



PHYTOCHEMICAL ANALYSIS AND PHARMACOLOGICAL STUDIES OF *CYDONIA VULGARIS* PERS

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Article Received on
20 Feb. 2017,
Revised on 10 March 2017,
Accepted on 31 March 2017,
DOI: 10.20959/wjpps20174-13586

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ABSTRACT

The *Cydonia vulgaris* is commonly known as Quince. It is used in Unani System of Medicine since ancient times. It has a wide range of Therapeutic uses like Asthma, Diarrhoea, Dysentery, Diabetes, pharyngeal demulcent, emulsifying agent in the preparation of hair-fixing lotions. **Methods:** Preliminary Phytochemical studies were carried out on extracted samples. The extracts were subjected to various qualitative phytochemical tests such as alkaloids, glycoside, carbohydrates, phenolic compound, tannins, phytosterols, fixed oils, flavonoids, proteins, amino acids and presence and absence of mucilage was done by ruthenium red test. Pharmacological studies of *Cydonia vulgaris* have also been thoroughly analyzed. **Results:** In the

current study the preliminary phytochemical analysis of hydroalcoholic extract of *Cydonia vulgaris* has been done which showed presence of carbohydrate, glycosides, flavonoids, fixed oils, Diterpenes. **Conclusion:** The present study has provided evidence based scientifically validated data for standardization of *Cydonia vulgaris* and will serve as a useful tool to minimize adulteration and substitution of *Cydonia vulgaris*.

KEYWORDS: *Cydonia vulgaris*, phytochemical analysis, Scientific Studies.

INTRODUCTION

In Unani system of Medicine *Cydonia vulgaris* is known as *Bihidana*. it is found to have various pharmacological actions like Hypoglycemic, Hypolipidemic, Antioxidant, Aphrodisiac, Anti-allergic, Hepatoprotective, Antihypertensive, Anti-inflammatory, anticancerous, Antibacterial and a tonic for heart and brain.^[1,2] *Cydonia vulgaris* is a small tree with bright golden yellow pome fruits. it belongs to family Roseaceae.^[3] The main aim of the study was to find out the phytochemical constituents present in *Cydonia vulgaris*.

MATERIALS AND METHODS

Preliminary Phytochemical analysis

Preliminary Phytochemical studies were carried out on extracted samples. The extracts were subjected in various qualitative Phytochemical tests such as alkaloid, glycosides, carbohydrates, phenolic compounds, tannins, phytosterols, fixed oils, flavonoids, proteins, amino acids, and presence or absence of mucilage's was done by ruthenium red test.^[4,5]

Test for Carbohydrates^[4,5]

Fehling's solution test: To 2 ml aqueous extract of the drug add 1 ml of a mixture of equal parts of Fehling's solutions A and B, previously mixed and boil the contents of the test tube for few mints. Formation of red or brick red colour precipitate was observed. A red or brick red precipitate of cuprous oxide indicates the presence of reducing sugars.

Molisch's Test: To 2 ml of aqueous extract of the drug add 2 drops of freshly prepared 20% alcoholic solution of α -naphthol and 2 ml of concentrate Sulphuric acid was gently poured. Formation of red-violet colour ring at the junction of the two solutions indicates the presence of reducing sugars.

Benedict's test: To 0.5 ml of aqueous extract of the drug add 5 ml of Benedict's reagent in a test tube and heated in the boiling water bath for five minutes. The colour of the solution was observed. The solution colour appears green, yellow, or red depending on amount of the reducing sugars present in the test solution.

Tests for Alkaloids^[6]

A small amount of extract were dissolved separately with a few drop of dilute hydrochloric acid and filtered. The filtrate was tested with various alkaloid reagents.

Dragendorff's test: Filtrates were treated with few drops of Dragendorff's reagent (solution of Potassium Bismuth Iodide) and colour of precipitate was observed. Formation of orange or orange-red precipitate indicates the presence of alkaloids.

