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Phytochemical Screening of Corchorus olitorius by using various solvent By Soxhlet Extraction

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Abstract

Exploring ' medicinal and nutritional potential necessitates plants for phytochemical screening. Corchorus olitorius, often known as jute mallow or Egyptian spinach, is a versatile plant with a long history of use in traditional medicine and as a source of food components. A phytochemical screening of Corchorus olitorius was performed using methanol extraction in this study. Only a few of the phytochemical components studied were alkaloids, flavonoids, phenols, tannins, saponins, and terpenoids. The presence of a variety of bioactive compounds in Corchorus olitorius revealed the possibility of potential therapeutic and nutritional effects.

INTRODUCTION

Corchorus olitorius, a leafy vegetable in the Malvaceae family, is native to Asia and Africa's tropical and subtropical areas. It has become a popular crop due to its edible leaves, which are rich in vitamins, minerals, and dietary fiber. Corchorus olitorius has long been used in traditional medicine for its medicinal properties in addition to its nutritional content.

Phytochemicals are organic compounds found naturally in plants that have a variety of biological processes, including antioxidant, anti-inflammatory, anti-hyperglycemic, and anticancer effects. Such substances have an opportunity to serve as the foundation for the invention of novel medicines and nutraceuticals. As a result, phytochemical examines to determine whether plants like Corchorus olitorius have bioactive substances are vital In accordance to the literature review, Corchorus olitorius are utilized for an range of therapeutic applications. Its leaves are said to erase tumors, chronic cystitis, gonorrhea, and achy. The dried young leaves' diuretic, demulcent, tonic, and carefully febrifuge outcomes are used in an infusion that boosts appetite and vitality. Its seeds are purgative and have been reported for showing estrogenic activity as well as being beneficial for heart conditions due to the presence of a high amount of active cardiac principles, which includes Olitoriside, with exhibited an effect comparable to strophanthin in chronic cardiac patients. The stem is the primary conduit for the production of jute fiber.

It additionally occurs in creams for the hands, face, and hair, as well as lotions. Additionally, Corchorus olitorius contains anti-inflammatory, analgesic, anti-tumor, hypoglycemic, antibacterial, anti-inflammatory, anti-obesity, gastroprotective, and wound healing results.

Further phytochemical examination verified the presence of cardiac glycosides, alkaloids, flavonoids, tannins, as well as additional constituents. These substances' non-nutritive elements are known as

phytochemicals. The qualitative analysis and quantification of phytochemicals present is a critical phase in any type of medicinal plant inquiry.

COLLECTION OF PLANT MATERIAL AND CHEMICALS

Plants of Corchorus olitorius originated from reliable sources. Plant samples were dried at room temperature in the shade, crushed into a fine powder in a mortar, and kept in sealed containers at room temperature. The chemicals were bought as well from reliable sources.

Fig:1 *Corchorus olitorius*

EXTRACTION PROCEDURE

The total weight of the content has been determined to be 800 g after drying and grinding into coarsely powdered crude medicine. Out of 800 g of crude drug, 40 g of crude powdered drug was extracted per batch using the hot extraction method, which meant that a thimble packing of the crude powdered drug was placed into the Soxhlet chamber and extracted gradually using hexane l as the initial solvent(non polar) After the extraction cycle finished, the exhausted medication was removed from the thimble and left to dry. Another 40g of crude drug was extracted using hexane solvent in the second batch, and this process was repeated until the entire 800 g of crude powdered drug was extracted.
The subsequent solvents were used separately for ethyl acetate (midpolar) and methanol (polar) with another 800 gm of each sample. Following the completion of the process, hexane was evaporated from the crude extract using a water bath. The final concentration was lyophilized using a lyophilizer after evaporation in a water bath. Further, it has been stored in the refrigerator in 4℃ for further experiments and the % yield has been computed by utilizing following formula

$$\text{Percentage Yield: } \frac{\textit{Weight of the crude drug}}{\textit{Weight of the plant material}} \text{ X } 100 \quad \ldots\ldots\ldots\ldots\ldots\ldots \textit{(Equation 1)}$$

Fig:2 Extraction of sample

Qualitative Screening Of Phytochemicals

Phytochemical screening was carried out by standard methods available in literature

Alkaloid Test:
Alkaloids were screened by dissolving the extracts in diluted hydrochloric acid and filtering them.
Mayer's Test: To treat filtrates, the Mayer's reagent (Potassium Mercuric Iodide) was utilized. When a yellow-colored precipitate appears, alkaloids are present.
Wagner's Test: Filtrates were administered with iodine in potassium iodide (Wagner's reagent). When brown or reddish precipitate occurs, alkaloids are present.
Dragendroff's Test: Filtrates were placed in a solution of Dragendroff's reagent, potassium bismuth iodide. When red precipitate develops, alkaloids are present.
Hager's Test: Filtrates were subjected to a saturated picric acid solution (Hager's reagent). The presence of alkaloids was verified by the appearance of a yellow precipitate.

