ISSN: 0974-2115
www.jchps.com Journal of Chemical and Pharmaceutical Sciences

PHYTOCHEMICAL EVALUATION OF PENTATROPIS *CAPENSIS*, *PERGULARIA DAEMIA* AND *WATTAKAKA VOLUBILIS*

[1]M VAMSEE KRISHNA REDDY, [1]T CHIRANJIVI KOTESWARA RAO, [1]K SRINIJA, [1]P RAMA RAO, [1]A RAVI KUMAR, [2]K M SUBBU RATHINAM, [3]K NAGABHUSANAM

[1]Department of Pharmacognosy Bapatla college of Pharmacy, Bapatla 522101 Andhra India.
[2]Department of Biotechnology, Rajah Serfoji Govt College, Thanjavur, India
[3]Department of Pharmaceutical Chemistry University College of Pharmaceutical sciences, Acharya Nagarjunauniversity, Guntur, India

*** Corresponding author: E.Mail: vamsireddymarreddy @gmail.com**

ABSTRACT

A Phytochemical profile of three selected plant species *Pentatropis capensis, Pergularia daemia*, and *Wattakaka volubulis* was carried out. Crude dry powder analysis, ash value, solubility, extractive values analysis of phytochemicals and mineral contents of the chosen plants were studied using various solvents.

KEY WORDS: Phytochemical profile, Plant extracts, *Pentatropis capensis, Pergularia daemia*, and *Wattakaka volubulis*

1. INTRODUCTION

A Knowledge of the chemical constituents of plants is essential not only for the discovery of therapeutic agents, but also such information discloses the source of economic materials such as tannins, oils, gums, precursors for the synthesis of complex chemical substances of different values. In addition, the knowledge of the chemical constituents of plants would further be valuable in discovering the actual value of folkloric remedies.

Several Phytochemical surveys have been carried out, including the random sampling approach, which involved some plant accessions collected from throughout the world. The major chemical substances of interest in these surveys have been the alkaloids and however essential oil has also been reported. The present study was undertaken to determine the biologically active compounds that contribute to the flavor, color and other characteristic of the chosen plants.

2. MATERIALS AND METHODS

Three plant species roots of *Pentatropis capensis* stem of *Pergularia daemia* and stem of *Wattakaka volubilis* were authentified and collected from Coastal Andhra. Plant materials were made into fine powder in Willey Mill. The crude dried powdered materials are separately extracted with ethanol and water to a small bulk order reduced pressure at 50^0C was suspended in water. Further fractioned with solvents like hexane, benzene, chloroform, methanol and water were subjected to chemical evaluation value of benzene, chloroform, hexane, water and ethanol soluble extractive values are also determined.

Phytochemical screening:

Alkaloid determination: Around 5g of sample was weighed into a 250 ml beaker and 200 ml of 10% acetic acid in ethanol was added. The mixture was covered and allowed to stand for 4 hours. Then filtered and extract was concentrated on a water bath to one-quarter of the original volume. Concentrated ammonium hydroxide was added drop by drop to the extract until the precipitates completely dissolved. The whole solution was allowed to settle and the collected precipitates were washed with dilute ammonium hydroxide and the filtered. The alkaloid residue was dried and weighed.

Tannin determination: Around 500 mg of the sample was weighed into a 59 ml plastic bottle. To this, 50 ml of distilled water was added and shaken for 1 h in a mechanical shaker. This solution was filtered into a 50 ml volumetric flask and made upto the mark. Then 5 ml of the filtered was pipette out into a test tube and mixed with 2 ml of 0.1 M Ferric Chloride in 0.1 N. HCL and 0.008 M potassium ferrocyanide. The absorbance was measured at 420 nm within 10 min.

Saponin determination: The samples were ground and 20 g of each were taken in a conical flask and 100 ml of 20% aqueous ethanol was added. The samples were heated over a hot water bath for 4 hours with continuous stirring at about 55^0 C. The mixture was filtered and the residue was re-extracted with another 200 ml of ethanol. The combined extracts were reduced to 40 ml over water bath at about 90^oC. The concentrate was transferred into a 250ml separator funnel and 20 ml of diethyl ether was added and vigorously shaken. The aqueous layer was recovered while the ether was discarded. The purification process was repeated. Then 60 ml of n-butanol was

added. The combined n-butanol extracts were washed twice with 10 ml of 5% aqueous sodium chloride. The remaining solution was heated in a water bath. After evaporation the samples were dried in an oven constant weight and content determined.

Flavonoid determination: About 10 g of the plant sample was extracted repeatedly with 100 ml of 80% aqueous methanol at room temperature. The whole solution was filtered through Whatmann filter paper no. 42 (125 mm) and the filtrate was transferred to a crucible and evaporated to dryness over a water bath and weighed to a constant weight.

Determination of total phenolic compound: The fat free sample was boiled with 50 ml of ether for extraction of the phenolic competent for 15 min. From this 5 ml of the extract was pipette in to a 50 ml flask, then 10 ml of distilled water was added. Then 2 ml of ammonium hydroxide solution and 5 ml of concentrated amyl alcohol were also added. The samples were made up to mark and left to react for 30 min for color development. This was measured at 505 nm in a spectrophotometer.

