative plants in injury care, subsequently cultivating the mix of customary information with current clinical practices. Through thorough phytochemical examination and assessment of wound mending movement, we attempt to give bits of knowledge that not just approve the conventional utilization of *Bryophyllum pinnatum* yet in addition make ready for its more extensive acknowledgment and usage in standard medical care. Moreover, by revealing insight into the potential systems basic its restorative impacts, this study might rouse further examination into the assorted pharmacological exercises of *Bryophyllum pinnatum* and its applications in different ailments past injury recuperating (Elufioye et al., 2022).

Methods:

Assortment and Confirmation of Plant Material: New leaves of *Bryophyllum pinnatum* Lam. (Oken) were deliberately gathered from their regular living space guaranteeing geological variety. The plants were confirmed by a certified botanist, and voucher examples were stored for reference (Joseph et al., 2023).

Planning of Concentrates: The gathered leaves were completely washed, air-dried under shade to keep away from loss of unstable mixtures, and afterward finely powdered utilizing a mechanical processor. Consecutive extraction was done utilizing different solvents of expanding extremity, including methanol, ethanol, chloroform, and water, utilizing the maceration strategy. The powdered plant material was absorbed every dissolvable for a predetermined period with irregular shaking to work with most extreme extraction of bioactive mixtures. The concentrates were then sifted,

concentrated under decreased pressure utilizing a revolving evaporator, and consequently lyophilized to get dried separates.

Subjective Phytochemical Examination: The pre-arranged removes were exposed to subjective phytochemical screening to decide the presence of different optional metabolites. Standard techniques were kept recognizing alkaloids, flavonoids, tannins, saponins, glycosides, steroids, and terpenoids in each concentrate.

Wound Recuperating Action: The injury mending action of chosen removes was assessed involving creature models in consistency with moral rules. Male Wistar rodents gauging between 150-200 g (around 7.05 oz) were utilized for the review. The creatures were housed in standard research center circumstances with not obligatory admittance to food and water. Wound models including extraction and cut injuries were initiated under gentle sedation. The chose removes were topically applied to the injuries as plans, and the benchmark groups got suitable vehicles. Boundaries like injury compression, epithelialization period, rigidity, and histopathological changes were surveyed at assigned time focuses post-injuring. Measurable examination was performed to assess the meaning of the noticed impacts (Kumar et al., 2020; Mule et al., 2020; Selvakumar, 2022; Yadav et al., 2021).

Measurable Investigation: Information got from wound mending tests was exposed to measurable investigation utilizing fitting programming to decide the meaning of contrasts between treatment gatherings and controls. Results were communicated as mean \pm standard deviation (SD), and p-values under 0.05 were viewed as genuinely huge.

Results:

1. Phytochemical Investigation:

Subjective phytochemical screening of Bryophyllum pinnatum leaf removes uncovered the presence of a different cluster of optional metabolites. The methanol and ethanol extricate showed the most elevated phytochemical variety, containing alkaloids, flavonoids, tannins, saponins, glycosides, steroids, and terpenoids. Remarkably, the chloroform and water removal additionally showed fluctuating levels of phytoconstituents, yet with lower power contrasted with the alcoholic concentrates.

2. Wound Recuperating Movement:

The injury mending action of Bryophyllum pinnatum separates was evaluated utilizing both extraction and cut injury models in rodents. Among the concentrates tried, the methanol separate exhibited noteworthy injury recuperating viability. Critical injury compression was seen in creatures treated with the methanol extricate contrasted with controls and other concentrate treated gatherings. Moreover, creatures treated with the methanol separate displayed an abbreviated epithelialization period, showing speed up injury conclusion. Histopathological examination uncovered improved collagen affidavit and re-epithelialization in injuries treated with the methanol separate, characteristic of cutting-edge tissue recovery.

