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PHARMACOGNOSTIC STUDIES ON WASTE PODS OF *DOLICHOS LABLAB*: PROXIMATE ANALYSIS AND PRELIMINARY TESTS

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ABSTRACT

Dolichos lablab L., commonly known as lablab bean or hyacinth bean, is a leguminous plant with a rich history of traditional medicinal use. *Dolichos lablab* waste pods hold promise for sustainable development. Pharmacognostic studies on this plant aim to provide valuable information on its chemical composition and preliminary tests, which can aid in its medicinal and pharmaceutical applications. Proximate analysis reveals extractive and ash values. Preliminary tests identify bioactive compounds like alkaloids and flavonoids. These studies provide valuable insights into the chemical composition of the waste pods and help in their quality control testing, thus supporting their utilization as valuable resources in various applications. Utilizing these waste pods may promote eco-friendly practices and offer a cost-effective protein supplement alternative, addressing global food security concerns. This paper presents the results of proximate analysis, including extractive value, ash value, and preliminary tests, to understand the quality and potential therapeutic benefits of *Dolichos lablab* waste pods and highlights the importance of eco-friendly and economically viable practices, contributing to sustainable and responsible development.

KEYWORDS: Pharmacognostic study, *Dolichos lablab*, waste pods, ash value, extractive value, preliminary tests, phytochemicals, waste management, protein supplements, Sustainability.

INTRODUCTION

Dolichos lablab, commonly known as lablab bean or hyacinth bean, is a leguminous plant, a climbing herb that can grow up to 5 meters in length. The plant bears green pods, approximately 6 cm long by 2 cm wide, which are flattened and contain 4–5 seeds. When mature, the pods turn light brown. The plant has diverse medicinal uses in different cultures. The decoction treats intoxication, cholera, and diarrhoea. The fruit pods have astringent and digestive properties, and the flowers address uterus inflammation and menstrual flow. The plant is known for its anti-inflammatory, aphrodisiac, antispasmodic, and antidiabetic effects, benefiting various digestive disorders. In Africa, Asia, and the Caribbean, it is also consumed as a green vegetable, including the green bean, pod, and leaf (Al-Snafi, 2017).

Beyond its traditional applications, there is growing interest in exploring the potential of utilizing waste pods from *Dolichos lablab* as a means of promoting sustainable development. These waste pods, which are often discarded after harvesting the seeds, may have the potential to be valuable resources when properly studied and utilized. The low-cost protein-rich nature of this bean, combined with its significant content of phenolics and minerals, high antioxidant activity, and numerous bioactive compounds, presents opportunities for enhancing genotypes through breeding and biotechnological advancements (Das et al., 2023).

Physico-chemical parameters are crucial in assessing the drug's purity and quality. The accurate determination of active principles in the plant relies on the dry condition, making it vital to assess moisture loss to evaluate the crude drug's condition. Minimizing moisture content is essential to prevent decomposition. Total ash and acid insoluble ash measurements reveal information about foreign matter, inorganic composition, and drug purity. Low values for these parameters in the powder sample indicate its purity, free from foreign matter (Chaudhari & Girase, 2015).

Pharmacognostic studies focusing on the waste pods of *Dolichos lablab* can provide crucial insights into their chemical composition, medicinal properties, and potential applications. The proximate analysis, including extractive value and ash value measurements and preliminary tests can help identify specific bioactive compounds that may have therapeutic significance and also offers valuable data about the quality of these waste pods.

The utilization of waste pods aligns with the principles of sustainable development, as it promotes eco-friendly agricultural practices and reduces the burden of vegetable waste on the

environment. By repurposing these discarded materials, researchers can contribute to more responsible and efficient waste management practices.

Moreover, the potential of *Dolichos lablab* waste pods as a cheaper source of protein supplement alternative is of great interest, particularly in addressing global food security concerns. If found to contain significant protein content, these waste pods could be processed into nutritious supplements, offering an affordable and accessible protein source.

