



PHARMA SCIENCE MONITOR

AN INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES

Journal home page: <http://www.phamasm.com>**PHARMACOGNOSTICAL & PHYTOCHEMICAL EVALUATION OF USHIR (KHAS-KHAS) USED AS SWEDOPNAYANA IN AYURVED**Jagruti Makwana^{1*}, Jignesh Kevalia², Madhavi Patel³, Preeti Pandya⁴.

¹Lecturer, Department of Rasa Shastra and Bhaishajya Kalpana, Indian Institute of Ayurvedic Pharmaceutical Sciences, Gujarat Ayurved University, Jamnagar.

²HOD, Department of Pharmacognosy, Indian Institute of Ayurvedic Pharmaceutical Sciences, Gujarat Ayurved University, Jamnagar.

³Lecturer, Department of Dravyaguna, Indian Institute of Ayurvedic Pharmaceutical Sciences, Gujarat Ayurved University, Jamnagar.

⁴Laboratory Assistant, Department of Pharmacognosy, Institute of Post Graduate Teaching and Research in Ayurveda, Gujarat Ayurved University, Jamnagar.

ABSTRACT

Vetiveria zizanioides. (Linn.) Nash, Syn. *Andropogon squarrosus* Linn.f. belonging to family – Poaceae, commonly known as “Khas-Kash”, a perennial herb with fragranced root, found to contain volatile oil as chief constituent. As per Ayurvedic classical literature it is used and important drug to treat diseases like Varnya, Stanyajanan, Chardinigrahan, Dahaprashaman, Tiktaskandha, Pittasanshaman, Swedopanayan (that substantiate over sweating of body), etc. as it shows the best effect to treat bad odour of sweda (Sweat) and its common use in perfumery industries, it was thought worth to undertake this project work in detail.

The present work was carried to investigate and authenticate the drug by its pharmacognostical study, physico-chemical parameters and because of its fragranced root, quantitative evaluation of volatile oil constituents have also been done.

KEYWORDS: *Vetiveria zizanioides*, Ushir, Khas-Khas, Swedopanayan.

INTRODUCTION

During the last few decades considerable work in the field of natural products of pharmaceutical significance has been done globally. The development of science of Phyto-pharmaceuticals and the hope for remedies in chronic diseases generated a new enthusiasm in the research workers to develop herbal medicines.

Now a day's innovation is necessary in every field and Ayurvedic medicament is very important in today's era of modernization. Here traditional 'Lepa' is converted to spray form without losing its therapeutic efficacy, which is easy to carry and convenient to use. Similar other efforts should be made because continuous innovation and strict adherence to quality will take Ayurvedic medicines to greater lights.

Ayurvedic medicines are undergoing drastic changes in the present era, now a day people accept more elegant and acceptable forms of Ayurvedic products for example to reduce bad odour – herbal deodorant is more widely used.

Ayurved gives prime importance to preventive aspects of disease treatment. Dincharya and Ritucharya that affects individual Doshas, Dhatus and Malas, which are the precautionary measures for maintaining health and prevention of diseases.

Mala is a routine of Dincharya and are the substances or waste matter to be thrown out from the body. They are Purish (Stool), Mutra (Urine) and Sweda (Sweat). By products formed as a result of various physiological activities going on, in the body and their imbalance causes pathology or disease.

From these three forms of Malas, Sweda (Sweat) is a liquid excretion that regulates temperature, if a person is not sweating, or their sweat is toxic or smells then this may be a sign of Ama (indigested food). Human perspiration is largely odourless until it is fermented by bacteria and the area like underarms is among the most consistently warm parts on the surface of the body. When adult armpits are washed with alkaline pH soaps, the skin loses its acid mantle (pH 4.5 – 6), raising the skin pH and disrupting the skin barrier. Bacteria thrive in high pH or base environments, making it more susceptible to develop bacterial colonization which feed on sweat from the apocrine glands and on dead skin and hair cells, releasing 3 – methyl – 2 – hexanoic acid in their waste, which is the primary cause of body odour. There are several plants in Ayurved used as Swedopanayan¹, Daurgandhyahara² to treat body odour or perspiration e.g. Alfa Alfa, Parsley, Rosemary, Ushir, etc.

Amongst this Ushir, botanically known as *Vetiveria zizanioides*^{3,4,5} commonly available drug in India and found almost through out the plains particularly on the river banks and marshy area of our country up to an altitude of 1200m.

As of now, except few of its references^{6,7} no such efforts have been made for its correct authenticity and identity in detail and accurately, in addition to that because of its volatile oil contents and highly fragranced roots there may chances of adulteration of drug specially in perfumery industries. Hence it was thought worth to undertake this research work as mentioned below.