3. RESULTS AND DISSCUSSION

The present study carried out on the three plant samples *Pentatropis capensis, Pergularia daemia*, and *Wattakaka volubilis* revealed the presence of medicinally active constituents. Table 1 the chemical composition of the three plants are given.

Table.1.Crude dried powder analysis of the chosen plants

Plant	Total ash	Water Soluble ash	Alkalinity For water Soluble ash	Acid Insoluble ash	P^H 1% Aqueous solution	Loss on drying 110^{0} C
Pentatropis capensis	NLT 6.03	NLT 2.99	0.37	NLT 0.73	6.8	NMT 5%w/w
Pergularia daemia	NLT 6.24	NLT 1.98	0.51	NLT 0.69	7.4	NMT 11%w/w
Wattakaka volubilis	NLT 7.06	NLT 2.87	0.27	NLT 0.51	6.6	NMT 5%w/w

NLT = Not less than; NMT = Not more than

Tough minerals such as sodium, magnesium, chloride and sulphate are present in all the studied plant species but no traces of iron was found (Table 2)

Table.2.Mineral compositions of the selected plant species

Plant	Calcium	Sodium	Iron	Magnesium	Chloride	Sulphate
Pentatropis capensis	+	+	NT	+	+	+
Pergularia daemia	+	+	NT	_	+	+
Wattakaka volubilis	+	+	NT	+	+	+

NT – Not traceable

Quantitative estimations of the percentage of carbohydrates, total polysaccharides and tannic acid of these plants studied are summarized in Table 3.

Table.3.Percentage of crude polysaccharide, carbohydrate and tannin in the plants

Plant	Polysaccharide	Carbohydrate	Tannin
Pentatropis capensis	9.1 mg	11.5 mg	64 mg
Pergularia daemia	12.2 mg	14.5 mg	28.1 mg
Wattakaka volubilis	15.2 mg	13.6 mg	26 mg

Crude extract of the test samples in five different extracts were analysed and presented in Table 4.

Table.4.Extractive value of the chosen plants in various solvents

Plant	Benzene extractive values (%)	Chloroform extractive values (%)	Water soluble extractive values (%)	Ethanol soluble extractive values (%)
Pentatropis capensis	NMT 2.1681	NMT 3.09431	NMT 10.22821	NMT 14.1979
Pergularia daemia	NMT 10.22721	NMT 12.71423	NMT 19.8726	NMT 4.7173
Wattakaka volubilis	NMT 3.07927	NMT 3.43076	NMT 7.53358	NMT 13.847

NMT: Not more than

Phytochemical screening of the three plants extracted in the following solvents; hexane, chloroform, ethanol and water were analyzed and presented in table 5. The Phytochemical screening of the plants studied showed that the plants were rich in alkaloids, tannins. They were known to show medicinal activity as well as exhibiting physiological activity.

Table.5.Qualitative analysis of the phytochemicals of the selected plants under various solvents

Plant	Extract	Saponin	Anthraquinone	Fkavonoid	Protein	Carbohydrate	Terpene
Pentatropis capensis	Hexane	-	-	++	-	-	+
	Benzene	-	-	++	-	-	+
	chloroform	-	++	+++	-	-	-
	Ethanol	++	-	+	+	+	+
	Water	+	-	-	+	+	-
Pergularia daemia	Hexane	-	-	-	-	-	+
	Benzene	-	-	++	-	-	+
	chloroform	-	++	+++	-	-	-
	Ethanol	++	++	+	+	+	+
	Water	+	-	-	+	+	-
Wattakaka volubilis	chloroform	-	-	+++	-	-	-
	Ethanol	+	+	++	+	+	-
	Water	+	-	-	+	+	-

+ Present - Absent

The plants studied here can be seen as a potential source of useful drugs. Further studies are going on these plants in order to isolate, identify, characterized and elucidate the structure of the bioactive compounds.

4. CONCLUSION

The selected plants were analyzed for the presence of phytochemical constituents as presented in the tables. Further research works are in progress in study of isolation and structural determination of chemical constitutents of the selectd plants.

5. AKNOWLEDGEMENTS

The authors are thankful to all those who helped in completion of the project work.

REFERENCES

Averineni Ravi Kumar, K.M. Subbu Rathinam and G. Prabakar, Phytochemical screening of selected medicinal plants of Asciepiadaceae family, Asian journal of microbiology, biotechnology & environmental, 9(1), 2007, 177-180.

R.P.Saralla, R. Narendran, V. Uma rani, K. Sridharan, and P.Brindha, Pharmacognostic standards for diagnosis of *Pentatropis capensis*, (asclepiadaceae) a plant drug used in Indian system of medicine, International journal of pharmacy and pharmaceutical sciences, 4(2) supp.2, 2012, 91-96.

K.Chandrasekaran, L.Suseela, Anti inflammatory activity of ethanolic extracts of *Pentatropis capensis* and sarcostemma secamone, International Journal of Pharma and Bio Sciences, 2(4), 2011, 77-80.

Korukola Nirmala, Mohan Gandhi Bonthu, Kanaka Raj u Vegesna, Harish Varma, Santhosh Kumar Naidu Phyto chemical, anti fungal, anti microbial and anti oxidant studies on whole plant extract of *Pentatropis capensis*, International journal of pharmaceutical, chemical and biological sciences, 2(4), 2012, 453-463