

Phytochemical screening of Commiphora Mukul Seeds and Bark Powder - A Comparative Studies

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Abstract

Plants and its components have application in traditional medicines because of the numerous uses they have. The different medicinal plants such as arid zone plants, herbal plants and some shrubs have the potential role in the prevention and treatment of human diseases. The arid zone plants are also known as wild plants as they do not need special care and maintenance. The Commiphora mukul (Guggul) an arid zone plant, which had long been used for the treatment of various diseases. Present study was conducted to assess the qualitative phytochemical analysis of guggal bark and seeds powder. The extract of bark and seeds powder of guggal plants reveals the presence of many phytochemicals such as alkaloids, glycosides, flavonoids, saponnin, tannin, steroids, terpenes and phytosterols. The compounds isolated from this plant possess very important biological activities including anti-diabetic, anti-obesity anti-inflammatory and antioxidant, hypolipidemic, antihyperglycemic, Cardioprotective, Rheumatoid arthritis and Anti-cancer.

Keywords: Flavonoids, Saponnin, Tannin, Steroids, Phytosterols, Anti-Diabetic and Antihyperglycemic

I. INTRODUCTION

Medicinal plants have played an important role throughout the world in treating and preventing human diseases. The different medicinal plant, such as arid zone plants, herbal plants and some shrubs have the potential role in the prevention and treatment of human diseases. The arid zone plants are also known as wild plants as they do not need special care and maintenance. Such plants have some medicinal property thus used in prevention and treatment of various health ailments. They contain a variety of different nutritious and therapeutic constituents: Vitamins, minerals, trace elements as well as active ingredients with a variety of medicinal actions. Commiphora mukul belonging to family Burseraceae of class Magnoliopsida in the plant kingdom. It is found in arid areas of India, Bangladesh, and Pakistan. In India it is found in the states of Rajesthan (mainly in the western region) and Gujarat (Kutch Division). Karnataka (south India) also has a few minor guggul-production areas. A small, bushy tree with thorny branches, it produces a yellowish gum resin in small ducts located throughout its bark. Each collecting season a guggul tree yields between 250–500 grams of dry resin, which is extracted from the bark through a process called tapping. In this process, an incision is made on the bark of the tree. The resin, which then seeps out, is allowed to harden before it is collected.

The guggul have many medicinal properties which help in treating various diseases. The active components in guggul which are used as a medicinal module for the cure of various diseases are guggulipid, guggulsterones and plant steroids [Shishodia et al, 2008]. It is now accepted that guggulsterone is the bioactive principle in gum guggul responsible for its pharmacological action [Kimura et al,2001]. The presence of guggulsterones in C. mukul differentiates it from other Commiphora species. The two isomers, E and Z guggulsterones, from the ketonic fraction have pronounced hypolipidaemic and anti-inflammatory properties [Duwiejua et al,1993]. Apart from this,guggul has many traditional medicinal properties because it is one of the richest sources of bioactive compounds such as dimyrcene, α -camphorsene, linoleic, oleic, stearic, palmitic acids etc. Along with these,different amino acids are also found in the extract of guggul such as cysteine, histidine, alanine, proline, trysine, tryptophan, valine, leucine and isoleucine [Jajuja et al, 2012].

Beyond all these compounds, some phytochemicals are also present in guggul like flavonoids, steroids [Dubey et al,2009], terpenes, phytosterols and tannins which are present in different biological activities like anti- anti-inflammatory (Shishodia et al 2008), anti-diabetic(49 Sharma et al, 2009), anti-obesity(Yang et al, 2008), cardioprotective(Wang et al 2004), hypolipidemic(Chander et al,1996) and anti-carcinogenic activity [Pradhan and Dash, 2011] helps in preventing all these disease.

Owing to its medicinal properties of guggul, the ancient ayurvedic literature is full of praise for its wide range of therapeutic action. Guggul is traditionally believed to benefit people suffering from rheumatism, obesity, hypercholesterolemia, heart diseases, atherosclerosis, internal tumors, liver disorders, malignant sores and ulcers, urinary complaints, intestinal worms leucoderma (vitiligo), sinuses, edema and sudden paralytic seizures.

II. MATERIALS AND METHODS

A. Plant Material

The bark and seed powder of Commniphora mukul were collected from the herbal powder agency, from jaipur.

B. Qualitative Phytochemical Evaluation

1) Extraction

The coarse powder of Commniphora mukul bark and seeds extracted with petroleum ether, chloroform, methanol and water at the ratio of 30:70. The extracts of Commniphora mukul barks and seeds were collected separately and filtered using Whatman filter paper. All the extracts were concentrated and the excessive solvents were evaporated under vacuum.

2) Preliminary Phytochemical Analysis

All plant extracts were further used for chemical tests for the presence of following phytochemicals such as phenolics compounds, alkaloids, saponin, glycosides, phytosterols, tannin, flavonoids, steroids terpenoids using the methods mentioned below:-

a) Alkaloids:

1) Mayer's test:

To a few ml of filtrate, a drop or two of Mayer's reagent were added by the side of test tube. A white or creamy precipitate indicated the test as positive.

