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COMPARATIVE STUDY OF AQUEOUS EXTRACTS OF ALL PARTS OF *C. PANICULATUS* WILD

Kamalinee A. Deodhar ^{*1} and Nanda W. Shinde ²

K. L. E. Society's Science and Commerce College ¹, Kalamboli, Sector 1, Navi Mumbai - 410218, Maharashtra, India.

K. V. Pendharkar College of Arts, Science & Commerce ², MIDC, Dombivali - 421203, Maharashtra, India.

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Correspondence to Author:

Dr. Kamalinee Deodhar

K. L. E. Society's Science and
Commerce College, Kalamboli,
Sector 1, Navi Mumbai - 410218,
Maharashtra, India.

E-mail: ketbot@gmail.com

ABSTRACT: Herbal drugs play an important role in the health care programme especially in developing countries. Ancient Indian literature incorporates a remarkably broad definition of medicinal plants and considers "all" plant parts to be potential sources of medicinal substances. *C. paniculatus* is one of the Indian medicinal plants having a remarkable reputation as a factor of health care among the indigenous medicinal practitioner. There are many species of *C. paniculatus* which are medicinally important, but having very similar characters which makes confusion among the people about its authentication. As pharmacognosy is the 1st step in proving medicinal status as the crude drug of plant parts used in the health care system, the preliminary phytochemical studies of seeds, leaves, stem, and root of *C. paniculatus* were carried out.

INTRODUCTION: Herbal drugs play an important role in the health care programme especially in developing countries. Ancient Indian literature incorporates a remarkably broad definition of medicinal plants and considers "all" plant parts to be potential sources of medicinal substances ¹. *C. paniculatus* is one of the Indian medicinal plants having a remarkable reputation as a factor of health care among the indigenous medicinal practitioner. In India, 6 species of *Celastrus* viz. *C. hindsii*, *C. monospermus*, *C. stylosus*, *C. hookeri*, *C. monospermoids* including *C. paniculatus* are found ². All the species are memory enhancers and have been used as natural insecticides for a long time.

Local healers use different species to treat different ailments. All parts of *C. paniculatus* are gaining popularity in the primary health care system, and local values are using them regularly. The authentic identification of these parts is a problem for them because other species of *Celastrus* are also being used as herbal medicines and there is little morphological difference in members of these species. As pharmacognosy is the 1st step in proving medicinal status as the crude drug of plant parts used in the health care system, the pharmacognostic studies of seeds, leaves, stem, and root of *C. paniculatus* were carried out.

As medicinal property in a plant part is due to the presence of secondary metabolites like alkaloids or tannins or phenolics or flavonoids as active constituents, the preliminary phytochemical assay was done of each part.

MATERIAL AND METHODS:

Collection and Authentication: The plant material of *C. paniculatus* was collected from the forest

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areas of 3 different localities, *i.e.* Satara, Murbad and Kokan in August to October when it is flowering and fruiting. Care was taken to select healthy, full-grown plants and normal organs. The plant was authenticated from Blatter Herbarium, Department of Botany, St. Xavier's College,

Mumbai. (Specimen Accession No.1235 of H. Satapau). The voucher specimen of the plant is deposited at Research laboratory, Dept. of Botany, K. V. Pendharkar College, Dombivli (E) for further reference.



FIG. 1: *CELASTRUS PANICULATUS* INFLORESCENCE AND FRUITS

Extraction of Active Constituents: About 10 gms of the powdered drug of all the parts was extracted with water, Soxhlet apparatus. The extraction was carried out until the extractive became colorless. The excess solvent was removed from extractive by evaporation over boiling water bath. The dried extract was kept in a desiccator and used for identification of active constituents present.

Phytochemical Analysis: The following qualitative chemical tests for identifying various constituents were carried out on aqueous extracts prepared from all parts of *C. paniculatus*^{3,4,5,6,7}.

For Alkaloids: Mayer's reagent, Dragandroff's reagent, Wagner's reagent, Hager's reagent test.

For Carbohydrates: Molisch's test, Benedict's test, Barfoed's test, Fehling's solution test.

For Glycosides: Legal test, H₂SO₄ test, Borntrager's test, Killer-Killani test.

For Proteins and Amino Acids: Millon's reagent, Ninhydrin reagent test, Biuret test.

For Sterols and Triterpenoids: Libermann test, Salkowski test, Noller test.

For Phenolic Compounds: FeCl₃ test, Zinc-Hydrochloride reduction test.

For Flavonoids: Shinoda test, Zinc-Hydrochloride test, alkaline reagent test.

For Tannins: FeCl₃ test, Vanillin-Hydrochloride test, alkaline reagent test, Bromine water test.

For Saponins: Froth forming test.

For Fixed Oils and Fats: Spot test

For Mucilage and gums: Ruthenium red test and Water absorption test.

For Anthraquinone: Benzene and 1% NH₄ solution test.

