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MEDICINAL CHARACTERISTICS OF VARIOUS SPECIES OF CLERODENDRUM GENUS

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ABSTRACT

The Lamiaceae family includes the genus Clerodendrum, which has approximately 500 species and is widespread throughout the world. More than 11 species of Clerodendrum have been extensively studied for their chemical composition and biological activities. Monoterpenes and their derivatives, sesquiterpenes, diterpenoids, triterpenoids, flavonoids and flavonoid glycosides, phenylethanoid glycosides, steroids and steroid glycosides, cyclohexylethanoids, anthraquinones, cyanogens 283 compounds were isolated and identified, including glycosides. To date, many species of this genus are described in various systems of local medicine and used in the manufacture of folk medicines for the treatment of various life-threatening diseases. Pharmacological studies have shown that these substances and extracts of various species possess the properties of the plant, such as expectorant, gastric acid, anti-bronchitis, anti-nociceptive, antibacterial, anti-diarrheal, antioxidant and anti-carcinogenic.

KEYWORDS: Clerodendrum indicium, phytochemical screening, flavonoids, anti-diarrheal, saponins.

INTRODUCTION

The small trees, shrubs, herbs and other plants in the genus Clerodendrum L. are extensively dispersed in tropical and subtropical regions of the world. The antibacterial properties of several species of the genus Clerodendrum are mentioned in ancient writings. Against bacterial infections, Clerodendrum species demonstrated both antifungal and antibacterial

action. Several of these species are important therapeutic plants. Research on phytomedicine is drawn to these plants in an effort to validate their traditional applications and uncover novel pharmacological properties. Certain Clerodendrum species possess biological properties such as anti-asthma, anti-inflammatory and antipyretic, antifungal, antioxidant, and wound healing properties. They also have anti-obesity, antinociception, antimicrobial, and anti-mutagenicity properties.[1]

Many countries, such as China and India, have a long history. Herbal medicine has long been used. The Indian Ayurveda literature lists over eight hundred herbal treatments. The Sushruta Samhita and the Charaka Samhita are two extremely excellent compilations of information regarding plant-based medications that are still highly regarded globally.[2]

Chemical compounds found in many plants are utilised as natural medications to treat common bacterial illnesses. These prescribed because of their low risk of side effects and affordability, plants are widely used in several Indian medical systems. This has led to scientific validation of the therapeutic applications of plants in traditional medicine.[3]

COMMON NAME

Turks Turban

Tube Flower

Skyrocket

Bharangi

Chingari

Champagne Clerodendrum

Clerodendron

MORPHOLOGICAL CLASSIFICATION

Kingdom- Plantae

Phylum- Spermatophyta

Subphylum – Angiospermae

Class- Dicotyledonae

Order- Lamiales

Family- Lamiaceae

Subfamily – Ajugoideae Dicotyledonae

Genus- Clerodendrum

Species- Clerodendrum inerme, Clerodendrum serratum, Clerodendrum infortunatum Clerodendrum indicum, Clerodendrum viscosum, Clerodendrum cyrtophyllum, Clerodendrum paniculatum.

Figure: 1.1
Clerodendrum indicium

Figure: 1.2
Clerodendrum paniculatum

Figure: 1.3
Clerodendrum bungei

PHARMACOLOGICAL ACTIVITY

Anti-nociceptive Activity

Anti-Diarrheal Activity

Anti-Microbial Activity

Anti-oxidant Activity

Anti-cancer Activity

Anti-bronchitis Activity

Anti-pyretic Activity

Analgesic Activity

Table: 1.1 Pharmacological activities of different species of Clerodendrum genus.

Activity	Species	Part of plant
Anti-inflammatory	C. serratum methanolic extract C. phlomidis ethanolic extract C. petasites methanolic extract C. laevifolium ethanolic C. inerme aqueous extract C. paniculatum petroleum ether and chloroform extracts C. indicium ethanolic	aerial parts, roots and stems Leaves whole plant extract Leaves Aerial parts Leaves Roots
Antinociceptive Activity	C. serratum methanolic C. bungei n-butyl extract C. indicium methanolic extract C. inerme aqueous extract	Roots Roots Leaves Leaves
Analgesic Activity	C. serratum ethanolic C. serratum methanolic	Leaves Aerial part
Antipyretic Activity	C. serratum alcoholic extract	Roots
Antioxidant Activity	C. infortunatum Ethanolic extract C. volubile phenolic extract C. inerme methanolic extract C. serratum ethanolic extract C. serratum methanolic extract	Leaves Leaves Aerial parts Roots Leaves

