

An Overview on Microscopic, Pharmacological Activities and Uses of Vetiveria Zizanioides

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ABSTRACT

Vetiveria zizanioides belongs to Poaceae circle of relatives. It's far widely known plant from south India and extensively allotted in India, Burma, Ceylon, and spread from Southwest Asia to tropical Africa. Vetiveria zizanioides is usually referred to as khas-khas, khus, vetiver, Vala in exclusive languages. Root of Vetiveria zizanioides have been counseled within the Indian machine of drugs for some of diseases. These consists of as decoction in excessive fever, and irritation, as paste in diarrhea, chronic dysentery and in Ayurvedic arrangements and as juice as anthelmintic. This plant turned into screened pharmacologically for antibacterial, antifungal, anticataleptic, analgesic and anti-inflammatory, antirheumatic, antioxidant and anti-arthritic interest. This may be creating helpfulness closer to this medicinal plant and for instruction of various Ayurvedic formula with more healing and financial attention in remedy of numerous sicknesses.

Keywords: Herbal, Decoction and potent pharmacological properties.

I. INTRODUCTION

The oldest known form of health care in the future of humanity is herbal medicine. Herbs were used throughout history by all cultures. It was an essential component of modern civilization's growth. Plants provided food, clothing and medicine. A great deal of the herb medicinal use for wild animal observations and experiments and errors.¹ There have been several natural medicines frequently used nowadays. Roughly 25 percent of the prescription medicines delivered in the United State. include at least one herbal active component. Some are manufactured from herbal extracts, and others are synthetic to imitate a natural herbal substance.² About 70–80 percent of the world's population depends on it, and demand in developing nations, where drug costs and medical prices are above the limits of the majority, is growing every day. The anti-inflammatory medicines are used to relieve pain, including

arthritis, muscle and ligament discomfort, in different diseases. The efficacy of conventional pharmacological therapies in the supervision of the incidence and outcomes of numerous inflammatory disorders is limited. They also have a considerable number of patient side effects and found Nonconventional medicine in their primary health care, largely from herbal sources.³

PLANT DESCRIPTION

Khus, khas or khu grass is similarly known as Vetiveria zizanioides (Poaceae). The Vetivergrass is sociable and grows in groups, while the ecologically friendly grass is⁴. It has long, thin and stiff leaves and thick tufted grass, which reaches up to 1.5 metres high. The oil generated through its roots was grown for longer, as was the plant's capacity for soil retention and erosion.⁵ The herb is well recognized for its medicinal and fragrance-based oil. It is located in the plains and the lower mountains of India and in particular on the riverside, in rich areas of the land. It has sturdy, thick and flavorful roots, with narrow, upright, shrubby keeled with scabrid edges; KhasKhas is also used to chill, taste sharbat and make mattresses, hand fans, etc. Also reported is the antioxidant property. The roots remain frozen, febrifugal, diaphoretic, gastrointestinal and immunological.⁶



Fig1. Vetiveria zizanioides Plant

TAXONOMICAL POSITION OF VETIVERIA ZIZANIOIDE

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Monocots

Clade: Commelinids

Order: Poales

Family: Poaceae

Subfamily: Panicoideae

Genus: Chrysopogon

Species: *C. zizanioides*

Popular Name(s): KhasKhas, Cuscus and Vetiver

Parts Used: Roots and Essential oil

Habitat: In India, it is grown in the plains and low hills.⁷

MICROSCOPIC CHARACTER- T.S OF ROOT

The transverse section is circular in outline. Angular collenchymatous tissues are present below 3-4 layered epidermis. Aerenchyma (air spaces) is present and surrounded by the parenchymatous cells. Endodermis and xylem vessels are also present. Callose plugs inside the sieve tubes appear dark blue in colour due to staining with aniline blue. Pith is present at the centre, and pith cells are parenchymatous.⁸

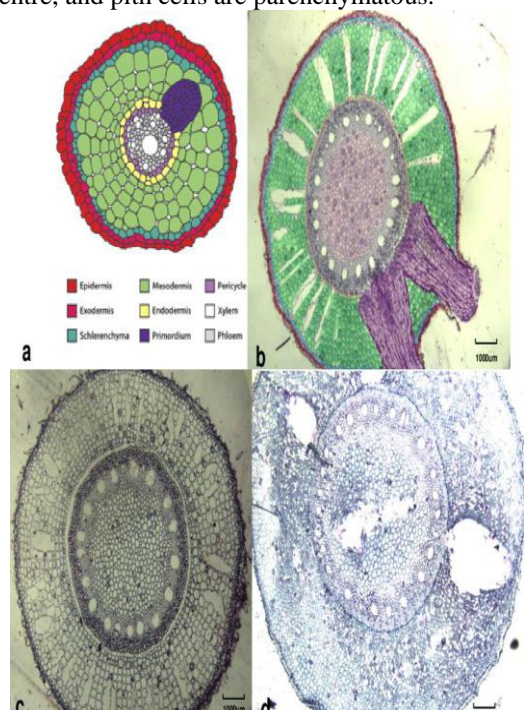


FIG 2: Diagram shows microscopic characters of roots

PHARMACOLOGICAL USAGE VETIVERIA ZIZANIOIDES

It has the following properties:

- Its roots are aromatic in nature.
- It has antifungal properties.
- It provides cooling in summers.
- It also used as diaphoretic, haemostatic, expectorant, diuretic, stimulant, hysterical, insomnia, skin disorders.⁹
- It also used in the treatment of asthma, amenorrhoea, antispasmodic, kidney difficulties, gall stones, mosquito repel etc.¹⁰

