



Review on Ethnomedicinal Claims and Pharmacological Activity of *Alambusha* (*Biophytum sensitivum* [Linn.] DC): An Extrapharmacopoeial Plant of Ayurveda

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ABSTRACT

Biophytum sensitivum (Linn.) DC., known as *Alambusha* in Ayurveda, is an herb famous for its therapeutic potential across diverse traditional medicine systems. *Alambusha* is widely used in folk medicine for treating inflammation, wounds, respiratory diseases and diabetes. This review compiles and analyzes ethnomedicinal claims and modern pharmacological studies on *Biophytum sensitivum*. Pharmacological research confirms its anti-inflammatory, wound-healing, antidiabetic, antioxidant and immunomodulatory activities validating many of the traditional claims. An effort has been made to compile all available data from books and published research articles.

However, further clinical studies are required to establish its efficacy and safety in humans, and future research should focus on bioactive compound isolation and synergistic applications.

KEYWORDS: *Alambusha*, ethnomedicinal claims, pharmacological studies

INTRODUCTION

Biophytum sensitivum (Linn.) DC., known as *Alambusha* in Ayurveda, is a herbaceous plant from the Oxalidaceae family, native to India, Africa, and Southeast Asia.^[1] This slender, sensitive plant is widely used in folk medicine for skin disorders, diabetes, respiratory ailments, and wound healing. Part of Kerala's revered "Dasapushpam" group, it holds cultural and medicinal significance.^[2] Traditionally used by Kerala's Muthuvan tribe for childbirth, wounds, and poison treatment.^[3,4,5] (Figure1: *Biophytum sensitivum*)

The objective of this review study is to comprehensively analyze the pharmacological, phytochemical and therapeutic properties of *Biophytum sensitivum* based on classical Ayurvedic literature and modern scientific research. This review will provide a detailed description of the ethnomedicinal uses and pharmacological research surrounding *Biophytum sensitivum*, enhancing the clinical utility of the plant in evidence-based Ayurveda.

MATERIALS AND METHODS

Literature Search

A comprehensive literature search was conducted across scientific databases (PubMed, Scopus, Google Scholar) and traditional Ayurvedic texts to compile information on the ethnomedicinal uses of *Biophytum sensitivum*. Pharmacological studies were reviewed to identify bioactive compounds and their mechanisms, focusing on anti-inflammatory, antioxidant, antimicrobial, and wound-healing properties. These sources were accessed through various web-based search engines during October 2024 to December 2024. The extracted data was categorized and systematically organized in a tabular format, detailing internal and external applications, dosage forms, major disease indications and textual references.

Results and Discussion

Distribution: In India, this plant is commonly found in the hotter regions, often growing as weeds in damp, shaded areas. Globally, it is distributed across wetlands in Madagascar, Cameroon (where it has been introduced), the Central African Republic (also introduced), as well as being widespread in India, Nepal, Sri Lanka, Thailand, Indochina, Java, peninsular Malaysia (Penang Isl., Melaka), Sumatra, Borneo, Sulawesi, Philippines, Lesser Sunda Isl., Moluccas, Myanmar [Burma] (Mandalay, Sagaing, Shan, Taninthayi, Yangon), Laos, Vietnam, China (Guangdong, Guangxi, Guizhou, Hainan, Yunnan) and Taiwan.^[6]

Parts used: Leaves and Whole plant^[7]

Local names: In Bengali, this plant is referred to as Jhalai, while in English it is called the Little Tree Plant, Sensitive Plant, wood sorrel tree or Sikerpud. In Hindi, it is known as Lajjalu, and in Malayalam, it is called Mukkutti. In Marathi, the plant is referred to as Jharera or Lajvanti, and in Sanskrit, it goes by the names Jhullipuspa, Alambusha, or Panktipatra. In Tamil, it is known as Tintanali, and in Telugu, it is called Pulicenta.^[8]

Therapeutic Uses

Biophytum sensitivum has been utilized across various traditional medical systems, often highlighting similar therapeutic applications. The following are some key ethnomedicinal claims associated with the plant (These are depicted in Table 1).

Commonly, the whole plant decoction is used for asthma and phthisis and the decoction of root is used for gonorrhea and lithiasis.^[9] Specifically, the leaves possess diuretic properties and alleviate strangury. They are commonly referred to as "Nagbeli" and are used in traditional medicine, particularly in Eastern Nepal, as a remedy for "Madhumeha" (Diabetes mellitus).^[10,11] The powdered leaves and seeds were used to apply on wounds.^[12] This plant commonly utilized in the treatment of snake envenomation, with the entire plant being employed to neutralize the effects of snake venom.^[13] Crushed plants are given in insomnia.^[14] Muthuvan, Kerala tribal people use this plant for delivery, cuts and wounds and also against poison.^[15]

