

Review Article



A Drug Review of Elathy Chooranam: A Siddha Formulation for the Management of Kaanakadi (Urticaria)

Shaira banu I^{1*}, Ravindiran G², Jinavani J¹, Priyadharshini M¹, Gomathy K³, Madhavan R⁴

¹PG scholar, Department of *Nanju Maruthuvam* (Siddha Toxicology), National Institute of Siddha, Tambaram Sanatorium, Chennai-600047, Tamil Nadu, India. (Affiliated to TN Dr. MGR Medical University).

²PG scholar, Department of *Gunapadam* (Siddha Pharmacology), National Institute of Siddha, Tambaram Sanatorium, Chennai-600047, Tamil Nadu, India. (Affiliated to TN Dr. MGR Medical University).

³Project Manager, Native Medicare Charitable Trust, Tamil Nadu, India.

⁴Professor & HOD, Department of *Nanju Maruthuvam* (Siddha Toxicology), National Institute of Siddha, Tambaram Sanatorium, Chennai-600047, Tamil Nadu, India. (Affiliated to TN Dr. MGR Medical University).

*Corresponding author's E-mail: dr.shairabanu@gmail.com

Received: 08-05-2026; Revised: 23-07-2026; Accepted: 29-07-2026; Published online: 20-08-2026.

ABSTRACT

Background: The Siddha system of medicine is one of the oldest traditional medical systems followed in South India. It emphasizes the use of herbal formulations for their therapeutic efficacy and safety. *Elathy Chooranam* is a classical Siddha formulation, traditionally used in Siddha medicine for its diverse therapeutic applications.

Objectives: This review aims to evaluate the composition, traditional indications and pharmacological evidence of the constituents of *Elathy Chooranam*.

Methods: The data for this review were collected from Classical Siddha texts, published research articles, pharmacological studies, and scientific databases. Relevant literature on the bioactive compounds and therapeutic applications of *Elathy Chooranam* and its key ingredients was systematically analysed.

Results: The constituents of *Elathy Chooranam* exhibit significant pharmacological activities, including anti-inflammatory, antioxidant, antihistamine, and immunomodulatory effects, as supported by in vitro and in vivo studies.

Conclusion: This review establishes a strong correlation between Siddha textual references and modern pharmacological research, affirming the therapeutic potential of *Elathy chooranam*. While scientific evidence supports its medicinal applications, further research is necessary to determine its safety and efficacy for widespread therapeutic use.

Keywords: *Elathy chooranam*, Siddha Medicine, Chemical constituents, *Kaanakadi*, Pharmacological activity.

INTRODUCTION

The Siddha system of medicine is one of the oldest traditional medical systems followed in South India. Based on a holistic approach, it aims to promote health, prevent disease and enhance longevity by maintaining a person's physical, mental, and spiritual health. In the Siddha system, medicinal substances are broadly classified into three categories: *Mooligai* or *Thavaram* (herbal origin), *Thathu* (inorganic substances), and *Jeevam* or *Sangamam* (animal origin)¹. Siddha medicines are further categorized into 32 internal (*Aga marunthu*) and 32 external (*Pura marunthu*) forms. Among the internal preparations, *Chooranam* is a traditional polyherbal formulation widely used in the Siddha system of medicine for the prevention and management of various diseases. Prepared through fine powdering and blending of medicinal herbs and spices, *chooranam* ensures rapid absorption, enhanced bioavailability, and ease of administration. *Elathy Chooranam* is a classical Siddha herbal formulation that was described in the Siddha text *Siddha Vaithiya Thirattu* for the management of *Kaanakadi*. The medicinal herbs used in the formulation are traditionally used to treat various diseases. "*Kaanakadi*" is the term used to describe an unknown bite or sting from an

insect or other organism, often accompanied by itching, redness, and wheal formation². The clinical symptoms of *Kaanakadi* can be correlated with urticaria in modern medicine. Nearly 20% of the global population suffers from urticaria at least once in his or her lifetime³. According to Siddha principles, the manifestation of skin ailments is correlated with vitiation of *Pitha Kuttram*. Improper diet, unhealthy lifestyle habits, environmental factors, psychological stress, allergies, and certain medications can cause this vitiation. This review examines the pharmacological activities, characteristic features, chemical composition, traditional therapeutic uses, and available scientific evidence for each ingredient of *Elathy Chooranam*.

MATERIALS AND METHODS

DATA COLLECTION SOURCES:

The data for this review were collected from classical Siddha texts, published research articles, and scientific databases such as PubMed, Web of Science, and Scopus.