DIFFERENT SPECIES OF CLERODENDRUM GENUS

C. SERRATUM

Anti inflammatory Activity: The phytochemicals present in the aerial parts, roots and stems of C.Serratum are Serratumin A, Serratoside A, Serratoside B, 7-O-p-couma-royloxyugandoside. These are responsible for the anti-inflammatory activity of C. Serratum

methanolic extract and the anti-inflammatory assay was done by Carrageenan induced inflammation and FCA (freund complete adjuvant) induced arthritic rat models.[4]

Anti-oxidant Activity: The anti-oxidant activity of C.Serratum ethanolic extract of roots was investigated by DPPH and Hydrogen Peroxide methods. The antioxidant activity is due to the presence of phytochemicals such as polyphenols and flavonoids whereas methanolic extract of leaves has higher antioxidant activity, as, it has higher polyphenolic content and done by DPPH and ABTS assays.[5]

Anti neoceptive Activity: Hot plate method and acetic acid-induced writhing methods were used to investigate the anti neoceptive effects of an alcoholic extract of C. serratum roots. The anti-nociceptive action of C. serratum was demonstrated by a decrease in the number of abdominal constrictions in mice that were writhing in response to acetic acid. This finding has been further corroborated by the results of the hot plate method, which showed a significant increase in area under curve. But, as compared to morphine, the response was substantially lower, and a thorough investigation of the precise mechanism is still needed.[6]

Analgesic Activity: With significant centrally acting analgesic activity in the tail flick test at 250 mg/kg dose and peripherally acting analgesic activity in the acetic acid induced writhing test at 500 mg/kg dose, the ethanolic extract of C. serratum leaves was found to have analgesic activity that was comparable to diclofenac sodium. The production of endogenous substances like prostaglandins or the obstruction of capillary permeability are two potential mechanisms. In a second investigation, the author showed that by blocking both early and late phase peripherally and centrally mediated nociception, a methanolic extract of the aerial portions of C. serratum, when subcutaneously injected into the right dorsal hind paw of the mice, had a strong analgesic effect.[7]

C. PHLOMIDIS

Anti inflammatory activity: C. phlomidis leaves demonstrated anti-inflammatory and anti-arthritic effects in rat models of inflammation created by carrageenan and arthritis caused by freund complete adjuvant (FCA). The results showed that lysosomal enzymes, protein-bound carbohydrates, acute phase proteins, and the paw oedema response could all be significantly reduced by HMSB. Moreover, HMSB may significantly lower the mRNA and protein production of the pro-inflammatory cytokines TNF, IL-1, and IL-6 in the joints in a dose-

dependent way. These results suggest that the HMSB has potent anti-inflammatory and anti-arthritic properties.[8]

C. PETASITES

Anti inflammatory and anti pyretic activity: The anti-inflammatory and antipyretic effects of C. petasites methanol extract at dosages of 1.0, 2.0, and 4.0 mg/ear, i.g. The results showed that the extract reduced the activity of blood alkaline phosphatase and had a somewhat inhibitory effect on the acute phase of inflammation in rats that experienced paw edoema (ED30 = 420.41 mg/kg) and ear edoema (ED50 = 2.34 mg/ear) caused by carrageenan. Additionally, in rats with hyperthermia brought on by yeast, the extract demonstrated outstanding antipyretic capabilities. The anti-inflammatory and antipyretic effects of the methanol extract may be due to its inhibition of prostaglandin synthesis.[9]

C. LAVEVIFOLIUM

Anti inflammatory and antioxidant activity: In an in vitro investigation, the ethanol extract derived from C. laevifolium leaves demonstrated the highest anti-inflammatory efficacy against lipoxygenase, with an IC50 of 14.12 µg/ml. Leaf extracts in ethanol and hexane were subjected to in vitro antioxidant activity assays. These tests included the 2, 2-Diphenyl-2-picryl-hydrazyl (DPPH) free-radical scavenging activity assay, the total reductive capability assay, the total antioxidant activity assay using ferric thiocyanate (FTC) and thiobarbituric (TBA) methods, and the phenolic content assay using the Folin–Ciocalteu method.[10]

C. INERME

Anti inflammatory activity: Moreover, a methanolic extract from the aerial parts of C. inerme showed anti-inflammatory activity at doses of 50, 100, and 200 mg/kg in rats with hind paw edoema caused by formalin.[11]

Anti oxidant activity: Utilising the DPPH test, the highest level of inhibition was noted for the methanolic extract (100 µg/ml) and the 5-hydroxy-6, 7, 4′-trimethoxyflavone (20 µM) that were separated from the aerial sections of C. inerme. These values were 61.84% and 37.19%, respectively. These findings showed a notable scavenging activity.[11]

C.INDICIUM

Anti-inflammatory activity: The methanolic extract of C. indicum at doses of 200 and 400 mg/kg showed a significant ($P < 0.001$) and dose-dependent reduction in the number of

writhes with 62.57% and 70.76% of inhibition in the acetic acid-induced writhing test, respectively.[12]

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