



CORIANDRUM SATIVUM L.: A NUTRITIONAL FOOD AND PHYTOMEDICINE

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ABSTRACT:-

The phytochemical screening of *Coriandrum sativum* showed that it contained essential oil, tannins, terpenoids, reducing sugars, alkaloids, phenolics, flavonoids, fatty acids, sterols and glycosides. It also contained high nutritional values including proteins, oils, carbohydrates, fibers and wide range of minerals, trace elements and vitamins. The previous pharmacological studies revealed that it possessed anxiolytic, antidepressant, sedative-hypnotic, anticonvulsant, memory enhancement, improvement of orofacial dyskinesia, neuroprotective, antibacterial, antifungal, anthelmintic, insecticidal, antioxidant, cardiovascular, hypolipidemic, anti-inflammatory, analgesic, antidiabetic, mutagenic, antimutagenic, anticancer, gastrointestinal, deodorizing, dermatological, diuretic, reproductive, hepatoprotective, detoxification and many other pharmacological effects. The current review was

designed to give an overview on the chemical constituents and pharmacological effects of *Coriandrum sativum*.

INTRODUCTION:-

: Dhaniya consist of dried ripe fruit of *Coriandrum Sativum* Linn Umbeliferae [1]; a slender, glabrous, branched, cultivated all over India, giving characteristic aroma when rubbed. It is annual herb originating from the Mediterranean[2]. The whole plant and especially the unripe fruit, is characterized by a strong disagreeable odour, wherever the name coriander (from the Greek k'opis, a bug) [3]. All part of the plants is edible but the fresh leaves and the dried seeds are the most common parts used in cooking. In India it is chiefly found in Madhya Pradesh, Tamil Nadu, Karnataka, Rajasthan, Andhra Pradesh and Bihar. In the Indian traditional medicine, a coriander is used in disorders of digestive, respiratory and urinary system, as it has diaphoretic, diuretic, carminative and stimulant. In Iranian traditional medicine, coriander has been indicated for a number of medical problems such as dyspeptic complaints, loss of appetite,[5]

KEY WORDS:- Introduction, Botanical description , Ayurvedic description, Taxonomy, Phytochemistry, Pharmacological activity..

BOTONICAL DESCREPTION:-

Coriander is native to regions spanning from Southern Europe and Northern Africa to Southwestern Asia. It is a soft plant growing to 50 cm (20 in) tall. The leaves are variable in shape, broadly lobed at the base of the plant, and slender and feathery higher on the flowering stems. The flowers are borne in small umbels, white or very pale pink, asymmetrical, with the petals pointing away from the center of the umbel longer (5–6 mm or 0.20–0.24 in) than those pointing toward it (only 1–3 mm or

0.039–0.118 in long). The fruit is a globular, dry schizocarp 3–5 mm (0.12–0.20 in) in diameter. Pollen size is approximately 33 . Micron.[6]



Fig 1; Flower and seed of coriandrum sativum L.

AYURVEDIC DESCRIPTION, :- [7]

Botanical name :- Coriandrum sativum Linn.

Sanskrit name :- Dhanika, Dhaniya, Vitunnaka,

Synonyms :- Dhana, Havija, Malli

Properties:-

Rasa :- Madhur, Tikta, Kashaya

Guna :- Laghu, Snigdha

Virya :- Ushna

Vipaka :- Madhur

TAXONOMY:-[8]

Kingdome	Plantae
Subkingdome	Tracheobionata
Class	Magnoliopsidai
Subclass	Rosidae
Order	Apiales
Family	Apiaceae
Genus	Coriandrum
Species	Sativum L.

PHYTOCHEMISTRY OF CORIANDRUM.SATIVUM L.:-

The odor and flavor of mature fruits and fresh herbage are completely different. While aliphatic aldehydes (mainly C10 to C16 aldehydes) with fetid-like aroma are predominant in the fresh herb oil, major components in the oil isolated from coriander fruit include oxygenated monoterpenes and monoterpene hydrocarbons (Bhuiyan et al., 2009). The most important constituents of coriander fruits are the essential oil and fatty oil. The essential oil content of dried coriander fruits varies between 0.03 and 2.6%, while the fatty oil content varies between 9.9 and 27.7%. Other constituents including crude protein, fat, crude fiber, and ash contents vary from 11.5 to 21.3%, 17.8 to 19.15%, 28.4 to 29.1%, and 4.9 to 6.0%, respectively (Coskuner and Karababa, 2007). The essential oil content of the dried coriander fruits varies from 0.1 to 0.36%. Linalool (40.9 to 79.9%), neryl acetate (2.3 to 14.2%), γ -terpinene (0.1 to 13.6%), and α -pinene (1.2 to 7.1%) were identified as the main components in the oil of the coriander fruits cultivated in Iran

(Nejad et al., 2010), while linalool (37.7%), geranyl acetate (17.6%), and γ -terpinene (14.4%) were characterized as the main ones in Bangladesh coriander cultivars (Bhuiyan et al., 2009). The leaf oil contained mostly aromatic acids, including 2-decenoic acid (30.8%), E-11-tetradecenoic acid (13.4%), capric acid (12.7%), undecyl alcohol (6.4%), tridecanoic acid (5.5%), and undecanoic acid (7.1%) as major constituents [9] Analysis of Kenya coriander leaves essential oil showed the presence of 2E-decenal (15.9%), decanal (14.3%), 2E-decen-1-ol (14.2%), and n-decanol (13.6%) as the main ones [10] The commonly known phytochemicals from *C. sativum* are volatile components, flavonoids, isocoumarins, fatty acids, sterols, and coriandrones, coumarins, catechins, polyphenolic compounds (Taniguchi et al., 1996; [11] Two new isocoumarins, coriandrone A and B were isolated from the aerial parts of *C. sativum* together with two known isocoumarins, coriandrin and dihydrocoriandrin. Three new isocoumarins, coriandrones C, D, and E were also isolated from *C. sativum* whole plants [12] Caffeic acid, protocatechinic acid, and glycitin were characterized as the major polyphenolics of coriander aerial parts [13]

