



Useful plants for animal therapy

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Abstract

Introduction

The interest in medicinal plants has increased significantly in recent years not only to cure humans but also to cure animals. There are several medicinal plants to treat different illnesses. In this review, we have discussed some of the effects that medicinal plants may have on different animals.

Conclusion

The use of non-conventional medicines could be considered in veterinary practise.

Introduction

The worldwide interest in herbal products has grown significantly. As described by Viegi et al.¹, cattle, horses, sheep, goats and pigs represent about 70% of the animals treated with herbal remedies, followed by poultry (9.1%), dogs (5.3%) and rabbits (4.3%). This is not only due to a general trend towards the usage of natural products for curing illnesses but also due to the availability of considerable evidence regarding the efficacy of herbal remedies. Furthermore, deeper knowledge of their composition has been acquired through the introduction of new analytical techniques. At present, the use of natural products is a useful tool in domestic animal therapy too. It is well known that animals can resort to natural therapy by themselves. 'Zoopharmacognosy' refers to the process by which animals self-medicate, by searching for herbs to treat or prevent diseases. This process has revealed that in many cases, instinct provides animals with therapeutic information, allowing them to choose the plant best capable of treating

their disease^{2,3}. The development of intensive farming in industrialised countries has led to a progressive neglect of veterinary phytotherapy due to the compatibility of synthetic drugs with the modern concept of efficient animal breeding. The ever-growing use of synthetic drugs can be attributed to the growing ease of their preparation and administration, making them suitable for the pressing pace of modern development. With respect to pet animals, for whom humans tend to care for as well as or better than they do for themselves, the use of natural products is becoming more and more important. In fact, there is a growing preference for natural rather than synthetic products because people think, rightly or wrongly, that natural products produce less side effects and undesirable consequences. Some medicinal plants used in veterinary practices are reported in Table 1. In this review, we have discussed different plants and their medicinal effects on animals.

Discussion

The authors have referenced some of their own studies in this review. The protocols of these studies have been approved by the relevant ethics committees related to the institution in which they were performed. Animal care was in accordance with the institution guidelines.

Cardiovascular System

Cardiovascular system therapy is primarily used in treating pet animals and horses because it is not cost-effective for farm animals⁴. Hawthorn (*Crataegus* spp.) contains procyanidines and flavonoids which have a slight inotropic action and act as peripheral and coronaric vasodilators; it is used in pets for arrhythmia and

cardiac failure, and is not very toxic⁵. Some herbalists suggest that Lily of the Valley (*Convallaria majalis*), which contains convallotoxin and convallioside glycosides, can be used as an alternative to digitalis for the treatment of cardiac failure. It has also been found that syrup from the wild pansy (*Viola tricolor*) is helpful for restoring strength to racing pigeons returning from long racing flights. Although little is known about its mode of action, coriander (*Coriandrum sativum*), in either whole herb or seed form, is recommended as a heart tonic for horses.

Skin

Synthetic products, e.g. the pyrethroid insecticides that are related to the natural pyrethrines derived from *Chrysanthemum cinerariaefolium*, are widely used in treating skin diseases, especially for ectoparasites in farm animals. Herbs are more commonly used against ectoparasites in pet animals. Many different plants are used for this purpose, generally those containing large amounts of terpenes. Celery (*Anethum graveolens*), caraway (*Carum curvi*), coriander (*Coriandrum sativum*), laurel (*Laurus nobilis*), peppermint (*Mentha piperita*), virgin-tree (*Sassafras albidum*), chamomile (*Matricaria chamomilla*), quassia wood (*Quassia amara*) and parsley are only a few examples. Eucalyptus (*Eucalyptus globus*) can also be used against parasites. In fact, koalas which feed exclusively on eucalyptus leaves seem to be free of cutaneous parasites. Pyrethrum powder and a lotion made from lemon juice are used against flea infestations that are frequently found in dogs. These infestations can be particularly dreadful because they give rise to allergic reactions that often become chronic. Garlic (*Allium sativum*) is also an active flea repel-

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Table 1. Some plants used in veterinary phytotherapy.

