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Phytochemical analysis and antioxidant potential of the aqueous leaf extract of *Bryophyllum Pinnatum* (Lam) Oken

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ABSTRACT

Introduction: *Bryophyllum pinnatum* (Lam.) Oken is a medicinal plant traditionally used for several health-related conditions and is reported to contain diverse bioactive phytoconstituents. This study evaluated the preliminary phytochemical profile and in vitro antioxidant potential of its aqueous leaf extract. **Methodology:** Fresh mature leaves of *B. pinnatum* were collected from Sirsa, Haryana, India, shade-dried, powdered, and extracted with distilled water at a 1:10 (w/v) ratio. The extract was evaluated through qualitative phytochemical screening, thin-layer chromatography (TLC), and preliminary column chromatographic fractionation. Antioxidant activity was assessed using DPPH, ABTS, and ferric-reducing antioxidant power (FRAP) assays, with ascorbic acid used as the reference antioxidant.

Results: The extract showed the presence of alkaloids, flavonoids, saponins, tannins, terpenoids, glycosides, phenolic compounds, and steroids. TLC demonstrated three prominent bands at R_f values of 0.60, 0.72, and 0.85, while column chromatography yielded four pooled fraction groups. At 100 µg/mL, the extract demonstrated $68.2 \pm 2.1\%$ DPPH radical-scavenging activity and $73.9 \pm 2.8\%$ ABTS inhibition. The IC_{50} values were 71.3 ± 3.4 µg/mL for DPPH and 64.8 ± 2.9 µg/mL for ABTS. The FRAP value was 182.4 ± 3.2 µmol Fe(II)/g extract.

Conclusion: The aqueous leaf extract of *B. pinnatum* demonstrated preliminary radical-scavenging and ferric-reducing antioxidant activity. Further quantitative phytochemical characterization, isolation of active constituents, and biological validation are warranted.

Keywords: *Bryophyllum pinnatum*, Aqueous leaf extract, Phytochemical screening, Antioxidant activity, DPPH, ABTS, FRAP

Introduction

Bryophyllum pinnatum (Lam.) Oken, commonly known as Patharchatta in India, is a succulent medicinal plant of the family Crassulaceae. Its fleshy leaves produce adventitious plantlets along the margins, and the species is widely distributed in tropical and subtropical regions. Traditional uses include treatment of wounds, ulcers, inflammatory disorders, and urinary complaints (Fürer *et al.*, 2016; Kamboj *et al.*, 2009; Ojewole, 2005; Yadav *et al.*, 2003) [1, 2, 3, 4]. Phytochemical studies have reported flavonoids, phenolic compounds, alkaloids, tannins, saponins, terpenoids, glycosides, steroids, and bufadienolides in *B. pinnatum* (Dhumane *et al.*, 2024 [5]; Fürer *et al.*, 2016 [1]; Isibor, 2026 [6]; Latif *et al.*, 2019 [7]; Okafor *et al.*, 2024) [8]. Phenolic and flavonoid constituents are of interest because they can participate in hydrogen- and electron-transfer reactions and may contribute to antioxidant responses. Previous studies have demonstrated antioxidant activity in *B. pinnatum* extracts, although reported values vary with plant part, geographical origin, extraction solvent, drying conditions, phytochemical composition, and assay methodology (Elufioye *et al.*, 2019; Fernandes *et al.*, 2019; Omojokun *et al.*, 2021; Silva *et al.*, 2024) [9, 10, 11, 12]. Oxidative stress reflects an imbalance between reactive oxygen species generation and antioxidant defenses and is associated with cellular damage and chronic disease (Fraga *et al.*, 2019; Sies, 2020) [13, 14]. However, chemical antioxidant assays provide preliminary biochemical evidence and do not by themselves establish cellular protection or therapeutic efficacy. Aqueous extraction is relevant to traditional herbal preparations and can preferentially recover water-soluble constituents. Solvent polarity and extraction conditions influence the recovery of phenolics and other phytoconstituents and therefore the measured antioxidant response (Dai *et al.*, 2010; Sultana *et al.*, 2009) [15, 16]. TLC and column chromatography provide useful preliminary approaches for profiling and fractionating complex extracts, but R_f values and chromatographic fractions cannot establish compound identity without appropriate analytical characterization (Faboro *et al.*, 2016; Ogidigo *et al.*, 2021) [17, 18]. Because region-specific information on aqueous leaf extracts of *B. pinnatum* collected in Haryana is limited, the present study investigated the preliminary phytochemical profile and in vitro antioxidant potential of an

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aqueous leaf extract collected from Sirsa, Haryana, using qualitative screening, TLC, column fractionation, DPPH, ABTS, and FRAP assays.

