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Review Article

Insight of Herbal Veterinary Medicines: A Review Article

Anushka Trivedi[1], Pranki Shukla[1*], Richa Mishra[2], Aarati Maurya[3], Manish Srivastava[4]

[1]*Maharishi School of Pharmaceutical Sciences, MUIT, Lucknow, U.P., 226013, India.*
[2]*Rameshwaram Institute of Technology and Management, Lucknow, U.P., 227202, India.*
[3]*Metro College of Health Sciences and Research, Greater Noida, U.P., 201310, India.*
[4]*Kamla Nehru Institute of Management and Technology Faridipur, Sultanpur, U.P., 228118, India.*

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ABSTRACT

Herbal veterinary medicines have gained significant attention as an alternative and complementary approach to animal healthcare. This provides a comprehensive review of the historical use, pharmacognosy, and therapeutic applications of herbal medicines in veterinary practice. It explores the classification of medicinal plants, their active constituents, and the pharmacological actions that make them suitable for treating a range of conditions in animals. The study also addresses the formulation and dosage challenges unique to veterinary medicine, emphasizing species-specific considerations and the need for precise dosage calculations. Regulatory frameworks and quality control measures are discussed to highlight the importance of standardization in ensuring the safety and efficacy of herbal products. Furthermore, the chapter reviews clinical evidence supporting the efficacy of herbal treatments and discusses potential adverse effects and toxicity concerns. Future trends in the integration of herbal medicines with conventional veterinary practices and areas for further research are also identified. By advancing knowledge in this area, pharmacy students can contribute to the responsible and innovative use of herbal medicines in veterinary care.

Introduction

Veterinary medicine has a rich history, evolving from ancient practices in Egypt, Greece, and India to a formal scientific discipline with the establishment of the first veterinary school in France in 1761. It plays a vital role in animal health and welfare, encompassing disease prevention, diagnosis, treatment, and the management of zoonotic diseases. In recent years, there has been a growing interest in herbal medicines in veterinary practices, driven by their perceived safety, natural origins, and consumer demand. For example, turmeric is commonly used for its anti-inflammatory properties in animals, while garlic is employed for its antiparasitic effects *(Rana et al., n.d.)*.

Herbal medicines are seen as a complement or alternative to conventional treatments, especially in managing chronic conditions where traditional drugs might fall short. However, they also present challenges such as variability in potency and lack of standardization, which can affect their efficacy and reliability. Despite these challenges, the use of herbal treatments is becoming more prevalent as research continues to validate their benefits. The aims are to provide an understanding of herbal veterinary medicines, highlighting their role in modern animal care. Students will learn to evaluate the pros and cons of herbal versus conventional treatments, recognize the growing trend towards natural remedies, and understand the potential of herbal medicines in improving

***Corresponding Author:** Pranki Shukla

Address: Maharishi School of Pharmaceutical Sciences, MUIT, Lucknow, U.P., 226013, India.

Email ✉**:** shuklapran26@gmail.com

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animal health and welfare. This knowledge equips future pharmacists to make informed decisions when integrating herbal treatments into veterinary practice *(Cheema & Singh, 2021)*.

Traditional uses of herbal products in Veterinary Medicines

The use of herbs in animal healthcare has deep roots in ancient civilizations, where humans relied on the natural environment to treat various ailments in animals. Early agricultural societies, recognizing the need to keep their livestock healthy, turned to plants known for their medicinal properties. For instance, in ancient Egypt, garlic was widely used for its antimicrobial properties in both humans and animals. Similarly, Indigenous tribes in North America utilized echinacea for its immune-boosting effects in their domesticated animals *(Munir, 2015)*.

Several traditional medical systems have long histories of using herbs to treat animals. Ayurveda, originating in India, uses herbs like neem and turmeric for their antiseptic and anti-inflammatory properties. In Traditional Chinese Medicine (TCM), herbs like astragalus and ginseng have been used to enhance vitality and treat various animal diseases. The Unani system, rooted in Greco-Arabic traditions, incorporates herbs like fenugreek and licorice to address respiratory and digestive issues in animals *(Rastogi et al., 2015)*.

