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Blumea lanceolaria
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A Survey on the Ethnomedicinal claims of Blumea lanceolaria (Roxb.) Druce - An Anukta Dravya

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Many ethnobotanicals which are widely used by tribal communities and other forest dwellers, claimed to have therapeutic qualities but not mentioned in classical Ayurvedic text are said to be Anukta Dravyas (Extra-pharmacopoeial drugs). One such highly beneficial plant is Blumea lanceolaria (Roxb.) Druce. It is a traditionally significant medicinal plant widely distributed across the Northeast, Central and South India. It belongs to the family Asteraceae and has been used by indigenous communities for generations to treat various ailments. The main aim of this article is to discuss the ethnomedicinal uses of Blumea lanceolaria (Roxb.) Druce. For the first time, this paper delves deeply into the various uses of the plant among the Boro, Dimasa and Chakma communities of Meghalaya, Assam and Mizoram states. This article presents a comprehensive survey of the ethnomedicinal uses of Blumea lanceolaria, including its vernacular names, traditional applications, medicinally useful parts and their preparations. In the present survey study, it was found that this herb is consumed regularly in diets and is also utilised as a natural cure for numerous ailments like headache, fever, cough, asthma, dysentery, stomach problem, etc. indicating the pharmacological activities like anti-microbial, anti-oxidant, anti-inflammatory etc. The topic also comprises the morphology of the plant and reviews from various research articles, books, and authenticated websites. Ethnomedicinal plants used by local communities are often very effective for various ailments, as they claim, but thorough scientific research is required. The current study creates a baseline dataset on Blumea lanceolaria, setting the stage for further investigations in other domains.

Keywords: Ethnobotanicals, Anukta Dravyas, extra-pharmacopoeial, Blumea lanceolaria (Roxb.) Druce, Boro, Dimasa, Chakma tribes

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Introduction

Ever since the origin of life on this planet, there has been evidence of the use of plants as diet and as well as medicine. In Rigveda and Atharvaveda, the therapeutic benefits of ancient herbal remedies have also been recognised and recorded. As a biodiversity hotspot, north-eastern states of India have a wide variety of flora. Moreover, Northeast India is the hub of different groups of tribal communities and they engage in their own traditional kind of health care for curing any diseases. They acquire immense knowledge about medicinal plants from their live experiences, as they have a great connection with 'Mother Nature.' Ethnomedicine refers to the traditional medical practices followed by various ethnic groups, including their beliefs, healing practices, and use of locally available plants and materials for treating diseases. It includes folk medicine, tribal medicine and community-based herbal systems. Many ethnobotanicals which are widely used by tribal communities and other forest dwellers, claimed to have therapeutic qualities but not mentioned in classical Ayurvedic text are said to be *Anukta Dravyas* (Extra-pharmacopoeial drugs). For the treatment of all illnesses, the traditional medical system or folk medicines are crucial to the people of rural India and the primary health care system. According to WHO estimate, about 80% of the world population relies on traditional systems of medicines for primary health care, where plants form the dominant component over other natural resources.**[1]** Thus, it is necessary to document the undocumented, orally passed knowledge of traditional medicine from one generation to the next, so that it can be preserved and included in the Ayurvedic system of medicine.

In *Charaka Samhita,* about 1000 plants including Ahaar dravya, in *Sushruta Samhita*, 573 and *Acharya Vagbhata* in *Ashtanga Hridaya* described about 903 drugs.**[2]** But the flora of the worlds lists millions of plant species. *Acharya Charak* says that the unknown *Aushada naama, Roopa,* can be known through *Gopalaka* (Shepherds)*, Vanacharini* (forest dwellers) and folklore practitioners because these nomadic forest tribes know very well about the vernacular names and their usage.**[3]** Thus, Ayurveda itself evolved alongside ethnomedicinal practices. Many plants and remedies used by local tribal communities were later documented, classified and standardised by Ayurveda scholars.