In Congo, it has been employed as a sedative, while in Nigeria it is utilized for treating stomach pain, wounds, and urinary stones. In traditional medicine practices across Mali and Indonesia, it is commonly used for cerebral malaria, fever, wounds, and various skin conditions. Historically, in Nigeria, it has been applied to treat wounds, gonorrhea, urinary stones and stomach discomfort. The plant decoction is also used in amenorrhea and dysmenorrhea. In Gabon, it was used as a purgative, for hypertension in Togo, and in New Guinea, it is believed to enhance fertility.^[16]

The leaves are bitter and are used in Ayurveda to alleviate strangury. When rubbed with water and consumed, they act as a diuretic and help quench thirst during bilious fevers. The seeds, when powdered, are applied to wounds, and mixed with butter, they aid in promoting suppuration in abscesses. Decoction of the root is administered for conditions like gonorrhea and lithiasis. In Philippines, a leaf decoction serves as an expectorant, while the crushed leaves are used to treat wounds and bruises. Similarly, in Java, leaf decoctions are employed in the treatment of asthma, phthisis, and snake bites. In Madagascar, the plant is valued for its tonic and mild stimulant effects.^[17]

Pharmacological Activities

Biophytum sensitivum, a plant widely recognized in traditional medicine, exhibits a diverse range of pharmacological properties. It is known for its potent antioxidant, anti-inflammatory, and immunomodulatory

activities, which contribute to its efficacy in managing various ailments. The plant demonstrates antimicrobial properties, effective against a spectrum of bacterial and fungal pathogens, supporting its use in treating infections. Its antidiabetic and antihyperlipidemic potential has been validated through studies indicating its role in regulating blood sugar and lipid levels. Furthermore, *Biophytum sensitivum* possesses wound-healing and anti-ulcerative properties, making it valuable in promoting tissue repair and gastrointestinal health. Emerging research also suggests its anticancer activity, attributed to its ability to induce apoptosis and inhibit tumor growth. These pharmacological actions validate its traditional applications and encourage further exploration of its therapeutic potential. Pharmacological activities of *Biophytum sensitivum* are given in Table 2.

CONCLUSION

Alambusha (*Biophytum sensitivum*) holds considerable ethnomedicinal importance across numerous traditional medicine systems. In India, it is predominantly found in warmer regions, thriving as weeds in moist, shaded environments. On a global scale, the plant is distributed across wetlands in Madagascar, Cameroon (where it has been introduced), the Central African Republic (also introduced), and is widely present in India, Nepal, Sri Lanka, Thailand, and Indochina. The leaves and the whole plant are primarily utilized for therapeutic purposes. Its medicinal applications have been documented for 16 different diseases. Experimental studies have reported around 33 distinct pharmacological activities. This review aims to foster a renewed interest in exploring additional pharmacological properties of the plant and serves as a foundation for conducting clinical studies based on the currently documented activities.

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Conflicts of interest

There are no conflicts of interest.

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TABLES

Table 1: Ethnomedicinal/therapeutic uses



Table 2:

Area	Dosage form [external/internal application]	Therapeutic claims
	Decoction of root	Asthma and phthisis ^[9]
	Leaves	Diuretic and strangury ^{[10][11]}
Muthumala	Application of powdered leaves and seeds	Madhumeha
		Wounds ^[12]
		Snake venom ^[13]
		Insomnia ^[14]
Gabon		Purgative ^[15]
Togo		Hypertension ^[15]
New guinea		Fertility ^[15]
	In abscess, seed paste is applied to promote suppuration	
Philippines	Decoction of the leaves	Expectorant
	Application of grinded leaves	Wounds and bruises
Java	Decoction of the leaves	Asthma, phthisis and snakebite
Madagascar		Tonic and mild stimulant
	Internal administration when rubbed with water	diuretic

Pharmacological activities of *Biophytum sensitivum* Linn. in summarized form

No.	Parts used	Dosage form	Dose	Pharmacological action
1.	Callus	Phenolic extract		Anti-microbial activity ^[18]
2.	Leaf	Acetone extract		Anti-bacterial activity ^[19]
3.	Whole plant	Methanolic extract		Wound healing activity ^[20]
4.	Whole plant	Ethanolic extract		Anti-cancerous activity ^[20]
5.	Whole plant	Methanolic extract	200mg/Kg	Anti-pyretic activity ^[21]
6.	Whole plant	Methanolic extract	200mg/Kg	Anti-inflammatory activity ^[22]
7.	Whole plant	Methanolic extract	200mg/Kg	Analgesic activity ^[23]
8.	Whole plant	Methanolic extract	100mg/Kg, 200mg/Kg, 400mg/Kg, 500mg/Kg	Anti-urolithiatic activity ^[24]
9.	Whole plant	Ethanolic extract	250mg/Kg, 500mg/Kg, 750mg/Kg	Anti-urolithiatic activity and Antioxidant Activity ^[25]
10.	Whole plant	Methanolic extract		Inhibits Tumor Cell Invasion and Metastasis ^[26]
11.	Whole plant	Methanolic extract	0.1 mg/ml in L929 cell	Anti-tumour ^[27]

