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Preliminary Phytochemical Analysis of Leaf Extract of one Medicinal Plant *Premna tomentosa*

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Abstract

The knowledge of scientific validation of the efficacy of medicinal plants in the light of modern research parameters is of great importance in understanding the plant's role as medicine. *Premna tomentosa* L. (Verbanacae) is a medicinal plant used as an effective treatment for hepatotoxicity in ayurvedic medicine. Aqueous, Methanolic and Ethanolic extract of the leaves were used, Qualitative phytochemical analysis of these plants confirms the presence of various phytochemicals like alkaloids, flavonoids, tannins, steroids and phenolic compounds. There was a complete absence of Anthraquinons, Glycosides, Amino Acid, Proteins and Triterpenoids. Further work is in progress towards understanding this plant's role as a medicine.

Keywords

Premna Tomentosa, Hepatotoxicity, Flavonoids, Tannin, Phenolic Compounds.

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INTRODUCTION

Premna tomentosa is a plant with various medicinal roles, it is also known as ''Pudangainari'' and ''Krishnapalai''[1]. In Indian system of medicine, all parts of *P. tomentosa* have been employed for the treatment of various disorders[9], it is moderately sized deciduous tree with shoots, leaves and inflorescence densely clothed with a tawny yellow stellate tomentum. Extracts from *P. tomentosa* leaves are known to have diuretic[10], hepatoprotective[1], antioxidant[2], lipid lowering[3], immunomodulatory activities[4], anti-inflammatory antinociceptive, hypnotic effects, cytoprotective and protective against acetaminophen induced mitochondrial dysfunction properties[5].

The leaves of *Premna tomentosa* are used externally to treat dropsy. The decoction of leaves is used to cure dropsy and stomach disorders and extract of inner bark is used to arrest diarrhea. The aqueous extract of *P. tomentosa* leaves has been extensively used for the treatment of splenomegaly. Its bark extract is claimed to have a lasting cure for hepatic disorders. The leaves on steam distillation yield a light, yellow essential oil with a pleasing odour and burning taste [11]. The heart wood gave a 6, 8-di-C-glycoside favone $C_{26}H_{28}O_{14}$.

MATERIALS AND METHODS

Collection of Samples

Fresh leaves of *premna tomentosa* were collected from *Siddha Medicinal Plants Garden, Mettur dam*, Salem, Tamil Nadu, India. The Leaves were thoroughly washed to remove any dust and impurities and shade dried. The dried leaves were ground to fine powder.

Preparation of Extracts

The dried leaves were ground into a fine powder and the total mass was subjected to extraction by a hot percolation method with water, ethanol and Methanol in soxhlet apparatus for 72 hrs. Each solvent extraction step was carried out for 24 hrs. After extraction the extracts were concentrated by evaporation and stored at 4°C for further study[13].

Phytochemical Analysis

The extracts prepared were analyzed for the presence of alkaloids, saponins, tannins, steroids, flavonoids, phenol, anthraquinones, triple sugars, amino acids, proteins, glycosides and reducing sugars as per standard protocols.

Test for Steroids and Terpenoids

10mg of the extract was dissolved in chloroform. Few drops of acetic anhydride were added followed by 1 ml of conc. Sulphuric acid. The blue colour on the chloroform layer which changes to green shows the presence of steroids, whereas the appearance of pink colour in chloroform layer shows the presence of terpenoids.

Test for Alkaloids

About 0.5 g of the prepared residue was dissolved in 2 N Hydrochloric acids. The mixture was filtered, and the filtrate was divided into two equal portions. One portion was treated with a few drops of Mayer's reagent and the other was treated with equal amount of Dragendorff's reagent respectively. The appearance of creamish precipitate and orange precipitate respectively, indicated the presence of alkaloids.

Test for Saponins

About 0.5 g of the plant leaf extract was vigorously shaken with water in a test tube and then heated to boil. Frothing was observed which was taken as evidence for the presence of the Saponins.

Test for Tannins

About 0.5 g of plant leaf extract was added was in 10 ml of water in a test tube and filtered. A few drops of 0.1% ferric chloride was added and observed for brownish green or blue-black coloration.

Test for Flavonoids

2 ml of extract solution was treated with 1.5 ml of 50% methanol solution. The solution was warmed, and metal magnesium was added. To this solution few drops of conc. Hydrochloric acid was added and the red color was observed for flavonoids and orange color for flavones.

Test for Phenolic compounds

The extract was dissolved in alcohol and 1 drop of neutral ferric chloride was added to this. The intense colour indicates the presence of phenolic compound.

Test for Anthraquinones

About 0.5 g of extract was taken in a dry test tube and 5 ml of chloroform was added and shaken for 5 min. The extract was filtered, and the filtrate shaken with equal volume of 10% of ammonia solution. A pink violet or red color in the ammonical layer was observed for the presence of anthraquinones.

Test for Cardiac Glycosides

0.2 g of extract was dissolved in 1 ml of glacial acetic acid containing 1 drop of ferric chloride solution. This was then under layered with 1ml of concentrated sulphuric acid. A brown ring obtained at the interface indicated the presence of cardiac glycosides.

Test for Amino acids

To 2ml of sample was added to 2ml of Ninhydrin reagent and kept in water bath for 20 minutes. Appearance of purple color indicated the presence of amino acids in the sample.