Apart from three principal texts, many Nighantus (lexicons) of later periods, enriched classical pharmacopoeia by adding many new plant drugs. Thus, exploring unknown is never-ending process. Among such medicinal plants, *Blumea lanceolaria* (Roxb.) Druce holds special place in traditional or ethnomedicinal practices. It is not mentioned in any Ayurvedic classical texts neither in lexicons (*Nighantus*). However, other species of *Blumea* like *Blumea lacera* DC.*, Blumea balsamifera* DC., *Blumea densiflora* DC., *Blumea malcomii* Hook.f. & *Blumea eriantha* are mentioned in name of *Kukundara* by different authors of *Madanpal Nighantu, Bhavaprakash Nighantu, Priya Nighantu, Vanausadhi Nirdeshika, Vanaushadhi Chandrodaya, Dravyaguna Hastamlaka, Brihad Dravyagunadarsa, Dravyaguna Vijnana* & Materia Medica of Ayurveda*. B. lanceolaria* belonging to *Asteraceae* family & synonyms *Blumea myriochephala* DC., *Conyza lanceolaria* Roxb., *Blumea longifolia* DC [4] is not mentioned in any Ayurvedic classical text.

Phylogenetic classification of *Blumea lanceolaria* (Roxb.) Druce[5]

Clade - Angiosperms
Super order - Asteranae
Order - Asterales
Family - Compositea (Asteraceae)
Genus - *Blumea*
Species - *lanceolaria*

Local Vernacular Names

- *Jwglaori* (Boro Tribes of Meghalaya and Assam),
- *Mukumgere* (Dimasa Tribes of Assam),
- *Veishak* (Chakma Tribes of Mizoram),
- *Buarze* and *Terapaibi* (Mizo Tribes of Mizoram),
- *Agijal, Muisingha* (Local names of plants in Indian Folk Life)

Habitat - Forests, grassy slopes, riversides

Variety - *Blumea spectabilis* (DC) Randeria

World Distribution - India, Bangladesh, Myanmar, China, Sri Lanka and countries of South East Asia like Philippines, Vietnam, etc.**[6]**

Indian Distribution - Assam, Mizoram, Sikkim, West Bengal, Uttar Pradesh, Madhya Pradesh, Peninsular India like Maharashtra, Karnataka, Tamil Nadu, Kerala, Andaman & Nicobar Islands, up to an altitude of 600m.**[7]**

Morphology[8,9,10]

Habit - A large perennial herb, undershrub or shrub, stem tall, 0.75-2.0 m in height, hollow, branched above; branches stout, glabrous or puberulous.

Leaves - The lower and middle cauline leaves are thinly leathery, oblanceolate, narrowly oblong-lanceolate or elliptic, apically mucronulate or acuminate, minutely or distantly serrate- dentate margins, 5-35 cm long, 0.8-8.0 cm wide, basally attenuate and decurrent or sometimes narrowed into an appendaged petiole, the petiole is 2-3 cm long. Adaxially (upper surface) often rugose and glabrous, black when dry, abaxially (lower surface) grabrate or puberulent with sparse multicellular hairs; many nerved, the lateral veins are fine, in 13-20 pairs, the reticulate veins are obvious.

Stem - Woody herbaceous, hollow, 1-2 cm in diam., glabrate or puberulous particularly on younger parts and in inflorescence, usually unbranched except for inflorescence axis.

(A) Young plant

Flower - Head clustered on large terminal, pyramidal panicles, 0.6-1.1 cm in diam., pedunculate subsessile. Involucral bracts green to purplish, longer than florets, recurved and spreading, 1-9 mm long; the outer ones ovate-lanceolate, The inner narrowly lanceolate with scarious margins, all pubescent on bark, with ciliate margins and apices. Receptacle flat, alveolate, 2-3 mm in diam., pilose, rarely glabrate. Corolla of bisexual florets tubular, 5-6 mm long, 5-lobed; lobes acute, papillate, pubescent with colleters, of female florets filiform, 5-6 mm long, 2-3 lobed, glabrous.

