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Quantitative Screening of Phytochemicals of Different Parts of *Ficus benghelensis* Linn.

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Abstract

The present study was carried out to investigate the quantitative and phytochemical screening of different part of *Ficus benghalensis Linn* using standard technique. The Methanolic extract of different part of *ficus benghalensis* were analyzed quantitatively by spectrophotometric method for the phytochemicals: flavonoids, total phenol and flavonols. Phytochemical screening of the plant showed the presence of flavonoid, cardiac glycosides. The quantitative screening of phyto-constituents contained in the different plant extract of the *ficus benghalensis* revealed that flavonol are high 363µg/ml, flavonoid is relatively moderate 129.408 µg/ml and phenol content is 5.359 µg/ml. This study vindicates the curative usage of *ficus benghalensis* in traditional medicine.

Keyword*: Ficus Benghalensis Linn.* , Antioxidant, Phytochemical, ascorbic acid

1. Introduction

Plants are utilized extensively as raw drugs for many formulations in traditional systems of medicine[1,2]. Medicinal plants have curative properties due to the presence of various complex chemical substances of different composition, which are found as secondary plant metabolites in one or more parts of these plants[2,3]. The plants have the ability to produce large variety of secondary metabolites such as terpenoids, alkaloids, flavonoids and phenyl propanoids, which together account for 200,000 compounds[4]. Phytochemical are bioactive compound found in plant that work with nutrient and dietary fibers which protect against various diseases[5].

The most widely occurring group of Phytochemical is flavonoids and phenolic compound present in plant. Biological activity of these groups of Phytochemical was reported in several studies[6]. Phenolic compounds have gained much attention, due to their antioxidant activities and free radical-scavenging abilities, which potentially have beneficial implications for human health. Flavonoids are regarded as one of the most widespread groups of natural constituents found in plants. Polyphenols and flavonoids are used for the cure and prevention of various diseases[7].

Ficus bengalensis also known as Indian banyan tree[8] and its belong to the family Moraceae. The imposing banyan tree of poetry and legend is a store-house of invaluable remedies for some of the deadliest diseases[9]. *Ficus benghalensis* which is an indigenous plant possessing reputed medicinal properties, have been listed in Ayurvedic literature[2,10].Various scientific studies have been carried out on *Ficus benghalensis* and various pharmacological activities have been reported. It has been reported to possess immunomodulatory, hypoglycemic, antioxidant, antistress and antiallergic, anthelmintic activities[11]. The main

focus is given to the study of phytochemical screening and the quantitative activity of these plants.

2. Materials And Methods

PLANT MATERIALS AND EXTRACTION:

The different plant parts (leaves, bark, fruit, and stem) of *ficus benghalensis* were collected from University campus of MGCGV, Chitrakoot, Satna (M.P. India) washed with water and then washed with methanol and allowed to dry in shade at room temperature. Dried parts of plats grind and passed through 120 no sieve. Take 20gm of sieved powder of *F. benghalensis* then added 100ml (80%) methanol and using cold maturation method for extraction. Extract was filtered through the whatman No.1 filter paper. The filtrate was concentrated under room temperature for dryness.

2.1 Preliminary Phytochemicals Screening

Phytochemical screening performed were using by given standard procedure.

Flavonoids

In 1 ml methanolic extract added 1ml dilute ammonia in a test tube, yellow color appeared then added few drop of conc. H_2SO_4, yellow color was disappear. Indicate presence of Flavonoids.

Tannins

1 ml of the methanolic extract and 2 ml of water was added in a test tube. Then 2 to 3 drops of diluted ferric chloride solution was added and observed for green to blue-green (cathechic tannins) or a blue-black (gallic tannins) coloration.

Carbohydrate

In 2ml of methanolic extract and 1ml molish reagent was added in a test tube. Then added 2 to 3 drop of conc. H_2SO_4 at the side wall of test tube and observed purple and violet color ring at the junction of two liquid.

Reducing Sugar

The methanol extract (1 ml) and 2 drops of boiling Fehling's solution (A and B) was added in a test tube. The formation of a precipitate red-brick in the bottom of the tube indicates the presence of reducing sugars.

Starch

The aqueous extract 5ml was treated with the reagent of the starch (iodine) blue violet color obtain indicates the presence of starch.

