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Original Article

Pharmacognostic studies of leaves, roots, stem, and fruits of *Uraria picta*

Dr. Vijay D. Gulkari[1], Vidya S. Kukde[2]

Priyadarshini J L College of Pharmacy, Electronic Zone Building, Nagpur, India

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ABSTRACT

This study presents the detailed Macro and microscopical evaluation of leaves of crude drug *Uraria picta* belonging to family Leguminosae, Papilionaceae. The study was help to identify and establish the authenticity of *Uraria picta.* The parameters also help to standardize the crude drug and minimize the drug adulteration. The quality control parameters for the crude drugs as raw materials were established with the help of several official determinations based on morphology and microscopy studies. These studies were aimed at ensuring standardization of herbal drug under investigation. Morphological examination of drugs refers to evaluation of drugs by colour, odour, taste, size, shape and special features, like touch, texture etc. All these parameters were recorded for leaves, root, stem, fruit and seed of the plant *Uraria picta.* These were helpful in primary identification of *Uraria picta.* Paracytic type stomata and curve apex covering trichomes, a dense reticulate venation pattern, spongy mesophyll are the differential character, Calcium oxalate crystals of prismatic and rhomboidal shape, types are fairly abundant in the leaf which is the identification characters.

Keywords: *Uraria picta,* Prishnaparni, Herbal drugs, Microscopy, Macroscopy

Address for Correspondence: Dr. V. D. Gulkari, Associate Professor, Priyadarshini J L College of Pharmacy Electronic Zone Building Nagpur, India; Mail: **vijaygulkari@gmail.com**

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INTRODUCTION

Uraria picta Desv. (Family: Leguminosae, Papilionaceae), regularly known as 'Prishnaparni', is an erect, minimal spread, perpetual herb, 90-180 cm tall, usually found in dry prairies, squander places, and open woods in the sub-Himalayan tract from Kashmir to West Bengal and Assam, upto an elevation of 1,800 m., and everywhere throughout the fields of India. Leaves are entirely variable factor, 1-3 foliolate, upto 30cm long, blotched white: leaflets 4-6, seldom 9, direct - elliptical or lanceolate, insensitive, mucronate, stipules subulate; blossoms purple, in thick, round and hollow racemes; cases 3-6 jointed, cleaned, frequently whitish, glabrous.[1]Corollapurple or yellow; standard orbicular or obovate, limited into a hook; wings falcate-oblong, holding fast to the bottom; bottom marginally incurved, inhumane. Stamens diadelphous; anthersuniform. Ovary sessile or presently followed; style filiform, inflexed above; sitgma capitate, terminal. [2] *Uraria picta* is one of the parts of Dashmoola. It is credited with break recuperating properties. The root is credited with aphrodisiac properties. Its decoction is endorsed for hack, chills, and fever. The leaves are viewed as antiseptic and utilized in gonssorrhea.[1]The organic product is applied to the irritated mouths of kids. The plant should be a decent cure to the venom of *Ecnis carinata.*[2]

Fig.1: *Uraria picta* Plant

Fig.2: *Uraria picta* Leaf

Fig.3: *Uraria picta* Fruit

Fig.4: *Uraria picta* Stem

Fig.5: *Uraria picta* Root

Classical and common names: Ayurvedic: Prishniparni, Prithakparni, Sinhapushpi (Charaka, Sushruta). Siddha: Sittira Paladai.
Parts Used: Leaves, Roots, Flower, Stem.

Classical Use: The herb is an element of Dashmula (the Ten Roots) of Ayurvedic medication, utilized as a heavy drinker or watery medication, utilized as an alcoholic or aqueous concentrate in remittent fever and for the treatment of irritations. In people medication, the root is utilized as febrifuge, root and pod in prolapse of rear-end in newborn children; natural fruit in stomatitis. Leaves are viewed as antiseptic and are utilized in Indian medication, Prishnaparni and Shaalaparni are utilized together because of regular equivalent words. Shalaparni, likened with *Deshmodium gangeticum* DC. was utilized by Chraka as a cardiovascular tonic; by Sushruta with Prishnaparni and Brahati (*Solanum indicum*) for gout. Prishnaparni and Shalparni, both were remembered for Sudarshana churna and Dashmula Kwaatha of Shaarangadhara Samhitaa and Bhaavaprakaasha. [3]

MATERIALS AND METHODS

Chemical: HCl, Phloroglucinol, Glycerine, Distilled Water

Assortment of Plant materials: New Fresh plant of *Uraria picta* were gathered from the Kesav Shrushti Kandiwali, Mumbai. It was confirmed by Dr. Vinayak Naik, Senior Taxanomist, Piramal healthcare private limited, Mumbai. An example vouchers and confirmation declaration is kept in explore research center before the initiation of the work. Areas of leaf, root, stem, fruit & seed were taken, stained and mounted. The morphology and Histological area of cell substance were considered.

Organoleptic assessment: Organoleptic assessments were performed agreeing the color, size, odour and taste parameters.

Macroscopical Evaluation: Distinctive perceptible parameters of stem, root, fruit and seeds grown from the ground were noted. Leaf assessment incorporates nonattendance or nearness of petioles and various characters of lamina i.e., shape, base, surface, venations, zenith. Root was read for its size, shape, surface, crack.

Microscopical Evaluation: Microscopical evaluation is the technique utilized for recognizable proof of medications on cellular level. Take the T.S. of the Leaves, Roots, Stem, Fruit mounted on the slide utilizing HCl, Phloroglucinol and Glycerine then each slide was secured with cover slip and analyzed under advanced Microscope.

Powder microscopy: Shade dried leaves were finely powdered and concentrated under magnifying lens. Little amount of plant leaves powder was set independently on slides and each slide was mounted with 2-3 drops of HCl and Phloroglucinol and afterward plunge in glycerine for few moments each slide was secured with cover slip at that point inspected under computerized magnifying lens.

Pharmacognostical Study: Visible and Microscopic examinations and Powder microscopy were carried out with accessible rule at Pharmacognosy Lab, PJLCP, Hingna, Nagpur.

