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Preliminary phytochemical screening and reported biological activity from the leaves extract of selected indigenous and local medicinal plants

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ABSTRACT

Phytochemical screening is a precious stair in the detection of bioactive component present in particular medicinal plant and may lead to novel drug discovery. These phytochemicals are derived from a various parts of plants. Such as leaves, flowers, seeds, bark, roots, and pulps. The phytochemicals are used as source of direct Medicinal agents. Medicinal plants are one of the important source of medicine they play important role in clinical & Medicinal research. They have been used in traditional medicines system. They have several pharmacological activities. In the present study, eight medicinal plants ***Azadirecta indica, Abrus prectrorius, Aegle marmelos, Psidium guajava, Trigonella foenum, Ocimum sanctum, Adhatoda vasica***, ***Milletia pinnata***, were selected. Qualitative phytochemical analysis of these eight Medicinal plants confirms the presence of various phyto compounds like carbohydrates, proteins, anthroquinone, alkaloids, phenols, resins, and saponeins.

KEYWORDS: Medicinal properties, Qualitative screening, Medicinal plants, phytoconstituents

INTRODUCTION

Products from plants have been part of phytomedicines since ages. Plant products can be derived from barks, leaves, flowers, roots, fruits, seeds (Criagg and David, 2001). Knowledge of the chemical constituents of plants is desirable because such information will be value for synthesis of complex chemical substances and medcines (Mojab *et al*., 2003) (Parekh and Chanda, 2007).

The earliest reference to medicinal plants appears in the Rigveda, which was written between 3500 and 1600 B.C. and in Artharveda too. Most of the medicinal plants are wild and only a few of them have been cultivated. Studies of medicinal plants based on ancient literature and investigation in modern light is under process (Yadav *et al*., 2010).

Low polarity solvents which are used for the extraction of compounds (n-hexane, ethyl ether, ethyl acetate) could be used by other industries as in medicinal, cosmetics and perfumery. The extracts obtained are rich in different groups of compounds (Oirere, 2015) ; such as hydrocarbons, acids and fatty alcohols (Choi, 2016) (Hussain, 2015), esters and phytosterols among other compounds (Sun, 2003) (Gutiérrez, 2008) (Nuissier, 2002) (Prinsen, 2014) (Sun, 2001).

Studies have demonstrated the wide range of application of n-hexane solvent from different samples. As n-hexane is economical and its functionality. it is difficult to find a substance that competes with N- haxane to do the same function at a similar cost. So that we find a solvent, which works very efficiently, very cheap, is easily removed, can be recycled, and does not accumulate in the body or the environment. (Solá-Pérez *et al*., 2018).

In the present work, qualitative and quantitative phytochemical analysis were carried out in eight medicinal plants *Azadirecta indica, Abrus prectrorius, Aegle marmelos, Psidium guajava, Trigonella foenum, Ocimum sanctum, Adhatoda vasica, Milletia pinnata* of Girnar region of gujarat. Out of eight plant four plant species are indigenous which includes *Azadirecta indica, , Aegle marmelos, Ocimum sanctum, Adhatoda vasica.*

MATERIALS AND METHODS

Collection of plant materials

The plants were collected in June 2021 from Bhavnath regio

Extraction of plant materials

Leaves were thoroughly washed, separated, and dried under shade conditions. The dried leaves were homogenized to a fine powder and stored in air-tight bottles which were later used for extraction. The extractions were carried out using 10gm of each sample coarsely powdered plant materials with 250 ml of solvent and kept for 48 hours with slight shaking. The n-hexane solvent was used for extraction. The extraction was carried out at room temperature and filtered through whatmann filter paper no.1. The residual powder was weighed and redissolved in the respective solvent to get the final concentration of 1mg/ml. The powder was stored in an airtight container. It was used for further qualitative analysis.

Qualitative phytochemical analysis

Detection for carbohydrates:

Fehling's test:

An equal volume of Fehling solution A and Fehling solution B is added to an equal

volume of filtrate and then boiled in a Water Bath. The formation of a red precipitate indicates the presence of Sugar. (*De Silva et al,* 2017).

Benedict's test:

A mixture of plant extract and the benedict reagent is heated in a water bath for 2 minutes and a characteristic-colored precipitate indicates the presence of sugar (*De Silva et al,* 2017).

Detection for Protein:

The filtrate is dissolved in 10ml of distilled water and used for protein analysis (Saxena and Saxena, 2012)

Biuret test:

Add 4% sodium hydroxide solution and a few drops of 1% copper sulfate in the test solution. The Violet color of the solution indicates the presence of protein.

