



Phytochemical Screening of *Terminalia chebula* Fruit Extract in Different Solvents

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ABSTRACT

The present analysis deals with the phytochemical screening of fruit of Terminalia chebula in different solvents viz. Methanol, Ethanol, Acetone, Aqueous, Chloroform and Petroleum ether. Terminalia chebula records different types of secondary metabolites, which have important roles on many diseases. Particularly the tannins and phenols are more present, rendering Terminalia chebula with strong pharmacological significance. This plant may be a source of useful drugs but further research are needed for proper drug production to isolate the active components.

KEYWORDS: *Terminalia chebula, Extract, Phytochemical, Fruit*

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INTRODUCTION

Terminalia chebula, also known as chebulic myrobalan or black [1], is a genus of Terminalia, native to South Asia from Nepal east to India to Yunnan, and south to Malaysia, Sri Lanka and Vietnam [1, 2]. Medium to large deciduous tree rising to 30 m thick, with a root of up to 1 m in diameter. The leaves are reverse to sub-opposite in shape, triangular, 7cm to 8 cm broad, and 4.5cm -10 cm wide with a 1cm to 3 cm petiole [1]. They have an angular peak, cordat at the root, whole edges, glabrous on top with a yellowish pubescence below.

Terminalia chebula is originate all through Southeast Asia including Sri Lanka, India, Malaysia, Nepal, Bhutan, Bangladesh, Vietnam, Pakistan, Myanmar, Laos, Cambodia, Thailand and Indonesia. In China, it is local in W Yunnan and developed in Taiwan, Fujian, Guangxi and Guangdong. It is located in India at the Sub Himalayan region from Ravi east to West Bengal and Assam, rising up to the Himalayan level of 1,500 m. This tree is wild in Northern India wood, focal lands, and Bengal, common in Madras, Mysore, and the Bombay administration's southern piece [2]. Its living space incorporates evaporate inclines to 900 m in rise.

This tree grow thin and nut-like natural products which are chosen when despite everything green and afterward salted, overflowed with a slight included sugar in their own syrup or utilized in jelly. Natural product seed, which has a curved shape, is a rough seed encompassed by a meaty and firm mash. Seven sorts of organic product are perceived (putana, vijaya, amrita, rohini, jivanti, abhaya, and chetaki), in light of the locale where the natural product is reaped, just as the shading and state of the natural product. As a rule, the vijaya assortment is liked, which is generally developed in the Vindhya Range of west-focal India, and has a roundish instead of an increasingly precise shape. The organic product likewise gives material *Terminalia chebula* is the main plant used for kidney and liver dysfunctions in the Ayurvedic concept Triphala [3]. In Ayurveda, the dried organic substance is further used as a potential antitussive, cardiotoxic, homeostatic, diuretic, and purgative [3]. Various glycosides have been separated from haritaki, including the arjungenin, triterpenes arjun glucoside I, and the chebulosides I and II. Different constituents called chebulin incorporate a coumarin conjugated with gallic acids, just as other phenolic mixes including ellagic corrosive, 2,4-chebulyl- β -D-glucopyranose, chebulinic corrosive, gallic corrosive, ethyl gallate, punicalagin, terflavin A, terchebin, luteolin, and tannic corrosive [4]. Chebulic corrosive is a phenolic corrosive compound disengaged from the ready natural products [5, 6]. Luteic corrosive can be detached from the bark [7]. *Terminalia chebula* likewise contains terflavin B, a kind of tannin, while chebulinic corrosive is found in the natural products [8].

MATERIAL AND METHODS

COLLECTION OF PLANT MATERIAL

Fruits of *Terminalia chebula* were collected from Agra and were confirmed by Dr. A. K. Singh and Dr. J.S. Dhakre (Plant Taxonomist) comparison with Botanical department specimen of R.B.S. College, Agra. *Terminalia chebula* was shade dried, powdered finely and further used for phytochemical screening.

PREPARATION OF EXTRACT

Soxhlet Extraction method were used for preparation of extract [9]. Approximately 150 gm of powder was evenly stuffed into a Chromatography paper (thimble) and performed in a Soxhlet extractor. It was run exhaustibly with 500 ml of solvent before 22 processes have finished, or until the solvent becomes colorless. The extract filter with filter paper and the solvent in the rotary evaporator evaporate to achieve the quality of the syrup. Traces of alcohol will be extracted by holding the trace over anhydrous sodium sulfate and refrigerated at 4°C for identification phytoconstituents.

PHYTOCHEMICAL SCREENING

The concentrates of the plant material were investigated to primer phytochemical screening for the recognition of different constituents of plant [10].

TESTS FOR STEROLS

SALLIOWASKI REACTION

Approx. 1mg of each concentrate in a tube was taken. Add 2 ml each of conc. sulphuric acid and chloroform. Shaken the tube for few sec.. Occurrence of red color in the chloroform layer showed the presence of sterols [11].

TESTS FOR ALKALOIDS

IODINE TEST

Added few drops of iodine solution to test solution (3 ml). Appearance of blue colour indicate the presence of alkaloids [12].

