Phytochemical Examination of Coriander Leaves

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Abstract— Coriandrum sativum belongs to the family Apiaceae and is usually grown within the Mediterranean countries annually. Though in India, we are used to find plenty of Coriandrum leaves in vegetable market in winter but hot and humid temperature favours the expansion of the herb. The leaves are mostly referred to as "Cilantro". Leaves are used mainly for garnishing in cooking and they impart a delicious aroma to the food. The leaves of Coriandrum sativum also has medicinal properties and have use in Ayurveda and folk medicine for ages in India and other South East Asian countries. The leaves are rich in various potent phytochemicals with medicinal properties which actually impart the medicinal potency to the leaves of Coriandrum sativum. The objective of the work is to study the different active components obtained from the leaves of coriander and to identify them by performing phytochemical analysis of the extract of the leaves in solvents like Ethyl acetate, Acetone, Petroleum ether, Methanol and Water.

Keywords: Phytochemical Examination

I. INTRODUCTION

Coriandrum sativum which is also known as coriander and it has different names at different areas of India like i.e. In Hindi language it is termed as "Dhaniya" in Gujarati it is also called as "Kothmir" in Kannada it is pronounce as "Kothambri". In Kashmir it is termed as "Deaniwal" and at last in Sanskrit it is called as "Dhanyaka" it is the name where all these names are supposed to arrive. Coriander basically originates in Italy it is also cultivated in central and eastern Europe and Mediterranean countries and Asian countries are also included. In early times it was also used in burial might be because of its typical fragrance. The name 'coriandrum' is derived from "*koros"* a bug, referring to the disagreeable fetid smell of the leaves. The usage of a plant's seeds, berries, roots, leaves, bark, or flowers for medicinal purposes is termed as 'Herbal Medicine' or 'Botanical Medicine' or 'Phytomedicine'. Now a day, compounds isolated from medicinal herbs [phytocompounds or phytochemicals] constitute a big part of the pharmaceutical industry and Medicinal Science. In most of the studies, it is observed that some herbs when administered crude, work better than administration of the isolated bioactive compound alone. While in other instances, it is observed that the identified and isolated bioactive phytocompound when administered alone, works better to combat a specific pathogenic condition. Some experts are of the opinion that most phytochemicals work in combination with each other and hence, a crude plant or herb extract which is a mock tail of various potent bioactive compounds when administered together, act best by complementing each other's mode of action. Isolated compounds from herbs when administered alone can also act effectively to cure a pathogenic condition because the compound when isolated, gets concentrated and thus acts more effectively in some cases. Again, studies show that the majority phyto-compounds exhibit synergistic activity when combined with other compounds [herbal or conventional synthetic medicinal compounds].

II. MATERIALS AND METHOD

Coriander sativum leaves are commonly known as Dhaniya / Cilantro *leaves in* India. They were collected from local farm of Vadodara, Gujarat, India. They were identified and authenticated by Parul Institute of Agriculture, Parul University, Vadodara, India. Fresh leaves were collected from market and washed and then dried at room temperature for a week. Dry leaves were powdered and then this powder was collected in Soxhlet apparatus and extracted with different types of solvents.

A. Preparation of plant material-

- Fresh leaves were collected from market and washed and then dried at room temperature for a week. Dry leaves were powdered and then this powder was collected in Soxhlet apparatus and extracted with different types of solvents Ethyl acetate, Acetone, Petroleum ether, Methanol and Water.
- 15 gm of Coriander powder was subjected to the Soxhlet extraction with 200ml of solvents mentioned above along with few tiny pieces of porcelain and temperature was well maintained for 12 hours.

Fig. 1: Extraction of plant material in solvents

B. Procedure-

Test conducted on the solvent extract for phytochemical analysis of the components:

1) Shinoda Test: Few drops of NaOH was added to 1 ml extract. Yellow coloration is observed. On addition of few drops of dilute HCl it turns colorless. This indicates presence of Flavanoids.
2) Wagners Test: A fraction of extract was treated with 5 drops of Wagner's Reagent (1.2 g of iodine and 2g of KI in 100ml of water) and observed for the formation of brown precipitate or coloration. This indicates the presence of Alkaloids.
3) Phenol Test: A fraction of extract was treated with 5% ferric chloride and observed for the formation of deep blue or black precipitates or coloration. The change in color indicates the presence of Phenol.
4) Molisch Test: Few drops of Molisch reagent (alpha naphthol + ethanol) were added to extract. This was followed by the addition of concentrated sulphuric acid.

The mixture was allowed to stand for a few minutes. Formation of red or dull violet color at interphase of two layers indicates the presence of Carbohydrates.

5) Quinone Test: A small fraction of extract was treated with concentrated HCl and observed. Formation of yellow precipitates or coloration indicates the presence of Quinone.
6) Tannin Test: 10% Alcoholic ferric chloride was added to 2 ml extract. Formation of blue coloration indicates the presence of Tannins.
7) Saponins Test: A fraction of extract was taken in a test tube and water was added in it. Froth formation on shaking indicates the presence of Saponins.
8) Terpenoids Test: 2ml of chloroform was added in extract and then concentrated sulphuric acid was added to it. Formation of red precipitates indicates the presence of Terpenoids.
9) Glycoside Test: 10% lead acetate was added in extract. Yellow precipitation indicates present of Glycoside.

Fig. 2: Phytochemical tests on solvent extracts

III. Result

S.N.	Test	Ethyl acetate extract	Acetone extract	Petroleum ether extract	Methanol extract	Water extract
1	Shinoda test	+	+	-	-	-
2	Wagner's test	-	+	-	-	-
3	Phenol test	+	-	+	+	+
4	Molisch test	-	+	+	-	-
5	Quinone test	-	+	+	-	-
6	Saponin test	-	-	-	-	-
7	Glycoside test	-	+	-	+	-
8	Tannin test	-	-	-	-	-
9	Amino acid test	-	-	-	-	-

Table 1: Results of test conducted on different extracts

IV. Conclusions

- Phytochemical examination of the Ethyl acetate extract of Coriandrum sativum leaves indicates the presence of flavonoids. However other components like Quinone, Glycosides, Saponin, Tannins are absent.
- Phytochemical examination of the Acetone extract of the Coriandrum sativum leaves gives positive result towards Wagner's test and Glycoside test indicates the presence of Alkaloids & Glycosides in the extract. The others tests responded negatively.
- In the phytochemical examination of the Petroleum ether extract of the Coriandrum sativum leaves Phenol and Quinone test is found to be positive indicating the presence of Phenols & Quinone while the other tests like Glycoside, Tannins, Saponin are negative.
- In the Phytochemical examination of Methanol extract of Coriandrum sativum leaves gives positive response suggesting the presence of Phenol. However, all other tests give negative results.
- The phytochemical examination of the Water extract of the Coriandrum sativum leaves indicates the presence of carbohydrates due to the positive result of Molish test but the other test gives the negative results.
- Saponins, Tannins and Amino acid test gives negative response in all the solvent extracts.

Acknowledgement

Authors would really like to convey their sincere thanks to the management of Parul University for allowing to carry out the research work. Authors would like to thank to HOD, Department of Chemistry for her constant encouragement. Authors would like to convey their gratitude to the principal of PIAS for their efforts and encouragement.

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