WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 9, Issue 5, 244-252. Review Article ISSN 2277– 7105

# A REVIEW ON BIOLOGICAL POTENTIAL OF PSIDIUM GUJAVA, CORIANDER SATIVUM, CARUM CARVI

**Sonali D. Alhat*, Dr. Priya S. Rao and Tushar P. Dukre**

Department of Pharmacognosy, Pravara Rural College of Pharmacy, Pravaranagar. A/p- Loni BK, Tal -Rahata, Dist -A'Nagar (MS) 413736.

Article Received on
21 Feb. 2020,

Revised on 12 March 2020,
Accepted on 03 April 2020

DOI: 10.20959/wjpr20205-17205

***Corresponding Author**
**Sonali D. Alhat**
Department of Pharmacognosy Pravara Rural College of Pharmacy, Pravaranagar, A/P-Loni BK, Tal – Rahata, Dist – A' Nagar (M.S) 413 736.

## ABSTRACT

Medicinal plant used as sources of many potent and powerful medicines. The present study was focused on development and evaluation of polyherbal syrup from *Psidium gujava, Coriandrum sativum, Carum carvi* to conform its quality and potency. The developed syrup was evaluated for different physicochemical factors including physical appearance, pH and specific gravity. The combination oral liquid formulation has been praposed for antitussive, antispasmodic activity.

**KEYWORDS:** *Psidium gujava, Coriandrum sativum, Carum carvi,* Polyherbal formulation.

## INTRODUCTION

*Psidium guajava L.* is a medicinal plant that is native to South America. It is popularly known as guava (family - Myrtaceae) and has been used traditionally as a medicinal plant throughout the world for a number of ailments. There are two most common varieties of guava: the red *(P. guajava var. pomifera*) and the.

White (*P. guajava* var. *pyrifera*).[1-4] The tincture of guava along with honey is curing dry cough, common cough. It cures indigestion, acidity, swelling of the stomach caused by indigestion. It is beneficial in diarrhea and dysentery in children and burning sensation.[5]

Coriander (*Coriandrum sativum L*) is an annual and herbaceous plant, belonging to the Apiaceae family (carrot family).[6] The coriander plant gives two primary products which are employed for flavouring purposes: the fresh green herb and the spice (mature dried seed

capsule or fruit).[7,8,9,10] It has been widely used in India in food and as a medicine in Indian systems of medicine. It has been held in great herb amongst indigenous medicines, particularly many medicine systems from the earliest times.[11]

*Caraway [carum carvi]* is widely used in food products due to its pleasant flavor and preservative properties. Caraway fruits are used as remedy to cure indigestion, pneumonia, and as carminative, appetizer, and galactagogue in different traditional systems.[12-14] Caraway fruits possess stimulant, expectorant and antispasmodic effects and is used for stomach aches, constipation, and nausea.[15]

**Phytochemicals**

The guava fruit contains vitamin A, C, iron and calcium. It contains more vitamin C than the orange. The fruit contains saponin, oleanolic acid, lyxopyranoside, guaijavarin, quercetin and flavonoids.[16,17,18] Ascorbic acid and citric acid are the major ingredients of guava that play important role in anti-mutagenic activity.[19] There are 41 hydrocarbons 25 esters, 13 alcohols and 9 aromatic compounds in guava.[20] Guajadial is also present as major ingredient in guava.[21] Essential oil is present in leaves which contain α-pinene, limonene, β-pinene, isopropyl alcohol, menthol, caryophyllene and β-bisabolene. Oleanolic acid is also found in the leaves of guava.[22]

Coriander was one of the greatest world's leading essential oil plants.[23] The most important constituents of coriander seeds are the essential oil and the fatty oil.[24] The minerals also present in coriander such as Mg, Al. Si, P, Cl, K Ca, Ti, Mn, Fe, Cu, and Zn were also reported.[25] Anti-nutritive compounds such as glucosinolates (27.5µmol/g), sinapine (4 mg/g), condensed tannins1.1 mg/g) and in ositol phosphates (17.4mg/g) also present in *C. sativum* seeds.[26]

