WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 9, Issue 8, 1609-1618. Research Article ISSN 2277– 7105

ANATOMICAL AND CHEMICAL RECORDINGS OF VATAGHNI (JUSTICIA GENDARUSSA BURM F.) HERB USED IN TRADITIONAL PRACTICES

Thakur Bhavana[1], Mallya Suma V.[2]*, Prabhu Suchitra[3], Bhat Sudhakar[4] and Shetty Nivedita[5]

[1]PG Scholar, [2]Associate Professor, [5]Assistant Professor, Sri Dharmasthala Manjunatheshwara College of Ayurveda, Kuthpady, Udupi 574118.

[3,4]Research Officer, Sri Dharmasthala Manjunatheshwara Centere for Research in Ayurveda and Allied Sciences, Kuthpady, Udupi, Karnataka.

Article Received on
04 June 2020,

Revised on 24 June 2020,
Accepted on 14 July 2020

DOI: 10.20959/wjpr20208-18159

***Corresponding Author**
Dr. Mallya Suma V.
Associate Professor,
Sri Dharmasthala Manjunatheshwara College of Ayurveda, Kuthpady, Udupi 574118.

ABSTRACT

About: *Vataghni (Justicia gendarussa* Burm F.) from *Acanthaceae* family commonly known as *Kala Adusa* the aerial parts of which is used by folklore practitioners in various diseases. Few consider this as type of Nirgundi, and use in inflammatory conditions of joints. **Materials and Methods:** Matured leaves of *Vataghni (Justicia gendarussa* Burm F.) were collected macro-microscopic and phytochemical study conducted as per standard guidelines. Result: Simple leaf with entire to crenate margin and reticulate venation having sub-obtuse apex with acute base. In the midrib portion below the upper epidermis there were 2-4 layers of collenchymatous cells. The ground tissue was mostly parenchymatous. Vascular bundle was collateral type. Physicochemical standards were recorded. Phytochemical study shown the presence of alkaloid, carbohydrate and tannins. **Conclusion:** Authentic macro-microscopic and phytochemical records of a plant form evident data for further study.

INTRODUCTION

Vataghni (Justicia gendurussa Burm F.) is a small erect shrub from *Acanthaceae* family commonly known as *Kala Adusa* the aerial parts of which is used by folklore practitioners in various diseases.[1] The plant is harvested from wild as well as cultivated as hedge plant for various medicinal uses and also because of its mosquito repellant activity.[2] Few lexicons

like *Madanapala Nighantu*, *Raja Nighantu* made references about this drug and described it as a variety of *Nirgundi* ie *Nilanirgundi*(blue tinged).[3] Mainly leaves and young shots are used in medicine, which are used as antispasmodic, febrifuge, antirheumatic.[4] The decoction prepared out of whole plant is used to treat wound.[5] Beta sitosterol, d- glycoside are main chemical constituents present in the drug.[6] It is believed to be native of China and is grown widely across India, Sri Lanka, Malaysia. In India it is easily available in Western Ghats of south India and used by folklore practitioners in treatment of joint pain, earache, colic pain in children, asthma, hepatic injuries, etc.[7]

Herbal drug authentication and documentation of pharmacognostic and activity profile are must to provide evidence in drug research. Hence with this background this particular task was planned to record pharmacognostic standards of *Vataghni (Justicia gendarussa* Burm F.).

MATERIALS AND METHODS

Materials

Matured leaves of *Vataghni (Justicia gendarussa* Burm F.) were collected from Udupi district, washed thoroughly, taxonomically named, using floras, sample deposited at SDM center for Research in Ayurveda and Allied sciences (Voucher specimen No. 17032101).

