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Vetiver zizanioides and their Pharmacological Activity



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ABSTRACT

Vetiver zizanioides belonging to the family Gramineae, commonly known as Khas, is widely used as a traditional plant as refrigerant that cools and clams the entire body. Mostly root stems and leaves were used for the treatment of different diseases ancestors. Adventitious roots contain essential oil which used for multiphases such as perfumery and in the pharmacological industry. Vetiver is a perennial grass in India. This aromatic plant has gained attention for it various medicinal. Properties including its potential as an antipyretic agent. Antipyretic as substances that help reduce fever or lower elevated body temperature. Studies have investigates the antipyretic effects of vetiver and its Active compounds. Vetiver oils extract from the roots of the plant, contain several bioactive compounds such as zizanol and eudesmol, which have shown antipyretic properties in animal models. Research has found that vetiver oil and its constituents may exert antipyretic effects by inhibiting the synthesis of fever inducing substances called prostaglandins, specifically prostaglandin E2 (PGE2). These compounds are known to Contribute to the elevation of body temperature during fever. Additionally, vetiver oil has demonstrated anti-inflammatory and analgesics. Properties, which can further aid in alleviating fever-related symptoms.

INTRODUCTION:

Vetiver zizanioides is a magical and widely use grass. It is native to plant to India and belongs to the family Gramineae. It is commonly known as the khas-khas, in India. It is widely distributed in tropical and sub-tropical areas, especially in India. It grows on every type of soil. The screening of natural product has led to the discovery of many potent antipyretic drugs. *Vetiver zizanioides* popularly known as khas-khas or khus grass in India. *Vetiver zizanioides* has been known to India since ancient times. The great sage charaka has categorized it as varna (complexion-improving herb), angamardaprasamana (relieves body pains). The root decoction of the plant was used in analgesic and anti-inflammation, rheumatism, anthelmintic and antioxidant. Different parts of plant including roots are used for the treatment of ailments, such as mouth ulcers, acidity relief, headache, toothache, sprain, malarial fever and urinary tract infection. A major application of the root is as a refrigerant herbs that cools and calms the entire body and mind. The vetiver is one of the best refrigerant herbs that cools and calms the entire body and mind, with its influence spreading throughout the circulatory, digestive, respiratory, and urinary and nervous systems. The current study was designed and undertaken to screen *Vetiver zizanioides* to confirm and provides scientific basis for its antipyretic use in the Indian traditional system of medicines.

The grass is known by several local names in different regions in India.

Ayurvedic name: ushira

Marathi: Vala

Gujarati: Valo

Tamil: Vattiver

Telugu: Vettiveerum

Hindi: Khas

- **Taxonomical position of *Vetiveria zizanioides***

Kingdom-plantae, Subkingdom-tracheobionta, (vascular plant), Superdivision-Spermatophyte (seed plant), Division-Magnoliophyta (flowering plant), Class-Liliopsida (monocotyledon),

subclass Commelinidae, Order-Cyperales, Family-Gramineae (grass family), Genus-Vetiveria bory (Vetiver grass) Species -*Vetiveria Zizanioides*(L.) Nas.

- **Chemical constituents:**

The chemical constituents present in the plant are Vetiverol, vetivon , khusimone, Vetivene, Khositone, Terpenes, Benzoic acid, tripene-4-ol, B-Humulene, Epizizaenal, Vetivenyl Vetivenate, iso khusimol, vetiver oils, vetivazulene, zizaene , prezizaene , the major active constituents identified are khusimol , vetivone , eudesmol, khusimone , zizane , and prezizaene which are considered to be fingerprint of the oils.

