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ORIGINAL RESEARCH ARTICLE

Phytochemical and Pharmacognostical Investigation on *Ammania baccifera Linn* (Stem and Leaf)

Switu Jani*[1], Shukla V.J[2], Harisha C.R[3]

[1]*Scholar, M.Sc. (Med. Plants), I.P.G.T. & R.A., G.A.U., Jamnagar, Gujarat, India*
[2]*Head, Pharmaceutical Chemistry Lab, I.P.G.T. & R.A., G.A.U., Jamnagar, Gujarat, India*
[3]*Head, Pharmacognosy Lab, I.P.G.T. & R.A., G.A.U., Jamnagar, Gujarat, India*

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ABSTRACT

Ammania Baccifera Linn. Belonging to family Lythraceae, commonly known as 'dadmari' in Hindi, is a folklore medicinal herb, is used as an anthelmintic, antipyretic. In the Indian materia medica the folkloric use has been reported, leaves are applied to raise blister in Rheumatism, cure herpetic eruptions. The hot water extract or decoction of whole plant was found to be effective for renal or urinary calculi. As yet the different parts of plant have not found to be studied individually and hence the stem and leaves of this plant were investigated. T.S. of stem shows rosette crystals, vascular bundle radially arranged, pith occupying 1/3rd portion of the section. T.S. of leaf shows oil globules and prismatic crystals. Preliminary Phytochemical investigations show the presence of tannin, carbohydrate, phenol and flavonoids.

Key words: *Ammania Baccifera*, dadmari, folklore medicinal herb.

INTRODUCTION

Ammania baccifera Linn. (Lythraceae) commonly known as 'dadmari' in Hindi, is a medicinal herb distributed in moist places throughout India. Leaves sessile, young stem quadrangular and lower stem reddish tinged, axillary inflorescence and flowers sessile, red in colour, fruit capsule Globose [1]. It has been used for urinary calculi, and blister formation in cure of herpes, in rheumatic pains, ring worm and other skin diseases [2]. Aims and objective of present work is to carry out pharmacognostical and phytochemical primary screening on *Ammania baccifera*. In spite of its reputation in these ailments it has not yet been investigated scientifically and hence it was thought worth to study it in detail. The present paper highlights macroscopic, microscopic, powder characters, physicochemical and High Pressure Thin Layer Chromatographic analysis of methanol extract of aerial part (stem and leaves).

MATERIALS AND METHODS

Macroscopic evaluation [2, 3, 4]

Macroscopic characters of stem and leaves were recorded as per visual observation.

Organoleptic evaluation [5]

The colour, odour, and taste of stem and leaves powder were recorded separately.

Microscopic evaluation [6]

Free hand sections of all three samples were taken, cleared with chloral hydrate and then with phloroglucinol and hydrochloric acid. Histochemical tests for few constituents like tannin, etc. Microphotographs were also clicked by using Carl Zeiss binocular microscope.

Powder Microscopy

Cut pieces of stem & leaf were dried under shade, powdered with help of mechanical grinder and sieved through mesh no.60. *A. Baccifera* stem & leaf powder was studied under microscope with distil water and phloroglucinol and hydrochloric acid.

Histochemical tests

Histochemical tests for few constituents like tannin, starch grains etc, were done.

PHYTOCHEMICAL EVALUATION

Physical evaluation [7, 8]

In physical evaluation, moisture content, total ash, acid insoluble ash, and extractive values viz., alcohol soluble extractive value & water soluble extractive values were determined. The ash value represents the inorganic salts present in the drug (**Table 1**).

Preliminary Phytochemical Screening [7, 8]

The Methanol & water extractive was used to carry out the preliminary screening. The extract

***Corresponding Author:** Switu Jani**, Email:** janiswitu@gmail.com, **Phone No:** +91-9375902062

was further subjected for the presence of various constituents like alkaloids, tannins, phenols and for Flavanoids. Quantitative estimations of total tannin content & total Phenol content [9] were done. HPTLC [10] was carried out for analysis. Refer (**Table 2, 3 & 4**).