Scientific name	Used part	Use
<i>Allium sativum</i>	Cloves	Parasitosis
<i>Aloe</i> spp.	Latex, gel	Skin diseases, GI diseases, cancer
<i>Arcostaphylos uva-ursi</i>	Leaves	Urinary diseases
<i>Artemisia</i> spp.	Aerial parts	GI diseases, endoparasites
<i>Avena sativa</i>	Aerial parts	Mastitis
<i>Calendula officinalis</i>	Leaves, flowers	Wounds, gingivitis
<i>Capsella bursa-pastoris</i>	Aerial parts	Haemorrhages, reproductive disorders
<i>Carica papaya</i>	Seeds, latex	Endoparasites
<i>Cichorium intybus</i>	Aerial parts	Endoparasites
<i>Coriandrum sativum</i>	Seed, whole herb	Cardiotonic, ectoparasites
<i>Crataegus</i> spp.	Leaves, flowers	Cardiotonic
<i>Cucurbita pepo</i>	Seeds	Endoparasites
<i>Cynara scolymus</i>	Leaves	Hepatic diseases, GI spasms
<i>Dorycnium</i> spp.	Aerial parts	Endoparasites
<i>Echinacea</i> spp.	Root, aerial parts	Immunostimulant, wounds
<i>Eucalyptus globulus</i>	Leaves, essential oil	Ectoparasites, respiratory diseases
<i>Euphrasia officinalis</i>	Aerial parts	Eye affection
<i>Filipendula ulmaria</i>	Flowers, leaves	Wounds
<i>Genziana lutea</i>	Root	GI diseases
<i>Glycyrrhiza glabra</i>	Root	GI diseases, otitis
<i>Gossypium</i> spp.	Leaves	Endoparasites
<i>Hedera helix</i>	Leaves	Placental retention
<i>Hypericum perforatum</i>	Flowers	Wounds
<i>Humulus lupulus</i>	Flowers	Nervousness
<i>Juniperus communis</i>	Aerial parts, oil	Skin diseases, ectoparasites
<i>Lavandula officinalis</i>	Essential oil, stems	Ectoparasites, wounds, nervousness
<i>Lotus corniculatus</i>	Aerial parts	Endoparasites
<i>Malva sylvestris</i>	Aerial parts	Immunomodulation, respiratory diseases
<i>Matricaria chamomilla</i>	Flowers	Eye inflammation, ear problems, helminthiasis
<i>Melissa officinalis</i>	Leaves	Anxiety, stress
<i>Mentha piperita</i> and <i>M. cardifolia</i>	Leaves, essential oil	Ectoparasites and endoparasites, GI illness
<i>Onobrychis viciifolia</i>	Aerial parts	Endoparasites
<i>Passiflora incarnata</i>	Aerial parts	Anxiety, hormonal imbalance
<i>Plantago major</i>	Leaves	GI diseases, wounds
<i>Rosa canina</i>	Hip	Inflammation

lent and can be used for preventative purposes; its oral administration is also recommended for all types of parasitosis. Tobacco and derris powder are natural insecticides for external use that are well known in veterinary medicine. Animal kennels are often fumigated with cayenne pepper to protect them against fleas.

A lotion prepared from garlic, lemon, elder (*Sambucus nigra*) leaves, violet (*Viola odorata*) leaves, wormwood (*Artemisia absinthium*) and clover (*Trifolium pratense*), is used against mange, a common cutaneous parasitosis seen in domestic animals. A dressing prepared from tobacco powder and fresh lime can be applied to the backs of cows for treatment of warble fly. The Burdock plant (*Arctium lappa*), which contains fungicide and bacteriostatic substances, can be used for a number of cutaneous ailments. In fact, a brew of Burdock leaves can be administered orally for depurative cleansing, and the fresh leaves themselves can be applied for cicatrization. The leaves from many other types of plants, e.g. violet (*Viola odorata*), nasturtium (*Nasturtium officinale*), comfrey (*Simphyturn officinale*) and nettle (*Urtica dioica*), also have healing effects on animal skin. They not only revitalise the skin and make animals' coats shine but also have anti-itching, disinfectant, and star-healing effects. Grape vine, geranium, mallow and cabbage leaves are used for the healing of wounds. They are applied on the wound with a light bandage which must be changed every three hours. A brew of comfrey (*Consolida maggiore*), elder or rosemary flowers and leaves can be used to disinfect wounds. Plantain leaves yield very soothing mucilage which treats the inflamed areas surrounding wounds very well. In addition, the jelly from most cacti leaves is helpful in the healing of old wounds; a brew of flowers and leaves of *Filipendula ulmaria* is helpful in stanching wound bleeding.

