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Phytochemical Profile of Selected Plants of Local Origin

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Abstract

Natural products have been extensively used as restorative agents for several ailments since ancient days. The bioactive principles present in plants have been the source of healing components for various diseases. Preliminary phytochemical screening of plants is an essential step in the detection of secondary metabolites present in medicinal plants which leads to formulation of unique eco-friendly herbicides, pesticides and drug discovery. In the present study, efforts have been made to analyze the phytochemical constituents present in different plant parts. The aqueous extract of various plant parts are used for screening the phytochemical constituentspresent in the plants. Phytochemical screening indicated the presence of several active constituents namely tannins, flavonoids, alkaloids etc., in the investigated plant parts. The presence of exhaustive phytochemicals in these species provides a substantial groundfor utilization of these bio constituents as remedies for several ailments. Further studies are needed to ascertain the validity of these plant formulations in eco friendly treatment of modern day societal iss

Keywords: Phytochemical Screening, secondary metabolites, flowers, medicinal plants.

Introduction

The secondary metabolites present in plants are utilized as healing agents from time immemorial due to their antifungal, antibacterial and anti-inflammatory activities. Phytochemicals can be used to regulate oxidation and several chronic diseases namely diabetes and cardiovascular diseases as theyare powerful antioxidants. They can be either used individually or in combination with other extracts to treat any disease and disorder [1]. The presentwork is focused on the identification of phytoconstituents of some locally available plant species from bignoniaceae and euphorbiaceaefamily so as to exploit new bio constituents present in them.

Bignoniaceae family:

Bignoniaceae is commonly called the trumpet vine or trumpet creeper family.Literature survey reflected the presence of several phytochemical constituents such assaponins,flavonoids, kaempferol, terpenes, steroids, coumarins etc.Presence of such exhaustive phytochemicals in this family may opennew vistas in the field of discovery of new drugs [2]

PLANT DESCRIPTION -I (*Pseudocalymma alliaceum*)

Pseudocalymma alliaceum or 'Garlic Vine' is a species in the trumpet-creeper family. It isan evergreen fast growing climbing plant or mounding creeper with mauve flowers reaching around 10m in good conditions. [3]

PLANT DESCRIPTION -II (*Podranea ricasoliana*)

Podranea ricasoliana has glossy foliage and is abundant with attractive pink flowers. It is a woody, evergreen climber without tendrils.[4]

PLANT DESCRIPTION -III (*Clytostoma callistegioides*)

Clytostoma callistegioides belongs to the Bignoniaceae family and has distinctive showy flowers. It is a woody stemmed evergreen vine. Flowers are followed by large prickly seed pods.[5]

Euphorbiaceae family:

Euphorbiaceae has been traditionally defined as one of the largest families of flowering plants, comprising of over 300 genera and 8,000 species. The family is very diverse in range, consisting of large woody trees to simple weeds that grow in the ground.

The plants in this family are abundantly rich in several phytochemical constituents namely triterpenoids (3β-O-octadecanoyllupeol , glut-5-en-3β-ol , 24-methylenecicloartan-3β-ol, cicloart-23-ene-3β,25-diol cycloart-25-en-3,24-diol, cycloart-23-en-3,25-diol, and a-amyrin, in addition to b-sitosterol-b-D-O-glucoside, scopoletin, luteolin and kampferol along with the phenolic compounds ellagic acid and 3,3'-di-O-methylellagic acid[6]

***Croton sparsiflorus*- Plant Profile**

Croton sparsiorus Morong (syn.C. bonplandianus), is a woody shrub growing in Asia and South America. It is used as a potent hypotensive agent and also used for the treatment of fever, inflammation, hypertension etc.

The present research work is aimed at screening of phytochemical constituents in the selected plant parts.

Material and Methods

In any research work the materials and the methods adopted are the aspects, which decide and determine qualitatively and quantitatively the outcome of the research.

Endorsement of plant

Endorsement of plant was carried out by the botany department of our university for the authorized identification of plant.

Preparation of plant extract

The leaves / stem / roots of the selected plants were shade dried and the parts were crushed into powder. Powdered plant parts were soaked with ethanol for 48 hours and the solution was filtered. The filtered extracts were used for phytochemical screening [7]

Phytochemical Screening of the plant extracts

Phytochemical examinations were carried out using standard procedure.[8, 9, 10, 11]

Phytochemicals	Treatment needed before addition of reagent	Test	Reagent	Indication for the presence of respective phytochemical
Alkaloids	Extract + dilHCl.	Mayer's Test	Mayer's reagent (Potassium Mercuric Iodide)	yellow precipitate
		Wagner's Test	Wagner' s reagent (Iodine in	brown/reddish precipitate
		Dragendroff'	Dragendroff' s reagent (solution of Potassium Bismuth Iodide)	red precipitate
Carbohydrates	Extract+ 5 ml distilled water , filtered	Molisch's Test	2 drops of alcoholic-naphthol solution	Formation of the violet ring
		Benedict's Test	Benedict' s reagent and heated gently	Orange red precipitate
		Fehling's Test	dil. HCl + alkali, heated with Fehling' s A & B	Red precipitate
Glycosides	Extract + dil. HCl.	Modified Borntrager's Test	Ferric Chloride solution, extracted with benzene. Treated with ammonia solution.	Formation of rose-pink color in ammonical layer -anthranol glycosides.
		Legal's Test	Sodium nitroprusside in pyridine and sodium hydroxide	Formation of pink to blood red color - cardiac glycosides.
Saponins		Froth Test	Extract+ water, shaken for 15 minutes.	Formation of 1 cm layer of foam
		Foam Test	0.5 gm of extract shaken with 2 ml of water	Foam persistsfor ten minutes
Phytosterols		Libermann Burchard's test	Extracts + chloroform. Added few drops of acetic anhydride.Boiled,cooled, added Conc. Sulphuric acid	Formation of brown ring at the junction
Phenols		Ferric Chloride Test	3-4 drops of ferric chloride	Formation of bluish black colour
Tannins		Gelatin Test	1% gelatin solution containing sodium chloride	white precipitate
Flavonoids		Alkaline Reagent Test	sodium hydroxide	Intense yellow color changing tocolourlesson addition of dil acetic acid
		Lead acetate Test	lead acetate solution	yellow precipitate
Diterpenes		Copper acetate Test	Dissolved in water Added 3-4 drops of copper acetate.	emerald green color