Macroscopy

The morphological characters of leaves were observed by naked eye by following the standard procedure. After that the sample of drug was documented using size indicating rulers. The external features of the test samples were documented using Canon IXUS digital camera. The macroscopic features were compared to local flora for authentication.[8]

Microscopy

Sample was preserved in fixative solution. The fixative used was FAA (Formalin-5ml + Acetic acid-5ml + 70% Ethyl alcohol-90ml). The materials were left in FAA for more than 48 hours. The preserved specimens were cut into thin transverse section using a sharp blade and the sections were stained with saffranine. The slides were also stained with iodine in potassium iodide for detection of starch. Transverse sections were photographed using Zeiss AXIO trinocular microscope attached with Zeiss AxioCam camera under bright field light. Magnifications of the figures are indicated by the scale-bars.[9]

Physicochemical study

Leaf sample shade dried, powdered properly and loss on drying at 105ºC, total Ash, acid insoluble ash, water soluble ash, alcohol soluble extractive & water-soluble extractive were carried out as per standard methodology.[10]

Phytochemical study

Alcoholic extract of leaf powder was screened for the presence of various phytochemical constituents as per standard operative procedures and results recorded.[11]

RESULT

Macroscopic study

Shape of leaf was lanceolate or linear- lanceolate, 7-14cm long, 1-2.5 cm wide, glabrous, short- petioled, pale green beneath and dark violet green above, Mid-rib was entire to crenate 8 pairs of main nerves, mid rib and main nerve were prominent on the under surface. It had reticulate venation with acute base, sub obtuse apex, leathery upper surface and smooth lower surface. Taste was bitter astringent, without any characteristic odour. (Figure 1)

Figure 1: Macroscopy of Leaf *Vataghni* (*Justicia gendarussa* Burm F.)

Microscopic study

Leaf exhibited dorsoventral symmetry. At Midrib region 4 to 5 outer layer of collenchyma present. Lower midrib region show 4-5 layer of collenchymatous cells. Ground tissue show large circular compact thin walled parenchymatous cells which contain starch grains. Lamina had upper epidermis below which there are elongated columnar cells which were horizontally oblong and cutically prominent. Upper epidermis was thick and prominent radially oblong or squarish polygonal in outline. Cells contain narrow lumen. Abaxial epidermis was slightly wider with thin wavy anticlinal walls. Stomata was present in it is Diacytic, 2 subsidiary cells lying on the opposite side of the guard cells. Vascular bundle was shallow wide and thick. Xylem was toward center and there were 15 parallel lines in xylem element with wide parenchymatous spaces in between. The xylem element are narrow and thick walled with wide lamina. Phloem was toward the periphery, thin layer of discontinuous compact cell and mixed with parenchymatous cells. Mesophyll tissue had both palisade and spongy parenchyma. The palisade cells were less compact in height and is cylindrical with dilated upper part. The spongy parenchyma has cells with intercellular space. Trichome was funnel shaped sessile glandular trichomes seated within epidermal cavity and is fixed to a wide cell which is below the epidermal layer.(Figure 2)