2. Materials and Methods

2.1 Plant collection and authentication

Fresh, mature and disease-free leaves of *B. pinnatum* were collected from Ashoka Nursery, Sirsa, Haryana, India. The material was identified and authenticated by Dr. H. K. Sidhu, Professor, Department of Botany, Desh Bhagat University, Mandi Gobindgarh, Punjab, India. A voucher specimen was deposited in the Herbarium, Department of Botany, Desh Bhagat University.



Figure 1. Fresh leaves of *Bryophyllum pinnatum* used for aqueous extract preparation.

2.2 Preparation of leaf powder and aqueous extract

Leaves were washed 2–3 times with tap water and rinsed with distilled water. They were shade-dried at $25 \pm 2^\circ\text{C}$ to constant weight, coarsely powdered, passed through a 40-mesh sieve, and stored in airtight containers at 4°C . Fifty grams of leaf powder were mixed with 500 mL distilled water (1:10, w/v), heated at 80°C for 10 min, cooled, and filtered through Whatman No. 1 filter paper. The filtrate was stored at 4°C . Extraction yield = $\frac{\text{weight of dried extract}}{\text{weight of dried leaf powder}} \times 100$ and was $12.4 \pm 0.8\%$ (w/w, $n = 3$) (Azwanida, 2015; Sultana *et al.*, 2009) [19, 16].

2.3 Qualitative phytochemical screening

The aqueous extract was screened for alkaloids, flavonoids, saponins, tannins, terpenoids, glycosides, phenolic compounds, and steroids using characteristic colour reactions and/or precipitate formation. The tests and observations are summarized in Table 1 (Fernandes *et al.*, 2019; Kamboj *et al.*, 2009) [10, 2].

2.4 Thin-layer chromatography and column chromatography

TLC was performed on silica gel GF254 plates using ethyl acetate:methanol:water (8:1:1, v/v/v). Bands were visualized under UV light at 254 and 366 nm, followed by iodine vapour and anisaldehyde- H_2SO_4 reagent. R_f was calculated as the distance travelled by the compound divided by the distance travelled by the solvent front. For column chromatography, silica gel (60–120 mesh) was packed in a $45\text{ cm} \times 3\text{ cm}$ glass column. The concentrated extract was eluted with a gradient of hexane, ethyl acetate, and methanol. Fractions were collected sequentially, monitored by TLC, and pooled according to similar chromatographic profiles. Pooled fractions were concentrated under reduced pressure using a rotary evaporator (Buchi R-210) (Faboro *et al.*, 2016; Ogidigo *et al.*, 2021) [17, 18].



Figure 2. Schematic representation of aqueous leaf extract preparation from *Bryophyllum pinnatum*.

2.5 Antioxidant assays

DPPH, ABTS, and FRAP assays were performed in triplicate ($n = 3$), with results expressed as mean $\pm$ SD. Absorbance was measured using a UV–Visible spectrophotometer (UV-1800, Shimadzu, Japan), and appropriate reagent and sample blanks were included. Ascorbic acid was the reference antioxidant for DPPH and ABTS. For DPPH, 1 mL extract ($10\text{--}100\text{ }\mu\text{g/mL}$) was mixed with 3 mL freshly prepared 0.1 mM DPPH in methanol, incubated in the dark at $25 \pm 2^\circ\text{C}$ for 30 min, and read at 517 nm. For ABTS, 7 mM ABTS was mixed with 2.45 mM potassium persulfate and kept in the dark for 12–16 h; the solution was diluted to 0.70 ± 0.02 at 734 nm. One millilitre extract ($10\text{--}100\text{ }\mu\text{g/mL}$) was mixed with 3 mL working solution, incubated for 6 min, and read at 734 nm. Inhibition = $\frac{A_{\text{control}} - A_{\text{sample}}}{A_{\text{control}}} \times 100$, and IC_{50} was obtained from concentration–response curves (Brand-Williams *et al.*, 1995; Prior *et al.*, 2005; Re *et al.*, 1999) [20, 21, 22]. For FRAP, freshly prepared acetate buffer (300 mM, pH 3.6), TPTZ (10 mM in 40 mM HCl), and $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ (20 mM) were mixed at 10:1:1 (v/v/v). A $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ calibration curve (0.1–1.0 mM) was used. One millilitre extract was mixed with 3 mL FRAP reagent, incubated at 37°C for 30 min, and read at 593 nm; results were expressed as $\mu\text{mol Fe(II)/g}$ extract (Benzie *et al.*, 1996) [23].

