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RESEARCH ARTICLE

QUALITATIVE AND QUANTITATIVE PHYTOCHEMICAL TEST OF *RICINUS COMMUNIS*

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ABSTRACT

Ricinus communis L. (Castor oil plant) is an annual or perennial shrub belonging to the family Euphorbiaceae. The aim of present work to carried out extraction, phytochemical analysis and quantitative study of various phytoconstituents using UV Vis. Spectroscopy. Total phenolic content was estimated by gallic acid and expressed as milligrams of gallic acid equivalent (GAE). All the extracts contained a considerable amount of phenolic contents of GAE/g of extract. Flavonoid content was calculated from the regression equation of the standard plot ($y=0.02x+0.020$, $R^2=0.997$) and is expressed as quercetin equivalents (QE). Total Flavonoid content was 0.165mg/100mg quercetin equivalent in HERC. Flavonoids are the most common and widely distributed group of plant's phenolic compounds. *Ricinus communis* is rich in flavonoid, phenols and various compounds. It shows that the presence of such bioactive compounds have medicinal importance. As a promising source of bioactive compounds, it can be an excellent source of useful drugs. It will obviously be due to high contents of the phytochemicals in the Hydroalcoholic extract.

Key words: *Ricinus communis*, Total Phenolic content, Total Flavonoid content, Quantitative.

INTRODUCTION:

Ever since ancient times, in search for rescue for their disease, the people looked for drugs in nature. The beginnings of the medicinal plants' use were instinctive, as is the case with animals.[1] In view of the fact that at the time there was not sufficient information either concerning the reasons for the illnesses or concerning which plant and how it could be utilized as a cure, everything was based on experience. In time, the reasons for the usage of specific medicinal plants for treatment of certain diseases were being discovered; thus, the medicinal plants' usage gradually abandoned the empiric framework and became founded on explicatory facts. Until the advent of Photochemistry in 16th century, plants had been the source of treatment and prophylaxis.[2] Nonetheless, the decreasing

efficacy of synthetic drugs and the increasing contraindications of their usage make the usage of natural drugs topical again.

Phytochemicals are the chemicals that present naturally in plants. Now-a-days these phytochemicals become more popular due to their countless medicinal uses. Phytochemicals play a vital role against number of diseases such as asthma, arthritis, cancer etc. unlike pharmaceutical chemicals these phytochemicals do not have any side effects. Since the phytochemicals cure diseases without causing any harm to human beings these can also be considered as "man friendly medicines". This paper mainly deals with collection, extraction, qualitative and quantitative analysis of phytochemicals.

Ricinus communis L. (Castor oil plant) is an annual or perennial shrub belonging to the family Euphorbiaceae. Leaves have long petiole and palm like lobed blades. Inflorescence consists of unisexual flowers which are arranged at the top of the axis in the form of panicles; male flowers lie towards the base and female flowers towards the apex; perianth leaves (sepals and petals) are inconspicuous and caducous. Fruit is three chambered, globose capsule with soft spines [3]. When capsules mature, they split up into three cavities and the seeds are expelled out[4]. Seeds are dorsiventrally flattened, ovoid, fleshy, and covered by grayish, silvery or light brown generally dotted seed coats [5]. The aim of present work to carried out extraction, phytochemical analysis and quantitative study of various phytoconstituents using UV Vis. Spectroscopy.

Material and Methods

Collection of plant materials

The leaves of *Ricinus communis* (castor) were collected from local area of Bhopal in the period of March 2022, considering the seasonal conditions for obtaining maximum phytoconstituents.

Extraction (By Maceration Method) [6]

Maceration

Collected plant drugs namely *Ricinus communis* leaves were cleaned properly and washed with distilled water to remove any kind of dust particles. Cleaned and dried plant drugs were converted into moderately coarse powder in hand grinder. Powdered plant drugs were weighed (50 gm) and packed in (1 liter) air tight glass Bottle. The plant drugs were subjected to extraction by Methanol+water (20:80) as solvent for about 24 hrs. The liquid extract was collected in a tarred conical flask. The solvent removed from the extract by evaporation method using hot plate. The extracts obtained with each solvent were

weighed to a constant weight and percentage w/w basis was calculated.