Test for Proteins

To 2 ml of the extract solution 1ml of 40% NaOH solution and 1 to 2 drops of 1% CuSO4 solution was added. A violet color indicated the presence of peptide linkage of the molecule.

Test for Tri-Terpenoids

5 ml of each extract was added to 2ml of chloroform and 3ml of con. H2SO4 to form a monolayer of reddish-brown coloration of the interface was showed to form positive result for the tri-terpenoids.

Test for Triple Sugar

To 2 ml of extract 2 drops of Molisch's reagent was added and shaken well. 2ml of con. H2SO4 was added on the sides of the test tube. A reddish violet

ring appeared at the junction of two layers immediately indicated the presence of triple sugars.

RESULTS AND DISCUSSION

The present study was carried out on the plant samples revealed the presence of medicinally important bioactive compounds. The plant shows alkaloids, flavonoids, tannins, steroids and phenolic compounds (Table 1).

The phytochemical analysis of *Premna tomentosa* exhibit flavonoids in all the three solvents. Methanol and ethanol extract reveal steroids, tannins and phenol absent in water extracts. Alkaloid was prent in ethanol and aqueous extract, absent in methanol. No source of glycosides, amino acid, proteins, triterpenoids found in any of the solvent extract.

The present study suggests the bioactive compounds can be used for future studies and ethnobotonical survey reveals the usage of these plant extracts in treating hepatotoxicity. Further investigations are planned to conduct animal experiments to know the potency of bioactive compounds against hepatotoxicity.

Table 1: Phytochemical Screening

Sl. No	Phytochemical	Methanol	Ethanol	Aqueous
1	steroids	+	+	-
2	Alkaloid	-	+	+
3	Saponin	-	-	-
4	Tannin	+	+	-
5	Flavonoids	+	+	+
6	Phenol	+	+	-
7	Anthraquinons	-	-	-
8	Glycosides	-	-	-
9	Amino Acid	-	-	-
10	Proteins	-	-	-
11	Triterpenoids	-	-	-
12	Triple Sugars	-	-	-

CONCLUSION

From the overall scenario, it is concluded that *premna tomentosa* is found to be rich in phytochemicals, and pocess full of pharmacological and medicinal significance. Further study is required to find their potentials in the mentioned biological properties such as hepatotoxicity, anti-inflammatory etc.

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REFERENCES

1. Devi K, Devaki T. Protective effect of *Premnatomentosa* on acetaminophen induced hepatitis in rats. Med Sci Res. 1998; 26: 785–7.
2. Devi K, Anandan R, Devaki T,Apparananthanm T and Balakrishna K. Effectof *Premna tomentosa* on rat liver antioxidant defense system in acetaminophen intoxicated rats. Biomed Res. 1998; 19: 339 –42.
3. Devi KP, Sreepriya M, Balakrishna K and Devaki TJ. Protective effect of *Premnatomentosa* (L. Verbenaceae) extract on membrane-bound phosphatises and inorganic cations transport in acetaminophen-induced hepatotoxicity rats. Journal of Ethnopharmacology. 2004; 93: 371– 5.
4. Devi KP, Sairam M, Sreepriya M, Ilavazhagan G and Devaki T. Immunomodulatory effects of *Premna tomentosa* extract against Cr (VI) induced toxicity in splenic lymphocytes an *in vitro* study. Biomed. Pharmacather. 2003:57, 105-8.
5. Devi KP, Sreepriya M, Balakrishna K and Devaki T. Mol. Caller Biochem. 2005; 272,171.
6. Chin W, Jones WP, Mi Q, Rachman I, Riswan S,Kardono LBS, Chai HB, Frans worth NR, Cordell GA and Swanson SM. Cytotoxicclerodane diterpenoids from the leaves of *Premna tomentosa*. Phytochemistry. 2006; 67: 1243-8.
7. Alam M, Joy S, Susan T and Usman Ali S. Anti-inflammatory activity of *Premna tomentosa* Willd. In albino rats. Ancient Sci. 1993; 13:185– 8.
8. 8 Jaffnaa Banu M,. Elavarasan G, Amutha Iswarya Devi J* and Kottai Muthu A. *In vitro*antioxidant activity of various extracts of aerial parts of *Premna tomentosa* International Journal of Chemical and Pharmaceutical Sciences2015, June. Vol. 6 (2)21-26.
9. Kadereit JW. The Families and Genera of Vascular Plants. Springer, Berlin.2004; Vol.VII: 449.

10. Krishnamurthy. A (ed). The wealth of India: Raw materials; CSIR, New Delhi (India), 1969; 8: 240-1.
11. Muzaffer Alam, S. Joy, T.Susan and S. Usman Ali Anti-inflammatory activiy of *premna tomentosa* willd. In albino rat's ancient science of life, vol no. xiii nos. 1 & 2, july-october 1993, pages 185 – 188.
12. Twinkle S. Bansode and Dr. B.K. Salalkar, Int J Pharm Bio Sci 2015 Jan; 6(1): (P) 550 – 556.
13. S. M.Gopinath, C. K. Rakesh, G. M. Ashwini Patil and K. S. Dayananda, Preliminary phytochemical evaluation of leaf extracts of *euphorbia hirta, syzygium cumini* of siddarabetta, tumkur district, karnataka. International journal of pharma and bio sciences vol 3/issue 2/april – june 2012.