3. Results and Discussion

The aqueous extraction yielded $12.4 \pm 0.8\%$ (w/w) dried extract. The yield reflects recovery under the specific water-based extraction conditions and should not be interpreted as a general yield for *B. pinnatum* because solvent polarity, temperature, extraction time, plant material, and processing conditions can alter recovery (Dai *et al.*, 2010; Sultana *et al.*, 2009) [15, 16].

Qualitative screening detected alkaloids, flavonoids, saponins, tannins, terpenoids, glycosides, phenolic compounds, and steroids (Table 1). This broad profile is consistent with the reported phytochemical diversity of *B. pinnatum* (Dhumane *et al.*, 2024; Fürer *et al.*, 2016; Fernandes *et al.*, 2019) [5, 1, 10]. Phenolic compounds, flavonoids, and tannins are particularly relevant to antioxidant responses, and previous work has reported associations between these groups and antioxidant activity (Elufioye *et al.*, 2019) [9]. Nevertheless, the present tests were qualitative and cannot establish the concentration or individual contribution of any constituent.

TLC revealed three prominent bands at R_f 0.60, 0.72, and 0.85 (Table 2). The multiple bands indicate chromatographic complexity and provided a basis for monitoring column fractions. However, R_f values depend on the stationary phase, mobile phase, sample composition, and development conditions; therefore, they do not establish compound identity (Faboro *et al.*, 2016) [17]. Column chromatography generated four pooled groups from 12 collected fractions (Table 3). Group II (F4–F6) had the highest recovery (1.8 g) and showed R_f values of 0.45, 0.52, and 0.60. The fractions should be regarded as preliminary enriched fractions rather than purified individual compounds because

structural characterization was not performed (Ogidigo *et al.*, 2021) [18].

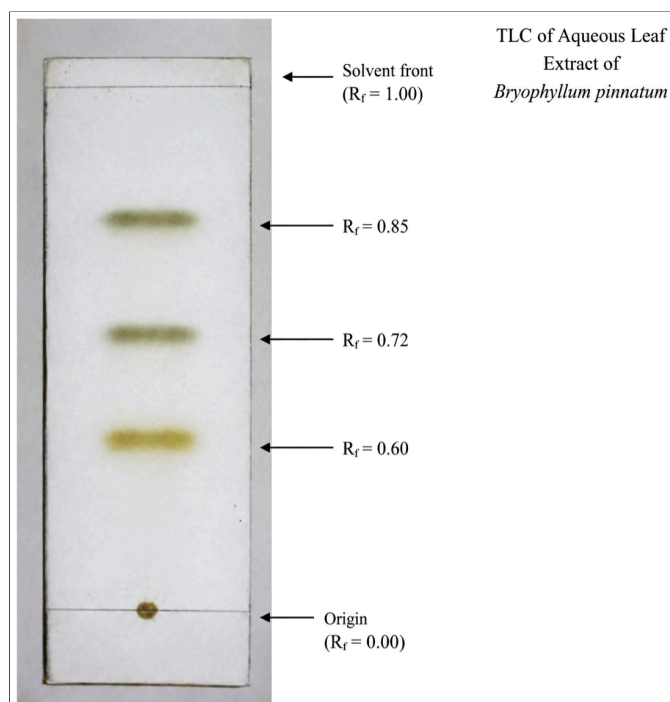


Figure 3. TLC profile of the aqueous leaf extract of *Bryophyllum pinnatum* showing prominent bands at R_f 0.60, 0.72 and 0.85 on silica gel GF254 plate.

