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## Phytochemical Screening of Folklore Medicine for Controlling Diabetes

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### ABSTRACT

The present work deals with the use of folklore medicine by tribal and non-tribal communities of Nalgonda district, Telangana state, India for controlling diabetes, a chronic disease. Here it is focused on the use of plant species as folklore medicine to cure diabetes by the ethnic groups. Preliminary phytochemical analysis was carried out with different extracts like distill water, petroleum ether, chloroform and methanol of folk medicine samples and their constituent plant parts from Nalgonda district. The folk medicine and the individual plant parts present in the sample showed the presence of similar kind of phytochemicals with various screening tests for the control of diabetes.

**Keywords:** Folklore, Plant extract, Diabetes, Phytochemicals, Diabetes.

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## INTRODUCTION

Folk medicine is the mother of all other systems of medicine such as Ayurveda and modern medicine. The folk medicines must have coevolved with age-old culture or generated from a specific locality or from the contribution of a particular ethnic group. The folk community has gained some traditional experiences of human health problems and knowledge of human anatomy from social environment and practical life experiences of human beings to take care of the common ailments among the society [1]. Folk medicine practices are widespread throughout the world especially on the traditional societies [2].

## MATERIALS AND METHOD

A survey on folk healers and folk medicinal powders, plant parts used by them for control of diabetes in Nalgonda district of Telangana state is carried. All information was collected based on interview and field studies with local Folk healers within the community. Folk medicine for diabetes control constituted various parts of the medicinal plants like root, stem, leaf, seed, bark etc. These plants used for the medicinal purpose are abundant in study areas of Devarakonda, Chandampeta, Peddaa dicharlapally, Dindhi, Nampally, Chinthapally, Gurrampode, Marriguda mandals of Nalgonda district. The leaves, seeds and roots used in the sample folk medicine are separately collected and cut into small bits and air dried in shade for two weeks. The dried parts are ground to powder, sieved and are used for qualitative phytochemical screening following standard protocols [3, 4, 5, 6].

### **Test for alkaloids:**

To 5ml of extract 5ml of 2n Hcl is added, boiled and filtered. To this a few drops of Mayer's reagent is added. A colored precipitate indicates presence of alkaloids.

### **Test for anthroquinones:**

5ml extract was boiled with 10 ml of sulphuric acid and filtered while hot. 5ml of chloroform was added to the filtrate and shaken, chloroform layer was pipetted out to a different test tube and 1ml of dilute ammonia is added. The change in colour indicates the presence of anthroquinones.

### **Test for cardiac glycosides:**

To 1ml extract, glacial acetic acid, few drops of ferric chloride and concentrated sulphuric acid were added. Appearance of reddish brown at the junction of two layers and green colour in the upper layer indicates the presence of cardiac glycosides.

### **Test for flavonoids:**

To 1ml of the extract, a few drops of dilute sodium hydroxide were added. The intense yellow colour produced became colorless on addition of few drops of dilute acid indicating the presence of flavonoids.

**Test for steroids:**

10ml of chloroform and equal volume of sulphuric acid were used to dissolve 1ml of extract. Appearance of red colour indicates the presence of steroids.

**Test for tannins:**

Add a few drops of 1% lead acetate to 5ml of plant extract Appearance of yellow precipitate indicates the presence of tannins.

**Test for terpenoids:**

1ml of the extract was dissolved in 1 ml of chloroform; 1ml of acetic anhydride and 2ml of sulphuric acid, reddish colour indicates the presence of terpenoids.

**Test for saponins:**

Boil 5ml of extract in 10ml of distilled water in a test tube and shake vigorously for about 30 seconds. Formation of froth indicates presence of saponins.

**Test for phenols:**

Phenols are tested by adding 2ml of ferric chloride solution to 2ml of plant extract. Appearance of bluish green color solution indicates the presence of phenols.

## RESULTS AND DISCUSSION

Folk medicine for diabetic sample I analysis for phytochemicals (Table1-3) showed the presence of alkaloids only in chloroform extract.

