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Review on “Extraction of *In vitro* anthelmintic activity using *Coriandrum sativum*”

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Abstract

C sativum belong to the family apiaceous, It is highly supposed ayurvedic herbal plant commonly known as Dhania.

It is aromatic herbaceous annual plant small sized herb growing throughout India, Bangladesh, china, Europe, Netherland and Italy.

The different Aerial parts of the contain Essential oils, Flavonoids fatty acid, and sterol have been Cloistered from different parts of dhania.

C sativum is a fragrant antioxidant rich herb that has many culinary uses and health benefits used as stimulation of heart, brain, skin, & GIT health

The herbal flowers & seeds have contain anti-diabetic activity, anti-oxidant, anti-helminthic activity, Antifungal, anti-cancer activity, postcoital, anti-fertility, antimulgenic, sedative -hypnotic & various phyto & pharmacological have been reported evaluation.

Keywords: Anthelmintic Activity, Earthworm, Extraction, *Coriandrum sativum* L Apiaceous

Introduction

Coriandrum sativum L. was originated in Italy but is today widely distributed in Netherlands, Mediterranean and middle East regions, eastern and central Europe, China, India and in many places for its beneficial uses. It as a fragrance, antioxidant - rich herb. Used as both herb and spice. It will help to decrease blood sugar, fight against infections and useful to promote brain, heart, skin as well as digestive health which belongs to the family Apiaceae. The presence of volatile oil in the seeds gives aroma of coriander, alcohol d - linalool is responsible for its fragrance. Geraniol, borneol, beta pinene, acetic acid are some of the constituents of the oil. In India coriander was used for relieving GIT discomfort, respiratory and urinary issues and in some areas like Pakistan the whole plant has folk medicinal uses to treat flatulence, dysentery, diarrhoea and vomiting. It can be applied externally for rheumatism and painful joints. The infusion of decoction of dried fruits of cardamom is useful for treatment of sore - throat, indigestion, vomiting and other intestinal problems. Coriander leaves and seeds are rich in vitamin K, which plays an important role in blood clot, prevents problems like Osteoporosis. The photochemical screening of *Coriandrum sativum* showed that it contains essential oils, tannins, terpenoids, reducing sugars, alkaloids, flavonoids, phenolics, sterols and glycosides. It also consists of high nutritional value including oils, proteins, carbohydrates, fibres, minerals, trace elements and vitamins.