Standard operating procedure:

Selection of the drug: *Elathy chooranam*, an herbal formulation indicated for the management.



of urticaria, was selected for the present review based on its reference in the classical Siddha text *Siddha Vaithiya Thirattu* (Pg. no.: 215)⁴.

Drug Procurement and Authentication: All the raw drugs were purchased from the authenticated raw drug store K. Ramaswamy Chetty, a Siddha and Ayurveda Raw Material Store, No 177, Rasappa Chetty Street, Park Town, Chennai-600003. They were identified and authenticated by Dr. D. Aravind, MD(s), M.Sc., Assistant Professor, Department of Medicinal Botany, National Institute of Siddha, Chennai.

Table 1: Ingredients of *Elathy Chooranam*

S.No	Ingredients	Botanical name	Quantity
1.	<i>Elam</i>	<i>Elettaria cardamomum</i> (L.) Maton	64 Part
2.	<i>Chukku</i>	<i>Zingiber officinale</i> Roscoe	32 Part
3.	<i>Kugaineer</i>	<i>Maranta arundinacea</i> . Linn	16 Part
4.	<i>Thalisapatri</i>	<i>Abies spectabilis</i> (D.Don) Mirb	8 Part
5.	<i>Sirunagapoo</i>	<i>Mesua ferrea</i> L	4 Part
6.	<i>Milagu</i>	<i>Piper nigrum</i> L.	2 Part
7.	<i>Lavangam</i>	<i>Syzygium aromaticum</i> Linn	1 Part
8.	<i>Sarkarai</i>	<i>Saccharum officinarum</i> . linn	127 Part

Method of Purification:⁵

- **Elam:** Removed the contaminated debris and dried in sunlight.

- **Chukku:** Dipped one part of *chukku* in twice the part of limestone water for one *samam* (3 hours). Then dried and removed the outer layer of it.
- **Kugaineer:** Mixed with water and filtered seven times. Then dried in sunlight.
- **Thalisapatri:** Removed the contaminated debris and dried in sunlight.
- **Sirunagapoo:** Removed the contaminated debris and dried in sunlight.
- **Milagu:** Soaked in buttermilk for a period of one *saamam*, then allowed to dry.
- **Lavangam:** Removed the contaminated debris and dried in sunlight.
- **Sarkarai:** Grind the solid sugar and remove the debris using *muram*.

Method of preparation: Purified raw drugs were dried, pulverized in *ural* and filtered with a cotton cloth. The powdered raw drugs were mixed with the sugar and stored in a container. **Dosage:** *Veukadi alavu* (1250mg to 1500mg or a large pinch, as much as can be taken up with the tips of the thumb and two fingers).

Indications: Gastrointestinal disorders, urticaria, leprosy, wound, tuberculosis, menorrhagia, tumors, etc.⁴

REVIEW OF DRUGS:

Table 2: Scientific & Selected Vernacular names, Families of the herbal ingredients⁶

S.No	Tamil Name	Botanical Name	English Name	Family
1.	<i>Elam</i>	<i>Elettaria cardamomum</i> (L.) Maton	Cardamom seeds	Zingiberaceae
2.	<i>Chukku</i>	<i>Zingiber officinale</i> Roscoe	Dried ginger	Zingiberaceae
3.	<i>Kugaineer</i>	<i>Maranta arundinacea</i> . Linn	East Indian Arrowroot	Marantaceae
4.	<i>Thalisapatri</i>	<i>Abies spectabilis</i> (D.Don) Mirb	Talisaptra or Indian silver Fir	Pinaceae
5.	<i>Sirunagapoo</i>	<i>Mesua ferrea</i> L	Ceylon ironwood	Calophyllaceae
6.	<i>Milagu</i>	<i>Piper nigrum</i> L.	Black pepper	Piperaceae
7.	<i>Lavangam</i>	<i>Syzygium aromaticum</i> Linn	Cloves, clove tree	Myrtaceae
8.	<i>Sarkarai</i>	<i>Saccharum officinarum</i> . linn	Sugarcane	Poaceae

Table 3: Habitat, Parts used & Organoleptic Characters of the Herbal ingredients⁶

