



Relative study of Phytochemical Analysis of Bioactive Compounds of *Emblica officinalis* fruit extract

Akanksha Tripathi¹, Ritu Thakur Bais¹ and Vinod Singh²

¹Department of Botany, MLB College, Bhopal.

²Department of Microbiology, Barkatullah University, Bhopal

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ABSTRACT

The main objective of the research work was to check the presence or absence of the phytochemical constituents in the *E. officinalis*. The results of the phytochemical analysis of this medicinal plant showed that the terpenoids, tannins, reducing sugar, flavonoids and alkaloids were found to be present in mentioned medicinal plant.

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Introduction

Plant based medicines are the basis of many of the modern pharmaceutical industries present for various ailments. Medicinal plants having one or more parts that contains substance can be used for therapeutic purpose or as precursor for synthesis of useful drugs [1]. Most of the plants used in traditional Indian system of medicine have been found active against a wide variety of microorganisms [2, 3, 4]. Phytochemical compounds that are present in plant parts are the natural bioactive compound found in plants, which work with fibers and nutrients to form an integrated part of immune system against stress conditions and various diseases. The quantitative estimation of various trace elements concentration is necessary for effective dose concentration and also for understanding their pharmacological actions.

The present study deals with the phytochemical standardization of methanolic extract of *Emblica officinalis*. The extract thus obtained after standardization may be used as medicinal agents and could be further processed and incorporated in any dose form such as tablets and capsules.

Material and Method

Sample Collection

The plant parts of *Emblica officinalis* were collected from field nearby in Bhopal and nurseries, gardens of Habibganj and identified taxonomically and was preserved for extraction.

Preparation of Solvent Extracts for *Emblica officinalis*

The fruits of *E. officinalis* plant were properly washed with tap water, then after rinsing fruits were shed dried and crushed to obtain powder. Dried powder of *E. officinalis* about 50gm was extracted with 500 ml methanol using soxhelt apparatus. The soxheltion at 30°C was done for one week to obtain extract. The extract was evaporated in water bath at 70°C to obtain crude for phytochemical analysis. After the complete evaporation, the weight of the extract was recorded and then labeled. The extract stored separately at 4°C in air tight bottle for phytochemical evaluation.

Phytochemical Screening

Chemical tests for the screening and identification of bioactive constituents in the *E. officinalis* medicinal plant

under study were carried out in extract using the standard procedures as described by Harborne (1973) [5]. The following tests were applied for the identification of bioactive components [6].

1) Test for Alkaloids: Methanolic extract was warmed with 2% H₂SO₄ for two minutes. It is filtered and few drops of reagents were added and indicated the presence of alkaloids.

(a) Dragendroff's reagent-A red precipitation indicates the positive.

(b) Mayer's reagent-A creamy- white colored precipitation positive.

(c)Wagner's reagent-A reddish-brown precipitation positive.

(d) Picric Acid (1%)-A yellow precipitation positive.

2) Test for Flavonoids: A small quantity of the extracts is heated with 10 ml of ethyl acetate in boiling water for 3 minutes. The mixture is filtered differently and the filtrates are used for the following test.

(a) Ammonium Test- The filtrate was shaken with 1 ml of dilute ammonia solution (1%). The layers were allowed to separate. A yellow coloration was observed at ammonia layer. This indicates the presence of the flavonoid.

(b) Aluminum Chloride Test- The filtrates were shaken with 1 ml of 1% aluminum chloride solution and observed for light yellow color. It indicated the presence of flavonoid and diluted NaOH and HCl was added. A yellow solution that turns colorless indicated positive.

3) Test for Terpenoids:

(a) Salkowski Test- The extract was mixed with 2ml of chloroform and concentrate H₂SO₄ (3ml) is carefully added to form a layer. A reddish brown coloration of the interface is formed to show positive result of the presence of terpenoids.