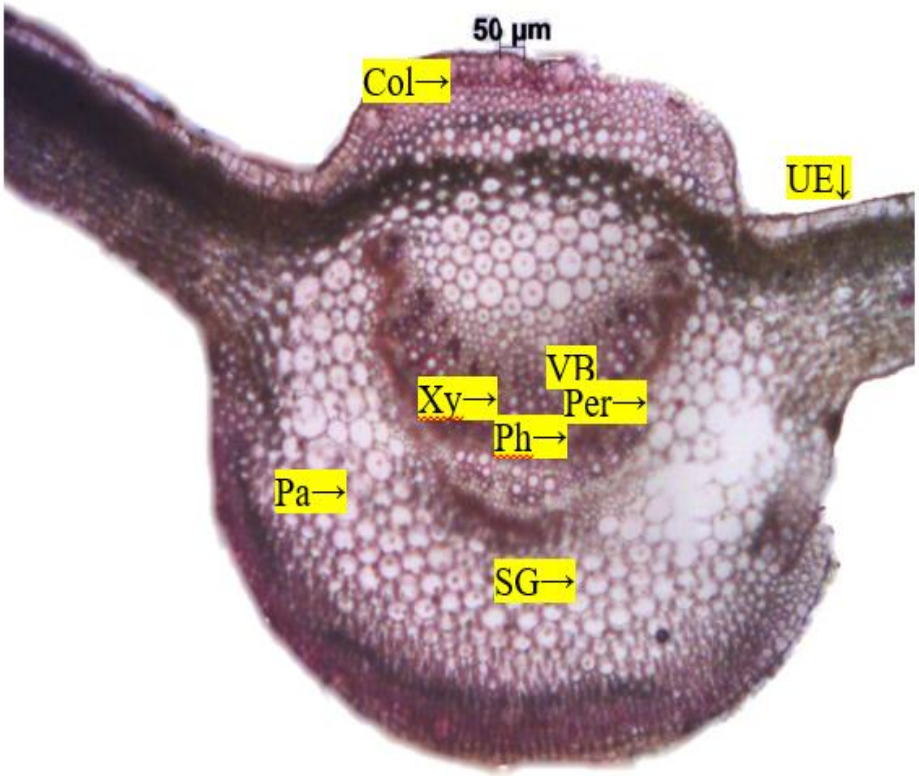

Fig. 2a: T. S. of leaf.

Col-collenchyma; Pa- parenchyma; Per – pericycle; Ph-phloem; SG – starch grains; UE – upper epidermis; VB – vascular bundle; Xy – xylem.

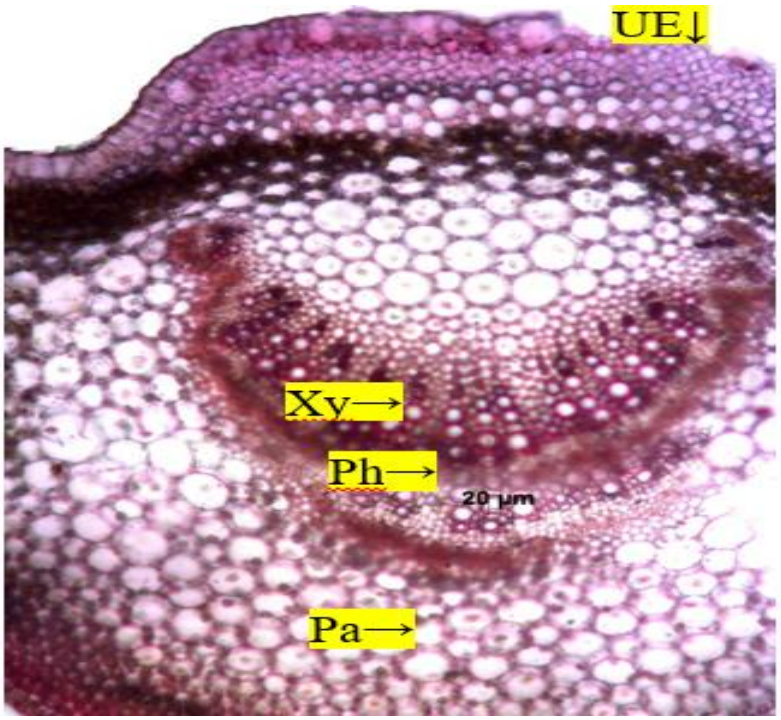

Fig 2b: A portion enlarged.

Pa- parenchyma; Ph-phloem; UE – upper epidermis; Xy – xylem.