(B) Leaves

(C) Fully grown plant

(D) Inflorescence (E) Flower

Figure 1: *Blumea lanceolaria*

Fruit - Achenes straw- coloured, oblong, ribbed, pubescent. Pappus yellowish white to pale red, up to 5mm long. Blooming and fruiting time – February - April; reproduce through seeds.

Chemical composition[11,12,13]

Preliminary phytochemical screenings of *Blumea lanceolaria* have revealed presence of bioactive compounds such as flavonoids, tannin, & alkaloids.

Dark brownish essential oil obtained by steam distillation of flowering plant contained chrysanthenone (37%) as major constituent along with aliphatic hydrocarbons, 2,3-dimethoxy-p-cymene, 2,4,5-trimethoxyallylbenzene, caryophyll-ene oxide, 2-methyl-5-isopropyl cyclopentene carboxylic acid methyl ester, *β*-pinene (82.3%), terpin-4-ol (4.1%),*γ*-terpinene (2.5%), sabinene (2.2%), monoterpene hydrocarbons (90.4%), oxy-genated monoterpenes (6.5%) & phenyl derivatives (0.2%). Essential oil of fresh leaves (flowering stage) was reported to have p-cymene as major component (98.74 per cent) [from India] & methyl thymol [from Vietnam]. Alcoholic extract of plant contains saponin. Root & stem containa-spinasterol.

Methodology of Survey Study

The primary data collected for present study involved telephonic survey which was carried out in August 2023 with local communities in selected regions of North-east India i.e. Meghalaya, Assam and Mizoram. Data on this plant was gathered from indigenous communities using a questionnaire.

