REVIEW ON VETIVERIA ZIZANIIOIDES: A MEDICINAL HERB.
*Satya Prakash Singh, Satish Kumar Sharma, Tanuja Singh, Lalit Singh
Sunder Deep Pharmacy College, Ghaziabad, UP, India

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INTRODUCTION:
Vetiveria zizanioides (Linn.) Nash, a member of the family “Poaceae” commonly known as the Khas-Khas, Khas or Khus grass in India, its synonymously known as “Chrysopogon zizanioides” it is a perennial grass with thick fibrous adventitious roots which are aromatic and highly valued. This tufted grass grows throughout the plains of India ascending up to an elevation of 1 200 m. Having wide ecological amplitude, this grass grows in a wide variety of ecological habitats covering all biogeographic provinces of India. No wonder that this is one grass which has been extensively used by almost all the tribes. Vetiveria zizanioides is a densely tufted grass with the culms arising from an aromatic rhizome up to 2m tall; the roots are stout, dense and aromatic; leaves are narrow, erect, keeled with scabrid margins; it is found throughout the plains and lower hills of India, particularly on the riverbanks and in rich marshy soil.

CULTIVATION:
Khas grass grows wild in many states, namely Haryana, Uttar Pradesh, Rajasthan, Gujarat, Bihar, Orissa and Madhya Pradesh and throughout South India. It is systematically cultivated in the North Indian states of Rajasthan, Uttar Pradesh and Punjab and in the South Indian states of Kerala, Tamil Nadu, Karnataka and Andhra Pradesh. The yield from the cultivated crops, however, meets only a very small percentage of the requirements of the country. The bulk of the roots used for cooling purposes and for the extraction of the oil are obtained from the wild.

ABSTRACT
About 80% of the world’s population uses folk medicine in traditional medicine states World Health Organisation. India is one of the richest countries in the world with regard to diversity of medicinal plants. Herbal medicines are very cheap in comparison with the conventional form of medication. They can be found very easily from a local drug store. One of the greatest benefit associated with herbal medicine is the non existence of side effects. The plants are commercial medications used for the treatment of heart disease, high blood pressure, pain, asthma, and other problems. Vetiveria zizanioides widely used as analgesic, anti-inflammatory and antipyretics and other problem. There are many activity have been done in this plant such as antioxidant, antimicrobial. Antibacterial, anthalminitic, Antifungal.and more activity of this plant are unknown.such activity is analgesic and anti inflammatory. The present review article provides an overview on potent pharmacological properties exhibited by this plant.

KEYWORDS: Herbal, vetiveria zizanioides, Khas khas, essential oil, potent pharmacological properties.
CHEMICAL CONSTITUENTS:

The chemical constituents present in the plant are Vetiverol, Vetivone, Khusimone, Khusimol, Vetivene, Khositone, Terpenes, Benzoic acid, Tripene-4-ol, $\beta$-Humulene, Epizizianal, vetivenyl vetivenate, iso khusimol, $\beta$-vetivone, vetivazulene. In the roots, the main component was valencene (30.36%), while in the shoots and leaves, they were 9-octadecenamide (33.50%), 2,6,10,15,19,23-hexamethyl-2,6,10,14,18,22-tetracosahexaene (27.46%), and 1,2-benzendicarboxylic acid, disooctyl ester (18.29%). The results showed that there were many terpenoids in the volatils. In shoot volatiles, there existed 3 monoterpenes, 2 sesquiterpenes and 1 triterpene. Most of the volatiles in roots were sesquiterpenes. (Ying Yong Sheng Tai Xue Bao 2004 Jan;15(1):170-2.)

MEDICINAL USE OF VETIVERIA ZIZANIOIDES:

Various tribes use the different parts of the grass for many of their ailments such as mouth ulcer, fever, boil, epilepsy, burn, snakebite, scorpion sting, rheumatism, fever, headache, etc. Apart from the medicinal uses, the culms along with the panicles form a good broom for sweeping. The culms and leaves are also extensively used by the tribes and villagers for thatching their huts, mud walls, etc. Some tribes (in Kerala) use the mats of the roots and leaves as bed for a cooling effect.

MULTIPLE USES OF KHAS GRASS IN INDIA:

- Traditional medicine
- Roots as water flavouring agent
- Root mats for door, window screens during summer for cooling effect
- For desert coolers in summer in North India
- As eco-friendly soil binders
- Roots for preparing Sharbat (sherbet) or soft drink during summer, especially in North India
- Socio-economic life of the rural population in India
- Dried roots for scenting clothes
- Dried culms as brooms and for thatching
- Pulp of the plant for paper and straw board.

