

A Review: Pharmacological uses and Phytochemistry Studies on *Blumea lacera* (Burm.f.) DC

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Abstract;

The majority of crude drug are still produced from plants. Considering how expensive the therapy was, so that the majority of India's rural population still uses traditional medicine, primarily herbal drugs. After the COVID-19 pandemic, patients moved towards the herbal medicine system, i.e., improving immunity. Blumea lacera is a tiny, branching annual herbaceous plant. In the ancient Ayurvedic and Unani systems of holistic health and herbal medicine of the east, the plant Blumea lacera (Asteraceae) plays a significant role. It has been claimed that Blumea lacera has anti-anxiety, diuretics, anti-inflammatory, analgesic, immunomodulatory, antiviral, and wound healing. This species has yielded a broad variety of chemical substances, including alkaloids, thiopenes, flavonoids, polyacetylenes, triterpenes, and their glycosides.

Keywords: Anti-anxiety, Beta sitosterol, Flavonoids, Thymol, Cuminol, *Blumea lacera*.

Introduction:

Herbs have been utilized to treat illnesses in all societies across history since the dawn of time. In 1960, in northern Iraq, it was discovered that Neanderthals had used herbal treatments as early as 60,000 years ago. The word "herbal drug" refers to plants or plant components that have undergone procedures including harvesting, drying, and preservation to become phytopharmaceuticals. (Dubey T., et al;2019).

The vast array of chemical components that plants create are known as secondary metabolites and that, despite appearances, have no direct role in plant development and reproduction. These chemical compounds have pharmacological effects on the human body. These physiologically active substances' flavonoids, alkaloids, phenolic compounds, and tannins are the most potent. As a result, the separation and purification of secondary metabolites from plants are becoming increasingly common. Local names for the Asteraceae plant *Blumea lacera* (Burm.f.) DC. include janglimulli, siyalmutra, susksampatra, and kakaronda. The herb is branched in a corymbose pattern and has a fragrance that is similar to camphor. Alkaloids, amino acids, carbohydrates, tannins, phenolic compounds, reducing sugar, flavonoids, saponins, coumarin, and terpenoids were the main secondary metabolite groups examined from this plant. The phytochemical research has revealed the presence of trace levels of campesterol, acetylenic substances, thiophene derivatives, diesters, prenylated phenol glycosides, flavonoids, and monoterpene glycosides. (Ashrafi s., et al; 2022)

Blumea lacera leaf extract in methanol has shown cytotoxicity, antibacterial, antifungal, and antipyretic action. *Blumea lacera* has antiviral, antileukemic, and antidiarrheal properties. The antioxidant properties of the *Blumea lacera* leaf methanol extract are due to the phytoconstituents flavonoids and tannins. (Hasan N. Md., et al;2015).

The Asteraceae family member *Blumea lacera* (*Burm.f.*) DC., whose leaves have long been utilized in traditional medicine, has a tremendous therapeutic benefit. The most useful and edible portion of the plant is the leaf. Even though leaf juice has a variety of medicinal properties, including antispasmodic, anthelmintic, astringent, febrifuge, stimulant, diuretic, and the ability to treat bronchitis, fevers, and burning sensations, little research has been done to date to examine its pharmacological potential. As a result, this study thoroughly studied *Blumea lacera's* antioxidant, anxiolytic, and antidepressant properties in addition to its chemical characterization. (Hossen A. Md., et al; 2021)

Plant profile:

Blumea lacera (*Burm. f.*) DC., a plant in the Asteraceae family also known as kukaraundha, *Blumea lacera* is a perennial plant with a camphoraceous scent that is herbaceous, bitter, acrid, astringent, thermogenic, anti-inflammatory, refrigerant, styptic, and antiscorbutic. The size of its leaves is 4–13 cm long and 3–7 cm wide. is native to the entire nation and is grown organically using GACP (Good Agriculture Farming Practices) to increase the percentage of active ingredients and boost the plant's therapeutic benefits through the use of real plant material and high-quality agricultural products. One of the biggest dicot families is Asteraceae. It is commonly known that the seeds of dicot plants, including legumes, oil seeds, and nuts, contain a significant quantity of phytic acid. By promoting the phytase enzyme-based breakdown of phytic acid, processing techniques including germination, soaking, fermenting, blanching, roasting, frying, and boiling lower phytate concentrations. 12.82 mg/100 g of phytate, which demineralizes calcium, iron, magnesium, manganese, copper, and other minerals, is discovered in *Blumea lacera* (*Burm.f.*) DC. (2-4). Phytate, cyanogenic glycosides, and alkaloids are some of its less desirable characteristics, but it is also a source of many other elements that are good for your health. (Singh L.R., et al;2019).