RESULT AND DISCUSSION

Organoleptic assessment: The organoleptic characters of leaves indicated the green appearance from both side having bend molded or curved shaped covering trichomes called as stellate hairs. The leaf powder was green in color, harsh in surface, somewhat aromatic-sweet-smelling with disagreeable odour and attributes characteristic taste. The stem was herbaceous green in nature. Roots were light earthy colored in shading, sweet-aromatic in odour, tasteless. Pod (fruit) has three to six joints. Fruit was dark grey in color, seed light earthy colored.

Macroscopical Characters:
Leaf: Lower leaves 1–3-foliolate, upper 5–7 foliolate

Leaflets: Linear to elongated or lanceolate, lower ones 3-10 × 2-3 cm., upper ones 6-24 × 0.5-2.5 cm, intense, once in a while obtuse, minutely pubescent underneath the lower (early) leaves are basic yet more established leaves are pinnately compound with 2-4 sets of leaflets and one terminal; now and again combines without the terminal leaf create during the vegetative stage. The leaves are now and then variegated because of the presence of flavones. [4]

Roots: The plant has tap root framework generally 10-30 cm long and 0.3-1.2 cm in breadth at its furthest point. The roots are intense and woody and remotely light yellow to grayish buff in shading, and when dry bear fine longitudinal striations, inside light yellow in the wood and buff in the bark locale. The transversely smoothened surface shows a dainty bark and the minimized chamber of wood. The crack is splintery or stringy. Odour is indistinguishable and taste is somewhat harsh to acrid.

Stem: Stem having short unpleasant hairs. [6] Stem are light yellow to brown remotely. It is tube shaped, fanned or branched and pubescent. It is

about 8.0 to 16.0 cm long, 0.2 to 0.4 cm in measurement. Develop stem longitudinally wrinkled. [7,8]Stem are precise in the upper part adjusted towards the base, bushy with the exception of in develop stems where it is smooth, particularly fanned, numerous branches emerging from the basal district and spreading every which way. The upper piece of the stem creates in the axils of the leaves various, slim, lengthened branches. A transversely smoothened surface shows a slender bark surrounding a chamber of yellowish-white wood, which thus encases a still more extensive essence. The bark shows the presence of strands both secluded and in little gatherings. [9]

Fruit: The fruit, which contain 3-5 seeds are abundantly explained, and the sections about isolated. They are totally glabrous and grey in color. The seeds are little, light earthy colored, smooth and polished, almost oval fit as a fiddle estimating 2.0 x 1.0 mm and weighing about 0.3 mg each. They can sprout following being shed given the conditions are good, or be lethargic for a while before growing. [5]

Microscopical Characters:

Leaf: T.S of Leaf is dorsiventral. Stomata are of paracytic type and present on both the epidermis, bottomless in lower epidermis when contrasted with upper epidermis. Epidermis is single layered secured with slim fingernail skin of cutical. Two layers of lengthened palisade cells are available underneath the upper epidermis followed by 3-5 layers of spongy parenchyma cells. Leaf bears unicellular covering trichomes inexhaustible on the lower epidermis with bended zenith. Midrib area shows collenchyma cells on both the sides underneath the epidermis. Midrib locale shows patches of sclerenchyma cells. Vascular bundles are seen dissipated. Leaf comprise Calcium oxalate crystals (Prismatic and Rhombohedral Crystals) beneath the vascular packs or bundles.

Root: The whole root is secured with plug or cork. Cork comprise of 5-6 layers of flimsy or thin walled lengthened cells. Phelloderm is tight, comprising of 4-6 layers of flimsy walled and oval conceivably extended cells. Number of phelloderm parenchyma partitions to shape fibers, which resemble phloem fibers. Prismatic and rhombohedral crystals of Calcium-oxalate are found in a portion of the cells. Optional phloem is more extensive and is made out of phloem parenchyma and phloem fibers transversed by medullary beams or rays. Phloem Fibers are exceptionally since quite a while ago lengthened, thick walled, having decreasing closures and extremely restricted lumen, the greater part of them are septet. Wood is made out of vessels, trachieds, strands and parenchyma. Xylem filaments resemble those of phloem fibers or strands. Medullary rays or beams in xylem district are prominent by their bigger size, pitted thickening and spiral extension. Prismatic Calcium-oxalate crystals and starch grains are likewise present.

Stem: T.S. of stem is round indicating single layer of epidermis with covering trichomes. Collenchyma underlies epidermis, which is 3-5 layered. Epidermis and collenchyma are trailed by parenchymatous cortex. Inside the cortex, sclerenchymatous patches are seen masterminded in a ring followed by vascular bundles or packs. Xylem vessels with spiral and scalar structure thickening are seen. Pith is made out of parenchymatous cells.

Fruit: T.S. of Fruit is oval shape indicating outer layer of epidermis. Fruit comprises of Vascular bundles or groups, Seed coat, Cotyledons, Hilum. Endosperm cells are in middle of fruit. In the piece of Testa Epidermis are at the highest point of Testa and Vessels and Parenchymatous cells are in the center piece of the Testa. Fruit comprise of Sclerides, and are in bunches too. It comprises some portion of Vascular Bundles which comprise Epidermis, Vascular Bundles, and Parenchymatous cells.

Powder Microscopy: Microscopic perception of Uraria picta leaves powder shows the diverse cell segments i.e., Trichomes, Stomata, Calcium oxalate crystals, Vessels, Starch Grains, Sclerides, Epidermis, Fibers, Parenchymatous cells, Fragments of fibers or strands.