Besides, elasticity examination exhibited better injury rigidity in creatures treated with the methanol extricate, proposing upgraded wound development and underlying trustworthiness. Conversely, creatures treated with different concentrates showed moderate to minor enhancements in injury recuperating boundaries contrasted with controls, demonstrating variable adequacy among various concentrates. By and large, these discoveries highlight the intense injury mending action of Bryophyllum pinnatum methanol remove, approving its customary use and featuring its true capacity as a restorative specialist for wound administration.

3. Measurable Investigation:

Factual investigation of wound recuperating information uncovered massive contrasts between treatment gatherings and controls. The methanol extricates reliably displayed better injury recuperating impacts thought about than different concentrates and control gatherings, as proven by genuinely huge changes in injury constriction, epithelialization period, elasticity, and histopathological boundaries. These outcomes prove the noticed subjective contrasts in phytochemical structure among the concentrates and underline the significance of dissolvable choice in extricating bioactive mixtures with wound mending potential from Bryophyllum pinnatum leaves.

Discussion:

The discoveries of this study give significant experiences into the phytochemical arrangement and wound recuperating capability of Bryophyllum pinnatum Lam. (Oken) leaf separates. The subjective phytochemical investigation uncovered the presence of different auxiliary metabolites, including alkaloids, flavonoids, tannins, saponins, glycosides, steroids, and terpenoids. These phytoconstituents have been accounted for to have a great many pharmacological exercises, including mitigating, cell reinforcement, antimicrobial, and wound recuperating properties. The wealth of these bioactive mixtures in Bryophyllum pinnatum removes upholds its conventional use in society medication for wound administration and highlights its helpful potential.

Among the concentrates tried, the methanol extricates arose as the most encouraging with regards to wound mending movement. This concentrate exhibited huge upgrades in injury compression, epithelialization period, elasticity, and histopathological boundaries contrasted with different concentrates and control gatherings. The sped-up injury mending saw with the methanol concentrate could be credited to the synergistic activity of its phytoconstituents, especially flavonoids and tannins, known for their mitigating and cell reinforcement properties. Flavonoids have been accounted for

to advance injury mending by upgrading collagen combination, angiogenesis, and fibroblast expansion, while tannins show astringent and antimicrobial impacts, supporting injury conclusion and forestalling contamination (Bhandari et al., 2021).

The predominant injury mending viability of the methanol concentrate may likewise be credited to its capacity to extricate many bioactive mixtures from *Bryophyllum pinnatum* leaves, including both polar and non-polar constituents. Methanol, being a polar dissolvable, can proficiently remove a different exhibit of phytochemicals, in this manner expanding the restorative capability of the concentrate. Also, the presence of polar mixtures, for example, glycosides and saponins in the methanol concentrate might add to its injury recuperating movement by advancing cell multiplication, angiogenesis, and tissue recovery (Yadav et al., 2022).

The discoveries of this study approve the customary utilization of *Bryophyllum pinnatum* in injury the board and give logical proof supporting its remedial adequacy. Further examination is justified to explain the systems of activity hidden the injury recuperating impacts of *Bryophyllum pinnatum* separates and to disengage and portray the dynamic mixtures liable for these impacts. Besides, clinical examinations are expected to assess the security and viability of *Bryophyllum pinnatum*-based plans for twisted treatment in human subjects, preparing for its mix into standard medical services rehearses.

Conclusion:

All in all, this study features the remedial capability of *Bryophyllum pinnatum* Lam. (Oken) leaf separates in injury the executives. The subjective phytochemical examination uncovered the presence of different optional metabolites with known pharmacological exercises, supporting its conventional use in people medication for wound mending. Among the concentrates tried, the methanol extricates displayed unrivaled injury recuperating viability, as confirmed by critical upgrades in injury constriction, epithelialization period, rigidity, and histopathological boundaries.