Results and Discussion:

Phytochemical Screening of *Pseudocalymma alliaceum*

The phytochemical tests permit toidentify the classes of organic compounds present in *Pseudocalymma alliaceum*(PAL, PAF). For that purpose, specific reactions with the properties of each family are realized according to a previously described experimental procedure. Mayer, Wagner and Dragendroff tests were used to identify the presence of alkaloids. The presence off lavonoids was identified by alkaline reagent and lead acetate tests. Ferric chloride test was used to determine presence of polyphenols and gelatin test for tannins.

The presence of glycosides was recognizedby Borntrager test and saponins by froth and foam tests. Libermann Burchard and Salkowski tests were used for identification of steroid and triterpine.The results are shown in table1.

Chemicals reported in *Pseudocalymma alliaceum* include: 24-ethyl-cholest-7-en-3-beta-ol, 3-beta-hydroxy-urs-18-en-27-oic acid, alliin, allyl sulfides, alpha 4-hydroxy-9-methoxy-lapachone, alpha 9-methoxy-lapachone, apigenins, aspartic acid, beta-sitosterol, leucine, luteolin, stigmasterol, triacontan-1-ol, triallyl sulfides, trithiacyclohexene, n-tritriacontane, and ursolic acid [12].

Phytochemical screening of *Podranea ricasoliana*

Phytochemical screening of *Podranea ricasoliana* leaves and flowers (PRL, PRF) extractsindicate the presence of phytoconstituents like flavonoid, terpenoids, steroids inPRL and the occurrence of flavonoids,terpenoidsin PRF extract. Phytochemical screening results are consistent with the literature survey.Literature studies reflect the presence of sterols, triterpenes, Iridoid glycosides, phenolic acids and flavonids as main constituents [13]

TABLE1-PHYTOCHEMICALSCREENINGOF PAF,PAL,PRFandPRL

PHYTOCONSTITUENTS	PAF	PAL	PRF	PRL	CCL	CCF	CSL	CSS	CSR
Glycosides	+	+	+	+	-	-	+	+	+
Sterols	+	+	+	+	+	+	+	+	+
Carbohydrates	+	-	+	-	-	-	-	-	-
Tannin	-	+	-	-	+	+	+	+	+
Flavonoids	+	+	+	+	+	+	+	+	+
Phenol	-	-	-	-	+	+	-	+	+
Terpenoid	+	+	+	+	+	+	+	+	+
Alkaloid	-	-	-	+	+	+	+	+	+
Saponin	-	-	-	-	+	+	-	-	-
+Present,-Absent									

Phytochemical screening of *Clytostomac allistegioides*

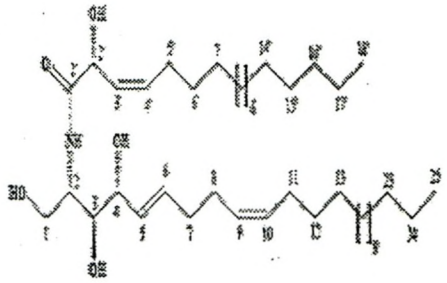
Phytochemical screening of *Clytostomac allistegioides* leaves and flowers (CCL, CCF) indicated the presence of sterols, atureelitetion coincided with tannins, flavonoids, phenols, terpenoids, alkaloids and saponins. Our investigation coincided with the literature survey [14]

Phytochemical screening of Croton sparsiflorus

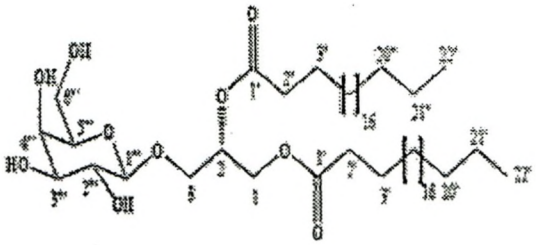
The results indicated the presence of phytoconstituents like flavonoid, tannins, terpenoids, steroids in the CSL, CSS and CSR extracts.

Phytochemical analysis from literature revealed that the main constituents are Sparsioamide , a new sphingolipid, sparsioside , a new diglyceridegalactoside.[15].

Sparsifloamide- sphingolipid



Sparsifloside- diglyceridegalactoside



From the results it can be noted that all the screened plant parts were found to contain several phytochemicals ike flavonoids- contain anti oxidant property; terpenoids-antimicrobial, anti inflammatory properties etc. These ocally available plant materials can be useful for several remedies when utilized properly.

ummary and Conclusion

The results corroborate the utilization of preliminary phyto screening tests to identify the bio active onstituents so as to exploit their potential in diverse areas of science and technology. Diversity of phytochemicals 1 these plant species rationalizes itsusefulness in medical and traditional plant based remedies. These plants are to e subjected to further studies toengage them for medicinal purpose for societal needs.

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