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Laxmi
Ph.D. Student Maharshi Dayanand Saraswati University, Ajmer, Rajasthan, India

Dr. Tahira Begum
Lecturer, S.P.C. Government College, Ajmer, Rajasthan, India

Correspondence
Laxmi
Ph.D. Student Maharshi Dayanand Saraswati University, Ajmer, Rajasthan, India

Phytochemical screening of some ethnomedicinal plants in Ajmer district

Laxmi and Dr. Tahira Begum

Abstract
Therapeutically speaking, phytochemicals are quite effective. Due to the alarming rise in the frequency of new diseases, there is an ongoing and urgent need to develop new medicinal chemicals with different chemical structures and innovative mechanisms of action. The identification of the phytochemical components found in medicinal plants depends heavily on the qualitative examination. Because specific bioactive ingredients are present, plants have therapeutic significance. The current investigation was conducted to Identify the phytoconstituents in the leaf extracts of four distinct medicinal plants, including *Punica granatum*, *Carissa carandas*, *Euphorbia hirta and Cryptostegia grandiflora*. four plants' leaves were gathered from their natural habitats, cleaned, dried by air, and then ground.. Using the Soxhlet apparatus with ethanol, the solvent extracts of the different leaves were created. Alkaloids, Steroids, Flavonoids, Saponin, Tannin and Terpenoids were estimate qualitatively by following the standard methods. Alkaloids, Steroids, Flavonoids and Saponin were present in all plants. Terpenoids present in all plants except Euphorbia hirta.

Keywords: Preliminary phytochemical analyses, *Punica granatum*, *Carissa carandas*, *Euphorbia hirta* and *Cryptostegia grandiflora*

1. Introduction
Through phytochemical screening, different plant compounds are isolated in order to evaluate their biological activity or potential as medicines. Due to the presence of specific chemical compounds that have a clear physiological effect on the living system, plants offer therapeutic significance [1]. Due to their many uses, chemicals derived from plants have recently attracted a lot of attention. A collection of species known as medicinal plants contain a variety of active concepts that can be used to treat different human or animal diseases. They are the world's most abundant bio-drug source. contemporary drugs, conventional medical practises, herbal remedies, dietary supplements, and nutraceuticals chemical entities and pharmacological intermediates counterfeit drugs [2] Due to the existence of phytochemical components that have a clear physiological effect on the human body, including as alkaloids, carbohydrates, terpenoids, steroids, flavonoids, and tannins, medicinal plants are effective for both treating and curing human ailments [3].
Punica granatum is a member of the *Punicaceae* family, used as used as an astringent, haemostatic, antihelmintic, stomachic, desiccant, and cicatrizant, among other things [4].
Carissa carandas leaves are used to treat recurrent fevers, earaches, discomfort, and syphilitic mouth pain. Skin infections are treated with a tincture of fruits, and a decoction of wood is used as a tonic to strengthen the tendons of slim patients [5].
Euphorbia hirta is more widely utilised to treat respiratory ailments, particularly cough, bronchitis, and asthma. It is used in India to treat worm infestations in children, as well as diarrhoea, gonorrhoea, jaundice, acne, digestive issues, and tumours, among other things [6].
Cryptostegia grandiflora leaves have long been used in India to treat eczema and other skin conditions.

2. Materials and Methods
2.1. Plant sample collection
The healthy leaves of *Punica granatum*, *Carissa carandas*, *Euphorbia hirta and Cryptostegia grandiflora* were collected from their natural habitats in Ajmer, India, and brought to the laboratory. The leaves were washed with tap water and air dried at room temperature. The dried samples of plants were powdered in an blender and stored in air tight plastic bags for further analysis.

All the plants were botanically authenticated as per APG IV classification.

2.2. Preparation of plant extract

Using a Soxhlet apparatus, 10 g of the dried and powdered plant material was extracted for 6 to 8 hours at a temperature below the boiling point of the solvents with 160 ml each of ethanol. The resulting crude extracts were filtered using Whatman No. 1 filter paper, concentrated using a rotary evaporator at 40 °C while under vacuum, and then kept at 4 °C for further use.

2.3 Phytochemical analysis

2.3.1 Test for Alkaloids 1 g of powdered material was extracted using 5 ml methanol and 5 ml 2N hydrochloric acid. Following that, Meyer's and Wagner's reagents were applied to the filtrate. The existence of turbidity in the samples was rated as either positive or negative [7].