**Table 1: Phytochemical screening of different compounds From folklore medicine for diabetes sample i**

| S.No | Phytochemical Constituents | Distilled Water | Petroleum Ether | Chloroform | Methanol | Ethyl Alcohol | Ethyl Acetate |
|------|----------------------------|-----------------|-----------------|------------|----------|---------------|---------------|
| 1    | Alkaloids                  | -               | -               | +          | -        | -             | -             |
| 2    | Anthroquinines             | -               | +               | -          | ++       | +             | +             |
| 3    | Cardiac Glycosides         | +               | -               | -          | -        | +             | +             |
| 4    | Flavonoids                 | +               | +               | -          | -        | -             | +             |
| 5    | Steroids                   | +               | -               | -          | ++       | +             | -             |
| 6    | Tannins                    | +               | +               | +          | +        | +             | +             |
| 7    | Terpenoids                 | -               | -               | -          | ++       | +             | +             |
| 8    | Saponins                   | -               | +               | -          | -        | -             | +             |
| 9    | Phenols                    | +               | +               | +          | ++       | ++            | +             |

- = indicates absence of phytochemicals.

+ = indicates presence of phytochemicals and

++ = shows moderate concentration.

**Table 2: Phytochemical Screening of *Phyllanthus Emblicadry* Fruit Extract From Various Solvents**

| S.No | Phytochemical Constituents | Distilled Water | Petroleum Ether | Chloroform | Methanol | Ethyl Alcohol | Ethyl Acetate |
|------|----------------------------|-----------------|-----------------|------------|----------|---------------|---------------|
| 1.   | Alkaloids                  | -               | -               | +          | -        | -             | -             |
| 2.   | Anthroquinones             | +               | -               | +          | +        | +             | ++            |
| 3.   | Cardiac Glycosides         | -               | +               | +          | -        | -             | -             |
| 4.   | Flavonoids                 | -               | +               | -          | -        | -             | -             |
| 5.   | Steroids                   | -               | -               | -          | +        | -             | -             |
| 6.   | Tannins                    | -               | -               | +          | +        | -             | -             |
| 7.   | Terpenoids                 | ++              | -               | -          | +        | +             | -             |
| 8.   | Saponins                   | ++              | -               | +          | -        | -             | -             |
| 9.   | Phenols                    | +               | +               | +          | +        | +             | +             |

- = indicates absence of phytochemicals.

+ = indicates presence of phytochemicals and

++ = shows moderate concentration.

**Table 3 Phytochemical Screening Of *Hemidesmis Indicus* Root Powder Extract From Various Solvents**

| S.No. | Phytochemical Constituents | Distilled Water | Petroleum Ether | Chloroform | Methanol | Ethyl Alcohol | Ethyl Acetate |
|-------|----------------------------|-----------------|-----------------|------------|----------|---------------|---------------|
| 1.    | Alkaloids                  | -               | -               | -          | -        | -             | -             |
| 2.    | Anthroquinones             | ++              | -               | -          | +        | ++            | ++            |
| 3.    | Cardiac Glycosides         | +               | +               | +          | -        | ++            | ++            |
| 4.    | Flavonoids                 | +               | +               | +          | ++       | ++            | +             |
| 5.    | Steroids                   | -               | -               | -          | -        | -             | -             |
| 6.    | Tannins                    | -               | -               | -          | +        | -             | -             |
| 7.    | Terpenoids                 | -               | +               | -          | +        | -             | -             |
| 8.    | Saponins                   | +               | -               | -          | -        | -             | ++            |
| 9.    | Phenols                    | -               | ++              | +          | -        | -             | ++            |

- = indicates absence of phytochemicals.

+ = indicates presence of phytochemicals and

++ = shows moderate concentration.

Alkaloids were found to be present in the chloroform extract of *Phyllanthus* dry fruit and absent in all the extracts of *Hemidesmus* root powder which are the component parts of the sample-I medicine.

Anthroquinones are moderately present in methanol extract, petroleum ether; ethyl alcohol and ethyl acetate. The component medicinal plant parts also showed anthroquinones in almost all the extracts.

Cardiac glycosides are found in ethyl alcohol and ethyl acetate in the sample-I. These are found only in the petroleum ether and chloroform extracts of *Phyllanthus* dry fruit extract and also in all the

extracts except the methanolic extracts of *Hemidesmis* root powder. Flavonoids are present in the petroleum ether and ethyl acetate extracts of Sample-I. These are present in petroleum ether extracts in *Phyllanthus* dry fruit extract and in all the extracts of *Hemidesmis*.

