An Analytical Study on Pharmacognostical Leaves on Cadaba Trifoliata used for the Treatment of Rheumatism

1Dr Chhavi Agrawal, 1Dr Yerramsetti V. Rao, 1*Dr Korra Amarnath Naik

1. Department of Anesthesia, Konaseema Institute of Medical Sciences Research Foundation, Amalapuram, Andhra Pradesh, India

*Corresponding author: Dr Korra Amarnath Naik
E-Mail: dr.amarnathaikk@gmail.com

Abstract

Cadaba trifoliata known as Maraviluthi in Siddha system of medicine is important medicinal plant. In folklore, the leaves are utilized in the conduct of rheumatism, as an antiphlogistic, purgative and antihelminthic. Roots of this plant are used as purgative and plasters. The present study provides complete pharmacogenetic assessment of this plant species that involves microscopy, standard physicochemical determinations. These morphologic aspects might make utilized for fast ID number of the drug, especially in the event that from claiming powdered materials and might potentially help should separate the pill from its other species. Preliminary phytochemical analysis revealed the presence of alkaloids in coal ether, chloroform and ethanol extracts, carbohydrates and glycosides in petroleum ether, chloroform, ethanol and aqueous extracts, flavonoids in chloroform, acetone and ethanol extracts and phenolic compounds and tannins in all extracts. Volatile oils and saponins were absent in all extracts.

Key words: Stremia trifoliata, Pharmacognosy, Diagnostic characters, Cadaba trifoliata

How to cite this article: Agrawal C, Rao YV, Naik KA (2020): An analytical study on pharmacognostical leaves on cadaba trifoliata used for the treatment of rheumatism, Ann Trop Med & Public Health; 23(S21): SP231943. DOI: http://doi.org/10.36295/ASRO.2020.231943

1. Introduction

Cadaba trifoliata (Roxb.) Wt. and Arn. (Maraviluthi) is an important siddha drug; the leaves are utilized in the treatment of rheumatism, as an antiphlogistic, antihelminthic, purgative and as febrifuge. Leaves and roots of C. fruticosa (Viluthi) an allied species of C. trifoliata are included in various siddha formulations and in folklore C. fruticosa is used in the treatment of ailments such as rheumatism, as an antiphlogistic, anthelminthic, purgative and as febrifuge. As per folklore C. trifoliata also possess similar uses and no scientific reports are available both on the chemical constituents and biological activity of this plant. Hence the present investigation is undertaken. The purposes of the current study are to carry out pharmacogenetic study counting microscopical characters, powder analysis standard physiochemical characters and phytochemical parameters on the leaves of C. trifoliata which assist by recognition of the drug.

Materials and methods:

The fresh leaves of Cadaba trifoliata were collected in the month of September 2005 from Tinnelvely, Dist., Tamil Nadu Annals of Tropical Medicine & Public Health. http://doi.org/10.36295/ASRO.2020.231943
Nadu, India. The botanical individuality is established by Department of Pharmacognosy, Central Research Institute for Siddha, Chennai, India. A voucher specimen of the leaf was deposited in the department of Pharmacognosy, M.S. Ramaiah College of Pharmacy, Bangalore for future reference (016).

**Chemicals and Instruments**

Entire chemicals and reagents utilized for the study were by explanatory review Merk. The leaves were washed and utilized for *macroscopically* and *microscopically* investigations, histochemical tests, macerate Also powder analysis. For *microscopically* investigations, the leaves were obtained utilizing a sharp razor sharpened steel. Segments were cleared by warming with a couple drops of chloral hydrate, stained with phloroglucinol: concentration Hcl (1:1), utilized for iodine result and also *safranin*. Segments were then mounted to *glycerin* with spread slip to microscope.

Photographs of the pictures were by observed for distinctive segments under an intensify binocular magnifying lens (Olympus – CH 20 i model) with CMOF simple camera, AV-digitalizer. Extraordinary product (Grand VCD 2000+) might have been utilized for catching those pictures. These were exchanged should a calculated following determination and photograph prints were taken. Estimations from claiming tissues were recorded utilizing micro picture liter picture Investigation programming. (Erma – Japan).

**2.5 Preliminary analysis**

Physico-chemical parameters like different extractive values, rate of total ash, acid-insoluble ash, water dissolvable powder and sulphated powder were ascertained for every component in Indian Pharmacopoeia (1996). *Fluorescence* analysis was used to prepare the protocols. Preliminary phytochemical Investigation might have been conveyed crazy toward utilizing standard procedures.