The extract showed measurable antioxidant activity in all three assays (Table 4). At 100 $\mu\text{g/mL}$, DPPH scavenging was $68.2 \pm 2.1\%$, with an IC_{50} of $71.3 \pm 3.4 \mu\text{g/mL}$. ABTS inhibition was $73.9 \pm 2.8\%$, with an IC_{50} of $64.8 \pm 2.9 \mu\text{g/mL}$. FRAP capacity was $182.4 \pm 3.2 \mu\text{mol Fe(II)/g extract}$, and the $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ calibration curve showed good

linearity ($R^2 = 0.998$). The lower ABTS IC_{50} indicates a stronger response under the conditions used, but DPPH and ABTS values should not be compared as interchangeable measures because the assays differ in radical chemistry and reaction conditions (Brand-Williams *et al.*, 1995; Re *et al.*, 1999; Thaipong *et al.*, 2006) [20, 22, 24]. FRAP assesses reducing capacity rather than radical scavenging, so its result provides complementary evidence of antioxidant behaviour (Benzie *et al.*, 1996) [23].

The antioxidant responses may be associated with the combined presence of phenolics, flavonoids, tannins, and other secondary metabolites. A direct causal relationship cannot, however, be established from qualitative screening. Differences from published *B. pinnatum* antioxidant values may arise from geographical origin, plant material, drying procedure, extraction system, concentration range, and assay methodology (Elufioye *et al.*, 2019; Omojokun *et al.*, 2021; Okafor *et al.*, 2024; Silva *et al.*, 2024) [9, 11, 8, 12]. The present values therefore apply specifically to the aqueous extract and experimental conditions used here.

Use of DPPH, ABTS, and FRAP together strengthens the preliminary assessment because the assays measure complementary antioxidant properties. The main limitations are the qualitative nature of the phytochemical screening, absence of definitive structural identification of TLC bands and column fractions, and reliance on chemical in vitro assays. Such assays do not account for absorption, metabolism, bioavailability, tissue distribution, cellular uptake, or physiological concentrations and therefore do not demonstrate cellular protection or therapeutic efficacy (Fraga *et al.*, 2019; Sies, 2020) [13, 14]. Further work should quantify phytochemical constituents and characterize enriched fractions using appropriate analytical methods such as HPLC, LC-MS, FTIR, or NMR, followed by bioassay-guided fractionation and cellular or in vivo validation (Ogidigo *et al.*, 2021; Okafor *et al.*, 2024) [18, 8].

Phytochemical screening was performed in triplicate ($n = 3$). “Present” indicates a positive reaction and does not provide quantitative information on constituent concentrations.

Table 1. Qualitative phytochemical profile of the aqueous leaf extract of *Bryophyllum pinnatum*.

Phytochemical	Test performed	Observation	Result
Alkaloids	Mayer's test	Creamy white precipitate	Present
Flavonoids	Alkaline reagent test	Yellow colour disappeared on acidification	Present
Saponins	Foam test	Persistent froth ≥ 10 min	Present
Tannins	Ferric chloride test	Blue-black/greenish-black colouration	Present
Terpenoids	Salkowski test	Reddish-brown interface	Present
Glycosides	Keller–Killiani test	Reddish-brown ring at interface	Present
Phenols	Ferric chloride test	Deep blue/green colouration	Present
Steroids	Liebermann–Burchard test	Violet to blue/green colour change	Present

Table 2. Column chromatographic fractionation and TLC profiles of the aqueous leaf extract of *Bryophyllum pinnatum*.

Pooled group	Fractions	Total mass (g)	Rf values
Group I	F1–F3	1.2	0.15, 0.22

Pooled group	Fractions	Total mass (g)	Rf values
Group II	F4–F6	1.8	0.45, 0.52, 0.60
Group III	F7–F9	1.3	0.72, 0.78
Group IV	F10–F12	0.5	0.85, 0.91

Table 3. Antioxidant activity of the aqueous leaf extract of *Bryophyllum pinnatum*.

