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PHYSICOCHEMICAL ANALYSIS OF CHANGERI [OXALIS CORNICULATA. LINN] WHOLE PLANT

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ABSTRACT

Oxalis corniculata, Linn, Family- Oxalidaceae is an a common garden weed found throughout india. This plant species is well known for having potential in traditional medicine practices for the traeatment of variety of diseases like grahani, atisar, kushta, arsha, gudabransha. An establishment of pharmacognostical standard on identification, purity, quality and classification of herbal plant is required. Microscopic characteristics were observed under a light microscope. Physicochemical properties including loss on drying, total ash value, acid insoluble ash, water soluble and alcohol soluble extractive were determined. The microscopic characteristics show the single layered epidermis composed with rectangular cells, vascular bundles consisted few elements of xylem and phloem, unicellular covering trichomes, pith composed of parenchtmatous cells, round to oval starch grains. These findings will be useful towards establishing pharmacognostic standards o n identification, purity, quality and classification of the plant drug research.

KEYWORDS:- Changeri, Oxalis corniculata, Physicochemical investigation, Pharmacognostic standardization.

INTRODUCTION

Oxalis corniculata linn, oxalidaceae family known as ambuti in Marathi. This is a common garden weed found throughout india.[1] Changeri is described in brihat trayi among the

vegetable category. Changeri possesses amla Kashaya rasa, laghu ruksha guna, ushna virya & amla vipaka as therapeutic properties.[2]

It is used in diseases like grahani, atisar, kushta, arsha, gudabransha etc. chraka and sushruta have highlighted its utility in grahani and arsha.[3]

Changeri is a good source of vit. C and carrotine. they are rich in calcium and potassium oxalate, citric and tartaric acid.[4]

Botanical name: oxalis corniculata

Family- oxalidaceae

Vernacular names- Hindi- *tinpatiya, changeri,* Telugu - *pulichitta,* gujarati- *amboti,* Marathi-aambati, ambuti, bhuisarpati, Kannada- *sibargi, English - Indian sorrel*

Synonyms - changeri, chukrika, dantashatha, ambashtha, amlalonika, ashmantaka, shafari, kushali, amlapatraka.

Vedic text quoted it as a kaphavathar, dipaniya, grahi, ruchikar and agnivardhak.

Classical catagerization[5]

It is included in following *gana and varga*

Charaka Samhita - shakavarga

Sushruta Samhita - shakavarga

Vagbhata samhita - shakavarga

Kaidev Nighantu[6] - Aushadhi varga

Bhavprakash Nighantu[7]- Shak varga

Nighantu Adarsh[8] - Changeriyadi varga

Madanpal Nighantu[9] - shak varga

Shodhal Nighantu[10] - Amradi varga

Changeri is an appressed pubescent, diffuse, perinial crepping herb. Leaves palmatly *Samhita* 3foliolate, long petioled, stipulate leaflets. flowers are yellow born in 2-8 flowered umbelliform in florescence. Fruit sub cylindric, 5 angles capsules, seeds numerous transversely ribbed darked. Distribution throughout india.

MATERIALS AND METHODS

Collection of plant material- sample of oxalis corniculata were collected from departmental medicinal plant garden of shri ayurvedic mahavidyalaya, Nagpur of Maharashtra. Plant

material that is whole plant were dried in shed and ground to a coarse powder.

Physicochemical study[11]

The physicochemical standards help in assessment of crude drug. These are rarely constant, but helps in evaluation of drug. Quality of the drug can be assessed with this analysis and thus biochemical variations, adulterations, substitutions, effect of storage/treatment occurring in it can be tested. The moisture content / loss on drying, ash value, acid insoluble ash, water soluble ash, acid insoluble ash, water soluble extractive, alcohol soluble extractive and pH of the powdered sample were determined by the method as described in WHO guidelines.[12] Results are tabulated in table no. 1.

Evaluation of the dried powder Oxalis corniculata whole plant.

Table no. 1

Evaluation parameter	Whole plant value (%w/w)
Loss on drying	6.24
Total ash value	11.45
Acid insoluble ash	1.91
Alcohol soluble extractive	23.39
Water soluble extractive	24.43
pH	5.1

Pharmacognostic study

Pharmacognostic means to acquire the knowledge of the drug. It also be defined as a branch of bioscience which treats in detail medicinal or related product of crude or primary type obtain from plants, animals, mineral origins. It includes microscopic and macroscopic study

Macroscopic study[13]

It helps to evaluation of drug by colour, taste, size, shape and special features like touch, texture etc. It is a technique of qualitative evaluation based on the studyof morphological and sensory profile of whole drug.