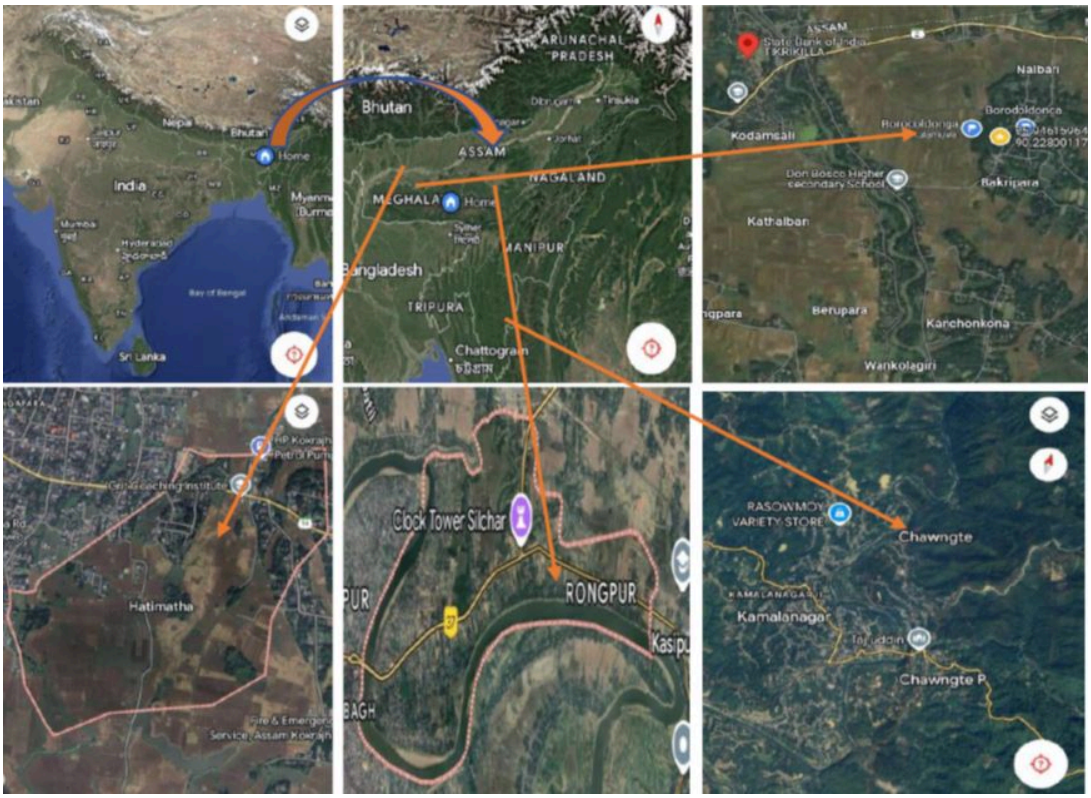

Figure 2: Satellite view of survey area

Study Area

The survey areas picked for the research are particularly some regions of the three states of Northeast India. Namely: *Tikrikilla*, West Garo Hills, Meghalaya; *Rongpur*, Silchar, Assam; *Hatimatha, Kokrajhar,* Assam and *Chawngte, Lawngtlai*, Mizoram. It is a known fact that the above-mentioned states have a diverse topography, with valleys between plains, plateaus, and mountains, additionally receives the most notable amount of rainfall from June to September. The GPS coordinates of *Tikrikilla,* Meghalaya is 25.87104 N and 90.21094 E;**[14]** *Rongpur*, Silchar, Assam is 24.82733000 N and 92.79787000 E;**[15]** *Kokrajhar,* Assam is 26.60000000 N and 90.20000000 E**[16]** and *Lawngtlai,* Mizoram is 22.53000000 N and 92.90000000 E.**[17]**

Survey within the tribal communities

Table 1: Ethnomedicinal values of *B. lanceolaria*

SN	Community	Plant Part	Mode of Preparation	Ailment Treated	Region
1.	Boro	Leaves	Soup (in diet)	Digestant	Tikrikilla, West Garo Hills, Meghalaya
			Kwatha (decoction)	Coughs, colds, fever.	
2.	Boro	Leaves	Kwatha (Decoction)	Coughs, colds, fever	Kokrajhar, Assam, India
3.	Dimasa	Leaves	Swarasa (Juice)	Stomach-ache, indigestion.	Rongpur, Silchar, Assam
			Chutney	Appetizer	
4.	Chakma	Leaves, roots or whole plant	Salad	Appetizer	Lawngtlai, Mizoram
			Swarasa (Juice) and Vati (polyherbal tablet)	Headache, dysentery,	
			Kalka (Paste)	Inflammation	

The telephonic survey was conducted during month of August 2023 among above-mentioned states. Eight- nine informants from each tribal community were taken for the survey and interviewed through telephonic calls. Mainly people from *Boro, Dimasa* and *Chakma* tribal communities use *B.lanceolaria* in their day-to-day life. The information regarding usage of *B. lanceolaria* were collected through a proper questionnaire. Data were collected on plant local names, parts used, preparation methods, ailments treated, and modes of administration. During survey, it was concluded that leaves of *B. lanceolaria* were consumed as food and for medicinal uses.

The leaves are used as chutney, salad or soup which act as an appetizer. Mostly leaves and occasionally roots are used internally in the form of decoction, juice and polyherbal tablet forms in various diseased conditions like fever, cough, sore throat, dysentery, stomach-ache and headache. A paste prepared from leaves is locally applied in many kinds of inflammation (Table 1).

Previously mentioned Ethnomedicinal Uses of *Blumea lanceolaria*

The data was also accumulated from various other electronic databases like Google scholars, PubMed and Scopus. Relevant books and articles were also reviewed.

