Original Article

INTERNATIONAL JOURNAL OF CLINICAL PHARMACOKINETICS AND MEDICAL SCIENCES

Published by Pharma Springs Publication. Journal Home Page: https://pharmasprings.com/ijcpms

# The study of chamomile (*Matricaria recutita*)

Arava Vidyadhari[1], Porumamilla Ram Prathap Goud*[2], Bandi Divya Sree[2], Tummala Pavani[2], Tatiparthi Siva Prasad [2], Ashok Kumar V[2], Mangala Teja Divya[2], Swathi Krishna K V[3]

[1]Department of Pharmacology, Saastra College of Pharmaceutical Education & Research Near Varigonda, Jwalamukhi Temple, Muthukur Road, Kakupalli, Nellore-524311, Andhra Pradesh, India

[2]Saastra College of Pharmaceutical Education &Research, Near Varigonda, Jwalamukhi Temple, Muthukur Road, Kakupalli, Nellore-524311, Andhra Pradesh, India

[3]Department of Pharmaceutics, Saastra College of Pharmaceutical Education & Research, Near Varigonda, Jwalamukhi Temple, Muthukur Road, Kakupalli, Nellore-524311, Andhra Pradesh, India

*Article History:*

Received on: 26 Jan 2024
Revised on: 24 Mar 2024
Accepted on: 05 Apr 2024

*Keywords:*

Chamomile,
Holistic Program,
Benefits,
Pharmacological Action,
Pharmacological Activity

## Abstract

In Western culture, chamomile is a well-known plant. Hippocrates, Galen, as well as Asclepius are just a few of the ancient figures who wrote upon their medical use. Paediatricians always want to know if a child's caretaker has used over-the-counter medications or herbal items, and this information should be included in any medication history. Children with GI issues including colic, dyspepsia, and diarrhoea, as well as skin ailments like dermatitis, are frequently treated with chamomile. According to clinical research, chamomile may be beneficial in the management of diarrhoea, colic, and atopic dermatitis. Children don't experience many negative effects. But use chamomile with caution if your child has allergies to ragweed, asters, or chrysanthemums.

∗Corresponding Author

Name: Porumamilla Ram Prathap Goud
Phone: +91 7780274602
Email: ramrebel1653@gmail.com

eISSN: 2583-0953
DOI: https://doi.org/10.26452/ijcpms.v4i2.597

Production and hosted by
Pharmasprings.com


## INTRODUCTION

The plant chamomile has long been used for its medicinal properties. Since the Middle Ages, humans have been aware of, studied, and used this plant. The chamomile plant is a member of the Compositae or Asteraceae family, sometimes referred to as the Daisy family [1].

The Asteraceae family of plants includes chamomile, which can be either annual or perennial. This plant increases appetite and reduces uncomfortable swellings and perspiration. Originating in temperate parts of Asia and Europe, chamomile is grown all over the world for its high nutritional, therapeutic, and cosmetic value. Greece, Rome, and ancient Egypt have all employed it for thousands of years. The extensive usage of this herb in Uyghur medicine was first documented in China. TCM practitioners with extensive training feel that chamomile-based medicines have a relaxing effect. The plant is additionally utilised in several conventional

homoeopathic and Unani medicines. Anthemis nobilis (L.) All. (CN) and Matricaria chamomilia L. (MC) are the two primary kinds of chamomile. The species Matricaria includes Matricaria chamomilia L [2]. The flowering season for this annual plant occurs in China between May and July. Plants in the genus Chamaemelum include the perennial Chamaemelum nobile (L.) All. In China, April through May is the flowering season. Generally utilised and well-researched, Matricaria chamomilia L. is a relatively common plant. We currently have this plant listed in the pharmacopoeias of 26 different countries. Medicinal uses for chamomile flower heads are widespread. In addition to other substances, chamomile contains terpenes, sterols, volatile oils, flavonoids, organic acids, and polysaccharides. Chamomile is a plant with a large number of chemicals that have a variety of pharmacological properties, including Antica, antidepressant, hypoglycemic, hypotensive, hypolipidemic, antiallergic, anti-inflammatory, antioxidant, and neuroprotective properties, among others [3].

