

Exploring Knowledge about Medicinal Plant Coriander

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Abstract: *Coriandrum sativum* (*C. sativum*), belonging to the *Apiaceae* (*Umbelliferae*) family, is widely recognized for its uses in culinary and traditional medicine. *C. sativum* contains various phytochemicals such as polyphenols, vitamins, and many phytosterols, which account for its properties including anticancer, anti-inflammatory, antidiabetic, and analgesic effects. The cardiovascular benefits of *C. sativum* have not been summarized before, hence this review aims to further evaluate and discuss its effectiveness in cardiovascular diseases, according to the recent literature. Moreover, the traditional uses and phytochemistry of coriander were surveyed in the original resources and summarized. As a result, most of the studies that cover cardiovascular benefits and fulfilled the eligibility criteria were *in vivo*, while only a few were *in vitro* and clinical studies. In conclusion, *C. sativum* can be deemed a functional food due to its wide range of cardiovascular benefits such as antihypertensive, anti-atherogenic, antiarrhythmic, hypolipidemic as well as cardioprotective effects. Coriander (*Coriandrum sativum* L.), a herbal plant, belonging to the family *Apiaceae*, is valued for its culinary and medicinal uses. All parts of this herb are in use as flavoring agent and/or as traditional remedies for the treatment of different disorders in the folk medicine systems of different civilizations. The plant is a potential source of lipids (rich in petroselinic acid) and an essential oil (high in linalool) isolated from the seeds and the aerial parts. Due to the presence of a multitude of bioactives, a wide array of pharmacological activities have been ascribed to different parts of this herb, which include anti-microbial, anti-oxidant, anti-diabetic, anxiolytic, anti-epileptic, anti-depressant, anti-mutagenic, anti-inflammatory, anti-dyslipidemic, anti-hypertensive, neuroprotective and diuretic. Interestingly, coriander also possessed lead-detoxifying potential. This review focuses on the medicinal uses, detailed phytochemistry, and the biological activities of this valuable herb to explore its potential uses as a functional food for the nutraceutical purpose.

Keywords: *Coriandrum sativum*, cardiovascular, coriander, antihypertensive, hypolipidemic.

I. INTRODUCTION

Plants are the main source of traditional as well as modern medicinal systems. Plant-based drugs commonly called phytomedicines have been in use for health benefits since ancient times. As of now, there is a restoration of interest in the utilization of phytomedicines, especially for preventive measures.

As per the WHO report, 80% of people depend on traditional medicines mainly on herbs. Coriander (*Coriandrum sativum* L.) is one of the oldest herbs that has been utilized for over 3,000 years (Ebers papyrus of 1550 BC). For both cuisine and medicinal purposes, coriander is one of the significant and earliest seed spices in the world since the historical backdrop of Queen of Sheba who visited King Solomon referenced in the Holy Bible. India is the greatest producer, purchaser, and exporter of coriander in this world with a yearly production of around three lakh tons.

The seeds and green leaves of the plant are consumed and added in the various dishes as garnishes due to their fragrance and colour. Various parts of the coriander plant have been accounted for various health functions and organic activities like coriander oil has been utilized in the cosmetic industry for body care products and perfumes. This review provides broad aspects of coriander including its botanical information, folk usages, Ayurvedic usage, phytochemical compounds and therapeutic potentials, which could be advantageous for multidisciplinary fields.



BIOLOGICAL SOURCE :-

Coriander consists of dried ripe fruits of *Coriandrum sativum* Linn., belonging to family Umbelliferae.

GEOGRAPHICAL SOURCES :-

India it is cultivated in Maharashtra, U.P., Rajasthan, Jammu, and Kashmir. It is also found in aarwild state in the east Of England. Cultivated in Central and Eastern Europe, particularly in Russia, Hungary, in Africa and India.

Taxonomy of *Coriandrum sativum*

Taxonomic rank -Taxon
Kingdom -Plantae
Division- Spermatophyte
Order -Apiales
Class -Magnoliopsida
Family- Apiaceae
Genus -*Coriandrum*
Species -*C. sativum*
Common Name- Coriander

PHARMACOLOGICAL EFFECTS

Coriander fruits and its oil have been used for many diseases such as for the Treatment of rheumatism, gastrointestinal upsets, insomnia, Flatulence, and joint pain in Humans. Moreover, coriander has a positive influence on Lipid profile in plasma of rats. The fruits of the plant are famous for carminative, diuretic, flavouring agent and also for food garnishing.

