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PHYTOCHEMICAL ANALYSIS OF MABA BUXIFOLIA (Rottb.)Juss.STEM

KEYWORDS: Maba buxifolia stem, Hexane, Ethyl acetate, Methanol extracts, Phytoconstiuents.

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ABSTRACT

Nature always stands as a golden mark to exemplify the outstanding phenomena of symbiosis. Ayurveda and other Indian literature mention the uses of plants in treatment of various ailments. India has around 45000 plant species and among them several thousands have been claimed to have medicinal properties. The objective of present study was to investigate the presence of various phytochemicals from hexane, ethylacetate and methanol extracts of Maba buxifolia stem. The three different extracts from stem found to contain Alkaloids, Phlobatannins,Tannins,Glycosid es,Flavonoids,Phenols, saponins, and terpenoids.

1. Introduction:

A wide range of biochemicals can be synthesized by plants through various biosynthetic pathways and stored in different parts of plant body as primary and secondary metabolites and are the potentials of phytotaxonomy. The application of chemical data to plant systematics has receivied much attention as this data useful for solving taxonomic problems.Taxonomical identification and phytochemical characterization of medicinal plants provides authentic means to be used them as crude herbs or extracts, pure natural compounds and foods beneficial to health1. Advancement in chemical and biological techniques for analysis of herbs from last decade brought transformation of research in pharmacognosy2. Evaluation of whole plant or plant parts or their products has always been important area in the field of research to discover a phytodrug3.India is perhaps the largest producer of medicinal herbs and is rightfully called the"Botanical garden of the world"4,5. Herbal medicine also called botanical medicine or phytomedicine is currently in demand and their popularity is increasing day by day because of better patient tolerance, compliance, cheaper, easily available, ecofriendly, prolong and apparently uneventful use of herbal medicines may offer testimony of their safety and efficacy6. The leaves juice of Maba buxifolia is used to strengthen the liver7. Hence the stem of plant is taken for study.

1.1.Botanical Description:

Evergreen small tree; branch lets glabrous, bark grey to black. Leaves obovate -spathulate or elliptic, entire, obtuse or emarginated, base acute to attenuate, glabrous, coreaceous. Flowers white, trimerous, male flowers in short cymes; female flowers 10-13, together. Sepals and petals 3 each.Stamens-6.Ovary trilocular.Berries globose, orange when ripe.

Systematic position

Kingdom : Plantae
Phylum : Magnoliophyta
Class : Magnoliopsida
Family : Ebenaceae
Genus : Maba
Species : buxifolia

2.Materials and methods:

2.1Collection of Plant Materials:

The Stem of Maba buxifolia(Rottb.)Juss.of family Ebenaceae,commonly called Utikayalu in telugu collected from hill slopes of Tirumala, Andhra Pradesh,India and authenticated by Ravi Kiran, BSI, Coimbatore. A voucher specimen is deposited in Department of Botany, Acharya Nagarjuna University, Guntur and the specimen number is ANU Y9B0R024 .Collected stem was shade dried till the moisture content is evaporatedand finally pulverized in to small pieces.

2.2Solvent Extraction:

Crude plant extract was prepared by Soxhlet extraction method.Plant stem peices were uniformly packed into 3/4th volume of the thimble and extracted with 300ml of different solvents separately. Polarity based solvents used were Hexane, Ethylacetate and Methanol.The process of extraction continues till the solvent in siphon tube of an extractor become colorless. The extract was taken in a beaker and kept it for air dry till the solvent got evaporated.Dried extract was kept in refrigerator at 4^{o}C for their future use in phytochemical analysis.

2.4Qualitative Phytochemical Screening8,9,10,11,12

I.Detection of Alkaloids:

1.Mayer's Test: One or two drops of Mayer's reagent is added to plant extract by the sides of the test tube. White precipitate indicates the presence of alkaloids.

2.Wagner's test:

One or two drops of Wagner's reagent is added to plant extract by the sides of the test tube. Reddish brown precipitate indicates the presence of alkaloids.

3.Hager's Test:

One or two drops of Hager's reagent is added to plant extract. Prominent yellow precipitate indicates the presence of alkaloids.

II.Detection of Phlobatannins:

To 0.5ml plant extract few drops of 10% ammonia solution

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was added. Pink color precipitate indicates the presence of Phlobatannins.

III. Detection of Coumarins:
1ml of plant extract is added with 10% sodium hydroxide. Yellow colour indicates the presence of coumarins.

IV.Detection of Anthraquinones:
0.5ml of plant extract is treated with few drops of 2% HCL. Red color precipitate indicates the presence of anthraquinones.

V.Detection of Tannins:
Ferric chloride test:
5mg of plant extract was dissolved in 5 ml of distilled water and few drops of neutral 5% ferric chloride solution were added. The formation of blue green color indicates the presence of tannins.

