Studies on the phytochemical and Pharmacological potential of the leaves of Coriandrum sativum.

PROJECT WORK

THIS IS A PROJECT REPORT THAT FULFILLS SOME OF THE REQUIREMENTS FOR A BACHELOR OF PHARMACY DEGREE. IT HAS BEEN SUBMITTED TO THE DEPARTMENT OF PHARMACY AT DAFFODIL INTERNATIONAL UNIVERSITY.

SUBMITTED TO

DEPARTMENT OF PHARMACY, FACULTY OF HEALTH & LIFE SCIENCES

DAFFODIL INTERNATIONAL UNIVERSITY

SUBMITTED BY

Student ID: 203-29-425

Batch: 24th

Department of Pharmacy

Daffodil International University

Date of Submission:

30th September 2024

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APPROVAL

A project paper investigating the medicinal properties of the leaves of ***Coriandrum sativum*** has been submitted and accepted by the Department of Pharmacy at Daffodil International University for partial fulfillment of a Bachelor of Pharmacy degree.

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DECLARATION

In partial satisfaction of the criteria for the Bachelor of Pharmacy degree, I thus declare that I completed this project report under the supervision of Dr. Sarowar Hossain, Associate Professor in the Pharmacy Department of Daffodil International University. I hereby certify that this project is entirely my own creation. Additionally, I affirm that neither this project nor any portion of it has ever been submitted for consideration for a bachelor's degree or other degree elsewhere.

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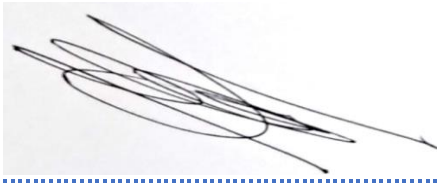
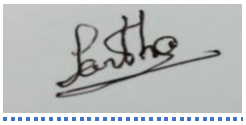


DR. Md. Sarowar Hossain

Associate Professor

Department of Pharmacy,
Daffodil International University

SUBMITTED BY:



Partho Mondal

ID: 203-29-425

Batch: 24th

Department of Pharmacy,
Daffodil International University

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ACKNOWLEDGMENT

First and first, I want to express my sincere gratitude and respect to the all-powerful and kind Allah, whose constant assistance, fortitude, and direction allowed me to successfully complete this dissertation. My supervisor, Dr. Md. Sarowar Hossain, Associate Dean, Associate Professor in the Department of Pharmacy, has provided me with essential guidance and unwavering support throughout this endeavor. I am extremely appreciative of Md. A.K. Azad, Assistant Professor in the Pharmacy Department of Daffodil International University, for his kind assistance and unwavering support, which enabled me to carry out my assignment with diligence and efficiency. I also want to express my sincere appreciation to my distinguished teachers for their wise counsel, skillful administration, perceptive analysis, steadfast interest, and encouraging words. Their unwavering encouragement, insightful criticism, and unending support helped to mold my research path. Additionally, I would like to thank the hardworking employees of Daffodil International University's Pharmacy Department, especially all the lab assistant, for their support and collaboration. Finally, I would like to express my gratitude to my buddy Khandaker Md. Rehan Uddin, who helped with this project's preparation either directly or indirectly. Throughout our endeavor, their encouragement and support have been tremendous.

- **Partho Mondal**

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DEDICATED TO MY BELOVED PARENTS, RESPECTED TEACHERS, AND WELL-WISHERS.

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ABSTRACT

The annual herb coriander (Coriandrum sativum), commonly referred to as cilantro, belongs to the Apiaceae family. Although the entire plant is edible, the portions that are most frequently used in cooking are the dried seeds and fresh leaves.The purpose of this study was to examine ***Coriandrum sativum's*** phytochemical, thrombolytic, and antioxidant qualities. To find the existence of numerous bioactive chemicals, phytochemical screening was carried out utilizing a variety of chemical tests. The DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging assay was used to measure the antioxidant activity, and the thrombolytic activity was evaluated by calculating the percentage inhibition of clot lysis. Comparing the plant extract to the standard chemicals, the results showed that it has considerable thrombolytic and antioxidant properties. The discovered biological activities were associated with the presence of phytochemicals, suggesting that, it can be contain natural compounds that could be used therapeutically to treat thrombosis and disorders related to oxidative stress. Above all, Coriandrum sativum provided satisfactory thrombolytic and anti-oxidant properties.

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CHAPTER ONE: INTRODUCTION

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1.1 GENERAL INTRODUCTION

For decades, natural chemicals obtained from diverse sources have played a crucial role in the process of medication discovery. Their extensive range of biological activities and structural diversity provide inspiration for new medication ideas. While some natural substances can be utilized straight away as medications, others can be used as models to make new compounds with better qualities. They can also be used as biological probes to investigate illnesses and find possible targets for medications. Thanks to technological improvements, natural chemicals continue to offer considerable promise in the field of drug discovery despite hurdles like complexity, supply, and bioavailability. [1,2]

