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Screening of Antioxidant Activity of *Coriandrum sativum*

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ABSTRACT

Free radicals cause oxidative damage to the body and antioxidants plays a vital role in protecting the body from this oxidative stress. A variety of free radical scavenging antioxidants is found from natural sources. The main objective of this study was to investigate antioxidant activity of the volatile oil collected from Coriander leaves (Coriandrum sativum). Coriandrum sativum is popularly known as coriander in India belongs to the family Apiaceae.

In the present study research was done for pharmacognostical as well as phytochemical characteristics including parameters such as, physical evaluation and preliminary phytochemical studies of the Coriander leaves. Preliminary phytochemical screening of crude powder drug revealed presence of carbohydrates, proteins, phenolic compounds, tannins, flavonoids etc. The antioxidant capacity of this extract was investigated by using DPPH radical scavenging method.

Keywords : Coriandrum sativum, clevengers apparatus, DPPH (2, 2-diphenyl-2-picrylhydrazyl) method, antioxidant

INTRODUCTION

Plants have been one of the important sources of medicines even since the beginning of human civilization. A review represents that 80% of the world's population relies on medicinal plants for their primary healthcare. The Free radicals and reactive oxygen species have been implicated in the induction of various types of oxidative damage to bio-molecules that results aging, cancer, neurodegenerative diseases, atherosclerosis, several pathological events in living organisms and different other diseases associated with our life-style.

It is well known that herbs and spices possess antioxidant activity. Caffeic acid derivates, flavonoids and terpenoids are suggested to be responsible for this effect[1].Coriander oil is sometimes included in lotions used as counter-irritant to treat painful joints, rheumatism and menstrual disorders[2]. In unani medicine an infusion of the fruits are used in bleeding piles, neuralgia, cephalalgia and spermatorrhoea[3]. The aqueous extract of coriander seed possesses diuretic activity[4].The sedative and hypnotic activity is determined by administering aqueous and hydro-alcoholic extract and essential oil to rat[5]. Volatile components in essential oil, from both seeds and leaves, have been reported to inhibit growth of a range of micro-organisms [6]. The results also revealed that the ethanolic extracts of *Coriandrum sativum* plant took the less time to cause paralysis of the earthworm than that of carbon tetrachloride extract thus it conclude that ethanolic extracts of *Coriandrum sativum* possess potent anthelmintic activity compared to carbon tetrachloride extract[7]. The aim of our study was to investigate the antioxidant activity from leaves of coriander.

MATERIALS AND METHODS

Materials

The plant materials used were the leaves of *Coriandrum sativum* which were collected from local area of Berhampur. The samples were prepared by extraction of leaves with aqueous distilled water by using clevengers apparatus for six hours.

Methods

Materials like DPPH, methanol and ascorbic acid were used.1,1-Diphenyl-2-picryl-hydrazyl (DPPH) was obtained from Sigma Aldrich Co., St. Louis, USA, methanol from Thomas Baker Pvt limited, Mumbai and ascorbic acid from Vee Exel Drugs and Pharmaceuticals Pvt limited, Delhi.

Pharmacognostical studies

Physical evaluation:

Determination of loss on drying, total ash, acid insoluble ash, water soluble ash, extractive values (water soluble extractive and alcohol soluble extractive) of coriander sativum was carried out.

A. Loss on drying[8]

Glass stoppered weighing bottle was used for the determination of loss on drying, which was previously dried and weighed. The drug sample (5gms) was placed in the bottle and weighed. The sample was shaken gently sidewise to produce even distribution. Then the bottle was placed in the drying chamber at 100°C after removing the stopper. After specified time period the bottle was stoppered and removed out from the oven. It was allowed to cool to room temperature. The weight[66] was taken and again the sample was dried in hot air oven. This procedure was repeated until three constant weights were obtained by the sample. The difference in weight of the sample was determined and percentage of weight loss during drying was calculated.