4) Test for Tannins/ Phenol: A small quantity of the extract is boiled with 5 ml of 45% solution ethanol for 5 minutes. Each of the mixture is cooled and filtered. The different filtrates were used to the following test:

(a) Lead Sub Acetate Test- 1ml of the different filtrate was added with three drops of lead sub acetate solution. A cream gelatinous precipitation indicates positive test for Tannins.

(b) Ferric Chloride Test- 1ml each of filtrate is diluted with distilled water and added with two drops of ferric chloride. A transient greenish to black color indicates the presence of Tannins.

5) Test for Steroids 2ml of acetic anhydride was added to extract 2ml of H₂SO₄. The color changed from violet to blue or green in some samples indicated the presence of steroids.

6) Test for Saponins:

(a) Frothing Test- A small quantity of different extract was diluted with 4 ml of distilled water. The mixture was shaken vigorously and then observed on standing for stable brake.

7) Test for Carbohydrates: The extract was shaken vigorously with water and then filtered. To the aqueous filtrate was added few drops of Molisch's reagents. Followed by vigorous shaking again, concentrated H₂SO₄ 1ml was carefully added to form a layer below the aqueous solution. A brown ring at the interface indicated the positive.

Results and Discussion:

The results were summarized in Table 1. In our studies it was investigated that alkaloids, phenols, terpenoids and flavonoids are present in *Emblca officinalis*, whereas reducing sugars and saponins were found to be absent.

Table No. 1. Phytoconstituents of *Emblca officinalis* extracts.

S. No.	Phytochemical Tests	Observations
1	Cardio glycosides.	+ve
2	Flavonoid.	+ve
3	Tannins.	+ve
4	Alkaloids	+ve
5	Phenols	+ve
6	Reducing Sugar	-ve
7	Saponins	-ve
8	Terpenoid	+ve

where +ve indicate presence of phytochemical and -ve absence

Many biochemical constituents of plants have been shown to possess excellent biological activities [7, 8]. Selected medicinal plant for screening was found to possess phenol. Phenols have amazing stringent properties. They are known to hasten the healing of wounds and inflamed mucous membranes [9, 10, 11]. Flavonoids are also present in selected medicinal plant as a potent water-soluble antioxidant and free radical scavenger, which prevent oxidative cell damage and also have strong anticancer activity [12,13]. It also helps in managing diabetes induced oxidative stress. Terpenoids have been found to be useful in the prevention and therapy of several diseases, including cancer. Terpenoids are also known to possess antimicrobial, antifungal, antiparasitic, antiviral, anti-allergenic, antispasmodic, antihyperglycemic and antiinflammatory and immunomodulatory properties [14, 15]. In addition, terpenoids can be used as protective substances in storing agriculture products as they are known to have insecticidal properties as well.

In these present study the phyto-constituents reported in *Emblca officinalis* fruit extract are Cardiolglycosides, phenols, terpenoids, flavonoids and alkaloids are present.

Since the plant is rich in a wide variety of secondary metabolites such as tannins, phenols, steroids, flavonoids and cardiolglycosides, it could be used to produce more effective's antimicrobial agent to demonstrate the extract from the fruits of *Emblca officinalis* linn effective as modern medicine to combat E.coli and pseudomonas. Now due to biologically and pharmacological screening of these medicinal plant using the modern tool may leads to some new safe and interesting drug.

Which could be further exploited for isolation and characterization of the novel phytochemical drugs used in the treatment of infectious diseases especially in the conditions of drug resistant microorganisms [16].

Conclusion

The present study was conducted to evaluate the presence of bioactive compound in *Emblca officinalis* extract. Preliminary phytochemical as well as various aspects of the sample were studied and described along with phytochemical studies in authentication. Since bioactive compounds occurring in plant material consist of multi-component mixtures, their separation and determination still creates problems. Practically most of them have to be purified by the combination of several chromatographic techniques and various other purification methods to isolate bioactive compound.

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