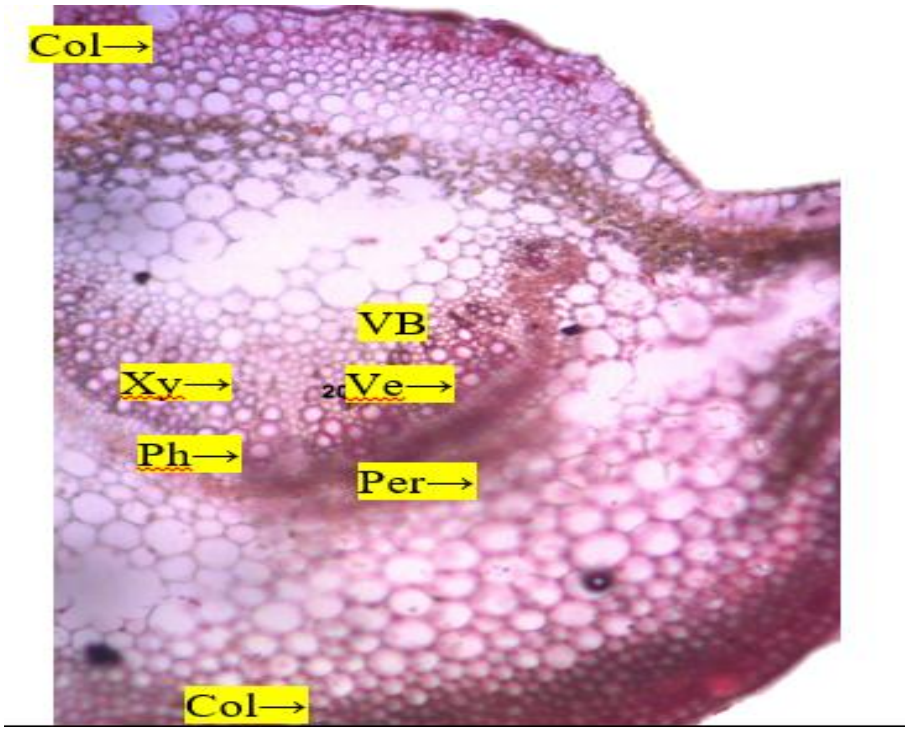

Fig. 2c: A portion of midrib.

Col-collenchyma; Per – pericycle; Ph-phloem; Ve – vessels; VB – vascular bundle; Xy – xylem.

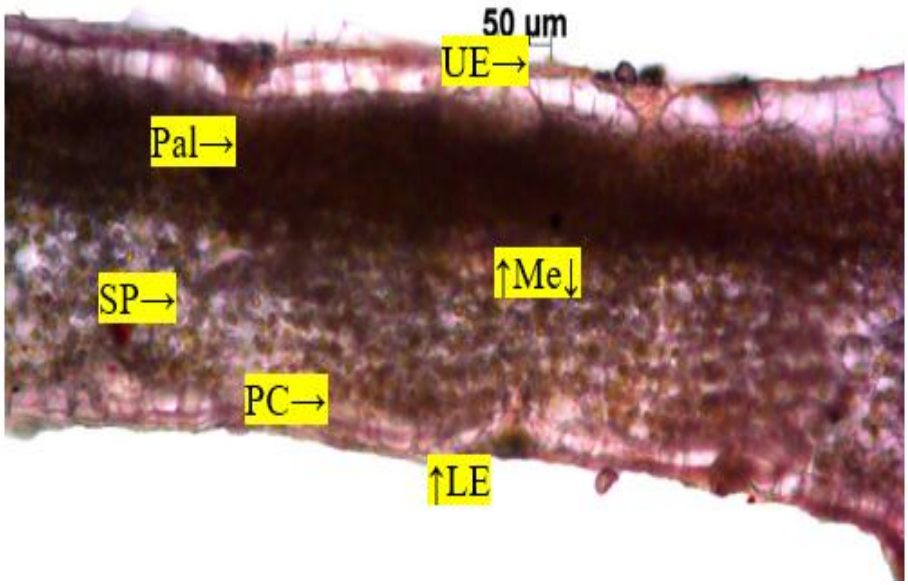

Fig. 2d: Lamina.

LE-lower epidermis; Pal- palisade parenchyma; SP – spongy parenchyma; UE – upper epidermis; ME – middle epidermis.