2.3.2 Test for Steroids 2 ml of concentrated sulfuric acid and 2 ml of acetic anhydride were added to 1 ml of extract, the colour changed from blue to dark green, indicating the presence of steroids [8].

2.3.3 Test for Flavonoids 10 ml of ethyl acetate were heated with 1 g of powdered material for 5 minutes over a steam bath (40–50 °C). Using 1 ml of diluted ammonia, the filtrate was treated. A golden colouring indicated that a test for flavonoids was successful [7].

2.3.4 Test for Saponins 2 g of the powdered sample were cooked in a water bath with 20 ml of distilled water before filtering the mixture. In order to create a stable, long-lasting froth, 10ml of the filtrate was combined with 5ml of distilled water and forcefully shaken. Three drops of olive oil were added to the foam, and the mixture was vigorously shaken to create an emulsion, which showed the presence of saponins [8].

2.3.5 Test for Tannins 2-3 ml of methanolic extract were mixed with 10% alcohol-based ferric chloride solution (1:1). The solution turned a dark blue tint, indicating that tannins were present [9].

2.3.3 Test for Terpenoids Salkowski test was carried out. 2 ml of chloroform were combined with 5 ml of the aqueous extract. To create a layer, 3ml of concentrated sulfuric acid was then added. The presence of terpenoids was suggested by the interface's reddish brown colouring [8].

3. Results

The pharmacological effects of these all plants are due to the presence of bioactive chemical constituents. *Cryptostegia grandiflora* contained all tested constituents as shown in Table. Alkaloids, Steroids, Flavonoids and Saponin were present in all plant species. Terpenoids present all plans except, *Euphorbia hirta*. Tannin present all plants except *Punica granatum*, and *Carissa carandas.*
Following table shows the results of qualitative analysis of different medicinal plants.

Table 1: Preliminary phytochemical analysis

S.N.	Plant name	Alkaloids	Steroids	Flavonoids	Saponin	Tannin	Terpenoids
1	*Punica granatum*	+	+	+	+	-	+
2	*Carissa carandas*	+	+	+	+	-	+
3	*Euphorbia hirta*	+	+	+	+	+	-
4	*Cryptostegia grandiflora*	+	+	+	+	+	+