Aims & Objects:

- To evaluate its pharmacognostical characters.
- To detect its physico-chemical parameters.
- To determine its volatile oil constituents.

Drug review

Classical, morphological, microscopical and chemical compilation of *Vetiveria zizanioides* was accomplished referring various text books, research journals, web sites, etc.



Natural habitat of plant

Experimental study**A. Pharmacognostical study**

A detailed macroscopic and microscopic character of the drug was carried out and evaluated genuinely.

B. Physico – chemical analysis:

In this section, the physico – chemical parameters were studied as per the Ayurvedic Pharmacopoeia of India.

C. Determination of volatile oil content:

The volatile oil content of the sample was determined by using Clevenger apparatus as per the method mentioned in Ayurvedic Pharmacopoeia of India.

MATERIALS AND METHODS

The roots of *V. zizanioides* (Linn) were collected from Dishant Ayurvedic suppliers, Gujarat and cut into small pieces and pounded to make coarse powder, then were stored in air tight containers for further use.

The morphological evaluation was done by studying external features of the sample and microscopical examination was carried out by taking transverse sections and observing of powder microscopy. Histochemical tests were also performed to confirm components like starch grains, volatile oil globules and lignifications of cell wall using various reagents.

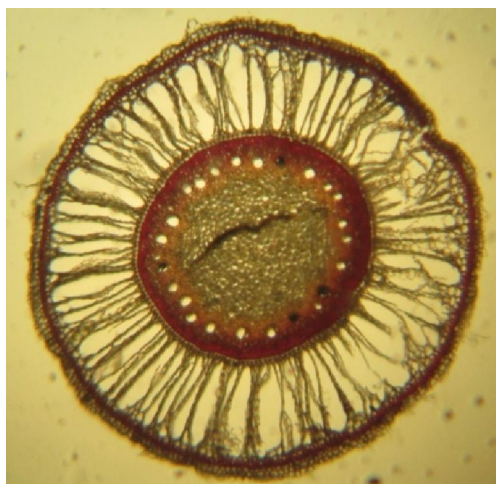
RESULT AND DISCUSSION**Macroscopy**

Roots are fibrous, wiry, long, slender, often attached with stout root stock, measuring up to 2 mm in diameter; surface smooth or longitudinally grooved, colour creamish yellow-light brown with strong aromatic odour and slightly bitter in taste.

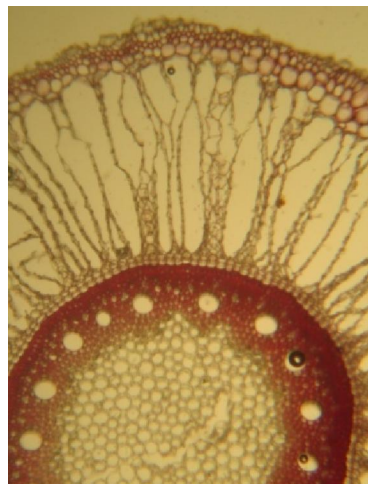


Fibrous root with its stock

Microscopy



Schematic arrangement



Transverse Section

Detailed TS of the root shows outermost oval to rectangular cells of epiblema occasionally bearing with unicellular root hairs, underneath this lies 2 – 3 layered, circular to polygonal, lignified, thick walled exodermis followed by wide cortex characterized by two regions – the outermost zone composed of one to two rows of spherical, compactly arranged cells of parenchyma with pitted thickening and the innermost region is radially elongated, gigantic, lacunated cells, often alternating with fully of halfly splitted column of spherical, parenchyma, their cells being collapsed at places, yellowish brown globular contents scattered as such

throughout the cortex region, below that a layer of endodermis and pericycle is distinct; centrally located pith is made of thin and thick walled cells of parenchyma surrounded by polyarch vascular bundle and sclerieds; simple and compound starch grains scattered throughout the pith region.