- **Conventional uses:**

Khas served as medicine in various tribes of India. Different parts of the plant are used for different diseases. root for cooling inflammation and sexual diseases in santhals. Lodhas used root paste for headache, fever, diarrhea, and chronic dysentery. Root ash used for acidity in oragon. Juice of root used for anthelmintic. Also providing cooling effect. Vapor of root for malarial fever. vetiver oils, leaf paste, stem juice are used as stimulants. leaves and roots of mats are also used as beds providing cooling effect. Vetiver oil, leaf paste stem juice used as stimulant, diaphoretics, refrigerant, rheumatism, boil burn, snake bite, epilepsy and mouth ulcer.

This useful effect also applied pharmacologically some of the major application in pharmacological effects are described below.

➤ **Pharmacological activity:**

- **Anti-inflammatory**

Anti-inflammation is the pain relieve activity. At particular dose these drugs can reduce the inflammation. It is a body's response against injury and irritation. These drugs used for long term pain relives. Essential oil of *vetiver zizanioides* (L) showed an anti-inflammatory effect. it is mostly used as anti inflamers in the circulatory system and nervous system. it is also used as good tool for inflammations caused by sunstroke, dehydration and dry win.

- **Anti oxidant activity**

Anti oxidant molecules restrict the other molecules for oxidation. In the oxidation process many free radicals generated and can damage the cell. These anti-oxidant agents terminated the chain reactions. The plant extract of *Vetiveria zizanioides* shows anti-oxidant activity by scavenging free radicals in vivo. free radicals cause various diseases by DNA damage and lipid by pre oxidation. root of *Vetiveria zizanioides* in ethanolic extract use for different anti-oxidant activity and reducing the ability of oxidation, superoxide anion radical capturing ability and total anti-oxidant capacity.

- **Antifungal activity:**

The antifungal activity of ethanol and aqueous extracts of *vetiveria zizanioides*. Ethanol and aqueous extract of *vetiveria zizanioides* were prepared. Standard cultures of *asperigullsniger*, *asperigulls clavatus* and *candida albicanus* were used for the study. The antifungal tests were conducted by using the agar well plate method nystatin and griseofulvin were used as standard.

- **Antibacterial activity :**

The antibacterial activity is measured by zone of inhibition. Totally four bacterial strains (two gram-positive *S. aureus*, *B. subtilis* and two gram-negative bacteria *P.aeurogenosa*, *E.coil*. ethanolic extract of *vetiveriazizanioides* is known to posses flavonoids, alkaloids, terpenoides , saponins , tannins and phenols which either individually or in combination exert antimicrobial activity. The study showed that EEVZ inhibited gram negative bacteria than gram positive bacteria. Flavonoids are found to be effective anti microbial substance against a wide range of microorganisms, probably due to their ability to complex with extracellular and soluble protinsand to complex with bacterial cell wall ; more lipophilic flavonoids may disrupt microbial membrane. Anti-bacterial activity of tannins may be related to their ability to inactivate microbial adhesion enzymes and cell envelope transport protins, they also complex with polysaccharides. The presence of tannins present in the roots of *Vetiveria zizanioides* implied that tannin may be the active compound which may be responsible for in vitro anti bacterial activity in this study .tannin in the plant extract was found to possess antibacterial.

- **Hepatoprotective activity:**

Methanolic extract of *Vetiveria zizanioides* linn shows hepatoprotective.

- **Anti-tubercular activity:**

Vetiveria zizanioides L. Nash root extracts and fractions were evaluated for anti mycobacterial activity.

- **Anti hyperglycaemic activity:**

The effect of root extract of *Vetiveria zizanioides* in normal fasted rats after multiple doses showed significant antidiabetic activity at 2nd and 4th hour after administration compared to diabetic control, result were comparable with standard glibenclamide. The study indicates the ethanolic extract of *Vetiveria zizanioides* roots posses better anti hyperglycaemic activity than any other extract, in both normal and allaxon induced diabetic rats.

- **Antidepressant activity**

The ethanolic extract of *Vetiveria zizanioides* posses antidepressant activity and the combination of fluxetine and ethanolic extract of *Vetiveria zizanioides* is effective in tail suspension test and force swim test-induced depressive behaviour.