Where; + Positive, - Negative

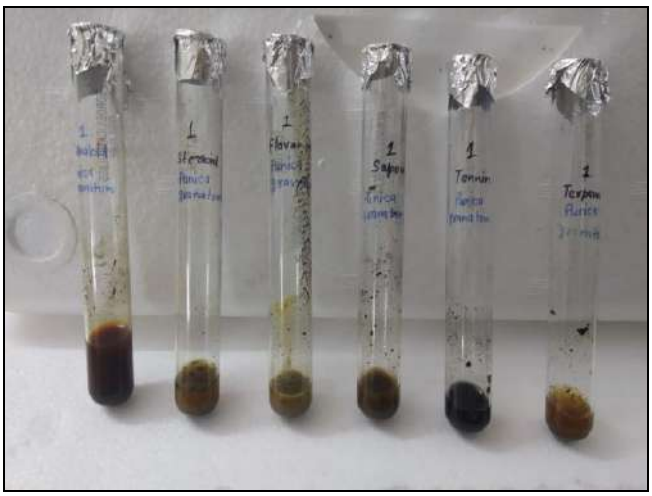

Fig 1: Preliminary phytochemical analysis in *Punica granatum*

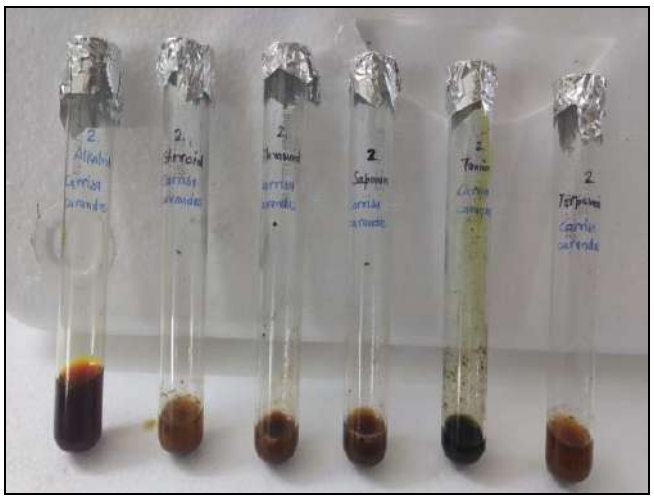

Fig 2: Preliminary phytochemical analysis in *Carissa carandas*

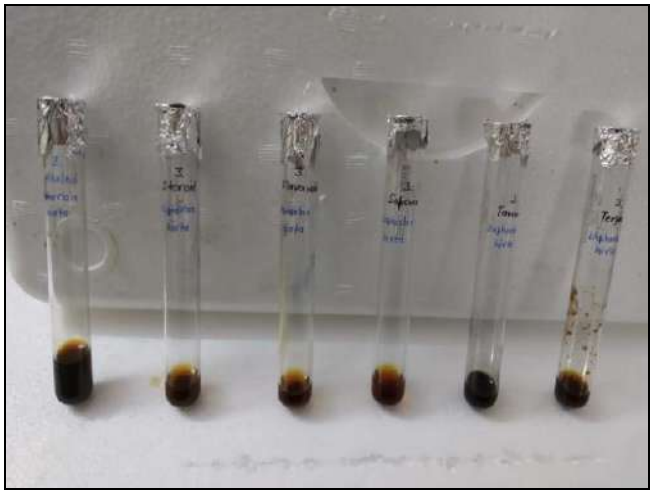

Fig 3: Preliminary phytochemical analysis in *Euphorbia hirta*

Fig 4: Preliminary phytochemical analysis in *Cryptostegia grandiflora*

4. Discussion

The preliminary phytochemical analysis of the four medicinal plants used in this study revealed that they all possess the phytochemicals that make up them and that these phytochemicals have a variety of significant biological functions. Alkaloids have pharmacological actions such as antibacterial [10], antiarrhythmic, analgesic [11], and antihyperglycemic [12] actions, according to reports. Alpha-glucosidase activity [13], antioxidant activity [14], and anti-inflammatory activity [15] were all known properties of flavonoids.

Due to the presence of the aforementioned biologically significant phytochemicals that the current study was able to identify in the leaves Punica granatum, *Carissa carandas*, Euphorbia hirta and *Cryptostegia grandiflora* these research findings clearly support the medicinal use of these plants.

Saponins have antifungal, antibacterial, anti-protozoal, and lipid-lowering characteristics, while glycosides are known for their effects on the contractile forces of cardiac muscle. The presence of ascorbic acid in plant species has demonstrated significant levels of overall antioxidant qualities of plants. The presence of saponin in all plant species demonstrates that they can be utilised to decrease cholesterol and have antibacterial and anthelmintic properties. Due to the presence of saponins, all of these may be utilised as cytotoxic and expectorants by inducing an upper digestive tract response [16].

The activity of numerous enzymes, including those thought to be involved in the formation of free radicals such xanthine oxidase, peroxidase, and nitric oxide synthase, can also be inhibited by flavonoids. As a result, the oxidative damage to macromolecules is reduced [17].

All plants contain phenolic chemicals, which have been found to have a variety of biological benefits, including antioxidant, free radical scavenging, anti-inflammatory, and anti-carcinogenic properties. Due to the presence of phenolic compounds, they may help prevent a number of chronic illnesses, including diabetes, cancer, cardiovascular disease, and infections caused by bacteria and parasites [18].

While the presence of reducing sugars in these plants has a reductive qualities, tannins also have astringent, antioxidant, and free radical scavenger properties that aid in wound healing and are useful in treating peptic ulcers [19].

Terpenoids included here may have antioxidant and cardio protecting effects [20]. In biological systems, steroids are commonly used as signalling chemicals and reduce membrane fluidity.

5. Conclusion

In conclusion, the overall results of study suggest that that all four plants of leaves *Punica granatum*, *Carissa carandas*, *Euphorbia hirta and Cryptostegia grandiflora* have at least one component that is pharmacologically active. To create therapies that show promise in the treatment of dysfunctional disorders, it is also use discover a new compound use as drugs for treatment of disease. Further quantitative and chromatographic studies should be carried out on the phytochemical compounds present in all plants.

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