1.2 STATUS OF MEDICINAL PLANTS IN BANGLADESH:

Bangladesh, a nation with a subtropical climate, is home to numerous natural reserves of medicinal plants. Domestic woods provided a significant portion of the supply for local herbal medicine businesses, primarily Ayurvedic and Unani, which produced 80% of their own medicine and imported 20% in the early 1980s. However, the pattern hasn't been the same since. Presently, imports account for a staggering 80% of supply, with just 20% of demand being satisfied domestically. Despite Bangladesh's enormous biodiversity, the Bangladesh Agricultural Research Institute (BARI) counts a pitiful 722 medicinal plant species, far fewer than India's 4,000. In Bangladesh, traditional medicine employs only approximately 700 of these species; 255 are utilized in the production of Ayurvedic and Unani medicines.[3]

1.3 PLANTS IN TRADITIONAL MEDICINE:

Around the world, between 70 and 80 percent of people mostly rely on traditional herbal medicine for their medicinal needs. This demonstrates the widespread nature of the behavior. Herbal medicine also has a substantial and expanding market. The quantity of medicinal plants collected has multiplied tenfold in the last ten years in the province of Yunnan, China alone. For instance, the market for ayurvedic medications is expanding at an incredible rate of twenty percent annually in India. [4,5] This growing need is caused by a number of factors,

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such as population growth and the dearth of Western allopathic medicine in many emerging nations. [6] As a result, gathering spots such as the Indian Himalayan Gori Valley are under more stress, and the medicinal and aromatic plant (MAP) harvesting season now spans two to five months every year. [7][8]

1.4 AN OVERVIEW OF *Coriandrum sativum:*

In the Apiaceae family, ***Coriandrum sativum***, popularly known as cilantro or coriander, is a widely used annual herb. It is highly valued for its distinct flavor and scent, which provide many different meals around the world a special touch. Packed with iron and vitamin K, among other vitamins and minerals. includes antioxidants, which may aid in preventing cell damage. may lessen inflammation and help with digestion. This adaptable herb has a distinct flavor profile that may improve a range of recipes, whether you prefer the warm, spicy flavor of coriander seeds or the fresh taste of cilantro.[9]

1.5Plant Profile:

1.5.1 Scientific Name: *Coriandrum sativum,*

Also referred to as cilantro or coriander, this widely popular herb is commonly used in cuisines across the globe. Its unique aroma and flavor have made it an essential component in many dishes. [10]

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1.5.2 Taxonomic Classification

Kingdom: Plantae

Phylum: Magnoliophyta

Class: Magnoliopsida

Subclass: Rosidae

Order: Apiales

Family: Apiaceae

Genus: Coriandrum

Subject: Coriandrum sativum L. [11]

1.5.3 Synonyms

- Coriandrum sativum var. majus
- Coriandrum sativum var. minus
- Coriandrum vulgare [12]

1.5.4 Common Vernacular Names

Dhaniya patti, Dhaniya patta (Hin.); Kotthamalli (Tam.); Kothamiri doppu, Kothambari soppu (Kan.); Kothimeri (Tel.) [13]

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1.5.5 Plant Description/Morphology

Coriandrum sativum (coriander) features solid, ridged stems, with its leaves becoming increasingly divided toward the top. The upper leaves are finely dissected with narrow, linear segments, while the lower leaves are broader, often lobed or pinnate. The plant's inflorescences are composed of umbels with 3 to 6 rays, each supporting 8 to 20 flowers. Its fruit measures 4 to 6 mm in length, with wrinkled ridges when ripe, and the fruiting pedicels are 2 to 4 mm long. The styles are slender and flexible, ranging from 1.5 to 2 mm in length. [14]

1.5.6 The Plant Part Utilized in This Study

The leafy portion was used in this work.

[15]

Fig: 01

1.5.7 Traditional Uses

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Coriander has been used in traditional medicine for centuries to treat various ailments. Some of the traditional uses include:

Used for conditions such as rheumatoid arthritis, inflammation, and joint pain. Employed in the treatment of measles, diabetes, aerophagy, and gastroenteritis. Acts as an antiviral agent and neuro-energizer. Utilized in managing certain liver diseases. Known for its diuretic properties and used in treating various renal conditions. [16]

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CHAPTER TWO: LITERATURE REVIEW

2.1 Preliminary Phytochemical Screening, GC-MS, FT-IR Analysis of Ethanolic Extracts of *Rosmarinus Officinalis*, *Coriandrum Sativum* L.

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Three (3) edible medicinal plant leaves that were thought to have medical value and have physiological effects such as anti-inflammatory, antibacterial, anti-pyretic, antioxidant, laxative, etc. underwent phytochemical and some proximate composition study. The research's primary goal is to identify the phyto-components and compounds found in the ethanolic extracts of Coriandrum Sativum (coriander), Mentha Spicata L. (mint), and Rosemarinus Officinalis (rosemary) using two distinct analytical techniques: GC-MS and FT-IR. The GC-MS analysis indicates various chemicals identified as significant ingredients and virtually all the compounds detected was shown to exhibit therapeutic qualities. The majority of the strong absorption bands are represented by the FT-IR spectrometry data analysis, which also identifies important functional groups such carboxylic acids, alkanes, primary and secondary aromatic acids, and aliphatic amines. However, the ethanolic extracts of the plant extracts show the presence of flavonoids, tannins, triterpenoids, and saponins according to the preliminary phytochemical screening that was done. Because of their varied ethno-pharmacological significance, the results show that all of the chosen plant samples are potential sources of therapeutic activity and can be used in the field of phytomedicine.[17]