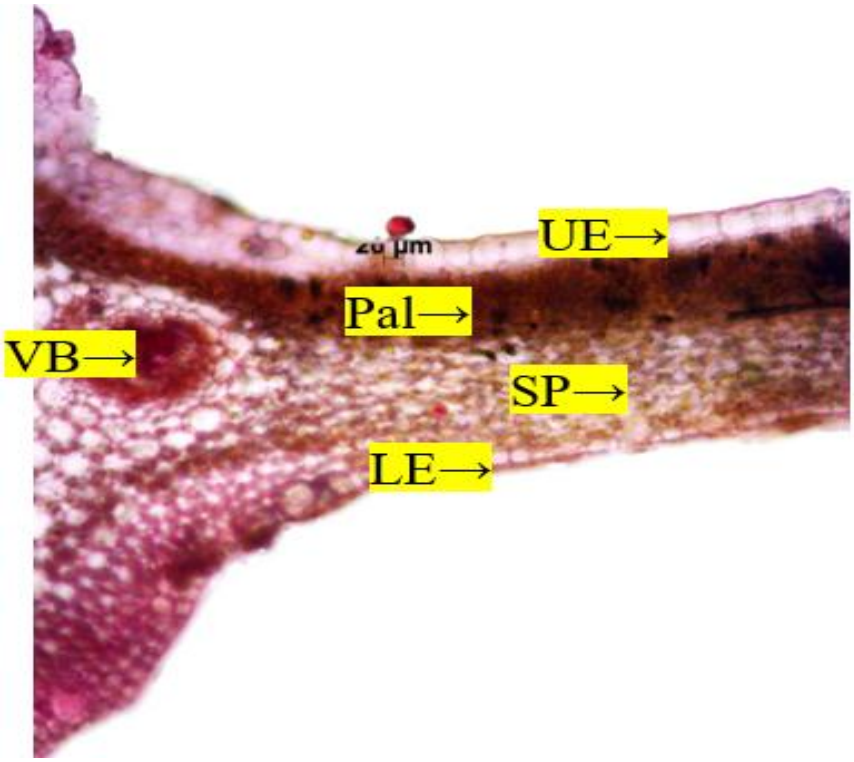

Fig. 2e: T.S. of Lamina enlarged.

LE-lower epidermis; Pal- palisade parenchyma; SP – spongy parenchyma; UE – upper epidermis; VB – vascular bundle.

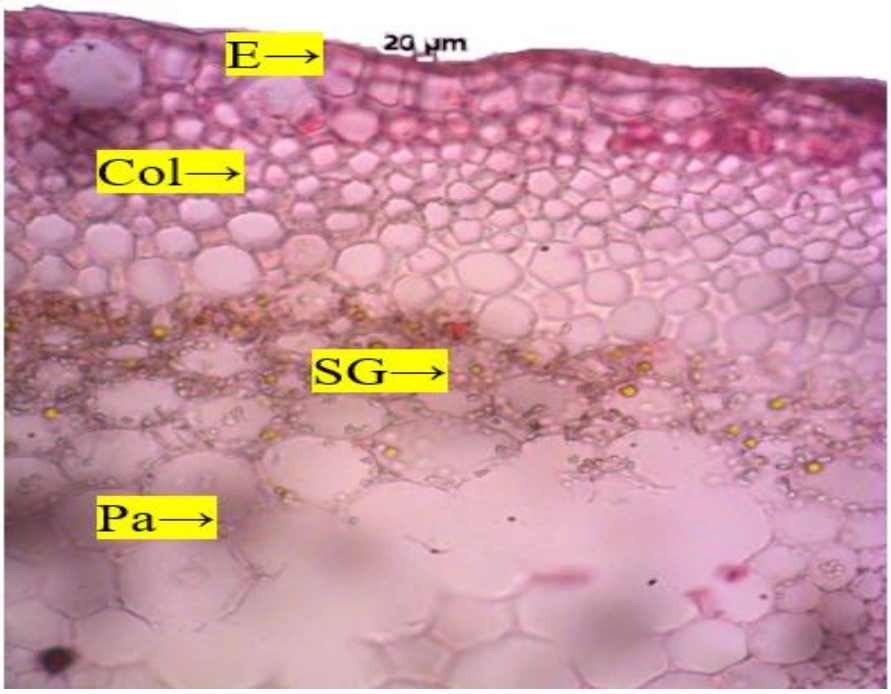

Fig. 2f: Upper midrib.

