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PRELIMINARY PHYTOCHEMICAL SCREENING OF SOME IMPORTANT MEDICINAL PLANTS

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ABSTRACT Phytochemical screening of crude extracts of selected medicinal plants namely Anisomeles malabarica R. Br., Cullen corylifolia (L.) Medik., Embelia basaal (R.& S.) DC., Garcinia indica (Thou) Chois., Garcinia talbotii Raiz ex Sant., Helicteres isora L., Saraca asoca (Roxb.) Willd. was carried out with different solvents such as acetone, alcohol, ethanol, methanol and water. Phytochemical screening was performed for alkaloids, steroids, terpenoids, flavonoids, tannins, reducing sugars, carbohydrates, glycosides, saponins, phenols, proteins and amino acids. Phytochemical studies revealed that alkaloids, terpenoids, flavens, catlouch tannins, reducing sugars, carbohydrates, glycosides, saponins, phenols, proteins and amino acids were predominantly found in alcohol, ethanol and methanol extracts.

KEYWORDS : : Medicinal Plants, phytochemical screening

INTRODUCTION:

Ayurveda is one of the world's oldest medical systems. In modern society herbal drugs are gaining importance due to the undesirable side effects of allopathic drugs and high cost. Medicinal plants are one of the important natural antioxidants traditionally used for thousands of years which are present in a group of herbal preparations of the Ayurveda. Plants are the major resource of drugs in modern as well as in traditional system of medicine. Several secondary metabolites were isolated from the plants which are used as antimicrobial agents. Alkaloids, tannins, flavonoids and phenolic compounds are most important bioactive components present in plants (Hill, 1952). Phytochemicals (secondary plant metabolites) present in plants have been extensively investigated as source of medical agents (Prince and Prabakaran, 2011). Biologically active compounds from natural sources have always been of great interest to scientists working on infectious diseases. These biologically active compounds are useful in drug research and development. Therefore, the present work was undertaken to evaluate the phytochemical constituents of some important medicinal plants.

MATERIALS AND METHODS:

Collection of Plant material

Several field visits were undertaken to collect the plant material. Different parts of plants were collected for the present work viz. stem and leaves of *Anisomeles malabarica* R. Br., Seeds of *Cullen corylifolia* (L.) Medik., Seeds of *Embelia basaal* (R.& S.) DC., Leaves of *Garcinia indica* (Thou) Chois., Leaves of *Garcinia talbotii* Raiz ex Sant., Fruits of *Helicteres isora* L. and Flowers of *Saraca asoca* (Roxb.) Willd. The collected parts were washed thoroughly 2-3 times with running tap water and once with sterile distilled water and air dried at room temperature. After complete drying, these parts were powdered well using a mixer. Then the powdered material was weighed and kept in air tight container and stored in a refrigerator.

Extraction of plant material

About 5 gm of the each powdered plant material was weighed and subjected to successive solvent extraction in 100 ml of different solvents such as acetone, alcohol, ethanol, methanol and water separately. The mixture was kept on shaker for 24 hours to obtain homogenate. This homogenate were filtered by whatmann filter paper and the extracts are stored in bottles at 10^0 C for phytochemical screening.

Preliminary phytochemical screening of the plant

The extracts of different solvent used for preliminary phytochemical screening was carried out using standard procedures to test the presence of bioactive compounds with slight modifications (Joshi *et al.*, 2011).

Test for alkaloids

1 ml plant extract was treated with a few drops of Mayer's reagent. White–yellowish precipitate produced immediately which indicated the presence of alkaloids (Siddiqui and Ali, 1997). Alkaloids are precipitated from neutral or slightly acidic solution by Mayer's reagent (Evans, 2002).

Test for steroid and terpenoid

4 ml extracts was treated with 0.5 ml acetic anhydride and 0.5 ml chloroform, then concentrated H_2SO_4 added slowly. Steroid solution shows green blue colour and terpenoid solution shows red violet colour.

Test for flavonoids and flavones

4 ml extracts was treated with 1.5 ml of 50% Methanol solution , solution was warmed and metal magnesium was added, then 5-6 drops of concentrated hydrochloric acid was added. Flavonoid solution show red colour and flavones solution show orange colour (Siddiqui and Ali, 1997).

Test for tannins

1 ml distilled water added to 0.5 ml extract solution, then 1-2 drops of ferric chloride solution added. Gallic tannin solution show blue colour and catecholic tannin solution shows green black colour.

Test for reducing sugar

1ml distilled water added to 0.5 ml extract solution, then 5-8 drops Fehling's solution –A and B was added at hot respectively. Reducing sugar shows brick red precipitate.

Test for carbohydrates (Molish's test)

1 ml extract was treated with 2 drops of α–napthol solution, carefully incline the tube and pour drop wise concentrated H_2SO_4 using droper along the side to tube. Presence of carbohydrate shows violet colour at the junction of two liquids.