The caraway seeds contain 3% water soluble proteins, 3-glucosides and 3-galactosides of kaempferol, quercetin and isorhamnetin and a hydrocarbon. 5-methoxy- and 8-methoxy psoralens, sterol, umbelliferone, scopoletin and herniarin are also present.[27] Carum carvi seeds contain volatile oil, which consists of aldehydes, pinene and alpha terpineol, flavonoids, including apigenin.[28]

**Therepeutic use**

Guava was use in treating diarrhea, type 2 diabetes. The processing of the fruits yields by products that can be fed to livestock. Guava edible fruits can be eaten raw or cooked. The leaves can also be used as fodder.[29]

Coriander fruits are used in the preparation of fish, meat and also for baking.[30] The seed has also been used to treat indigestion, worm infections rheumatism, loss of appetite, convulsion, insomnia, anxiety and pain in the joints. Coriander is used traditionally in Morocco as a diuretic plant.[31]

Caraway was used for gastrointestinal cramps and feelings of fullness, as well as nervous cardiac-gastric complaints, in spasmodic gastrointestinal complaints, flatulence, irritable stomach, indigestion, lack of appetite, dyspepsia in adults, and in relieving flatulent colic of infants. The essential oil is used as constituent in mouthwashes and bath additives and in perfumery, for scenting soap and as a parasiticide.[32-34]

**Pharmacological activity of guava**

**Antimicrobial activity**

Guava has antimicrobial activity. Guava leaf's extract can reduce the amount of cough due to its anti-cough activity. Aqueous, chloroform and methanol extract of leaves can reduce the growth of different bacteria. Due to its anti-cough activity it is recommended in the condition of cough.[35]

**Antidirrheal activity**

Guava leaves have quercetin-3-arabinoside and quercetin which can be isolated from leaves. Its leaves contain a compound which has morphine like action. Quercetin has a strong effect on ileum. It is thought that quercetin in guava leaf are responsible for its spasmolytic activity.[36]

**Anti-inflammatory activity**

Guava extract in ethyl acetate can stop the germ infection and thymus production. It can act as anti-viral agent. It used to enhance the mRNA expression. Guava can alter the heme oxygenase-1 protein's work. And due to this reason, it can be used as anti-inflammatory agent for skin.[37]

**Antioxidant activity**

Guava contains high amount of antioxidants and anti-providing nutrients which are essential to control the free radical activities. Extracts of guava in water and organic solvents have a large quantity of antioxidants which can stop the oxidation reaction.[38]

- **Pharmacological activity of coriander**

**Antimutagenicity activity**

Coriander played a protective role against the deleterious effects in lipid metabolism in experimental colon cancer induced by 1, 2-dimethyl hydrazine in rats.[39] The antimutagenicity of coriander juice against the mutagenic activity of 4-nitro-o-phenylenediamine, m-phenylenediamine and 2-aminofluorene was investigated using the Ames reversion mutagenesis assay with the *S. Typhimurium* TA98 strain as the indicator organism. It was found that aqueous crude coriander juice significantly decreased the mutagenicity of metabolised amines.[40]

**Anthelmintic activity**

Crude aqueous and hydro-alcoholic extract of the seeds of *C. sativum* completely inhibited hatching of nematode eggs at concentration lower than 0.5 mg/mL with no statistically significant difference between both extracts. Efficacy of anthelmintic activity in vivo was tested by faecal egg count reduction (FECR) and total worm count reduction (TWCR) in sheep's artificially infected with *Haemonchus contortus.*[41]

**Antidiuretic effect**

The aqueous extract of coriander increased dieresis and the urinary excretion of sodium, potassium, chloride and the glomerular filtration rate at doses of 40 and 100 mg/ kg administered by intravenous infusion (120 min) in anesthetised Wistar rats. The mechanism of diuretic action of coriander appeared to be similar to that of furosemide.[42]

**Anxiolytic effect**

The aqueous extract of *C. sativum* seed has anxiolytic effect and may have potential sedative and muscle relaxation effect. The aqueous extract (100 mg/kg, i.p.) showed an anxiolytic effect in male albino mice using the elevated plus-mazemodel by increasing the time spent on open arms and the percentage of open arm coordination. Furthermore, the aqueous extract (50, 100 and 500 mg/kg) significantly reduced spontaneous activity and neuromuscular coordination compared to the control group.[43]