Assay	Concentration	% inhibition/value	IC_{50} /result	Positive control
DPPH	100 $\mu\text{g/mL}$	$68.2 \pm 2.1\%$	$71.3 \pm 3.4 \mu\text{g/mL}$	$12.4 \pm 0.8 \mu\text{g/mL}$ (ascorbic acid)
ABTS	100 $\mu\text{g/mL}$	$73.9 \pm 2.8\%$	$64.8 \pm 2.9 \mu\text{g/mL}$	$10.2 \pm 0.6 \mu\text{g/mL}$ (ascorbic acid)
FRAP	–	$182.4 \pm 3.2 \mu\text{mol Fe(II)/g}$	–	$520.5 \pm 5.1 \mu\text{mol Fe(II)/g}$ (ascorbic acid)

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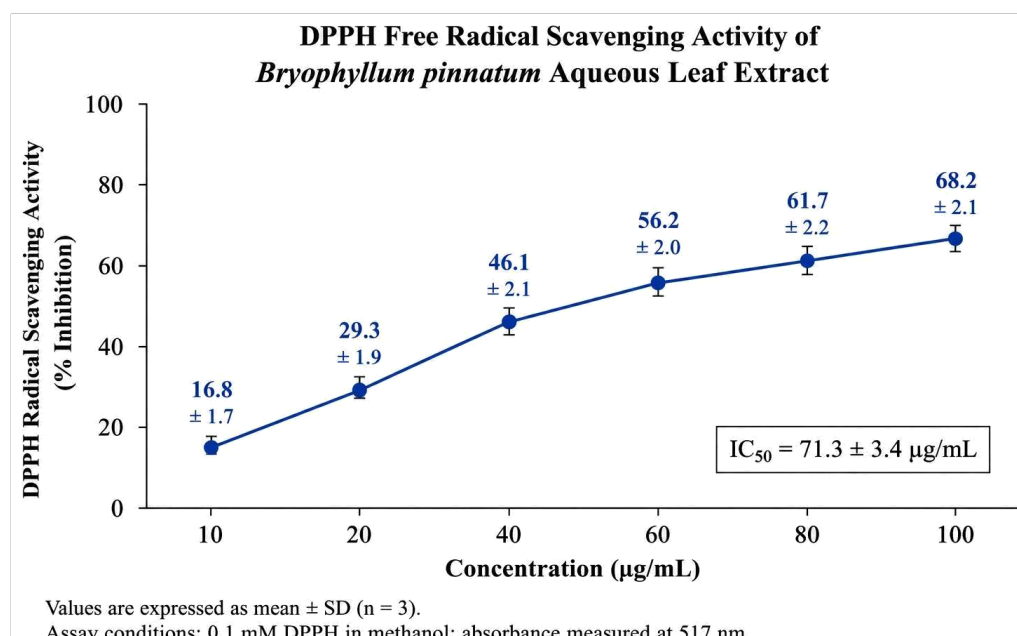


Figure 4. Concentration-dependent DPPH free-radical scavenging activity of *Bryophyllum pinnatum* aqueous leaf extract.

4. Discussion

The present study demonstrated that the aqueous leaf extract of *Bryophyllum pinnatum* possesses appreciable in vitro antioxidant activity, which increased in a concentration-dependent manner across all assays. In the DPPH assay, radical-scavenging activity increased from 16.8% at 10 µg/mL to 68.2% at 100 µg/mL, with an IC₅₀ value of 71.3 ± 3.4 µg/mL. Similarly, the ABTS assay showed higher inhibition, rising from 18.6% to 73.9% over the same concentration range and producing an IC₅₀ of 64.8 ± 2.9 µg/mL. The lower ABTS IC₅₀ suggests comparatively stronger activity in this radical cation decolorization system.

The FRAP assay further confirmed the reducing potential of the extract, with the ferric-reducing value increasing from 51.2 to 182.4 µmol Fe(II)/g extract at 10 and 100 µg/mL, respectively. These findings may be attributed to the presence of flavonoids, phenolic compounds, tannins, terpenoids, alkaloids, and glycosides detected during preliminary phytochemical screening. Such phytoconstituents can donate electrons or hydrogen atoms, neutralize reactive free radicals, and reduce oxidizing agents. Overall, the findings support the traditional use of *B. pinnatum* and indicate that its aqueous leaf extract may serve as a promising natural source of antioxidant compounds.