Fig. 1

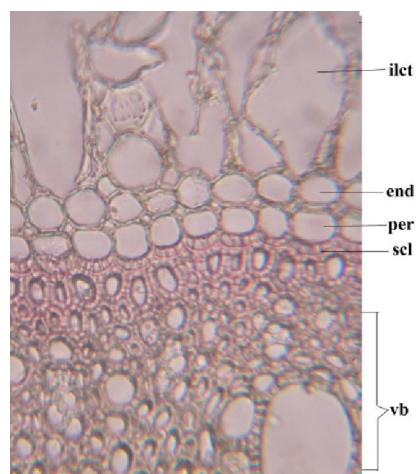


Fig. 2

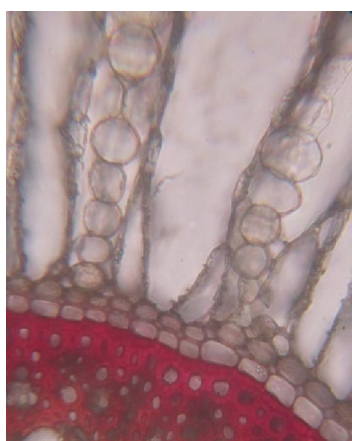


Fig. 3

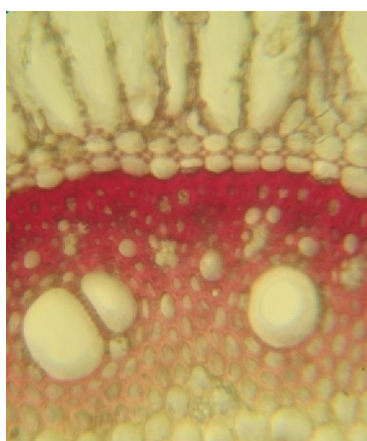


Fig. 4

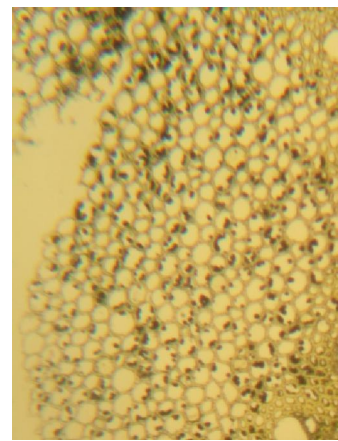


Fig. 5

Fig. 1 epiblema with inner and outer cortex.

Fig. 2 inner cortex, endodermis, pericycle end stelar region.

ilct – inner lacunated cortex

end – endodermis

per – pericycle

scl – sclereid

vb – vascular bundle

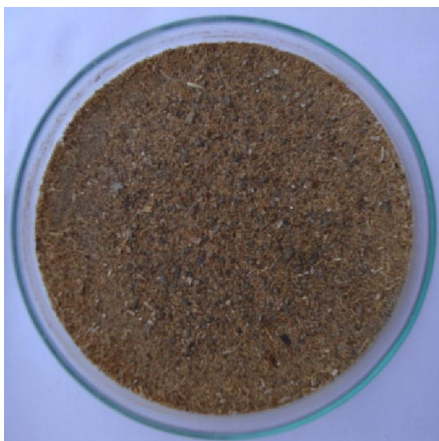
Fig. 3 & 4 enlarge view as shown in figure 2.

Fig. 5 parenchymatous pith embedded with starch grain.

Powder

Light to dark brown, fibrous, strongly aromatic and slightly bitter in taste.

The diagnostic characters of powder shows abundant simple and compound with two to four granules of starch grains scattered as such or embedded in parenchymatous cells; annular, pitted and reticulately thickened vessels; fragments of root hair; thin to thick walled fibres; sclereids of various sizes and shapes; parenchymatous cells containing orange to dark brown globules; fragment of lignified exodermis.