PHARMACOLOGICAL ACTIVITIES

Antioxidant Activity

Antioxidant activity had been demonstrated for Vetiver root essential oil. Recently, Vetiver oil has been exposed to take antioxidant properties.¹¹ It was attributed to -vetinine, -vetinone, and vetinone. These compounds have been secluded by using many different analytical methods such as silica gel open column chromatography, HPLC, GC, in addition to mass spectrometry. Vetiveriazizanioides is an excellent plant for reclaiming metalliferous mining wastelands. Outstanding to the fact that the occurrence of Pb and Zn significantly increased the activity of superoxide dismutase (SOD), Glutathione peroxidase, and catalase, numerous detoxification processes occur in diverse sections of the plant for active oxygen species¹². These findings suggest that Vetiver oil and certain of its constituents may be useful as natural antioxidants in their own right.

Antibacterial Activity

Microorganisms are an incredibly varied collection of living organisms that fall into numerous separate classifications. Bacteria are prokaryotic bacteria (do not include chlorophyll)¹³. Except for species classed as complex bacteria (Actinomycetales), they are unicellular and lack true branching¹⁴. To cure chronic and infectious illnesses, traditional medicine plants include a diverse array of active ingredients. Numerous plant leaves that have antimicrobial chemicals, including tannins, essential oils, and other aromatic components. *Escherichia coli* NCIM 2118; *Bacillus subtilis* NCIM 2063; *Porphyromonas aerogenosa* NCIM 2036; and *Staphylococcus aureus* NCIM 2079 were employed as test organisms.¹⁵

Vetiveriazizanioides (Vetiver)

Antibacterial activity against microorganisms was investigated on *Staphylococcus aureus*,

Streptococcus pyogenes, *E. coli*, and *Corynebacterium* sp. In the purest form and with 1:10, 1:100, 1:1000, and 1:10000 dimethyl sulphoxide diluted, the amount of verified oil was more than two other *S. aureus* oils; inhibition by pure oil was between 60-70% of penicillin or streptomycin. The greater inhibitory effective action against *M. smegmatis* and *E. coli* bacteria that are resistant to the drug, strains related with KS-1 is *Vetiveria zizanioides*¹⁶

Antifungal Activity

Organisms as test subjects have been utilised like *Niger*, *clavatus Aspergillus* and *Albicans Candida*. All stock cultures were obtained from Karpagam University's Department of Microbiology in Coimbatore, India.

Antitubercular Activity

Using the radiometric BACTEC 460 TB system, fractions and extracts have been tested for antibacterial action with strains H(37)Rv and H(37)Ra of *Mycobacterium TB*. The integral and wasted root ethanolic extract exhibited strong antituberculosis action at a minimal concentration of 500µg/ml.

Antimicrobial Activity

At 1000g/ml, it exhibits high antibiotic effectiveness against the organisms of *Staphylococci*, *E. coli*, and *Bacillus subtilis* included. *Vetiveria zizanioides* has historically been used to delicacy a variety of bacterial and fungal infections¹⁷

Purpose of Free Radical Scavenging Activity

The antioxidant action of the *Vetiveria* root and ethanol and ethyl acetate extracts, investigated by 1,1- Picryl-2 Hydrazyl, for their free In-Vitro radical scavenging activity. The extracts exhibited substantial dose-dependent scavenging action against free radicals. *Vetiveria zizanioides* root extract possesses a reducing property, indicating that it is accomplished of donating hydrogen atoms in a dose-dependent way.¹⁸

Anti-Arthritic Activity

Anti-arthritis activity was progressively extracted from *Vetiveria zizanioides* with 200mg/kg root extract dosage using oil ether, ethyl acetate, chloroform, methanol utilising maceration soxhlet and distilled water. Each extract was then exposed using Freund's adjuvant arthritis model for

preliminary phytochemical research, acute toxicity tests and pharmacological studies for anti-arthritis. The whole study shows that several *Vetiveria zizanioides* extracts can be utilized as an anti-arthritic medicament¹⁹

Antiseptic

It used to cure acne, cuts and dry skin.¹⁹

Antispasmodic

It used in Muscles pain and spasm.

Rubefacient

Blood flow to sore muscles.

Circulatory Tonic

It revitalised by fortifying red blood cells.¹⁹

Fixative

Soap, Cosmetic, Perfume.

USES OF VETIVERIA ZIZANIOIDES AS MEDICINAL PLANT

It is widely used in fragrances and cosmetics as well as for fragrant soaps. It is best mixed with sandalwood, patchouli and rose oils. Leaf decoction is suggested as diaphoretic. It is an excellent embrocation and gives relief if administered topically in rheumatism, lumbago and sprain.²⁰ The herb is used in the state of Madhya Pradesh in youngsters as an anthelmintic. As a carminative, the oil is supposed to be useful for flatulence, colic, and determined vomiting. Well-thought-out as a stimulant, refrigerant and antibacterial, it removes the surplus body heat and provides a cooling effect on the outside. A diaphoretic infusion of the leaves is recommended.²¹

II. CONCLUSION

The above composed information concerning the microscopic character, pharmacological activities and uses of *Vetiveria zizanioides* is matched with existing literature. In the present scenario, ethno-botanical and traditional procedures of natural compounds, especially of plant derivation received much attention as they are well tested for their efficacy and generally believed to be safe for human use. It is best classical approach in the search of new molecules for management of several diseases. Researchers are exploring the therapeutic latent of this plant as it has more therapeutic properties which are not known

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