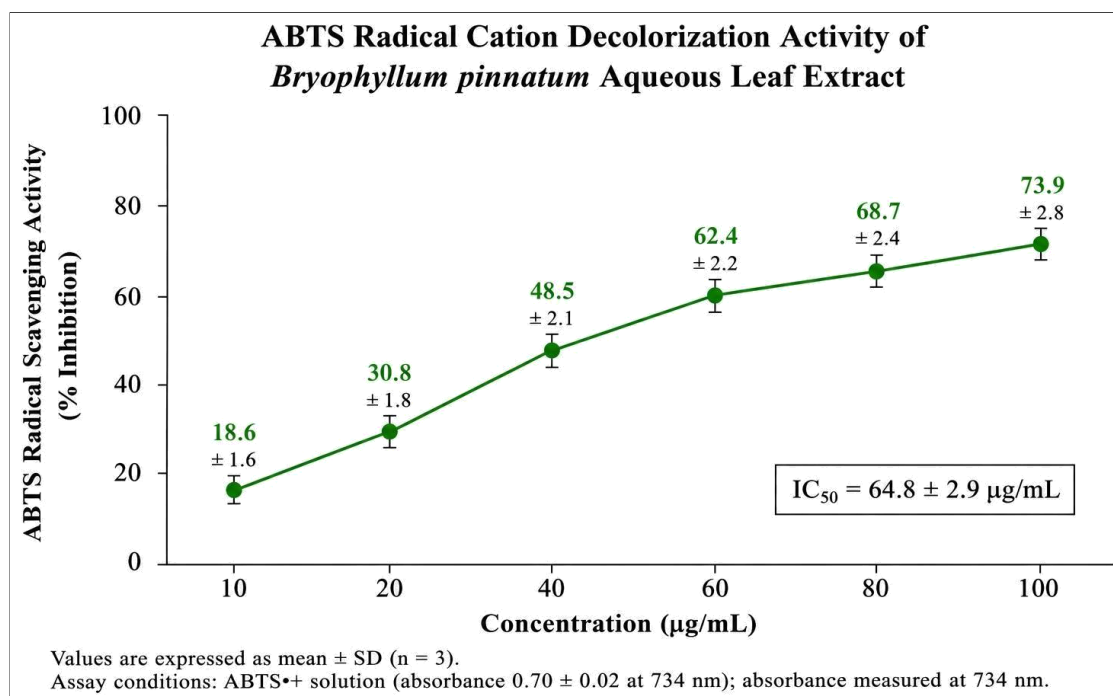


Figure 5. Concentration-dependent ABTS radical cation decolorization activity of *Bryophyllum pinnatum* aqueous leaf extract.

5. Conclusion

The aqueous leaf extract of *B. pinnatum* collected from Sirsa, Haryana, showed a diverse qualitative phytochemical profile, preliminary chromatographic complexity, and measurable in vitro antioxi-

dant activity. The extract yielded 12.4 ± 0.8% (w/w), showed DPPH and ABTS activities of 68.2 ± 2.1% and 73.9 ± 2.8% at 100 µg/mL, respectively, and had corresponding IC₅₀ values of 71.3 ± 3.4 and 64.8 ± 2.9 µg/mL. FRAP capacity was 182.4 ± 3.2 µmol Fe(II)/g extract. These findings provide a preliminary basis for quantitative phytochemical profiling, compound-specific characterization, and biolog-

ical validation, but they do not establish the identity of active constituents or therapeutic/cardioprotective efficacy.