**Medical Description:**

A restless feeling that is less severe than anxiety and is frequently accompanied by a difficulty to focus or sleep well. It may be caused by stress, mental and emotional disorders, or caffeinated beverages like cola, tea, or coffee.

**Holistic Program:**

Deep breathing is a very powerful technique for regular mind-body relaxation because it reduces sympathetic tone and stimulates the parasympathetic branch of the autonomic nervous system (also known as the "flight or fight" syndrome). Exercise, stretching, meditation, and focusing on one's own and one's relationships' clarity can all be beneficial [4]. Herbs known for their calming effects include linden blossoms, valerian, hops, passionflower, kava, and California poppy.

Recuperation can be accelerated with physical therapy, stretching, hydrotherapy, exercise, and a diet high in whole foods. Experience demonstrates that dramatic procedures in modern medicine, such as surgery, are frequently unnecessary and can even set the stage for chronic issues in the future. The following herbs can help reduce pain and swelling: anti-inflammatories that can be applied topically (like arnica, horse chestnut), topically (like plantain, vitamin C, and bromelain), and topically (like California poppy, willow bark, valerian, and Roman chamomile) [5].

**Drug Interactions**

There have been three reports of cyclosporine and chamomile interactions in renal transplant recipients. The process involves suppressing P450 CYP1A2 and 3A4 activity. It has been noted that there may be interactions between warfarin and this same type of P450 inhibition. Combining this medicine with other sedatives and anxiolytics may have an additional impact [6].

**Use in Pregnancy and Lactation**

Although many pregnant women use chamomile as a beverage to relieve morning sickness, there have been no studies on the safety of chamomile for pregnant or breastfeeding women.

**Pharmacologic Action [7]**

Chamomile contains a wide range of chemical compounds that have been found, such as coumarins (umbelliferone, alpha-bisabolol), flavonoids (apigenin, luteolin), and terpenoids (chamazulene). The anti-inflammatory, carminative, and antispasmodic qualities of the flavonoids luteolin and apigenin. The blue essential oil of German chamomile, which includes sesquiterpene alcohol, alpha-bisabolol, chamazulene, and flavonoids, is thought to have antibacterial, anti-inflammatory, and wound-healing properties.

**Figure 1: Image of Chamomile**

**Health Benefits**

Many regions of Europe, South America, and Mexico use chamomile tea as a frequent treatment

for children experiencing colic and other digestive issues, fever, insomnia, and the restlessness and irritability that come with teething. Chamomile has been used for period cramps and PMS by women for a long time. Furthermore suggested uses for it include nervine treatment, headache relief, indigestion relief, and relief from flatulent colic and cramping in the muscles. As a remedy for respiratory tract discomfort, inhale steam extracted from the herb. It is possible to soothe and mend burns, wounds, diaper rash and sore nipples by applying chamomile lotions and ointments topically on the skin. When a baby is teething or fussy, homoeopathic tablets are administered [8].

**Side Effects [9]**

- Allergy in Sensitive Individuals.
- When using blood thinners, stay away from chamomile teas as they contain coumarins, a natural
- blood thinner.
- Strong teas can make you throw up.

**Benefits**

- Improves Heart Health
- Boost Your Immune system
- Soothes Stomach Pain
- Benefit Blood Sugar Control
- Helps with Digestion
- Helps in Weight Loss
- Protect Against cancer
- May Improve Sleep
- Cures Mouth Ulcers
- Keep Kidneys & Urinary Tract Clean

**Figure 3: Chamomile plant**

**Agriculture**

It is well recognised that a variety of fungus, insects, and viruses can affect chamomile plants. The chamomile plant is known to be susceptible to a number of fungi, including Erysiphecichoracearum (powdery mildew), Sphaerotheca macularis (powdery mildew), Albugotragopogonis (white rust), and Cylindrosporium matricariae. The moth Autographachryson is responsible for defoliation, and aphids have been recorded feeding on chamomile plants. Typically, the plant's flowers and leaves are utilised, with the flowers being the most frequently utilised component. You can use the flowers dry or fresh. On a sunny day, while the plant is in flower, it is collected [10].

