

***Ageratum* spp: An excellent therapeutic medicinal plant**

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Abstract: *Ageratum* spp. are medicinal weed plant. Two varieties *Ageratum houstonianum* Mill and *Ageratum conyzoides* are very common and using in the medicinal field. *Ageratum houstonianum* Mill plant is ubiquitously found in every continent of the world. It is commonly known as Blue mink. Whereas *Ageratum conyzoides* Mill. is commonly known as blue billygoatweed and jungali pudina or appa grass in hindi. In India these are found everywhere in the tropical region. This weed plant have several medicinal properties such as antioxidant, phenolics, flavonoids, anti-diabetic, antimicrobial etc. The bioactive compounds of *Ageratum* Mill plants commercially used to treat several health problems such as wound healing. Recently blue mink has been screened for its antimicrobial and mosquitocidal activities. In this review authors have tried to summarize the bioactive compounds of medicinal values from the *Ageratum* spp. and their medicinal uses for human welfare.

Keywords: *Ageratum* spp; Medicine; bioactive compounds; anti-cancerous; wound healing

INTRODUCTION

The word “*Ageratum*” comes from the Greek word ‘ageras’ that means “agingless” (Chahal et al, 2021). This plant belongs to family ‘Asteraceae’. Two varieties are most common varieties in the world. The *Ageratum houstonianum* (Mill) and *Ageratum conyzoides*. All explants of these Asteraceae plants have medicinal properties such as leaves of these plants have anti-fungal and antibacterial properties (Pandey et al, 1984). The annual weedy plant *Ageratum houstonianum* Mill. species has blue and purple flowers. Leaves are opposite, simple, serrate,

and pilous, with a length of 10-12 cm with a width of 6-8 cm. *A. houstonianum* is a fragrant upright annual medicinal weed. This weed species can be grown near to the tropical and subtropical regions. The medicinal weed is commercially used as folk medicine for the treatment of different types of ailments (Sofowora et.al., 1993). The leaves of *Ageratum* sp., is commonly used in the parasites and headaches in the country Cameroon. The essential oil extracted from *A. conyzoides* and their chemical analysis has been done and benzopyran derivatives was found which is a component involves in antimicrobial, antioxidant, antiplatelet, and anticancer activities. In traditional Chinese medicine, the whole plant of *A. houstonianum* species is used to remove various harmful elements. *Ageratum houstonianum* Mill is one of the most important plants having lot of medicinal value, basically which is native to the Asian countries such as Nepal, Bhutan, Myanmar, Sri Lanka and India, however in America, it has also distributed (Kumar, 2014). Several phytochemicals and bioactive compounds have been identified from this medicinal plant, having several medical properties such as pesticidal, antibacterial and antifungal properties (Ravindran et al., 2012; Kurade et al., 2010; Tennyson et al., 2011; Pandey et al., 1984).

Bioactive compounds of *Ageratum* spp.

The *Ageratum* sp. has been used as traditional medicine as a reliever for constipation and fever and also used as key agent against wound healing as well as an anti-ulceric agent. In West African country i.e Togo, the *Ageratum* weed herb is used to treat measles and snake bite, whereas in Nigeria, it is used for skin related diseases, wound healing, diarrhea, pain around the navel in children, and even used to treat HIV/AIDS also (Diallo et al., 2010).

The essential oil of the *Ageratum* green leaves has anti-dermatophytic compounds that is nontoxic (Njateng et al., 2010). The species *A. houstonianum* is a good source of biologically active compounds possessing phytotoxic and α -amylase enzyme inhibition activity, so it is using as anticancer and anti-diabetic compounds (Rizvi et al., 2014). This medicinal plant is commonly used as an antiphlogistic to overcome swelling in throat region swelling and soreness (Lin et.al., 2020). Essential oil obtained from *A. houstonianum*'s leaves have been shown to have antifungal and antimicrobial activities, as well as mosquito repellent activity (Tennyson et.al, 2012). *A. houstonianum* grows worldwide in large area of land in several countries and also carrying several useful secondary metabolites. In recent years, spread of fast growing plant species has been a major concern in country Nepal. *Ageratum* spp., is one of them major medicinal weed belongs to family Asteraceae, it is a strong seed producer.

However, little bit information received on the germination biology of the *Ageratum* plant. Results revealed that this medicinal plant was moderately drought tolerant on the basis germination quality. Greater germination found at neutral to acidic than at alkaline pH (Lamsal et al., 2019).

A. houstonianum Mill. explants methanolic and water extracts was evaluated against few plants pathogenic fungus such as *Alternaria brassicae*, *Fusarium oxysporum*, *Phytophthora capsici* and bacteria such as *Staphylococcus epidermidis*, *S. aureus*, *Bacillus subtilis*, *B. cereus*, *E. coli*, *Enterobacter aerogenes*, *Klebsiella pneumoniae*, and *Pseudomonas aeruginosa*. The photochemical screening of methanolic extract of the *Ageratum* species revealed the presence of bioactive compounds. This Methanol explants extract had higher antifungal and antibacterial properties, which might be used for the plant disease management (Devkota and Sahu, 2019). A study revealed that various secondary metabolites in the leaves of the *A. houstonianum* have significant antioxidant and antibacterial properties (Zeeshan et al., 2012). Medicinal plants are very safe and used as therapeutic agent to treat various diseases from ancient time. The bioactive compounds formed during secondary metabolic process of any medicinal plant species, it is widely used as therapeutic agent against various threatened diseases diabetes mellitus, carcinoma etc. In a study the analysis of phytochemicals was evaluated by color differentiation method, to identify the toxic effect by phytotoxic assay, anti-diabetic activity by α amylase enzyme inhibition and antioxidant activity of green extract of *Ageratum houstonianum*. The results revealed that extract showed moderate activity. The antioxidant potential of *Ageratum houstonianum* extract showed mild activity when compare with the standard ascorbic acid. It is concluded *Ageratum* extract could be used as a herbal source to use as extract bioactive compound (Sharma, 2020).