S.No	Ingredients	Growth Habit	Parts Used	Taste	Potency	Division
1.	<i>Elam</i>	Perennial herb	Dried fruit	Acrid	Hot	Acrid
2.	<i>Chukku</i>	Perennial herb	Dried rhizome	Acrid	Hot	Acrid
3.	<i>Kugaineer</i>	Perennial herb	Root powder	Sweet	Hot	Sweet
4.	<i>Thalisapatri</i>	Tree	Dried leaves	Acrid	Hot	Acrid
5.	<i>Sirunagapoo</i>	Tree	Dried flowers	Bitter, Astringent	Cold	Acrid
6.	<i>Milagu</i>	Climber	Dried fruits	Acrid, Bitter	Hot	Acrid
7.	<i>Lavangam</i>	Tree	Dried fruits	Acrid	Hot	Acrid
8.	Sugar	Grass	Crystallised sugar	Sweet	Cold	Acrid



Table 3: Actions, Chemical constituents and Medicinal uses in Siddha

S. No	Ingredients	Actions ⁶	Chemical Constituents	Medicinal Uses in Siddha ⁶
1.	<i>Elam</i>	Stimulant, Carminative, Stomachic, Antispasmodic, Tonic.	Limonene, terpinyl acetate, α - and β -pinene, α -terpineol and 1,8-cineole. ⁷	Cough, diarrhoea, cold, diseases of mouth, jaw, throat, spider bite, increases sperm count.
2.	<i>Chukku</i>	Stimulant, Carminative, Stomachic.	Camphene, phellandrene, zingiberene, cineole, gingerol, borneol, flavonoids, polyphenols, tannins, isovanillin, and adenine, zingerone. ⁸	Indigestion, diarrhoea, gastric ulcer, asthma, cough, cold, sinusitis, bloating, anaemia, etc.
3.	<i>Koogaineer</i>	Refrigerant, Demulcent, Nutrient.	Alkaloids, glycosides, phenolic compounds, terpenoids, saponins, flavones, and tannins ⁹	Cough, fever, thirst.
4.	<i>Thalisapatri</i>	Carminative, Stomachic, Expectorant, Tonic.	Flavonoids, alkaloids, tannins, Pyrazole [4,5-b] imidazole, ribofuranosyl, naphthoquinones ¹⁰ .	Fever, chronic cough, indigestion, diarrhoea, Bronchial asthma, vomiting, fever, etc,
5.	<i>Sirunagapoo</i>	Carminative, Astringent, Anti-inflammatory, Anti-pyretic.	Coumarins, xanthenes, terpenoids, alophyllin-B, euxanthone, mesuaferrins A, B & C, tovo pyrifolin C, mesuaxanthone – A & B and jacareubin. ¹¹	Diarrhoea, leucorrhoea, cough, wound, etc.
6.	<i>Milagu</i>	Carminative, Pungent, Anti-periodic, Analgesic, Anti-inflammatory, Antidote.	Piperine, pipene, piperamide, piperamine, piperettine, pipericide, piperolein B, sarmentine & sarmentosine. ¹²	Cough, fever, cold, haemorrhoids, gastric ulcer, diarrhoea, ageusia, giddiness, indigestion, jaundice, hemiplegia.
7.	<i>Lavangam</i>	Carminative, Anti-spasmodic, Stomachic.	Eugenin, ellagitannins, isobiflorin, syzyginins A & B, biflorin. ¹³	Diarrhoea, giddiness, vomiting, dysentery, cataract, etc.
8.	Sugar	Antiseptic, Demulcent.	Polyphenols, flavonoids, phenolic acids, long-chain fatty alcohols, and phytosterols. ¹⁴	Hiccup, <i>vatha</i> diseases, vomiting.

PHARMACOLOGICAL ACTIVITIES OF INDIVIDUAL INGREDIENTS:

1. *Elettaria cardamomum*

Anti-Inflammatory Activity: The anti-inflammatory properties of *Elettaria cardamomum* (cardamom) are attributed to bioactive compounds such as 1,8-cineole, terpinene, limonene, borneol, and flavonoids. They inhibit the production of inflammatory mediators by blocking COX and LOX enzymes and suppressing pro-inflammatory cytokines. Cardamom also relieves joint pain and swelling caused by inflammatory diseases. Additionally, its strong antioxidant properties reduce oxidative stress, further contributing to its anti-inflammatory effects ⁷.

