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PHYTOCHEMICAL ANALYSIS OF A MIRACLE HERB *Coriander sativum*

DEEPAK KUMAR SHRIVASTAVA[1]

P.G. Department of Botany, A.B.R.P.G. College Anpara, Sonebhadra, Uttar Pradesh, India

ABSTRACT

***Coriander sativum* (C.*sativum*) is one of the most useful essential oil bearing species as well as medicinal plants. Belong to the family umbelliferae /apiaceae. It is highly reputed ayurvedic medicinal plant commonly known as "Dhanya" in India. Plant has played a critical role in maintaining human health. In this phyto-chemical screening secondary metabolites such as cardiac glycosides, terpenoids, steroids, saponin, tannin, flavonoid and alkaloids have screened in chloroform, methanol, and aqueous extract leaf, fruit and stem part of *Coriander sativum*. In chloroform extract of leaf of *Coriander sativum* only,terpenoids, and steroids were present. Absence of cardiac glycosidase, saponin, tannin, flavonoid and alkaloid was observed. In methanolic extract of leaf only presents of cardiac glycosidase terpenoids and steroids was observed. Saponin, tannin, flavonoid and alkaloid was absence. In aqueous leaf extract tannin, flavonoid and alkaloid were absent. Rest phytocompound was present. *Coriander sativum* is a source of valuable bioactive that can used as a medicines in different disorders such as cancer, cardiovascular disease, arthritis, diabetes, gastrointestinal disorders such as anorexia, dyspepsia, diarrhea, pain and vomiting etc.**

KEYWORDS: Secondary Metabolites, Bioactive, Phyto-Chemical Screening

Nature can be described as the oldest and most comprehensive pharmacy of all time, and in phytomedie has been practiced for health benefits in different systems of traditional medicine. According to the latest report, around 80% of the world population relies on some forms of traditional medicines mainly the herbs (WHO, 2012) One of the oldest herbs that has been used for over 3,000 years (Ebers papyrus of 1550 BC), for both culinary and medicinal purposes.

Herbal medicines are known to mankind. Medicinal plants have been used as tradition treatment for numerous human diseases for centuries in many part of the world. In developing countries, where the availability of modern health services is limited, folk medicine, mainly based on plant are popular (Khare *et al.,* 2004). The rich plant diversity of India is well utilized by the native communities for the treatment of many diseases like oral care practice. Many plants were reported to inhibit the growth of many bacteria, particularly oral bacteria and control plaque and thus prevent caries. The term of medicinal plants include a various type of plants use in herbalism and some of these plant plants have medicinal activities. Medicinal plants considered a rich source of ingredients which can be used in drug development and synthesis around the whole world medicinal plant a critical role in the development of human culture (Okwu, 2005). Some plants considered a important source of nutrients these plants are used therapeutic values (Pandey *et al.,* 2014,15).

Coriander sativum

Coriander sativum (C.*sativum*) is one of the most useful essential oil bearing species as well as medicinal plants. Belong to the family umbelliferae /apiaceae. It is highly reputed ayurvedic medicinal plant commonly known as "Dhanya" in India. Plant has played a critical role in maintaining human health. All parts of plant are edible, fresh leaves can be used for garnishing and are common ingredient in many foods like chutneys and salads. Fresh juice of *Coriander* is extremely advantageous in curing many deficiencies related to vitamins and iron. This plant is used to cure diseases like digestive tract disorders, respiratory tract disorders, urinary tract infection. Its other use in seasoning food preparation. Its seeds leaves are widely used in folk medicine Antifungal antibacterial antioxidant activities are found in *C.sativum*. It is useful for flavouring agent for food preparation it is also used in food preservation. Prevent food borne disease and food spoilage. The various part of this plant, such as seeds, leaves, flower and fruit possess antioxidant activity, anti-diuretic activity, anti-mutagenic, antimicrobial activity, anthelemintic activity.(Figure 1&2)

Taxonomical/Scientific Classification

Kingdom :plantae

Subkingdom : angiosperm

Division :Eudicot

Class :asterid

[1]**Corresponding author**

Order :apiales

Family :apiaceae

Genus :*Coriandrum*

Species :*sativum*

Figure1: *Coriander* (fruit, powder leaves)

Figure 2: *Coriander* (root)