Wound healing properties of *Ageratum* spp.

A wound is defined as a type of injury by the physical or chemical methods induced in a living tissues. Several wound healing synthetic medicine are present in the market. At the current stage there is no standard and authentic treatment available for wound healing. Bioplacenton is a topical preparation that is available in the market. This product is commonly used for wound healing treatment by people of various countries (Boakye et al., 2018; . Sen et al., 2012; Hong et al., 2010). Now days the wound healing process is promoted by various herbal extracts, which are composed of biologically active compounds like terpenoids, alkaloids, flavonoids, tannins, saponins, anthraquinones, etc. (Akpalo et al., 2015).

A study in which *Ageratum conyzoides* L. leaf's ethanolic extracts to determine the wound healing activity. For in-gel preparation, three different formulas of gelling agents, namely carbopol, hydroxypropyl methylcellulose, and natirum-carboxy methyl cellulose were employed. The results revealed that the carbopol gelling agent formula was better than hydroxypropyl methylcellulose and natirum-carboxy methyl cellulose (Sukmawan et al., 2021). Biologically wound healing process is promoted by active agents who compose water and alcohol based medicinal plant green extracts and those components act synergistically. In a study of *Ageratum conyzoides* Linn. leaves were taken for soft aqueous extraction by four different methods (A, B, C and D). The purpose of the study using four different methods to obtain tannins and flavonoids using the techniques thin layer chromatography, High performance liquid chromatography (Akpalo et al., 2020). *A. conyzoides* extract enhanced the proliferation of cell and synthesis of collagen. Wounds treated with the green extract of *Ageratum* spp. were found to heal much faster healing than control (Arulprakash et al., 2012).

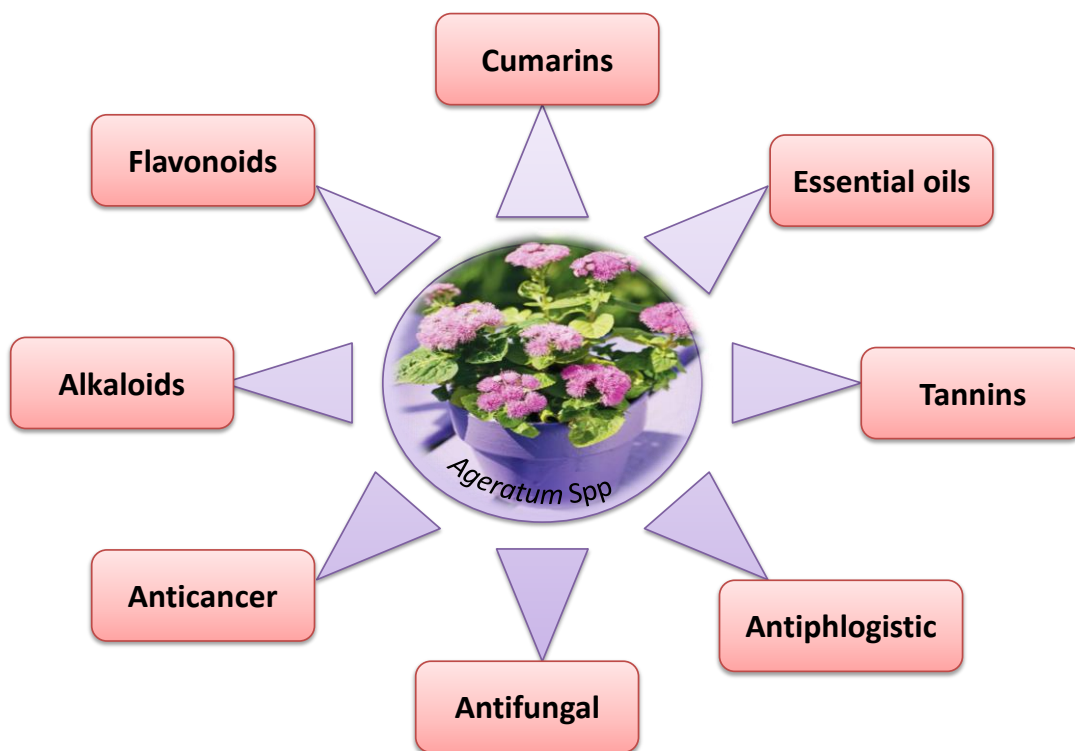


Figure 1: Medicinal properties of *Ageratum* spp Mill plant

CONCLUSION AND FUTURE PROSPECTIVE

The high cost and limited availability of synthetic drugs related to the wound healing and other medicinal properties. The herbal plants play a crucial role in the field of medicine related to the wound healing and other related issues. Recently, researchers around the globe have devoted a lot of their work to exploring specific herbal plants such as *Ageratum* sp., and their bioactive compounds to discover new therapeutic drugs for the medical science. Moreover, essential oils obtained from these plants, also having several medicinal properties such as antifungal, antibacterial, stress tolerant and helps in sleeping disorders. Amongst the all species of *Ageratum*, the species *A. conyzoides* has been most attentive among the researchers and scientists of the world, and it is most studied species in terms of medicine and the pharmaceutical approaches. Nevertheless, more clinical studies are needed to introduce the metabolites of the plant *Ageratum* at commercial level and provide a variety of novel valuable compounds of pharmaceutical use.

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