2.2 Antimicrobial and antioxidant properties of *Coriandrum sativum* L. seed essential oil

In the current study, the essential oil of Coriandrum sativum L. seed was hydrodistilled in order to assess its antibacterial activity against clinical pathogens such as Candida albicans, Enteobacter aerogenes, Klebsiella, P. aeruginosa, and E. Coli. The DPPH assay was also used to determine the minimum bactericidal concentration and antioxidant activity. Consequently, the maximum inhibitory concentration (MIC) for E. coli was 0.64 mg/ml, whereas the lowest MIC for Candida albicans, Klebsiella pneumoniae, and P. aeruginosa was 0.02 mg/ml and 0.04 mg/ml, respectively. According to the results of the minimum bactericidal concentration, the MBC value ranges from 0.02 to 2.56 mg/ml. While C. albicans has a low MBC and/or MFC value of 0.04 mg/ml, P. aeruginosa has a high value of 2.56 mg/ml. The essential oil of Coriandrum sativum L. seed showed significant antioxidant activity; the percentages of inhibition for standard ascorbic acid were 66.2% and 87.8%, respectively. The IC50 values were 0.108 and 0.147 mg/ml, respectively.

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[18]

2.3 Thrombolytic activity of some spices and plants available in Bangladesh

An in vitro model was used to assess the thrombolytic activities of several plants that are available in Bangladesh, including Tamarindus indica (Fabaceae), Flemingia congesta (Fabaceae), Lawsonia inermis (Lythraceae), Mesua nagassarium (Clusiaceae), and spices, including Coriandrum sativum (Apiaceae), Curcuma longa (Zingiberaceae), Cinnamomum tamala (Lauraceae), Nigella sativa (Ranunculaceae), and Eugenia aromaticum (Myrtaceae). In vitro-formed clots, the percentage of weight loss corresponding to the thrombolytic activity was found to be 43.25 ± 7.18% for C. sativum, 53.32 ± 4.96% for C. longa, 22.10 ± 3.18% for N. sativa, 28.49 ± 3.72% for E. aromaticum, 32.18 ± 3.10% for T. indica, 35.27 ± 7.35% for F. congesta, 62.40 ± 5.04% for L. inermis, 39.54 ± 7.15% for M. nagassarium bark, and 46.75 ± 3.97% for M. nagassarium leaf. These results were compared to 8.37 ± 1.18% for negative control distilled water, and 84.63 ± 1.03% for positive control streptokinase. [19]

2.4 In vitro free radical scavenging and DNA damage protective property of *Coriandrum sativum L.* leaves extract.

Coriander, or Coriandrum sativum L., is a common spice used in Indian cooking that is said to enhance flavor. It is an annual herb in the family Umbelliferae, or Apiaceae. Nitric oxide (NO) radical scavenging, lipid peroxidation by thiobarbituric acid, 2, 2′-diphenyl-1-picrylhydrazyl, reducing power, and other in vitro tests were conducted to fully investigate the antioxidant efficacy of the hydro-alcohol extract of Coriandrum sativum L. at a dose of 1 mg/ml. It was discovered that the 70% ethanol extract contained 44.5 µg of flavonoids and 133.74 µg of total phenols per milligram of extract (galic acid equivalents). The leaf extracts demonstrated metal chelating capability, with IC50 values of 368.12 µg/ml compared to 26.7

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μg/ml for conventional EDTA. The IC50 values for 2, 2′-azino-bis (3-ethylbenzothiazoline-6-sulphonic acid radical scavenging) were 222 μg/ml, whereas the results for traditional ascorbic acid were 22.6 μg/ml. The leaf extract's IC50 value for its NO scavenging activity was 815.6 μg/ml, while the standard BHA's value was 49.1 μg/ml. Every plant extract offered protection against DNA damage; however, the level of protection at 8 μg/ml was about the same as that of regular gallic acid. With IC50 values of 589.6 μg/ml, the leaf extract of Coriandrum sativum was able to inhibit in vitro lipid peroxidation, while standard BHA only showed an IC50 of 16.3 μg/ml. Significant ferric reducing power was also demonstrated in our experiments, demonstrating the extract's capacity to donate hydrogen. According to this study, leaf extract has the potential to be a source of nutraceuticals or natural antioxidants that might be used in the food sector to lessen oxidative stress in biological systems.[20]

