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PHARMACOGNOSTIC SCREENING AND EVALUATION OF ANTIOXIDANT ACTIVITY OF LUDWIGIA ADSCENDENS, LAUNAEA PINNATIFIDA, AND CARICA PAPAYA

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ABSTRACT

Background: Ludwigia adscendens, Launaea pinnatifida, and Carica papaya are traditionally used plants with reputed antioxidant properties. This study aims to conduct pharmacognostic profiling and evaluate their antioxidant activity. **Methods:** Macroscopic and microscopic characteristics were documented. Powdered plant parts were subjected to phytochemical screening. Crude extracts prepared via ethanolic extraction were analyzed using DPPH radical scavenging, ABTS assay, and total phenolic content (Folin–Ciocalteu method). **Results:** Distinct diagnostic traits were recorded. Phytochemical tests indicated presence of flavonoids, phenolics, tannins, and saponins. In DPPH and ABTS assays, Carica papaya showed the strongest antioxidant activity, followed by Ludwigia adscendens and Launaea pinnatifida. Total phenolic content correlated positively with antioxidant capacity. **Conclusion:** All three species exhibit significant pharmacognostic markers and antioxidant potential, with Carica papaya being most potent. These plants warrant further exploration as sources of natural antioxidants.

KEYWORDS: Pharmacognostic screening; antioxidant activity; Ludwigia adscendens; Launaea pinnatifida; Carica papaya; DPPH assay; phenolic content.

INTRODUCTION

Traditional use of Ludwigia adscendens, Launaea pinnatifida, and Carica papaya underscores their therapeutic potential, particularly as antioxidants. Oxidative stress is implicated in numerous pathologies. Identifying plant-based antioxidants remains important for developing safer pharmacotherapeutics. This study provides comparative pharmacognostic evaluation and quantitative antioxidant profiling of these species.

MATERIALS AND METHODS

Plant Material

Fresh leaves of Ludwigia adscendens, Launaea pinnatifida, and Carica papaya were collected, authenticated, and deposited with voucher numbers.

Pharmacognostic Analysis

Macroscopic and microscopic examinations were conducted, including leaf morphology, epidermal cell types, stomatal index, and trichome morphology.

Phytochemical Screening

Qualitative tests for alkaloids, flavonoids, phenolics, tannins, saponins, and glycosides were conducted.

Extraction

Dried powdered samples were extracted with 70% ethanol via maceration.

Antioxidant Assays

DPPH, ABTS, and total phenolic content assays were performed.

Statistical Analysis

Experiments were conducted in triplicate, with results reported as mean ± SD.

RESULTS

Pharmacognostic Features: Distinct morphological and microscopic features were observed for each plant species.

Phytochemicals	L. adscendens	L. pinnatifida	C. papaya
Flavonoids	+	+	+
Phenolics	+	+	+
Tannins	+	+	+

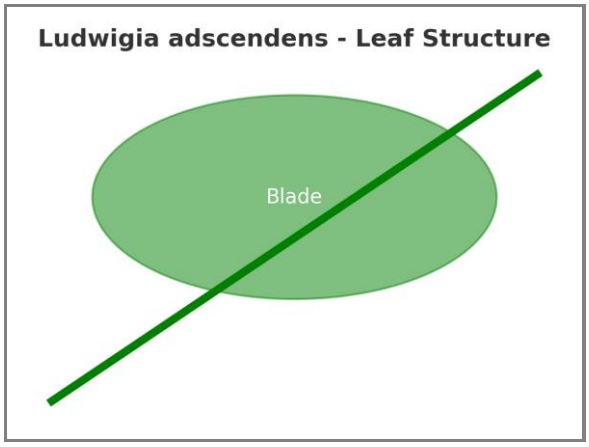

Figure 1: Leaf structure of Ludwigia adscendens.