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Scientific name	Used part	Use
<i>Ruta graveolens</i>	Leaves	Helminthiasis
<i>Salvia officinalis</i>	Leaves, flowers	Endoparasites, dehydration
<i>Silybum marianum</i>	Fruits	Hepatic diseases, galactogen
<i>Taraxacum officinalis</i>	Root, leaves	GI diseases
<i>Thymus vulgaris</i>	Flowers	Respiratory and GI diseases
<i>Tilia cordata</i>	Flowers	Respiratory diseases
<i>Ulmus rubra</i>	Bark	Diarrhoea
<i>Urtica dioica</i>	Seeds	Endoparasites, diarrhoea
<i>Valeriana officinalis</i>	Root	Anxiety
<i>Zingiber officinale</i>	Rhizomes	Vomiting

The list presented above has been adapted from Russo et al. and has been modified³. GI, gastrointestinal.

Helminthiasis

Worms are very common in domestic animals, especially in grazing animals, and they cause large economic losses for zootechny. A number of traditional natural products are still used in developing countries, and they are often far more toxic than modern manufactured anthelmintics⁶. However, this need not be a serious drawback because based on their long experience, traditional herbalists are usually aware of these dangers. Animal owners are also likely to know the correct use of these preparations. However, animal owners may be confused by the numerous new formulations that are seen with the use of manufactured anthelmintics. Garlic, eucalyptus and rue (*Ruta graveolens*) are well known for their vermifuge effects. Brews obtained from the flowers and leaves of white mustard (*Sinapis alba*), the green leaves of the walnut tree and the seeds of nasturtium, are also effective vermifuges and are recommended for dogs. A number of plants with a sharp taste and/or pungent smell are indicated for the prevention of verminosis in pet animals, e.g. celery, coriander (*Coriandrum sativum*), ginger (*Zingiber officinale*) and cayenne pepper.

In Europe, nicotine sulphate from *Nicotiana tabacum* has been used against *Monezia*, *Ascaridia* and other

gastrointestinal nematodes found in large animals. Before the discovery of phenothiazine and piperazine, wormseed oil was used against *Ascaris* in horses and pigs, against *Toxoascaris* and *Toxocara* in dogs and against *Strongylus* in horses. Arecoline and a number of other alkaloids obtained from the dried seeds of *Areca catechu* were used for the treatment of cestoid infestations in dogs and poultry. The extract of *Dryopteris filix-mas* has been used against the flatworms *Dicrocoelium* and *Fasciola*; it has also been used in combination with carbon tetrachloride for the treatment of distomatosis in sheep. Its active component is the filicin which acts as a vermifuge, causing the detachment of the scolex from the intestinal mucosa. Santonin, which is derived from *Artemisia cina* and other species of *Artemisia*, is used against ovine nematodes⁷. Kamala, derived from the fruit of *Mallotus philippinensis*, has been used against flatworms. A brew prepared from the dried wood of *Picroenia excelsa* has been used for the treatment of oxyuriasis in horse. A well known bolus prepared using the juice of aloe (*Aloe ferox*) has been used against horse worms.