Test for glycosides

1ml glacial acetic acid added to 1 ml extract, and then few drops of $FeCl_3$ added. Appearance of brown colour ring at top indicates presence of glycosides.

Test for saponins (foam test)

1 ml of the extract was added to 2 ml of distilled water and shaken for few minutes in a test tube. 1 cm layer of foam for 10 minutes indicates the presence of saponins.

Test for phenols (Ferric chloride Test)

1 ml extract is dissolved in 1 ml distilled water or ethanol, and then add few drops of ferric chlorides solution. Phenolic solution show Red, Blue, green, Purple coloration.

Test for amino acids and proteins (Xanthoprotic test)
1 ml extract was added 2-6 drops in concentrated HNO_3, this solution was neutralized with alkali. Protein and Amino acid solution shows yellow or orange colour.

Table 1: Phytochemical screening of *Anisomeles malabarica* and *Cullen corylifolia*

Phytochemical groups	Anisomeles malabarica					Cullen corylifolia				
	Methanol	Ethanol	Alcohol	Acetone	Aqueous	Methanol	Ethanol	Alcohol	Acetone	Aqueous
Alkaloids	+	-	+	-	-	+++	+++	+++	-	-
Steroid	-	++	-	+	-	-	-	-	-	-
Terpenoid	+++	-	+++	-	++	+++	+++	++	+++	+
Flavonoid	-	-	-	-	-	-	-	-	-	-
Flavones	+	+	-	-	+	+++	+++	++	+++	-
Gallic Tannins	-	-	-	-	-	-	-	-	-	-
Catecholic Tannin	++	++	++	-	++	-	-	-	++	-
Reducing Sugar	+	+	-	-	-	+	+	-	-	+
Carbohydrates	+++	+++	+++	++	+++	+++	+++	+++	+++	+++
Glycosides	++	+++	++	++	++	+++	+++	+++	+++	++
Saponins	-	+	+	-	++	+++	+++	-	-	+++
Phenols	+	+++	++	++	++	+	+	++	++	++
Protein and Amino acid	+++	+++	+++	++	+++	+++	+++	++	+++	++

- = Not detected; + = Low concentration; ++ = Moderate concentration; +++ = High concentration

Table 2: Phytochemical screening of Embelia basaal and Helicteres isora

Phytochemical groups	Embelia basaa	Helicteres isora								
	Methanol	Ethanol	Alcohol	Acetone	Aqueous	Methanol	Ethanol	Alcohol	Acetone	Aqueous
Alkaloids	+	+	+	-	-	-	++	+++	+	+
Steroid	-	-	-	-	-	-	-	-	-	-
Terpenoid	+++	-	+++	-	-	-	-	++	-	-
Flavonoid	-	-	-	-	-	-	-	-	-	-
Flavones	++	++	+++	-	-	-	-	-	-	-
Gallic Tannins	-	-	-	-	-	-	-	-	-	-
Catecholic Tannin	++	+++	+++	+	-	-	-	-	-	-
Reducing Sugar	-	-	-	-	-	-	-	-	-	-
Carbohydrates	+++	+++	+++	++	+++	+++	+++	++	+++	+
Glycosides	+	++	++	++	++	++	++	+++	++	+
Saponins	++	+	+	-	++	-	-	-	-	++
Phenols	+++	+++	++	-	-	-	-	-	-	-
Protein and Amino acid	+++	+++	+++	+	++	-	-	+++	-	-

= Not detected; + = Low concentration; ++ = Moderate concentration; +++ = High concentration

Table 3: Phytochemical screening of Garcinia indica and Garcinia talbotii

Phytochemical groups	Garcinia indica					Garcinia talbotii				
	Methanol	Ethanol	Alcohol	Acetone	Aqueous	Methanol	Ethanol	Alcohol	Acetone	Aqueous
Alkaloids	++	++	+	-	-	+	++	++	-	-
Steroid	-	-	-	-	-	-	-	-	-	-
Terpenoid	+++	+++	++	-	-	+++	+++	+++	-	+
Flavonoid	-	-	-	-	-	-	-	-	-	-
Flavones	+++	++	++	-	-	+++	++	+++	-	-
Gallic Tannins	-	-	-	-	-	-	-	-	-	-
Catecholic Tannin	++	++	-	-	-	+++	++	+++	-	-
Reducing Sugar	+++	-	+++	-	-	+++	+++	++	++	+++
Carbohydrates	+++	++	+++	++	+++	+++	+++	+++	++	+++
Glycosides	+++	++	+++	+	+++	+++	++	++	+++	++
Saponins	-	+++	+++	-	+++	++	+++	+++	-	++
Phenols	++	++	++	-	+	+++	++	++	++	+++
Protein and Amino acid	+++	+++	+++	++	++	+++	+++	+++	+++	+++