2) Wagner's test:

To a few ml of filtrate, few drops of wagner's reagent were added by the side of the test tube. A reddish-brown precipitate confirmed the test as positive.

b) Glycosides:

1) To ml of aqueous extract of the samples, 5ml of Benedict's solution and few drop of dilute HCl were added and heated for minutes. The solution became red with precipitate which indicated the presence of glycosides.

2) Brontrager's Test: To 2 ml of filtered hydrolysate, 3 ml of chloroform was added and shaken, chloroform layer was separated and 10% ammonia solution was added to it pink colour indicated the presence of glycosides.

c) Terpenoids:

Libermann - Burchard's test: 2ml of acetic anhydride solution was added to 1ml of petroleum ether extract of the drug in chloroform, followed by 1 ml of concentrated sulphuric acid. A violet color ring was formed indicating the presence of terpenoids.

d) Steroids:

Libermann -Burchard's test: 2 ml of acetic anhydride solution was added to 1 ml of petroleum ether extract of the drug in chloroform followed by 1 ml of concentrated sulphuric acid. A greenish color was developed which turned to blue.

e) Saponins:

In a test containing about 5 ml of an aqueous extract of the drug, a drop of sodium bicarbonate solution was added. The mixture was shaken vigorously and left for 3 minutes. Honeycomb like froth was formed.

f) Tannins:

To 1-2 ml of plant extract, a few drops of 5% FeCL3 solution were added. A green color indicated the presence of gallotannins which brown color indicated tannins.

g) Phytosterol:

1) Libermann -buchard's test: The extract (50 mg) was dissolved in 2ml acetic acid anhydride. To this, one or two drops of concentrated sulphuric acid were added slowly along the side of the test tube. An array of color changes showed the presence of phytosterols.

2) The extract was treated with Salkowski's reagent: The yellowish colour with green fluorescence appearance indicated the presence of phytosterol in it.

h) Flavonoids:

1) SHONODA TEST: In a test tube containing 0.5 ml of alcoholic extract of the drug, 5-10 drops of dilute HCL was added followed by small pieces of magnesium. In the presence of flavonoids, a reddish pink or brown colour produced.

III. RESULT AND DISCUSSION

In the present study the comparison between the phytochemical property of Commniphora mukul bark and seeds were estimated. The preliminary phytochemical investigation on Commniphora mukul bark and seeds extracts revealed the presence of various secondary metabolites such as alkaloids, glycosides, steroids, flavonoids, saponin, tannin, terpenoids and phytosterols in the different extracts (Table 1 &2).

Table - 1
Preliminary Phytochemical Screening of Commniphora mukul Bark Powder Extract

Name of the chemical test	Petroleum ether extract	Chloroform extract	Methanol extract	Distill water extract
Alkaloids	-	-	+	+
Glycosides	-	+	-	+

<i>Steroids</i>	+	+	+	+
<i>Flavonoids</i>	+	-	+	+
<i>Saponin</i>	+	+	-	+
<i>Tannin</i>	-	-	+	+
<i>Terpenoids</i>	+	-	-	+
<i>Phytosterols</i>	-	-	+	+

The phytochemical analysis of Commiphora mukul bark powder showed the presence of various phytochemical compounds in bark extract. The phytochemicals such as alkaloid, glycosides, steroids, flavonoids, saponin, tannin, terpenoids and phytosterols are present in distilled water extract where as in petroleum ether, chloroform and methanol extract some phytochemicals were absent.

Table – 2
Preliminary Phytochemical Screening of Commiphora mukul Seed Powder Extract

Name of the chemical test	Petroleum ether extract	Chloroform extract	Methanol extract	Distill water extract
<i>Alkaloids</i>	+	+	+	+
<i>Glycosides</i>	+	-	+	+
<i>Steroids</i>	+	+	-	+
<i>Flavonoids</i>	+	-	+	+
<i>Saponin</i>	-	-	-	+
<i>Tannin</i>	+	+	-	+
<i>Terpenoids</i>	+	+	-	+
<i>Phytosterols</i>	-	-	+	+

In the water extract of Commiphora mukul seeds powder showed the presences of all the phytochemicals, where as some phytochemical compound were absent in other extract of seeds powder. The estimation of phytochemical compounds in bark and seed powder extract showed that the water extract of seed and bark were rich in phytochemical compound which may help in treating many disease. In other prepared extract some phytochemicals were absent which may due to presence of chemical in the extract which react with the compound and makes it invisible. And, thus the powder had lost their phytochemical compound which makes them weak to enhance the quality of bark and seed powder. Thus, the study revealed that the bark and seed powder of Commiphora mukul have the potential to cure many disease.

IV. CONCLUSION

From the ancient times, plants have been used for treatment of variety of disease. Thus, the present study revealed that a number of positive effects of commiphora mukul (guggul) such as phytochemicals were found which is beneficial for the health. The phytochemical such as alkaloids, glycosides, steroids, flavonoids, saponin, tannin, terpenoids and phytosterols were present which increases the medicinal potential of guggul and thus can be used for the treatment of various diseases. Therefore, the arid zone guggul plant should be promoted to have a benefit of having ayurvedical medices in the garden.

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