Detection for the Anthraquinones:

Benzene test:

5 ml filtrate was mixed with 10 ml benzene then 5ml of 10% ammonia solution was added to the filtrate. The mixture was shaken, the presence of pink, red, or violet color in the lower phase indicated the presence of anthraquinones. (Ajiboye *et al*, 2013).

Detection for alkaloids:

Mayer's test:

Two drops of Mayer's reagent are added along the side of the test tube into about 5ml filtrate. White creamy precipitates indicate the presence of alkaloids (*De Silva et al,* 2017).

Wagner's test:

A few drops of Wagner's reagent are added to about 5ml filtrate and a reddish-brown color precipitate shows the presence of alkaloid (*De Silva et al,* 2017).

Dragendroff's test:

A few drops of Dragendroff'ss reagent are added to about 5ml filtrate and Orange, yellow, brown precipitates indicate the presence of alkaloids (*De Silva et al,* 2017).

Detection for phenol:

Lead acetate test:

To the test, solution add a few drops of 10% lead acetate solution. White precipitate indicates the presence of phenolic compound (*De Silva et al,* 2017).

Lead iodine test:

Take 3 ml of the extracted solution then add a few drops of iodine. The red color indicates the presence of phenolic compounds (*De Silva et al,* 2017).

Detection for resin:

Acetone test:

The filtrate was mixed with water and acetone then the solution turned turbid,

which indicates the presence of protein (Samarawickrama *et al*., 2017).

Detection for saponins:

The crude extract was mixed with 5ml of distilled water in a test tube then it was shaken vigorously. The formation of the foam layer is an indication of saponins (Samarawickrama *et al*., 2017).

Test for steroids:

10 ml chloroform was added into 2 ml of plant extracts. 1 ml of acetic anhydride was added. Then 2 ml of concentrated sulphuric acid was added along the sides of the test tube. Bluish-green color formation at the junction indicates the presence of steroids.

Test for Terpenoids:

10 ml chloroform was added into 2 ml of plant extracts. 1 ml of acetic was added. Then 2 ml of concentrated sulphuric acid was added along the sides of the test tube. Red, pink, or violet color formation at the junction indicates the presence of terpenoids.

Sr. No	Name Of The Plants	Carbohydrate	Protein	Anthroquanine	Phenol	Alkaloid	Resin	Saponin
1	***Azadirecta indica***	+	+	-	+	+	+	+
2	***Abrus prectrorius***	-	+	-	+	+	-	-
3	***Aegle marmels***	-	-	-	+	+	-	-
4	***Psidium guajava***	-	+	-	+	+	+	+
5	***Trigonella foenum***	+	-	-	+	+	-	+
6	***Ocimum sanctum***	-	-	-	+	+	-	-
7	***Adhatoda vasica***	-	-	-	+	+	+	+
8	***Milletia pinnata***	+	+	-	+	+	+	-

RESULTS AND DISCUSSION

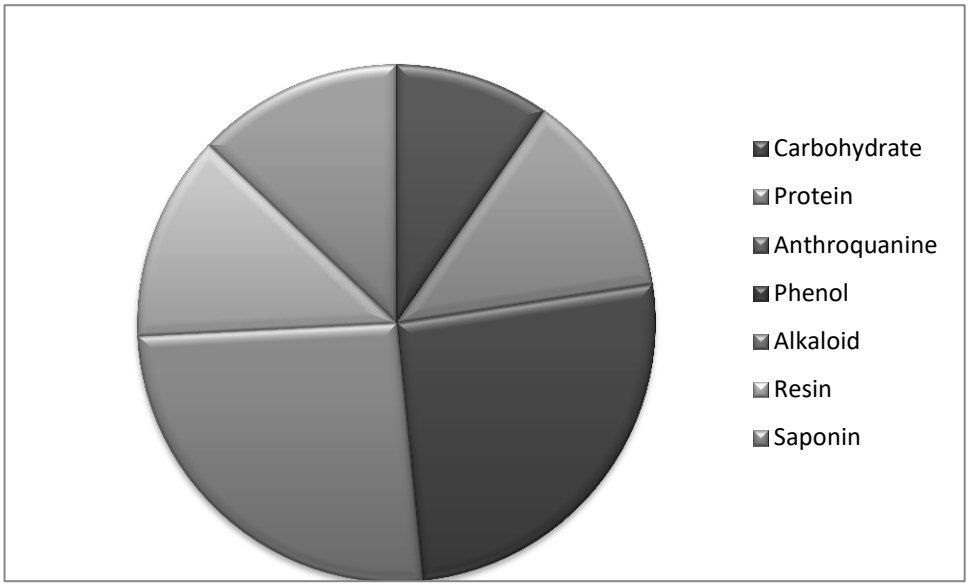
The preliminary qualitative phytochemical screening of the crude powder of 8 plants was done to assess the presence of bioactive components in n-haxane solvent. The phytochemical characteristics of eight medicinal plants in n-haxane solvent was summarized in the table-1.

