Phytochemical Analysis of Some Endangered Medicinal Plants

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Abstract

The preliminary phytochemical analysis of leaf extracts of *Aegle marmelos*, *Butea monosperma*, *Comnifora wighti*, *Cycas beddomei*, *Holostemma ada-kodien*, *Decalepis hamiltonii*, *Gloriosa superba*, *Gymnema sylvestre*, *Pterocarpus santalinus*, *Santalum album* and *Saraca asoca* showed the presence of flavonoids, tannins and phenolic compounds, terpenoids, alkaloids, saponins and phytosterols, carbohydrates and proteins, This explains the medicinal properties of the above medicinal plants. There is need to elucidate phytochemical components present in the extracts which might be responsible for the antimicrobial activity. There is a need to determine the possible mechanism of antimicrobial action of the extracts. There is a need to determine individual contribution of each plant extracts towards combined effect.

Keywords: Endangered, Medicinal Plants, Phytochemical Analysis

1. Introduction

India is generally known as the professional flowerbed of the world since it is the biggest maker of medicinal herbs (Shariff 2006). Medicinal plants go about as an indigenous wellspring of new mixes having helpful esteem and can likewise be utilized in medication improvement. 80% of the number of inhabitants in creating nations rely upon customary drugs, for the most part normal plant items, for their essential human services needs as assessed by WHO (Vines 2004). Due to the developing acknowledgment of characteristic items the interest for medicinal plants has been expanding everywhere throughout the world. They have insignificant lethality, are practical and pharmacologically dynamic, and give a simple solution for some human afflictions when contrasted with the manufactured medications which are a subject of corruption and reactions (Saet 2007). The disturbing increment in the rate of contamination by antibiotic-resistant microorganisms has asked researchers to scan for mixes which have potential antimicrobial movement (Davis 1982). The capacity to blend mixes by auxiliary digestion having antimicrobial potential makes plants an important wellspring of

pharmaceutical and remedial items (Lis-Balchin 1997). The adequacy of plant removes on microorganism has been considered overall (Ates 2003, Seedi 2002, Rojas 2003, Duraipandiyan 2006).

2. Materials and Methods

A total of 11 endangered medicinal plants from different places of Andhra Pradesh and Telangana States were selected for the present study are as follows: *Aegle marmelos, Butea monosperma, Comnifora wighti, Cycas beddomei, Holostemma ada-kodien, Decalepis hamiltonii, Gloriosa superba, Gymnema sylvestre, Pterocarpus santalinus, Santalum album* and *Saraca asoca.*

Preparation of Leaf Extracts

The leafs of *Aegle marmelos, Butea monosperma, Comnifora wighti, Cycas beddomei, Holostemma ada-kodien, Decalepis hamiltonii, Gloriosa superba, Gymnema sylvestre, Pterocarpus santalinus, Santalum album* and *Saraca asoca* were dried under shade and made to a fine powder. The powder (100 grams) were extracted with methanol and dried for 3 hours.

Phytochemical Analysis

Qualitative phytochemical analyses of the extracts were performed by following the protocol of Adetuyi and Popoola (2001).

a) Procedure for Alkaloids: 2ml of extract is taken and added 2ml of wagner's reagent a brownish precipitate indicate the presence of alkaloids.

b) Cardiac Glycosides: 2ml of extract is dissolved with 2ml of chloroform and concentrated sulphuric acid is carefully added to form in to a layer. The deep reddish brown colour at the inter face of steroid ring indicates the presence of cardiac glycosides.

c) Flavonoids: 2ml of extract is treated with 2 ml of 10%lead acetate. Brownish green colour indicates the presence of flavonoids.

d) Saponins: 2ml of extract is dissolved with 2ml of Benedicts reagent. Blue black ppt indicates the presence of saponins.

e) Tanins: 2ml of extract is treated with 0.1% of ferric chloride. There was no brownish green ppt found hence tannins were absent.