TESTS FOR SAPONINS

FOAM TEST

1 mg of the extract of plant was added to a tube and shaken overwhelmingly with a little measure of water and sodium bicarbonate. It is a steady, trademark honeycomb like foam is acquired, saponins are available [11].

TESTS FOR TANNINS

FERRIC CHLORIDE REAGENT

The check residue of each plant extract was taken individually, warmed and dissolved in H₂O. Ferric chloride solution was formulated 5 percent w/v in 90 percent alcohol. A significant number of drops of this solvent is applied to the filtrate. When deep blue or dark green pigment is obtained, tannins are confirmed.

TESTS FOR FLAVANOIDS

SHINODA TEST

A little amount of test deposit was broken down into 95% of 5 ml ethanol and reacted with just a few drops of condensed corrosive HCL and 0.5 g of Mg. Occurrence of pink, or dark red color indicate the presence of flavanoids [11].

TESTS FOR PROTEINS

BIURET TEST

Add 1ml of 4% sodium hydroxide to the test solution. This was trailed by a drop of 1% arrangement of copper sulfate. Violet shading is shaped if proteins are available

TESTS FOR AMINO ACIDS

NINHYDRIN TEST

The ninhydrin reagent in n-butanol is 0.1 per cent ninhydrine solution. To the check sample a little of this reagent has been applied. Development of Violet and Purple color confirms the presence of Amino acids.

TESTS FOR CARBOHYDRATES

BARFORD'S TEST

This reagent was formed by dissolving in 200 ml of 1 per cent acidic corrosive arrangement 13.3 gm of crystalline unbiased copper acetic acid derivation. The check sample was broken up in water and a tad bit of the reagent warmed it up. Monosaccharides are accessible in the case that a red signal of cuprous oxide is produced within two minutes.

TEST FOR PHENOLIC COMPOUNDS

FERRIC CHLORIDE SOLUTION

Heat the test solution and add 2ml of FeCl₃ solution. Occurrence of green and blue color shows the existence of phenolic compounds [13].

TEST FOR RESINS

5 ml of D.W. were added to the plant extract and noticed for turbidity. A combination of extract in 3ml of acetone and 3 ml of HCl were heated in a water bath for 30 min. and observed for pink color.

TEST FOR GLYCOSIDES

Some amount of the plant extract was hydrolysed by boiling with dilute HCL for a few min. and the hydrolysate was subjected to the following tests.

LEGAL'S TEST

The hydrolysate was dissolved in pyridine, and a sodium nitroprusside solution was introduced and rendered alkaline.

RESULTS AND DISCUSSION

Qualitative phytochemical investigation of the fruit extract revealed the existence of Tannins and phenolic compounds in all the solvents used. The antioxidant effects of medicinal plants which are high in phenolic compounds have been shown in several studies. Tannin-containing plants are known to have anthelmintic activity. Sterols were detected in methanolic and ethanolic extract whereas, alkaloids and flavanoids were revealed in all the solvent used except ethanolic extract. Amino acids and carbohydrates were present in Methanolic, Ethanolic and aqueous extract whereas, saponins and proteins were not found in any of the solvents used. Finally, glycosides were present in all the extract except acetone. Glycosides (Phenylethanoid) present in plants are naturally occurring compounds and are known to possess wide array of pharmacological activities. The findings are in support of Manohar *et al.* [14] who showed the presence of phytosterols, Triterpenoids, glycosides, carbohydrates, phenolic compounds and tannins whereas, Vemuri *et al.* [15] also revealed the presence of different phytoconstituents in different solvents. Subha and Divakar [16] showed the presence of various types of secondary metabolites such as phenols, flavonoids, terpenoids and tannins.

Table 1: Phytochemical screening of *Terminalia chebula* fruit extract in different solvents

	Plant part used	Methanol	Ethanol	Acetone	Aqueous	Chloroform	Petroleum ether
Sterols	Fruit	+	+	-	-	-	-
Alkaloids	Fruit	+	-	+	+	+	+
Saponins	Fruit	-	-	-	-	-	-
Tannins	Fruit	+	+	+	+	+	+
Flavanoids	Fruit	+	-	+	+	+	+
Proteins	Fruit	-	-	-	-	-	-
Amino acids	Fruit	+	+	-	+	-	-
Carbohydrates	Fruit	+	+	-	+	-	-
Phenolic compounds	Fruit	+	+	+	+	+	+
Resins	Fruit	+	-	+	-	-	-
Glycosides	Fruit	+	+	-	+	+	+

CONCLUSION

Because of its therapeutic value, *Terminalia chebula* has been used since long ago. Thanks to this, numerous plant-based effects were demonstrated including antioxidant, antidiabetic, etc. However further studies are necessary to study its complete investigation including quantitative or semi-quantitative analysis, describe structure of chemical and determine its biological activities. *Terminalia chebula* has been used since decades because of its rich ethnomedical significance. Due to this, numerous pleiotropic effects have been exhibited by the plant including antioxidant, antidiabetic, renoprotective, hepatoprotective, antianaphylactic, immune modulator and prokinetic effects.

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