Transverse section of Leaf:

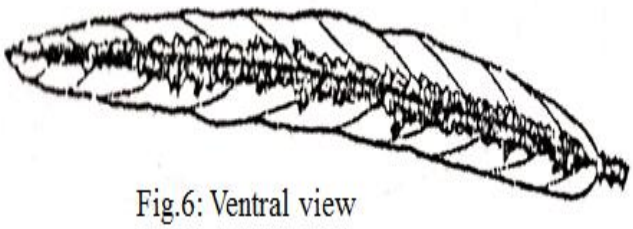

Fig.6: Ventral view

Fig.7: Dorsal View

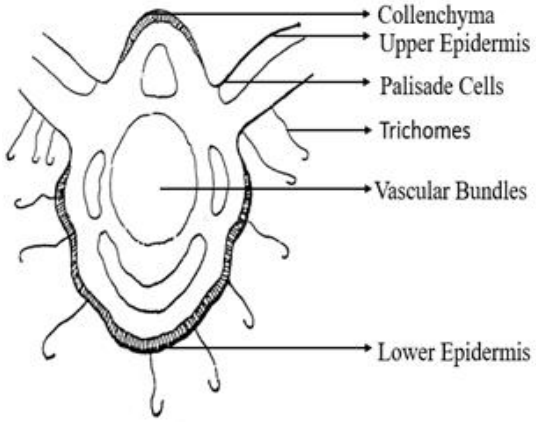

Fig. 8: Diagrammatic Section

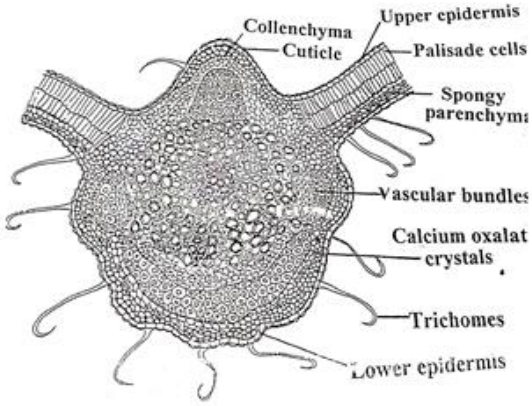

Fig.9: T.S. Of Leaf

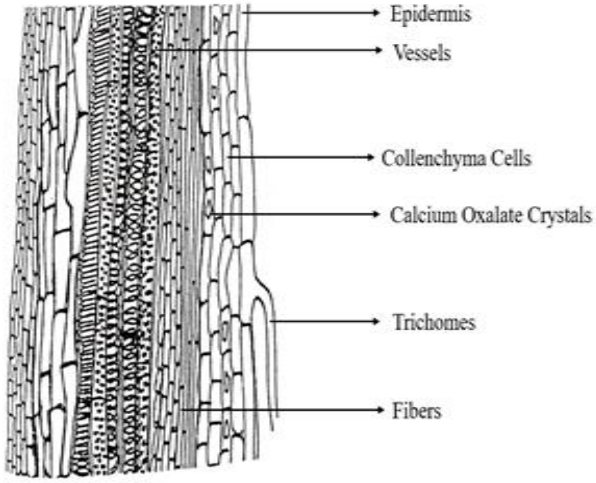

Fig.10 : L.S. of Leaf Passing through the Midrib

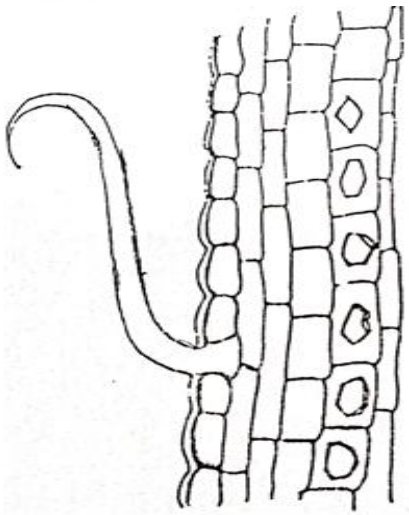

Fig.11: Sheath Of Calcium Oxalate Crystals

Fig.12: Prismatic Calcium Oxalate Crystals

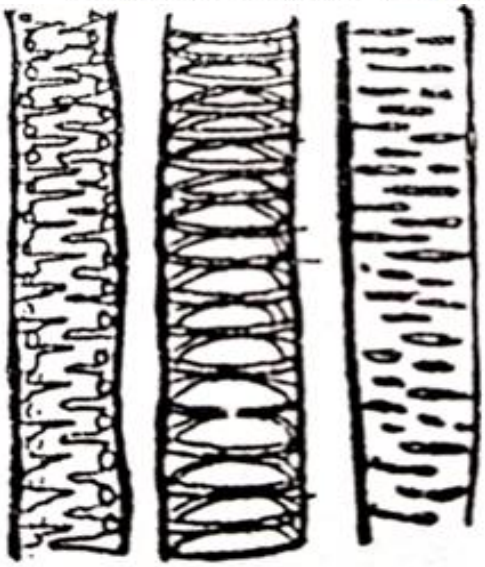

Fig.13: Vessels

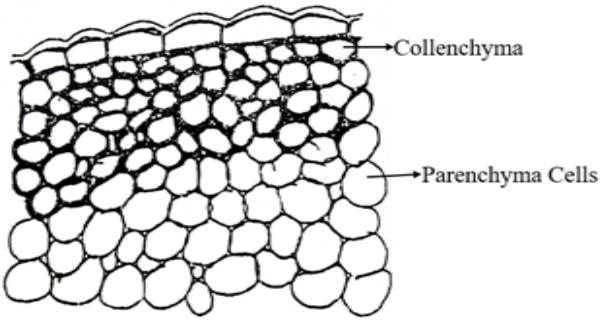

Fig.14: Part of Leaf Showing Collenchyma

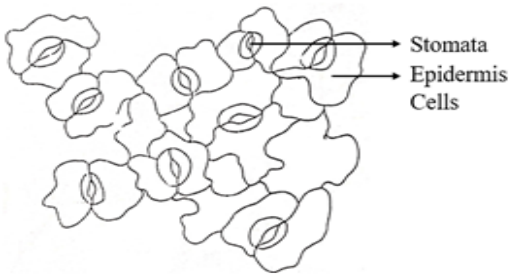

Fig.15: Stomata on Lower Epidermis

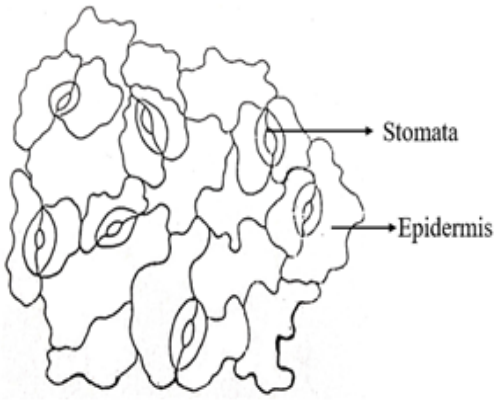

Fig.16: Stomata on Upper Epidermis

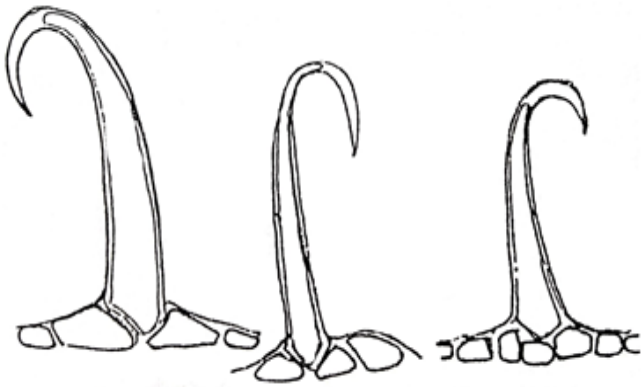

Fig.17: Trichomes

Transverse section of Root:

Fig.18: Entire

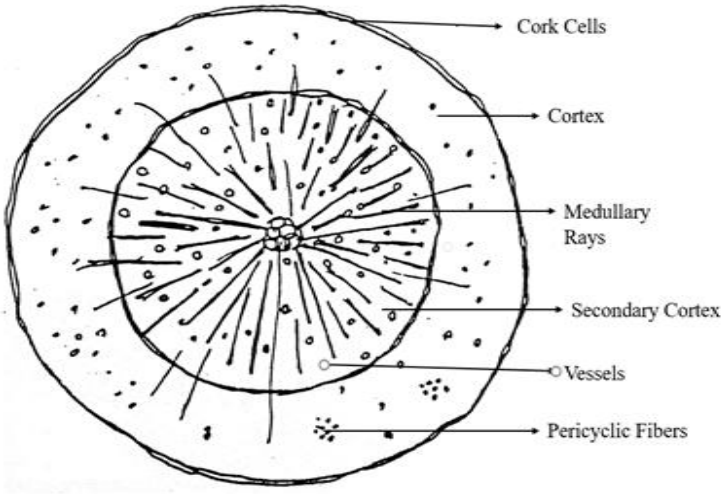

Fig.19: Schematic Diagram

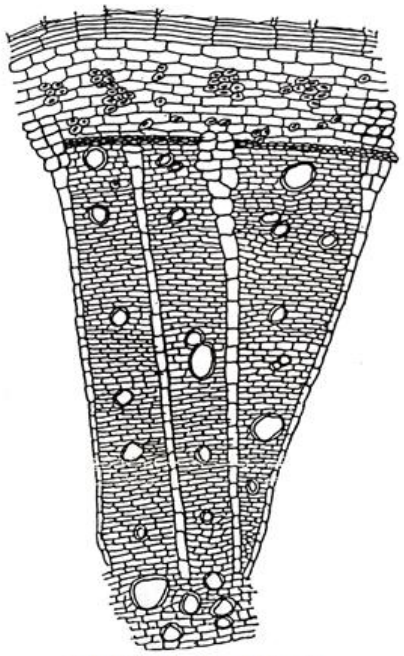

Fig.20: T. S. of Root

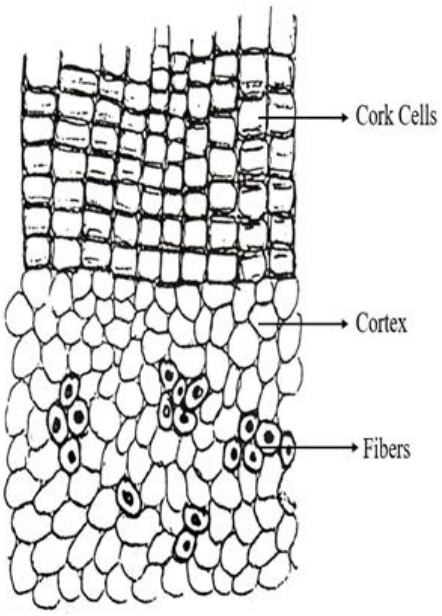

Fig.21:Cork cells

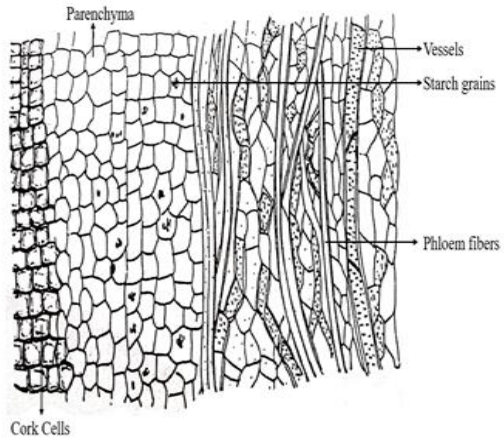

Fig.22: L.S. of Root

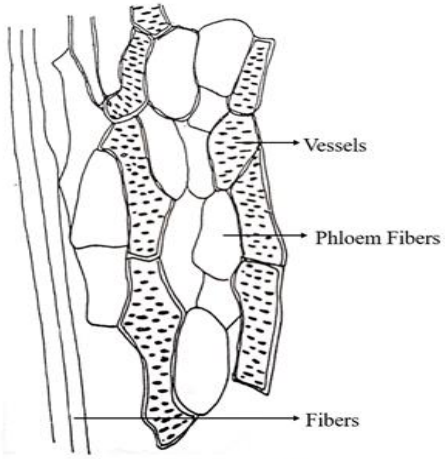

Fig.23 Vessels & Fibers

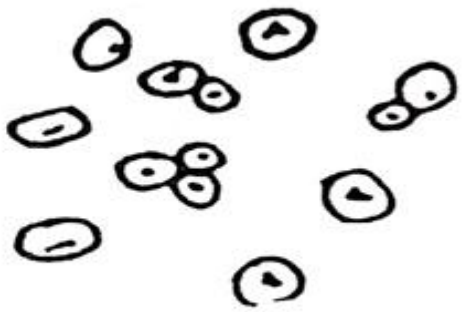

Fig.24: Starch Grains

Fig.25: Cork in Surface View

Fig.26: Trachieds

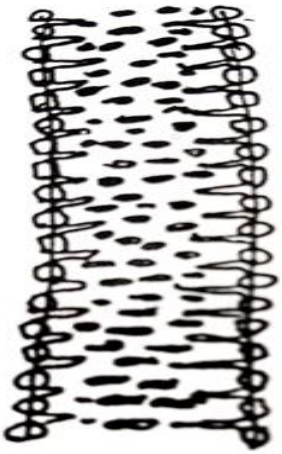

Fig.27: Vessels

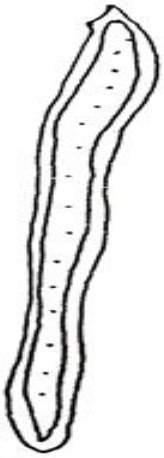

Fig.28: Fibers

Transverse section of Stem:

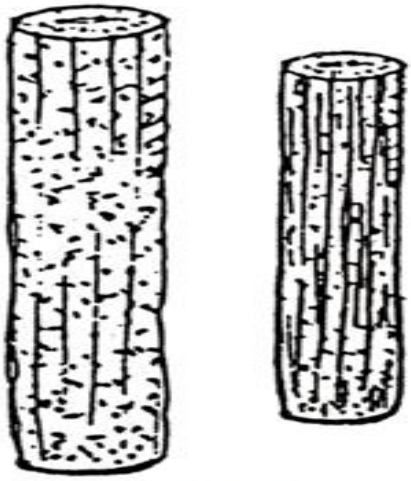

Fig.29: Entire

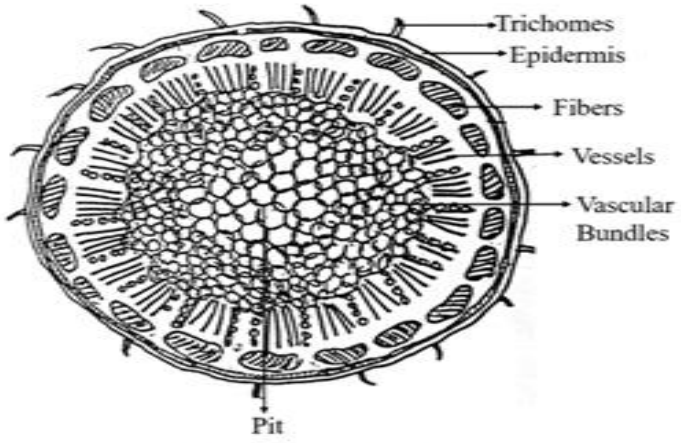

Fig.30: Schematic Diagram

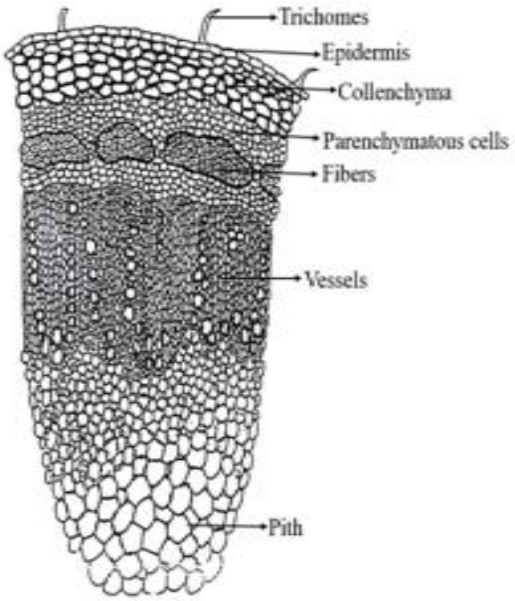

Fig.31: T. S. Stem

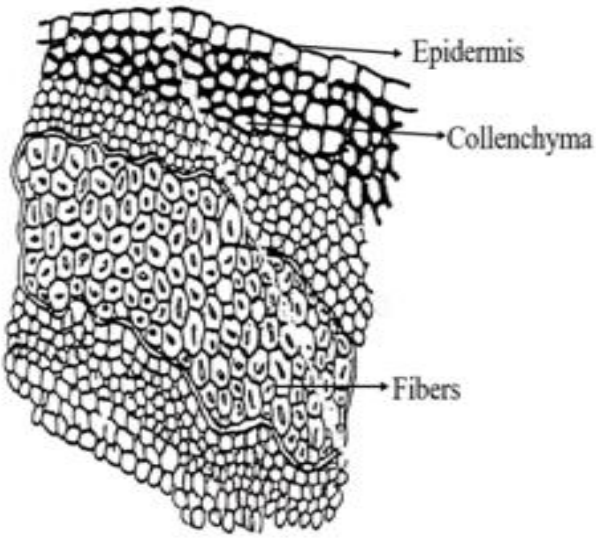

Fig.32: Fibers

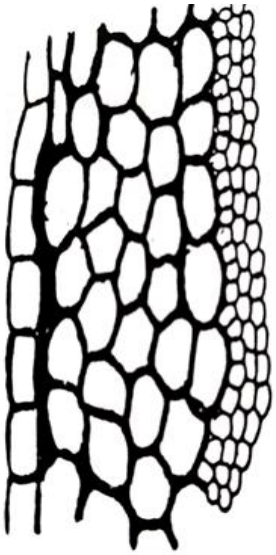

Fig.33: Part of Epidermis and Collenchymas Cells

