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Original Article**Clinical uses of aloe vera in veterinary medicine**

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Abstract

Traditional herbal therapy gives very promising results in a variety of ailments. Now a days, use of various herbs is constantly seen in veterinary practice. Aloe vera is one such herb which is commonly used in various clinical conditions of animals. The main part is succulent leaves of aloe vera which are arranged in rosette manner with components like antioxidant vitamins A, C and E, B12, folic acid, choline, Enzymes like bradykinase, lipase, cellulose, catalase etc. Minerals like calcium, chromium, copper, selenium, potassium, magnesium, zinc, sodium, Sugars, Hormones, Fatty acids, Anthraquinones and eight essential amino acids. Aloe vera serves as cheap, readily available and natural source for improving the life of animals.

Keywords: Herbal, Aloe vera, Anthraquinones, bradykinase.

Introduction

According to World Health Organization (WHO), medicinal plants are the best sources to obtain a variety of drugs. Developing countries like India relies on traditional medicine to maintain animal and human health because of lack of resources. Many active ingredients in various chemically manufactured drugs are originally derived from plant compounds. Plant compounds are homemade, less toxic, less expensive, safer and more natural than manufactured drugs.

Aloe vera is the oldest and the most applied medicinal plant worldwide. Aloe vera is a succulent, xerophytic plant species belonging to the genus aloe. It has got worldwide distribution and in many parts of the world, it is considered as an invasive plant species. There are more than 250 species of Aloe plants. However, only two popular species are grown today commercially, with *Aloe barbadensis* Miller and *Aloe arborescens*.

Synonyms

Aloe barbadensis, *Aloe chinensis*, *Aloe indica*, *Aloe vulgaris*, *Aloe flava*, *Aloe elongata*, *Aloe perfoliata* and so on.

Historical Background

Aloe vera, an evergreen perennial is considered to be native only to south east Arabian Peninsula but it is widely cultivated around the world for multipurposes. Aloe vera is a stemless or very short stemmed plant growing to 60-100 centimeters tall, spreading by offsets. Leaves are thick, fleshy, green to grey-green with leaf margins being serrated and has small white teeth. The leaf has three layers: The outer layer is called Rind with a protective function and synthesizes carbohydrates and proteins. The middle layer has a yellow sap which is bitter and contains anthraquinones and glycosides. An inner layer is clear mucilaginous gel which contains 96% water.

Aloe vera gel is obtained either from hand-filleted leaves of *Aloe barbadensis* (or other species) or by cold processing of the whole leaf.

The important constituents of Aloe vera gel are mucopolysaccharides (acetylated mannans, polymannans,), enzymes (peroxidase, allase, catalase, lipase, cellulose, carboxypeptase, amylase and alkaline phosphatase), anthraquinone C-glycosides, anthrones, anthraquinoids like emodin and lectins, saponins, lignin, 7 essential amino acids, vitamins (Vitamin A, C, D, B12, choline)

minerals (calcium, sodium, copper, magnesium, potassium, chromium, manganese, zinc and iron) , hormones (auxins and gibberellins) and plant steroids (cholesterol, campesterol, beta-sisosterol and lupeol). Total solids are in the range of 1.3 to 2%.

Medicinal Properties

The medicinal use of aloe was already mentioned more than 4000 years ago in a collection of Sumerian clay tablets dated 2100 BC. Aloe has had a very long historical use as a strong laxative treatment for chronic constipation and it is still listed as a laxative in many pharmacopoeias.

Aloe vera gel is used topically for its anti-inflammatory, antiseptic, and wound-healing properties, but it has also been used internally as a general tonic. It helps in relieving tumor and diabetes. Aloe vera gel is also reported to have antibacterial, antifungal and antimycotic activity in vitro. The glucomannans, in particular acemannan in Aloe vera gel is shown to have immunomodulating (stimulating) properties in vitro and in vivo. In vivo oral administration of Aloe vera gel (juice) and aqueous whole leaf extract has been reported to be anti-ulcerogenic. Aloe vera is known to contain several pharmacologically active ingredients, including a carboxypeptidase that inactivates bradykinin in vitro, salicylates and a substance (s) that inhibits thromboxane formation in vivo. Aglycoprotein with anti-allergic properties, called alprogen has been isolated from Aloe vera gel.

Forms of Aloe vera in Pet food industry

In pet industry, aloe vera can be used in various forms like- pet food grade powders, free flowing powders with moisture (<5%) for pellet, chow or bulk powder. Loading forms from 5% to over 70%, depending upon the material. Aloe Vera can also be used as Juices, chewable tablets, soft chews, granules and semi solids. Aloe Vera juice is non toxic, non -irritant and ideal to use as a tonic for run down, recovering lethargic or retired old pets.