In developing countries where synthetic products are rarely used, other natural products are still being utilised. In Tanzania, herbalists are

usually consulted before veterinary help which is sought only if herbal treatment is unsuccessful⁸. Herbalists classify *Cissampelos mucromata*, *Senecio lyratipartus* and *Croton macrostachys* as powerful anthelmintics. Other plants used in Africa as anthelmintics are the bark of *Anogeissus leiocarpus*, the leaves and stems of *Securinega virosa*, the bark and branches of *Khaya senegalensis* and the roots of *Neruclea latifolia*, all of which provide the most effective anthelmintic preparations in traditional veterinary medicine. An infusion of the bark of *Khaya senegalensis* is also used as a treatment for fasciolosis. In the analysis of eighteen plants which have been traditionally used in Nigeria for the treatment of animal and human helminthoses, only *Aloe barteri*, *Terminalia avicerrinoides*, *Annona senegalensis*, *Cassia occidentalis*, *Anogeissus leiocarpus* and *Diospyros merpilifbrmis*, showed significant anthelmintic activity. Papaya (*Carica papaya*) latex (8 g/kg) has been effective in the treatment of ascariasis in pigs⁹; however, mild, transient, adverse effects have occurred in pigs receiving very high doses.

Ascariidosis in cattle and buffalo is common in Pakistan, and it has a considerably adverse economic impact. The efficacy of santonin against *Toxocara vitulorum* in buffalo calves that were naturally infected, has also been evaluated^{10,11}.

There is evidence that some pasture plants have anti-helmintic properties. In Tadzhikistan, a decrease in sheep gastrointestinal infections has been noted during the springtime when *Ferula foetidissima* is abundant in the pastures. The powder made from *Heracleurn sosnowskyi*, a common pasture plant, cured 60% of the sheep in the pastures, suffering from natural nematode infections. Several studies show that other forages such as sulla (*Hedysarum caronarum*), chicory (*Chicorium intybus*), alfalfa (*Medicago sativa*) and lotus major (*Lotus pedunculatus*)



exhibit anti-parasitic properties^{12,13,14} while other studies did not show such properties^{15,16}. Macchioni et al.¹⁷ showed acaricidal activity of aqueous extracts of chamomile (*Matricaria chamomilla*) flowers against the mite *Psoraptres cuniculi*.

Digestive apparatus

Natural products are used in veterinary medicine, especially in the treatment of digestive apparatus dysfunctions. Even in industrialised countries, there are cases where products with active ingredients derived from vegetable matter are used, although, this is seen less frequently now than in the past. Cats and dogs spontaneously eat couch-grass (*Agropyron repens*) in order to vomit which performs a mechanical cleaning action in the stomach. In contrary cases of incoercible vomiting in pets, the administration of gentian root powder is advised. In order to prevent travel sickness in dogs, the powder obtained from the rhizome of ginger (*Zingiber officinale*) can be used. Ginger also reduces (100 mg/kg and 200 mg/kg) cisplatin-induced emesis in dogs¹⁸ and nausea and vomiting in pregnant dogs¹⁹. An infusion of peppermint (*Mentha piperita*) and lemon-balm (*Melissa officinalis*) given orally to dogs for 2 days is useful to treat stomach and intestinal illnesses²⁰. For the treatment of enteric disturbances in pigs bred under intensive farming conditions, cholagogues such as boldo (*Peumus boldus*) which contains the boldin alkaloid and artichokes which have cynarin as the active ingredient, have been proposed. In monogastrics, castor oil is still largely used as a purgative, whereas in ruminants, irritant oily purgatives are generally not used due to the saponifying activity in the rumen. Indirect irritant purgatives such as aloe (*Aloe ferox*) and *Rhamnus catharticus* are used sometimes; however, drastic resinous purgatives are never used due to their excessive irritating

action, capable of inducing colic pain in animals.