The results revealed that the presence of medically active compounds in these plants. From the table it could be seen that Alkaloids and phenols were present in all plants, while anthroquinone were absent in the all plants. Carbohydrate was present in the *Azadirecta indica, Trigonellafoenum-gracum* and *Milletia pinnata*. Proteins were present in *Azadirecta indica, Abrus prectrorius, Psidium guajava* and *Milletia pinnata*. Resins were present in *Azadirecta indica, Psidium guajava, Adhatod avasic a*and *Milletia pinnata.* Saponeins were present in *Azadirecta indica, Psidium guajava, Trigonella foenum-gracum* and *Adhatoda vasica.*

Table no.1:Preliminary qualitative phytochemicalcompound analysis of plants in N-hexane solvent

Indicate the presence of phytochemicals and (-) Indicate the absence of phytochemicals

Plate 1 showing dry powder of



leaves

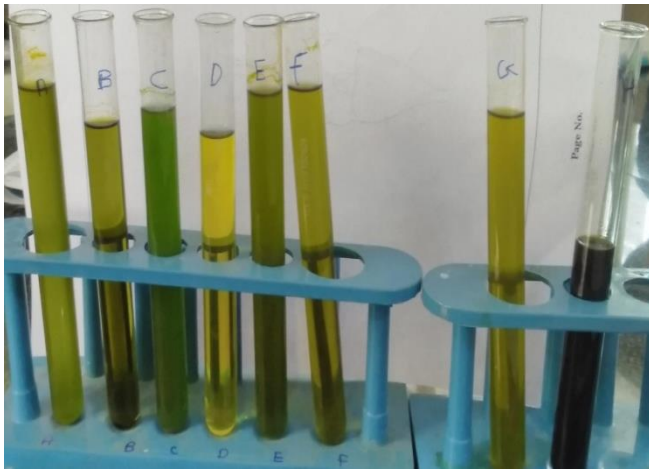


Plate 2 showing extraction of leaves by N-haxane solvent

A(*Azadirecta indica),* B*(Abrus Pretorius*), C*(Aegle marmelos),* D*(Psidium guajava),* E*(Trigonella foenum-gracum*), F*(Ocimum sanctum),* G(*Adhatoda vasica).*

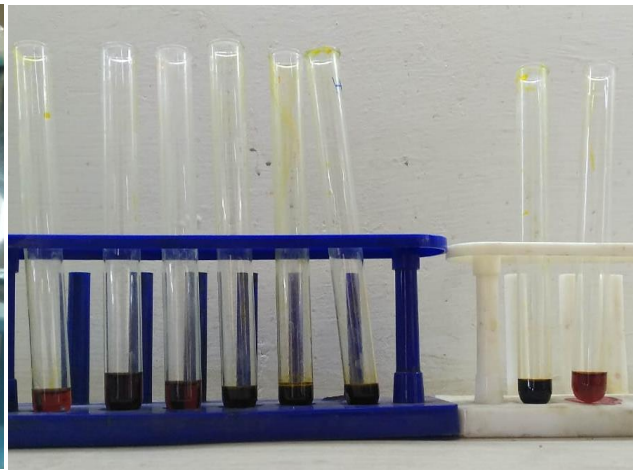


Plate 3 showing alkaloid test of the phytochemicals analysis

A(*Azadirecta indica),* B*(Abrus Pretorius*), C*(Aegle marmelos),* D*(Psidium guajava),* E*(Trigonella foenum-gracum*), F*(Ocimum sanctum),* G(*Adhatoda vasica).*

CONCLUSION

Before the era of modern medicine folk medicine is also known as indigenous or traditional medicine which comprises medical knowledge systems that developed over generations within various societies. These medicines are prepared from a single plant or combination of more than one plants. in plant species phytochemicals are responsible for medicinal activity. Hence, in the present study, preliminary phytochemical screening of eight medicinal plant, was carried out. Qualitative phytochemical analysis of this plant confirms the presence of various secondary metabolites like alkaloids, glycosides, tannins, saponin, flavonoids, steroid, triterpenes and phenols.

As a conclusion it is said that these plant species are very important medicinal plants having many abilities which can be used for making medicines against many disease causing by microorganisms in future. As well as phytochemical analysis of these plants is important commercially. N-hexane is good solvent for phytochemical extractions. By performing phytochemical test it is concluded that alkaloids and phenols were present in the all eight medicinal plants while athroquinones were absent in all eight medicinal plants. These plants are the reservoir of potentially useful chemical compounds which serve as cheap, safe and effective drugs for future.

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