**3 Results and discussion**

The genus *Cadaba* possess inflexible wiry unarms shrubs. Abandons basic alternately 3-foliolate. Blooms solitary, corymb alternately raceme. Sepals 4, unequal, for 2 whorls, external 2 valvate. Petals 4 or 2, clawed, hypogynous, plate large, colored, surrounding those gynophores for its tubular stalk And stretched trumpet-wise toward the top banana or spathulate. Stamens 4-6, embedded unilaterally on the thin gynophore. Ovary 1-celled, shame sessile; ovules many, once 2-4 parietal placentas. Apples and oranges a meaty slim cylindric berry or here and there dehiscing extreme frisbee Toward two valves which fall away starting with the placentas. Seeds globose, testa horny; cotyledons convolute. Abandons trifoliolate, petals 2, immaculate white for yellowish veins; circle appendage splendid yellow; stamens 6; apples and oranges 2-4 inch long, dehiscent ~ 1. Trifoliata..

*C. trifoliata* is a rigid, branched shrub or a small tree with hairy shoots. Leaves trifoliate; leaflets ovate or lanceolate, base cuneate with an entire margin and an acute apex; upper surface greenish and glabrous while the lower surface is pale green; flower – pure white with yellowish vein, petals 2, stamens 6; fruit capsule, cylindric, 2-4 inch long, blunt usually curved; seeds angular or reniform, finely muricate(Fig.1).
Leaves trifoliate; leaflets ovate or lanceolate, base cuneate, borderwhole; apex acute; superior surface greenish, glabrous lower surface pale green and fibrous. Taste slightly bitter with a characteristic odour. The petiole is abaxially circular with two thick, long adaxial horn-shaped wings. The epidermis is distinct comprising of circular cells by thin cuticle and dark tannin content. The ground tissue is homogeneous and circular, thick walled parenchymatous cells. Fairly large druses of calcium oxalate crystals are communal in the crushed parenchyma cells. This vascular bundle is single, large and circular with adaxial opening; the two free ends of the adaxial openings are invaginated into the central part (Fig 2). The xylem consists of several, thick walled, radial conical bands, the intervening gaps of the xylem bands has thin walled parenchyma cells. The xylem elements are circular, narrow and thick walled. Phloem occurs in discontinuous masses along the lower part of the xylem. Sclerenchyma sheath is absent or scanty, solitary sclerenchyma are seen.
The lamina is dorsiventral, smooth and even. The adaxial epidermis is slightly wider with squarish or rectangular cells and thick, smooth cuticle. The abaxial epidermis is thin and consists of small squarish cells. The mesophyll is not well differentiated into palisade and spongy parenchyma. However, the adaxial half of the lamina has one or two layers of wide, rectangular palisade cells and the lower half has four or five layers of spherical, less compact spongy parenchyma cells. The vascular bundles of the lateral veins are placed in the median part of the mesophyll. The vascular bundles are small, collateral and have sclera caps on the lower and upper ends. Dried leaf powder is green in color. Elements with specific colors were shown by the plant powder upon treatment with different chemical reagents (Fig.3). They are fibers, vessels with spiral thickenings, trichome, epidermal peel, parenchyma cells, sclereids, simple starch grains, globular in shape, appearing bluish (when treated with iodine) and druses of calcium oxalate crystal.

Leaf coefficients like stomatal number, stomatal index, palisade ratio, vein islet number and veinlet termination number were found to be 187.5 – 230 – 255, 20 - 23.90 - 25.50, 9 - 11.23– 12.21, 05 – 06.5 – 08 and 06.5 - 08 – 10.5. Physicochemical tests such as ash value, extractive value, moisture content and crude fibre content are provided. Fluorescence investigation helps in identifying the drug in powder form and presented in Table-3. Successive solvent extractive values and nature of extracts were found and presented in Table-4. Opening phytochemical tests revealed the occurrence of different metabolites and are presented in Table-5. Chemical constituents such as alkaloids, carbohydrates and glycosides, flavonoids, phenolic compounds, triterpenoids and tannins are current in the leaves that are similar to the
reported allied species *C. fruticosa*.

**Conclusion**

The pharmacogenetic parameters help in recognition, standardization and also aid in formulating pharmacopoeia standards of drugs. Eco morphological characters serve as useful tool to identify the species taxonomically. Pharmacogenetic study comprises of taxonomical characters, macroscopical, microscopical characters including macerate studies, powder analysis and histochemical tests of *C. trifoliata*. Physicochemical constants, phytochemical investigations of the extracts rendered valuable information about the nature and intensity of phyto constituents present in the plant. This also helps in preparing a comparative study amongst its species that are in progress.

**References**

3. Sharma PC, Yelne MB, Dennis TJ. *Database on medicinal plants used in Ayurveda*.vol.1, 2nd ed. Delhi, Central Council for Research in Ayurveda and Siddha, 2000, p. IX.