Effects and used in the treatment of cold, fever, nausea, and Stomach disorders

The fruit extract has been found as aStrong analgesic agent than dexamethasone. Laribi et al. Discussed with all aspects regarding the pharmacological effects of f coriander in a review. In this manner, the most frequent Effects of coriander will be debated in an order.

Biological activities

Diuretic activity

The aqueous extract of coriander seed possesses diuretic and Saluretic activity, thus, validating the use of coriander as a Diuretic plant in Moroccan pharmacopoeia aqueous extract of Coriander seed was administered by continuous intravenous Infusion (120 min) at two doses (40 and 100 mg/kg) to Anesthetized Wistar rats. Eurosemide (10 mg/kg), a

standard Diuretic was used as the reference drug. Excretion of water and Electrolytes (sodium, potassium and chloride) in urine was Measured, and glomerular filtration rate (equal to creatinine Clearance) was determined. The crude aqueous extract of Coriander seeds increased diuresis, excretion of electrolytes, and Glomerular filtration rate in a dose-dependent way; furosemide Was more potent as a diuretic and saluretic. The mechanism of Action of the plant extract appears to be similar to that of Furosemide .

Anticancer activity

The biochemical effect of coriander fruits on lipid parameters in 1, 2-dimethylhydrazine Induced colon cancer has been studied in rats. The Concentrations of cholesterol and cholesterol to phospholipid Ratio declined while the level of phospholipid increased Significantly in 1, 2-dimethylhydrazine control group compared to the coriander Administered group. Fecal Dry weight, fecal neutral sterols, and bile acids showed a sharp Increase in the coriander-fed Group compared with the DMH-administered group. Thus, it Seems that the coriander plays a Protective role in the lipid metabolism of colon cancer Although there are not many studies on the anticancer effect of Coriander, there are some studies based on antioxidant effect.

Antimicrobial activity

The antimicrobial activity of the coriander has been arisen from the essential oil content. The spice, *C. sativum* is one of the plants that are known to produce essential oils with antimicrobial activity .. The coriander seed essential oil was screened for antibacterial activity against both Gram positive (*Staphylococcus aureus*, *Bacillus* spp.) and Gram negative (*Escherichia coli*, *Salmonella typhi*, *Klebsiella pneumonia*, *Proteus mirabilis*, *Pseudomonas aeruginosae*) bacteria and a pathogenic fungi *Candida albicans*. The essential oil showed pronounced antibacterial activity against all of the microbes tested except for *P. aeruginosae*, *B. cereus* and *Enterococcus faecalis* , which showed resistance. *C. sativum* showed a significant antibacterial activity against *E. coli* and *B. megaterium* bacterial species and two mycopathogenic ones responsible for cultivated diseases as determined with the agar diffusion method whereas *F. vulgare* var. showed a much reduced effect

Sedative and Hypnotic activity

Coriandrum sativum L. has been recommended for relief of insomnia in Iranian traditional medicine. To determine sedative & hypnotic activity Aqueous and hydroalcoholic extract & essential oil administer to rat. The results of experiment shows that aqueous extract prolonged pentobarbital-induced sleeping time at 200, 400 and 600 mg/kg. Hydro-alcoholic extract at doses of 400 and 600 mg/kg increased pentobarbital- induced sleeping time compared to saline-treated group. The essential oil increased pentobarbital induced sleeping time only at 600mg/kg. The extracts and essential oil of coriander seeds possess sedative-hypnotic activity .

Antioxidant effects activity

Addition of coriander to food increased the antioxidant content of food due to the presence of antioxidant and anti-inflammatory compounds . It was a potent natural antioxidant and inhibited unwanted oxidation processes. The coriander leaves showed stronger antioxidant activity than the seeds . It was reported that the aqueous extracts of seeds exhibited antioxidant activity both in vitro and in vivo .