$$\% \text{ Loss on drying} = W2\text{-}W3/W_2\text{-}W_1 \times 100$$

B. Extractive Values[9]

1) Water soluble extractives**:** 10gms of powdered leaf was taken and macerated with 100ml of chloroform water in a stopper flask for 24 hours and frequently shaken during the first 6 hours. This mixture was filtered and 20ml of the filtrate was evaporated to dryness in a tare swallow dish. Dried to constant weight at 105°C and the percentage of water soluble was calculated with reference the air dried powder.
2) Alcohol soluble extractive**:** 10gms of powdered leaf was taken and macerated with 100ml. of 90% ethyl alcohol in a stopper flask for 24 hours, shaken frequently dur-

ing the first 6 hours, filtered and 20ml of the filtrate was evaporated to dryness in a tarred swallow dish. It was dried to constant weight at 105°C and the percentage of water soluble was calculated with and the percentage of water soluble was calculated with reference the air dried powder.

Method:
DPPH (2, 2-diphenyl-2-picrylhydrazyl) method[10]

PRINCIPLE
The scavenging reaction between DPPH and an antioxidant (H-A) can be written as (DPPH)+(H-A) (purple) → DPPH-H+(A)(yellow)

Preparation of DPPH solution:
DPPH in methanol (0.1mm) was prepared and 1.0ml of this solution was added to 3.0ml of extract solution in methanol of different concentration solution of DPPH. 0.1mm in methanol was prepared by dissolving 1.9mg of DPPH in methanol and volume was made upto 100ml with methanol. The solution was kept in darkness for 30mins for complete the reaction. 30mins later, the absorbance was measured at 517nm. A blank was prepared without adding extract. Ascorbic acid at various concentrations (1 to18µgm ml) was used at standard. Total volatile oil extracted from 100 gms of leaf was diluted by addition of 100 volumes of water and the resultant mixture was used as test sample. Lower the absorbance of the reaction mixture indicates higher free radical scavenging activity. The capability to scavenge the DPPH radical was calculated using the following equation.

DPPH scavenged (%) = (Abs. of control – Abs. of sample)/ Abs. of control x 100

RESULTS AND DISCUSSION
The powdered coriander (*Coriander sativum)* leaves has been subjected to Pharmacognostical studies like determination of loss on drying (0.6% w/v), total ash(14.2%w/v), acid insoluble ash (3.2%w/v), water soluble ash (7.5%w/v), extractive values (water soluble extractive 1.802%w/v and alcohol soluble extractive(1.526%w/v)). Carbohydrates, Fixed oils and fats, Flavonoids, Phenolic compounds and tannins are present in the plant part.The results and study clearly indicates that the volatile oil collected from *Coriander sativum* leaves shows antioxidant activity which has been determined by DPPH radical scavenging method. Percentage of radical scavenging by test sample was found to be 34.346.

TABLE 1: Showing screening for antioxidant activity

Concentration of ascorbic acid (µg)	Absorbance (nm)	% of radical scavenging
1	0.085	88.77
3	0.088	88.37
6	0.091	87.97
9	0.095	87.45
12	0.099	86.92
15	0.104	86.26
18	0.108	85.73

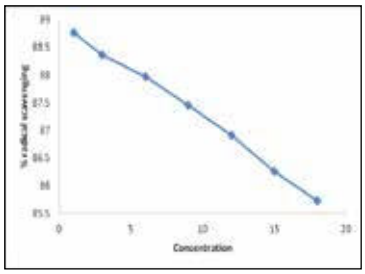

FIG 1 Showing % radical scavenging activity with respect to concentration

TABLE 2: Showing physical parameters of the leaves of *Coriandrum sativum*

1.	Loss on drying		0.6 %W/V
2.	Ash values	Total ash	14.2 %W/V
		Acid insoluble ash	3.2 %W/V
		Water soluble ash	7.5 %W/V
3.	Extractive values	Water soluble extractives	1.802 %W/V
		Alcohol soluble extractives	1.526 %W/V

Preliminary phytochemical analysis

CONCLUSION
Present study revealed the antioxidant activities of aqueous extract of the selected Coriander leaves. On the other hand, results of this study show that the selected Coriander leaves serve as natural sources as reducing agent and they could be considered as useful sources of materials for human health and as food preservatives.

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