**Table 1: Nutritional Values**

| Nutrient | Amount |
|---|---|
| Energy | 2.37kcal |
| Totalfat | 0 |
| Cholesterol | 0 |
| Totalcarbohydrate | 0.47g |
| Protein | 0 |
| Polyunsaturated fattyacid | 0.01g |
| Nutrient | Amount |
| Vitamin A | 47.40IU |
| Thiamine | 0.02mg |
| Riboflavin | 0.01mg |
| Pantothenic acid | 0.03mg |
| Folate | 2.37mg |
| Potassium | 21.33mg |
| Magnesium | 2.370mg |
| Manganese | 0.100mg |
| Calcium | 4.74mg |
| Iron47 | 0.19mg |

**Potential Uses [11]**

**Potential Uses of Chamomile for Anxiety**

The oil that is collected from the flowers is typically inhaled as vapours, and it may have a relaxing and pain-relieving effect. Thus it may show beneficial effects in mild to moderate anxiety disorder

**Potential Uses of Chamomile for Epilepsy**

According to research on animals, chamomile delays the onset of a seizure episode. To prove that

**Table 1 Recommended herbs**

| | | |
|---|---|---|
| Linden Infusion | 1-4grams | 1cup2-3xdaily |
| California Poppy | Tincture | 2-4dropperfulasneeded |
| Passion flower | Tincture | 30drops3-4xdaily |
| Valerian | Tincture | 30-40drops2-3xdaily |
| Hops | Infusion:6-8grams | 1cup2-3xdaily |
| Reishi | Standardized Extract | 2-4capsules2-3xdaily |

chamomile has this impact on people, human trials are necessary.

**Potential Uses of Chamomile in Headache**

Inhaled vapours can be used to treat headaches that precede seizures, during anxiousness, during hysterical episodes, and to alleviate discomfort. However, since insufficient studies are available for conditions for brain it is important to consult your medical practitioner for advice as the herb may have nervousness**.**

**Pharmacological Activities:**

**Anti-Infective Activity**

The growth of bacteria and fungi has been found to be inhibited by chamomile volatile oil. In addition, it treats urticaria and efficiently lowers the protease in mites. Mean corpuscular hemoglobin-ampicillin 1 (MCh-AMP1) is a naturally occurring peptide derived from the plant that exhibits broad-spectrum antifungal activity against yeasts and moulds that are harmful to humans. By enhancing the permeability of cell membranes and triggering the generation of reactive oxygen species (ROS), it eliminates Candida albicans. disclosed that the chamomile extract's minimum inhibitory concentrations 90 (MIC90) and MIC50 against Helicobacter pylori were 125 and 62.5 mg/mL, respectively [12].

**Anti-Inflammatory Activity**

The anti-inflammatory properties of chamomile are said to be attributed to its flavonoids. It has been reported that the strong anti-inflammatory effects of chamomile volatile oil in animal models are caused by a suppression of nuclear factor kappa beta (NF-κB)-driven transcription, which is achieved by preventing the production of inflammatory mediators such as tumour necrosis factor alpha (TNF-α) and interleukin-1β (IL-1β). Owing to its inflammatory-fighting properties, chamomile is frequently used to treat conditions like conjunctivitis, mammitis, colitis, dermatitis, and cystitis. Children's prickly heat, which is caused by perspiration congregating around sweat glands in the summer, can be successfully relieved by Chamomile Jinshui, an essential oil that is primarily constituted of Chamomile.