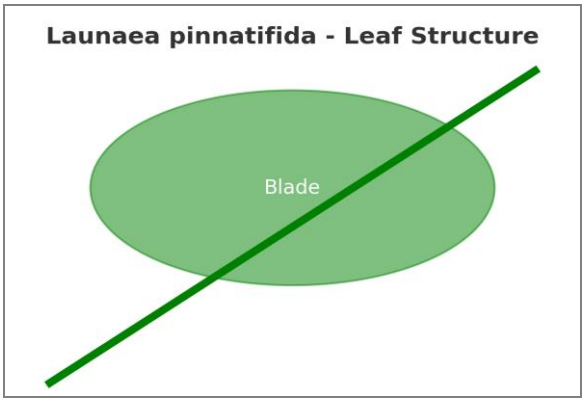

Figure 2: Leaf structure of Launaea pinnatifida.

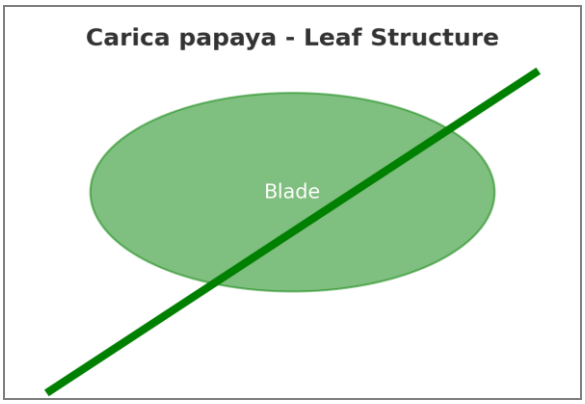

Figure 3: Leaf structure of Carica papaya.

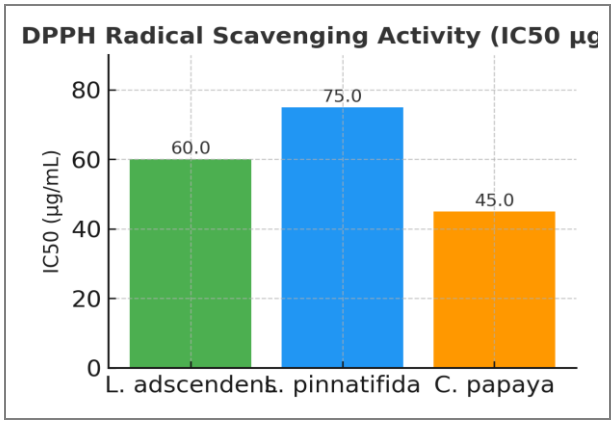

Figure 4: DPPH Radical Scavenging Activity.

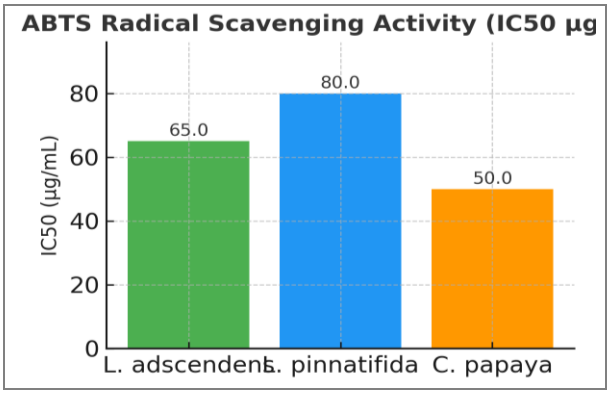

Figure 5: ABTS Radical Scavenging Activity.

DISCUSSION

The pharmacognostic distinctions identified are useful for correct identification and quality control. Phytochemical analysis suggests that phenolic and flavonoid constituents underpin antioxidant activity. The superior performance of Carica papaya aligns with reports highlighting its phenolic content.

CONCLUSION

This study establishes clear pharmacognostic parameters for three medicinally relevant species and confirms their antioxidant potential, with Carica papaya being most effective.

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