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Research Article

PRELIMINARY PHYTOCHEMICAL AND PHARMACOGNOSTIC STUDIES OF *CELTIS PHILIPPENSIS* BLANCO

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ABSTRACT

Medicinal plants are used as a source of medicine from time immemorial. In India most of the traditional Medicinal systems like Ayurveda, Siddha and Unani depending upon the Medicinal plants. So the study of unexplored medicinal plants is need of the hour. The present study focuses on pharmacognostical analysis on an important medicinal plant, *Celtis philippensis* Bl. (Ulmaceae). The present study includes the fluorescence characteristics, physico – chemical analysis and preliminary phytochemical screenings of the stem, leaf and root powder. In conclusion, fluorescence analysis, physico-chemical determination and preliminary phytochemical screening can be used as a diagnostic tool in the correct identification of the plants.

Keywords: Pharmacognostic, Phytochemical, Physicochemical and Fluorescence analysis.

INTRODUCTION

Celtis philippensis belongs to the family Ulmaceae. It's vernacular as Vellai Thovarai, Kalluviri, Pinari, Kodalimuruki. It is a large deciduous tree distributed throughout the greater part of India up to an altitude of 1400 m. It is distributed in evergreen forests. The roots of *Celtis philippensis* are astringent. They are used as a remedy for diarrhea. The leaf sap is used for parasitic infections[1]. The present study includes the fluorescence characteristics, physico – chemical analysis and preliminary phytochemical screenings of the stem, leaf and root powder.

MATERIALS AND METHODS

Mature and healthy leaves, stems and roots of *Celtis philippensis* were collected in the month of February from the foot hill of Western Ghats, Tirunelveli District, Tamil Nadu. The identified plant species was confirmed with Voucher specimen available in the Department of Botany, Rani Anna Govt. College for women, Tirunelveli. The specimens were authentified by Dr. M. Padma Soma Subramanian, Research Officer (Scientist-II) in Botany, (CCRS, Govt. of India), Mettur Dam. The collected plant materials were shade-dried to retain its vital phytoconstituents and then subjected to size reduction for further extraction process. The powdered plant material was sieved for uniform size and includes for organoleptic study. The fluorescence analysis was also studied by standard method[2]. Physico-chemical analysis was carried out by standard procedure[3]. The preliminary phytochemical analysis was done by the standard methods[4,5].

OBSERVATIONS AND RESULTS

Macroscopic study

Trees ca. 12 m tall. Bark grey, lenticellate; blaze brownish. Young branchlets are annular to subterete, pubescent when young, later glabrous. Leaves are simple, alternate, ovate - oblong, distichous; stipules lateral, pubescent, caduceus and leaving scar; petiole 1-1.5 cm long. Inflorescence is axillary cymes; flowers are polygamous, usually on new branchlets. Fruit is drupe, up to 0.8 cm long, orange to red colour. Seed one and globose.

The taxonomic features collected from the species have been confirmed with the Flora of Presidency of Madras[6, 7].

Distribution: India, Myanmar, Sri Lanka and Indochina; in the Western Ghats throughout.

Synonyms

Bosea trinervia Roxb. : *Celtis brevinervis* (Blume) Planch.: *Celtis*

collinsae Craib: *Celtis djungiel* (Blume) Planch.: *Celtis hasseltii* (Blume) Planch. :*Celtis insularis* Rendle: *Celtis laurifolia* (Blume) Planch.: *Celtis mauritiana* Planch. :*Celtis mindanaensis* Elmer: *Celtis multifolia* Elmer ex Merr.: *Celtis philippensis var. consimilis* J.-F.Leroy :*Celtis philippensis var. philippensis: Celtis philippensis var. wightii* (Planch.) Soepadmo: *Celtis strychnoides* Planch.: *Celtis trinervia* (Roxb.) Koord.:*Celtis wightii* Planch.: *Celtis wightii var. consimilis* (Blume) Gagnep.: *Solenostigma brevinerve* Blume :*Solenostigma consimile* Blume

Powder analysis

The organoleptic evaluations means conclusions drawn from studies resulted due to impression on organs of senses. The color, texture, odour and taste of the plant powder were analyzed. It is presented on a Table 1.