**Antithrombotic Activity**

Globally, cardiovascular diseases (CVD) rank among the top causes of death. By delaying hemostasis and coagulation, chamomile extract has antithrombotic action. This plant's luteolin inhibits the oxidative stress that results from adenosine diphosphate (ADP)-induced carotid artery thrombosis in mice. revealed that the chamomile polyphenol-polysaccharide combination had an antithrombotic effect by lowering platelet aggregation. found that the angiotensin-converting enzyme (ACE) half-maximal inhibitory concentrations (IC50) of butanol and water extracts were 0.353 mg/mL and 1.292 mg/mL, respectively. The aforementioned results provide additional support for chamomile's antithrombotic properties [13].

**Antioxidant Activity**

Free radicals hydroxyl and 1,1-diphenyl-2-picrylhydrazyl (DPPH) have been shown to be scavenged by chamomile's volatile oil, polysaccharides, and total flavonoids. Dosage dependence exists for the antioxidant action. In addition, chamomile ethanol extract lowers the amount of malondialdehyde (MDA) in mice and boosts the activities of glutathione peroxidase (GSH-PX) and superoxide dismutase (SOD). This research gives chamomile's antioxidant benefits a solid scientific foundation.

**Hypoglycaemic Activity**

In both normal and diabetic mice, chamomile extract raises glucose tolerance and lowers fasting blood glucose levels. Furthermore, it has been reported that the plant's total flavonoids

counteract the effects of exogenous glucose, lowering levels of fibrinogen (FBG), glycated haemoglobin, glucose tolerance, and glycated serum protein (GSP) in diabetic mice while increasing insulin secretion and glucose tolerance. Researchers have also examined the hypoglycemic effect of chamomile extract in streptozotocin (STZ)-diabetic rats. The outcomes demonstrated that it lessened the oxidative damage brought on by hyperglycemia as well as shielded islet cells.

**Antihypertensive Activity**

Research has indicated that chamomile extract exhibits antihypertensive properties in essential hypertensive rats. Simultaneously, a study conducted on normotensive rats revealed that chamomile extract did not have any detrimental effects on diastolic or systolic blood pressure (DBP), indicating that it is safe for use in normal blood pressure regulation. found that in rats with hypertension brought on by N-omega-nitro-L-arginine (L-NNA), chamomile extract exhibits antihypertensive effects through lowering oxidative stress and angiotensin II (Ang II) levels while elevating SOD levels [14].

**Antiallergy Activity**

In traditional medicine, chamomile is often used to treat a variety of allergy symptoms. For instance, long-term consumption of antiallergic tea has beneficial effects on cosmetology and anti-allergy activity. By evaluating the β-hexosaminidase (β-Hex) release in rat basophil leukaemia (RBL-2H3) cells, the antiallergic activity of chamomile aqueous extract (1.0 mg/mL) was revealed. A 21.42% inhibition of the β-Hex release was proposed as a result. Compound 48/80-induced allergy responses may be inhibited by a chamomile methanol extract. The impact was dose-dependent and was mediated via mast cell NO and histamine release inhibition.

**Antidepressant Activity**

Essential oil aromatherapy is regarded as a complementary therapy for depression. When depressed patients are in pain, both physically and mentally, chamomile is a great relief. The use of chamomile flower heads to make tea has been shown to be an effective way to alleviate depressed symptoms and improve postpartum women's sleep quality, offering a novel approach to treating depression. Chamomile may have antidepressant properties, according to certain pharmacological studies. For instance, polymerase chain reaction (PCR) study and isobaric tag for relative and absolute quantitation (iTRAQ) analysis revealed that the plant's α-pinene increased oxidative phosphorylation-related protein expression and parvalbumin mRNA expression in the rat brain [15].

## CONCLUSION

For centuries, chamomile has been used to cure insomnia and induce relaxation. Preparations including tea and essential oil aromatherapy have been suggested to have relaxing properties.

## ACKNOWLEDGEMENT

Thank Dr. G. H. Srinivaasa Rao Sir (Founder and Manager), Saastra College of Pharmaceutical Education &Research, Near Varigonda Jwalamukhi Temple , Muthukur Road , Kakupalli, Nellore-524311, Andhra Pradesh, India.