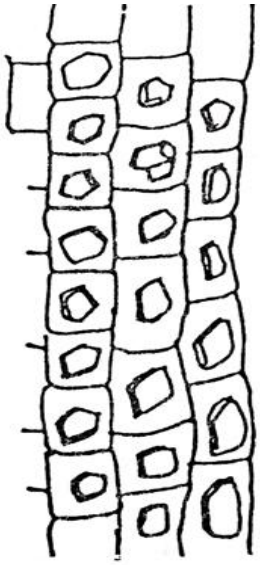

Fig.34: Sheath of Calcium Oxalate Crystals

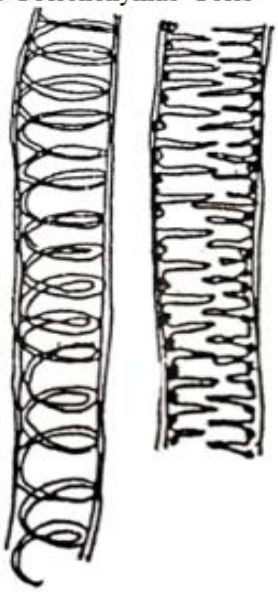

Fig.35: Vessels

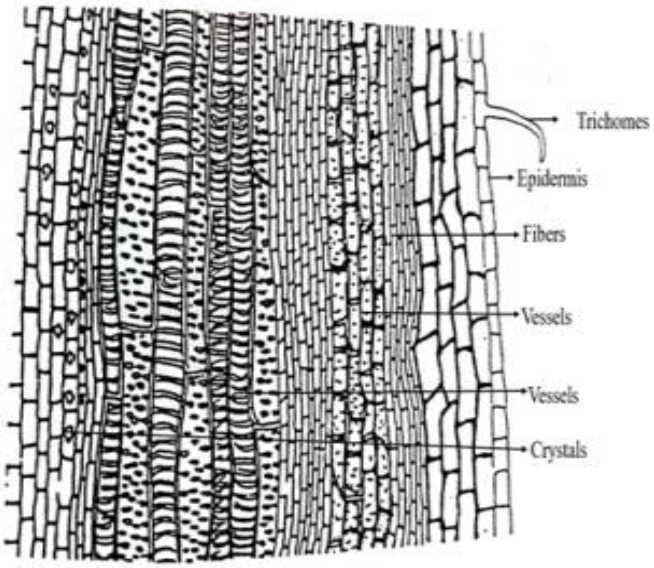

Fig.36: L. S. of Stem

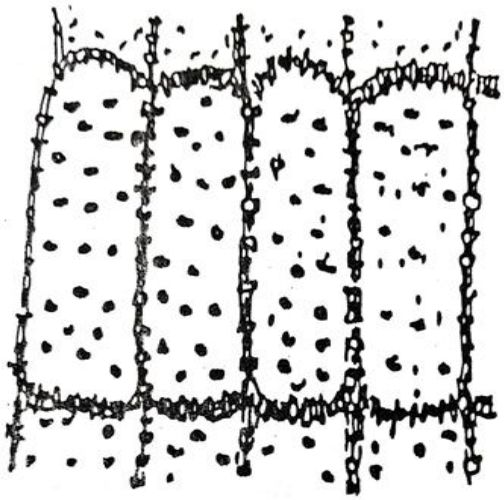

Fig.37: Trachieds

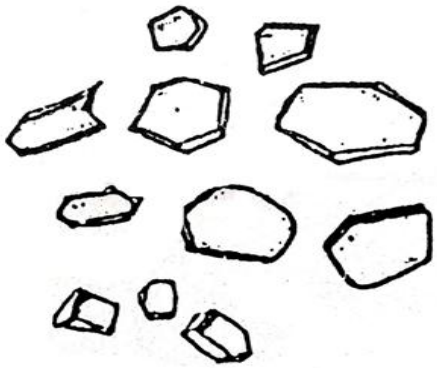

Fig.38: Calcium Oxalate Crystals

Transverse section of Fruit:

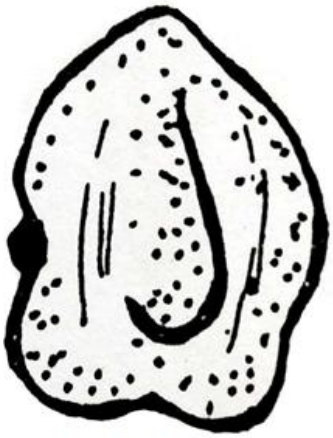

Fig.39: Seed

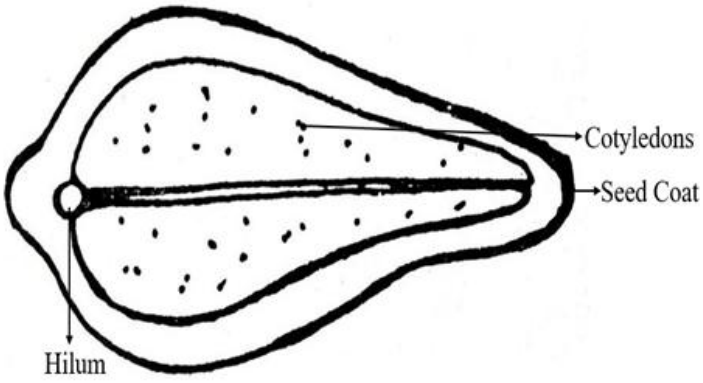

Fig.40: Schematic Diagram

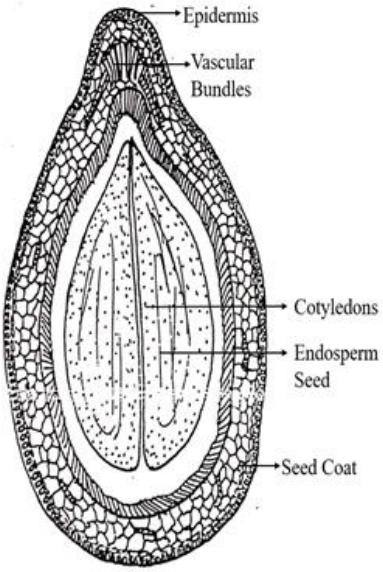

Fig.41: T. S. of Fruit

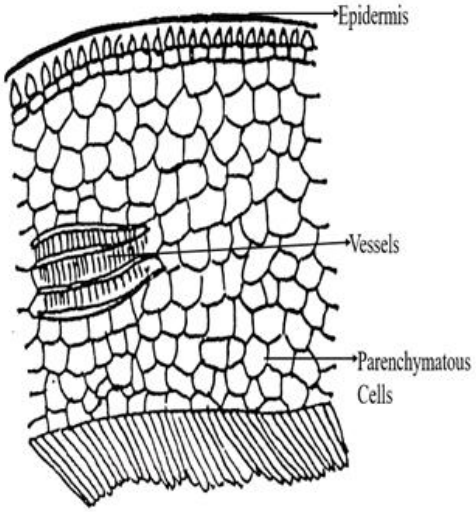

Fig.42: Part of Testa

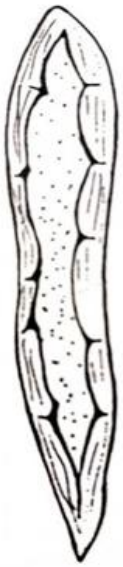

Fig.43: Sclerides

Fig.44: Sclerides in Groups

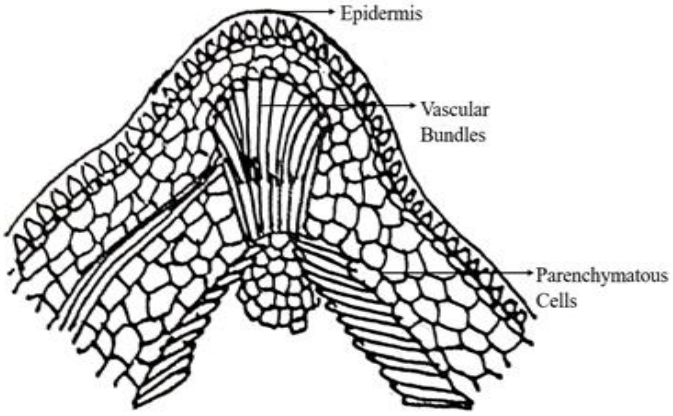

Fig.45: Part of Vascular Bundles

Powder microscopy:

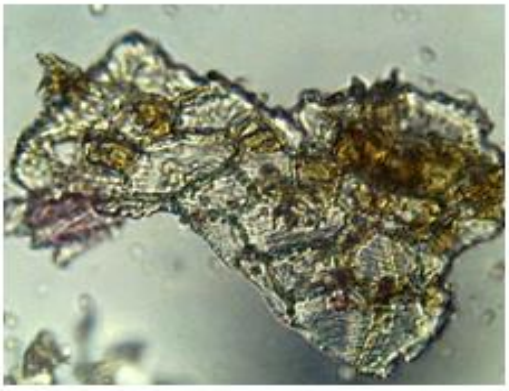

Fig.46: Epidermis is surface view, showing Stomata (Stomata on Lower & Upper Epidermis)

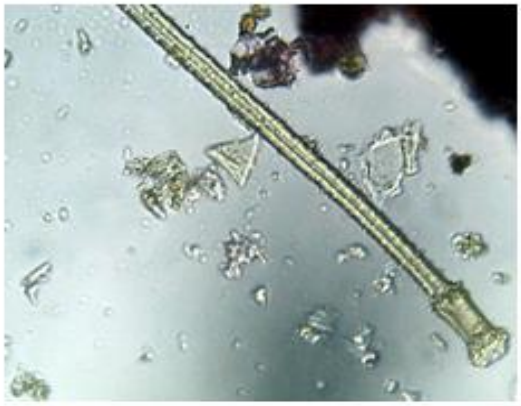

Fig.47: Fibers in L. S.

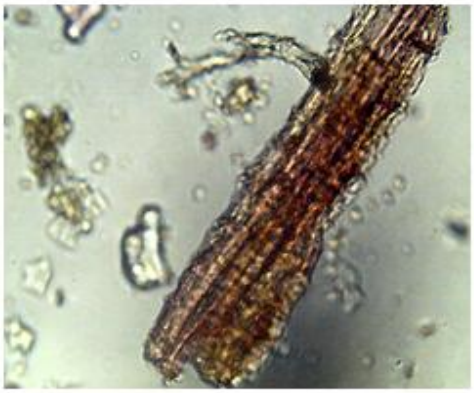

Fig.48: Fibrovascular tissues in L. S. View

Fig.49:Vessels (pitted) in L.S.