Protein

2 ml Methanolic extract of was added 1drap 1% NaOH and 2 drop 1% $CuSO_4$ in a test tube. Blue or purple color is obtained indicates the presence of protein.

Saponins

1 ml of methanolic extract was added and few volume of distilled water in a test tube. The solution was shaken vigorously and observed for a stable persistent froth for 20 min, indicates the presence of saponin.

Terpenoids

In 2 ml of methanolic extract was added 1 ml chloroform shake properly and added H_2SO_4. Raddish brown ring in obtained. Indicate the presence of terpenoids.

Steroids

2 ml of methanolic extract few amount of chloroform was added and shake properly and added 3 to 4 drop of acetic anhydride and 1drop H_2SO_4in a test tube. Formation of purple color change in to green. Indicate the presence of steroids.

Glycosides

2 ml of methanolic extract, 0.5 ml glacial acetic acid shake properly and added 3 to 4 drop of $FeCl_3$ in a test tube. Formation of brown color ring at the interface of test tube. Indicate the presence of cardiac glycosides.

Phenol

2 ml of methanolic extract was added 2 ml 5% aqueous $FeCl_3$ in a test tube. Formation of blue color obtained. Indicate the presence phenol.

Alkaloids

2 ml of methanolic extract was added 2 ml Mayer reagent in a test tube. Form white ppt. Indicate the presence alkaloids.

2.2 Quantitative Analysis

Total polyphenolic content

Total polyphenolic content of different part of plant extract was measured by using Folin - Ciocaiteu reagent. The 25µl of plant extract diluted with 125µl water followed by addition of 150µl of Folin- ciocalteu (1N) & 25µl of Na_2CO_3 (20% W/V) and incubated at 45°C for 60 min then absorbance was measured by spectrophotometrically at 765nm (Bio Tek Synergy H4 multimode micro plate reader Bio Tek instrument, Inc Winoosci, VT, USA). Absorbance was recorded triplicates. Quantification was performed with respect to the standard curve of querecitin (equation). Result was expressed as milligram of querecitin equivalent per ml of extract[14].

Total flavonoid content

Total flavonoid in the plant extracts, in brief, 100 µl of sample, followed by 100 µl of $AlCl_3.6H_2O$ in ethanol and 150µl Sodium acetate, solution added. The absorbance at 430nm was taken (BioTeksynergyH4 multi-mode microplate reader, Bio Tek Instruments, Inc Winooski, VT, USA), after 2.5 h of incubation at 200 C. Total flavonoid contents were calculated with respect to the standard curve of the flavonoid quercetin dehydrate (equation). Results were expressed as micrograms of quercetin dehydrate equivalents (QE) per ml of the extract[14].

Flavonol

Flavonol content in the sample (100 times diluted with methanol) was measured by mixing equal volume of plant extract with 2% $AlCl3.6H_2O$ in a 96 well plate. Absorbance was recorded at 420 nm spectrophotometrically (Bio Tek synergyH4 multi-mode microplate reader, BioTek Instruments, Inc Winooski, VT, USA). Flavonol contents in the extracts were determined with respect to the standard curve of the flavonoid quercetin (equation). Results were expressed as micrograms of quercetin equivalents (QE) per ml of the extract.

3. Results And Discussion

The result of screening of Phytochemical from different part of *Ficus bhenghalesi Linn* showed the presence of medicinal active constituent like Flavonoid, Tannin, saponin, terpenoids, steroids and glycosides were given in **Table-1**.

Phytochemical analysis conducted on the plant extracts revealed the presence of constituent which are known to exhibit medicinal as well as physiological activity. Analysis of plant extract revealed the presence of Phytochemical such as alkaloid, flavonoid, tannin, saponin, glycosides, terpeniods, steroids have been associated with medicinal properties. Phytochemical are the basic source for the establishment for several Pharmaceutical industries. The constituent present in the plants play a significance role in the identification of crude drugs. Phytochemical screening is very important in identifying the new source of therapeutically and industrial important compounds like alkaloids, flavonoids, terpeniods, phenolic compound, saponin, steroids etc.