Common Name

Cilantro, Chinese parsley, Mexican parsley, Arab parsley, Dhania



Fig 1: Flower of *C. SATIVUM*

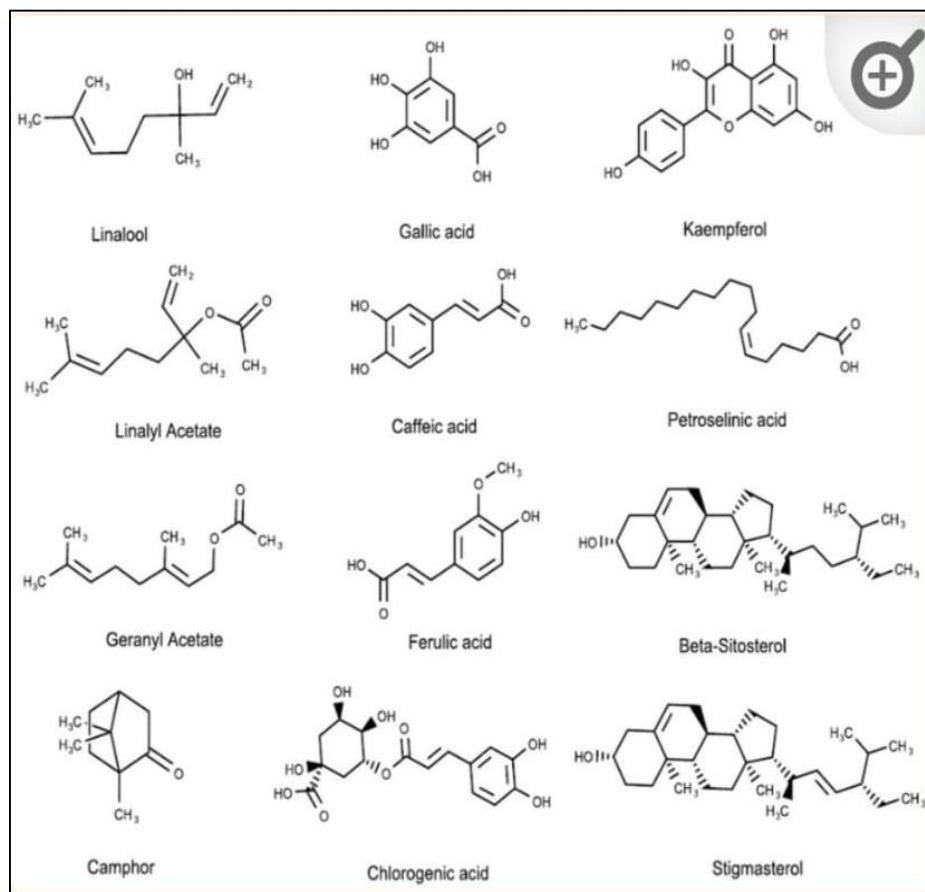


Fig 2: Leaves of *C. Sativum*

Botanical Description and Taxonomy

C. Sativum belongs to the family Apiaceous (Umbelliferae), which is herbaceous and grows annually. *C. Sativum* is known as “coriander” or “Chinese parsley” in English; “cilantro”. “kusthumbari” or “dhanian” in Sanskrit; “dhane” in Bengali; “pak chee” in Thailand; and “Yánsuī”, “Yán qiàn”, “Hú suī”, or “Xiāngcài” in Chinese. It is thought to have found in the regions of the Middle East and the Mediterranean region, where its growth may have spreaded

to China, Europe, India, Africa, and Asia; nevertheless, several authors have considered coriander as a weed in and its origin is still not clear. The leaves are green with a variable lanceolate shape and glabrous surfaces, while the flowers are white and pink in umbels with asymmetrical shapes. Meanwhile, the seeds are dry schizocarps with two mericarps with oval-shaped globules. Furthermore, the stems of *C. Sativum* are pale green with hollow branches and a glabrous surface.



Phytochemistry

Studies revealed that different kinds of alkaloids, essential oils, fatty acids, flavonoids, phenolics, reducing sugars, sterols, tannins, and terpenoids were extracted from *C. Sativum*. In the leaves were reported to have an abundant concentration of folates, ascorbic acid, gallic acid, caffeic acid, ferulic acid, and chlorogenic acid. The investigation of the water-soluble components of *C. Sativum* seeds showed the presence of 35 compounds, including monoterpenoid, monoterpenoid glycosides, glucosides, and aromatic compound glycosides such as norcarotenoid glucoside. In the vegetative part of the *C. Sativum*, different phenolics and flavonoids were detected in significantly high concentrations, such as quercetin diverse glycosides, kaempferol 3-O-rutinoside, in addition to ferulic acid glucoside and *p*-coumaroylquinic acid. Another study of the polyphenolic contents of coriander grass showed that a 45% methanol extract contains many flavonoids, coumarins, and phenolcarboxylic acid.

Description of *Coriandrum sativum*

Leaf

The green colour range from dark green and light green to white, orange and sometimes, pale-yellow. They have wide spreading underground & erect square branched stems, coriander will grow 10-20' Cm. Tall and leaves are arranged in alternate pairs, from oblong to lanceolate, often downy & with a Serrated margin. The flowers are produced in long bracts from leaf axils. They are white to brown the seed is a round, containing many seeds.

Traditional uses of *C. Sativum*

C. Sativum species, one of the World's most popular herbs,

are widely used in working and as alternative or Complementary therapy, mainly for the treatment of Gastrointestinal disorders like Indigestion, nausea, vomiting, anorexia & ulcerative colitis. To treat throat ailments. The devotion of is used to treat diabetes, Headache & tiredness, uses to treat bronchitis, chest pain, Lung disorders, Kidney, diuretics & used to treat skin diseases.

Materials and Methods

Raw materials

Raw materials fresh coriander leaves was cultivated and collected from the local farms.

Chemicals: methanol, Ethanol, Albendazole.

Glassware: Conical flask, Beker, Pippet.