2.5 Antioxidant activity of methanolic extracts from three coriander (*Coriandrum sativum* L.) fruit varieties

In this work, the fruit methanolic extract of three species coriander (Coriandrum sativum L.) was examined for antioxidant activity. The obtained data demonstrated substantial ($P < 0.05$) changes in the levels of total flavonoids (2.03 ± 0.04–2.51 ± 0.08 mg EC/g DW), total condensed tannin (0.09 ± 0.01–0.17 ± 0.01 mg EC/g DW), and 0.94 ± 0.05–1.09 ± 0.02 mg GAE/g DW of total polyphenols. The identification of phenolics in coriander fruits was made possible by the RP-HPLC analysis, with the predominant components in the Tunisian, Syrian, and Egyptian kinds being gallic and chlorogenic acids, respectively. Additionally, fruit methanolic extracts were used to demonstrate the DPPH radical scavenging action; the half maximum inhibitory concentration values ranged from 27.00 ± 6.57 to 36.00 ± 3.22 μg/mL. The reducing power activity's EC50 values varied significantly ($P < 0.05$), ranging from 54.20 ± 6.22 to 122.01 ± 13.25 μg/mL. The β-carotene bleaching assay's IC50 values ranged from 160.00 ± 18.63 to 240.00 ± 26.35 μg/mL. According to our findings, coriander fruit may be a rich and unusual source of natural antioxidants. It may also be recommended as a new possible source of natural antioxidants and employed as a food additive.[21]

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CHAPTER THREE:

PURPOSE OF THE STUDY

3.1 Purpose of Study:

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Identifying and quantifying the phytochemicals found in Coriandrum sativum leaves. Assessing the pharmacological activities, such as antioxidant, antimicrobial, anti-inflammatory, and other medicinal properties, using both in-vitro and in-vivo techniques. Investigating the relationship between the phytochemical components and their pharmacological effects to better understand the therapeutic potential of coriander leaves. Examining the possibilities for drug development by isolating bioactive compounds and evaluating their safety and efficacy.

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CHAPTER FOUR:

MATERIALS AND METHODS

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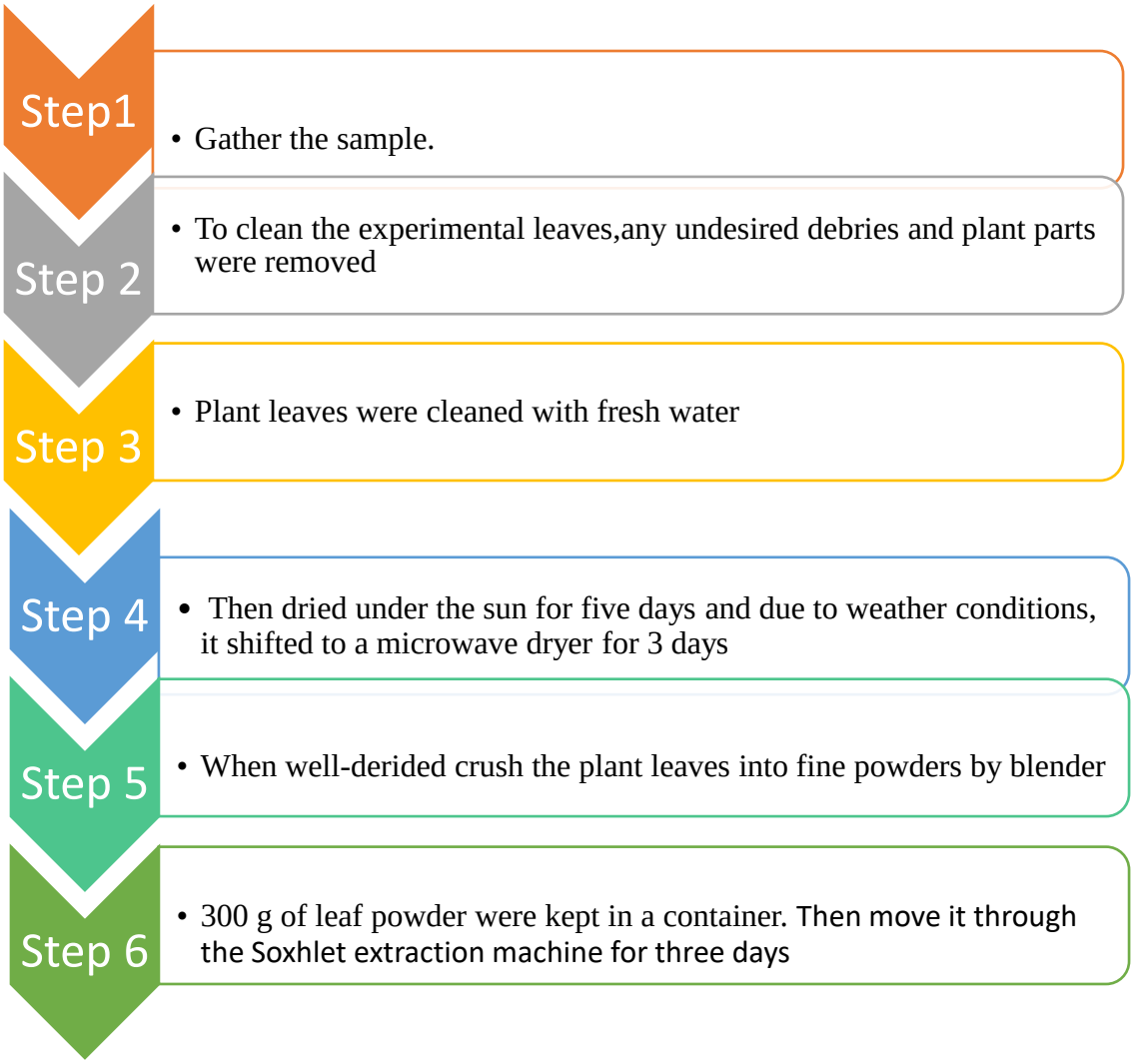
4.1 PLANT COLLECTION:

The *Coriandrum sativum* leaves were collected from the local area. It was collected during the day in June 2024. During collection of the leaves any chance of adulteration, hydrolysis, or chemical degradation was avoided.

