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ASSESSMENT OF SOLVENT SOLUBILITY BY USING PHYTOCHEMICAL SCREEN TESTS OF SOME EUPHORBIACEAE MEMBERS

Madane AN¹, Kamble SK¹, Patil BJ¹, Aparadh VT²

¹Department of Botany, Sadguru Gadage Maharaj College, Karad, India.

²Department of Botany, Yashvantrao Chavan Institute of Science, Satara, India.

ABSTRACT

Phytochemical screening of euphorbiaceae members were carried out for understanding their solvent solubility. Qualitative analysis of secondary metabolites was performed for the presence of Alkaloids, Tannins, Proteins, Flavonoids, Phenols, Steroids, Saponins, Quinines, Glycosides, Carbohydrates and Amino acid. The results revealed that in all studied species (viz. *Euphorbia tirucalli*, *Chrozophora rotleri* and *Phyllanthus reticulates*) shows negative response for steroids test indicates usefulness of these plants as food and fodder. It is evidence from result & literature available presence of phenol indicates their medicinal usefulness of these plants. The results also revealed that euphorbiaceae members have maximum phytochemicals which are soluble in organic solvent.

Key words: Phytochemical screening, Euphorbiaceae members, Solvent solubility.

INTRODUCTION

Plants are a source of large amount of drugs embracing to different groups having different medicinal potential. Such drugs are well known as phytochemicals. According to WHO[1] in the developing world, traditional medicine using plant extracts persists to provide health coverage for over 80% of the world's population. Extraction is process where separation of medicinally active compounds from plant tissues using selective solvents through standard procedures. Here in current research we used four different solvent viz. distilled water, alcohol, chloroform and acetone to know superior solubility of solvent for phytochemical screening. For this we have selected common weed species viz. *Euphorbia tirucalli*, *Chrozophora rotleri* and *Phyllanthus reticulates*. These plants were screened for its active chemical ingredients.

Genus *Euphorbia*, from family Euphorbiaceae comprises 8,000 species worldwide distributed *Euphorbia tirucalli* L. is one of them known worldwide for its many uses like to treat asthma, cough, earache, rheumatism, cancer, epithelioma, sarcoma, skin tumors and as a folk remedy against syphilis [2]. Sugumar *et al.* [3] reported

phytochemicals from *Euphorbia tirucalli* stem extracts. But in present articles leaves are used as source of phytochemicals. In *Chrozophora rotleri* another plant from Euphorbiaceae, is already studied for its phytochemical constituent by Narmadaa *et al.* [4]. Last species under study *Phyllanthus reticulates* is also from Euphorbiaceae well known as pancoli or karineli is also already studied for its phytoconstituents by Begum *et al.* [5]. Although all these plants are already studied we have also selected these for screening of perfect solvent to dissolve phytochemicals. In India these plant grow as weeds hence available at large quantity biomass for study.

MATERIALS AND METHODS

Plant material

The fresh plant was collected from campus surrounding S.G.M. Collage, Karad. The fresh leaves of *Euphorbia tirucalli*, *Chrozophora rotleri* and *Phyllanthus reticulates* were washed with water and cut into small pieces. These materials were subjected for extractions in different solvent.

Preparation of extracts

Fresh leaves were also subjected to Chloroform, alcohol, acetone and aqueous extraction. About 5 g of each studied euphorbiaceae member were immersed in different solvent and after hour that was kept for splitting entire cell on sonicator. The clear filtrate was obtained by filtering through a Buchner funnel. The filtrates were used for further studies.

Qualitative phytochemical analysis

Preliminary photochemical testing for the presence of various compounds by standard methods like Steroids [6], Benedicts test for reducing sugar[7], Alkaloid tests by Wagner *et al.*[8], Tannins [9], Saponins by Kumar *et al.* [10] and compounds like Phenols, Flavonoids, Glycosides by Khandelwal [11] were conducted.

Table 1. Assessment of solvent solubility by using phytochemical screen of some weeds

Test conducted		<i>Euphorbia tirucalli</i>				<i>Chrozophora rotleri</i>				<i>Phyllanthus reticulatus</i>			
		DW	Acetone	Alcohol	Chloroform	DW	Acetone	Alcohol	Chloroform	DW	Acetone	Alcohol	Chloroform
Alkaloids	Mayer's test	-	+	+	+	-	-	+	+	+	+	-	+
	Wagner's test	-	-	-	-	-	+	+	-	+	+	+	+
Tannin by 1% lead acetata		-	+	-	+	-	+	+	+	+	+	+	+
Tannin by FeCl ₃ and KOH method		-	-	-	+	-	-	-	+	-	-	-	+
Protein		-	-	+	+	+	+	-	-	+	+	+	+
Flavonoid		-	+	+	+	+	-	-	-	-	-	-	-
Phenol		+	+	+	-	-	+	-	+	+	+	+	+
Steroid		-	-	-	-	-	-	-	-	-	-	-	-
Saponin		+	-	-	-	+	+	-	-	-	-	-	-
Quinine		-	+	+	+	-	+	+	+	-	+	+	+
Glycoside		-	+	-	-	+	-	-	-	-	+	-	-
Carbohydrate	Benedict's test	-	+	+	+	-	-	+	+	+	+	-	+
	Fehling's test	-	-	-	-	-	-	-	-	-	-	-	-
Amino acid		-	-	-	-	-	-	-	-	-	-	-	-

RESULT AND DISCUSSION

Water is universal solvent which mostly used to extract plant products. Many traditional healers use primarily water for extraction but most of the plant extracts in organic solvents have been found to give more consistent medicinal properties as compared to water extract. Same kind of result were observed through current experiment which put forth mostly phytochemicals are soluble in organic solvent than that of water. The results revealed the presence of Alkaloids, Carbohydrate, Glycosides, Tannins, Steroids, Flavonoids and Saponins (Table 1) in chloroform extract of studied Euphorbiaceae members viz. *Euphorbia tirucalli*, *Chrozophora rotleri* and *Phyllanthus reticulatus*. When compared all studied species for their extraction it is found that *Phyllanthus reticulatus* contains higher water-soluble bioactive compounds. Similar kind of results was observed in case of acetone and chloroform extraction of these plants. While in case of alcohol extraction, *Euphorbia tirucalli* shows maximum solubility of phytochemicals than other studied species. Same kind of study has been reported by Kharade *et al.*, [12] in Commelinaceae members and Tupeet *al.* [13] in Cucurbitaceae members.

It is evidence from the result that Tannin by FeCl₃ and KOH method shows same correlation that shows positive response for chloroform solvent for all studied species. In case of organic solvent flavonoid

compound shows positive response for *Euphorbia tirucalli* species. While it is presented only in aqueous extract of *C. rotleri*. In *P. reticulatus* species flavonoids are totally gives negative response for all solvent. Chloroform and methanol extract of all studied species shows same percent positive response which is higher than that of other solvent studied. Many workers study on many groups of plants for screening of their secondary metabolites as medicinal plants [14], Gymnosperm [15], Weeds [16] and Filicales[17].

This study may be helpful to isolate and characterize the chemical constituents present in those plant extracts which would be helpful in discovering the actual value of folkloric medicines.

CONCLUSION

Positive response of studied euphorbiaceae members for presence of secondary metabolites indicates that these species can be used in medicine as per requirement. It is evidence from result & literature available presence of phenol indicates their medicinal usefulness of these plants. It can be concluded from results that in case of euphorbiaceae members that maximum phytochemicals are soluble in organic solvent. Chloroform and acetone are best solvent for phytochemical screening and further studies.

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