Powder

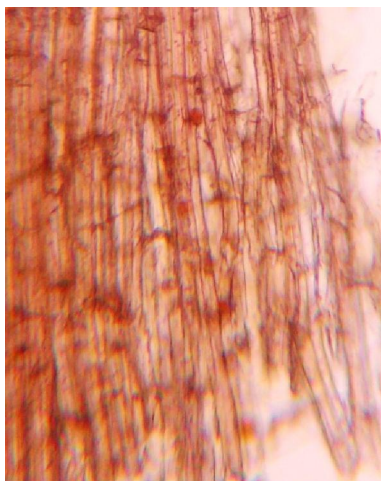


Fig. 1

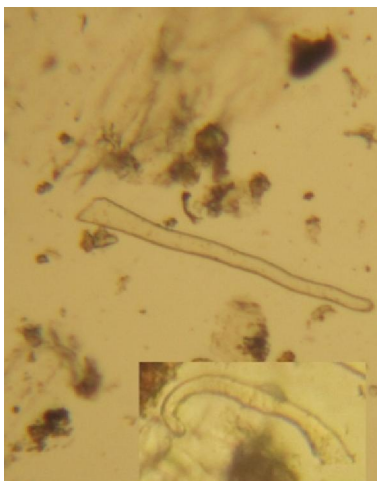


Fig. 2



Fig.3

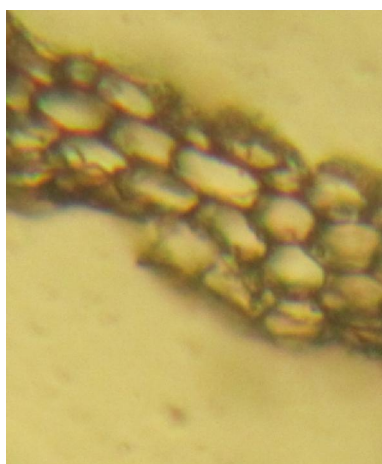


Fig. 4



Fig. 5

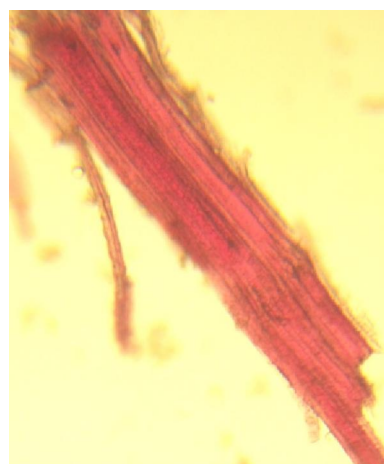


Fig. 6



Fig. 7



Fig. 8

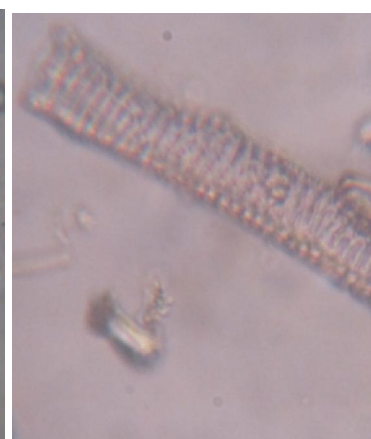


Fig. 9

Fig. 1 fragment of parenchymatous cells containing orange – dark brown globules.

Fig. 2 fragments of root hairs.

Fig. 3 parenchymatous cells containing starch grains.

Fig. 4 fragment of lignified exodermal cells.

Fig. 5 groups of sclereids of various sizes and shapes.

Fig. 6 fragment of groups of fibres.

Fig. 7,8 & 9 vessels with pitted, annular and reticulated thickening.

Physico-chemical Parameters:

Results obtained during physico-chemical study are presented in Table below.

Table No. - 1

Sr.No.	Parameters employed	Result
1	Foreign matter	Nil
2	Loss on drying	1.09 % w/w
3	Total ash	7.83 % w/w
4	Acid-insoluble ash	3.43 % w/w
5	Water Soluble extractive	13.7 % w/w
6	Alcohol soluble extractive	14.8 % w/w
7	Volatile oil content	1.5 % w/v

All the values obtained are within the prescribed limits of quality standards of Indian medicine.

RESULTS AND DISCUSSION

Results obtained by studying drug pharmacognostically, physico – chemical analysis and determination of volatile oil content have been discussed and interpreted in systemic manner with the support of authentic references.

SUMMARY AND DISCUSSION

Finally the observation on drug after studying its various parameters is summarised and concluded accordingly.

CONCLUSION

Roots are wiry, slender, fibrous, light brown in coloured and highly aromatic.

TS shows typical diagnostic characters like epiblema with root hairs and lacunated cells of cortex occasionally alternating with fully or halfly splited, radially arranged, spherical cells of parenchyma. Buff - light brown coloured powder with aromatic odour shows – fragments of root hairs, lignified exodermal cells and parenchyma containing volatile oil globules.

Physico – chemical parameters were also performed to set the standard of drug and quantitative estimation of volatile oil shows value of 1.5 % w/v. As it contains essential oil, it can be used as swedopanayan or as daurgandhyahara to treat bad odour of sweating.

REFERENCES

1. Charak Shamhita, Vaidhya Dayal Parmar, Saraswati Pustak Bhandar, 2003-04, 1st Edition, P. No. 49.
2. Dravyaguna Vijnana – Part III , Dr. Gyanendra Pandey, Krishnadas Academy, Varanasi, 1st Edition, 2001, P. No. 740-745.

-
3. G L Shah, Flora of Gujarat – Part II, 1978, 1st Edition, Sardar Patel University, P.No. 882.
 4. Forest Flora of Bombay Presidency and Sind, W.A.Talbots, 1976, Vol – II, M S Bishen Singh Mahendra Pal Singh, Dehradun, P.No. 991.
 5. R.N. Chopra, S. L.Nayar, I.C. Chopra, Glossary of Indian Medicinal Plants, 1956, 1st Edition, National Institute of Science Communication P. No. 254.
 6. Quality Standard of Indian Medicinal Plants, Indian Council of Medical Research, New Delhi, 2006, Vol.-4, P. No. 251-261.
 7. The Ayurvedic Pharmacopoeia of India Part-I, 1st edition, Vol. –III, Government of India Ministry of Health and Family Welfare Department of ISM & H, P.No. 220-221.

For Correspondence

Jagruti Makwana

Email: jagrutimakwana09@gmail.com