Changeri plant is low growing creeping weed often found in gardens, waste lands, hedges and roadsides. Branches of changeri plant is lie on the ground and starts rooting to form new plant.

Root are dark brownish, thin, about 1-2 mm thick, branched, rough, soft; odourless & tasteless.

Stem is creeping, brownish-red, soft, very thin, easily breakable;. odourless & tasteless.

Leaf is palmately compound, trifoliate; petiole-green, thin, about 3-9 cm long, cylindrical, pubescent & leaflets are green, 1-2 cm long, obcordate, glabrous, sessile or sub sessile, base cuneate; taste somewhat sour.

Flowers are yellow, axillary, sub-umbellate.

Fruits are capsules cylindrical, tomentose.

Seed is tiny, browinsh, numerous, broadly ovoid transversely striate.

Taxonomic position

Kingdom	*Plantae*
Division	*Magnoliophyta*
Class	*Magnoliospida*
Order	*Oxalidales*
Family	*Oxalidaceae*
Genus	*Oxalis*
Species	*O. corniculata*

Microscopic study

This method allows more detailed examination of the drug and it can be used to identify the organized drug by their known histological characters. It is mostly used for qualitative evaluation of organised crude drug in entire and powdered form.

Root - The cortex is a broad zone made up of rectangular and oval, thin-walled parenchymatous cells filled with simple starch grains, yellowish colour, and tannin. The root exhibits three to four layers of cork made up of cells with thin walls and a brownish appearance. Rectangular and polygonal inner cortical cells that are smaller than mitre cells; narrow strips of phloem made up of sieve tubes, companion cells, and phloem parenchy ma, followed by the cortex, with no discernible cambium; The xylem is made up of vessels, tracheids, fibres, and xylem parenchyma. The vessels are cylindrical, some of which have a tail-like extension at one end, and the tracheids are pitted with pointy ends with few starch grains present interspersed throughout the area.

Stem - Transverse section of stem displays a single layer of epidermis made up of cells that range in shape from rectangular to oval and some of which are extended to form trichomes that cover the cells. The cortex is made up of 4-5 layers of thin-walled, circular, and polyhedral parenchymatous cells. The endodermis is a single layer, layered with thin-walled rectangular cells; the pericycle is made up of two or three layers of square and polygonal sclerenchymatous cells; there are 6-7 vascular bundles arranged in a ring; the xylem is made

up of pitted vessels, tracheids, fibres, and xylem parenchyma; the pith occupies the central region and is made up of thin-walled parenchymatous cells; gular to oval cells, some of which are elongated to become unicellular covering trichomes; cortex consists of 4-5 layers of thin-walled, circular and polyhedral parenchymatous cells.

Leaf - The form of the leaf's petiole is rounded, with a single layer of thin-walled cells in the epidermis that are rectangular or circular; the cortex is made up of three to four layers of parenchymatous cells that are typically packed with green pigment. Endodermis is single-layered, followed by 2-3 layers of sclerenchymatous pericycle that are less developed on the upper side of the petiole. There are five vascular bundles arranged in a ring, with the centre occupied by a small pith, and a few plain, round to oval starch grains that are scattered throughout.

Lamina - Shows single layered epidermis on upper and lower surfaces, composed of rectangular cells; covering trichomes unicellular; palisade single layered composed of thin-walled, columnar cells, filled with green pigment; below palisade 2-3 layers of thin walled, spongy parenchyma consisting of circular to oval cells filled with green pigment.

Powder study - Greenish-brown; shows fragments of trichomes, parenchymatous, sclerenchymatous cells, fibres, epidermis showing irregular cell walls in surface view; a few simple, rounded to oval starch grains, scattered throughout the region.

RESULT AND DISCUSSION

Cross-section of different parts of Oxalis corniculata plant and powder form of whole plant had shown the presence of trichome, epidermis, phloem, xylem and parenchyma with pith in the whole plant.

The quantitative determinations of some pharmacognostic parameters are useful for setting standards for crude drugs. The physical constant evaluation is an important parameter in detecting adulteration or improper handling of the drug. Various ash values are important to determine the purity of the drug, i.e the presence or absence of foreign inorganic matter.

Since the plant *oxalis corniculata is useful in ayurvedic system of medicine for the treatment of the various ailments. It is important to standardize it for use as a drug.*

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