Phytochemistry

Seeds: The fruit (seeds and pericarp) are the most widely used component of the *coriander* plant with the most important constituents being the essential oil and the fatty oil. The fatty oil is around 25% of the seeds while the essential oil content is usually less than 1%. The fatty oil is a light yellow in color and has a characteristic smell. The oil is unique in that it contains high amount of petroselinic acid (C18: 1n-12). High level of total glycolipids (GL) are found in the seeds oil. Major Triacylglycerols (TAG) are tripetroselinin and/or dipetroselinoyloeoyl glycerol. The main markers of sterols (ST) are stigmasterol, beta-sitosterol, 24-stigmastadienol and camposterol. Total ST estimated to be in the range of 36.93-51.86 mg/g.

Leaves and Stem: The immature green leaves of *C.sativum* are widely used as fresh herbs, garnishes in chutneys and sauces. *Coriander* leaves are not as well studied as the fruits. Never the less, essential oil, flavonoids, phenolic acids and polyphenols are among the other compounds detected in the leaves (Chitravadivu *et al.,* 2009; Chopra *et al.,* 1969; Cowan *et al.,* 1999).

Nutritional Constituent:-*Coriander* consist of water, food energy, proteins, fat, carbohydrates, calcium, phosphorus, sodium, potassium, iron, vitamin A etc.

Chemical Constituents:-*Coriander* consist volatile oil, proteins. Volatile consist of D-lonalool, gerniol, pinene, it is also consist of coriander acetate L-borneol etc.

Toxicology :- The consumption of *Coriander sativum* no toxic effect was seen on human body.

Occurance :-In the word lavel – Coriander *sativum* is most popular in Malaysia, India, Korea, Thailand, Singapore, were its harvested and cultivated America, Latin, Canada, us etc. In India lavel- Maharashtra, Karnataka, Kerala, Tamil nadu, Utterpradesh, Chhattisgarh, Westbangal, Bihar, Gujrat, Madhyapradesh, Rajsthan, Jharkhand, Utrakhand etc.

MATERIALS AND METHODS

Collection of Plant Material

The leaf, stems and fruit and of *Coriander sativum* plant were collected from agricultural field..

Preparation of Plant Extract

The leaf, stem and fruit of *Coriander sativum* plant were cleaned and dried carefully on room temperature than dried stem, leaf and fruit are grinded and powdered. Than leaf, stem and fruit powder were extracted with methanol, chloroform and distill water for different phytochemical test and identification of different groups.

Phytochemical Screening

The commonly known phytochemicals from *Coriander sativum* are cardiac glycosides, terpenoids, steroids ,saponin, tannin, flavonoids and alkaloids.

Test for Cardiac Glycosides

0.5 ml of each extract was treated with 0.2 ml glacial acetic acid then 1 drop of 3.5%ferric chloride

($FeCl_3$) was added to the solution. This was layered with 1 ml of concentrated H_2SO_4. A reddish brown ring was occurred at the interface indicates the presence of cardiac glycosides.

Test for Teroenoids

0.5 ml of plant extract was added to the test tube then 2ml of chloroform was mixed to the solution. 3 ml of concentrated H_2SO_4 was added carefully from the wall of the test tube, to form a lower layer. Occurrence of reddish-brown color at the interface indicated the presence of terpenoids.

Test for Steroid

0.5ml of extract was dissolved in 3ml of chloroform. The solution was filtered, 2ml of concentrated H_2SO_4 was added to the filtrate to form a lower layer. A reddish-brown color ring at the interface was indicated the presence of steroid.

Test for Saponin

0.5ml of extract was taken in the test tube, and then 5ml of D/W was added to it. The solution was vigorously shaken and stable persistent froth was observed for the presence of saponin.

Test for Tannin

0.5ml of extract and 5ml of d/w was taken in test tube then it was boiled then filtered. Few drops of concentrated H_2SO_4 and 1% FeCl3 were added to the filtrate. Deep green, brownish green or blue black coloration was indicated the presence of tannin.

Test for Flavonoid

0.5ml of extract and 5ml D/W was added to test tube then it was filtered. 5ml of diluted ammonia solution was added to the filtrate then concentrated H2SO4 was added. A yellow coloration indicated the presence of flavonoid. The yellow color disappeared on standing.