Antioxidant activity: *Elettaria cardamomum* exhibits significant antioxidant properties attributed to the presence of phenols, flavonoids, tannins and other bioactive compounds. These compounds have antioxidant properties that help to neutralize free radicals and safeguard cells from oxidative damage. Cardamom also helps to inhibit lipid peroxidation and boost the body's natural antioxidant system. Consequently, it can help to lower the likelihood of oxidative stress-related conditions like cancer, diabetes, and cardiovascular disorders.¹⁵

2. *Zingiber officinale*

Anti-inflammatory activity: *Zingiber officinale* has potent anti-inflammatory properties due to compounds such as gingerols and 6-shogaol. These compounds inhibit the production of inflammatory mediators such as tumor necrosis factor alpha (TNF- α), Interleukin-1 beta (IL-1 β), and Interleukin-6 (IL-6). Ginger aids in the treatment of various inflammatory conditions including colitis, menstrual pain, allergies, and gout. It also helps to decrease inflammation caused by exercise and promotes recovery and overall health ⁸.

Antioxidant activity: *Zingiber officinale* has strong antioxidant properties due to compounds such as zingerone. This assists in counteracting the damaging effects of free radicals, preventing oxidative stress, and shielding cells from damage. Ginger can also help to protect the liver, kidney, and brain from oxidative damage. Moreover, it boosts the natural antioxidant defense system of the body ⁸.

3. *Maranta arundinacea*

Antioxidant and Anti-inflammatory Activity: *Maranta arundinacea* tuber extracts show strong antioxidant activity by neutralizing free radicals and reducing oxidative stress. These effects are mainly due to the presence of phenolics,



flavonoids, alkaloids, terpenoids, and saponins. The extracts are also known to have anti-inflammatory effects through reducing inflammation and stabilizing membranes. Thus, MA tubers may help protect against oxidative stress and inflammatory disorders.⁹

Immunomodulatory Activity: MA tuber extracts exhibit immunomodulatory activity by enhancing the production of immunoglobulins (IgG, IgM, and IgA) and interferon-gamma (IFN- γ), which support immune function. These effects are attributed to its phenolic and flavonoid compounds, along with its rich nutritional content. Additionally, the prebiotic and resistant starch components promote beneficial gut activity and strengthen immune responses.⁹

4. *Abies spectabilis*

Anti-inflammatory Activity: The methanolic extract of the leaves of *Abies spectabilis* exhibited potent anti-inflammatory effects in the carrageenan-induced paw edema model. The extract significantly decreased the paw swelling when compared with the standard drug, diclofenac sodium, at the dosage of 400 mg/kg, p.o. A noticeable reduction in inflammation was observed within 30 minutes of treatment, indicating its anti-inflammatory potential.¹⁶

5. *Mesua ferrea*

Antioxidant Activity: The antioxidant activity shown by *Mesua ferrea* is very prominent because it has the ability to scavenge free radicals. The methanolic flower extracts have exhibited excellent antioxidant activity against DPPH, superoxide and hydrogen peroxide radicals. Based on these findings, the plant may possess antioxidant activity and be used to prevent oxidative stress and free radical damage to cells.¹¹

Anti-inflammatory Activity: *Mesua ferrea* exhibits significant anti-inflammatory properties due to xanthones. It has been proven to inhibit swelling in experimental animal models using its extracts from the seeds. Furthermore, formulations with *M. ferrea* have been found to be effective in inhibiting edema and inflammation.¹¹

Immunomodulatory Activity: *Mesua ferrea* exhibits immunomodulatory properties, which include antibody production enhancement and immune cell response. This contains Mesuol, which has been shown to have immune-boosting properties in experimental research.¹¹

6. *Piper nigrum*

Antioxidant Activity: *Piper nigrum* shows high antioxidant activity because of the presence of piperine, flavonoids and phenolic compounds. These bioactive constituents scavenge free radicals, reduce oxidative stress, and protect cells from oxidative damage. Research has demonstrated that black pepper increases the activity of antioxidant enzymes and helps to prevent damage to brain, liver, heart, and kidney tissues. Its antioxidant properties may also contribute to the prevention of neurodegenerative and other oxidative stress-related disorders.¹²

Anti-inflammatory Activity: *Piper nigrum* possesses significant anti-inflammatory activity, mainly due to piperine. Piperine reduces the production of inflammatory mediators such as prostaglandin E₂ and interleukin-6, thereby decreasing inflammation and tissue damage. It has been demonstrated to reduce pain and swelling in experimental models. The results indicate that black pepper could be used naturally to manage inflammatory diseases.¹²

Immunomodulatory Activity: *Piper nigrum* exhibits immunomodulatory activity mainly due to piperine. Piperine improves immune function by increasing the production of white blood cells and stimulating the activity of macrophages and the proliferation of lymphocytes. It also increases the levels of cytokines that support the immune system like interferon- γ and interleukin-2. Such effects contribute to making the body stronger against infections and, in general enhance immune responses.¹²

