

A REVIEW ON MEDICINAL PROPERTIES OF BLUMEA LACERA

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ABSTRACT

Online databases such as Pub Med, Google Scholar, and online publications on medicinal plants were exhaustively explored to learn about the ethno medicinal, phytochemical, and pharmacological profiles of the plant in order to establish the justification for ethno pharmacological usage. These sources were examined in light of the many medical applications among remote ethnic populations in various Indian locations. Chemical and biological activity have supported the use of ethno medicine. On the basis of the reported research work, an effort is made to evaluate the validity and authenticity of herbal drugs. It is challenging to verify its application because of the lack of phytochemical, pharmacological, and clinical trials research. According to the author, there is an urgent need to concentrate on further research of this plant given its therapeutic potential. Earlier accounts of ethnobotanical work provide support for the usage of *Blumea lacera*. The functions of *B. lacera* as an anxiety reducer and an antidepressant, however, are not fully understood. Therefore, the current study seeks to investigate the potential bioactive metabolites and functions of *B. lacera* methanol leaf extract in reducing anxiety and depression by various experimental and computer-aided methodologies.

KEYWORDS: *Blumea lacera*, Herbal medicine, Phytochemical, Antipyretic, Asteraceae, Antidepressant.**INTRODUCTION**

The world's rapidly expanding and unquenchable growth for medicinal herbs has reached new heights due to their secure, efficient, non-addictive, dynamic, and immunologically impacts; concurrently provoking and inspecting humongous hormonal and enzymatic facilitated metabolic processes are mostly just a few of the key properties of medicinal herbs in the post-pandemic era (COVID-19). Since ancient times, plants have served as treasure trove of pharmaceuticals, nutritional supplements, and cosmeceuticals all across the world.^[1] According to the WHO, traditional medicines are the finest resource for obtaining a wide range of innovative ayurvedic medicines. As a result, it is critical to prioritise the research of medicinal plants found in traditional in order to identify the application potential of natural supplements.^[2]

Blumea is an annual herb with strong odorturpentine, distributed throughout the plain of northern-west India, up to an altitude of 2,000 mand a few species are found in Australia and still fewer in.^[3] Most *Blumea* species are found in various ruderal and strongly secondary habitats such as roadsides and fields. The *Blumea* stem is hairy or

glandular herbs are erect, ash coloured simple or branched, very leafy and 1-2 ft. in height. The leaves are oblate or oblanceolate, 5-12 cm long, 2-6 cm wide, smaller top. *Blumea* (Family: Asteraceae) is one of the common Rabi weeds of India,^[4] commonly known as Jungli muli and kukraundha. *Blumea* leaf beetle (*Chrysolina madrasae* Jackoby) is the main insect pest of this weed.

Blumea is described in Ayurveda as bitter, astringent, acrid, thermogenic, errhine, anti-inflammatory, styptic, ophthalmic, digestive, anthelmintic, liver tonic, expectorant, febrifuge, antipyretic, diuretic, deobstruent, and stimulant.^[5] The essential oil extracted from the leaves has analgesics, hypothermic, and sedative properties. The plant also has anti-leukemic, antimicrobial, and apoptotic effects on cancerous cells. We evaluated the anti-diarrheal, antimicrobial, anxiolytic, anti-atherothrombosis, membrane sustaining, and alpha-amylase cytotoxic activity of *B. lacera* as part of our ongoing attempts to examine herbal medicines of Bangladesh, and therefore to find rationale evidence for its ancient uses of this plant as described in Ayurvedic system of medicine.^[6] Campesterol has been isolated

from aerial parts and 5-hydroxy-3, 6, 7, 3', 4'-pentamethoxy flavones, 5, 3', 4' trihydroxy flavones and an unidentified flavone have been isolated from leaves. *B. lacera* species is considered a valuable homeopathic drug useful in case of enuresis, neuralgia, headache, cold borne cough.^[7] Natives of Chhattisgarh use this weed for treating health problems.^[8]

In the last century, significant development in biomedical science has conquered many diseases; however, cancer remains ambiguous especially from a therapeutic perspective. Cancer is still a growing health problem world-wide, and it is the second most common cause of death from disease after myocardial infarction. Tumour or neoplasm is usually defined as a growth of an abnormal mass of tissue due to uncontrolled cellular growth, while cancer is the term of all malignant tumours.^[9] Due to their availability, potential anti-cancer action, and reduced side effects when compared to chemotherapy, phytochemicals are being employed more and more in the treatment of cancer. There are thousands of scientific studies that have focused on the pharmacological activity of bio-active components from plants, increasing interest from scientific community as cancers suppressant. The *B. lacera* aqueous crude extract has been tested against various leukemic cell lines, such

as K562, L1210, P3HR1, Raji and U937.^[10] With L1210 cells experiencing the most cytotoxicity, the aqueous extract displayed widespread cytotoxicity toward those cell lines. Steroidal glycoalkaloid is a well-known, effective bioactive compound isolated from the methanol leaf extract of *B. lacera*. The steroidal glycoalkaloid of *B. lacera* is reported to be responsible for anti-proliferative activity against different cancers, such as human gastric carcinoma, colon carcinoma, HT-29, breast adenocarcinoma, MDA-MB-231 and MCF-7.^[11] However, the *B. lacera* steroidal glycoalkaloid has not been selectively tested against leukaemia cells yet. The results of the study showed that the entire plant or its crude extracts, as well as its isolated constituents, exhibit a wide range of biological activities, including antitumor, hepatoprotective, superoxide radical scavenging, antioxidant, antimicrobial and anti-inflammation, anti-plasmodial, anti-tyrosinase, platelet aggregation, enhancing percutaneous penetration, wound healing, and anti-obesity activities.^[11] Although numerous experimental and biological studies have been conducted, some traditional uses, like the treatment of rheumatism, still need to be supported by scientific pharmacological studies. Additional research, such as standardizing phytochemicals and authenticating bioactivity, would be helpful.