Col-collenchyma; SG – starch grains; E- epidermis; Pa- parenchyma.

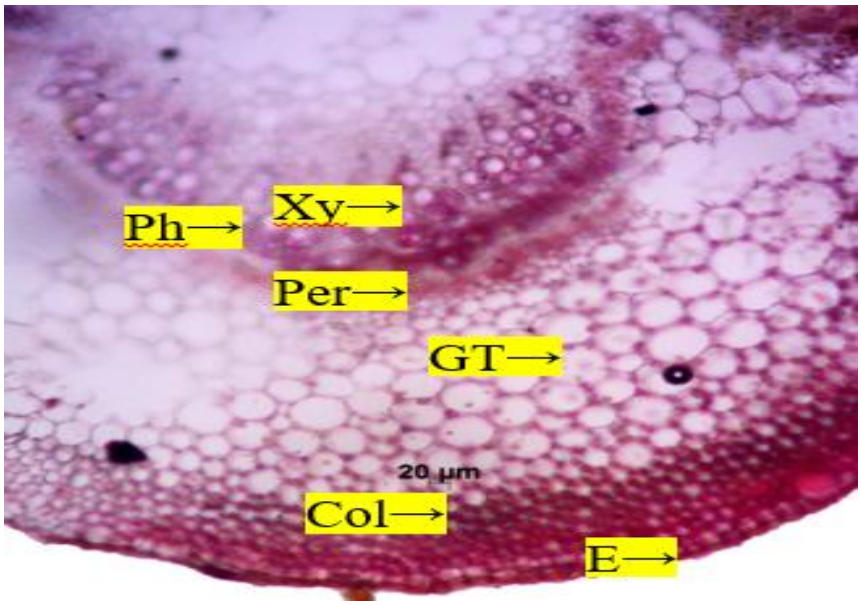

Fig. 2g: Lower midrib.

Col-collenchyma; GT – ground tissue; E- epidermis; Per – pericycle; Ph-phloem; Xy – xylem.

Figure 2. Transverse section of Leaf *Vataghni* (*Justicia gendarussa* Burm F.

Physico-chemical and phytochemical study

Results of physico-chemical standards have been displayed in Table 1. The result of phyto-chemical test reveal leaf of *Vataghni* **(***Justicia gendarussa* Burm F.) to have Alkaloid, Carbohydrate and Tannin as primary phytochemical constituents (Table 2).

Table 1: Physico-chemical standards of *Vataghni* (*Justicia gendarussa* Burm F.)

Parameter	Results n = 3 % w/w
Loss on drying	10.86± 0.005
Total Ash	13.90 ± 0.08
Acid Insoluble Ash	0.80 ± 0.005
Water soluble Ash	5.97±0.000
Alcohol soluble extractive value	4.34±0.01
Water soluble extractive value	28.83±0.005

Table 2: Preliminary phytochemical tests of Ethanolic extract of leaf Vataghni (*Justicia gendarussa* Burm F.)

Test	Inference
Alkaloid	+
Steroid	-
Carbohydrate	+
Tannin	+
Flavanoids	-
Saponins	-
Tri terpenoid	-
Coumarins	-
Phenol	-
Carboxylic acid	-
Resins	-
Quinone	-
Amino acids	-

(+) –Present; (-)-Negative

DISCUSSION

Macro-microscopy is the tool for the authentication of crude drug.[12] The macroscopic study showed the leaf as green with a smooth leathery texture, leaf margin was entire to crenate and reticulate venation having sub-obtuse apex with acute base. Its leaf was tested under microscope to see microscopical characters. In the midrib portion below the upper epidermis there were 2-4 layers of collenchyma cells. The ground tissue was mostly parenchymatous. Vascular bundle was collateral type; Xylem toward Centre and phloem toward periphery. There was a layer of pericyclic fiber from outer to phloem. The collenchyma patch which was 2-4 layer was also evident above the lower epidermis in the midrib reason. Lamina had upper

epidermis palisade cells which were elongated, columnar. The mesophyll tissue had both palisade and spongy parenchyma, the spongy parenchyma had cells with intercellular space.