- = Not detected; + = Low concentration; ++ = Moderate concentration; +++ = High concentration

Table 4: Phytochemical screening of Saraca asoca

Phytochemical groups	Saraca asoca				
	Methanol	Ethanol	Alcohol	Acetone	Aqueous
Alkaloids	++	++	++	+++	+
Steroid	-	-	-	+++	-
Terpenoid	+++	+++	+++	-	+
Flavonoid	-	-	-	-	-
Flavones	+++	+++	+++	+++	
Gallic Tannins	-	-	-	-	-
Catecholic Tannin	+++	-	+++	-	-
Reducing Sugar	+++	+++	+++	++	-
Carbohydrates	+++	+++	+++	+++	+++
Glycosides	+	+++	+++	+++	+++
Saponins	++	+	++	+	+++
Phenols	+++	+++	+++	+	+
Protein and Amino acid	+++	++	+++	+++	++

= Not detected; + = Low concentration; ++ = Moderate concentration; +++ = High concentration

RESULTS AND DISCUSSION

The present study carried out on the different medicinal plants revealed the presence of medicinally active constituents. Table 1 shows the result of phytochemical screening of various extracts of Anisomeles malabarica and Cullen corylifolia. Methanol, Ethanol, Alcohol, Acetone and Aqueous extracts of Anisomeles malabarica showed presence of Carbohydrates, Glycosides, Phenols, Catecholic Tannin, Protein and Amino acid. The tests for Flavonoid and Gallic Tannins showed negative results. Methanol, Ethanol and Alcohol extracts of Cullen corylifolia showed presence of Alkaloids,

Terpenoids, Flavones, Carbohydrates, Glycosides, Saponins, Phenols, Protein and Amino acid. Steroid, Gallic Tannins and Flavonoid showed negative results.

Table 2 shows phytochemical screening of various extracts of Embelia basaal and Helicteres isora. Methanol, Ethanol and Alcohol extracts of Embelia basal showed presence of Alkaloids, Terpenoid, Flavones, Catecholic Tannin, Carbohydrates, Glycosides, Saponins, Phenols, Protein and Amino acid. The tests for Steroid, Flavonoid, Gallic Tannins and Reducing Sugar showed negative results. Acetone and Aqueous extracts of Embelia basal showed negative results for Alkaloids, Steroid, Terpenoid, Flavonoid, Flavones, Gallic Tannins and Reducing Sugar. Methanol, Ethanol, Alcohol, Acetone, and Aqueous extracts of Helicteres isora showed presence of Carbohydrates and Glycosides. The tests for Steroid, Terpenoid, Flavonoid, Flavones, Gallic Tannins, Catecholic Tannin, Reducing Sugar, Phenols, Protein and Amino acid showed predominantly negative results in almost all extracts.

Table 3 shows phytochemical screening of various extracts of Garcinia indica and Garcinia talbotii. Methanol, Ethanol and Alcohol extracts of Garcinia indica and Garcinia talbotii showed presence of Alkaloids, Terpenoid, Flavones, Carbohydrates, Glycosides, Saponins, Phenols, Protein and Amino acid, Catecholic Tannin and Reducing Sugar. The tests for Steroid, Flavonoid and Gallic Tannins showed negative results.

Table 4 shows phytochemical screening of various extracts of Saraca asoca. Methanol, Ethanol, Alcohol, Acetone and Aqueous extracts of Saraca asoca showed presence of Alkaloids, Terpenoid, Flavones, Reducing Sugar, Carbohydrates, Glycosides, Saponins, Phenols, Protein and Amino acid. The tests for Gallic Tannins and Flavonoid showed negative results.

CONCLUSION

The phytochemical screening different medicinal plant extracts viz. stem and leaves of Anisomeles malabarica R. Br., Seeds of Cullen corylifolia (L.) Medik., Seeds of Embelia basaal (R.& S.) DC., Leaves of Garcinia indica (Thou) Chois., Leaves of Garcinia talbotii Raiz ex Sant., Fruits of Helicteres isora L. and Flowers of Saraca asoca (Roxb.) showed the presence of various bioactive compounds such as alkaloids, steroids, terpenoids, flavonoids, tannins, reducing sugars, carbohydrates, glycosides, saponins, phenols, proteins and amino acids. Flavonoids and Gallic Tannins were not detected in above plants. Quantitatively, the above seven plant extract also revealed a greater proportion of Terpenoids, flavones, carbohydrates, Catecholic Tannin, glycosides, proteins and amino acids, moderate concentrations of alkaloids, reducing sugars, saponins and phenols, while Steroid, alkaloids, reducing sugars and terpenes were in low concentrations.

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