Observation: Preliminary phytochemical screening of aqueous extract of all the powders answered positively only for alkaloids, Sterols & triterpenoids and phenolic compounds, saponins while proteins & amino acids, mucilage and gums, anthraquinone showed absence in aqueous extract. Aqueous extract, in addition, answered positively for the presence of flavonoids in all extracts expect aqueous extract of the leaf.

Similarly, tannins are observed only in two aqueous extracts namely seed and stem powder extract. The major variation is observed in carbohydrate tests performed for all aqueous extracts.

TABLE 1: PHYTOCHEMICAL TEST OBSERVATION

S. no.	Chemical Constituents and Test	Expected Observation	Aqueous extract of			
			Seed	Leaf	Stem	Root
1		Alkaloid				
	Extract + Mayer's reagent	White Creamish ppt.	++	++	++	++
	Extract + Dragandroff's reagent	Orange colour	++	++	++	++
	Extract + Wagner's reagent	Brown red ppt.	++	++	++	++
2	Extract + Hager's reagent	Yellow ppt.	++	++	++	++
		Carbohydrates				
	Extract + Molisch's reagent	Purple-Violet	++	++	++	++
	Extract + Benedict's reagent	Reddish-brown ppt.	---	---	---	++
	Extract + Barfoed's reagent	Red colour	++	++	++	++
3	Extract + Fehling's solution	Brick red ppt.	++	++	---	++
		Glycosides				
	Extract + Anthrone + H ₂ SO ₄ + heating	Purple-green colour	---	---	---	---
	Extract + Legal test	Pink to red	---	---	---	---
4	Extract + Borntrager's test	Pink colour	---	---	---	---
	Extract + Killer- Killani test	Greenish blue colour	---	++	---	++
		Protein & Amino acids				
	Extract + Millon's reagent	White ppt.	---	---	---	---
5	Extract + Ninhydrin reagent	Blue-violet colour	---	---	---	---
	Extract + Biuret test	Violet colour	---	---	---	---
		Sterols and triterpenoids				
6	Extract + Libermann test	Bluish green	++	++	++	++
	Extract + Salkowski test	Red fluorescent	++	++	++	++
	Extract + Noller's test	Pink colour	++	++	++	++
7	Phenolic compounds					
	Extract + FeCl ₃ test	Blue-green colour	++	++	++	++
8	Extract + Zinc-HCl reduction test	Yellowish-Orange	++	++	++	++
		Flavonoids				
	Extract + Shinoda test	Pink scarlet, crimson	++	---	++	++
9	Extract + Zinc-HCl reduction test	Red colour	++	---	++	++
	Extract + Alkaline reagent	yellow to colourless	++	---	++	++
		Tannins				
10	Extract + FeCl ₃ test	Blue-green ppt.	++	---	++	---
	Extract + Vanillin- H ₂ SO ₄	Purple-red colour	++	---	++	---
	Extract + Alkaline reagent	Yellow to red ppt.	++	---	++	---
	Extract + Bromine water	Decolourisation of Br ₂	++	---	++	---
11		Saponins				
	Froth forming test	Stable froth	++	++	++	++
12		Fixed oils & Fats				
	Spot test	Appearance of stain	++	++	++	++
13		Mucilage & Gums				
	Extract + Ruthenium Red	Pink colour	---	---	---	---
14		Antraquinone				
	Extract + Benzene+ 1% NH ₄	Pink, red or violet colour	---	---	---	---

CONCLUSION: The phytochemical analysis of aqueous extracts indicates the presence of alkaloids, sterols & triterpenoids and phenolic compounds prominently than other phytochemical components.

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CONFLICT OF INTEREST: Nil

REFERENCES:

- Shankar D and Ved DK: A balanced perspective for management of Indian medicinal plants. *Indian Forester* 2003; 129(2): 275-288.
- Ramamoorthy K: Celastraceae. In: Singh NP, Vohra JN, Hajra PK and Singh D.K (Eds), *Flora of India*. Botanical Survey of India, Calcutta 2000; 5: 75-137.
- Kokate CK, Purohit AP and Gokhale SB: *Practical Pharmacognosy*, Nirali Prakashan, 41st edition 2008.
- Radha R, Sivakumar T and Arokiyaraj S: Pharmacognostical evaluation of *Plumeria alba* Linn. *Research J Pharm Technol* 2008; 1: 496-501.
- Rajan S, Shalini R, Bharathi C, Aruna V, Elagin A and Brindha P: Pharmacognostical and phytochemical studies on *Hemidesmus indicus* root. *Inter J Pharm Phytochem Res* 2011; 3(3): 74-79.
- Suryavanshi J: Phytochemical investigation and anti-arthritis activity of seeds of *C. paniculatus* Wild. M. Pharm thesis, Bangaluru Karnataka 2005.
- Evans WC: *Trease and Evans Pharmacognosy*, 16th ed. Edinburgh; Saunders Elsevier 2009.

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