f) Terpenoides: (Salkowski test) 2ml of extract is dissolved with 2ml of chloroform and concentrated sulphuric acid is carefully added to form a layer. A reddish brown colour indicates the presence of terpenoids.

g) Anthraquinones: 1ml of extract is boiled with 10% HCL in a water bath for few minutes. It is filtered and allowed to cool. Then equal volume of CHCl3 is added to the filtrate few drops of 10% Ammonia is added to the mixture and is heated. The formation of rose pink colour indicates the presence of anthraquinones.

h) Glycosides: The extract is hydrolysed with HCL solution and neutralised with NaoH solution. A few drops of Fehlings solution A&B are added red precipitate indicates the presence of glycosides.

i) Reducing sugars: The extract is shaken with distilled water and filtered. The filtrate is boiled with drops of Fehling's solution A&B for few minutes. An orange red precipitate indicate the presence of reducing sugars.

j) Phlobatanins: The extract is dissolved in distilled water and filtered. The filtrate is boiled with 2% HCL solution. Red precipitate shows the presence of phlobatanins.

3. Results and Discussion

The preliminary phytochemical analysis of leaf extracts of *Aegle marmelos*, *Butea monosperma*, *Comnifora wighti*, *Cycas beddomei*, *Holostemma ada-kodien*, *Decalepis hamiltonii*, *Gloriosa superba*, *Gymnema sylvestre*, *Pterocarpus santalinus*, *Santalum album* and *Saraca asoca* showed the presence of flavonoids, tannins and phenolic compounds, terpenoids, alkaloids, saponins and phytosterols, carbohydrates and proteins, This explains the medicinal properties of the above medicinal plants (Table 1-11).

Table 1: Phyto Chemical Analysis of *Aegle marmelos*

Sl. No	Phytochemicals	Distilled Water	Petroleum Ether	Acetone	Methanol
1	Tanins	Positive	Positive	Positive	Positive
2	Anthraquinones	Positive	Negative	Positive	Positive
3	Flavanoides	Positive	Negative	Positive	Positive
4	Alkaloides	Positive	Negative	Positive	Positive
5	Terpenoids	Positive	Positive	Positive	Positive
6	Saponins	Positive	Positive	Positive	Positive
7	Cardiac glycosides	Positive	Positive	Positive	Positive
8	Glycosides	Positive	Negative	Positive	Positive
9	Reducing Sugars	Positive	Negative	Positive	Positive
10	Phlobatanins	Negative	Positive	Positive	Positive
11	Steroids	Positive	Positive	Positive	Positive

Table 2: Phyto Chemical Analysis of *Butea monosperma*

Sl. No	Phytochemicals	Distilled Water	Petroleum Ether	Acetone	Methanol
1	Tanins	Positive	Positive	Positive	Positive
2	Anthraquinones	Negative	Negative	Negative	Negative
3	Flavanoides	Positive	Positive	Positive	Positive
4	Alkaloides	Positive	Positive	Negative	Positive
5	Terpenoids	Positive	Positive	Positive	Positive
6	Saponins	Positive	Positive	Positive	Positive
7	Cardiac glycosides	Positive	Positive	Positive	Positive
8	Glycosides	Positive	Positive	Positive	Positive
9	Reducing Sugars	Positive	Positive	Negative	Positive
10	Phlobatanins	Negative	Positive	Positive	Positive
11	Steroids	Positive	Positive	Positive	Positive

Table 3: Phyto Chemical Analysis of *Comnifora wighti*

Sl. No	Phytochemicals	Distilled Water	Petroleum Ether	Acetone	Methanol
1	Tanins	Positive	Positive	Positive	Positive
2	Anthraquinones	Negative	Positive	Positive	Positive
3	Flavanoides	Positive	Positive	Positive	Positive
4	Alkaloides	Positive	Positive	Positive	Positive
5	Terpenoids	Positive	Positive	Positive	Positive
6	Saponins	Positive	Positive	Positive	Positive
7	Cardiac glycosides	Positive	Positive	Positive	Positive
8	Glycosides	Positive	Negative	Positive	Positive
9	Reducing Sugars	Positive	Positive	Positive	Positive
10	Phlobatanins	Positive	Positive	Positive	Positive
11	Steroids	Positive	Positive	Positive	Positive