Different cultures have their own preferred herbs based on local availability and traditional knowledge. For example, Ayurveda uses ashwagandha to boost energy and reduce stress in animals, while TCM uses dang gui (angelica) to improve blood circulation. In Unani medicine, black cumin is known for its broad-spectrum antimicrobial effects. These systems have developed a rich pharmacopeia of herbal remedies tailored to the specific needs of animal healthcare *(Rawat et al., 2007)*.

The transition from traditional to modern herbal veterinary medicine has been shaped by the integration of ancient wisdom with contemporary scientific research. Traditional practices have laid the foundation for modern herbal treatments, with many herbs that were once used empirically now being studied and validated through scientific methods. For instance, the use of milk thistle for liver disorders in animals, a practice rooted in ancient herbalism, is now supported by clinical studies. This blending of traditional knowledge with modern veterinary

Table 1: Traditional uses of herbal products in veterinary use.

Section	*Herb*	*Traditional System*	*Traditional Use*	*Modern Veterinary Use*
Historical Perspective	Garlic *(Allium sativum)*	Ancient Egypt	Used to prevent infections and parasitic infestations in livestock.	Antimicrobial and antiparasitic uses in livestock and pets.
	Echinacea *(Echinacea purpurea)*	Native American Tribes	Boosted immune system and helped animals recover from infections.	Immune system support in horses and other animals.
Traditional Systems of Veterinary Medicine	Neem *(Azadirachta indica)*	Ayurveda	Treated skin infections and wounds in cattle.	Used for its antiseptic and anti-inflammatory properties in skin care.
	Turmeric *(Curcuma longa)*	Ayurveda	Treated joint issues and digestive problems.	Used for anti-inflammatory purposes in joint care and digestion.
	Astragalus *(Astragalus membranaceus)*	Traditional Chinese Medicine (TCM)	Enhanced immune system, prevented colds and flu-like symptoms.	Immune system support in livestock and pets.
	Ginseng *(Panax ginseng)*	Traditional Chinese Medicine (TCM)	Improved energy levels and vitality in aging animals.	Used as a supplement for vitality and energy in older pets and working animals.
	Fenugreek *(Trigonella foenum-graecum)*	Unani	Supported lactation and enhanced digestion in livestock.	Used to support lactation and improve appetite in dairy animals.
	Licorice (*Glycyrrhiza glabra*)	Unani	Soothed respiratory issues like coughs and bronchitis.	Used to treat respiratory problems in pets and livestock.
Transition from Traditional to Modern Herbal Veterinary Medicine	Milk Thistle (*Silybum marianum*)	Various Traditional Systems	Treated liver ailments in animals.	Validated for hepatoprotective effects, used for liver diseases in dogs and cats.
	Chamomile *(Matricaria chamomilla)*	Various Traditional Systems	Calmed anxiety and digestive upsets.	Used to treat stress-related disorders and digestive issues in pets.
	Calendula *(Calendula officinalis)*	Various Traditional Systems	Promoted wound healing and reduced inflammation.	Commonly used in topical ointments for wound care in pets.

science (as shown in table 1) has led to the development of more effective, standardized herbal treatments that are increasingly accepted in contemporary veterinary practice *(Wani et al., 2007)*.

Commonly Used Herbs or Plants in Veterinary Practice

Herbal medicine has long been a part of traditional veterinary care, offering natural remedies for various health conditions in animals. With a growing interest in holistic approaches, many veterinarians are now incorporating herbs into their practices to complement conventional treatments. These plants provide a wide range of therapeutic benefits, from supporting digestion to boosting the immune system, making them valuable tools in promoting animal health and well-being *(Sadangi et al., 2009)*. Herbal medicine has been widely used in veterinary practice to treat various ailments in animals. Here's a brief overview of some commonly used herbs and their applications:

Herbs for Gastrointestinal Disorders

Gastrointestinal issues are common in animals, and herbal remedies can play a crucial role in managing these conditions. Herbs like ginger, peppermint, and fennel have been traditionally used to treat digestive problems such as nausea, indigestion, bloating, and gas. These herbs help soothe the digestive tract, improve appetite, and enhance overall gastrointestinal function, offering a gentle and effective alternative to synthetic medications *(Chintu et al., 1998)*. Herbs like Ginger, Peppermint, and Fennel are often used to manage gastrointestinal issues in animals. Ginger is known for its anti-nausea properties, making it useful for treating motion sickness and upset stomach. Peppermint is used for its soothing effects on the digestive tract, while fennel helps relieve bloating and gas *(Phondani et al., 2010)*.

Herbs for Respiratory Conditions

Respiratory conditions in animals, such as coughs, colds, and bronchitis, can be effectively managed with the use of specific herbs. Plants like eucalyptus, thyme, and licorice have strong therapeutic properties that help clear respiratory passages, reduce inflammation, and soothe irritated airways *(Mishra et al., 1996)*. These herbs are often used in the form of teas, tinctures, or inhalations, providing relief from respiratory discomfort and supporting the animal's overall respiratory health. Eucalyptus, Thyme, and Licorice are popular herbs for respiratory support. Eucalyptus has decongestant properties that help clear the airways, thyme acts as an antimicrobial agent to treat respiratory infections, and licorice soothes the throat and reduces coughing *(Takhar, 2004)*.

Herbs for Skin and Wound Care

Several herbs have been traditionally used for skin and wound care due to their anti-inflammatory, antimicrobial, and healing properties. Aloe vera is widely known for soothing burns, promoting wound healing, and reducing inflammation. Calendula *(Calendula officinalis)* contains flavonoids that enhance tissue regeneration and reduce swelling. Turmeric *(Curcuma longa),* rich in curcumin, has strong anti-inflammatory and antioxidant properties, aiding in wound healing and preventing infection. Tea tree oil *(Melaleuca alternifolia)* possesses powerful antimicrobial effects, useful for treating cuts and infections. Gotu kola *(Centella asiatica)* stimulates collagen production and enhances skin repair. Chamomile *(Matricaria chamomilla)* soothes skin irritation and accelerates healing. These herbs, when applied topically or incorporated into formulations, promote faster recovery and protect the skin from infections. Aloe Vera, Calendula, and Turmeric are effective in treating skin issues and promoting wound healing. Aloe Vera is renowned for its cooling and healing properties, Calendula helps in reducing inflammation and promoting tissue regeneration, while turmeric acts as an anti-inflammatory and antiseptic agent *(Mohammad, 2016)*.

Herbs for Immune System Support

Skin issues and wounds are common in veterinary practice, and herbal treatments offer a natural way to promote healing and reduce inflammation. Aloe vera, calendula, and turmeric are widely recognized for their skin-healing properties. These herbs can be applied topically to treat wounds, burns, and other skin conditions, accelerating the healing process and reducing the risk of infection. Their anti-inflammatory and antimicrobial effects make them particularly valuable in maintaining healthy skin and treating minor injuries. Echinacea, Astragalus, and Garlic are used to boost the immune system in animals. Echinacea enhances immune function and helps fight infections, Astragalus is an adaptogen that strengthens the immune response, and garlic acts as a natural antibiotic and antifungal agent *(Fazaeli et al., 2010)*.

Herbs for Anti-inflammatory and Pain Relief

Managing pain and inflammation is a key concern in veterinary care, particularly in cases of chronic conditions like arthritis. Herbs such as boswellia, devil's claw, and willow bark offer natural alternatives to conventional pain relief medications. These herbs possess strong anti-inflammatory properties that help reduce swelling, alleviate pain, and improve mobility in animals. Their use in veterinary practice provides a safer option for long-term pain management without the side effects associated with synthetic drugs. For anti-inflammatory and pain relief, herbs like Boswellia, Devil's Claw, and Willow Bark are commonly used. Boswellia reduces inflammation and is used in treating arthritis, Devil's Claw is effective in managing pain, particularly in musculoskeletal conditions, and Willow Bark is known as a natural alternative to aspirin for pain relief *(Jadhav & Kim, 2013)*.

