Medicinal and Therapeutic Values of Sesbania Grandiflora

ABDUL KADER MOHIUDDIN

ABSTRACT

There are around 60 global species belonging to the genus Sesbania which are commonly found to be grown in Africa, Australia, and Asia. The leaves of Sesbania grandiflora have been used in local traditional medicine since ancient times. Major chemical constituents are alkaloids, flavonoids, glycosides, tannin, anthraquinone, steroid, phlobatannins, and terpenoids. Isovestitol, medicarpin, sativan (isoflavonoids) and betulinic acid (tannin substance) are the major constituents responsible for antibacterial and antifungal, antioxidant, anti-urolithiatic, anticonvulsant and anxiolytic, and hepatoprotective properties. Also, the plant extract contains alkaloids, phenolics, tannins, triterpenoids, and sterols. All parts of S. grandiflora are used in traditional medicine and phytochemical investigations have been conducted on extracts of the leaves, seeds and roots of S. grandiflora to provide scientific validation of its properties.

KEYWORDS: Sesbania Grandiflora, Isoflavonoids, Heron Flower, Traditional Medicine, Bengali Cuisine

INTRODUCTION

Leaves of Sesbania grandiflora can possibly be utilized as a remedy for thrombosis, diarrhea, and inflammatory diseases and against couple of significant bacterial pathogens.\(^4\) The juice of the leaves of S. grandiflora has been purportedly utilized in the treatment of bronchitis, cough, vomiting, wounds ulcers, diarrhea, and dysentery. The flowers have revealed antimicrobial activity. Powdered roots of this plant are mixed in water and applied externally as a poultice or rub for rheumatic swelling.\(^5\) The leaves are traditionally used to treat nasal catarrh, nyctalopia and cephalgia. Studies demonstrate that, S. grandiflora have antioxidant, antiurothiatic, anticonvulsive, anti-ligament, antiinflammatory, anti-helminthic, antibacterial and anxiolytic activity.\(^6\)\(^-\)\(^8\)

Gandhi et al., 2017 announced that anti-biofilm and antibacterial adequacy of S. grandiflora assumes a vital role over biofilm delivering pathogens and go about as a decent hotspot for controlling the microbial population.\(^9\) Saifudin et al., 2016 detailed that bloom goes about as a promising material to build up the active ingredient of anti-plaque toothpaste just as mouthwash arrangement.\(^10\) It has been accounted for that a biofilm is emphatically connected with the medication obstruction property.\(^11\) Consequently, eradication of biofilm is regularly viewed as a troublesome assignment and in this manner utilization of plant items to repress biofilm might be a feasible option.\(^12\) Ramesh et al., 2015 indicated mind oxidative harm reestablished by S. grandiflora in cigarette smoke-exposed rats.\(^13\) Prior, the lead creator and partners displayed cardio-protective activity of S. grandiflora watery suspension that reestablished the antioxidant status and held the degrees of micronutrients in cigarette smoke-exposed rats.\(^14\)\(^-\)\(^15\) Thereafter, Ramesh et al., 2010 revealed that S. grandiflora watery suspension essentially diminished the raised hepatic, renal and lipid peroxidation markers and enhanced the decreased antioxidant levels while reestablished the hepatic and renal design in cigarette smoke-exposed rats.\(^16\)

Semwal et al., 2018 revealed critical neuroprotective impact in celecoxib treated mice through the alteration in cholinergic framework or by the blockage of oxidative pressure and restraint of AchE enzyme.at the dosages of 200 and 400 mg/kg in mice.\(^17\) S. grandiflora shields the lung from the oxidative harm through its antioxidant potential.\(^18\) Prior, Pajaniradje et al., 2014 detailed methanolic part of S. grandiflora was found to apply strong antiproliferative impacts particularly in the human lung cancer cell line, A549.\(^19\) Bhomuk et al., 2016 revealed hepatoprotective activity against CCl4 instigated hepatotoxicity in rats by watery concentrate.\(^20\) Plants contain an enormous scope of active compounds with the most inexhaustible being polyphenols, carotenoids, (nutrient A, C, riboflavin,
nicotinic corrosive), and minerals like zinc and selenium which structure an indispensable piece of antioxidant frameworks and diminish cellular harms. Roy et al., 2013 detailed that a division disengaged from flowers, specially executes leukemic cells (especially those of histiocyte lymphoma) by activating customized cell passing. In 4 distinct studies from 2012 to 2016, it was discovered that the bloom, leafy foods entire plant concentrates reduced blood glucose, cholesterol, TG and LDL, lipid peroxidation and expanded and superoxide dismutase and catalase of insulin and hemoglobin in experimental animals. A while later, Prasanna et al., 2018 showed the hydroxy methoxy benzaldehyde (HMB) content as anti-glycogen lead that restrained formation of early HbA1c and advanced glycation final results (AGEs). The hypoglycemic activity is believed to be because of expanded hepatic digestion pursued by incitement of combination as well as arrival of insulin from pancreatic beta cells and additionally insulin saving impact. High substance of quercetin, myricetin and kaempferol were distinguished in a methanolic concentrate of the leaves and a novel protein division was segregated from the new flowers, which showed chemopreventive impacts.