**Antibacterial, antifungal, anthelmintic and insecticidal effects**

The antibacterial effect of aqueous and ethanolic extracts of different coriander parts was studied against nine different pathogenic bacteria isolated from urine, blood, and stool and cerebraspinal fluid of different patients. Cold aqueous extract of coriander seeds had inhibitory effect against some tested bacteria. On the other hand, ethanolic extracts of seeds, leaves and stems showed wide range of antibacterial activity and the highest values for inhibition zone was recorded against Klebsiella pneumoniae and Proteus mirabilis.[44]

**Effect on fertility**

Effect of the aqueous extract of fresh coriander (Coriandrum sativum) seeds has been studied on female fertility in rats including the effects on oestrus cycle, implantation, foetal loss, abortion, and teratogenicity and serum progesterone levels on days 5, 12 and 20 of the pregnancy. The extract at doses of 250 and 500 mg/kg orally produced a dose-dependent significant anti-implantation effect, but did not produce complete infertility. Treatment of animals during day-8 to day-12 and day-12 to day-20 of the pregnancy did not produce any significant abortifacient activity.[45]

- **Pharmacological activity of caraway**

**Anticarcinogenic/antimutagenic activity**

In independent studies, dietary supplementation of both cumin and caraway was found to prevent the occurrence of ratcolon cancer induced by a colon-specific carcinogen, 1, 2-dimethylhydrazine (DMH). In cumin receiving animals, nocolon tumors were observed. In cumintreated rats, the levels of cholesterol, cholesterol/phospholipid ratio and 3-methylglutaryl COA-reductase activity were reduced.[46]

**Diuretic activity**

The traditional use of caraway as a diuretic was confirmed in an experimental study in which peroral treatment of an aqueous extract of caraway (in acute and sub-chronic mode) was shown to increase the urine output during and after 24 hours in rat. Carum extract did not produce any renal toxicity or any other adverse effects during the study period.[50]

**Immunomodulatory activity**

It stimulated the T cells (CD4 and CD8) and Th1 cytokines expression in normal and cyclosporine-induced immune-suppressed mice. In restraint stressinduced immune-suppressed animals, the active compound of cumin countered the depleted T lymphocytes,

decreased the elevated corticosterone levels and size of adrenal glands and increased the weight of thymus and spleen.[51]

**Gastrointestinal activity**

The antispasmodic effect of an alcoholic extract of caraway has shown inhibitory effects on smooth muscle contractions induced by the spasmogens, acetylcholine and histamine. This response has been evaluated to explain the beneficial effect of caraway in relieving gastrointestinal symptoms associated with dyspepsia. This effect was related to the efficacy and usefulness of caraway oil in traditional medicine for treating symbiosis which is associated with a number of gastrointestinal and systemic disorders.[51]

## CONCLUSION

This review discusses the chemical constituent, pharmacological and therapeutic effects of *Psidium gujava*, Coriandrum *sativum, and Carum carvi*. According to the wide range of pharmacological activities.

Many researchers have been demonstrating the presence of a wide variety of bioactive compounds in the leaf, seed and bark of *medicinal plant* that are capable of showing beneficial effects on human health. If we consider that chronic degenerative diseases have reached epidemic proportions in many countries and increase the socio-economic burden for the public health system, it is necessary to find non-allopathic alternatives that minimize risk factors of these diseases and help in the treatment. Furthermore, population consumes medicinal plants also to treat other kind or diseases because of high costs of allopathic medications. *Natural ingredient* has been in use since times immemorial to treat wide range of indications. It has been subjected to quite extensive phytochemical, experimental and clinical investigations.

## REFERENCES

1. Anonymous. Indian Herbal Pharmacopoeia, Volume I, Indian Drug Manufacturers' Association, Mumbai, 1998; 179-197.
2. Khandelwal KR. Practical Pharmacognosy, Nirali Prakashan, Pune, 2006; 149-156.
3. Morton JF (1987). "Guava, in Fruits of Warm Climates, ". Center for New Crops & Plant Products, Department of Horticulture and Landscape Architecture, Purdue University, West Lafayette, Indiana. Retrieved, 2015; 24: 356-63.
4. "Thai Guava farming gets momentum". Dhaka Tribune, 2016; 28.

