

**VETIVERIA ZIZANIOIDES (LINN.) NASH: A PHARMACOLOGICAL OVERVIEW**

Bharat Bhushan*, Sharma Satish Kumar, Singh Tanuja, Singh Lalit, Arya Hema
Department of Pharmacology, Sunder Deep Pharmacy College, Ghaziabad, UP, India

*Corresponding Author Email: bharatarya12@yahoo.co.in

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ABSTRACT

Vetiveria zizanioides is belonging to Poaceae family. It is well known plant from south India and widely distributed in India, Burma, Ceylon, and spread from Southwest Asia to tropical Africa. *Vetiveria zizanioides* is commonly known as khas - khas, khus, vetiver, Vala in different languages. Root of *Vetiveria zizanioides* have been suggested in the Indian system of medicine for a number of diseases. These includes as decoction in high fever, inflammation and sexual disorder, as paste in diarrhea, chronic dysentery and in Ayurvedic preparations and as juice in anthelmintic. This plant was screened pharmacologically for antibacterial, antifungal, anticataleptic, analgesic and anti-inflammatory, Rheumatism, anti oxidant and anti arthritic activity. This will be creating helpfulness towards this medicinal plant and for preparation of different Ayurvedic formulation with more therapeutic and economic consideration in treatment of various diseases.

Keywords: Herbal, essential oil, potent pharmacological properties.

INTRODUCTION

Vetiveria zizanioides (L.) Nash belonging to the family Poaceae also commonly known as Khas-Khas or khus grass; is native to India. Vetiver has been known to India since ancient times. It is well known plant from South India and widely distributed in India, Burma, Ceylon, Bangladesh and spread from Southwest Asia to tropical Africa. Today the plant is cultivated in the North Indian states of Rajasthan, Uttar Pradesh and Punjab and in the South Indian states of Kerala, Tamil Nadu. The vetiver grass has a gregarious habit and grows in bunches. It is a densely tufted grass, with long, thin and rigid leaves and can grow up to 1.5 meters high¹. It is found throughout the plains and lower hills of India, particularly on the river banks and in rich marshy soil. The plant is different from the other grass forms, in that instead of having mat-like root systems, the plant grows in large clumps from a branched 'spongy' rootstock with erect culms. It has been cultivated longest for the scented oil produced by its roots as well as for the ability of the plant to retain soil and prevent erosion². The roots of some cultivars and ecotypes possess essential oil that has been utilized as fragrant material since ancient times. The plant also contains active ingredients used in traditional medicine and as botanical pesticide. The plant is well known for its oil that is used in medicine and perfumery. Roots are used for preparing Sharbat (sherbet) or soft drink during summer, especially in north India. Along with this, Khas Khas is also used for cooling purposes, flavoring sharbats, and making mats, hand fans etc. The antioxidant property also reported. The roots are having the refrigerant, febrifuge, diaphoretic, stomachic and immunogogue property¹.

Chemical Constituents

The chemical components of the oil obtained from the plant is benzoic acid, furfural, vetivene, vetivenyl vetivenate, terpinen-4-ol, 5-epiprezizane, Khusimene, a-murolene, Khusimone, Calacorene, β -humulene, a-longipinene, d-selinene, d-cadinene, valencene, Calarene, gurgunene, a-amorphene, Epizizanal, 3-epizizanol, Khusimol, Iso-khusimol, Valerenol, β -vetivone, a-vetivone, vetivazulene⁴. *Vetiveria zizanioides* L. is a tall, tufted, perennial, scented

grass, with a straight stem, long narrow leaves and a lacework root system that is abundant, complex and extensive. Since the ancient time, Vetiver grass has been used as a fragrant material and in traditional medicine because its roots contain essential oils that have aromatic and biological properties. *Vetiveria zizanioides* an aromatic plant commonly known as vetiver has been used for various ailments. Ayurvedic literature mentioned that plant is used as digestive, carminative stomachic, constipating, haematinic, expectorant, antispasmodic, antiasthmatic, antigout, anthelmintic, antimicrobial and diuretic. The root (Figure 2) are used for cooling to the brain and also used in treatment of ulcers. In addition to these, the plant is used for anemia, amenorrhea and dysmenorrhea. Vetiver oil posses sedative property and has been traditionally used in aromatherapy for relieving stress, anxiety, nervous tension and insomnia².

Therapeutic Role of Vetiver Oil

The main action of vetiver oil is on the nervous system and it is both sedating and strengthening in effect. It is excellent in the treatment of depression, nervous tension, debility, insomnia and many stress-related diseases and acts as an aphrodisiac where there is a clear connection between impotence or frigidity and stress. It may be used in massage blends and the bath; it has a rather powerful smell but is very pleasant when diluted. It stimulates the circulatory system and makes useful massage oil for elderly or debilitated people with poor circulation. It also helps to stimulate the production of red blood cells and is thus beneficial for anemia. It makes a useful warming and pain-relieving rubbing oil, suitable for deep massage of muscular aches and pains, sprains, stiffness, rheumatism and arthritis. It may be added to sports oil blends and massaged into muscles before and after sports. In skin care, it helps to balance the secretion of sebum. It is also a useful antiseptic and is slightly stringent. It is used in lotions, compresses and baths for the treatment of oily skin, acne and weeping sores¹⁴. Vetiver oil revitalizes the body by fortifying the red blood corpuscles crucial in transporting oxygen to all parts of the system. Increased blood flow could alleviate muscular aches and pains and said to be useful in cases of rheumatism and arthritis¹⁵. Vetiver oil is particularly useful