Gelatin test:
Few ml of plant extract was treated with gelatin solution. Formation of white precipitate indicates the presence of tannins.

VI.Detection of Glycosides:
Legalstest :
2ml of plant extract is treated with 3ml of chloroform and10% ammonia solution. Formation of pink colour indicates the presence of Glycosides.

Liebermann's test:
Few ml of plant crude extract was mixed with 2ml of chloroform and 2ml of acetic acid. The mixture was cooled in ice. Conc.$H_2SO_4$was added carefully. A colour change from violet to blue to green indicates the presence of glycosides.

Keller-kilani test:
Few ml of plant crude extract was treated with 2ml of glacial acetic acid containing 1-2 drops of 2% solution of $FeCl_3$. The mixture was then poured into a test tube containing 2ml of concentrated H_2SO_4. Formation of brown ring at the interphase indicated the presence of cardiac glycosides.

VII. Detection of Phytosterols:
Salkowski reaction test:
0.5 ml chloroform extract is treated with 1 ml of concentrated H_2SO_4 from the sides of the test tube. Formation of reddish brown colour in chloroform layer indicates the presence of phytosterols.

VIII.Detection of flavonoids:
Watery plant extract was treated with ammonium hydroxide solution. The yellow fluorescence indicated the presence of flavonoids.

Alkaline reagent Test:
When plant extract was treated with sodium hydroxide solution, shows increase in the intensity of yellow color which would become colorless on addition of few drops of dilute Hydrochloric acid, indicates the presence of flavonoids.

Lead acetate solution Test:
Plant extract treated with few drops of 10% lead acetate solution. Formation of yellow precipitate indicates the presence of flavonoids.

IX.Detection of Phenols:
Lead acetate test
5 mg of plant extract was dissolved in distilled water and 3 ml of 10% lead acetate solution was added. Formation of a bulky white precipitate indicates the presence of phenols.

Ferric chloride test:
Plant extract was treated with 5% ferric chloride. Formation of intense colour indicates the presence of phenols.

X. Detection of Saponins:
The plant extract was mixed with 5ml of distilled water and was shaken vigorously. Formation ofstable foam indicates the presence of saponins.

XI. Detection of Terpenoids:
0.5ml of plant extract was mixed with 2ml of chloroform and concentrated H_2SO_4 is added carefully. Formation of red brown color at the interface indicates the presence of terpenoids.

3. Results and Discussion:
The present study revealed the presence of various phytochemicals considered as active medicinal principles. Wound healing properties, anti-inflammatory and analgesic activity of plant is due to the presence of phlobatanins[13]. Antimalarial, anti-viral and anti-inflammatory activity of plants lies with its terpenoids[14].Qualitative phytochemical is an important tool in detection of bioactive compounds and a path for drug discovery and development[15].The presence of saponins and glycosides shows the cardio protective nature[16]. Plants with phenolic compounds and flavonoids are known to possess biological properties such as anti-aging, anti-inflammation, cardiovascular protection[17,18]. The three different extracts from stem found to contain Alkaloids, Phlobatanins, Tannins, Glycosides, Flavonoids, Phenols, saponins and terpenoids. From the analysis hexane extract contains more phytoconstituents followed by Ethyl acetate and methanol in equal proportion.

Conclusion:
Phytochemical screening of medicinal plants is very much useful in new drug discovery.Phytochemicals in plants make their use in curing various ailments and are a good source of natural drugs. The secondary metabolites have various biological activities.Present study reveals the presence of various secondary metabolites. Further studies of these compounds and their isolation, purification and characterization will be an informative tool in revolutionizing the herbal medicine.

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S.No	Name of the Test	Hexane Extract	Ethyl Acetate Extract	Methanol Extract
1	Alkaloid test			
	Mayer's test	+	-	-
	Wagner's test	+	+	-
	Hagers' test	+	-	-
2	Phlobatanins	+	-	-
3	Coumarins	-	-	-
4	Anthraquinones	-	-	-
5	Tannins			
	Fecl3 test	-	-	-
	Gelatin test	-	-	+
6	Glycosides			

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	Legals's test	-	-	-
	Liebermann'stest	+	-	-
	Keller-Kilani test	+	+	+
7	Phytosterols			
	Salkowski test	-	-	-
8	Flavonoids			
	Ammonium hydroxide test	+	+	+
	Alkaline reagent test	+	+	+
	Lead acetate test	+	+	+
9	Phenols			
	Lead acetate test	+	+	+
	Fecl3 test	+	+	+
10	Saponins	+	-	+
11	Terpenoids	+	+	-

Table-I: Phytochemical screening of Maba buxifolia (Rottb.)Juss.Stem

+ = Present- = Absent

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