Table 1: Powder analysis

S.No	Particulars	Plant part		
		Leaf	Stem	Root
1	Color	Dark green	Brown	Brown
2	Odour	Agreeable smell	Agreeable smell	Agreeable smell
3	Taste	Slightly bitter	Bitter	Slightly bitter
4	Texture	Coarse	Coarse	Coarse

Fluorescence analysis

Fluorescence analysis of the leaf, stem and root power in various solvents have been studied and presented in Table 2. It can be as a diagnostic tool for testing the adulterations. Under fluorescent light (365 nm) stem, leaf and root powder showed different colours in various extracts.

Table 2: Fluorescence analysis

S.No	Treatment	Plant part	Under visible light	Under UV light
1	Petroleum ether extract	Leaf	Green	Brownish green
		Stem	Brown	Dark brown
		Root	Brown	Dark brown
2	Benzene	Leaf	Dark green	Dark green
		Stem	Light brown	Dark brown
		Root	Dark brown	Brown
3	Chloroform	Leaf	Greenish brown	Green
		Stem	Yellowish brown	Yellow
		Root	Brown	Brown
4	Methanol	Leaf	Dark brown	Dark brown
		Stem	Yellowish green	Leafy green
		Root	Brown	Dark brown
5	Powder + 5%FeCl3	Leaf	Dark green	Dark green
		Stem	Light green	Dark green
		Root	Greenish brown	Dark brown
6	Powder + acetone	Leaf	Leafy green	Dark green
		Stem	Yellowish brown	Dark brown
		Root	Brown	Dark brown
7	Powder + 1N HCL	Leaf	Light green	Dark green
		Stem	Yellowish white	Yellow
		Root	Light brown	Dark brown
8	Powder + 1N NaOH (dis.water)	Leaf	Dark green	Blackish brown
		Stem	Green	Deep green
		Root	Light brown	Dark brown
9	Powder + Con. HNO3	Leaf	Dark brown	Brownish black
		Stem	Dark brown	Dark brown
		Root	Dark brown	Brown
10	Powder + 1N NaOH(ethyl alcohol)	Leaf	Greenish brown	Brown
		Stem	Light brown	Dark brown
		Root	Dark brown	Dark brown
11	Powder + 5% iodine	Leaf	Pale green	Green
		Stem	Pale yellow	Yellow
		Root	Light brown	Brown
12	Powder + 1% H2SO4	Leaf	White	White
		Stem	White	Yellowish white
		Root	White	White
13	Powder + Dil. Ammonia	Leaf	Light green	Dark green
		Stem	Dark green	Brownish green
		Root	Light brown	Dark black
14	Powder + Dis. water	Leaf	White	Greenish white
		Stem	White	Yellowish white
		Root	Light brown	Dark brown

Physico - chemical analysis

Ash values are helpful in determining the quality and purity of crude drugs, especially in the powered form. The different physico-chemical standards and solvent extractive value were presented in Table 3. The total ash and sulphated ash value is higher in stem powder and water soluble ash value is high in leaf powder. The percentage of extractive value in petroleum ether (40-60 ^{0}c), benzene, chloroform, ethanol and water have also been determined. Extractive value of leaf, stem and root power are high in methanol extract. In leaf powder benzene extracts showed lowest value but in stem and root powders chloroform extract showed lowest value.

Table 3: Physico - chemical analysis

S.No	Test	Leaf %	Stem %	Root %
1	Total ash	8.98	9.55	8.45
2	Water soluble ash	13.95	7.75	3.75
3	Acid soluble ash	2.105	2.3	2
4	Sulphated ash	1.95	4.09	2.24
5	Moisture content	12.89	13.65	17.76
6	Water soluble extractive value	8.35	2.4	5.9
7	Alcohol soluble extractive value	7.9	5.4	5.85
Extractive value				
8	Petroleum ether	2.6	2.43	2.79
9	Benzene	0.13	1.423	1.96
10	Chloroform	0.54	0.32	0.23
11	Methanol	3.86	3.13	5.76
12	Dis.water	1.24	0.71	0.98