Plant Taxonomy: (Yadav K. V., et al;2018)

Kingdom	Plantae
Subkingdom	Tracheobinota
Super division	Spermatophyta
Division	Magnoliophyta
Class	Manngoliopsida
Subclass	Asteridae
Order	Asterales
Family	Asteraceae
Genus	<i>Blumea</i>
Species	<i>Blumea lacera</i>

Vernacular Name-(synonyms): (Yadav K.V., et al 2018)

English	<i>Blumea, malay blumea</i>
Hindi	<i>Kukaraundha</i>
Gujarati	<i>Kolhar</i>
Telgu	Advimulangi, Karupogaku
Tamil	Kattumullangi, Narakkandai
Bengali	Kukurmuta
Marathi	Bharmunda
Malayalam	Kukkavriksham and Rakkila

In Saroorpur, Meerut district, the author saw a widespread population of *Blumea lacera* while conducting research on the medicinal plants of Uttar Pradesh. The two geographical areas of Uttar Pradesh are the Ganga Plain and the Southern Hills and Plateau. Meerut, Saharanpur, Moradabad, Aligarh, Bareilly, and Agra are just a few of the seven areas that make up Western Uttar Pradesh, which is located in Northern India. The W.U.P. climate is predominantly affected by the predominance of dry air of the continental type throughout the majority of the year, with the summer being extremely hot and the winter being frigid. Uttar Pradesh has a lengthy and interesting history. The Ramayana and Mahabharata, two of the greatest epics, both reference this location. Between 23°52' and 29°45' North Latitudes, to 77°04', is where Uttar Pradesh is located. (Tomar A., et al 2017)

Blumea lacera is another important herb used in medicine, having applications in several well-known systems such as Ayurveda, Homoeopathy, and Unani. Both domestic and foreign drug markets are experiencing high demand for various strains of this cannabis, including both fresh and dry varieties. Leaf juice is used to treat blood disorders, bronchitis, bleeding piles, diuretics, astringents, stimulants, anthelmintics, and liver tonics.

The plant also functions as an excellent stomachic and antispasmodic agent. It is utilized in traditional medicine for the treatment of cough, bronchitis, dysentery, and wound healing capabilities. Despite the fact that, these herbs can be best employed for their therapeutic properties, no study is available on the GC/MS profiling of weed extracts from chosen plants. The purpose of the present study was to examine and develop the phytochemical profile. (Mokat D. N., et al;2020).

Specific uses in different systems of healing:

Ayurveda, Homoeopathy, Unani, Siddha, and Allopathic systems of medicine all use *Blumea lacera* to treat a variety of bodily diseases. Jalodar, Sandhivaat, Sotha, Atisaar, Raktagrathi, and Vranaropan are all treated with it in Ayurveda. Its essential oil is utilized as Muqawwi-e-Aam in the Unani system. The Mudirr-e-Baul, Kasir-e-Riyah, and Zof-e-Meda are also widely known. The mother tincture of the homoeopathic method is frequently used as a febrifuge and to treat bleeding piles. 'Narakkarandai' is a deobstruent and an anthelmintic used in the Siddha school of medicine to treat threadworm infestation. (Singh, L.R., et al;2019).

***Blumea lacera* plants parts used:**

Because this plant has great medicinal potency, it is utilized in numerous ways, including as leaves, stems, and the entire plant (leaves are more conspicuously used)

Geographical distribution:

In addition to Nepal, Bangladesh, and India, *Blumea lacera* is also found in other parts of the world. In India, it can be found in the states of Bihar and Uttar Pradesh and may reach heights of up to 1000 meters. It is thought that this plant has great defenses against several plants and has allelopathic effects on them.

Cultivation and collection:

The plant is found to grow in a variety of soils viz. loamy, sandy loam, silty loam, and clay loam. The amount of rain fluctuates greatly from year to year. The most rain ever measured between July and September during the monsoon. The year may be split into four seasons based on climate. After the cold season, which lasts from about the end of November to the beginning of March, comes the hot season which lasts until about the conclusion of June. The south-west rainy season lasts until the conclusion of September, with the following two months serving as the transitional phase. For the majority of the year, the air is dry. The driest months are often April and May. (Tomar, A., et al;2017).

Pharmacognostical Studies:

Blumea lacera is a perennial plant with a camphoraceous scent that is herbaceous, bitter, acrid, astringent, thermogenic, anti-inflammatory, refrigerant, styptic, and antiscorbutic. The size of its leaves is 4–13 cm elongated and 3–7 cm wide.