RESULTS AND DISCUSSION

Macroscopic evaluation

A.baccifera

It belongs to the family Lythraceae. It is an herb growing in water logging areas. Root dicot, externally spongy, leaves sessile, axillary inflorescence, flower sessile, red in colour, fruit capsule globose. (**Fig 1**)

***A .baccifera* (stem)**

Herbaceous, branched, lower parts of plant reddish brown tinged, young stem is Quadrangular, greenish in colour with proper nodes and internodes.

***A.baccifera* (leaf)**

Leaves simple, dorsiventral, alternate, exstipulate, sessile, lanceolate, tip acute, margin complete, reticulate veination, at lower surface midrib red in colour dark green above and glossy, light green below, measuring about 3-5x1.5-2cm, odour specific

family character (Lythraceae), taste pungent.

Microscopic evaluation

T.S. of *A.baccifera* (stem)

T.S. of stem shows quadrangular with four proturbensis with well differentiates epidermis, cortex, vascular bundle and pith. Epidermis is made up of barrel shaped parenchyma cells, and is compactly arranged with some yellowish brown pigments, 2-3 layer hypodermis followed by epidermis, made up of parenchymatous cells without any intercellular spaces with some chlorophyll pigments along with colouring pigments with some oil globules. Cortex made up of loosely arranged parenchyma cells with numerous rosette crystals of calcium oxalate, with some simple starch grains. Endodermis single layered some somewhat barrel shaped parenchyma cells followed by pericycle. Vascular bundles radially arranged, proto xylem towards pith Meta xylem towards periphery with some xylem parenchyma, medullary rays biserrate to multi serrate embedded with starch grains, phloem situated above xylem. Pith occupies 1/3th portion of section composed of parenchyma cells (**Fig 2-6**).

T.S. of *A.baccifera* (leaf)

Leaf dorsiventral shows single layer of epidermal cells covered with cuticle some of epidermal cells consisting brown coloured matter, followed by single layer of upper palisade parenchyma cells filled with chlorophyll pigments, oil globules and prismatic crystals. Lower 3-4 layers of spongy parenchyma consisting some rosette crystals of calcium oxalate and some oil globules. T.S. through mid –rib shows centrally locate vascular bundle supported by connective collenchymatous cells on both upper and lower epidermis with some rosette crystals. Vascular bundle consisting metaxylem arrange towards lower epidermis and proto xylem towards upper epidermis. Xylem consists of few xylem parenchyma. Phloem is below the metaxylem with some sieve elements (**Fig 7-9**).

Powder microscopy:

A.baccifera (stem)

The diagnostics character of stem powder shows epidermal cells in surface view,

greenish coloured oil globules, lignified fibers, scleried, and spiral and annular vessel

from vascular bundle region. (**Fig 10-14)**.

***A. baccifera* (leaf)**

Epidermal cells in surface view, anisocytic stomata, tannin and coloured matter,

Rosette crystals in the parenchyma and annular vessel are observed. (**Fig 15-18**).

Phytochemical results

The physiochemical parameter results are given in (**Table 1**). The results of quantitative and qualitative parameters are given in (**Table 2 & 3**) respectively. And (**Table 4**) shows the HPTLC results. The solvent system used for *A.baccifera* (stem+ leaf) was Toluene: Ethyl acetate: Acetic acid (7:2:1) v/v. (**Fig 19-21**).

Table 1: Physiochemical parameters of *A.baccifera*

S. No	Physicochemical Parameters	*A.baccifera* (stem+ leaf) (% w/w)
1.	Loss on Drying at 105°C	5.47
2.	Ash value at 450°C	13.13
3.	Acid insoluble ash at 450°C	0.02
4.	Water soluble extractive	18
5.	Alcohol soluble extractive	16

Table 2: Qualitative test of *A.baccifera*

S. No	Chemical Constituents	*A.baccifera* (stem+leaf)
1	Alkoloids	---
2	Tannin	++
3	Flavonoids	++
4	Phenols	++
5	Carbohyrate	++

++ Present; – absent.