Physico-chemical constants of a drug reveal about its chemical nature, moisture content, ash value, minerals if any etc.[13] Loss on drying suggest moisture content of the drug, which was 10.86%w/w. Total ash of the drug was 13.90 %w/w which suggest carbonaceous matter content of the drug. 5.97 %w/w a less acid insoluble ash value denotes few minerals associated with the drug. The drug dissolves equally in alcohol as well as water accordingly the extractive values were; 4.34% w/w, 5.97% w/w respectively. Preliminary phytochemical test will just indicative of secondary metabolite present in the test drug, further isolation techniques will define particular group of compounds.[14] The test has shown the presence of alkaloid, carbohydrate and tannins.

CONCLUSION

Justicia gendarussa Burm F. belonging to *Acanthaceae* family is a small bluish black tinged shrub with diverse medicinal properties used in traditional system of medicine. Authentic macro-microscopic records of a plant with medicinal properties help in future researches along with its proper utility in therapeutics. Standard features of macro-microscopy and phytochemical records published in this paper will help in this regard.

REFERENCES

1. Suresh Jet al; Phytochemical screening of Justicia gendrussa; Int J Pharmacon, Chinese Med, 2019; 3(1): 000015.
2. Nadakarni KM., Indian Material Medica Vol-I, Dehradun; International book Distributor, 2006; 395.
3. Priyavat Shamra, Dravyaguna Vijnana, Varanasi. Chaukambha Bharati Academy, 1998; 2: 242.
4. Subramanian N, Jothimanivannan C, Moorthy K, Antimicrobial activity and preliminary phytochemical screening of Justicea gendarusaa Burm.f. against Human pathogens; Asian Journal of Pharmaceutical and clinical research, 5(3): 230-38.
5. Kirtikar KR and Basu BD, Indian Medicinal plants Dehradun; International Book Distributors, 1996; 1896: 3.
6. Khare CP. Indian Medicinal Plants an illustrated Dictionary, New Delhi, Springer, 2007; 76.

7. Anonymous. The wealth of India, A dictionary of Indian raw materials & industrial products Vol-IV. Newdelhi: Council of scientific & industrial research, 2009; 270- 275.
8. Gokhale S B, Kokate CH, Purohit AP. A textbook of Pharmacognosy, Pune: Nirali prakashan, 2013; 34: 542-544.
9. Mallya Suma V. Biological evaluation of Shweta and Krishna Nirgundi, Vitex species with diverse medicinal quality; International Journal of Scientific Research, 2019; 8(11): 44-46.
10. Mallya Suma V, Nesari Tanuja; Antibacterial activity profile and quality standards of Cymbopogon citratus Stapf- an aromatic grass used in Indian system of medicine; Journal of Ayurvedic and Herbal Medicine, 2016; 2(3): 63-66.
11. Mallya Suma V, Nesari Tanuja, Sunil kumar KN, Pharmacognostic standards of Katphala(Myrica nagi Hook. F. non- Thumb); a potent bark drug used in Indian system of medicine; Journal of Scientific and Innovative Research, 2016; 5(4): 135-7.
12. Mukharjee Pulok K, Quality Control of Herbal Drugs; New Delhi: Business Horizons; 2002; 68.
13. Bani Shashikala, Mallya Suma V, Prabhu Suchitra, Quality control constraints of Guozotia abyssynica Cass. Source of medicinally used edible oil seeds; The Journal of Phytopharmacology, 2018; 7(5): 431-436.