7. *Syzygium aromaticum*

Antioxidant Activity: Clove oil is a potent antioxidant and is similar to synthetic antioxidants

like BHA and pyrogallol. It removes free radicals, blocks lipid peroxidation and also normalizes glutathione levels to reduce oxidative stress. The antioxidant properties may shield cells from damage and enhance memory loss caused by oxidative stress.¹³

Anti-inflammatory Activity: A major compound in clove oil responsible for its anti-inflammatory properties is eugenol. Synergistic anti-inflammatory effects have been demonstrated in animal studies using clove oil extract in combination with other active substances, such as cod liver oil. In addition, flavonoids such as rhamnetin, kaempferol and β -caryophyllene further enhance the anti-inflammatory properties of clove oil.¹³

8. *Saccharum officinarum*

Anti-inflammatory and Antioxidant Activities: Phytochemical extracts rich in polyphenols exhibited potent antioxidant and anti-inflammatory properties, scavenging free radicals, as well as reducing lipid peroxidation and inflammatory mediators in activated macrophages. The extracts also inhibited protein denaturation and exhibited proteinase inhibitory activity. Polyphenols were found to be important in the antioxidant and anti-inflammatory activity, with higher content correlated with stronger activity.¹⁴

DISCUSSION

Transient wheals, intense itching and erythema are the hallmark features of *Kaanakadi* (Urticaria) along with mast cell degranulation, histamine release and inflammatory cascades. As per Siddha principles, the appearance of skin disorders is related to the vitiation of *Pitha Kuttram*, which can be further aggravated by wrong diet, lifestyle, stress, allergens and medications.

In the present review, the pharmacological profile of 8 ingredients of *Elathy Chooranam* was analyzed to establish the rationale for the traditional use in urticaria. The analysis



shows that the formulation has a synergistic anti-inflammatory, antioxidant, and immunomodulatory profile, all of which target key pathophysiological mechanisms of urticaria.

The anti-inflammatory activity was significant in the extracts of *Elettaria cardamomum*, *Zingiber officinale*, *Abies spectabilis*, *Mesua ferrea* and *Piper nigrum* due to their ability to inhibit COX/LOX enzymes and downregulate pro-inflammatory cytokines like TNF- α , IL-1 β , and IL-6, respectively. *Piper nigrum* showed significant anti-inflammatory activity by inhibiting the level of prostaglandin E₂ and IL-6; *Syzygium aromaticum* has eugenol and β -caryophyllene, which are already known to inhibit the level of pro-inflammatory cytokines. *Abies spectabilis* and *Mesua ferrea* also showed significant anti-inflammatory activity by inhibiting the level of pro-inflammatory cytokines. These may help prevent wheal formation, swelling and itching from urticaria.

Oxidative Stress plays a role in the activation of mast cells and the development of Chronic Urticaria. All the ingredients showed antioxidant activity both in terms of free radical scavenging activity and the stimulation of endogenous antioxidant enzymes. The inhibition of lipid peroxidation and stabilization of membranes by polyphenols and flavonoids from *Maranta arundinacea* and *Saccharum officinarum* was demonstrated. By reducing oxidative stress, the formulation may help in preventing recurrent mast cell degranulation and tissue damage in urticaria patients.

Chronic urticaria has been associated with immune dysregulation, and *Maranta arundinacea*, *Mesua ferrea*, and *Piper nigrum* are reported to modulate macrophage and lymphocyte function, increase immunoglobulin production, and increase the production of interferon-gamma and interleukin-2. *Maranta arundinacea* was also reported to contain components that are prebiotic and potentially contain resistant starch, which can provide support to gut-associated immunity. Such immunomodulatory effects could help in restoring immune balance and reducing allergic hypersensitivity in urticaria.

Considering all the above-mentioned medicinal properties, *Elathy Chooranam* is a rational choice for the treatment of urticaria in the Siddha system of medicine. The polyherbal formulation works through more than one action, unlike conventional antihistamines, which target only one pathway; this could have wider efficacy with potentially fewer side effects. Additionally, the formulation contains fewer ingredients and is cost-effective, making it suitable for long-term management. In vitro and in vivo pharmacology studies have demonstrated the pharmacological properties of individual ingredients, whereas with regard to urticaria, there is only limited clinical evidence on *Elathy Chooranam*. More studies are needed to assess its efficacy, safety, bioavailability, and mechanism of action.