Steps in preparation of coriander Powder

Pre-treatment to coriander: Fresh coriander leaves were washed using water to remove adhere material then chop into pieces with knife. Then 2%NaCl was sprinkled and kept that for 15 minutes. Then by using muslin cloth to remove the excess water in leaves.

Drying: The treated leaves are uniformly spread in a single layer on steel trays & shade dry for 3 days in room temperature.

Preparation of Coriander leaves powder

Coriander powder was prepared by grinding the dried leaves of *C. sativum* and pulverized continuously till the whole sample passed through 160-micron sieves. Obtained powder weighed and packed in HDPE pouch.

Methods 2: Extraction Using Sonicator

The dried powder was extracted with methanol using a sonicator at 25c for 30 min and then kept in a shaking incubator for 24 hr at 250 rpm and 30c. The extract was centrifuged at 1200 rpm for 10min. The solvents was then evaporated using a rotary evaporator at 45c, and the extract was weighed and kept at -80c until use. Crude seed extract also prepared in a similar manner.

Anthelmintic activity

The extract of various plant parts of *C sativum* including leaf, seeds have been investigated and found to be pharmacologically active against helminths.

Conclusion

Leaves existing various biological activity such as anti-inflammatory, anti-bacterial, anti-viral, scolicidal, antitumor, neuroprotective among that one is anthelmintic activity This present review has given the information regarding extraction, chemical constituent of *C. sativum*