PHARMACOLOGICAL USE OF VETIVERIA ZIZANIOIDES:

The roots are aromatic, antifungal action (Dixit A et al 1984) cooling, antiemetic, diaphoretic, haemostatic, expectorant, diuretic (Chen F et al Dec 2005), stimulant, hysteria, insomnia, skin diseases (Thakur R.S. et al 1989) asthma, amentia, amenorrhoea, antispasmodic, aon...

**TAXONOMICAL POSITION OF VETIVERIA ZIZANIOIDE:**

- **Botanical Name(s):** Vetiveria Zizanoides
- **Family Name:** Poaceae
- **Kingdom:** Plantae (Plants)
- **Subkingdom:** Tracheobionta (Vascular Plants)
- **Superdivision:** Spermatophyta – Seed plants
- **Division:** Magnoliophyta (Flowering plants)
- **Class:** Liliopsida (Monocotyledons)
- **Subclass:** Commelinidae
- **Order:** Cyperales
- **Family:** Poaceae (Grass family)
- **Genus:** Vetiveria Bory (vetivergrass)
- **Species:** Vetiveria zizanioides (L.) Nash (vetivergrass)
- **Popular Name(s):** Khas Khas, Cuscus and Vetiver
- **Parts Used:** Roots and Essential oil
- **Habitat:** Cultivated in plains and low hills of India.

**KNOWN PHARMACOLOGICAL ACTIVITIES:**

1. **ANTIOXIDANT ACTIVITY:**

   The essential oil of vetiver root has been shown to possess antioxidant activity. Recently antioxidant activity of vetiver oil has been attribute to β-vetinine, β-vetinone and α-vetinone.

   Vetiveria zizanioides useful in the rehabilitation of metalliferous mine wastelands. As the presence of pb and zn greatly enhanced the activity of superoxide dismutase (SOD), peroxidase (POD), catalase (CAT)4 implying different mechanism to detoxify active oxygen species exist in different part of the plant(10). These result shows that vetiver oil and some of its component can be potential alternative natural antioxidants.

2. **ANTIBACTERIAL ACTIVITY:**

   Micro organisms are heterogeneous group of several distinct classes of living beings. Bacteria are prokaryotic microorganisms, which do not contain chlorophyll. They are unicellular and does not show true branching, expect in the so called higher bacteria (Actinomycetales)2. To treat chronic and infectious diseases plants used in traditional medicine contain a wide range of ingredient(5). Many plant leaves have antimicrobial principles such as tannins, essential oils, and other aromatic compounds(7).

   The test organisms used were *Escherichia coli* NCIM 2118; *Bacillus subtilis* NCIM 2063, *P. aerogenous* NCIM 2036 and *Staphylococcus aureus* NCIM 2079. *Vetiveria zizanioides* (vetiver) against *Staphylococcus aureus*, *Streptococcus pyogenes*, *Escherichia coli* and *Corynebacterium ovis* were evaluated. Against *S. aureus*, vetiver oil was superior to the other two oils in the pure state and diluted with dimethyl sulphoxide 1:10, 1:100, 1:1000 and 1:10000; inhibition by the pure oil was 60-70% that by penicillin or streptomycin.

3. **ANTIFUNGAL ACTIVITY:**

   The test organisms used were *Asperigulls nigar*, *Asperigulls clavatus and Candida albicanus*. All the stock cultures were obtained from Microbiology department Karpagam University, Coimbatore, India.

4. **ANTITUBERCULAR ACTIVITY:**

   Extracts and fractions were evaluated for antimycobacterial activity against *Mycobacterium tuberculosis* H(37)Rv and H(37)Ra strains using radiometric BACTEC 460 TB system. The ethanolic extract of intact as well as spent root were showed potent antituberculosis activity at a minimum concentration of 500μg/mL.

**CONCLUSION:**

This study is undertaken medicinal plants (vetiveria zizanioides) used in the treatment of analgesic and anti-inflammatory activity in different parts of the world. The present study revealed anti-inflammatory and analgesic activity of some medicinal plants.

In conclusion, the medicinally important plant species, listed in the present paper appear to be promissory sources of anti-inflammatory and analgesic agents. The future outlook for the development of new antiinflammatory drugs derived from these medicinal plants is therefore positive and this review can help others to explore herbs to further extent and its use in various other disease and toxicity studies along with clinical trials.

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