			culture and 500 μ /dose/animal / BALB/c mice	
	Leaves	Water extract	100 and 200 mg/kg for 28 days / Swiss albino mice	
12.	Whole plant	Methanolic extract	10 μ /mL in B16F-10 melanoma cells	Apoptotic Effect ^[28]
	Amentoflavone (biflavonoid)		10 μ /mL in B16F-10 melanoma cells	
13.	Whole Plant	Methanolic extract	50 mg/kg in B16-F10 melanoma cell-induced capillary formation in C57BL/6 mice	Anti-angiogenic activity ^[29]
	Leaf	Acetone extract	Fertilized eggs of gallus	

14.	Whole plant	Methanolic extract		Chemo protective effect ^[30]
15.	Whole plant	Methanolic extract		Anti-metastatic effects ^[31]
		Amentoflavone (biflavonoid)	/ 50 mg/kg for 10 days	
16.	Leaves	Ethanolic extract	500mg/Kg, 5000mg/Kg	Anti-ulcer activity ^[32]
17.	Leaves	Methanolic extract		Antioxidant, cytotoxicity, larvicidal potential ^[33]
18.	Whole plant	Methanolic extract, Water extract	10mg/Kg	Diuretic activity ^[34]
19.	Whole plant	Aq. Ethanolic extract	200mg/Kg	Anti-diabetic potential ^[35]
20.	Leaf			Anti- angiogenic activity ^[36]
21.	Whole plant	Methanolic extract		Anti-oxidant activity ^[37]
22.	Root, stem and leaves	Methanolic extract		Anti-oxidant activity, anti-inflammatory activity, anti-diabetic acitivity, anti-angiogenic activity,

				anti-cancer effect, chemoprotective effect, immunomodulatory effect, radioprotective and wound healing ^[38]
23.	Whole plant	Methanolic extract	50mg/Kg, 100mg/Kg	Anti-oxidant activity, neuroprotective activity ^[39]
24.	Leaf	Water Extract		Hypocholesterolemic Effect ^[40]
25.	Leaf	Water Extract	200mg/Kg	Hypoglycaemic effect ^[41]
26.	Whole plant	Methanolic extract		Nano-medicine character, anti-cancerous activity ^[42]
27.	Whole plant	Ethanol extract, chloroform extract		Anti-cancerous activity ^[43]
28.	Whole plant	*ME>**AE>Chloroform E	200mg/Kg	Nephroprotective activity ^[44]
29.	Leaves	Acetone extract		Larvicidal activity ^[45]
30.	Whole plant	Acetone extract		Anti-fungal activity ^[22,46]

31.	Whole plant	Hydroalcoholic extract	1 mg /ml /kg	Anti-hypertensive activity and Calcium antagonistic activity ^[47]
32.	Whole plant	Ethanol extract>ethyl acetate, chloroform and n-butanol extract	400mg/Kg	Anti-fertility activity ^[48]
33.	Whole plant	Methanolic extract	50mg/Kg	Radioprotective ^[49]
38.	Whole plant	Methanolic extract	4000mg/Kg	Safety and toxic profile ^[38]
	Leaves	Aqueous extract	100mg/Kg, 200mg/Kg, 300mg/Kg	
*ME = Methanolic extract, **AE= Acetone extract				

सारांश

बायोफाइटम सेंसिटिवम (*Biophytum sensitivum* (Linn.) DC.), जिसे आयुर्वेद में *अलंबुष* के नाम से जाना जाता है, अपने चिकित्सीय गुणों के लिए प्रसिद्ध एक जड़ी-बूटी है। पारंपरिक चिकित्सा प्रणालियों में इसका उपयोग सूजन, घाव, श्वसन संबंधी रोगों और मधुमेह के उपचार में किया जाता है। यह समीक्षा *बायोफाइटम सेंसिटिवम* से संबंधित पारंपरिक औषधीय दावों और आधुनिक औषधीय अध्ययनों का संकलन और विश्लेषण करती है। औषधीय अनुसंधान से इसके *सूजनरोधी*, *घाव भरने वाले*, *मधुमेहरोधी*, *एंटीऑक्सीडेंट* और *प्रतिरक्षी* संशोधित (इम्यूनोमॉडुलेटरी) गुणों की पुष्टि होती है, जो कई पारंपरिक दावों को वैज्ञानिक रूप से प्रमाणित करता है। हालांकि, इसकी प्रभावशीलता और सुरक्षा को सिद्ध करने के लिए और अधिक नैदानिक अध्ययन आवश्यक हैं। भविष्य के शोध को इसके जैवसक्रिय यौगिकों के पृथक्करण और समन्वित अनुप्रयोगों पर केंद्रित किया जाना चाहिए।