Table 4: Phyto Chemical Analysis of *Cycas beddomei*

Sl. No	Phytochemicals	Distilled Water	Petroleum Ether	Acetone	Methanol
1	Tanins	Positive	Positive	Positive	Positive
2	Anthraquinones	Negative	Negative	Negative	Negative
3	Flavanoides	Positive	Positive	Positive	Positive
4	Alkaloides	Positive	Positive	Positive	Positive
5	Terpenoids	Positive	Positive	Positive	Positive
6	Saponins	Positive	Positive	Positive	Positive
7	Cardiac glycosides	Positive	Positive	Positive	Positive
8	Glycosides	Positive	Positive	Positive	Positive
9	Reducing Sugars	Positive	Positive	Positive	Positive
10	Phlobatanins	Negative	Negative	Negative	Negative
11	Steroids	Positive	Positive	Positive	Positive

Table 5: Phyto Chemical Analysis of *Holostemma ada-kodien*

Sl. No	Phytochemicals	Distilled Water	Petroleum Ether	Acetone	Methanol
1	Tanins	Positive	Positive	Positive	Positive
2	Anthraquinones	Positive	Positive	Positive	Positive
3	Flavanoides	Positive	Positive	Positive	Positive
4	Alkaloides	Positive	Positive	Positive	Positive
5	Terpenoids	Positive	Positive	Positive	Positive
6	Saponins	Positive	Positive	Positive	Positive
7	Cardiac glycosides	Positive	Positive	Positive	Positive
8	Glycosides	Positive	Positive	Positive	Positive
9	Reducing Sugars	Positive	Positive	Positive	Positive
10	Phlobatanins	Negative	Positive	Negative	Positive
11	Steroids	Positive	Positive	Positive	Positive

Table 6: Phyto Chemical Analysis of *Decalepis hamiltonii*

Sl. No	Phytochemicals	Distilled Water	Petroleum Ether	Acetone	Methanol
1	Tanins	Positive	Positive	Positive	Positive
2	Anthraquinones	Positive	Positive	Positive	Positive
3	Flavanoides	Positive	Positive	Positive	Positive
4	Alkaloides	Positive	Positive	Positive	Positive
5	Terpenoids	Positive	Positive	Positive	Positive
6	Saponins	Positive	Positive	Positive	Positive
7	Cardiac glycosides	Positive	Positive	Positive	Positive
8	Glycosides	Positive	Positive	Positive	Positive
9	Reducing Sugars	Positive	Positive	Positive	Positive
10	Phlobatanins	Positive	Positive	Positive	Positive
11	Steroids	Positive	Positive	Positive	Positive

Table 7: Phyto Chemical Analysis of *Gloriosa superba*

Sl. No	Phytochemicals	Distilled Water	Petroleum Ether	Acetone	Methanol
1	Tanins	Positive	Positive	Positive	Positive
2	Anthraquinones	Positive	Positive	Positive	Positive
3	Flavanoides	Positive	Positive	Positive	Positive
4	Alkaloides	Positive	Positive	Positive	Positive
5	Terpenoids	Positive	Positive	Positive	Positive
6	Saponins	Positive	Positive	Positive	Positive
7	Cardiac glycosides	Positive	Positive	Positive	Positive
8	Glycosides	Positive	Positive	Positive	Positive
9	Reducing Sugars	Positive	Positive	Positive	Positive
10	Phlobatanins	Positive	Positive	Positive	Positive
11	Steroids	Positive	Positive	Positive	Positive