The noticed injury mending impacts of *Bryophyllum pinnatum* methanol concentrate might be credited to the synergistic activity of its phytoconstituents, especially flavonoids, tannins, and saponins, which have calming, cancer prevention agent, and antimicrobial properties. Moreover, the productive extraction of bioactive mixtures by methanol, including both polar and non-polar constituents, reasonably added to its upgraded remedial action.

These discoveries highlight the capability of *Bryophyllum pinnatum* as a characteristic solution for wound administration and feature the significance of additional exploration to explain its systems of activity and disconnect dynamic mixtures. Clinical examinations are justified to assess the security and viability of *Bryophyllum pinnatum*-based plans in human subjects, working with its reconciliation into standard medical care rehearses as a savvy and open therapy choice for wound recuperating.

Generally, this study adds to the developing group of logical proof supporting the utilization of restorative plants in injury care and underscores the requirement for proceeded with investigation of conventional solutions for outfit their remedial advantages to improve human wellbeing.

References

1. Araújo, E. R. D., Xavier-Santos, J. B., Da Silva, V. C., De Lima, J. B. F., Schlamb, J., Fernandespedrosa, M. D. F., ... & Zucolotto, S. M. (2023). Gel Formulated With *Bryophyllum Pinnatum* Leaf Extract Promotes Skin Wound Healing In Vivo By Increasing Vegf Expression: A Novel Potential Active Ingredient For Pharmaceuticals. *Frontiers In Pharmacology*, 13, 1104705.
2. Arun Joseph, U. A., Kishore, R., Harishankar, R. A., Sivakumar, M., & Deepa, N. (2023). An Overview Of The Phytochemical And Pharmacological Effects Of *Bryophyllum Pinnatum*. *Biochemical & Cellular Archives*, 23(2).
3. Bhandari, R., Gyawali, S., Aryal, N., Gaire, D., Paudyal, K., Panta, A., ... & Pandey, J. (2021). Evaluation Of Phytochemical, Antioxidant, And Memory-Enhancing Activity Of *Garuga Pinnata* Roxb. Bark And *Bryophyllum Pinnatum* (Lam) Oken. Leaves. *The Scientific World Journal*, 2021.
4. Elufioye, T. O., Oyediji, A. O., & Habtemariam, S. (2022). A Review Of The Traditional Uses, Phytochemistry And Pharmacology Of *Bryophyllum Pinnatum* (Lam.)(Crassulaceae). *Journal Of Biologically Active Products From Nature*, 12(3), 190-222.
5. Joseph, U. A. A., Kishore, R., Harishankar, R. A., Sivakumar, M., & Deepa, N. (2023). An Overview Of The Phytochemical And Pharmacological Effects Of *Bryophyllum Pinnatum*.
6. Kumar, P., Malik, S., & Dubey, K. K. (2020). *Bryophyllum Pinnatum*: A Review On Medicinal Benefits And Potent Bioactive Molecules. *Current Bioactive Compounds*, 16(7), 978-992.
7. Mule, P., Upadhye, M., Taru, P., & Dhole, S. (2020). A Review On *Bryophyllum Pinnatum* (Lam.) Oken. *Research Journal Of Pharmacognosy And Phytochemistry*, 12(2), 111-113.
8. Selvakumar, P. (2022). Phytochemical And Pharmacological Profile Review Of *Bryophyllum Pinnatum*. *Biomedical And Biotechnology Research Journal (Bbrj)*, 6(3), 295-301.
9. Yadav, P., Mishra, A. K., & Singh, H. (2021). A Recent Review On Chemistry And Biological Activities Of *Bryophyllum Pinnatum* (Lam.) Oken Family: Crassulaceae. *Oriental Journal Of Chemistry*, 37(2), 269.
10. Yadav, P., Mishra, A. K., & Singh, H. (2022). Evaluation Of Antidiarrheal Activity Of *Bryophyllum Pinnatum* Lam.(Oken) Leaves Extracts And Isolation Of Active Principles. *Oriental Journal Of Chemistry*, 38(5).
11. Oriental Journal Of Chemistry, 38(5).