Test for Alkaloid

0.5 ml dried extract was taken and 3ml of methanol was added to it. Then 300µl of acetic acid (10% of methanol) was added to the solution ammonium hydroxide was added drop wise. Appearance of precipitate indicated the presence of alkaloid.

Observation Table-

Table 1: Phytochemical screening of *Coriander sativum* leaf extract

SN	Phytocompounds	Chloroform	Methanol	D/w
1.	Cardiac glycosides	-	+	+
2.	Terpenoids	+	+	+
3.	Steroid	+	+	+
4.	Saponin	-	-	+
5.	Tannin	-	-	-
6.	Flavonoid	-	-	-
7.	Alkaloid	-	-	-

Table 2: Phytochemical screening of *Coriander sativum* stem extract

SN	Phytocompounds	Chloroform	Methanol	D/w
1.	Cardiac glycosides	+	+	+
2.	Terpenoid	+	+	+
3.	Steroid	+	+	+
4.	Saponin	-	-	-
5.	Tannin	-	-	-
6.	Flavonoid	-	-	-
7.	Alkaloid	-	-	-

Table 3: Phytochemical screening of *Coriander sativum fruit* extract

SN	Phytocompounds	Chloroform	Methanol	D/w
1.	Cardiac glycosides	+	+	+
2.	Terpenoid	+	+	+
3.	Steroid	+	+	+
4.	Saponin	-	+	-
5.	Tannin	-	+	-
6.	Flavonoid	-	-	+
7.	Alkaloid	-	+	-

Phytochemical Screening of Leaf Extract of *Coriander sativum*

Figure 3: Leaf extract in chloroform

Figure 4: Leaf extract in methanol

Figure 5: Leaf extract in water

Phytochemical Screening of Stem Extract of *Coriander sativum*

Figure 6: Leaf extract in chloroform

Figure 7: Leaf extract in methanol

Figure 8: Leaf extract in water

Phytochemical Screening of Fruit Extract of *Coriander sativum*

Figure 9: Leaf extract in chloroform

Figure 10: Leaf extract in methanol

Figure 11: Leaf extract in water

RESULTS AND DISCUSSION

In this phyto-chemical screening secondary metabolites such as cardiac glycosides, terpenoids, steroids, saponin, tannin, flavonoid and alkaloids have screened in chloroform, methanol, and aqueous extract leaf, fruit and stem part of *Coriander sativum.*

In chloroform extract of leaf of *Coriander sativum* only, terpenoids, and steroids were present. Absence of cardiac glycosidase, saponin, tannin, flavonoid and alkaloid was observed. In methanolic extract of leaf only presents of cardiac glycosidase terpenoids and steroids was observed. Saponin, tannin, flavonoid and alkaloid was absence. In aqueous leaf extract tannin, flavonoid and alkaloid were absent. Rest phytocompound was present (Savithramma *at el.,* 2014).

In chloroform extract of stem of *Coriander* cardiac glycosides, terpenoids and steroids were present. In methanolic stem extract phyto-compounds such as cardiac glycosides, terpenoids, and steroids, presence were observed. Both chloroform and methanolic extract

of stem saponin, tannin, flavonoid, alkaloid was not found. In aqueous extract of stem absence of tannin, saponin and alkaloids was observed, rest phyto-compound were present.

In chloroform extract of fruit of *Coriander* phyto-compounds such as cardiac glycosides, terpenoids and steroids were found. In methanolic fruit extract absence of flavonoid and alkaloids were observed, rest phyto-compounds were present. In aqueous extract of fruit absence of saponin, tannin and alkaloid was observed. Rest phyto-compound such as cardiac glycosidase, terpenoids, steroids, and flavonoids were present.

Ashok Kumar *et al.,* 2010 had worked on phytochemical screening of *Coriander sativum* linn. They had prepared methanolic extract of fruit and performed phytochemical screening by qualitative and thin layer chromatography technique and they had reported presence of linalool, linayl acetate, cymene, triterpene in fruit part of *Coriander sativum*. Beegum *et al,*2014. had done qualitative analysis for the presence of several antioxidant compounds. They used the seed extract of *Coriander sativum* and reported the presence of principle components responsible for high anti-oxidant activity of *Coriander sativum* such as ascorbate, riboflavin, tocopherol, polyphenols, gallic acid, caffeic acid, ellagic acid, querectin, kaempferol.All the results show in table1,2,& 3 and figure 3 to11.

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