Table 8: Phyto Chemical Analysis of *Gymnema sylvestre*

Sl. No	Phytochemicals	Distilled Water	Petroleum Ether	Acetone	Methanol
1	Tanins	Positive	Positive	Positive	Positive
2	Anthraquinones	Positive	Positive	Positive	Positive
3	Flavanoides	Positive	Positive	Positive	Positive
4	Alkaloides	Positive	Positive	Positive	Positive
5	Terpenoids	Positive	Positive	Positive	Positive
6	Saponins	Positive	Positive	Positive	Positive
7	Cardiac glycosides	Positive	Positive	Positive	Positive
8	Glycosides	Positive	Positive	Positive	Positive
9	Reducing Sugars	Positive	Positive	Positive	Positive
10	Phlobatanins	Positive	Positive	Positive	Positive
11	Steroids	Positive	Positive	Positive	Positive

Table 9: Phyto Chemical Analysis of *Pterocarpus santalinus*

Sl. No	Phytochemicals	Distilled Water	Petroleum Ether	Acetone	Methanol
1	Tanins	Positive	Positive	Positive	Positive
2	Anthraquinones	Negative	Positive	Positive	Positive
3	Flavanoides	Positive	Positive	Positive	Positive
4	Alkaloides	Positive	Positive	Positive	Positive
5	Terpenoids	Positive	Positive	Positive	Positive
6	Saponins	Positive	Positive	Positive	Positive
7	Cardiac glycosides	Positive	Positive	Positive	Positive
8	Glycosides	Positive	Negative	Positive	Positive
9	Reducing Sugars	Positive	Positive	Positive	Positive
10	Phlobatanins	Positive	Positive	Positive	Positive
11	Steroids	Positive	Positive	Positive	Positive

Table 10: Phyto Chemical Analysis of *Santalum album*

Sl. No	Phytochemicals	Distilled Water	Petroleum Ether	Acetone	Methanol
1	Tanins	Positive	Positive	Positive	Positive
2	Anthraquinones	Negative	Negative	Negative	Negative
3	Flavanoides	Positive	Positive	Positive	Positive
4	Alkaloides	Positive	Positive	Negative	Positive
5	Terpenoids	Positive	Positive	Positive	Positive
6	Saponins	Positive	Positive	Positive	Positive
7	Cardiac glycosides	Positive	Positive	Positive	Positive
8	Glycosides	Positive	Positive	Positive	Positive
9	Reducing Sugars	Positive	Positive	Negative	Positive
10	Phlobatanins	Negative	Positive	Positive	Positive
11	Steroids	Positive	Positive	Positive	Positive

Table 11: Phyto Chemical Analysis of *Saraca asoca*

Sl. No	Phytochemicals	Distilled Water	Petroleum Ether	Acetone	Methanol
1	Tanins	Positive	Positive	Positive	Positive
2	Anthraquinones	Negative	Positive	Positive	Positive
3	Flavanoides	Positive	Positive	Positive	Positive
4	Alkaloides	Positive	Positive	Positive	Positive
5	Terpenoids	Positive	Positive	Positive	Positive
6	Saponins	Positive	Positive	Positive	Positive
7	Cardiac glycosides	Positive	Positive	Positive	Positive
8	Glycosides	Positive	Negative	Positive	Positive
9	Reducing Sugars	Positive	Positive	Positive	Positive
10	Phlobatanins	Positive	Positive	Positive	Positive
11	Steroids	Positive	Positive	Positive	Positive

4. Conclusions

The present study reveals the Phtochemical analysis leaf extracts of *Aegle marmelos*, *Butea monosperma*, *Comnifora wighti*, *Cycas beddomei*, *Holostemma ada-kodien*, *Decalepis hamiltonii*, *Gloriosa superba*, *Gymnema sylvestre*, *Pterocarpus santalinus*, *Santalum album* and *Saraca asoca* There was the presence of phytochemicals in the plant extracts flavonoids, tannins and phenolic compounds, terpenoids, alkaloids, saponins and phytosterols, carbohydrates and proteins, This explains the medicinal properties of the above medicinal plants.

- There is need to elucidate phytochemical components present in the extracts which might be responsible for the antimicrobial activity.

Suggestions for further studies

- Determine the possible mechanism of antimicrobial action of the extracts.
- Determination of individual contribution of each plant extracts towards combined effect.

5. References

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