5. Recommended Herbal Plants in The Philippines" Business Mirror, 2017; 10.
6. Weiss, E.A. Spice Crops. CAB International, Wallingford, UK. 2002; 411.
7. Wangensteen H, Samuelsen AB, Malterud KE. Antioxidant activity in extracts from coriander. Food Chemistry, 2006; 88: 293-297.
8. Baba K, Xiao YQ, Taniguchi M, Ohishi H, Kozawa M. Isocoumarins from Coriandrum sativum. Phytochemistry, 1991; 30(12): 4143-4146.
9. Msaada K, Hosni K, Taarit MB, Chahed T, Kchouk ME, Marzouk B. Changes on essential oil composition of coriander (Coriandrum sativum L.) fruits During three stages of maturity. Food Chemistry, 2007; 102: 1131-1134.
10. Aluko RE, McIntosh T, Reaney M. Comparative study of the emulsifying And foaming properties of defatted coriander (Coriandrum sativum) Seed flour and protein concentrate. Food Research International, 2001; 34: 733‑738.
11. Eyres G, Marriott PJ, Dufour JP. The combination of gas chromatographyolfactometry and multidimensional gas chromatography for the Characterisation of essential oils. Journal of Chromatography A, 2007; 1150: 70-77.
12. I. Rasooli, A. Allameh, caraway (Carum carvi L.) essential oils, in Essential oils in food preservation, flavor and safety, ed. by V.R. Preedy (Academic Press, San Diego, 2016; 32: 287–293.
13. S. Malhotra (ed.), Caraway. Handbook of Herbs and Spices, vol. (Elsevier, Amsterdam, 2006; 270–298.
14. K. Peter, Handbook of herbs and spices (Woodhead Publishing, Cambridge, 2006.
15. Arima H, Danno G. Isolation of antimicrobial compounds from guava (Psidium guajava L.) And their structural elucidation. Biosci Biotechnol Biochem, 2002; 66: 1727 30.
16. Das AJ. Review on nutritional, medicinal and pharmacological properties of Centella asiatica (Indian pennywort). J Biol Act Prod from Nat, 2011.
17. Dweck AC. A review of guava (Psidium guajava), 1987.
18. Grover IS, Bala S. Studies on antimutagenic effect of guava (Psidium Guajava) in Salmonella typhimurium. Mut Res, 1993; 300: 1–3.
19. Vernin G, Vernin E, Vernin C, Metzger J. Extraction and GC-MS-SPECMA data Bank analysis of the aroma of Psidium guajaua L. fruit from Egypt. Flavour Fragr J, 1991; 6: 143–8.
20. Yang X, Hsieh K, Liu J. Guajadial: An Unusual Meroterpenoid from Guava Leaves Psidium guajava. Org Lett, 2007; 9: 5135–8.

21. Begum S, Hassan SI, Ali SN, Siddiqui BS. Chemical constituents from the Leaves of Psidium guajava. Nat Prod Res, 2004; 18(2): 135–4.
22. Lawrence BM. A planning scheme to evaluate new aromatic plants for the Flavor and fragrance industries. In: New crops. Janick J, Simon JE (Eds). New York, Wiley, 1993; 620-27.
23. Coskuner Y, Karababa E. Physical properties of coriander seeds (Coriandrum sativum L.). Journal of Food Engineering, 2006; 80: 408-416.
24. Al-Bataina BA, Maslat AO, Al-Kofahi MM. Element analysis and biological Studies on ten oriental spices using XRF and Ames test. J. Trace Elem. Med Biol, 2003; 17(2): 85-90.
25. Matthaus B, Angelini LG. Anti-nutritive constituents in oilseed crop from Italy. Industrial Crops and Products. 2005; 21: 89-99.
26. Anonymous. The Wealth of India- A Dictionary of Indian Raw Materials and Industrial Product. (Ca-Ci). (New Delhi): Publication & Information Directorate, CSIR, 1992; 3: 313-316.
27. Khare CP. Encyclopedia of Indian Medicinal Plants; (New York): Verley Berlin Heideberg, 2004; 130-132.
28. Pelegrini PB, Murad AM, Silva LP, et al. Identification of a novel storage glycine-rich peptide from guava (Psidium guava) seeds with activity against gram-negative bacteria. Peptides, 2008; 29(8): 1271-1279.
29. Eikani MH, Golmohammad F, Rowshanzamir S. Subcritical water Extraction of essential oils from coriander seeds (Coriandrum sativum L.). Journal of Food Engineering, 2007; 80: 735-740.
30. Aissaoui A, El-Hilaly J, Israili ZH, Lyoussi B. Acute diuretic effect of Continuous intravenous infusion of an aqueous extract of Coriandrum Sativum L. in anesthetized rats. J of Ethnopharmacol, 2008; 115: 89-95.
31. IT Vasil, Israel Program for Scientific Translations, Jerusalem, 1970; 240.
32. AF Hill. Economic Botany, the Maple Press, Pennsylvania, 1952.
33. R Chiej. Encyclopaedia of medicinal plants, MacDonald, Edinburgh, 1984.
34. Jaiarj P, Khoohaswan P, Wongkrajang Y, Peungvicha P, Suriyawong P, Sumal Saraya ML, et al. Anticough and antimicrobial activities of Psidium guajava Linn. Leaf extract. J Ethnopharmacol, 1999; 67(2): 203–12.