- **An evaluation of antipyretic potential of *vetiver zizanioides* (Linn) root:**

- **MATERIAL AND METHOD:**

- **Preparation and of extracts**

The roots of *Vetiveria zizanioides* were purchased from the local market. Dried roots were powdered mechanically and sieved through No. 22 mesh sieve. The finely powdered roots were kept separately in air tight container until the time of use. About 750 g of powder was soaked with 3 liters of ethanol and hexane in separate glass beaker for 12 h and then macerated at room temperature using a mechanical shaker for 4 h . The extract was filtered off and the marc was again soaked and then further extracted for 4 h and filtered. The filtrates were then combined concentrated under reduced pressure and evaporated at 40^oC. the percentage yield of MEVZ and HEVZ was found to be 6.1 % w/v and 8.4 % w/v

respectively. The extracts were subjected to preliminary qualitative tests in order to identify the various phytoconstituents present in plants.

➤ **Animal :**

Adult rats (albino Wistar) of either sex weighing 180 -200 g were used for the present study. They were maintained under standard environmental conditions and were fed with standard pellet diet and water ad libitum. The experimental procedures and research protocol used in this study were reviewed and approved by institutional animal ethics committee (CPCSEA) constituted as per the guidelines of committee for purpose of control and safety on experiments on animals, in India.

➤ **Study on normal body temperature :**

Rats of either sex were divided into seven groups, six in each group. The body temperature of each rat was measured rectally at predetermined intervals before and for 5 hours after administration of either 2 % aqueous tragacath solution or HEVZ and MEVZ at doses of 75, 150 and 300 mg/kg body weight orally.

➤ **Induction of yeast-induced pyrexia :**

Healthy rats showing 37.5 +/- 0.5 degree celcius were selected. Then they were fasted for 24 hrs inducing pyrexia. Pyrexia was induced by subcutaneously injection of 10ml/kg body wt of 15% w/v methyl cellulose solution. Rats were then returned to their housing cages and were allowed to feed. Basal rectal temperature was measured before the injection of yeast, by inserting digital clinical thermometer to a depth of 2 cm into the rectum. The rise in rectal temperature was recorded 19 hours after injection.

• **RESULT AND DISCUSSION:**

Fever may be the result of infection or one of the sequelae of tissue damage, inflammation, graft rejection or other disease states. Antipyretics are drugs which reduce elevated body temperature. Regulation of body temperature requires a delicate balance between the production and loss of heat, and the hypothalamus regulates the set point at which body temperature is maintained. In fever, this set is elevated and drugs like paracetamol do not influence body temperature when it is elevated by factors such as exercise or increases in ambient temperature. And anti pyretic drug reduces fever primarily through action on the

hypothalamus, there by causing heat dissipation through augmented peripheral blood flow and sweating. In North India. the pastes of *Vetiveria zizanioides* roots externally or internally, are used to control excessive sweating and burn sensation.

The results of antipyretic activity of hexane extract and methanol extract of *vetveria zizanioides* roots are significant antipyretic effects in yeast induced pyrexia in rats, and its effect is comparable to that of the standard drug paracetamol. It was observed that methanol extract at a dose of 300 mg/kg body weight showed maximum antipyretic activity amongst other extract. furthermore, the HEVZ and MEVZ also significantly reduced the normal body temperature.

• CONCLUSION:

The result of the present study confirmed the antipyretic activity of *Vetiveria zizanioides* roots in rats. The antipyretic activity of roots supports its use in traditional medicine to reduce fever. Antioxidant supplementation decreases the lipid per-oxidation process. *Vetiveria zizanioides* roots possess anti oxidant activity. Hence oxidant activity may be one of the possible mechanisms by which it reduces the elevated body temperature. Further studies are needed to elucidate the exact mechanism; isolation and characterization of active principle for antipyretic effects are under planning in our laboratory.

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