PHARMACOLOGICAL AND BIOLOGICAL ACTIVITY:-

Each parts of coriander plant contain different different chemical constituents, have various pharmacological and biological activity such as :-

- **ANTIOXIDANT ACTIVITY:-**

An aqueous coriander extract obtained through a sequential extraction process identify the phenolic compounds responsible for its antioxidant activity. When considered with the recognized antioxidant ability of phenolic acids, suggest that they are principal

components responsible for the antioxidant activity of the aqueous coriander extract. This study is designed to examine the fruit essential oil composition, the total phenolic amounts and the antioxidant activities in methanolic extracts of *Coriandrum sativum*. Five fractions (b-carotene, b-cryptoxanthin epoxide, lutein-5, 6-epoxide, violaxanthin and neoxanthin) were isolated from a coriander ether extract using column chromatography and identified according to their chromatographic and spectral characteristics. Extracts of different polarity from leaves and seeds of coriander and coriander oil were investigated for their antioxidant activity coriander to food will increase the antioxidant content and may have potential as a natural antioxidant and thus inhibit unwanted oxidation processes. Extracts from both leaves and seeds showed a concentration-dependent DPPH scavenging activity respectively [14,15]

- **HEPATOPROTECTIVE ACTIVITY:-**

Coriandrum sativum extract protects liver from oxidative stress induced by carbon-tetrachloride (CCl₄) and thus helps in evaluation of traditional claim on this plant. Pretreatment of rats with different doses of plant extract (100 and 200 mg/kg) significantly lowered serum glutamate oxaloacetate transaminase (SGOT), serum glutamate pyruvate transaminase (SGPT), and TBARS levels against CCl₄ treated rats. Hepatic enzymes like superoxide dismutase (SOD), catalase (CAT), and glutathione peroxidase (GPx) were significantly increased by treatment with plant extract, against CCl₄ treated rats. Oral administration of the leaf extract at a dose of 200 mg/kg significantly reduced the toxic effects of CCl₄.

The activity of leaf extract at this dose was comparable to the standard drug, silymarin [16].

- **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 result of experiment shows that aqueous extract prolonged pentobarbital-induced sleeping time at 200, 400 and 600 mg/kg. Hydroalcoholic 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 600 mg/kg. The extracts and essential oil of coriander seeds possess sedative-hypnotic activity [17]

- **HYPOLIPIDEMIC EFFECT:-**

Hyperlipidemia increases the risk for generation of lipid oxidation products, which accumulate in the subendothelial spaces of vasculature and bone. Atherogenic high-fat diets increase serum levels of oxidized lipids, which are known to attenuate osteogenesis in culture and to promote bone loss Lal et al. (2004) studied the hypolipidemic effect of coriander (*Coriandrum sativum* L.). Coriander was given at a dose of 1g/kg to triton induced hyperlipidemic rats. It was found that coriander decreases the uptake and enhances the breakdown of lipids. Results were compared with commercially available herbal drug for hypolipidemia. From these findings it was assumed that coriander can be used as preventive and curative herbal against hyperlipidemia[18]

- **DIURETIC ACTIVITY:-**

The diuretic activity of the plant extracts on wistar rats of either sex (200 to 250 g). Negative and positive control group comprising of five animals, each received saline and standard diuretic drug: furosemide (10 mg/kg), while rest of the groups with similar number of animals, were given different doses of the plant extracts dissolved in saline (50 ml/kg). The results concluded that the diuretic effect of coriander was confirmed due to significant increase in urine output (diuresis) in rats, similar to furosemide, a standard diuretic. Therefore, diuretic is considered as one of the best choices for the treatment and management of uncomplicated hypertension[19]

NUTRITIONAL VALUE:-

Coriander nutrition is basically due to its green leaves and dried fruits. Like all other green leafy vegetables, its leaves are a rich source of vitamins, minerals and iron. Its leaves contain high amount of vitamin A (β -carotene) and vitamin C. The green herbs contain vitamin C upto 160 mg/100 g and vitamin A upto 12 mg/100 g. It is very low in saturated fat and cholesterol and a very good source of thiamine, zinc and dietary fiber. Green coriander contains 84% water.[20]

CONCLUSION:-

Herbs and spices are processed in foods from early times for seasoning as well as to increase shelf life of food and to restore health. Coriander is one of miraculous herb that functions as both, spice as well as herbal medicine. Although plant can be grown throughout the year, it is processed to increase its palatability, profitability and facilitate international trade. The leaves and fruits are highly fragrant and contain

nutrients like fat, proteins, vitamins minerals etc. Its health benefits activities ranging from antibacterial to anticancer activities. Most important and well characterized property of coriander is its use as antioxidant. Due to its multifunctional uses and protective and preventive action against various chronic diseases, this herb is rightly called as “herb of happiness”. Moreover, processing of fruits and leaves of coriander is the best way to preserve this herb..

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