CONCLUSION

To conclude, the ingredients used in *Elathy Chooranam* have several pharmacological properties which are relevant to the management of urticaria. The anti-inflammatory, antioxidant, and immunomodulatory properties have formed the scientific foundation of *Kaanakadi's* traditional use. But to prove its therapeutic use, it needs clinical validation.

Source of Support: The author(s) received no financial support for the research, authorship, and /or publication of this article.

Conflict of Interest: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and /or publication of this article.

REFERENCES

1. Saraf S, Shukla S, Saraf S. Fundamental aspect and basic concept of siddha medicines. Syst Rev Pharm. 2011;2(1):48. doi:10.4103/0975-8453.83439
2. Nanjmurivunool. 4th ed. Department of Indian Medicine and Homoeopathy, Chennai-106; 2004. 126 p.
3. Lee SJ, Ha EK, Jee HM, Lee KS, Lee SW, Kim MA, et al. Prevalence and Risk Factors of Urticaria With a Focus on Chronic Urticaria in Children. Allergy Asthma Immunol Res. 2017 May;9(3):212–9. doi:10.4168/aair.2017.9.3.212 PubMed PMID: 28293927; PubMed Central PMCID: PMC5352572.
4. Dr. K. N. Kuppusamy Muthaliyar, H.P.I.M., Dr. K. S. Uththamarayan, H.P.I.M.,. Siddha Vaithiya Thithathu., 6th ed. Department of Indian Medicine & Homoeopathy, Chennai - 106; 2016.
5. C.Kannusami pillai. Sikicha rathana depam vaidhiya nool. Thirumagal vilasagam; 2007. 28,29,31,34.
6. Dr. K. S. Murugesu mudhaliyar. Gunapadam - Mooligai (Siddha Materia Medica). 9th ed. Department of Indian Medicine & Homeopathy;; 2013.
7. Pathak A, Sanskar, Yadav N, Pandey D, Bajpai H, Kuma P, et al. An Overview of Elettaria cardamomum and It's Therapeutic Uses and Role as an Essence of Life. J Sci Innov Nat Earth. 2025 Mar 1;5:29–33. doi:10.59436/jsiane.303.2583-2093
8. Dissanayake KGC, Liyanage R, Waliwita WALC. A Review on Medicinal Uses of Zingiber officinale (Ginger). Vol. 10. 2020 Apr 25;10:142–8.
9. Fidianingsih I, Aryandono T, Widyarini S, Herwiyanti S, Sunarti. Arrowroot (Maranta arundinacea L.) as a new potential functional food: A scoping review. Int Food Res J. 2022 Dec 6;29:1240–55. doi:10.47836/ifrj.29.6.02
10. Prajapati C, Saini LS, Gaur A, Kumar P, Uddin J, Ghazi RM. GC–MS characterization and in-silico evaluation of TNF- α binding efficacy of leaf extract from Abies spectabilis (D. Don) Spach. Sci Rep. 2026 Jan 9;16(1):3563. doi:10.1038/s41598-025-33563-w
11. Ethnobotanical and Phytopharmacological attributes of Mesua ferrea: A mini review. J Appl Pharm Sci. 2017. doi:10.7324/JAPS.2017.70435
12. Damanhour Z, Ahmad A. A Review on Therapeutic Potential of Piper nigrum L. (Black Pepper): The King of Spices. Med



Aromat Plants. 2014 Aug 4;3:161. doi:10.4172/2167-0412.1000161

13. Mittal A, Khan U, Danish S, Mohammad, Parveen U. A review on biological and therapeutic uses of Syzygium aromaticum Linn. (Clove): Based on phyto-chemistry and pharmacological evidences. 2020 Jul 6;33–9.

14. Kumar VA, M, Kamalanadhan NG. A review on pharmacology and phytochemistry of sugarcane rind. Vol. 7. 2021;7(8):49-54.

15. Kar S, Das MT, Das R. Diversity, ethnomedicinal and pharmacological properties of Elettaria cardamum (L.) Maton and Amomum subulatum Roxb.: A review. J Med Plants Stud. 2026 May 1;14(3):53–6. doi:10.22271/plants.2026.v14.i3a.2104

16. Saravanan V. Bioactivities of Isolated Phytochemicals and Extracts of Abies spectabilis (D.Don) Mirb. Matrix Sci Pharma. 2021 Jun;5(2):42. doi:10.4103/mtsp.mtsp_6_21

For any questions related to this article, please reach us at: globalresearchonline@rediffmail.com

New manuscripts for publication can be submitted at: submit@globalresearchonline.net and submit_ijpsrr@rediffmail.com