The ethanol concentrate of the leaves and flowers were effective in hindering the tumor growth in ascitic models and that is practically identical to 5-Fluorouracil. Chung et al., 2016 detailed that silver nanoparticles (AgNPs) synthesized with leaf concentrates were shown to be cytotoxic to MCF-7 cancer cells. In addition, the synthesized AgNPs indicated intense antibacterial activity against multi-drug resistant (MDR) microscopic organisms, for example, Salmonella enterica and Staphylococcus aureus. Later on, a few studies uncovered antimicrobial potential of S. grandiflora synthesized AgNPs. Gupta et al., 2018 uncovered antioxidant activity of flavonoids particularly quercetin and hydro-alcoholic concentrate found to lessen the degrees of TNF-α and IL-6 in acidic acid induced ulcerative colitis in mice. Sesbania could manage the cost of a huge protective impact against erythromycin estolate-induced hepatotoxicity, liquor and polyunsaturated unsaturated fat (PUFA)- induced oxidative pressure and nephrotoxicity (because of quality of phenolic compounds and anthocyanins). Likewise, the leaf juice of S. grandiflora demonstrated huge antiurolithiatic activity against calcium oxalate-type stones in a more seasoned examination. The natural products are utilized for frailty, bronchitis,
fever, tumors. They are diuretic, and have mentally animating properties. Organic product extricates fundamentally diminished the degrees of blood glucose, cholesterol, TG and LDL, lipid peroxidation and expanded and superoxide dismutase and catalase in rats. Hasan et al., 2012 originally revealed of the four compounds (Isovestitol, medicarpin, sativan and betulinic acid) disconnected from the base of S. grandiflora and their anti-tuberculosis properties.

The bark concentrate has demonstrated the protective impacts against the intense and perpetual irritation. The bark of S. grandiflora is exceptionally unpleasant and considered as an astringent and harsh tonic. Decoctions of leaves and flowers is utilized to treat leucorrhea and vomiting of blood. The bark of S. grandiflora is utilized as an astringent and treatment of little pox, ulcers in the mouth and the nutritious trench, baby stomach issue and scabies. Utilization of leaf powder as an iron and folate supplement demonstrated improvement in hemoglobin levels of people with gentle and moderate pallor. Ethanoic concentrate of S. grandiflora altogether repressed gastric mucosal damage induced by headache medicine, ethanol and indomethacin. Methanolic concentrate of S. grandiflora showed a noteworthy and dose dependent analgesic activity. Additionally, triterpene containing portion of S. grandiflora exhibits a wide range of anticonvulsant profile and anxiolytic activity.

CONCLUSION
Among very few plants of the world, S. grandiflora is the one whose all parts are utilized for the treatment of various types of ailments. Other than this, it has capability to fix atmospheric nitrogen and can be used as green manure to improve soil conditions. It can also be planted as windbreak and shade tree in plantations. The wood is soft and light, used as poles, in floating fishing nets, for fuel and charcoal-making. It is also a major source of pulp for making paper. So, the diversity of use surely demands more research in future regarding its cultivation, adaptation in new environments, impact of environmental factors on its major therapeutic contents, raw material collection, storage conditions and availability sources for regular use in pharmaceuticals.

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Abbreviations: Hydroxy Methoxy Benzaldehyde (HMB); Advanced Glycation End Products (AGEs); Polyunsaturated Fatty Acid (PUFA); Low-density lipoprotein (LDL); Triglyceride (TG); multi-drug resistant (MDR); Silver Nanoparticles (AgNPs); Hemoglobin A1c (HbA1c); Tetrachloromethanone (CCl4); Michigan Cancer Foundation-7 (MCF-7); Acetylcholinesterase (AchE)

REFERENCES


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Abdul Kader Mohiuddin


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AUTHOR AFFILIATIONS AND CORRESPONDING ADDRESS:
Assistant Professor
Department of Pharmacy, World University of Bangladesh
151/8, Green Road, Dhanmondi, Dhaka – 1205, Bangladesh
trymohi[at]gmail[dot]com

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