Steroids are present in the water, methanol and ethyl alcohol extracts of diabetic Sample-I, where as these are absent in *Hemidesmis* root powder and meagerly present only in the methanol extracts of *Phyllanthus* fruit extract. Tannins are present in all the extracts of sample, that are present in chloroform and methanol extract of *Phyllanthus* dry fruit and in the methanol extract of *Hemidesmis* root powder. Terpenoids are present in methanol, methyl alcohol and ethyl acetate extracts of diabetic sample-I. These are found in water, methanol and ethyl alcohol extracts of *Phyllanthus* dry fruit and in the petroleum ether and methanol extracts of *Hemidesmis* root powder. Saponins are present in petroleum ether and ethyl acetate extracts of diabetes Sample-I. These are also found in water and chloroform extracts of *Phyllanthus* extracts and in water and ethyl acetate extracts of *Hemidesmis indicus*. Phenols are present in all the extracts of sample-I and *Phyllanthus* dry fruit extracts while these are present in petroleum ether, chloroform and ethyl acetate of the *Hemidesmis* root powder.

Folk medicine for diabetic sample-II analysis for phytochemicals(Table 4-7) showed the presence of alkaloids only in methanol and water extracts.

**Table 4 Phytochemical Screening of Folklore Medicine Sample-Ii For Diabetes Control In Different Extracts.**

| S.No | Phytochemical Constituents | Distilled Water | Petroleum Ether | Chloroform | Methanol | Ethyl Alcohol | Ethyl Acetate |
|------|----------------------------|-----------------|-----------------|------------|----------|---------------|---------------|
| 1    | Alkaloids                  | -               | -               | -          | +        | -             | -             |
| 2    | Anthro quinones            | -               | -               | +          | +        | +             | -             |
| 3    | Cardiac Glycosides         | +               | -               | -          | ++       | -             | -             |
| 4    | Flavonoids                 | -               | -               | +          | -        | +             | -             |
| 5    | Steroids                   | -               | -               | -          | ++       | -             | -             |
| 6    | Tannins                    | +               | -               | +          | ++       | +             | +             |
| 7    | Terpenoids                 | -               | +               | -          | +        | ++            | +             |
| 8    | Saponins                   | +               | -               | -          | -        | -             | +             |
| 9    | Phenols                    | +               | -               | +          | +        | -             | +             |

- = indicates absence of phytochemicals.

+ = indicates presence of phytochemicals and

++ = shows moderate concentration.

**Table 5 Phytochemical Screening Of *Trigonella Foenum-Graecum* Seed Powder Extract From Various Solvents**

| Phytochemical Constituents | Distilled Water | Petroleum Ether | Chloroform | Methanol | Ethyl Alcohol | Ethyl Acetate |
|----------------------------|-----------------|-----------------|------------|----------|---------------|---------------|
| Alkaloids                  | ++              | -               | +          | -        | -             | -             |
| Anthro quinones            | +               | +               | +          | +        | -             | +             |
| Cardiac Glycosides         | -               | -               | +          | -        | ++            | ++            |
| Flavonoids                 | ++              | -               | +          | ++       | ++            | -             |
| Steroids                   | -               | -               | -          | -        | +             | -             |
| Tannins                    | ++              | -               | -          | +        | -             | -             |
| Terpenoids                 | +               | +               | -          | +        | +             | +             |
| Saponins                   | ++              | ++              | -          | +        | +             | -             |
| Phenols                    | -               | +               | -          | -        | -             | ++            |

- = indicates absence of phytochemicals.

+ = indicates presence of phytochemicals and

++ = shows moderate concentration.

**Table 6 Phytochemical Screening Of *Trigonella Foenum-Graecum* Leaf Powder Extract From Various Solvents**

| Phytochemical Constituents | Distilled Water | Petroleum Ether | Chloroform | Methanol | Ethyl Alcohol | Ethyl Acetate |
|----------------------------|-----------------|-----------------|------------|----------|---------------|---------------|
| Alkaloids                  | -               | -               | -          | -        | -             | -             |
| Anthro quinones            | +               | +               | +          | +        | +             | +             |
| Cardiac Glycosides         | +               | ++              | +          | -        | -             | -             |
| Flavonoids                 | +               | -               | -          | -        | -             | -             |
| Steroids                   | -               | -               | -          | -        | -             | -             |
| Tannins                    | +               | -               | -          | +        | +             | -             |
| Terpenoids                 | -               | -               | -          | +        | -             | -             |
| Saponins                   | +               | -               | -          | +        | ++            | -             |
| Phenols                    | -               | ++              | -          | -        | -             | -             |

- = indicates absence of phytochemicals.