4.2 PREPARATION OF PLANT FOR THE TEST:



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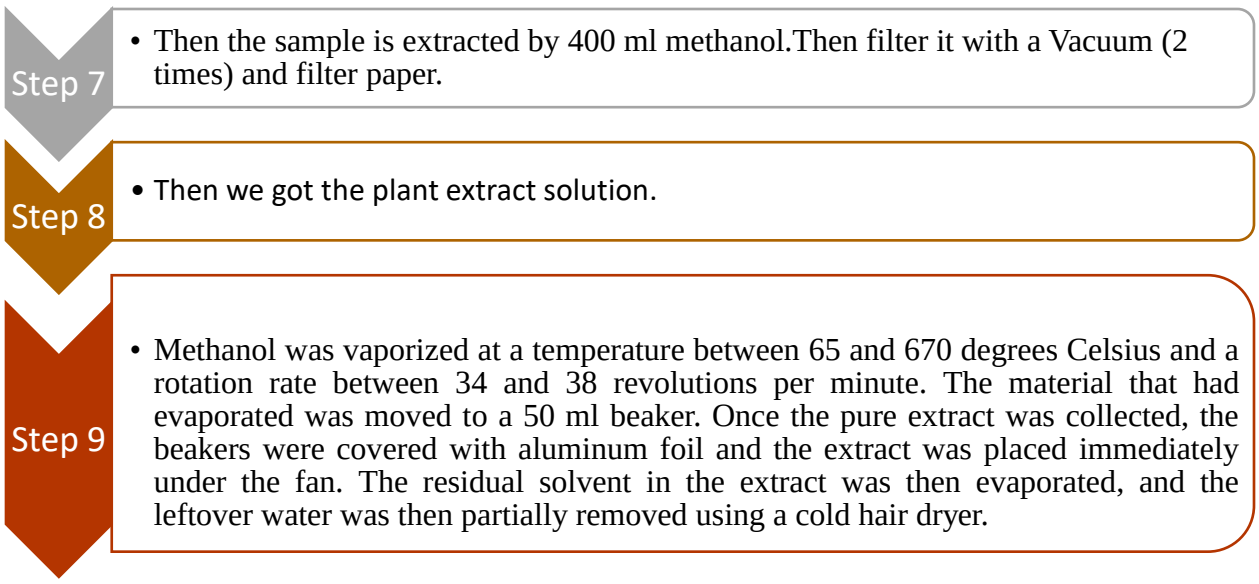

4.3 Preparation of plant sample

The leaves were picked when they were at their freshest. After around five days of shed drying, the leaves were sun-dried for two hours every day for two days to ensure that any residual moisture was gone and the leaves were crispy. The finely powdered leaves are ground and kept in an airtight container somewhere cool, dry, and dark until needed.

4.4 Extraction

Methanol was used to extract the dried leaves for a period of twelve days. To enhance the extraction process, the jar holding the methanol and leaves was shook often and sealed to keep air out.

4.5 Filtration

Following the extraction procedure, the plant extract was filtered using Whatman filter paper and sterile cotton. After being soaked in the necessary solvent, both objects were placed inside a funnel. The collected filtrate was stored in a glass jar.

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4.6 Evaporation

A rotary evaporator was used to evaporate the liquid extract. At a temperature of 65–670 degrees Celsius and a rotating speed of 34–38 revolutions per minute, the methanol was evaporated. A cool hair drier was used to evaporate the remaining solvent after the evaporated material was collected in a beaker.

4.7 Chemical Group test

Testing of a number of chemical groups included in the extract, which represents the preliminary phytochemical investigation. The following is how the chemical group test is conducted:

4.7.1 Test for Alkaloids

➢ Mayer's test:

Two milliliters of the sample solution and two milliliters of diluted hydrochloric acid were put to a test tube. Next, a milliliter of potassium mercuric iodide, also known as Mayer's reagent, was added. The production of a yellow precipitate indicates the presence of alkaloids.

➢ Dragendroff's Test

Two milliliters of the extract solution and two milliliters of diluted hydrochloric acid were put to a test tube. The Potassium Bismuth Iodide Solution, also known as Dragendroff's reagent, was then added in one milliliter. An orange-brown precipitate indicates the presence of alkaloids.

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➢ Wagner’s Test:

Wagner's reagent (potassium iodide) in 1 milliliter and the extract solution in 2 milliliters.When a brown or reddish-colored precipitation occurs, alkaloids are present.

4.7.2 Test for Flavonoids

A few drops of strong hydrochloric acid were applied to 1 milliliter of crude extract. The instantaneous creation of red hue suggested the presence of flavonoids.

4.7.3 Test for Saponins:

One milliliter of the extract solution was added to twenty milliliters of distilled water. Then shake it vigorously for fifteen minutes. This will cause clear foam to form, which indicates the presence of saponin.