(A)



(B)



(C)

Fig. *Blumea lacera*

Pharmacological properties

Anthelmintic activity - *B. lacera* ethanol and water extract were examined for in-vitro antiparasitic efficacy against *Ascaris lumbricoides* and *Pheritema postuma* using Piperazine Citrate as a reference. The findings from this research revealed that plant extracts have significant dose-dependent antiparasitic effect. It was shown that alcoholic extract had a little higher efficacy than water extract.^[12]

Antidiabetic activity - The current investigation concluded that methanolic extract of *B. lacera* DC have significant anti-diabetic potential. Furthermore, a 400 mg/kg dose of methanol extract of *B. lacera* (MEBL) obtained significant dose-dependent antidiabetic activity without any destruction and regenerated the structure of hyperglycaemic rats' liver and pancreas.^[13]

Antiviral activity - In a recent study, hot water (HW) extracts from *B. lacera* was found to inhibit the multiplication of HSV-1 (herpes simplex virus) and HSV-2 viral cell lines. The IC₅₀ values for hot water extract from *B. lacera* against HSV-1 was 83.2 1.5 24 g/ml and 43.3 25.1 g/ml for HSV-2. Here as consequence, its IC₅₀ values were less than 100 g/ml.^[12]

Antioxidant activity - Various factors can influence plant extract antioxidant capacities, which cannot be adequately described by relying on a single approach. Plant extracts antioxidant potential is probably mediated by phenolic content, which, according to their oxidation-reduction characteristics, can serve as reducing agents, electron donors, and singlet or triplet oxygen scavengers.^[14] As a consequence, in order to understand the many mechanisms of antioxidant properties, more than one type of antioxidant properties tests must be performed. The antioxidant properties of extraction of *B.*

lacera was tested in this work using the DPPH (2, 2-diphenyl-1-picrylhydrazyl), FRAP (Ferric reducing ability of plasma), and TEAC (Trolox equivalent antioxidant capacity) assays. As previously indicated, this was the first study to measure the antioxidant properties of the studied *B. lacera*; hence, no reference data was provided for comparison.^[14]

Anti-inflammatory activity- Previous study looked into the medicinal effects of an ethanol extract from *B. lacera* aerial parts against indomethacin-induced enterocolitis. Male Wistar rats were divided into 6 groups (n = 5) and given various proportions of ethanolic extract (100 and 200 mg/kg) and sulphasalazine (100 mg/kg) for 7 days. Here on seventh and eighth days, two further doses of indomethacin (7.5 mg/kg) induced enterocolitis. The plant's antioxidant, anti-inflammatory, antibacterial, and membrane-stabilizing properties verified its preventive activity against indomethacin-induced enterocolitis in rats.^[15]

Anti-diarrheal activity- The antidiarrheal effects seen in the animal model may possibly be due to some alkaloids, mono, di, and tri terpenoids, and cardiac glycosides found in plants. These results support the wide-ranging traditional usage of this plant. To quantify ligand-target interactions and obtain a better understanding of the pharmacological properties of isolated phytochemicals, extensive molecular docking studies have also been used. It provides in-depth insights into the potential biological functions of various proteins as well as the binding profiles of problematic phytochemicals. For docking investigations, three extracted phytochemicals from *B. lacera* were chosen to better understand their pharmacological effects antioxidant, cytotoxicity.^[17]

For the treatment of cholera and diarrhoea, *Blumea eriantha* DC and *Blumea lacera* roots have been employed in ayurveda and other traditional medicines. The total amount of diarrheal faeces was significantly reduced (P 0.001) by the dosages of EEBC (ethanolic extract *Blumea eriantha*) and EEBC (ethanolic *Blumea lacera*) extract. PI reduces the oral dosages of EEBC and EEBC by 250, 500, and 750 mg/kg, respectively.^[16] It was similar to the common medication atropine sulphate. Conclusion: In experimental rats, EEBC has greater antidiarrheal action compared to EEBC, but is less efficacious when compared to atropine sulphate.^[17]

Anti- pyretic activity- Antipyretics prevent the production of PGE1 by competing with arachidonic acid at the COX active site. Additionally, *Blumea lacera* has reportedly been traditionally used to alleviate fever and pain, which seems to be supported in this investigation. The leaves of *Blumea lacera* were found to contain substances such as flavonoid, -sitosterol, and triterpenes. These substances are known to block the prostaglandin synthetase enzyme, which results in notable antipyretic effects.^[18]

Brewer's yeast was used to induce pyrexia in order to study antipyretic efficacy. More than 2000 mg/kg of BLE (*Blumea lacera*) was the acute oral LD50 in female rats. For examining the antipyretic effect of BLE in rats, three ascending dosages of 100 (1/20 LD50), 200 (1/10 LD50), and 400 mg/kg (1/5 LD50) were chosen. Brewer's yeast-induced pyrexia in rats was reduced by BLE at dose rates of 200 and 400 mg/kg, indicating that BLE has an antipyretic action.^[18]

CONCLUSION

Studies indicate that this plant extract contains bioactive secondary metabolites that have alpha-amylase inhibitory, antibacterial, anti-anxiety, anti-atherothrombotic, and anti-diarrheal properties. Chemical components such phenolic chemicals (tannins and flavonoids) and terpenoids, which are present in the extract, may be the cause of its activity. It has been noted that phenolic can hinder the actions of amylase. They also contain anti-hyperglycaemic properties and prevent the onset of diabetes.

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Conflict of interest

None.

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