Recommended Aloe Vera Juice dosage in finished products –

ANIMAL	BODY WEIGHT	DAILY MINIMUM ALOE AMOUNT
Dog	3-6 Kg	10-20 ml
Cat	3-6 Kg	10-20 ml
Cow	Approx. 500 Kg	200-250 ml
Horse	Approx. 500 Kg	200-250 ml
Sheep , Pig	Approx. 150 Kg	100-120 ml
Calf , Foal , Pony	100-200 Kg	100-150 ml
Hamster, Mouse	0-100 g	2 ml
Rat, Chinchilla, Guinea Pig, Rabbits	400g -2 Kg	4 ml

Clinical uses of Aloe Vera in Animal Practice

- In veterinary medicine, topical application of aloe vera gel promotes wound healing on general skin wounds in all animals.
- In lactating cows, it has been recommended as a teat-dip by intra-mammary administration for (adjuvant) treatment of mastitis or high somatic cell counts.
- For bovine mastitis, the combination of aloe vera (250 g), Turmeric (50g) and Calcium oxide (10g) paste can be applied over the entire udder 6 to 7 times daily for 5 days.
- Aloe vera can be given orally in all food-producing species as adjuvant treatment for a number of afflictions ranging from anaemia to infertility, mastitis, burns and shock.
- Aloe vera gel stimulates cell growth of basal keratinocytes in vitro.
- Oral administration of aloe vera gel is also claimed to have anti-arthritis properties. This property of aloe vera gel can be employed in treatment of arthritis in animals.
- In monkeys, in vivo oral administration of aloe vera gel (juice) and aqueous whole leaf extract has been reported to lower blood glucose and serum lipid levels.
- Kamr *et al.*(2020) investigated the therapeutic efficacy, anti-inflammatory and anti-oxidative properties of aloe vera gel ointment on dog's *Staphylococcus* pyoderma compared to gentamicin ointment. Preparation of aloe vera gel ointments 20% and 40% formula was carried out by adding 20 g and 40 g of aloe vera gel, respectively, 3 g of wax and 5 mL of paraffin oil with 72 g and 52 g of Vaseline™, respectively. All components were mixed well into mortar until obtaining homogenous ointments.
- Aloe vera is used in the treatment of ringworm, boils, scalds, itchy allergic conditions, insect stings and bites.
- Aloe vera can be added as a feed supplement in poultry sector to control coccidiosis.

- Aloe vera is a perfect dietary supplement as it has shown bio-enhancer and excipient properties to release other active ingredients. Adding aloe vera gel to pet foods and pet supplements not only stimulates and encourages a good appetite but also increases their energy potential. It strengthens gastrointestinal area causing detoxification and drainage of harmful metabolites.
- Aloe vera can also be used as a mouth freshener. For this, aloe vera juice is mixed with peppermint and mint to freshen up pet's breath thereby improving oral health care.
- Aloe vera can be used as an electrolyte replacement. It is good for puppies and cats, as well as for mothers after giving birth.
- For dog shampoo, aloe vera can be formulated with jojoba or neem to treat several post-fleabite of numerous canine cutaneous conditions. Several commercial preparations have used aloe vera for making pet shampoos. For example, Softas shampoo from Intas contains permethrin and aloe vera.
- In case of feline cystitis, aloe vera juice can be combined with a urine acidifier (called curecal) and can be given orally.
- Feline respiratory syndrome (FRS) is a common ailment of cats under stress and it can be treated with supplementation of aloe vera juice either orally or in diet to ameliorate the condition but it also prevents its recurrence. This aloe vera supplementation should be combined with long term doses of antibiotics such as ampicillin.
- Aloe vera powder has shown to increase the solubility of water soluble drugs. The aloe vera concentration is directly proportional to drug release so it can be used as bioavailability enhancer.
- Aloe vera with glucosamine and chondroitin either alone or in combination can be used to treat osteoarthritis in dogs and cats.
- Aloe vera with omega 3 fatty acids are formulated into joint support products for their anti-inflammatory properties.
- Mixing aloe vera with relaxing herbs, essential oils and natural pheromones can be helpful to reduce nervousness, anxiety and motion sickness.
- Older dogs and cats tend to develop senile cataract. In this regard, aloe vera with omega 3 fatty acids, DHA and EPA are beneficial as "vision support" supplements.
- Aloe vera with prebiotics like *Lactobacillus acidophilus* and *Bifidobacterium bifidum* stimulate the growth of beneficial bacteria so as to improve host health and inhibiting the growth of pathogenic microorganisms.
- Aloe can be used as a disinfectant of the wounds or flea bite dermatitis with Aloe and silver colloidal to apply directly (As gel or rub).
- Aloe can be used as laxative and soothes and normalizes digestive tract functioning. Aloe is also effective in the cleansing of dog's intestine and treat damaged intestinal flora.

Conclusion

In conclusion, evolution of pet "humanization" lead to growing preferences for natural health products and ingredients in modern times. In this regard, Aloe vera is an easily accessible and excellent natural option which contains over 75 known nutritive substances. Aloe vera is the key to healthy and long life for animals.

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