References

- Prachayasittikul V, Prachayasittikul S, Ruchirawat S, Prachayasittikul V. Coriander (*Coriandrum sativum*): A promising functional food toward the well-being. Food Research International. 2018;105:305–323.
- Mandal S, Mandal M. Coriander (*Coriandrum sativum* L.) essential oil: Chemistry and biological activity. Asian Pacific Journal of Tropical Biomedicine. 2015;5(6):421–428.
- Riella KR, Marinho RR, Santos JS, Pereira-Filho RN, Cardoso JC, Albuquerque-Junior RL, Thomazzi SM. Anti-inflammatory and cicatrizing activities of thymol, a monoterpene of the essential oil from *Lippia gracilis*, in rodents. Journal of Ethnopharmacology. 2012;143(2):656–663.
- Matsubara E, Fukagawa M, Okamoto T, Ohnuki K, Shimizu K, Kondo R. (-)-Bornyl acetate induces autonomic relaxation and reduces arousal level after visual display terminal work without any influences of task performance in low-dose condition. Biomedical Research. 2011;32(2):151–7.
- Sun G, Zhang S, Xie Y, Zhang Z, Zhao W. Gallic acid as a selective anticancer agent that induces apoptosis in SMMC-7721 human hepatocellular carcinoma cells. Oncology Letters. 2016;11(1):150–158.
- de Lucena JD, Gadelha-Filho CV, da Costa RO, de Araújo DP, Lima FA, Neves KR. L-linalool exerts a neuroprotective action on hemiparkinsonian rats. Naunyn-Schmiedeberg's Archives of Pharmacology. 2020;393:1077–88.
- Souto-Maior FN, de Carvalho FL, de Morais LC, Netto SM, de Sousa DP, de Almeida RN. Anxiolytic-like effects of inhaled linalool oxide in experimental mouse anxiety models. Pharmacology Biochemistry and Behavior. 2011;100(2):259–263.
- Souto-Maior FN, Fonsêca DV, Salgado PR, Monte LD, de Sousa DP, de Almeida RN. Antinociceptive and anticonvulsant effects of the monoterpene linalool oxide. Pharmaceutical Biology. 2017;55(1):63–67.
- Li XJ, Yang YJ, Li YS, Zhang WK, Tang HB. α -Pinene, linalool, and 1-octanol contribute to the topical anti-inflammatory and analgesic activities of frankincense by inhibiting COX-2. Journal of ethnopharmacology. 2016;179:22–26.
- Laribi B, Kouki K, M'Hamdi M, Bettaieb T. Coriander (*Coriandrum sativum* L.) and its bioactive constituents. Fitoterapia. 2015;103:9–26.
- Khan SW, Khatoon SU. Ethnobotanical studies on some useful herbs of Haramosh and Bugrote valleys in Gilgit, northern areas of Pakistan. Pakistan Journal of Botany. 2008;40(1):43.
- Singleton K. Coriander: overview of potential health benefits. Nutrition today. 2016;51(3):151–161.
- Mahendra P, Bisht S. Coriandrum sativum: A daily use spice with great medicinal effect. Pharmacognosy Journal. 2011;3(21):84–88.
- Kaptoge S, Pennells L, De Bacquer D, Cooney MT, Kavousi M, Stevens G. World Health Organization cardiovascular disease risk charts: revised models to estimate risk in 21 global regions. The Lancet global health. 2019;7(10):e1332–e1345.
- Rahman FA, Abdullah SS, Manan W. Efficacy and Safety of Cyclosporine in Acute Myocardial Infarction: A Systematic Review and Meta-Analysis. Frontiers in Pharmacology. 2018;9:238.
- Wei JN, Liu ZH, Zhao YP. Phytochemical and bioactive profile of *Coriandrum sativum* L. Food Chemistry. 2019;286:260–267.
- Khazdair MR, Anaeigoudari A, Hashemzahi M, Mohebbati R. Neuroprotective potency of some spice herbs, a literature review. Journal of traditional and complementary medicine. 2019;9(2):98–105.
- Sahib NG, Anwar F, Gilani AH, Hamid AA, Saari N, Alkharfy KM. Coriander (*Coriandrum sativum* L.): A potential source of high-value components for functional foods and nutraceuticals-A review. Phytotherapy Research. 2013;27(10):1439–1456.
- Chrysant SG, Chrysant GS. Herbs Used for the Treatment of Hypertension and their Mechanism of Action. Current Hypertension Reports. 2017;19:77.
- Hussain F, Jahan N, Rahman KU, Sultana B, Jamil S. Identification of Hypotensive Biofunctional Compounds of *Coriandrum sativum* and Evaluation of Their Angiotensin-Converting Enzyme (ACE) Inhibition Potential. Oxidative Medicine and Cellular Longevity. 2018;2018(1):4643736.
- Agunloye OM, Oboh G, Ademiluyi AO. Cardio-protective and antioxidant properties of caffeic acid and chlorogenic acid: Mechanistic role of angiotensin converting enzyme, cholinesterase and arginase activities in cyclosporine induced hypertensive rats. Biomedicine & Pharmacotherapy. 2019;109:450–458.
- Micallef MA, Garg ML. Beyond blood lipids: phytosterols, statins and omega-3 polyunsaturated fatty acid therapy for hyperlipidemia. The Journal of nutritional biochemistry. 2009;20(12):927–939.
- Oliveira JR, Ribeiro GH, Rezende LF, Fraga-Silva RA. Plant terpenes on treating cardiovascular and metabolic disease: A review. Protein and Peptide Letters. 2021;28(7):750–760.
- Al-Snafi AE. A review on chemical constituents and pharmacological activities of *Coriandrum sativum*. IOSR Journal of Pharmacy. 2016;6(7):17–42.
- Gantait S, Sharangi AB, Mahanta M, Meena NK. Agri-biotechnology of coriander (*Coriandrum sativum* L.): an inclusive appraisal. Applied Microbiology and Biotechnology. 2022;106(3):951–969.