Mayer's test: Filtrate was treated with few drops of Mayer's reagent (Potassium Mercuric Iodide). Formation of a yellow or white colored precipitate or turbidity indicates the presence of alkaloids.

Hager's test: Filtrates were treated with few drops of Hager's reagent (saturated picric acid solution). Presence of alkaloids confirmed by the formation of yellow colored precipitate.

Wagner's test: Filtrates were treated with few drops of Wagner's reagent (Iodine in potassium iodide). The yellow or brown precipitate indicates the presence of alkaloids.

Test for Cardiac Glycosides

Test for deoxysugars (Keller-killiani test): To 2 ml extract, glacial acetic acid, one drop 5% Ferric chloride and concentrated sulphuric acid were added. Reddish brown colour appears at junction of the two liquid layers and upper layer appears bluish green.^[7,8]

Test for Bufadenoloids (Liebermann's test): 2 ml of the extract was dissolved in 2 ml of chloroform and 2 ml of acetic acid was added and the solution cooled well in ice. Sulphuric acid was then added carefully. A colour change from violet to blue to green indicates the presence of a steroidal nucleus (that is, a glycone portion of glycoside).^[9]

Tests for Proteins and Amino acids^[4]

Ninhydrin test: Test solution was mixed with few drops of Ninhydrin solution and heated. After heating gently on water bath for few minutes, formation of blue to red- violet colour indicates presence of Amino acids.

Biuret's test: To 1 ml of hot aqueous extract of the drug add 5-8 drops of 10% concentrated sodium hydroxide solution, followed by 1 or 2 drops of 1% copper sulphate solution. A violet or red colour indicates the presence of proteins.

Millon's reaction: Dissolve a small quantity of aqueous Extract of the drug in 1 ml of distilled water and add 5-6 drops of Million's reagent and the colour of precipitate were observed. Formation of white precipitate which turns to red upon heating indicates the presence of proteins.

Xanthoprotenic test: The extracts were treated with few drops of conc. Nitric acid. Formation of yellow colour indicates the presence of proteins.

Test for flavonoids^[4,5]

Alkaline reagent Test: 2 ml of extract was treated with few drops of 20 % sodium hydroxide solution. Formation of intense yellow colour, which becomes colourless on addition of few drops of dilute acid, indicates the presence of flavonoids.

Lead acetate Test: Extract was treated with few drops of lead acetate solution. Formation of yellow colour precipitate indicates the presence of flavonoids.

Test for Tannins

Ferric chloride test: To 1-2 ml of an aqueous Extract of the drug add a few drops of 5% ferric chloride solution. A bluish black colour, which disappears on the addition of a few ml of dilute sulphuric acid solution followed by the formation of a yellowish brown precipitate, indicates the presence of tannins.

Test for saponins^[8]

Froth test: The presence of saponins was determined by Frothing test. The extract was vigorously shaken with distilled water and was allowed to stand for 10 minutes and classified for saponins content as follows: no froth indicates absence of saponins stable froth of more than 1.5 cm indicated the presence of saponins.

Foam test: 2ml of extract was taken in a test tube and 6ml of distilled water was added to it. The mixture was shaken vigorously and observed for the formation of persistent foam that confirms the presence of saponins.

Test for Phenols^[4, 5]

Ferric chloride test: For the determination of free phenols the ferric chloride test was done, this test is known as confirmatory test for free phenols. Dissolve a small quantity of alcoholic or aqueous Extract of the drug in 2 ml of distilled water and add a few drops of 10 % ferric chloride solution. The change in the colour was observed. The blue or green colour indicates the presence of phenols.

Test for Phytosterols/Terpenes^[4, 5]

Salkowski's Test: 5ml of extract was taken in a test tube and 2ml of chloroform was added to it followed by the addition of 3ml of concentrated sulphuric acid. Formation of reddish brown layer at the junction of two solutions confirms the presence of terpenoids.