This paper aims to present the results of Pharmacognostic studies on *Dolichos lablab* waste pods, highlighting their potential as valuable resources in sustainable development. The information obtained from these studies can serve as a basis for further research and development of eco-friendly and economically viable applications, contributing to the advancement of sustainable practices in the pharmaceutical, nutraceutical, and agricultural industries.

MATERIALS AND METHODS

The plant material i.e., empty pods of *Dolichos lablab*, for the present work, were collected from Vile Parle vegetable market, Vile Parle West, Mumbai, Maharashtra, India (ADD GPS LOACTION). The dried powdered material was used to carry out the analysis. For extractive value, ash value and preliminary analysis, the method followed was as per Khandelwal, 2007.

OBSERVATIONS AND RESULTS

The tests were carried out showed the following results:

Table 1.1: Extractive values of *Dolichos lablab*.

Solvent	*Dolichos lablab*
Hydro-Alcoholic (40:60)	13.256±0.25
Water	10.022±0.95
Methanol	10.913±0.90
Ethanol	3.533±0.62
Petroleum Ether	1.282±0.07
Chloroform	1.126±0.40
Acetone	2.748±0.58

All values in the table represent the mean ±SD (n=10).

Hydro-alcohol > Methanol > Water > Ethanol > Acetone > Petroleum ether > Chloroform.

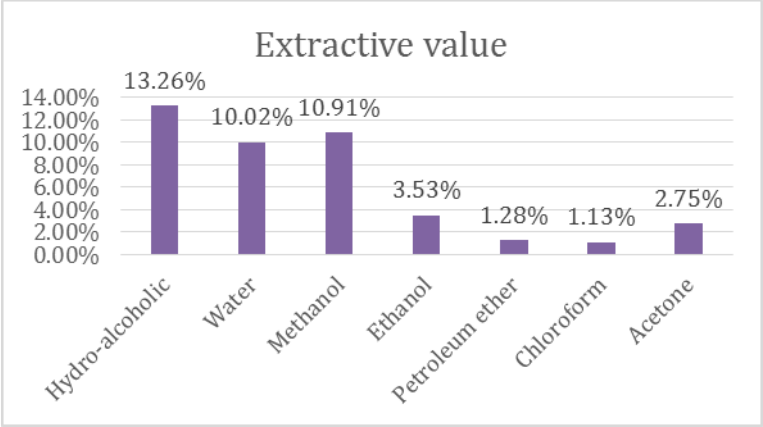

Fig. 1: Extractive values of *Dolichos lablab.*

Table 1.2: Ash values of *Dolichos lablab.*

Parameters	***Dolichos lablab***
Total Ash	5.951± 0.38051
Acid Insoluble Ash	0.61± 0.2079
Water Insoluble Ash	2.695± 0.500805

All values in the table represent the mean ±SD (n=10).

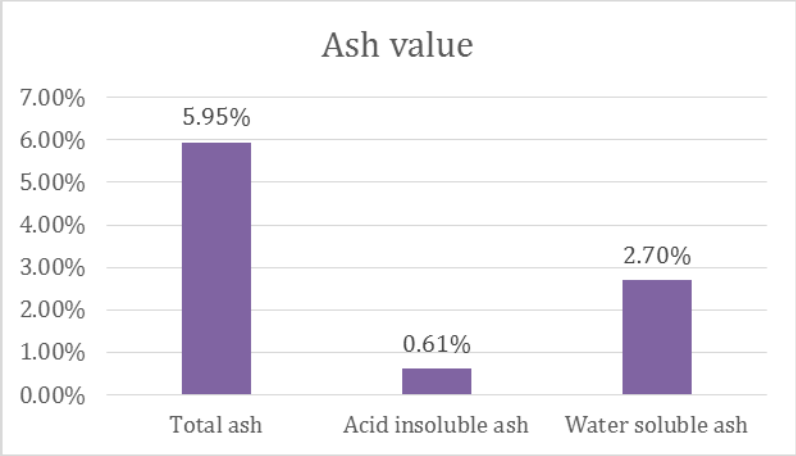

Fig. 2: Ash values of *Dolichos lablab.*

Table 1.3: Preliminary analysis of *Dolichos lablab.*

SR.NO.	TEST	OBSERVATION	INFERENCE
1	Fehling test	Brick red ppt	Reducing sugar present
2	Biuret	Violet colour	Protein present
3	Millon's test	Red coloration	Proteins present
4	Xantho-protein test	Yellowish orange colour	Protein containing tyrosine or tryptophan present.
5	Ninhydrin	Purple colour	Amino acids present
6	Test for Alkaloids: Dragendroff's test	Orange ppt	Alkaloids present
	Mayer's Reagent	Ppt	Alkaloids present