- The Chakma peoples traditionally used the paste of leaves for the treatment of fever by applying on head and forehead.**[18]**
- In Mizoram the plant in folklore medicine this plant is used as an anti-cancer agent and pressed juice of leave is useful for wound healing, chronic ulcers and infusion of leaves to control dysentery.**[19]**
- The leaves are aromatic and used as a flavouring agent for the food. In traditional medicine, the leaves are used for the treatment of bronchitis, aphthae and asthma.**[20]**
- It is used in the treatment of vermifuge, cholera, fever, scurvy, bronchitis and as antioxidants which has been used in traditional folklore medicine for their analgesic, antipyretic and anti-inflammatory activities.**[21]**
- A decoction of the leaves is taken orally to treat stomach ulcers, dysentery and wounds.**[22]**
- The leaves are employed for treating bronchitis and asthma and as a poultice for rheumatism. **[23]**
- The herb is used in China as a carminative and in severe constipation and as an anti-beri-beri agent.**[24]**
- The young leaves are eaten as condiment especially with fish, in Vietnam.**[25]**
- Saponin contained in the alcoholic extract of the plant shows haemolytic effect on human blood. **[26]**
- The leaves are used in body ache. The shoot is used for post-partum complaints.**[27]**

- Leaves juice used in poisoning, burning sensation, thirst, leprosy, boils, vomiting, eye diseases, worm infestation, diseases of the throat.**[28]**
- In case of injury caused by knocks and falls, appropriate amount of fresh *Blumea lanceolaria* leaves are mashed, stir fried with wine for application, or decocted in water for washing the affected areas.**[29]**

Pharmacological properties

From above mentioned sources it is observed that there is very little work carried out on the pharmacological activities of this plant. Pharmacological properties as summed up from recent research studies are –

Anti-microbial[30]

- **Root:** Both ethanolic (12.1 mm ± 0.28) and methanolic (8.1 mm ± 0.28) extracts of root showed the highest antibacterial activity against *aureus.* Among gram negative bacteria, ethanolic extract showed more inhibition towards *E. coli* (8.1 mm ± 0.28).
- **Leaves:** Ethanol and methanol extracts of leaf of *lanceolaria* showed the highest antibacterial activity against *S. aureus* strain. Highest zone of inhibition was achieved in case of ethanol extract (12 mm ± 0.00). Among gram-negative bacteria, ethanolic extract of leaf showed more inhibition towards *P. aeruginosa* (7 mm ± 0.0) zone of inhibition. Methanolic extract of leaf too showed more zone of inhibition towards P. aeruginosa among gram negative bacteria (3.6 mm ± 0.28).
- **Stem:** In gram positive bacteria (S. aureus), highest zone of inhibition was achieved in case of ethanol (10.1 mm ± 0.28) and methanol (7 mm ± 0.0) extracts. Both ethanolic and methanolic extracts showed more inhibition towards E. coli (9 mm ± 0.00 and 6 ± 0.50 mm, respectively) when it comes to gram negative bacteria.

Anti-oxidant activity[31]

Methanolic extracts of root showed highest reducing activity of superoxide dismutase (9.4 SOD units/ mg protein) and ascorbic acid oxidase (1.52 ascorbic acid oxidase units/mg proteins) indicating that roots of *B. lanceolaria* are a rich source of antioxidants.

Anti-inflammatory[32]

Anti-inflammatory activity of MEBL (methanolic extract of the leaves of *Blumea lanceolaria*) was measured at the doses of 200 and 400 mg/kg b.w. i.p. against acute paw oedema induced by Carrageenan produced significant ($p < 0.01$) anti-inflammatory activity and the results were comparable to that of Diclofenac as a standard drug. The MEBL at the doses of 200 and 400 mg/kg showed an inhibition of (22.5%, 27.68%, 34.89%, 38.13% and 28.33%), (12.73%, 23.18%, 29.44%, 33.26% and 17.81%) and 68.61%, 67.76%, 68.95%, 70.04% and 69.87% respectively. This study showed that all the doses of MEBL effectively suppressed the oedema produced by histamine, so it may be suggested that its anti-inflammatory activity is possibly baked by its antihistaminic activity. The MEBL produced significant analgesic effect and this effect may be due to inhibition of the synthesis of the arachidonic acid metabolite. In addition, MEBL potentiates the analgesic activity of morphine.