Glycoside Screening Test: Before screening for glycosides, the extracts were dissolved with weak hydrochloric acid.
Borntrager's Modified Test: The extracts were placed in a ferric chloride solution and heated for about five minutes. After cooling, the mixture was extracted with an equal amount of benzene. After division, the benzene layer was treated with ammonia solution. When the ammonical layer is rose-pink in color, anthranol glycosides are present.
Legal's Test: The extracts were treated with sodium nitropruside in pyridine and sodium hydroxide. When a pink to blood-red color develops, cardiac glycosides are present.

Flavonoids Screening:
Alkaline Reagent Test: The alkaline reagent test included treating the extracts with a few drops of sodium hydroxide solution. When diluted acid is added, a bright yellow color seems, but it eventually fades. The presence of flavonoids is apparent by the absence of color.
Lead Acetate Test: A small amount of lead acetate solution was added to the extracts. The presence of The yellow color of the precipitate shows the presence of flavonoids.

Tannin Examination:
Gelatin test: Sodium chloride-containing 1% gelatin solution was added to the extract. The presence of tannins is shown by the formation of white precipitate..

Screening Of Phytosterols:
Salkowski's Test for Phytosterol Screening: Chloroform was employed to treat and filter the extracts. The filtrates were stirred and permitted to stand after a few drops of strong sulphuric acid were added. A golden-yellow hue indicates the presence of triterpenes.
Libermann Burchard's Test: Before filtration, the extracts were treated with chloroform. Before heating and cooling the filtrates, a few drops of acetic anhydride were added. Sulphuric acid was added, and phytosterols were found when a brown ring formed at the junction,phytosterol are present.

Saponin Screening Test:
Froth Test: The extracts were diluted in 20 ml of distilled water and agitated in a graduated cylinder for 15 minutes. The creation of a 1 cm layer of foam indicates the presence of saponins.
Foam test, 0.5 g of extract and 2 cc of water were shaken together. If the foam created lasts longer than 10 minutes, saponins are present.

Phenol Screening test:
Ferric Chloride Test : The extracts were exposed to a 3-4 drop treatment with ferric chloride solution. When a blue-black color emerges, phenols are present.

Diterpene Screening test:
Copper Acetate Test : After extracts were dissolved in water, they were subjected to 3-4 drops of a copper acetate solution. The appearance of emerald green indicates the presence of diterpenes.

Screening Of Proteins And Amino Acids:
Xanthoproteic Test: The extracts were treated with a few drops of strong nitric acid. The presence of proteins can be observed by the formation of a yellow color.

Ninhydrin Test: The extract was heated briefly after being treated with 0.25% w/v ninhydrin reagent. The presence of an amino acid is indicated by the production of a blue hue.

Carbohydrate Screening: The extract was individually diluted in 5ml of distilled water and then filtered. The presence of carbohydrates in the filtrates was investigated.
Bendict Test:Filtrates were gently heated while being treated with Benedict's reagent. Orange or red precipitate indicates the presence of reducing carbohydrates.
Fehling's Test: After being hydrolyzed with weak hydrochloric acid, filtrates were heated with Fehling's A & B solutions, neutralized with alkali, and analyzed. When a red precipitate appears, reducing sugars are present.
Molisch's Test: Filtrates were treated in a test tube with two drops of an alcoholic -naphthol solution. The presence of carbs is shown by the formation of a violet ring at the junction.

Cholesterol Screening Test: A total of 2 mL of chloroform and 2 mL of sample extract were added. The liquid was thoroughly shaken after adding 10 to 12 drops of anhydrous CH3COOH. The solution was then given two drops of concentrated H2SO4. The change of the reddish-brown substance into blue-green revealed the presence of cholesterol.

Table 1: Phytochemical Presence Of Corchorus olitorius solvent Extract

Tests	Hexane	Ethyl Acetate	Methanol
Alkaloids	-	-	+
Glycosides	-	+	+
Tannins	+	-	-
Phenols	+	+	+
Proteins and Amino acids	-	-	+
Carbohydrates	-	-	+
Diterpenes	-	-	+
Phytosterols	-	-	+
Flavonoids	+	+	+
Cholesterol	-	-	+

+:Present, -:Absent

CONCLUSION:

After phytochemical screening using various extraction, a number of bioactive substances, including alkaloids, flavonoids, phenols, glycosides, saponins, and terpenoids, have been identified in Corchorus olitorius plant. According to these research, Corchorus olitorius has an extensive variety of phytochemicals, which may account for its historical therapeutic application and potential health advantages.
This investigation emphasizes the value of phytochemical screening for assessing the bioactive makeup of plants such as Corchorus olitorius, paving the way towards additional study and the development of new therapies and nutritious foods. More research is needed to extract, establish, and investigate the unique health advantages of these phytochemicals.

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