The apex of the leaves is generally acute to apiculate, obovate, or, less frequently, oblanceolate, pilose with colleters and multicellular hair. The leaves are frequently lyrate-lobed.

Procumbent stem with branches growing from the base.

Capitula: Corolla lobes of bisexual flowers have hairy corollas, and capitula are found in compact, spiciform panicles.

Flowers: coarse

Cypselae: just marginally pilose.

Phytochemistry:

There are components in different parts of the plant that are useful for treating ailments. Around the world, the leaves are more often and prominently utilized for therapeutic purposes. In order to increase the medicinal advantages, the leaves should be collected in the months of January and February before 50% of blooming, as advised by WHO-GHP (Good Harvest Processing Practices). Camphor, (Z)-lachnophyllic acid, nerolidol, gernacrene, monoterpene glycosides, flavonoids, farnesene, dihydroxy-trimethoxy flavone, diacetyl glucopyranoside, -

caryophyllene, campesterol, -humulene, amyirin, amyirin acetate, lupeol, lupeol acetate, hentriacontane, and beta sitosterol, beta sitosterol is produce anxiolytic effect. (Singh, L., et al.; 2019).

The outcomes of the EBL's phytochemical showing revealed the existence of phenol, phytosterols, flavonoids, tannins, and alkaloids, as well as carbohydrates, reducing sugars, proteins, and amino acids, as important ingredients. However, it was discovered that anthraquinone glycosides, cardiac glycosides, saponins, and hexose sugars were lacking. (Siva, H., et al; 2019).

Bioactivity:

The *Blumea lacera* plant extract has a variety of pharmacological and therapeutic effects. These are anti-inflammatory, anti-diabetic activity, wound healing activity, hyperglycemic activity, expectorant activity, antipyretic, and wound healing activity.

Pharmacological activities of *Blumea lacera*:

Anti- atherothrombosis:

Blumea lacera whole plant crude methanol extract has been examined for anti-atherothrombosis. The anti-atherothrombosis activity was assessed using conventional streptokinase. The extract demonstrated anti-atherothrombotic properties in an in vitro assay. Compared to the benchmark, streptokinase (81.53%), clot lysis was 46.17% lower (Ibrahim, M., et al; 2014).

Cytotoxic and Antibacterial activity:

The potential cytotoxic and antibacterial effects of *Blumea lacera* Burm. The crude extract was examined. it was powdered and successfully extracted with methanol and petroleum ether. The extracts phytochemical analysis exposed the occurrence of alkaloids, tannins, steroids, gums, and reducing sugar. The results of the antimicrobial research revealed that the petroleum ether and methanol extracts had antibacterial action against a fungus, two gram-positive and gram-negative bacteria, respectively. The herb has medicinal benefits for diabetes, sedation, stomach illness, and cholera, according to the literature study (Jahan, K., et al; 2014).

Anti- Diarrheal activity:

The goal of the study was to find a possible *Blumea lacera* compound with antidiarrheal action the discovered chemical of interest, *Blumea lacera*, was demonstrated to have strong antidiarrheal action the method castor oil-induced diarrhea test was used for evaluating anti-diarrheal activity (Ashrafi, S., et al; 2022).

Antioxidant and Antibacterial activity:

Blumea lacera, which has a long history of usage in treating a variety of ailments, was used in phytochemical and biological research. Acyclic diterpene phytol and the fatty acids linolenic acid and oleic acid were isolated by chemical investigations. All of the structures were identified by ¹H-NMR spectroscopic investigation, and this plant is the first to disclose them. Assays for antioxidant, cytotoxicity, antibacterial, and antidiarrheal properties were performed on various fractions of crude methanol extract. Utilizing online resources, UCSF Chimera, Discovery Studio and molecular docking studies. Additionally, using PASS online tools, the ADME/T analysis and PASS estimate were put into practice. The compounds have shown substantial binding affinity extending from 4.5 to 6.2 in the molecular docking investigation of antioxidant, antibacterial, and anti-diarrheal action. (Alam, S., et al; 2022).

Anti- Diabetic activity:

A fragrant annual plant called *Blumea lacera*. has been used for centuries to cure or prevent diabetes. It has infallible uses, but its supply is constrained by how quickly it wears out. In this work, we want to further our considerate of the molecular mechanisms underlying the anti-diabetic properties of its micro propagated plants in a type 2 diabetes mammalian (mouse) model. Mice with diabetes that were generated by streptozotocin were used to evaluate the water extract of the micro propagated plants. Effectively suppressing glucose levels, preventing weight loss, and improving dyslipidemia in mice were all effects of the extract. Additionally, it reduced liver damage and all examined toxicity markers, such as serum glutamate-pyruvate transaminase, and serum C-reactive protein, which is an anti-inflammatory sign. The investigation of intramolecular interactions showed (Hasan, M., *et al*; 2022).