4.7.4 Test for Phenols:

To a 2 ml extract solution, add 3 or 4 drops of ferric chloride solution. The appearance of a blue-black color indicates the presence of phenols.

4.7.5 Test for Glycosides:

i. One milliliter of water was mixed with a small amount of an alcoholic extract made from either fresh or dried plant material. A few drops of sodium hydroxide in water were then added. Previously, it was thought that the presence of glycosides was indicated by a yellow tint.

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ii. Fehling's solution was heated along with a small amount of water, alcohol, and an alcoholic plant material extract. It was believed that the brick-red precipitates indicated the presence of glycosides.

iii. A few drops of diluted sulfuric acid were added to a fraction of the extract that had been dissolved in alcohol and water, heated, and neutralized with sodium hydroxide solution. The purpose of this procedure was to detect the presence of glycosides.

4.7.6 Test for Gum:

Molish reagent and sulfuric acid were then added to the 5 ml extract of solution. A violet ring forms at the intersection of two liquids, signifying the presence of gum.

4.7.7 Test for Steroids:

One milliliter of the aqueous solution was dissolved in two milliliters of chloroform in a test tube. Carefully applying strong sulfuric acid to the test tube wall created a lower layer. The presence of a reddish-brown color at the interface suggested the presence of a steroid ring, or the aglycone portion of the glycoside.[22]

4.8 Thrombolytic Activity Test:

Thrombocytes, or platelets, are a component of blood that work in tandem with coagulation factors to react to bleeding caused by damage to blood vessels by clumping together and initiating a blood clot. Thrombosis is the term used to describe the formation of a blood clot, or thrombus, inside a blood vessel. It prevents blood from regularly flowing through the circulatory system. A blood clot that forms in the veins is referred to as venous thromboembolism. This may lead to deep vein thrombosis and pulmonary emboli. A clot that forms in the arteries and can result in a heart attack or stroke is known as Atheros-thrombosis.

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Working procedure and dose calculation of Thrombolytic activity

Standard:

Streptokinase 1500000 IU/5ml

Dose: 30000 IU in 100 µl

That means, 1500000 IU streptokinase dissolved in 5 ml distilled water

= 100 µl distilled water contains 30000 IU streptokinase

Extract Dose:

1000 µg in100 µl

Extract Concentration:

Stock solution=100mg/10ml

That means, 100 mg extract dissolved in 10 ml distilled water

Or, 100000 µg extract dissolved in 10000 µl distilled water

1000 µg extract dissolved in 100 µl distilled water = 100µl distilled water i.e. 1000µg/100 µl

Procedure:

1. Weighed the blank tube initially.
2. After that, draw blood from the subject and fill each tube with 1 milliliter.
3. And waits for the clot to develop for 45 minutes at 37 °C incubation.
4. Next, use a tube to separate serum from blood and weigh the first clot.
5. Mass of 1^{st} coagulation = mass of 1^{st} coagulation with tube - mass of blank tube
6. Next, apply a standard dose of 100 µl, or 30000 IU, control with 100 µl of distilled water, and extract 100 µl, or 1000 µg/100 µl.
7. And once more stands for a 90-minute clot lysis incubation at 37 °C.
8. Take off the tube containing the lysis blood fluid.
9. and used tube weight to measure the second clot.
10. Next, 2^{nd} coagulation mass is equal to 2^{nd} clot with tube mass less blank tube mass.
11. 1st coagulation mass – 2nd coagulation mass equals the weight of the Lysis clot.

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12. Finally,

$$\% \text{ of lysis} = \frac{\text{wt of Lysis clot}}{1^{st} \text{ clot weight}} \times 100$$

[23]

4.9 Anti- Oxidant Activity:

A serial dilution of the plant extract was performed using a stock solution that was made in methanol (10 mg/ml). Initially, five volumetric flasks are used to create five distinct concentration types: 10, 25, 50, 100, and 500 µg/ml. Foil paper is used to cover volumetric flasks and test tubes. A serial dilution of the extract is carried out and labeled in five volumetric flasks.

Using a pipette, 2 ml of each concentration's sample and 2 ml of the 0.004% DPPH solution are added to 5 test tubes, respectively. Each test tube is then wrapped in foil, and the solution is left in a dark room for 30 minutes. To create the blank solution, two milliliters of 0.004% DPPH and two milliliters of methanol are taken and placed in a different test tube. After that, absorption is measured using UV spectroscopy. The following formula is used to compute the percent of inhibition. [24][25][26]

$$\% \text{ inhibition} = \frac{\text{Blank absorbance} - \text{Solution absorbance}}{\text{Blank absorbance}} \times 100$$

Working Procedure for Anti-oxidant Test

Stock Solution Concentration:

10 mg/ml

Measured 2.5 ml stock solution:

1ml contain 10 mg

2.5ml contain (10X25) mg =25 mg

Dilution of Stock solution:

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Dilution Factors = Old Concentration/ New Concentration

Then, **Dilution Factors** = New volume/Old volume

Serial Dilution:

Serial Dilution of Concentration **500µg, 100µg, 50µg, 25µg, 10µg**

500µg = 1ml stock solution + 19ml solvent (methanol)

100µg= 1ml 500µg concentration solution + 4ml solvent (methanol)

50µg= 5 ml 500µg concentration solution + 5 ml solvent (methanol)

25µg= 5 ml 50µg concentration solution + 5 ml solvent (methanol)

10µg= 4 ml 50µg concentration solution + 6 ml solvent (methanol)

DPPH solution:

The DPPH stock solution has a 0.004% DPPH content.