+ = indicates presence of phytochemicals and

++ = shows moderate concentration.

**Table 7 Phytochemical Screening Of *Momordica Charantia* Seed Powder Extract From Various Solvents**

| Phytochemical Constituents | Distilled Water | Petroleum Ether | Chloroform | Methanol | Ethyl Alcohol | Ethyl Acetate |
|----------------------------|-----------------|-----------------|------------|----------|---------------|---------------|
| Alkaloids                  | -               | -               | -          | -        | -             | -             |
| Anthro quinones            | +               | -               | +          | +        | +             | +             |
| Cardiac Glycosides         | ++              | +               | +          | +        | ++            | +             |

|            |    |   |   |   |    |   |
|------------|----|---|---|---|----|---|
| Flavonoids | ++ | + | + | + | ++ | - |
| Steroids   | -  | - | - | - | -  | + |
| Tannins    | -  | - | - | - | -  | - |
| Terpenoids | +  | + | + | + | +  | + |
| Saponins   | +  | - | - | + | +  | - |
| Phenols    | -  | - | - | - | -  | + |

- = indicates absence of phytochemicals.

+ = indicates presence of phytochemicals and

++ = shows moderate concentration.

These are present in chloroform extract of *Trigonella foenum-graecum* seed powder and absent in *Trigonella foenum-graecum* leaf powder and *Momordica charantia* seed powder, the component parts of the sample-II.

Anthroquinones are present in chloroform, methanol, ethyl alcohol extracts of Sample-II folklore medicine. The component parts from the Sample-II also showed the presence of anthroquinones in almost all the extracts except in ethyl alcohol of *Trigonella foenum-graecum* seed powder and petroleum ether of *Momordica charantia* seed powder.

Cardiac glycosides are found in distil water and methanol extracts of the sample-II. These are also found in chloroform, ethyl alcohol and ethyl acetate extracts of *Trigonella foenum-graecum* seed powder, also in distil water, chloroform, petroleum ether extracts of *Trigonella foenum-graecum* leaf powder and in all extracts of *Momordica* seed powder.

Flavonoids are present in chloroform and ethyl alcohol extracts of Sample-II for diabetes controle. These are present in chloroform, water, methanol, ethyl alcohol extracts of *Trigonella* seed powder, in water extract of *Trigonella* leaf powder and in most of *Momordica* seed powder extracts. Steroids are present in methanol extract of diabetic Sample-II, which are present in ethyl alcohol of *Trigonella foenum-graecum* seed powder, absent in all extracts of *Trigonella* leaf powder and present only in ethyl acetate extract of *Momordica* seed powder.

Tannins are present in all the extracts except in petroleum ether of diabetic sample-II. These are also present in methanol, water extracts of *Trigonella foenum-graecum* seed and leaf powder and completely absent in all extracts of *Momordica* seed powder. Terpenoids are present in most of the extracts of diabetic sample-II. These are present in all extracts except chloroform of *Trigonella foenum-graecum* seed powder and only present in methanol extract of *Trigonella* leaf powder and in all extracts of *Momordica charantia* seed powder.

Saponins are only present in distil water and ethyl acetate extracts of diabetes Sample-II. These are found to be present in most of the extracts of *Trigonella foenum-graecum* seed, leaf powder and *Momordica charantia* seed powder. Phenols are present in all the extracts except in petroleum ether,

ethyl alcohol of sample-II. These are present in petroleum ether extracts of *Trigonella foenum-graecum* seed and leaf powder, and only in ethyl acetate extract of *Momordica charantia* seed powder.

## CONCLUSION

The medicinal properties of plants have been exploited by native people from ancient times. Phytochemicals from medicinal plants generally includes, Alkaloids, Anthraquinones, Cardiac glycosides, Flavonoids, Steroids, Tannins, Terpenoids, Saponins, Phenolsetc. The present study revealed the presence of certain phytochemicals in the folklore medicine that are also found to be present in constituent plant parts of the folk medicine. The combination of the plant parts in the folk medicine and individual plant parts possessed similar kind of phytochemicals without much difference.

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