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The Potential Role of Herbal Medicines as an Alternative to Antibiotics in Veterinary Medicine

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The rich history of veterinary botanical medicine is interwoven with the advancement of human medicine around the world and across cultures. Asclepias, the Greek god of medicine, is said to have declared that of all the creatures it was the dog he admired most because of its ability to know and use herbs to prevent and cure all ailments of the canine race.

Ayurvedic veterinarians wrote about the importance of medicinal plants in the treatment of elephants and horses in ancient India and texts from the Shang Dynasty describe treating horses with traditional Chinese herbs. Evidence of veterinary herbal medicine is found in ancient Egyptian parchments and in the famous code of Hammurabi. The first official veterinary medical school was founded in France in 1762 where students grew and administered medicinal plants to their patients. Until the first half of the 20th century, herbs formed the basis of veterinary medicine and before the 1960s veterinary textbooks included extensive herbal pharmacopoeias.

A major distinction between herbal and pharmaceutical medical approaches is the complex interaction of the many constituents contained within whole plant material in contrast to single chemical compounds used in modern drug therapy. The medicinal effects of herbs are due to hundreds of metabolites that can have additive, synergistic or antagonistic effects on one another. The vitamins, minerals, flavonoids, carotenoids, alkaloids, sugars and amino acids contained within a single plant all contribute to the action seen within the body. Together these compounds assist the body in mounting a physiologic response while potentiating desired and inhibiting detrimental effects. Many of the 'active' constituents within plants remain unknown to modern medical science, which means they cannot be extracted or isolated and can only exert their actions when used as part of a whole plant. External variables such as climate, soil conditions and the season harvested all impact the levels at which certain constituents are found within a given plant. The intricate evolutionary dance between plants and animals has led to the development of receptors within the bodies of animals into which these plant metabolites can fit and exert physiologic effects.

Botanical medicine works on many levels. Herbs can act as disease modifiers, they may improve the efficacy of the body's own systems via enhancing circulation or immune response, or they may increase the bioavailability of certain compounds while decreasing the toxicity of others. Herbal medicine aids the body in reestablishing homeostatic balance and tries to address the root cause of imbalance, whereas in conventional medicine often the focus is on masking symptoms.

Antibiotic resistance is becoming an obvious problem worldwide; it would behoove medical professionals to consider increased use of antimicrobial herbs and to save pharmaceuticals for serious cases when they are truly needed. When using botanical medicine to treat an animal suffering from an infection it is important to develop a formula that includes more than just an herb with direct antimicrobial properties. Immune-modulating plants can be added to support the body's own ability to fight off infection and restore vital energy, these include adaptogens like licorice root, Panax ginseng or *Astragalus* and alteratives like *Scrophularia*, cleavers or nettles. Herbs to enhance elimination can be added, including diuretics like couch grass or dandelion, laxatives like burdock or aloe and expectorants like mullein or *Angelica*. Often it is important to incorporate anti-inflammatory herbs such as chamomile, turmeric or chickweed. It may be necessary to promote rest by including nervine or sedative herbs such as lavender, passionflower or valerian. Finally, analgesic herbs such as *Corydalis* or meadowsweet may be called for. Additionally it is important to consider the primary constitution of the patient as well as the properties of particular diseases and herbs, for example using cooling herbs such as marshmallow or peppermint for hot conditions.

Herbs can be used in place of antibiotics in many situations for various types of infections in our veterinary patients and the plants available to practitioners are myriad. The path of a veterinary herbalist is one of lifelong learning; the following examples are the tip of our vast *materia medica*. Matthew Wood says the following about berberine, an alkaloid found in Oregon grape root, goldenseal, coptis and barberry, "In the days before antibiotics, the berberine-containing herbs were one of the few medicines strong enough to combat dangerous fever and infection". Berberine has been shown to have antibacterial activity against various organisms including resistant strains of *Pseudomonas aeruginosa* & *Escherichia coli*, to inhibit enterotoxin activity and effectively treats skin, urinary, GI & ear infections.

There are a number of antimicrobial and anti-inflammatory botanicals we can use topically for wounds, burns and abscesses. Some herbs, such as Calendula, also accelerate the rate of contraction and epithelialization to speed wound closure. Sage, yarrow, dilute tea tree oil and demulcent marshmallow are additional soothing options for inflamed skin lesions. Plantain is especially effective for dog and cat bite-wounds and is an excellent drawing & drying agent. Echinacea was traditionally used for snake and spider bites as well as systemic infections.

Bacteriostatic cranberry is known for its use in the prevention and treatment of urinary tract infections via inhibiting the binding of bacterial fimbrial adhesins to uroepithelial cell receptors. Gentle antimicrobials like couch grass and uva ursi can also be used to relieve urinary tract infections. Expectorants like mullein and thyme are effective against contagious bronchitis and for soothing inflamed mucous membranes; immunostimulants like thyme are also great for use in leukopenic patients. Milk thistle provides gentle support against drug-induced hepatocellular damage and is an excellent adjunct for patients on long courses of liver-depleting drugs.

The practice of veterinary botanical medicine has been refined over millennia and science is now able to describe in modern terms many of the mechanisms behind this ancient art of healing. Plants are often a more balanced way to heal the body, but it is important to remember that 'natural' does not always mean harmless, veterinarians practicing herbal medicine should do so with caution and respect, both for our animal patients and the tradition of botanical medicine.

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