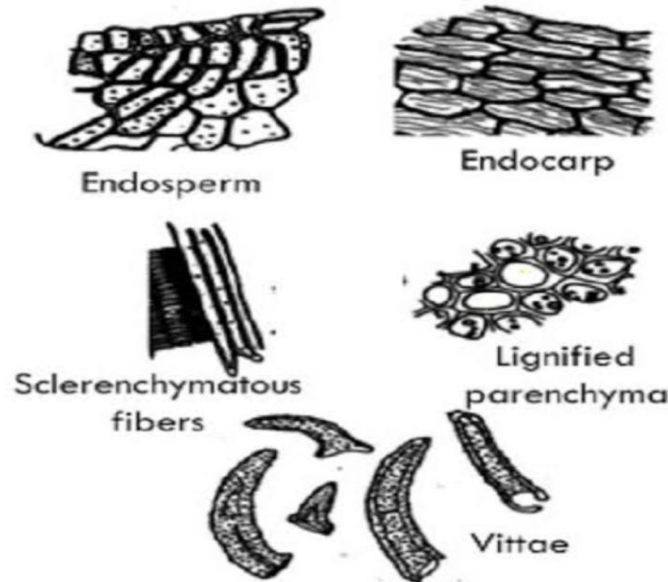
Antidiabetic activity

In many articles, we can find the antidiabetic effects regarding the coriander. In fact, coriander has been confirmed as an antidiabetic remedy. The studies have confirmed the antihyperglycemic effect of coriander in streptozotocin diabetic mice. The mechanism of action of the antihyperglycemic action of the aqueous extract of the coriander fruits is connected with stimulation of insulin secretion, enhancement of glucose uptake and metabolism by muscle. In general, the effect is generated by one or more components existed in the extract. Therefore, *C. sativum* is acceptable as a possible antihyperglycemic dietary supplement and can be accounted for a potential source of a new orally active agent for diabetes . In another study, a single dose of coriander fruit-extract or glibenclamide suppressed hyperglycemia in obese-hyperglycemic-hyperlipidemic Merionesshawi rats. After administration, the insulin resistance significantly

decreased in the rats. Interestingly, the hypoglycemic effect was lower in normal rats its mean; the test substances reduced plasma glucose, insulin and insulin resistance, cholesterol, LDL-cholesterol, and triglyceride.

Power Characteristics

Fig.1 :- Powder Characteristics of Coriander



The endosperm cells are thick-walled and polygonal in shape and contain aleurone grains, fixed oil and micro residues of Calcium oxalate. Two yellowish brown vittae are present on the inner surface of each mericarp.

SOIL PREPARATION for cultivation of coriander:-

Climate-Cool and comparatively dry, frost free climate Season-June – July and October – November For cultivation of coriander the field should be loamy soils or Well drained silt are suited for cultivation, temperature Range of 20 – 25 °C and pH should be 6 – 8.

Chemical constituents

It contains chemical compounds as follows-borneol, geraniol, linalool, naryl acetate, camphor, dodecanal, and some Essential oil as nonane, cubenol, E-2 undecenal, phyton, tetradecane.1. Volatile oil:

