Research Article

Preliminary Phytochemical Analysis and Estimation of Total Phenol Content in Coriander Extract (*Coriandrum sativum*)

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ABSTRACT

The aim of the study is to analyse phytochemical and to estimate the total phenol content in coriander extract and the objective is to determine the total phenol content and various phytochemical present in coriander extract. Coriander (*Coriandrum sativum* L) which belongs to the family Apiacease is mainly cultivated from its seeds throughout the year. All parts of the herbs are in use as flavouring and/or as traditional remedies for the treatment of different disorders. Coriander is a good source of polyphenols and phytochemical due to its high antioxidant activity. Reactive species of oxygen can cause oxidative stress and consequently, the damage of tissues and bio molecules. Phytochemical are chemical compounds that occur naturally in plants. Phytochemical has many biological significance and they can protect us from various deadly diseases such as heart disease and cancer. It is well-known that plant produce these chemicals to protect themselves they can demonstrate that they can also protect humans against diseases. The reason is to create awareness about phytochemical and phenol content of coriander extract among the society. The preliminary phytochemical test indicates the presence of alkaloids, flavonoids, reducing sugars terpenoids, phlobatannins in coriander extract. This further proves that Coriander as herb can be used to help prevent deathly diseases such as cancer and heart attack.

Keywords: Coriander, herb, phenol content.

INTRODUCTION

This study designed to evaluate antioxidant activity, screen the existence of phytochemical compounds and to determine phenol contents of *Coriander sativum* to prove its utilization to protect us from various deadly diseases such as heart diseases and cancer. Coriander (*Coriandrum sativum* L) which belongs to the family Apiacease is mainly cultivated from its seeds throughout the year. All parts of the herbs are in use as flavouring and/or as traditional remedies for the treatment of different disorders. Coriander is a good source of polyphenols and phytochemicals due to its high antioxidant activity[1]. Reactive species of oxygen can cause oxidative stress and consequently, the damage of tissues and bio molecules. Phytochemicals are chemical compounds that occur naturally in plants.This study can also help create awareness about phytochemical and phenol content of coriander extract among the society.[2]

The value of medicinal plants in drug discovery is known to us well and the human being used them for various purposes from the beginning of the human history [3]. Traditional folk remedies from plants have always guided scientists to search for new medications in order to maintain and promote healthy life for human and animals[4]. Coriander (*Coriandrum sativum*), also known as cilantro or Chinese parsley, is an annual herb in the family Apiaceae. All parts of the plant are edible, but the fresh leaves and the dried seeds are the parts most traditionally used in cooking. 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[5]. 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 centre 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[6]. Coriander grows wild over a wide area of Western Asia and southern Europe, prompting the comment, "It is hard to define exactly where this plant is wild and where it only recently established itself.[7]

Coriander seems to have been cultivated in Greece since at least the second millennium BC. One of the Linear B tablets recovered from refers to the species as being cultivated for the manufacture of perfumes, it apparently was used in two forms: as a spice for its seeds and as a herb for the flavour of its leaves.[8] All parts of the plant are edible, but the fresh leaves and the dried seeds are the parts most traditionally used in cooking Cilantro is packed with bunch of health and medicinal benefits. Due to its numerous nutritional values, it is also regarded as Wonder herb of the world. It is full of phyto nutrients, antioxidants, essential oils, antiseptic, analgesic, aphrodisiac, fungicidal, natural stimulant, etc. It has adequate amount of vitamins A, C and K including with many essential oils and acids. The leaves are full of calcium, potassium, iron, manganese and sodium[9]. 100 grams of *Coriandrum sativum* contains the following nutrients. Carbohydrate (3.67g), protein (2.13g), fat (0.52g), fibre (2.80g), energy (23 Kcal), foliates (62 µg), niacin (1.11 mg), pantothenic acid (055 mg), pyridoxine (0.14mg), riboflavin (0.16 mg), thiamin (0.067mg), vitamin