Anti-Haemorrhoids activity:

According to an ethnopharmacological study of the Madia-Gond Tribe in the Maharashtra State's Gadchiroli area, anal fissures and hemorrhoids/piles are treated using an aqueous extract of *Blumea lacera* (BL) leaves. (Tiwari, V. J., *et al*;2016).

Anti-Ulcer activity:

Blumea lacera (Burm.f.) DC. is a beneficial medicinal plant that is mentioned in several well-known medical systems. Reporting on the *in vivo* antiulcer activity of *Blumea lacera* methanol extract (MEBL) and *in silico* analysis of its bioactive components is the aim of the investigation. Omeprazole (20 mg/kg, *p.o.*) was utilized in this study as a reference medication and as a normal control prior to fasting. 0.5 mL of 80% ethanol was administered to Long-Evans rats in order to cause stomach ulcers. As a pretreatment, MEBL was then given orally at various levels (250 and 500 mg/kg, *p.o.*, *b.w.*). *In silico* action against the stomach H⁺-K⁺ ATPase enzyme was also studied. The outcomes demonstrated that the MEBL therapy considerably decreased ulcers and maintained the integrity of. (Hossen, Md. A., *et al*;2021).

Anti- Cancer activity:

This study examined *Blumea lacera* crude leaf extract's anticancer and antioxidant effects. The 1,1-diphenyl-2-picrylhydrazyl radical scavenging activity, ferric reducing antioxidant power assay, and thiobarbituric acid reactive substances for evaluation of antioxidant activity were used to investigate the methanol and ethanol-based extracts. These extracts' anticancer efficacy was evaluated using the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide assay, wound healing assay, and colony formation assay (Rao, A. M., *et al*; 2021).

Anti-Pyretic activity:

The goal of the current study was to evaluate the antipyretic effects of *Blumea lacera* leaf (BLE) methanolic extract on albino rats. According to OECD recommendations, a limit test was used to assess the acute toxicity of *Blumea lacera*. Brewer's yeast was used to induce pyrexia in order to study antipyretic efficacy. More than 2000 mg/kg of BLE was the acute oral LD₅₀ in female rats. To examine the antipyretic efficacy of BLE in rats, three ascending dosages of 100 (1/20 LD₅₀), 200 (1/10 LD₅₀), and 400 mg/kg (1/5 LD₅₀) were used. Brewer's yeast-induced pyrexia in rats was reduced by BLE at dose rates of 200 and 400 mg/kg, indicating that *Blumea lacera* has an antipyretic action. (Verma, L. K., *et al*; 2012).

Anti- anxiety activity:

The existing work aims to explore the possible bioactive metabolites and activities of *Blumea lacera* methanol leaf extract in lowering anxiety and depression using a range of experimental and computer-aided techniques. The chemical makeup of the methanolic extract of *Blumea lacera* was characterized using conventional phytochemical and GC-MS analyses. Me-BLL was administered orally to Swiss albino mice at 200–400 mg/kg to explore the neuropharmacological insights. The anxiolytic effects were examined using the elevated plus maze (EPM), light-dark box (LDB), and hole-board tests; the antidepressant effects were evaluated using the forced swimming (FST) and tail suspension (TST) tests. Diazepam (1 mg/kg, i.p.) and fluoxetine HCl (20 mg/kg, p.o.) made up the reference standard. Several bioactive metabolites, such as increased levels of total phenolics. (Hossen, Md. A., et al; 2021).

Conclusion;

A tiny, branching herbaceous medicinal plant called *Blumea lacera* has considerable therapeutic benefits for treating a number of ailments. A remarkable action for treating a variety of ailments is provided by *Blumea lacera*. It is frequently used as a medication to treat conditions including diabetes, fever, wound healing etc. It has a diverse spectrum of chemical components. Clinical studies have been conducted on pharmacological actions such as anti-anxiety, anti-cancer, anti-diarrheal, anti-depressant, etc. The wide variety of bioactive substances, including glycosides, thymol, cuminol flavonoids, triterpenoids, and alkaloids etc. Future investigations on the standardization and stability of *Blumea lacera* extract can serve to demonstrate that it is a potential source in the nutraceutical and pharmaceutical industries.