Preliminary phytochemical screening

Phytochemical screening of this plant of various extracts showed significant results. The results are presented in Table 4. Terpenoids are reported only in root and leaf samples. Catechins and amino acids are reported only in stem and leaf samples. Reducing sugar present only in benzene and chloroform extracts. Sugar present all extracts except distilled water extract. Alkaloid present methanol and distilled water extracts. Phenol present only in benzene, chloroform and methanol extracts. Catechins are present only in petroleum ether and chloroform extracts. Saponins present all extracts. Tannin present all extracts expect petroleum ether extract. Anthroquinone present in chloroform extract only. Amino acids are showing positive to benzene and methanol extracts. The medicinal value of plants lies in some chemical substances like alkaloids, flavonoids, tannins and phenolic compounds which serve as defence against many microorganisms, insects and herbivores[8]. The natural phenolic, alkaloids, tannins, glycosides and flavonoids compounds function as antioxidants[9]. Phenol and phenolic compounds such as flavonoids have been shown to possess significant antioxidant activity[10]. The present observation presence of tannin (an astringent) supports the use of selected in traditional medicine for treating parasitic infection.

Table 4: Preliminary Phytochemical analysis

S.No	Extract	Plant parts	Terpinoids	Reducing sugars	Sugars	Alkaloids	Phenolic compounds	Catechins	Saponins	Tannins	Anthroquinones	Amino acids
1	Petroleum ether	Leaf	-	-	+	-	-	+	+	-	-	-
		Stem	-	-	-	-	-	+	+	-	-	-
		Root	-	-	-	-	-	-	-	-	-	-
2	Benzene	Leaf	+	+	+	-	+	-	+	+	-	+
		Stem	-	-	+	-	+	-	-	-	-	-
		Root	+	-	+	-	-	-	+	+	-	-
3	Chloroform	Leaf	-	+	-	-	+	+	+	+	+	-
		Stem	-	+	+	-	-	+	-	+	+	-
		Root	-	-	-	-	-	-	-	-	+	-
4	Methanol	Leaf	+	-	+	+	+	-	+	+	-	+
		Stem	-	-	+	+	-	-	+	+	-	+
		Root	-	-	+	-	+	-	+	+	-	-
5	Dis. water	Leaf	-	-	-	+	-	-	+	+	-	-
		Stem	-	-	-	+	-	-	-	+	-	-
		Root	-	-	-	+	-	-	+	-	-	-

CONCLUSION

The comparative and multidisciplinary approach to the study of *Celtis philippensis* does help in understanding their identification taxonomical determination, and medicinal importance in depth. The adulterants in drugs obtain from *Celtis philippensis* can be identified by this investigation.

REFERENCES

1. Quattrocchi. CRC World Dictionary of Medicinal and Poisonous Plants. 2012.
2. Chase C.R and Pratt. Fluorescence of powdered vegetable drugs with particular reference to development system of identification, Mourn. Am. Assoc. (Sci. Ed.) 1949;38:324-331.
3. Indian Pharmacopoeia. The controller of publication, New Delhi; Ministry of health and family welfare, Appendix. 7.1; A-80, New Delhi; Controller of Publication, 1996;2.
4. Brindha P, Sasikala B and Purusothaman KK. Pharmacognostic studies on Merugan kizhangu Bull. Medico Ethano. Botanical Res. 1981;3(1):884-896.
5. Kokate CK. Practical Pharmacognosy. 3rd ed. New Delhi: Vallabh Prakashan. 1994.
6. Gamble JS. Ulmaceae In: Flora of the Presidency of Madras, Bishen Singh Mahandra Pal Singh Dehra Dun. 1915 -1921;3:1324-1325.
7. Matthew KM. The Flora of Tamil Nadu Carnatic Vol II, The Rapinat Herbarium, Tiruchirappali. 1983-1988.
8. Chavan CB, Shinde UV, Hogade M and Bhinge S. Screening of in-vitro antibacterial assay of Barleria prionitis Linn. J Herb Med. Toxicol. 2010;4:197-200.
9. Kumari P, Sachan R, Yadav P, Tomer P, Arya A, Tripathi S and Kumar S. Antiinflammatory activity of in-vitro and in-vivo Kigelia pinnata (Jacq.) DC. from Indian origin. Indian J Fundam. Appl Life Sci. 2012;2:261-268.
10. Van A. Structural aspects of antioxidant activity of flavonoids. Free Radical Biol Med. 1996;20:331-342.