A (6748 IU), vitamin C (27mg), vitamin E (2.50 mg), vitamin K (310 mcg).[10]Cilantro lowers the level of bad cholesterol (LDL) and increases the amount of good cholesterol (HDL) due to presence of essential oils. The oils and different acids reduce the level of cholesterol in blood and prevent you from cardiovascular disease, strokes and heart attacks.[11]

Phytochemical are non-nutritive plant chemicals that have protective or disease preventive properties. They are non-essential nutrients, meaning that they are not required by the human body for sustaining life. It is well-known that plant produces these chemicals to protect themselves but recent researches demonstrate that they can also protect humans against diseases. There are more than thousand known phytochemical. Some of the well-known phytochemical are lycopene in tomatoes, isoflavones in soy and flavonoids in fruits. [12]

MATERIALS AND METHODS

Collection and preparation of plant materials

Coriander Sativum was collected locally. The selected leaves were washed, air dried for few days and the leaves were crushed into powered form. The plant powder was then taken into a test tube and distilled water was added to it and shaken well. The powdered content was then placed in tight closed container. The solution was then filtered with the help of the filter paper and the filtered extract was used for phytochemical analysis and total phenol content.

Phytochemical Analysis

Test for phlobatannis

Plant powder sample was mixed with distilled water in a test tube, the shake it well and filter to take plant extract. Then to each plant extract, 1% aqueous HCl was added and each plant sample was then boiled with the help of hot plate stirrer [13]. Formation of red coloured precipitate confirmed a positive result.

Tests for carbohydrates

Fehling's solutions test: Boil a mixture of Fehling solutions A and B with equal volumes were added to crude plant extract. A red colour precipitate indicated the presence of reducing sugars. Benedict's reagent test: Boil 2 ml of Benedict's reagent with a crude extract, a reddish brown colour indicated the presence of the carbohydrates.

Tests for flavonoids

Alkaline reagent test: 2 ml of 2% NaOH solution was mixed with plant crude extract, intensive yellow colour was formed, which turned into colorless when added 2 drops of diluted acid to solution, this result indicated the presence of flavonoids.

Test for alkaloids

For the purpose of phytochemical analysis of the selected plants, 0.2g of the selected plant samples were added in each test tube and 3ml of hexane were mixed in it, shaken well and filtered. [14]Then took 5 ml of 2% HCl and poured in the test tube having the mixture of plant extract and hexane. Heated the test tube having mixture, filtered it and poured few drops of picric acid in the mixture. Formations of yellow colored precipitate indicate the presence of alkaloids.

Test for terpenoids

Two milliliter of chloroform was mixed with the plant extract and evaporated on the water path then boiled with 2 ml of H2SO4 concentrated. A grey color produced indicated the entity of terpenoids.

Test for total phenolic content

The total phenolic content in the coriander extract using the Folin-Ciocaletu's reagent.

RESULTS AND DISCUSSION

The preliminary phytochemical test indicates the presence of alkaloids, flavonoids, reducing sugars, terpenoids, and phlobatannins in coriander extract. It was also found that the total phenolic content was 75mg of Gallic acid,1g of dried extract of coriander. Coriander contains more of phlobatannis flavonoids and terpenoids than reducing sugar and alkaloids.

Phytochemical	Coriander	Observations
phlobatannis	++	Red colour precipitate
Reducing sugar	+	Reddish brown precipitate
Flavonoids	++	Yellow colour which turned into colourless
Alkaloids	+	Yellow precipitate
Terpenoids	++	Grey colour

Total phenol content: Is expressed in terms of Gallic acid equivalents. The total phenolic content was 75mg of Gallic acid, 1g of dried extract of coriander.

CONCLUSION

The preliminary phytochemical test indicates the presence of alkaloids, flavonoids, reducing sugars, terpenoids, and phlobatannins in coriander extract. This further proves that Corainder as a herb can be used to help prevent deathly diseases such as cancer and heart attack.[15]

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