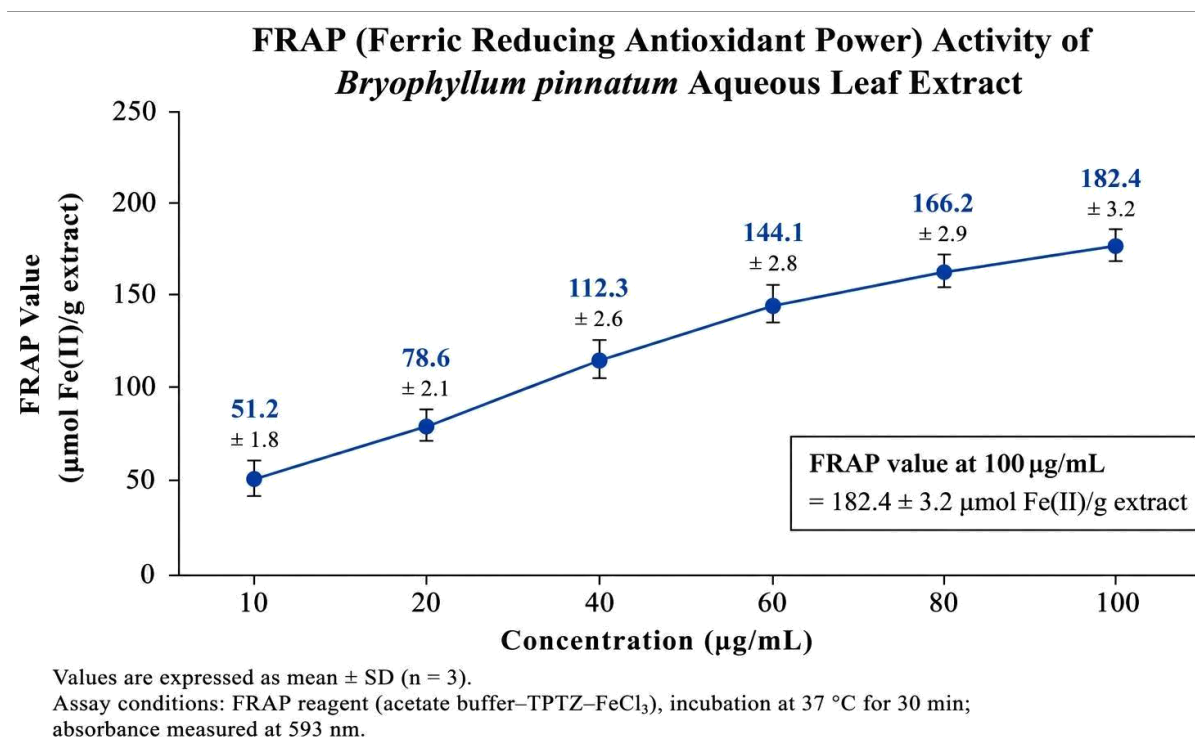


Figure 6. Concentration-dependent ferric reducing antioxidant power (FRAP) of *Bryophyllum pinnatum* aqueous leaf extract.

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Author contributions

Vaishali Bajaj: conceptualization, methodology, investigation, data collection, analysis, interpretation, and manuscript preparation. H.K. Sidhu: supervision, guidance, and critical review of the manuscript. Both authors approved the final manuscript.

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Data availability

The data generated and/or analyzed during the present study are available from the corresponding author upon reasonable request.

Conflict of interest

The authors declare that they have no conflict of interest.