Table 3: Quantitative test of *A.baccifera*

Sample	% of Tannin	Total phenol content %
A.buccifera (stem + leaf)	4.141	3.53

Table 4: HPTLC results of *A.baccifera*

A.baccifera (stem + leaf)			
R_f values			
spots	254 nm	spots	366 nm
5	0.05, 0.12, 0.27, 0.51, 0.57	3	0.05, 0.13, 0.57

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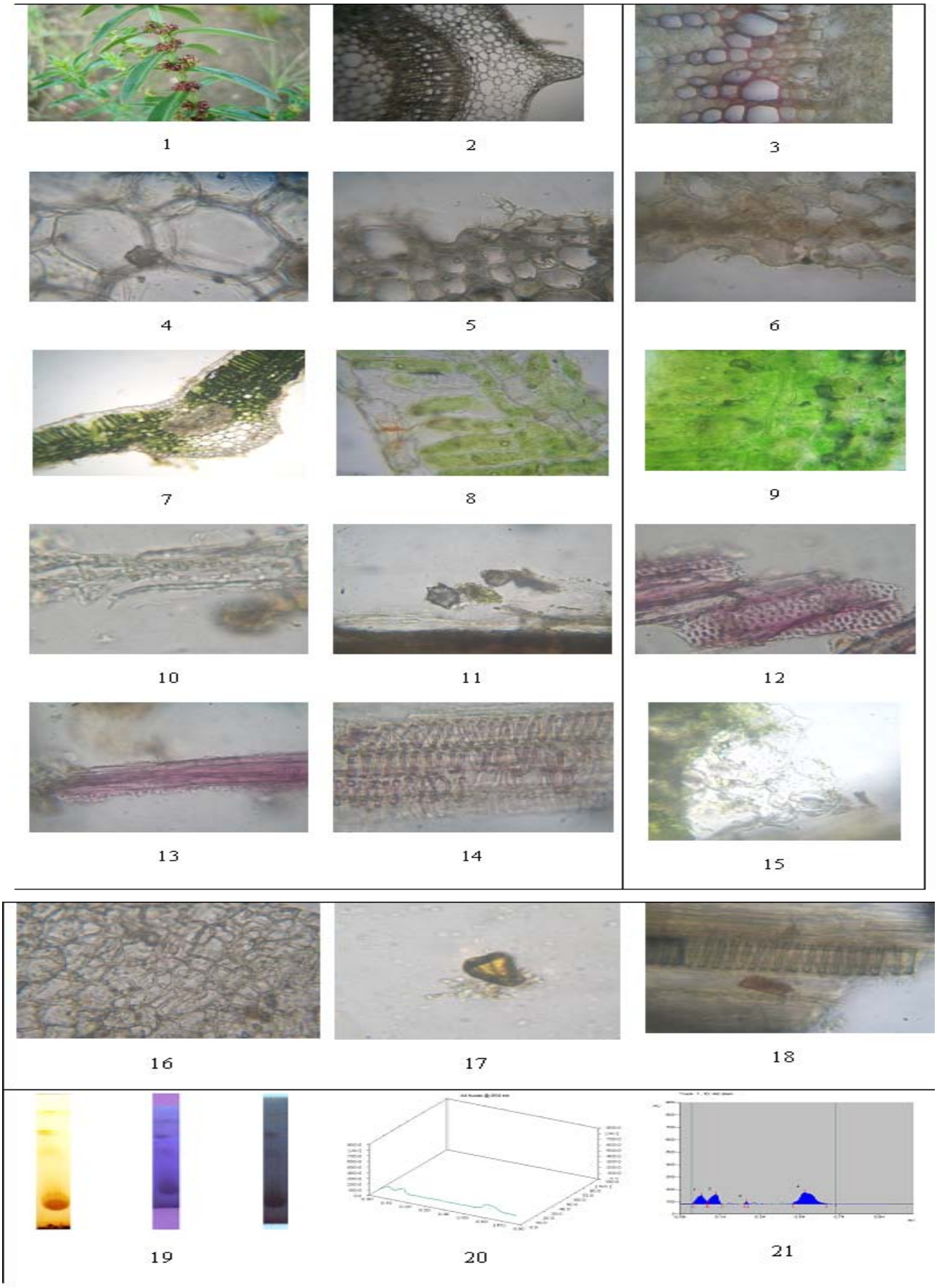
CONCLUSION

The pharmacognostical & Phytochemical screening of stem and leaf of *A.baccifera* was carried out which is not included in the pharmacopeia this study is helpful for future researches and pharmacological evaluations.



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