1. Volatile Oil

Main (+) linalool (coriandrol) and α -pinene

Limonene

A and γ -telpinen

P-cymene

Camphor

Geraniol

Borneol

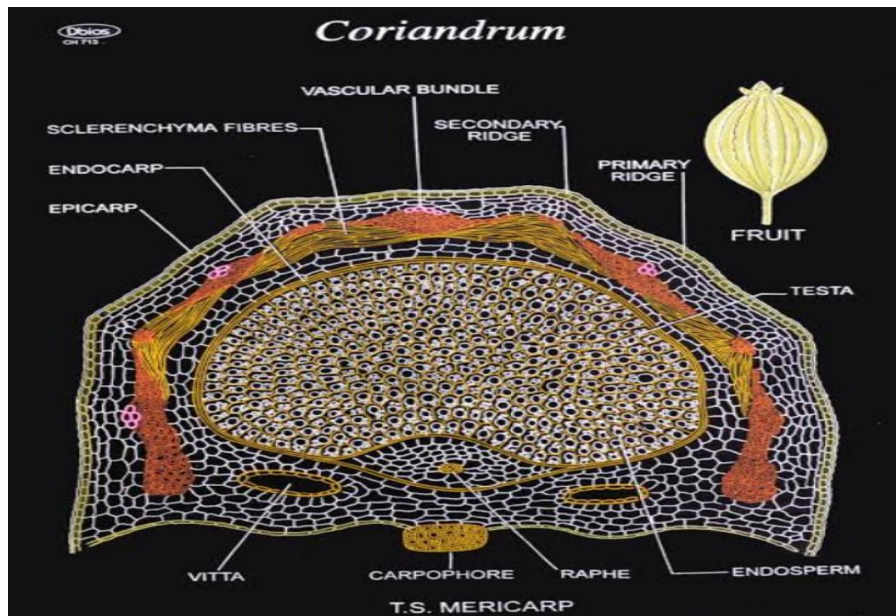
2. Fixed oil

3. Malic acid

4. Tannin

5. Vitamin A.

Microscopy



Epicarp: Polygonal cells with occasional stomata and calcium oxalate crystal.
Mesocarp: Inner and outer layer of parenchyma with sclerenchyma in between.
Sclerenchyma in tangential and longitudinal bands.
 Two vittae on the commissural surface and four lacunae on the dorsal surface.
Endocarp: Elongated cells forming parquetry layer.
Endosperm: Cellulosic parenchyma containing oil globules and aleurone grains.

Side Effects

When taken by mouth: Coriander is commonly consumed in foods. It is possibly safe when used in larger amounts as medicine. It seems to be well-tolerated, but some people might be allergic to coriander. When applied to the skin: Coriander is possibly safe when used appropriately. Coriander oil 6% ointment has been used safely twice daily for up to 28 days. It seems to be well-tolerated. Side effects might include skin irritation and itching.

Special Precautions And Warnings

When taken by mouth: Coriander is commonly consumed in foods. It is possibly safe when used in larger amounts as medicine. It seems to be well-tolerated, but some people might be allergic to coriander. When applied to the skin: Coriander is possibly safe when used appropriately. Coriander oil 6% ointment has been used safely twice daily for up to 28 days. It seems to be well-tolerated. Side effects might include skin irritation and itching. **Pregnancy and breast-feeding:** There isn't enough reliable information to know if coriander is safe to use when pregnant or breast-feeding. Stay on the safe side and stick to food amounts. **Allergies.** People who are allergic to mugwort, aniseed, caraway, fennel, dill, or similar plants might have allergic reactions to coriander.

Surgery: Coriander might lower blood sugar and blood pressure, and cause sleepiness. This might interfere with blood sugar and blood pressure control during surgery. It might also interfere with medications used during surgery that also cause sleepiness. Stop using coriander at least 2 weeks before a scheduled surgery.

Interactions ?

Moderate Interaction

Be cautious with this combination

Medications for diabetes (Antidiabetes drugs) interacts with CORIANDER

Coriander might lower blood sugar levels. Taking coriander along with diabetes medications might cause blood sugar to drop too low. Monitor your blood sugar closely.

Medications for high blood pressure (Antihypertensive drugs) interacts with CORIANDER

Coriander might lower blood pressure. Taking coriander along with medications that lower blood pressure might cause blood pressure to go too low. Monitor your blood pressure closely.

Sedative medications (CNS depressants) interacts with CORIANDER

Coriander might cause sleepiness and slowed breathing. Some medications, called sedatives, can also cause sleepiness and slowed breathing. Taking coriander with sedative medications might cause breathing problems and/or too much sleepiness.

Medications that increase sensitivity to sunlight (Photosensitizing drugs) interacts with CORIANDER

Some medications might make the skin more sensitive to sunlight. Coriander might also make the skin more sensitive to sunlight. Using these products together might increase the risk of sunburn, blistering, or rashes when the skin is exposed to sunlight. Be sure to wear sunblock and protective clothing when spending time in the sun.

Dosing

Coriander is commonly consumed in foods. As medicine, there isn't enough reliable information to know what an appropriate dose of coriander might be. Keep in mind that natural products are not always necessarily safe and dosages can be important. Be sure to follow relevant directions on product labels and consult a healthcare professional before using.

II. CONCLUSION

Inclusion of both seeds and leaves from coriander in the cuisine will increase the content of antioxidants, and thus probably prevent oxidative deterioration of food. However, it is uncertain if quantity of spices in diet is enough to have an influence on antioxidant

defense of the body. So coriander seeds and leaves may be used as a potential source of food flavoring and antioxidants. Value addition can be as simple as presenting a commodity in a cleaned graded form, which would instill confidence in the consumers for its quality image. On the other hand, it can be a completely different product such as oil, oleoresins, etc. The value added form of spices has tremendous growth potential. The global market is increasingly shifting away from the commodity form towards the value added form of consumer packed branded spices, which overcome the disadvantages of raw spices. The future is bright, but significant investment in evaluation and feeding trials to demonstrate the health promoting properties is required.

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