References

- Fürer K, Simões-Wüst AP, von Mandach U, Hamburger M, Potterat O. *Bryophyllum pinnatum* and related species used in anthroposophic medicine: constituents, pharmacological activities, and clinical efficacy. *Planta Med.* 2016;82(11–12):930–941.
- Kamboj A, Saluja AK. *Bryophyllum pinnatum* (Lam.) Kurz.: phytochemical and pharmacological profile: a review. *Pharmacogn Rev.* 2009;3(6):364–374.
- Ojewole JAO. Antinociceptive, anti-inflammatory and antidiabetic effects of *Bryophyllum pinnatum* (Crassulaceae) leaf aqueous extract. *J Ethnopharmacol.* 2005;99(1):13–19.
- Yadav NP, Dixit VK. Hepatoprotective activity of leaves of *Kalanchoe pinnata* Pers. *J Ethnopharmacol.* 2003;86(2–3):197–202.
- Dhumane S, Naik T, Shelke M, Dukare K, Dhongade K. Exploring the therapeutic potential: phytochemistry and pharmacology of *Bryophyllum pinnatum*. *J Drug Deliv Ther.* 2024;14(2):171–177.
- Isibor J. Phytochemistry and bioactivity studies of *Bryophyllum pinnatum*: a review. *Discov Chem.* 2026;3:33.
- Latif A, Ashiq K, Qayyum M, Ashiq S, Ali E, Anwer I. Phytochemical and pharmacological profile of the medicinal herb: *Bryophyllum pinnatum*. *J Anim Plant Sci.* 2019;29(6):1528–1534.
- Okafor CE, Ijoma IK, Igboamalu CA *et al.* Secondary metabolites, spectra characterization, and antioxidant correlation analysis of the polar and nonpolar extracts of *Bryophyllum pinnatum* (Lam.) Oken. *BioTechnologia.* 2024;105(2):121–136.
- Elufioye TO, Olusola DM, Oyediji AO. Correlation of total phenolic, flavonoid and tannin content of *Bryophyllum pinnatum* (Lam.) (Crassulaceae) extract with the antioxidant and anticholinesterase activities. *Pharmacogn J.* 2019;11(5):1003–1009.
- Fernandes JM, Cunha LM, Azevedo EP *et al.* *Kalanchoe laciniata* and *Bryophyllum pinnatum*: an updated review about ethnopharmacology, phytochemistry, pharmacology and toxicology. *Rev Bras Farmacogn.* 2019;29(4):529–558.
- Omojokun OS, Obboh G, Ademiluyi AO, Oladele JO, Boligon AA. Impact of drying processes on *Bryophyllum pinnatum* phenolic constituents and its anti-inflammatory and antioxidant activities in human erythrocytes. *J Food Biochem.* 2021;45(3):e13298.
- Silva NLF da, Dantas-Medeiros R, Tavares E de A *et al.* Phenolic-rich extract from *Bryophyllum pinnatum* leaf cultivated under drought stress conditions modulates the antioxidant and anti-inflammatory response. *Phytochem Lett.* 2024;61:78–88.
- Fraga CG, Croft KD, Kennedy DO, Tomás-Barberán FA. The effects of polyphenols and other bioactives on human health. *Food Funct.* 2019;10(2):514–528.
- Sies H. Oxidative stress: concept and some practical aspects. *Antioxidants.* 2020;9(9):852.

15. Dai J, Mumper RJ. Plant phenolics: extraction, analysis and their antioxidant and anticancer properties. *Molecules*. 2010;15(10):7313–7352.
16. Sultana B, Anwar F, Ashraf M. Effect of extraction solvent/technique on the antioxidant activity of selected medicinal plant extracts. *Molecules*. 2009;14(6):2167–2180.
17. Faboro EO, Wei L, Liang S, McDonald AG, Obafemi CA. Phytochemical analyses from the leaves of *Bryophyllum pinnatum*. *Eur J Med Plants*. 2016;14(3):1–10.
18. Ogidigo JO, Anosike CA, Joshua PE *et al*. UPLC-PDA-ESI-QTOF-MS/MS fingerprint of purified flavonoid enriched fraction of *Bryophyllum pinnatum*; antioxidant properties, anticholinesterase activity and in silico studies. *Pharm Biol*. 2021;59(1):444–456.
19. Azwanida NN. A review on the extraction methods use in medicinal plants, principle, strength and limitation. *Med Aromat Plants*. 2015;4:196.
20. Brand-Williams W, Cuvelier ME, Berset C. Use of a free radical method to evaluate antioxidant activity. *LWT Food Sci Technol*. 1995;28(1):25–30.
21. Prior RL, Wu X, Schaich K. Standardized methods for the determination of antioxidant capacity and phenolics in foods and dietary supplements. *J Agric Food Chem*. 2005;53(10):4290–4302.
22. Re R, Pellegrini N, Proteggente A, Pannala AS, Yang M, Rice-Evans C. Antioxidant activity applying an improved ABTS radical cation decolorization assay. *Free Radic Biol Med*. 1999;26(9–10):1231–1237.
23. Benzie IFF, Strain JJ. The ferric reducing ability of plasma (FRAP) as a measure of antioxidant power: the FRAP assay. *Anal Biochem*. 1996;239(1):70–76.
24. Thaipong K, Boonprakob U, Crosby K, Cisneros-Zevallos L, Byrne DH. Comparison of ABTS, DPPH, FRAP, and ORAC assays for estimating antioxidant activity from guava fruit extracts. *J Food Comp Anal*. 2006;19(6–7):669–675.

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