Fig.50: Filled vessels & covering Trichomes with curved Apex

Fig.51: L.S. Of Fibers

Fig.54: Groups Of Vessels

Fig.55: Fibers

Fig.56: Fragments Of Fibers in L.S. View

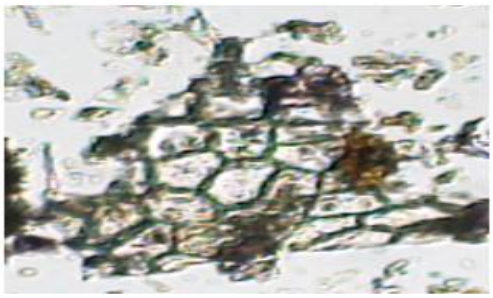

Fig.57: Epidermis in Surface View

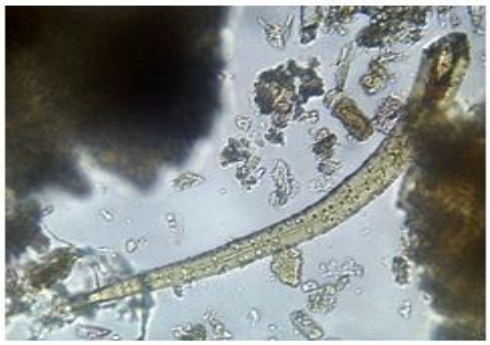

Fig.58: Trichomes (Hollow) with curved surface

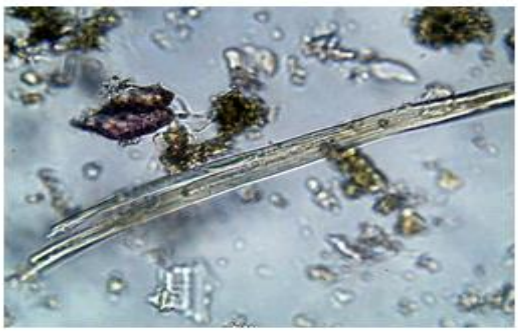

Fig.59: Sectional view of Trichomes & Fibrovascular tissue

Fig.60: Parenchymatous cells, Fibers

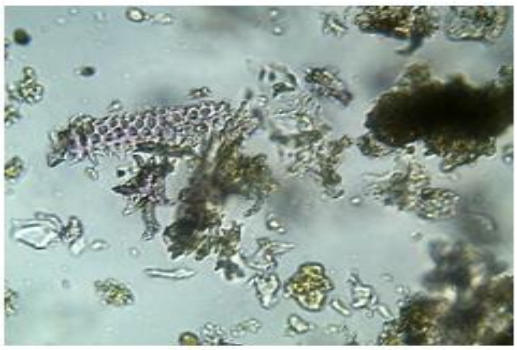

Fig.61:Vessels (Pitted)

Fig.62: Pitted Vessels in L.S. View

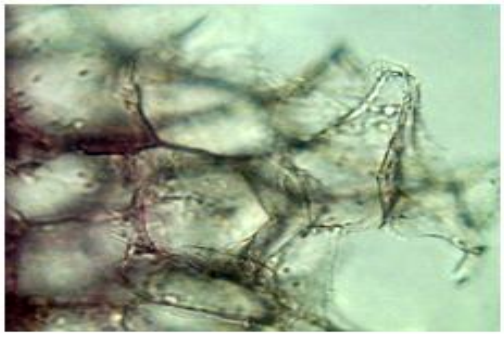

Fig.63: Sclerides cells in sectional view

Fig.64: Fibrovascular tissue stained with HCL, Phloroglucinol

Fig.65: Fragments of Fibers & Tissues of Parenchymatous cells

Fig.66: Trichomes & Parenchymatous Cells

CONCLUSION

This investigation gives the logical information to the best possible distinguishing proof and foundation of guidelines of Uraria picta plant. As there is no announced proof on the pharmacognostic assessment of the plant. This will be a monograph for distinguishing proof of plant by morphological and microscopical assessment. The dried leaves are green, harsh in surface, somewhat aromaticsweet-smelling with disagreeable odour and attributes characteristic taste. Microscopically, the important identification characters are curved shaped covering trichomes called as stellate hairs present on both the epidermis, the stem was green in nature with covering trichomes. Roots were buffed colored, sweet-aromatic in odour, tasteless. Pod (fruit) has three to six joints. Fruit was dark grey in color, seed light earthy colored. Leaflets are Linear to elongated or lanceolate, 3-10 × 2-3 cm, upper ones 6-24 × 0.5- 2.5 cm. T.S of Leaf is dorsiventral, covered with cuticle, paracytic Stomata. Two layers of lengthened palisade cells are available underneath the upper epidermis followed by 3-5 layers of spongy parenchyma cells. Leaf bears unicellular covering trichomes inexhaustible on the lower epidermis with bended zenith. Midrib area shows collenchyma cells on both the sides underneath the epidermis. Midrib locale shows patches of sclerenchyma cells. Vascular bundles are seen dissipated. Leaf comprise Calcium oxalate crystals (Prismatic and Rhombohedral Crystals) beneath the vascular packs or bundles. The tap root, light yellow to grayish buff 10-30 cm long and 0.3-1.2 cm in breadth intense and woody, and when dry bear fine longitudinal striations, the wood is covered with bark at maturity. The root is with plug or cork, comprise of 5-6 layers of flimsy or thin walled lengthened cells, 4-6 layers of

Phelloderm. Prismatic and rhombohedral crystals of Calcium-oxalate are found in a portion of the cells. Wood is made out of vessels, trachieds, strands and parenchyma. Xylem filaments resemble those of phloem fibers or strands. Medullary rays or beams in xylem district are prominent by their bigger size, pitted thickening and spiral extension. Prismatic Calcium-oxalate crystals and starch grains are likewise present. Stem are light yellow to brown, 8.0 to 16.0 cm long, 0.2 to 0.4 cm in measurement, covered with pubescent hair [6], longitudinally wrinkled [7,8] T.S. of stem is round, single layer of epidermis with covering trichomes. 3-5 layer of Collenchyma underlies epidermis. Inside the cortex, sclerenchymatous patches are in a ring followed by vascular bundles or packs. Xylem vessels with spiral and scalar structure thickening are seen, with center Pith cells. The glabrous and grey colour fruit, which contain, 3-5 oval, smooth, light earthy colored seeds with 2.0 x 1.0 mm in dimension and weighing about 0.3 mg each. [5] T. S. of Fruit is oval, microscopically it shows the outermost layer, epidermis, it is highest point of Testa and vessels, parenchymatous cells abundant in the center, vascular bundles or groups, Seed coat or testa, Cotyledons, Hilum, Endosperm cells are in middle, sclerides and are in bunches too. Microscopic perception of U. picta leaves powder shows the diverse cell segments i.e., Trichomes, Stomata, Calcium oxalate crystals, Vessels, Starch Grains, Sclerides, Epidermis, Fibers, Parenchymatous cells, Fragments of fibers or strands when stained and observed under the high-power objectives. The plant shows assortment of morphological and anatomical characters, which is useful in the recognizable proof of the authentication of herbs and checking the adulteration and substitution with the other species. As one of the drugs of Dashmoola, this can be standardization methods for the identity of authenticity of the herbs used.

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