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Physicochemical analysis of*patha* [*cissampelospareira*, *linn*.] Stem

Gote Pallavi Vinayak*[1], Landge Surekha T[2], Minakshi Jadhao[3]

1. M.D. 3rd year (Dravyaguna), Shri Ayurvedic Mahavidyalaya, Nagpur, Maharashtra, India
2. M.D. (Dravyaguna), Assistant Professor and HOD (dravyaguna), Shri Ayurvedic Mahavidyalaya, Nagpur, Maharashtra, India.
3. M. pharm, Pharmacologist.

***Corresponding Author**- pallavigote535@gmail.com

ABSTRACT

Cissampelos pareira, Linn, Family- menispermaceae is perennial climbing herbs with small greenish -yellow flower.It belongs to genus cissampelos, of which 30-40 species are distributed in the tropical and subtropical world. One species occur in IndiaThree plants cissampelos pareira, cyclea peltate and stephania japonica are being used as source of *patha*.Therefore, 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 wavy epidermis with unicellular trichomes, lignified xylem, vessels, biseriate radial medullary rays had also been found. These findings will be useful towards establishing pharmacognostic standards on identification, purity, quality and classification of the plant drug research.

Keywords- *Patha*, *Cissampelospareira*, physicochemical investigation, pharmacognostic standardization.

INTRODUCTION:

Cissampelos pareira, a well-known medicinal climber plant of menispermeceaefamily, has been extensively used in the traditional medicinal system. Since the ancient times for the treatment of numerous diseases such as ulcer, wounds, rheumatism, fever, asthma, cholera, diarrhea, inflammation, snakebite, malaria, rabies[1] and also recommended

for blood purification as used in skin diseases[2].Tribal people in India use the plant to prevent pregnancy[3].

Botanical name – cissampelospareira linn.

Family- menispermaceae

Vernacular names- Hindi- *padhi, padha.* Tamil- *appatta,* gujarati- *venivel,* Marathi- *padavela*, Telugu- *chiruboddi*, Kannada-*padavali,*

Synonyms- *ambastha, papacelika, varatikta, kucelika, ekasthila, devajuta,* and *sahasvat*

Vedic text quoted it as *viryavati, vishagna, rakshoghana, medhya, kamya, kamala,* and *garbhasthapana, Rugveda*delineats it as *vasikarana*. In Atharvaveda it is utilized for improving the IQ and conquering the opponent during the debate.

Classical catagerization[4]

It is included in following *gana*

Charaka- sandhaniya, jwarahara, stanyashodhana.

Sushruta- mustadi, aragvadhadi, pippalyadi, ambasthadi, bruhatyadi, patoladi.

Vagbhata- mustadi, aragvadhadi, ambasthadi, patoladi, vatsatadi.

Cissampelos pareira,Linn it is a climbing shrub; branches are pubescent.Leaves are peltate, 3.8-10cm diameter. Flowers are minute, yellowish and male flowers in the axillary cymes.Peduncle 18mm long, sepals 4 and hairy,obovate-oblong. Petals combined into a cyathiform corolla, half the length of the sepals.Filament are longer than corolla. Female flowers are elongate, solitary or twin, axillary racemes. Pedicles very short; bracts foliaceous or nearly sessile, orbicular or reniform.Sepal 1, obvate-oblong.Petal 1, subround. Fruits are drupe, subglobose, hairy, red, endocarp transeversely ridge.Distribution- Found throughout tropical and subtropical India[5].

Materials and methods

Collection of plant material- sample of *cissampelosepareira* were collected from departmental garden of shri ayurvedic mahavidyalay Nagpur of Maharashtra. Plant material stem were dried in shed and ground to a coarse powder.

Physicochemical study[6]

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.[7]Results are tabulated in table no. 1

Evaluation of the dried powder Cissampelos pareira stem.

Evaluation parameters	Stem value (%w/w)
Moisture content	10.01
Total ash value	9.95

Water soluble ash value	5.34
Acid insoluble ash value	1.86
Alcohol soluble extractive value	8.09
Water soluble extractive value	0.67
pH	6.4

[Table No- 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[8]

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 study of morphological and sensory profile of whole drug.