That means,

100 ml solvent (methanol) contain 0.004gm DPPH

For STD solution, Ascorbic Acid:

25 mg in 2.5 ml methanol solution.

Serial Dilution of Concentration **500µg, 100µg, 50µg, 25µg, 10µg**

500µg = .5 ml stock solution + 9.5 ml solvent (methanol)

100µg= 2 ml 500µg concentration solution + 8 ml solvent (methanol)

50µg= 5 ml 500µg concentration solution + 5 ml solvent (methanol)

25µg= 5 ml 50µg concentration solution + 5 ml solvent (methanol)

10µg= 4 ml 50µg concentration solution + 6 ml solvent (methanol)

Working Procedure:

1. At first, prepare the stock solution of extract in concentration 10mg/ml.

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2. Then, dilution this concentration of 500µg, 100µg, 50µg, 25µg, 10µg concentration of serial dilution
3. Prepared 0.004% DPPH solution in solvent (methanol)
4. Then, different strength of extract solution/standard solution and DPPH solution are added in 1:3, that means 1ml extract solution and 3ml DPPH solution are added.
5. Blank solution prepares the 1ml solvent (methanol) added with 3ml DPPH solution.
6. Then, 45 minutes stay in dark place.
7. Finally, measured the blank solution and different concentration of extract solution/standard solution of absorbance in 517 nm.

Measurement of % of inhibition:

For Extract:

$$\% \text{ of inhibition} = \frac{\text{Blank solution absorbance} - \text{Extract solution absorbance}}{\text{Blank solution absorbance}} \times 100$$

For STD:

$$\% \text{ of inhibition} = \frac{\text{Blank solution absorbance} - \text{STD solution absorbance}}{\text{Blank solution absorbance}} \times 100$$

Next, enter the Microsoft Excel data together with the X-excess of concentration and the Y-excess of inhibition percentage.

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CHAPTER FIVE:

RESULT AND DISCUSSION

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6.1: Results of phytochemical screening:

Phytochemical constituents	Results
Alkaloids	+
Flavonoids	+
Saponins	+
Phenols	+
Glycosides	–
Gum	–
Steroids	+

Table: 01

Positive sign means presence of compound and negative sign means absence of compound. The plant contains steroids, phenols, saponins, alkaloids, flavonoids.

Discussion:

The results you provided indicate that the plant or plant extract you are studying contains a variety of phytochemical constituents with potential medicinal properties. Further research can help to identify the specific compounds present and their potential applications.

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6.2 Result of Thrombolytic Activity:

Serial	Tube weight (g)	1st clot weight with tube (g)	Weight of 1st clot (g)	2nd clot with tube (g)	Weight of 2nd clot (g)	% of lysis
Blank	.672	1.712	1.4	1.532	.86	17.31
Standard	.71	1.76	1.5	1.004	.294	72
Sample (250 µg/ml)	.8	1.708	.908	1.439	.639	29.63
Sample (500 µg/ml)	.754	1.49	.736	1.22	.471	36
Sample (1000 µg/ml)	.794	1.594	.8	1.265	.471	41.13

Table : 02

The data indicates that the experimental agent is capable of breaking down blood clots, and its effectiveness is influenced by its concentration.

Discussion:

The data suggests that fibrinolytic activity is actually present in the experimental samples. The proportion of lysis rises in tandem with the agent's concentration. This implies that the concentration of the drug and its capacity to dissolve clots are related in a dose-dependent manner.

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6.3 Anti-Oxidant Activity Test:

For STD (Ascorbic acid):

Concentration (µg)	Absorbance (nm)	% of inhibition
500	0.083	73.05
100	0.097	68.5
50	0.119	61.36
25	0.161	47.72
10	0.197	36.03