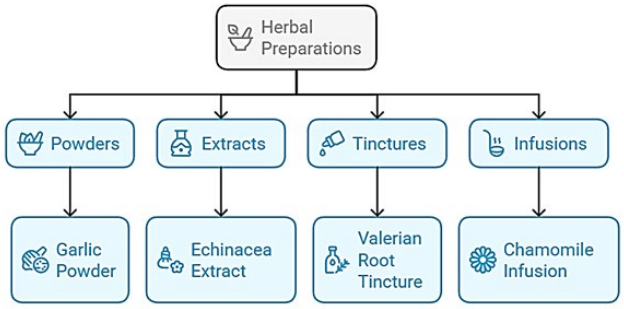

Figure 1: Herbal preparations & their uses.

Dosage Forms of Herbal Veterinary Medicines

Herbal veterinary medicines can be administered in various forms, each tailored to suit the needs of different species and the nature of the active ingredients *(Fan et al., 2011)*. The most common dosage forms as shown in fig. 1.

Powders

Powders are finely ground forms of herbal materials that are commonly mixed with food or water for easy administration. The preparation process involves drying the plant material, such as leaves, roots, stems, or flowers, and grinding them into a fine powder using specialized mills or grinders. Powders are one of the oldest and most convenient forms of herbal preparations because they are easy to mix, dose, and store. The fine particle size increases the surface area for dissolution, leading to faster absorption. An example of a widely used herbal powder is **garlic powder** (*Allium sativum*), known for its antibacterial, antifungal, and antiviral properties *(Rahman, 2007)*. The active compound in garlic is **allicin**, which helps prevent infections and supports cardiovascular health by lowering blood pressure and cholesterol levels. Garlic powder is often added to animal feed to promote immunity and overall health. In pharmaceutical practice, herbal powders are used for their consistent potency and ease of incorporation into various dosage forms like capsules and tablets. Finely ground herbal material, mixed with feed or water. Example: Garlic powder for its antibacterial properties.

Extracts

Extracts are concentrated herbal preparations obtained by using solvents like water, alcohol, or glycerol to extract the active phytochemicals from plant materials. The process involves soaking the plant material in the solvent, followed by filtration and evaporation to concentrate the active ingredients. Extracts are classified based on the type of solvent used—aqueous extracts (using water), alcoholic extracts (using ethanol), and hydro-alcoholic extracts (combination of water and alcohol). A good example is **Echinacea extract** (*Echinacea purpurea*), which is used to boost the immune system and reduce the severity of colds and infections *(Ahmadi, 2024)*. The key active components in Echinacea include **alkylamides, polysaccharides**, and **flavonoids**, which stimulate immune response by increasing macrophage activity and cytokine production. Extracts are preferred in pharmaceutical formulations due to their high potency and bioavailability, making them effective for treating infections and enhancing immune function. Concentrated herbal preparations obtained through solvent extraction (e.g., alcohol, water). Example: Echinacea extract used to boost the immune system.

Tinctures: Tinctures are liquid herbal preparations made by soaking herbal material in alcohol or a mixture of alcohol and water. This process extracts both water-soluble and alcohol-soluble active compounds, creating a highly potent solution. Tinctures are known for their fast onset of action because alcohol enhances the absorption of active compounds. They are easy to administer using a dropper, which allows for accurate dosing. A well-known example is **Valerian root tincture** (*Valeriana officinalis*), used for its calming and sedative effects. The active compound, **valerenic acid**, acts on **GABA receptors** in the brain, enhancing relaxation and reducing anxiety. Tinctures are widely used in both human and veterinary medicine for treating nervous system disorders, stress, and insomnia *(Park et al., 2021)*. Their long shelf life and high concentration of active ingredients make them highly effective for rapid therapeutic action. Alcoholic or hydro-alcoholic solutions of herbal extracts, often used in small doses. Example: Valerian root tincture for calming nervous animals.