Phytochemical Analysis

Preliminary Phytochemical Screening

Preliminary phytochemical screening means to investigate the plant material in terms of its active constituents. In order to detect the various constituents present in the Hydroalcoholic extract of leaves of *Ricinus communis*, were subjected to the phytochemical tests as per standard methods. Phytochemical screening was revealed for the presence of alkaloids, glycosides, carbohydrates, tannins, resins, flavonoids, steroids, proteins and amino acids using standard methods [7, 8].

Estimation of total phenolic content

Total phenolic content of the extract was evaluated with Folin-Ciocalteu method. Samples containing polyphenols are reduced by the Folin-Ciocalteu reagent there by producing blue colored complex. The phenolic concentration of extracts was evaluated from a gallic acid calibration curve. To prepare a calibration curve, aliquots of 5, 10, 15, 20 and 25µg/mL methanolic gallic acid solutions were mixed with 2.5 mL Folin– Ciocalteu reagent (diluted ten-fold) and 2.5 mL (75 g/L) sodium carbonate. After incubation at 25°C for 30 min, the quantative phenolic estimation was performed at 765 nm against reagent blank by UV Spectrophotometer 1650 Shimadzu, Japan. The calibration curve was constructed by putting the value of absorbance vs. concentration. A similar procedure was adopted for the extract as above described in the preparation of calibration curve. All determinations were performed in triplicate. Total phenolic content was expressed as milligrams of gallic acid equivalent (GAE) per g of extract [9].

Estimation of total flavonoids content

The aluminum chloride colorimetric method was modified from the procedure reported by Woisky and Salatin [10]. Quercetin was used to make the calibration curve. Ten milligrams of quercetin was dissolved in 80% ethanol and then diluted to 10 to 50 µg/mL. The diluted standard solutions (0.5 mL) were separately mixed with 1.5 mL of 95% ethanol, 0.1 mL of 10% aluminum chloride, 0.1 mL of 1M potassium acetate and 2.8 mL of distilled water. After incubation at room temperature for 30 min, the absorbance of the reaction mixture was measured at 415 nm with a Shimadzu spectrophotometer. The amount of 10% aluminum chloride was substituted by the same amount of distilled water in blank.

Similarly, 0.5 mL of Hydroalcoholic extracts and Flavonoid standard solutions (100 ppm) were reacted with aluminum chloride for determination of Flavonoid content.

Results and Discussion

The percentage yield of Hydroalcoholic extract of *Ricinus communis* was found to 6.32% by using maceration method. The percentage yield was found to be slight higher due to polar nature of solvent, methanol and water table 1.

Results of Phytochemical test showed the presence of Carbohydrates, Flavonoids, Proteins & Amino acids, Phenols, Diterpenes and Saponins, Alkaloid was found to absent in extract *Ricinus communis* leaves. The results of phytochemical revels that the all polar and Methanolic and aqueous soluble compound was found to be present in *Ricinus communis* leaves extract table 2.

Total phenolic content was estimated by gallic acid and expressed as milligrams of gallic acid equivalent (GAE). The extract contained a considerable amount of phenolic contents of GAE/g of extract. The results were presented in table 3, Fig 1.

Flavonoid content was calculated from the regression equation of the standard plot ($y=0.02x+0.020$, $R^2 =0.995$) and is expressed as quercetin equivalents (QE) table 4, Fig. 2. Total Flavonoid content was 0.165mg/100mg quercetin equivalent in HERC.

Table 1: Extractive values obtained from *Ricinus communis*

S. No.	Solvent	% Yield
1.	Methanol+water (20:80)	6.32%

Table 2: Preliminary phytochemical screening of *Ricinus communis*

S. No.	Solvent	% Yield	S. No.
1	Alkaloids	Wagner's Test	**-(ve)**
2	Carbohydrates	Fehling's Test	**+(ve)**
3	Flavonoids	Lead acetate	**+(ve)**
		Alkaline reagent test	**+(ve)**
4	Proteins & Amino acids	Precipitation test	**+(ve)**
5	Phenols	Ferric chloride test	**+(ve)**
6	Diterpenes	Copper acetate test	**+(ve)**
7	Saponins	Foam test	**+(ve)**

