



A REVIEW ON BIOACTIVITY OF GRANGEA MADERASPATANA (L) POIR.

Chaudhary Nirali¹, Jyoti Chauhan², Bharat Maitreya³

Department of Botany, Bioinformatics and Climate change Impacts management, School of sciences, Gujarat University, Ahmedabad-380009, Gujarat, India.
Email ID-chaudharynirali1111@gmail.com

ABSTRACT

Grangea maderaspatana (L.) Poir., also known as Madras Carpet, is a medicinal flowering plant in the Asteraceae family. This is a common weed that grows in sandy soils and waste areas. This plant has produced a wide range of phytochemical substances. It has been used for thousands of years in traditional Ayurveda Indian medicine to treat a number of diseases. This plant has oestrogenicity, antifertility, analgesic, anti-inflammatory, antiarthritic, cytotoxic, antioxidant, hepatoprotective, diuretic, and antibacterial effects have all been studied. The leaves have stomachic, a sedative, carminative, emmenagogue, and antifatulent properties. The review covers biological activity phytochemicals derived from these plants in detail.

Keywords: Grangea maderaspatana (L.) Poir., Bioactivity, anticancer, antioxidant

INTRODUCTION

Grangea is a small plant genus found in Africa and Asia's tropical and subtropical regions. Grangea maderaspatana (L) Poir. grows in damp areas of India, mainly Bengal. It is a medicinal plant that is widely utilised in Indian traditional medicine to treat a variety of diseases. The herb has a very bitter terrible taste, antipyretic, useful for discomfort in the eyes and ears, the earliest traditional system of India demonstrates that ancient Indians had a wealth of information about the therapeutic benefits of many plants. Grangea maderaspatana (L) Poir. contains a variety of pharmacological effects, including analgesic, diuretic (Ahmed et al., 2001), (Ahmed et al., 2001) hepatoprotective (Chimplee et al.,2019), anti-nociceptive, anti-inflammatory, anti-rheumatic (Raxit et al.,2015), (Chang et al.,2016), anti-anxiety, and anti-breast cancer (Siriphorn et al.,019). The plant's essential oil was discovered to be a strong source of antioxidants with great antibacterial capabilities (Galani et al.,2015), (Pandey et al., 2010). Despite the numerous virtues attributed to this plant, few studies on the phytochemicals and antioxidant capabilities of extracts of the various organs of this plant adapted in Burkina Faso have been published to our knowledge.

The herb is worthy for pain in the eyes and ears. The root is an appetizer, astringent to the bowels, diuretic, anthelmintic, useful in griping, in troubles of the chest and lungs, headache, rheumatism in the knee joint, piles, pain in the muscles, diseases of the spleen and the liver, troubles of the ear, the mouth and the nose and lessens perspiration. Further, plant has reported to have analgesic, oestrogenic and antimplantation activities.

As a traditional herb, it has stomachic and uterine stimulating properties. In dyspepsia, hysteria, and blocked menstruation, an infusion of the leaves with ginger and honey is administered. It can be used externally as an anodyne and antiseptic fomentation to swollen and sore areas. Powdered leaves are applied to wounds and ulcers as an antibacterial. For earache, fresh leaf juice is infused into the ear. In view of the numerous new findings of interest on this plant, this review includes a complete analysis of the morphology, phytochemical ingredients, traditional usage, pharmacological activity, and toxicity research (Kirtikar et al., 2004).

Anti-breast cancer

The anti-breast cancer potential of frullanolide, an isolated and purified component from the Grangea maderaspatana plant, for selected human breast cancer cell lines (MCF-7, MDA-MB-468 and MDA-MB-231). The MTT assay was used to assess cytotoxic activity in the breast cancer cell lines. The IC₅₀ values of frullanolide for the breast cancer cell lines exhibited strong anti-breast cancer activity against MDA-MB-468 (IC₅₀, 8.04 ±2.69 µg/ml) and weak

cytotoxicity against MCF-7 (IC₅₀, 10.74 ± 0.86 µg/ml) and MDA-MB-231 (IC₅₀, 12.360.31 g/ml). In the human normal epithelial breast cell line (MCF 12A) and mouse fibroblast cell line, the IC₅₀ of frullanolide was high (L 929). By promoting cell death, frullanolide may have anticancer potential in breast cancer cell lines. Frullanolide may provide a novel strategy to breast cancer treatment (Srisawat et al., 2013), (Chimplee et al., 2019).