Table : 03

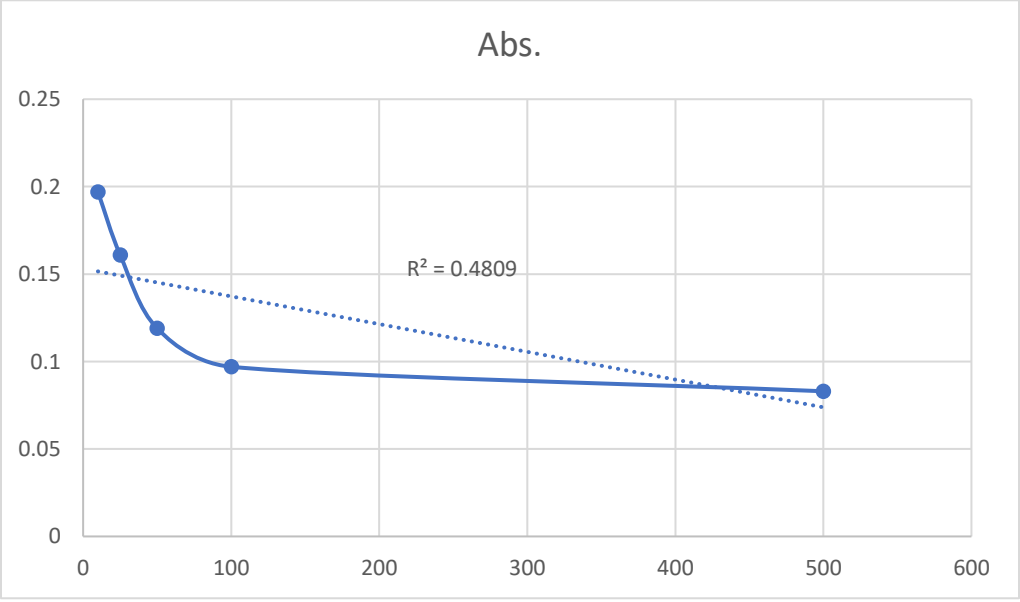

Fig: 02 STD - Ascorbic Acid

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The absorbance falls as the substance's concentration rises (from 10 µg to 500 µg). A greater degree of inhibition is indicated by this drop in absorbance. As a result, the chemical inhibits the process being tested more effectively at larger concentrations.

Discussion:

The information shows that the chemical inhibits the measured process in a concentration-dependent manner. A greater comprehension of the substance's characteristics and possible uses can be obtained through additional investigation, such as IC50 determination and mechanistic research.

For sample (*Coriandrum sativum L.*)

Concentration (µg)	**Absorbance (nm)**	**% of inhibition**
500	0.098	68.18
100	0.137	55.52
50	0.165	46.43
25	0.209	32.14
10	0.248	19.48

Table : 04

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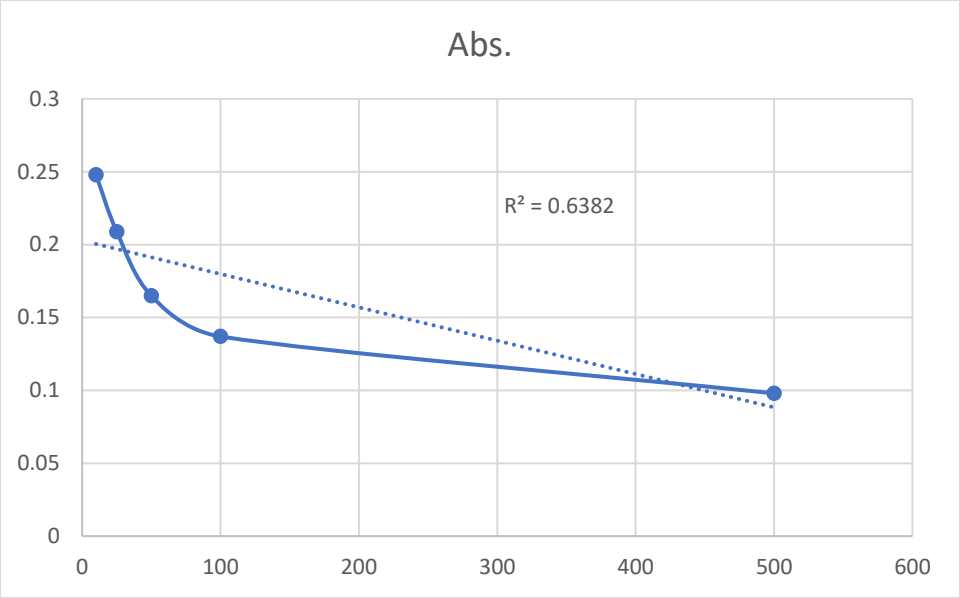

Fig 03: Sample

The absorbance falls as the substance's concentration rises, suggesting a greater degree of inhibition. This implies that the material is successfully obstructing the process under measurement.

Discussion:

The information shows that the chemical inhibits the measured process in a concentration-dependent manner. A greater comprehension of the substance's characteristics and possible uses can be obtained through additional investigation, such as IC50 determination and mechanistic research.

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CHAPTER SIX: CONCLUSION

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6.1 CONCLUSION

The results of this investigation show that Coriandrum sativum leaves have a promising future as a natural chemical source with potential medical uses. Numerous bioactive substances, including alkaloids, flavonoids, saponins, phenols, and steroids, were found through phytochemical screening. These substances have been linked to a number of pharmacological characteristics, including thrombolytic, antioxidant, and anti-inflammatory effects. Coriandrum sativum's promise is further supported by the biological activity testing. Significant thrombolytic activity was shown by the plant extract, indicating that it may be used to treat or prevent thrombotic diseases. Furthermore, the extract exhibited strong antioxidant activity, suggesting its capacity to counteract oxidative stress and offer protection against associated illnesses. To completely understand the unique mechanisms of action of the bioactive chemicals and assess their safety and effectiveness in vivo, more research is necessary. Understanding particular compounds' pharmacological characteristics and possible uses may be gained by isolating and analyzing them. Overall, the study's findings point to Coriandrum sativum leaves as a possible natural chemical source for the creation of cutting-edge medicinal products. Subsequent investigations ought to concentrate on examining the possible advantages of this herb in several medicinal domains.

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CHAPTER SEVEN: REFERENCES

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