References:

1. Abolfazl, S., Amirhossein, S. & Behjat, J. (2015). *Mellisa officinalis L- A review of its traditional uses, phytochemistry and pharmacology. Journal of Ethnopharmacology*, 2-18.
2. Akter, R., Uddin, S. J., & Grice, D. (2015). A new cytotoxic steroidal Glycoalkaloid from the methanolic extract of *Blumea lacera* leaves. *J Pharm Sci*, 18(4): 616-633.
3. Amjad H., Md., Ali Reza A. S. M., (2021). Bioactive metabolite of *Blumea lacera* attenuate anxiety depression in rodents and computer-aided model, *Food Sci Nutr*, (9): 3836–385
4. Ashrafi S., Alam S., Islam A., (2022). Chemico- biological profiling of *Blumea lacera* (Burm.f.) DC. (Family: Asteraceae) provide new insights as a potential source of Antioxidant, cytotoxic, Antimicrobial, and Antidiarrheal Agents. *Evidence- Based Complementary and alternative medicine*.
5. Eivan, M., Mehdi, E., Nahid, K & Khosronezhad, N. (2020). *Mellisa officinalis – A memory enhancing remedy, Pharmacol*, 24(3): 159-164.
6. Elizabeth, M., Kury, R., Elizabeth, B. & Charles, N. (2009). *The Neurobiology of Anxiety disorders. Brain Imaging, Genetics & Psychoneuroendocrinology. Psychiatr Clin North Am*, 32(3): 547-575.
7. Fatma, M., Akmal, M., Fadia, Z. & Dalia, H. (2014). *Psychiatric evaluation of a group of workers in Al industry. Egyptian Journal of Psychiatry*, 34(1): 1.

8. Ghazala, I., Anila, I., Aamra, M., Mehpara, F. & Touqeer, A. (2016). *Memory enhancing effect of Black pepper in Aluminum chloride induced neurotoxicity mouse model is mediated through its active component Chavicine. Current pharmaceutical Biotechnology, 1-2.*
9. Goti, U., Desai, P., (2020). *Qualitative and quantitative estimation of secondary metabolites of Blumea lacera (leaf and stem) using multifarious solvents. World Journal of Pharmaceutical Reserch, 9(6): 1688-1701.*
10. Holmesa, S. Parmigianib, P.F. Ferraric, P. Palanzab, R.J. Rodgersd., (2000). *Behavioral profile of wild mice 2.in the elevated plus-maze test for anxiety Physiology & Behavior, 71: 509- 516.*
11. Jahan, k., Kumar, S., & Bake, Md. A. (2014). *Evulation of antimicrobial and cytotoxic activities of the methanolic and petroleum ether extract of Blumea lacera Burm. In Bangladesh. Journal of Pharmacognosy and Phytochemistry, 2(6): 104-108.*
12. Khair, A., Ibrahim, Md., Ashan, Q, (2014). *Pharmacological activities of Blumea lacera (Burm. F) DC: A medicinal plant of Bangladesh. British Journal of pharmaceutical, 4(13): 1677-1687.*
13. Khandekar, U., Tippat, S., & Ghongae, R. (2013). *Investigaton on Antioxidant, Antimicrobial and phytochemical profile of Blumea lacera leaf. International Journal of Biological & Pharmaceutical Research, 4(11): 756-761.*
14. Manome, T., Hara, Y., & Ishibashi, M. (2022). *Isolation of various Flavonoids with trail Resistance-overcoming activity from Blumea lacera. Molecules, 28: 264.*
15. Milind, P., Suman, D. & Suresh, K. (2010). *Animal models for screening anxiolytic agents. Animals of pharmacy and pharmaceutical science, 1(2): 116-12*
16. Maheshwari, K. K., (2015). *Drugs acting on central nervous system. Drug screening Techniques. Pharmacological method, p.p. 22-128.*
17. Singh, B., Singh, S., & Singh, S. (2010). *Ethanobotanical significance and Antimicrobialactivity of Blumea lacera (Roxb.) DC. International Journal of Pharmaceutical & Biological Archives, 1(3): 314-316.*
18. Verma, L. K., Singh, A. K., & Pachade, V. R. (2012). *Antipyretic activity of Blumea lacera leaves in albino rats. Exploratory Animal and Medical Research, 2(1): 56-59.*
19. Yadav, V. Y., Irchhiaya, R., & Ghosh, A. K. (218). *Phytochemical and pharmacogonostical studies of Blumea lacera (Roxb.) DC. International Journal of Green Pharmacy, 12(1): 140.*
20. Yonghua, C., Yi, C. & Hongxin, W. (2020). *Bergamot essential oil attenuate aluminum induced anxiety like behavior through antioxidation, anti-inflammatory & GABA regulation in rats. Food and Chemical Toxicology, 145: 11-66.*