Antioxidant Activity

The antioxidant activity of this plant extract was determined using in vitro tests and compared to the standard antioxidant ascorbic acid. In the systems investigated, the extract and ascorbic acid were shown to exhibit varying amounts of antioxidant activity. Grangea maderaspatana methanolic extract demonstrated considerable ($p < 0.05$) reducing power, radical scavenging activity, nitric oxide radical scavenging activity, hydrogen peroxide (H₂O₂) scavenging activity, and prevention of -carotene bleaching. The antioxidant property is concentration dependent and increases with increasing amount of extract. The presence of phenolic and flavonoid components in the extract may contribute to the extract's free radical scavenging and antioxidant properties. The antioxidant capacity of the oil produced by steam distillation of extract in vitro antioxidant potential of the oil obtained by steam distillation of extract of aerial parts of Grangea maderaspatana (L.) Poir., was evaluated using, DPPH radical scavenging. The oil showed antioxidant potential with significant reducing power (ASE/mL 2.01 ± 0.00) and DPPH radical scavenging activity (IC₅₀ 2.90 ± 0.96). The current study's findings suggest that Grangea maderaspatana is a possible source of natural antioxidants (Singh et al., 2013), (Veena et al., 2009).

Antimicrobial Activity

Due to their complexity and variety, antimicrobial action is difficult to attribute to a single molecule. The antibacterial action of the oil was investigated using the bacterium *Candida albicans*, which is responsible for the majority of clinical yeast infections. The oil was shown to be active against *C. albicans* with a ZOI of 11.00 ± 0.00 mm and a MIC value of 5 µL/ mL, and it was also active against *E. coli* with a ZOI of 7.33 0.58 mm and a MIC value of 10 µL/ ml. The activity was strongest against *S. candidus* and *B. subtilis* (9.33 ± 0.58 and 8.00 ± 0.00 mm, respectively) with MIC values of 5 µL/mL for each, whereas *Aeromonas hydrophila* and *Klebsiella pneumoniae* were the least effective. As positive controls for bacteria, Gentamicin and Kanamycin were utilised, while nystatin was used for fungi (Singh et al., 2013).

Anti-inflammatory and Antiarthritic activity

The anti-inflammatory effect of *G. maderaspatana* methanolic extract (1000 mg/kg, p.o.) was tested in an acute model of carrageenan-induced rat paw edoema (Galani et al., 2015).

Analgesic activity

Grangea maderaspatana whole plant methanol extract (1 and 3 g/kg, p.o.) substantially and dose-dependently reduced acetic acid-induced writhing in mice. The smaller dosage (1 mg/kg, p. o.) was shown to be equally efficacious as the reference aminopyrine (50 mg kg, p.o.). In laboratory, methanolic extracts of the plant (500 mg and 1 g/kg, p.o.) were also tested in the tail flick model. The plant extract significantly improved tail flick delay in both doses, indicating analgesic action (Ahmed et al., 2001).

Acute toxicity study

The methanol extracts of *Grangea maderaspatana* were well tolerated by mice, and there were no symptoms of immediate or delayed toxicity following oral dosing. Although increasing concentrations up to 2000 mg/kg (p.o.) were not deadly, the LD₅₀ values for the extract were calculated to be more than 2000 mg/kg for oral administration. As a result, this administration route appears to be sufficient and safe for producing psychopharmacological effects.

Anti-implantational Activity and Oestrogenicity

A mixture of flavonoids extracted from the plant *Grangea maderaspatana* exhibited oestrogenicity and anti-implantational activities, in the mouse. In the three-day uterotrophic bioassay, administration of the medication intramuscularly to ovariectomized females at a concentration of 20 mg/kg body weight per day resulted in a highly significant ($p < 0.001$)



increase in moist uterine and vaginal weights. In compared to conjugated oestrogen, the extract was shown to be slightly oestrogenic. Flavonoids, when taken orally at the same concentration level, effectively affected all phases of pregnancy. The medication had the greatest interceptory effectiveness when delivered on days 4-6 post coitum. The drug has antinidational activity was reduced only when delivered on days 1-3 and 7-9 post coitum. (Ruangrungsi et al., 1989).

Cytotoxic Activity

Grangea maderaspatana crude chloroform extract has high cytotoxic action (Dhawan et al., 1958). In the KB cell culture experiment, a crude chloroform extract demonstrated high cytotoxic action (ED₅₀=2g/ml).

CONCLUSION

Grangea maderaspatana (L.) Poir is found across India. The plant appears to have a wide range of anti-ailment action. Anti-breast cancer, antioxidant activity, antimicrobial activity anti-inflammatory and antiarthritic activity, analgesic activity, acute toxicity study, Antiimplantational activity and oestrogenicity and cytotoxic activity have been studied in various portions of the plant. Flavonoids, diterpenes, sesquiterpenoids, steroid, and essential oil are said to be present. The plant should be studied further using a combination of exploitation and exploration methodologies, which may help to discover effective ideas for further study into its standardisation.

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