	Wagner's test	Reddish brown ppt	Alkaloids present
	Hager's reagent	Yellow ppt	Alkaloids present
7	Test for Tannins and phenolic compounds: Dilute $HNO_{3:}$ reddish to yellow colour	Reddish colour	Tannin/phenolic compounds present
	Lead acetate solution	White ppt	Tannin/phenolic compounds present
8	Test for Flavonoids:	Yellow colour	Flavonoids present

The data reveals the presence of phytoconstituents in the crude powder in pods of *Dolichos lablab* are alkaloids, flavonoids, tannins, proteins, amino acids, carbohydrates, hexose sugars and reducing sugars are present.

DISCUSSION

Vaidya and Vishwakarma (2020) have also carried out Pharmacognostic studies of *Pithecellobuim dulce* (Roxb). Benth. stem and leaves. Another detailed study by Gupta et al. (2012) was carried out of the Pharmacognostic profile of leaves and stem of *Careya arborea* (*C. arborea*) Roxb. (Lecthyidaceae). (Gupta et al., 2012). Pharmacognostic investigation and the establishment of quality control criteria for the fruit, bark, and leaf of *Zanthoxylum armatum* (Rutaceae) were also conducted by Alam and Us Saqib, 2015.(Alam & Us Saqib, 2015).

Fluorescence investigations on various plants have been carried out, including studies on *Costus speciosus* by Vaidya and Charania (2019), *Zizyphus jujuba* by Vaidya and Bari (2017), in Euphorbia hirta by Vaidya and Acharya (2017), *Helicteris isora* by Vaidya (2015), *Calophyllum* by Vaidya et al. (2015), *Holarrhena antidysenterica* by Vaidya (2015), as well as anatomical studies on *Barringtonia acutangular* by Vaidya and Ghaznavi (2017), *Ruta graveolens* by Vaidya and Shingadia (2015), and *Schleichera oleosa* by Vaidya and Guleria (2015). Verma and Vaidya (2015) performed a thorough macroscopic and microscopic assessment of *Carica papaya* L. leaves, paying special attention to the presence of sexual dimorphism.

CONCLUSION

The physiochemical and qualitative chemical assessment of plants holds significance as they validate the plant's quality, purity, and identity. The gathered information proves valuable for subsequent pharmacological and therapeutic assessments, as well as the standardization of

plant materials. This current endeavour represents a modest step in advancing these objectives.

In conclusion, this research delved into the pharmacognostic aspects of *Dolichos lablab*, focusing on key quality control parameters such as ash value, extractive value, and preliminary analysis. The meticulous assessment of these parameters provided valuable insights into the botanical and chemical characteristics of *Dolichos lablab*. These findings contribute to the broader understanding of the plants identity, purity, and potential therapeutic properties.

The importance of establishing these quality control parameters cannot be overstated. They form the foundation for ensuring the consistency and reliability of herbal materials in various applications, including traditional medicine and pharmaceutical industries. In an era where the demand for natural products is growing, standardized quality control parameters play a pivotal role in enhancing the safety, efficacy, and reproducibility of herbal preparations.

As further research unfolds, it becomes evident that the need for robust quality control parameters becomes even more imperative. The dynamic nature of plant materials, coupled with the increasing commercialization of herbal products, emphasizes the necessity of standardized methods to validate the authenticity and potency of botanicals. This research underscores the significance of ongoing efforts to refine and expand these quality control parameters, ultimately contributing to the advancement of Pharmacognostic studies and the broader field of natural product research.

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