**Conflict of Interest**

The authors declare no conflict of interest, financial or otherwise.

**Funding Support**

The authors declare that they have no funding for this study.

## REFERENCES

[1] M E Aggag, and R T Yousef. Study of antimicrobial activity of chamomile oil. Planta Medica, 22(2):140–144, 1972.

[2] William P Jones, Young-Won Chin, and A Douglas Kinghorn. The role of pharmacognosy in modern medicine and pharmacy. Curr Drug Targets, 7(3):247–264, 2003.

[3] R B Philip. Herbal remedies: the good, the bad, and the ugly. Journal of Complementary and Integrative Medicine, 1(1):1–11, 2004.

[4] H V Hansen, and K Ib Christensen. The common chamomile and the scentless may weed revisited. Taxon. International Association for Plant Taxonomy, 58(1):261–264, 2009.

[5] D L McKay, and J B Blumberg. A review of the bioactivity and potential health benefits of chamomile tea (Matricaria

recutita L.). Phytotherapy Research, 20(7):519–530, 2000.

[6] E Lemberkovics, A Kery, G Marczal, B Simandi, and E Szoke. Phytochemical evaluation of essential oils, medicinal plants and their preparations. Acta Pharmaceutica Hungarica, 68:141–149, 1998.

[7] N A Babenko, and E G Shakhova. Effects of Chamomilla recutita flavonoids on age-related liver sphingolipid turnover in rats. Experimental Gerontology, 41:32–39, 2006.

[8] R Avallone, P Zanoli, G Puia, M Kleinschnitz, P Schreier, and M Baraldi. Pharmacological profile of apigenin, a flavonoid isolated from Matricaria chamomilla. Biochemical Pharmacology, 59(11):1387– 1394, 2000.

[9] V Svehlikova, R N Bennett, F A Mellon. P W Needs, S Piacente, P A Kroon, Y Bao. Isolation, identification and stability of acylated derivatives of apigenin 7-O-glucoside from chamomile (Chamomilla recutita [L.] Rauschert). Phytochemistry 65(16):2323–2332, 2004.

[10] A Carnat, A P Carnat, D Fraisse, L Ricoux, and J L Lamaison. The aromatic and polyphenolic composition of Roman camomile tea. Fitoterapia, 75(1):32–38, 2004.

[11] R Avallone, P Zanoli, G Puia, M Kleinschnitz, P Schreier, and M Baraldi. Pharmacological profile of apigenin, a flavonoid isolated from Matri caria chamomilla. Biochemical Pharmacology, 59(11):1387-1394, 2000.

[12] H Viola, C Wasowski, M Levi de Stein, C Wolfman, R Silveira, F Dajas, J H Medina, and A C Paladini. Apigenin, a component of Matricaria recutita flowers, is a central benzodiazepine receptors-ligand with anxiolytic effects. Planta Medica, 61(3):213-216, 1995.

[13] Y B Xu, H Tang, S Y Zhu, W Zhe, K Wang, D S Mao, L Fu, and R K Chen. Analysis of volatile components in chamomile oil from different origins by gas chromatography time-of-flight mass spectrometry. Science and Technology Food Industry, 36(14):69–74, 2015.

[14] Z Asadi, T Ghazanfari, and H Hatami. Anti-inflammatory Effects of Matricaria chamomilla Extracts on BALB/c Mice Macrophages and Lymphocytes. Iran Journal of Allergy Asthma and Immunology, 19(S1):63–73, 2020.

[15] M Shaaban, A M El-Hagrassi, A F Osman, and M M Soltan. Bioactive compounds from Matricaria chamomilla: Structure identification, in vitro antiproliferative, antimigratory, antiangiogenic, and antiadenoviral activities. Zeitschrift Fur Naturforschung C Journal of Biosciences, 77:85–94, 2021.