Plant is common in orchards, hedges, parks and gardens of moist soil either creeping or twining around other plants, also common on the hilly tracts along water courses. C.pareira is perennial climbing shrub with small greenish-yellow flowers, peltate or orbicular, reniform, ovate, subreniform leaves with truncated, cordate base, glabrous or hairy above up to 2-3cm long. Flowers are unisexual, the pedicle is upto 2mm long. Male flowers are with 4-5 sepals ovate to abovate, c.1.5 ×c.0.5mm keeled, hairy,outside, greenish or yellowish, corolla cup shaped, c.1mm long, filaments of stem are completely fused; female flowers are with one seple c.1.5mm long, one obtriangular to kidney shaped petals c.1.5 ×2mm, ovary is superior, hairy, one celled. Style thick with spreading below stigma. The fruits is short,hairy, orange to red, 5mm long and is curved with style scar near base; stone is with two rows of very prominent tranverse ridge and is one seeded. Seeds are horse-shoe shaped[9]. The embryo is elongated, narrowand is embedded in endosperm. The flowers are pollinated probably by small insects[10]. The stems of field bindweed are slender, vines than run along the ground or climb any available object. Stem length ranges from 1-6feet. They are normaly hairless but can be pubescent. Roots are cylendrical 1-1.5cm in diameter, light brown to yellowish in colour, surface rough and at places rugged due to transverse wrinkles.Cracks and fissures, fracture short and splintery, odour, faint aromatic taste, bitter.

Taxonomic position[11]

Kindom	Plantae
Subkingdom	Tracheobionata
Super division	Spermatophyta
Division	Magnoliophyta
Class	Magnoliopsida
Sub class	Asteridae
Order	Solanales
Family	Menispermaceae
Genus	Cissampelos
Species	Cissampelospariera

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.

The T.S. of young stem: In microscopic view present a circular outline with a smooth and undulated surface. Epidermis is single layer composed of rectangular cells, outer walls of cells are cuticularized. Some of the epidermal cells are provided with long uniseriate, bicellular trichome. A cholenchyma zone consisting of two layers are located beneath the epidermis followed by two to three parenchyamatous layers. Cortex is composed of, thich wall lignified fibers forming a cap arching over vascular strands and a few layers of large, thin wall parenchyma cells enclosing the secondary phloem.

T.S. of mature stem: shows eight vascular bundles arranged in a ring. Adjacent vascular bundles are separated by wide bands of parenchymatous vascular rays. The vascular bundles are collateral, disperedaroud the parenchymatous ground tissues. A strand of thick wallsclerenchyma fibers forms a cap on the outside of each vascular bundles. This sclerenchyma fibers or extraxylary are later join latterly to form a regularly idented ring. The sclerenchyma fibers are about six cells broad in each bundles and contain plenty of starch grains between the secondary phloem and ring of extraxylary fibers, developed a parenchymatous zone composed of 7-8 cells. This large thin wall parenchyma cell in between the cortical sclerenchyma fibers and secondary phloem appears to the characteristic feature of the stem of C. pareira. The parenchyma are polygonal in shape, cells of second rows are comparatively large in size. This parenchyma cells are larger in size than that of the cells of pith and cortical cells and two to three times larger than that of the cells of sclerenchyma fibers. Primary phloem are crushed and collapsed formed tangential bands of arenchyma deposition of compound and simple starch grains and prismatic calcium oxalate crystals in sclerenchyma fibers are a common feature. The calcium oxalate crystals found in secondary phloem cells are comparatively larger in size.

Xylem occupies a small portion of stem. Vessels are mostly circular, solitary in shape; vessels with wide lumen are co-occurred with vessels bearing narrow lumens. Vessel cluster of two was seldom occurred. Xylem vessels with spiral and pitted thickening were observed. Intervessel pitting was found in alternate position.

The rays inmenispermaceae have been interpreted by many as being medullary [12,13].

Result and discussion

Cross-section of Cissampelos pareira stem had shown the presence of trichome, epidermis, phloem, xylem and parenchyma with pith in the stem.

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 *Cissampelospareira* is usefull in traditional medicine for the treatment of various ailments. It is important to standardize it for use as a drug.

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