Infusions

Infusions are herbal teas prepared by steeping fresh or dried herbs in hot water for a specific period, usually between 5 to 10 minutes. This method extracts water-soluble compounds and is used for mild conditions due to its gentle action. Infusions are often preferred for their soothing and natural properties, making them suitable for children and the elderly. A popular example is **chamomile infusion** (*Matricaria chamomilla*), which is widely used for its digestive and calming effects. Chamomile contains **apigenin**, a flavonoid that binds to GABA receptors, promoting relaxation and reducing anxiety *(McKay & Blumberg, 2006)*. Chamomile infusion is also effective in treating mild gastrointestinal discomfort and sleep disorders. In pharmacy practice, infusions are commonly recommended for managing stress, indigestion, and mild insomnia because they are well-tolerated and easy to prepare. Herbal teas prepared by steeping herbs in hot water, typically used for mild conditions. Example: Chamomile infusion for soothing digestive issues.

Considerations in Formulating Herbal Medicines for Animals

Formulating herbal medicines for animals presents unique challenges and considerations that differ significantly

from those in human medicine. Unlike humans, animals have diverse physiological and metabolic processes, which can influence how they absorb, metabolize, and respond to herbal treatments. Therefore, creating effective and safe herbal formulations for animals requires an understanding of species-specific needs, palatability issues, and appropriate administration methods *(Gupta & Dey, 2017)*. One of the primary considerations is the species-specific formulation. Animals such as cats, dogs, horses, and livestock each have distinct metabolic pathways that can affect the way they process herbal compounds. For instance, certain herbs that are beneficial for dogs might be toxic to cats due to differences in liver enzyme activity. Therefore, it's crucial to tailor herbal formulations to the specific species to avoid adverse effects and ensure the therapeutic efficacy of the treatment *(Costa-Neto, 2005)*. Palatability is another significant factor in the formulation of herbal veterinary medicines. Unlike humans, animals cannot be reasoned with when it comes to consuming medicine, making taste and ease of administration crucial. Bitter or unappealing herbs may need to be masked with flavourings or given in a form that is more acceptable to the animal, such as encapsulated powders or flavoured tinctures. Proper formulation can greatly enhance the likelihood of an animal accepting and benefiting from the treatment *(Hamada & Nagai, 1995)*.

Dosage Calculations and Guidelines

When administering herbal veterinary medicines, determining the correct dosage is crucial to ensure therapeutic efficacy while minimizing the risk of toxicity. Unlike synthetic drugs, herbal medicines often contain a complex mixture of active compounds, and their effects can vary significantly depending on the species, weight, and overall health condition of the animal. Therefore, precise dosage calculations are necessary to tailor treatments to the specific needs of each animal.

Dosage calculations typically consider several key factors, including the species of the animal, its body weight, and the severity of the condition being treated. These factors help in estimating an appropriate dosage that balances effectiveness with safety. Additionally, the method of administration—whether oral, topical, or another route—can influence how the herb is absorbed and metabolized, further impacting dosage decisions.

Conclusion

Herbal veterinary medicines represent a vital and growing field within animal healthcare, blending traditional knowledge with modern scientific practices. This chapter has provided an in-depth exploration of the historical roots, pharmacognosy, and therapeutic applications of herbs in veterinary medicine, highlighting their importance in treating various animal health conditions. The efficacy and safety of these natural remedies have been supported by emerging research, although challenges in standardization and regulation persist. Pharmacy students play a crucial role in advancing this field by ensuring the safe, effective, and ethical use of herbal treatments in veterinary practice. The future of herbal veterinary medicine lies in the integration of these natural remedies with conventional veterinary care, supported by ongoing research and innovation. As the demand for natural and holistic treatments continues to rise, the need for skilled professionals in this area becomes increasingly evident. By fostering a deeper understanding of herbal veterinary medicines, pharmacy students can contribute to improving animal health and well-being, while also addressing the challenges and opportunities within this evolving discipline.

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