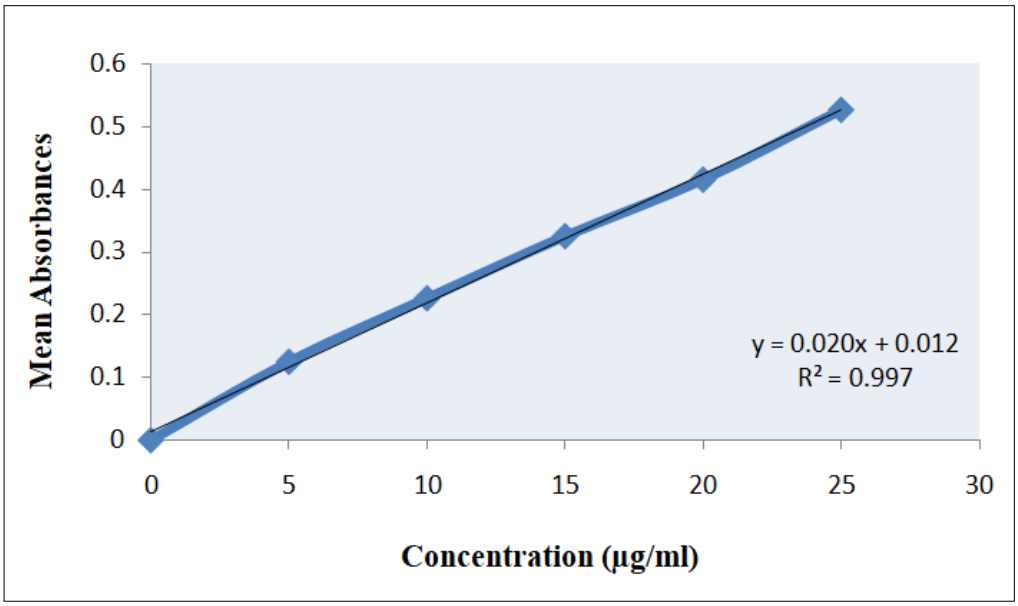

Figure: 1 Standard (Gallic acid) Calibration curves

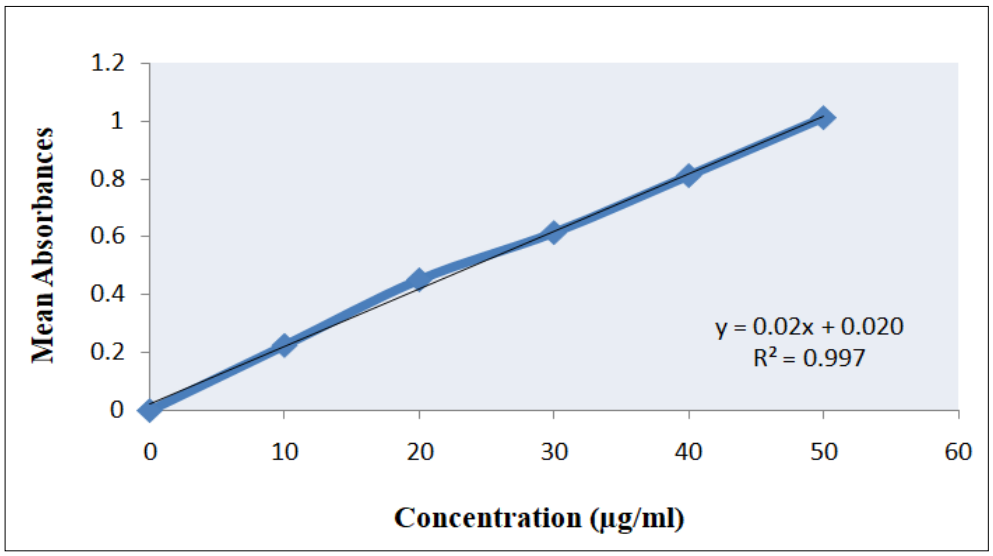

Figure: 2 Standard (Quercetin) Calibration curves

Table 3: Total Phenolic Content of Hydroalcoholic extract of *Ricinus communis*

Sample	Total phenolic content GAE mg/100mg
Hydroalcoholic extract 100µg/ml	0.215

Table 4: Total Flavonoid content of Hydroalcoholic extract of *Ricinus communis*

S. No.	Solvent	% Yield
1	Hydroalcoholic extract (100µg/ml)	0.165

Conclusion

In the present study, we have found that the plant *Ricinus communis* is rich in flavonoid, phenols and various compounds. It shows that the presence of such bioactive compounds have medicinal importance. As a promising source of bioactive compounds, it can be an excellent source of useful drugs. It will obviously be due to high contents of the phytochemicals in the Hydroalcoholic extract.

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