for jet lag and for grounding and clarity while traveling¹⁶. Vetiver oil is helpful during emotional stressful times and has been used as tonic for women suffering post-menstruation syndrome. In Sri Lanka and India, it is known as “the oil of tranquility”¹⁶. In Ayurveda, vetiver oil reduces ‘Vatha’ and increases ‘Pitta’ and ‘Kapha’. It is valued most for its sedative properties. It is used in massage and in baths to relieve stress, anxiety, nervous tension and insomnia. It is a stimulant and rubefacient, so it can provide relief from arthritis or rheumatism and general muscular aches and pains. It is useful in skin care as an antiseptic, tonic and detoxifier. Vetiver oil also helps to clear acne and because it promotes skin regeneration and strengthens the connective tissue, it assists with wound healing and benefits aging skin¹⁶. Vetiver is used to strengthen the red blood cells and promotes oxygen throughout the body. Vetiver is often used to alleviate the symptoms of rheumatism, arthritis and muscular aches such as muscle pain, sprains and joint and muscle stiffness. It also aids the reproductive system; it is used to promote fertilization of the female egg. Vetiver is also useful for the skin, it can be used to alleviate the inflammation of acne, aids in healing of cuts and it reduces oil in the skin. Vetiver is not toxic and nonirritant; it is great for the skin for sensitive and older skin.

Pesticidal Role of Vetiver Oil

Vetiver oil is known to repel insects; people in India and elsewhere have placed vetiver root among their clothes to keep insects away. It also repels flies and cockroaches and may make a useful ingredient in insect repellents¹⁷. It has been used to repel moths. The two tricyclics quiterpenoids – zizanal and epizizanal – isolated from vetiver oils responsible for insect repelling activity¹⁸. It also has some anti-fungal properties¹⁹.

Potential Use of Vetiver

As Medicinal Plant

In Traditional Medicine

Various tribes use the different parts of vetiver for many of their ailments such as a mouth ulcer, boils, epilepsy, burns, snake bite, scorpion stings, rheumatism, fever, headache, etc. The Santhal tribe of Bihar and West Bengal, India use the

paste of fresh roots for burns, snakebite and scorpion stings; decoction of the roots has been used as tonic for weakness. The Lodhas of West Bengal region uses the root paste for headache, rheumatism and sprain; the stem decoction is used for urinary tract infection. The tribals of Mandla and Bastar of Madhya Pradesh use the leaf juice as anthelmintic. It is also used for boils, burns, epilepsy, fever, scorpion sting, snakebite and mouth sore. Root extract is used for headache and toothache. The tribals of Varanasi, India inhale the root vapor for malarial fever. The root ash is given to patients for acidity by the Oraon Tribe. Likewise, there are many different applications of the plant for different ailments among different ethnic tribes in other parts of India^{2,3}. Local application of leaf paste for rheumatism, lumbago and sprain gives good relief. The dried roots are also used to provide fragrance to linen clothes⁷. Vetiver oil is used as stimulant, diaphoretic and refrigerant⁷.

As Pest Control

Vetiver oil could be utilized as anti-bacterial and anti-fungal agents to combat agricultural pests²⁰. The powdered root, used in sachets, protected Indian muslin from moths and insects¹⁵.

As Aromatic Plant

The bulk of the very sweetly-scent roots are used for cooling purposes and for the extraction of essential oil. A pleasant aroma is released from the Vetiver root dug from the soil and hanged in the shade³. In the hilly regions of Karnataka, India people made use of the roots to prepare refreshing drinking water. Vetiver oil is utilized in perfumery, cosmetics and soaps and for flavoring sherbets⁷. The dried roots are also used to give fragrance to the linen clothes. The root mass of the vetiver plant is used as a blind to cool down the heat of the summer, a common practice in northern India. The blind is woven from the wiry, fibrous root of vetiver. The vetiver blind is continually doused with water throughout the day, turning the very wind that can dehydrate a person walking in the sun, into a scented cooling breeze, which passes through the soaked vetiver blind, releasing a bitter - sweet aroma.



Figure I



Figure II

Table 1: Common Names

Language	Vernacular name ¹³
Tamil	Lamichamver, Vettiver
Kannada	Vettiveeru, Laamanche
Sanskrit	Abhaya, Amrinala
Hindi	Bala, Balah, Bena
Urdu	Khas
Bengali	Khas-Khas
Gujarati	Valo
Marathi	Vala, Khas-Khas.
Punjab	Panni

Table 2: Some Traditional Uses of *Vetiveria zizanioides*

Plant Part	Tribe	Ailments ^{2,3,4}
Root Decoction	Santhals	As Cooling in high fever, Inflammation Sexual disease etc.
Root Paste	Lodhas	Headche, fever, Ayurvedic preparation "Brihat Kasturi", "Bhairava Rasa" for fever, Diarrhea, Chronic dysentery
Root ash	Oraons	Acidity
Root Juice	Tribes of M.P	Anthelmintic
Rot Vapour	Tribes of Varanasi	Malarial Fever
Vetiver oil	Most Tribes	Stimulant, diaphoretic and refrigerant
Leaf Paste	South Indian tribes	Rheumatism and sprain
Root and stem juice	South Indian tribes	Boil, burn, epilepsy, scorpion sting, Snakebite and mouth ulcer

CONCLUSION

The above collected information regarding the uses and pharmacological activities of *Vetiveria zizanioides* is matched with available literature. In the present scenario, ethnobotanical and traditional uses of natural compounds, especially of plant origin 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 various diseases. Thorough screening of literature available on *Vetiveria zizanioides* depicted the fact that it is a popular remedy among the various ethnic groups, Ayurvedic and traditional practitioners for treatment of ailments. Researchers are exploring the therapeutic potential of this plant as it has more therapeutic properties which are not known.

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