35. Teixeira RDO, Camparoto ML, Mantovani MS. Assessment of two medicinal Plants, Psidium guajava L. and Achillea millefolium L., in in vitro and in vivo Assays. Genet Mol Biol, 2003; 555: 551–5.
36. Jeong S, Cho SK, Ahn KS, Lee JH, Yang DC, Kim J. Anti-inflammatory effects of an ethanolic extract of guava (Psidium guajava L.) leaves in vitro and in vivo. J Med Food, 2014; 17(6): 678–85.
37. He Q, Venant N. Antioxidant power of phytochemicals from Psidium guajava leaf. J Zhejiang Univ Sci A, 2004; 5(6): 676–83.
38. Chitra V, Leelamma. Coriandrum sativum – effect on lipid metabolism in 1,2-dimethyl hydrazine induced colon cancer. J of Ethnopharmacol, 2000; 71: 457-463.
39. Cortes-Eslava J, Gomez-Arroyo S, Villalobos-Pietrini R, Espinosa-Aguirre JJ. Antimutagenicity of coriander (Coriandrum sativum) juice on the Mutagenesis produced by plant metabolites of aromatic amines. Toxicology Letters, 2004; 153: 283-292.
40. Eguale T, Tilahun G, Debella A, Feleke A, Makonnen E. In vitro and in vivo Anthelmintic activity of crude extracts of Coriandrum sativum against Haemonchus contortus. J of Ethnopharmacol, 2007; 110: 428-433.
41. Aissaoui A, El-Hilaly J, Israili ZH, Lyoussi B. Acute diuretic effect of Continuous intravenous infusion of an aqueous extract of Coriandrum of its anxiolytic effect in the elevated plus-maze. J of Ethnopharmacol, 2005; 96: 365-370.
42. Emamghoreishi M, Khasaki Aazam MF. Coriandrum sativum: evaluation of its anxiolytic effect in the elevated plus-maze. J of Ethnopharmacol, 2005; 96: 365-370.
43. Oudah IM and Ali YH. Evaluation of aqueous and ethanolic extraction for Coriander seeds, leaves and stems and studying their antibacterial activity. Iraqi Sci J Nursing, 2010; 23(2): 1-7.
44. Al-Said MS, Al-Khamis KI, Islam MW, Parmar NS, Tariq M and Ageel AM. Post-coital antifertility activity of the seeds of Coriandrum sativum in rats. J Ethnopharmacol, 1987; 21(2): 165-173.
45. N Nalini; K Sabitha; P Vishwanathan; VP Menon, J. Ethnopharmacol., 1998; 62: 15-24.
46. N Nalini; V Manju; VP Menon, J. Med Food, 2006; 9: 237-45.
47. S Lahlou; A Tahraoui; Z Israili; B Lyoussi, J. Ethnopharmacol, 2007; 110: 458-63.
48. PS Chauhan; NK Satti; KA Suri; M Amina; S Bani, Chem. Biol. Interac., 2010, 185: 66-72.
49. J Thomson Coon; E Ernst, Aliment Pharmacol Ther., 2002; 16: 1689-99.