26. Nair V, Singh S, Gupta YK. Anti-granuloma activity of *Coriandrum sativum* in experimental models. *Journal of Ayurveda and Integrative Medicine*. 2013;4(1):13-18.
27. Paniagua-Zambrana NY, Bussmann RW, Romero C. *Coriandrum sativum* L. A piaceae. *Ethnobot Andes*; c2020. p. 1–7.
28. Musselman LJ. *Encyclopedia of Common Natural Ingredients Used in Food, Drugs, and Cosmetics*. 2nd ed. Leung AT, Foster S, editors. New York, NY, USA: Springer; c1996.
29. Platel K, Srinivasan K. Digestive stimulant action of spices: a myth or reality?. *Indian Journal of Medical Research*. 2004;119(5):167.
30. Ootom SA, Al-Safi SA, Kerem ZK, Alkofahi A. The use of medicinal herbs by diabetic Jordanian patients. *Journal of Herbal Pharmacotherapy*. 2006;6(2):31-41.
31. Tahraoui A, El-Hilaly J, Israili ZH, Lyoussi B. Ethnopharmacological survey of plants used in the traditional treatment of hypertension and diabetes in south-eastern Morocco (Errachidia province). *Journal of Ethnopharmacology*. 2007;110(1):105-117.
32. Al-Rowais NA. Herbal medicine in the treatment of diabetes mellitus. *Saudi Medical Journal*. 2002;23(11):1327-1331.
33. Chaudhry NM, Tariq P. Bactericidal activity of black pepper, bay leaf, aniseed and coriander against oral isolates. *Pakistan Journal of Pharmaceutical Sciences*. 2006;19(3):214-218.
34. Ugulu I, Baslar S, Yorek N, Dogan Y. The investigation and quantitative ethnobotanical evaluation of medicinal plants used around Izmir province, Turkey. *Journal of Medicinal Plants Research*. 2009;3(5):345-367.
35. Emamghoreishi M, Heidari-Hamedani G. Anticonvulsant effect of extract and essential oil of *Coriandrum sativum* seed in conscious mice. *Iranian Journal of Pharmaceutical Research*. 2004;3:71.
36. Emamghoreishi M, Heidari-Hamedani G. Sedative-hypnotic activity of extracts and essential oil of Coriander seeds. *Iranian Journal of Medical Sciences*. 2006;31:22–27.
37. 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. *Journal of Ethnopharmacology*. 2008;115(1):89-95.
38. Taherian AA, Vafaei AA, Ameri J. Opiate system mediate the antinociceptive effects of *Coriandrum sativum* in mice. *Iranian Journal of Pharmaceutical Research: IJPR*. 2012;11(2):679.
39. Wichtl M. *Herbal Drugs and Phytopharmaceuticals: A Handbook for Practice on a Scientific Basis*. Wichtl M, editor. Stuttgart, Germany: Medpharm GmbH Scientific Publishers; c2004.
40. Khare CP. *Indian Medicinal Plants: An Illustrated Dictionary*. Berlin/Heidelberg, Germany: Springer Science & Business Media; c2008.
41. Grieve M. *A Modern Herbal*. Volume 2. North Chelmsford, MA, USA: Courier Corporation; c2013.
42. Hassar M. La phytothérapie au Maroc. *Espérance médicale*. 1999;6(47):83-85.
43. B Bashir S, Safdar A. Coriander seeds: ethno-medicinal, phytochemical and pharmacological profile. *Science of Spices and Culinary Herbs-Latest Laboratory, Pre-Clinical, and Clinical Studies*. 2020;2:39-64.
44. Chauhan P, Jaryal M, Kumari K, Singh M. Phytochemical and *In vitro* Antioxidant Potential of Aqueous Leaf Extracts of *Brassica juncea* and *Coriandrum sativum*. Tainan, Taiwan: World Vegetable Center; c2012.
45. Ishikawa T, Kondo K, Kitajima J. Water-soluble constituents of coriander. *Chemical and Pharmaceutical Bulletin*. 2003;51(1):32-39.
46. Barros L, Duenas M, Dias MI, Sousa MJ, Santos-Buelga C, Ferreira IC. Phenolic profiles of *in vivo* and *in vitro* grown *Coriandrum sativum* L. *Food Chemistry*. 2012;132(2):841-848.
47. Oganesyan ET, Nersesyan ZM, Parkhomenko AY. Chemical composition of the above-ground part of *Coriandrum sativum*. *Pharmaceutical Chemistry Journal*. 2007;41(3):149-153.
48. Rahimi AR, Babaei S, Mashayekhi K, Rokhzadi A, Amini S. Anthocyanin content of coriander (*Coriandrum sativum* L.) leaves as affected by salicylic acid and nutrients application. *International Journal of Biosciences*. 2013;3(2):141–145.
49. Patel DK, Desai SN, Gandhi HP, Devkar RV, Ramachandran AV. Cardio protective effect of *Coriandrum sativum* L. on isoproterenol induced myocardial necrosis in rats. *Food and chemical toxicology*. 2012;50(9):3120-3125.
50. Jabeen Q, Bashir S, Lyoussi B, Gilani AH. Coriander fruit exhibits gut modulatory, blood pressure lowering and diuretic activities. *Journal of Ethnopharmacology*. 2009;122(1):123-130.