Hosse's reaction test: the extract was mixed with chloroform and 2 ml concentrated sulphuric acid was poured from the side of the test tube. The colour of the ring at junction of the two layers was noted. A red colour ring indicates the presence of sterols / terpenes.

Liebermann Burchard's test: The extract (2 mg) was dissolved in 2 ml of acetic anhydride, heated to boiling, cooled and then 1 ml of concentrated sulphuric acid was added along the side of the test tube. A brown ring formation at the junction and the turning of the upper layer to dark green colour confirmed the test for the presence of phytosterols.

Test for diterpenes

Copper acetate Test: Extract was dissolved in water and treated with 3-4 drops of copper acetate solution. Formation of emerald green colour indicates the presence of diterpenes.

RESULTS

The results of Hydroalcoholic extract of *Cydonia vulgaris* showed presence of carbohydrates, glycosides, flavonoids, fixed oils and Diterpenes. Results are given in table 1.

Table 1: Results of Phytochemical Screening of *Cydonia Vulgaris*.

Test for Carbohydrates (Molish test, Benedicts test, fehling test)	+ve
Test for Mucilage (Ruthenium red)	+ve
Test for Glycosides (KellarKilliani test)	+ve
Test for Alkaloids (Mayers, Dragendorff's, Wagner's, Hagar's test)	-ve
Test for Terpenes/ Phytosterols (Salkowski test, Hosse's test)	-ve
Test for flavonoids (Alkaline reagent test)	+ve
Test for Tannins (Ferric chloride test)	-ve
Test for saponins (Froth test, Foam test)	-ve
Test for Phenols (Ferric chloride test)	-ve
Test for Fixed oils (Filter paper test)	+ve
Tests for Proteins and Amino acids (Ninhydrin, Biurett's test, Million's Test, Xanthoprotenic test)	-ve
Test for Diterpenes (Copper Acetate Test)	+ve
Test for Quinones	-ve

Pharmacological studies

The following pharmacological studies have been done on *Cydonia vulgaris*.

Antiallergic activity

Shinomiya F. et al. revealed the antiallergic effect of hot water extract of Quince both in vivo and in vitro. Result showed that significant decrease in the development of atopic dermatitis like skin lesion.^[10]

Aphrodisiac activity

Muhammad Aslam et al. evaluated the aphrodisiac activity of the hydroalcoholic extract of the fruits of *Cydonia oblonga* Miller (quince) in Wistar rats.^[11]

Wound healing effect

Ali Asghar Hemmati et al. has examined the wound healing effects of creams prepared from quince seed mucilage on dermal toxicity induced by T-2 toxin. Results obtained by this study shows that quince seed mucilage (15%) has more and better healing effects on dermal toxicity caused by T-2 toxin comparing to no treatment or eucerin cream without mucilage.^[12]

Antioxidant activity

Branca M. Silva et al. has evaluated the antioxidant activity of methanolic extract of quince fruit (pulp, peel, and seed) and jam by DPPH method.^[13]

Antioxidant and anti influenza viral activity

Yasunori Hamauzu et al. evaluated the antioxidant and anti influenza virus activity of phenolic extracts of Chinese quince, quince, and apple fruits.^[14]

DISCUSSION

The present study has provided evidence based scientifically validated data for standardization of *Cydonia vulgaris* and will serve as a useful tool to minimize adulteration and substitution of *Cydonia vulgaris*. Hydroalcoholic extract of *Cydonia vulgaris* show positive test to ruthenium red which indicates the presence of mucilage. It shows presence of carbohydrate, glycosides, flavonoids, fixed oils, Diterpenes, and absence of Alkaloid, Terpenes, Tannins, Saponins, Phenol, Quinones, protein and amino acids. The presence of phytoconstituents makes the plant and its part useful for treating different ailments of human being.

Conflict of interest: Nil.

ACKNOWLEDGEMENT

The authors are highly thankful to Director National Institute of Unani Medicine Bengaluru for allowing us in doing the research in Laboratories of NIUM.

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