Analgesic[33]

The methanolic extract of the leaves of *Blumea lanceolaria* showed significant peripheral analgesic activity at the tested dose level. The activity was comparable with morphine sulphate in all the analgesic activity. It exhibited significant ($p<0.01$) inhibition of the control writhes at the rate of 22.68, 50.52 and 79.89% respectively in the acetic acid induced writhing test. In case of hot plate test and tail flick test it showed significant increase in reaction time and increase in the tail flick latencies when compared to that of morphine sulphate, 5 mg/kg i.p. and control group.

Anti-pyretic[34]

Subcutaneous injection of yeast suspension markedly elevated rectal temperature after 24 h of administration. Treatment with MEBL at doses of 200 and 400 mg/kg significantly ($p < 0.01$) decrease rectal temperature of rats in a dose dependent manner. The antipyretic effect started as from first hour and effect was maintained for 4h, after administration of extract.

Anti-cancerous[35]

The methanol extract of leaf of *Blumea lanceolaria* exhibited moderate cytotoxicity (20100) against HeLa cell lines.

The cytotoxicity of plants extract showed increase in cell death with the increase in concentration of plant extracts on HeLa cell lines.

Discussion

The ethnomedical practices of various tribal communities have significant impact on their living conditions, education, socio-cultural behaviour, socio-economic status and socio-religious beliefs and practices. The consistent use of *Blumea lanceolaria* across geographically and culturally distinct communities highlights its therapeutic relevance in traditional medicine. Through this survey of the local people of Northeast India, it is evaluated that the *B. lanceolaria* is used by many tribes in their daily lifestyle in various ways. The ethnomedicinal uses of *B. lanceolaria* are diverse and cover a wide range of health conditions. Leaves, roots and whole plant are used in various forms, including decoctions, poultices, infusions, and crude extracts. The role of *B. lanceolaria* in treating respiratory and gastrointestinal ailments is particularly notable. While some uses, such as its application for wound healing and rheumatic pain, are well-documented ethnobotanically, others require further pharmacological validation. Even it has been researched and documented for Anti-cancerous activity. Thus, it has immense potentiality. The presence of phytochemical constituents like alkaloids, tannins, flavonoids, saponins and essential oils indicate the plant's anti-inflammatory, antimicrobial and analgesic properties reported in ethnomedicinal practices.

A crucial but frequently underappreciated aspect of healthcare is traditional medicine/ethnomedicine. The ethnomedicinal practices play a vital role in a developing country like India, especially in the rural areas. Additionally, for antimicrobial resistance and novel diseases, safer and inexpensive drugs are of utmost importance. Moreover, it can be a substitute of other endangered plant species with comparable pharmacodynamic qualities. Despite its extensive use in folk medicine, scientific studies on its pharmacological and phytochemical properties remain relatively limited. Ethnomedicinal plants are *Anukta Dravyas* from the perspective of classical Ayurveda. Several *Anukta Dravyas* identified from ethnomedicinal traditions have been scientifically validated and integrated into Ayurvedic formulations or practices.

Similarly, integrating this traditional knowledge of *B. lanceolaria* with Ayurveda through scientific research will help enriching Ayurvedic pharmacopoiea. Thus, it will lead to a new horizon for the development of new drugs and contribute to humankind. Therefore, documenting its ethnomedicinal applications is crucial for future pharmacological validation and scientific research.

Conclusion

Blumea lanceolaria is valuable medicinal plant with diverse ethnomedicinal applications across South & Southeast Asia. This survey consolidates traditional knowledge & underscores need for further pharmacological studies to scientifically validate its therapeutic potentials. Additionally, preserving this indigenous knowledge is essential for cultural heritage & sustainable healthcare practices.

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