The quantitative analysis of *Ficus bhenghalesis Linn*. total phenolic content, total flavonoide and flavonol were carried out using multimode micro plate reader. The total phenolic content in plant extract is expressed in term of Cathechol equivalent **Fig. 1** (The equation of standard curve is Y =0.0139 X + 0.085 R^2 = 0.9859). The concentration of total phenolic content was estimated 5.395 in leaf, 0.359 in stem, 3.093 in bark and 2.589 µg/ml in fruit were given in **Table-2**. Phenolic compound occur ubiquitously in plants and a va- riety of biological activities have been attributed to them.

The total flavonoid content in plant extract is expressed in term of qurecetin equivalent **Fig. 2** (The equation of standanrded curve is Y = 0.0049 X +0.0949 R^2 =0.9969). The concentration of total flavonoid content in plant extract was estimated 55.326 in leaf, 129.408 in stem, 134.91 in bark, and 99.6122 in fruit were given in **Table-3**.

The flavonol content in plant extract is expressed in term of qurecetin equivalent **Fig. 3** (The equation of standanrded curve is Y= 0.0024+0.0635 R^2 =0.9855). The concentration of flavonol content in plant extract was estimated 123.5417 in leaf, 363.125 in stem, 268.9583 in bark and 111.875 in fruit were given in Table-4.

Table 1: Phytochemical screening of different part of ficus benghalensis

Phytochemicals	Test	Laef	Stem	Bark	Fruit
Flavonoid	-	+	+	+	+
Tannin	-	+	+	+	+
Carbohydrate	Molish	+	+	+	+
	Fehling	+	+	+	+
Protein	Biuret	+	-	-	+
Saponin	Foam	+	+	+	+
Terpeniods	-	+	+	+	+
Steroids	-	+	+	+	+
Glycoside	-	+	+	+	+
Phenol	-	+	+	+	+
Alkaloids	Meyer	-	-	-	-
Starch	Iodine	+	+	+	+

Table 2: Total Polyphenol content of different part of ficus benghalensis

S.NO.	Plant name	Botanical name	Total Polyphenol
1.	Bargad leaf	*Ficus benghalensis*	5.395µg/ml
2.	Bargad bark	*Ficus benghalensis*	3.093 µg/ml
3.	Bargad stem	*Ficus benghalensis*	0.359µg/ml
4.	Bargad Fruit	*Ficus benghalensis*	2.589 µg/ml

Table 3: Flavonoid content of different part of ficus benghalensis

S.NO.	Plant name	Botanical name	Total Flavonoid
1.	Bargad leaf	*Ficus benghalensis*	55.326µg/ml
2.	Bargad bark	*Ficus benghalensis*	139.91µg/ml
3.	Bargad stem	*Ficus benghalensis*	129.408µg/ml
4.	Bargad Fruit	Ficus benghalensis	99.6122µg/ml

Table 4: Flavanol content of different part of ficus benghalensis

S.NO.	Plant name	Botanical name	Total Flavonol
1.	Bargad leaf	*Ficus benghalensis*	123.54 µg/ml
2.	Bargad bark	*Ficus benghalensis*	268.95 µg/ml
3.	Bargad stem	*Ficus benghalensis*	363.12 µg/ml
4.	Bargad Fruit	*Ficus benghalensis*	111.87µg/ml

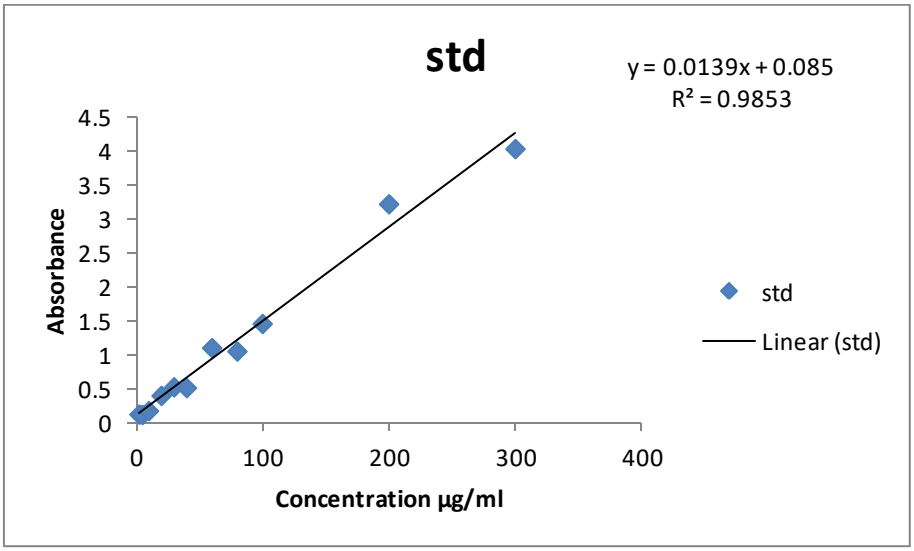

Fig. 1: Standanred graph of cathechol for total phenol

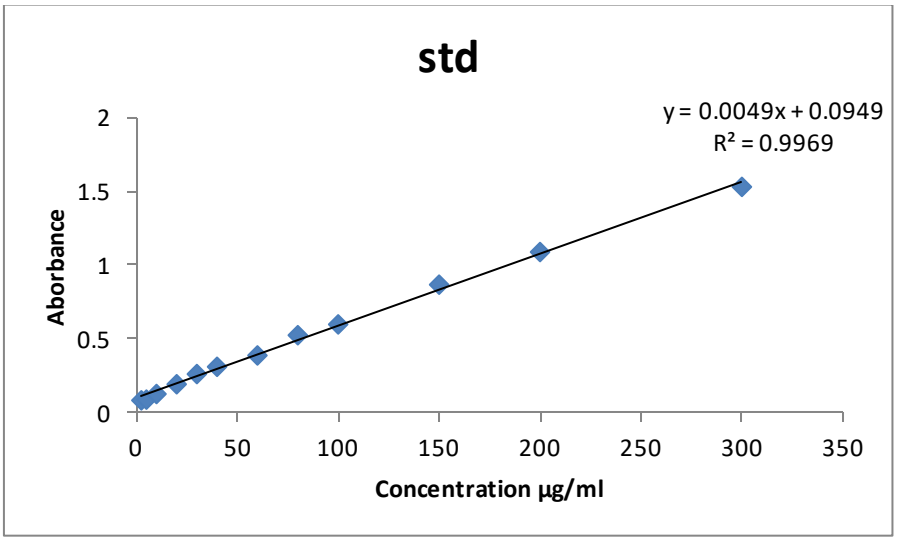

Fig. 2: Standarderd graph of qurecetin for Flavonoid

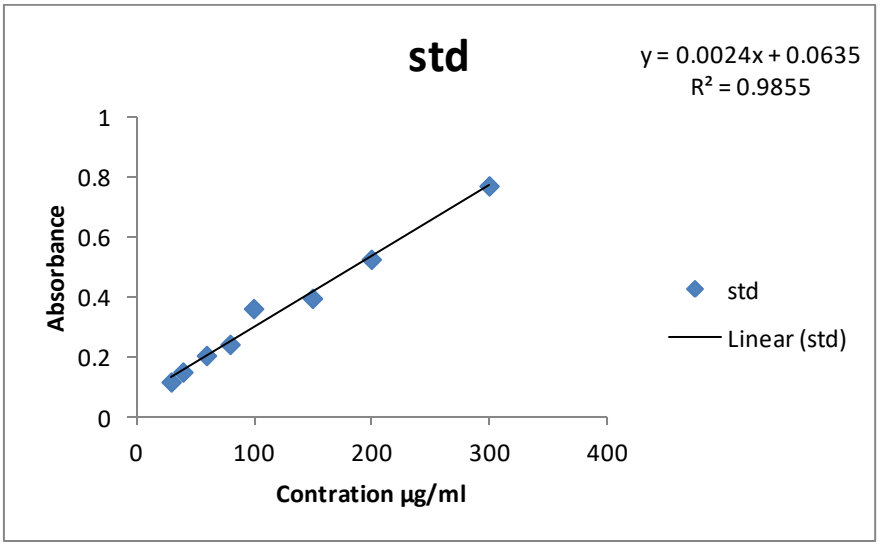

Fig. 3: Standared graph of qurecetin for Flavonol

4. Conclusion

The present research work concludes that *Ficus* benghalensis is important medicinal plants and contains various active phyto constituents. The overall result obtain by present study we observed that the total flavonoid content was highest in *Ficus benghalensis* leaf and lowest in stem. Highest flavonol content was found in *F. benghalensis* stem, lowest in fruit and total phenolic content was highest in leaf and lowest in stem.

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