Tannic vegetables such as hamamelis (*Hamamelis virginiana*), *Krameria triandra* and *Acacia catechu* that are used for their astringent activity, have been substituted by tannin synthetic derivatives which release the tannic acid more slowly; the former, however, are still widely used when the latter are unavailable. The brews of mint, rosemary, balm-mint and thyme have a lenitive action on the gastroenteric tube. For the treatment of diarrhoea in pets, the powdered bark of red elm (*Ulmus rubra*) or parsnip (*Pastinaca sativa*), the juice of bilberry and the brew of black currant (*Ribes nigrum*) leaves and chamomile, in association with carrot juice and rice decoction, are advised. In small animals, all the plants that come from the garlic and onion families can be used against diarrhoea; lemon juice is also recommended due to its disinfectant, astringent and lenitive properties. For rumination ailments in bovines, gentian, liquorice, red pepper and green aniseed (*Pimpinella anisum*), are used; for ruminal meteorism, a brew of parsley and lemon verbena (*Lippia citriodora*) can be administered together with vegetable charcoal. The feeding of fennel seems to be useful in the prevention of colic conditions in horses, and gentian root, liquorice juice and the oil of peppermint can relieve these painful attacks. Externally, warm cloths soaked in a strong brew of hop (*Humulus lupulus*) heads or their flowers can be applied; thyme and mustard can also be used in the same way. For intestinal flogosis in horses, an oatmeal mash with gentian powder is recommended; a brew of horse tail (*Equisetum arvense*) also seems to be effective. For bovine colic conditions, the powder of *Maranta arundinacea* is used sometimes. For domestic animals that manifest jaundice, pomegranate juice and brews obtained from rhubarb and

from dandelion (*Taraxacum officinale*) roots and leaves are administered. For ruminants, the use of fumitory (*Fumaria officinalis*), cleavers (*Galium aparine*) and cornflower (*Centaurea cyanus*) is also recommended. In dogs with perianal gland inflammation, the dandelion brew can be administered orally, and a strong brew obtained from linseed can be applied topically.

Respiratory apparatus

For the control of cough in dogs and cats, brews of sage and liquorice roots with the addition of honey seem to be effective. In addition, syrups or essential oils obtained from bramble leaves, elder (*Sambucus nigra*) flowers, borage (*Borrago officinalis*) and thyme (*Thymus vulgaris*), have a lenitive effect on coughs. Massages can be given using eucalyptus oil dissolved in warm olive oil²¹. In horses, brews of pine needles and elder twigs, blossoms or leaves (*Tussilago fibrifera*), are recommended for coughs. The most effective plant against asthma is elecampane (*Enula campana*), and chrysanthemum flowers are an alternative.

Garlic and eucalyptus are indicated for bronchitis, pleurisy and pneumonia because of their antibacterial activity. A brew obtained from lemon peel and pine needles, with the addition of liquorice and honey for sweetness, seems to be very effective against respiratory ailments in dogs. For throat inflammation, the fruit of black currant is advised. For catarrhus syndromes in large animals, the administration of a brew of sage, and the placing of pine and rosemary branches on their bedding are indicated.

In cases of fever, brews prepared using yarrow (*Achillea millefolium*), meadowsweet (*Fihpendula ulmaria*), sorrel (*Rumex acetosa*) and the leaves and flowers of red currant (*Ribes rubrum*) are administered to promote sweating; hay tea with parsley also seems to be effective. Finally, echinacea powder is shown

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to reduce respiratory tract infections in canines²².

Reproductive apparatus

For the prevention of abortion in cattle, strawberry leaves, the fruit of the dog-rose, haws and the powder of the dried root of *Alcea rosea*, can be used. Garlic can be administered due to its antibacterial activity. In order to facilitate delivery, the brew of raspberry is advised. In addition, feverfew (*Crysanthemum parthenium*), ivy (*Hedera elix*) and pennyroyal (*Mentha pulegium*), have a tonic effect on the uterus of ruminants. All these plants are also useful for the retention of the afterbirths. Ivy leaves are always advised after parturition because cattle instinctively search for them on their own at that time. For post-partum bleeding, vaginal douches of salt water with hamamelis and tonics such as ginger powder are administered. For the treatment of parturient paresis (milk fever), the administration of seaweed with molasses and milk is indicated, with the possible addition of camphor powder.

Additional uses

Herbal treatments seem to be particularly efficacious against mastitis. Raspberry leaves, herb-robert (*Geranium robertianum*), southernwood (*Artemisia abrotanum*), *Brassica oleracea*, *Avena sativa*, *Anagallis arvensis*, *Linum usitatissimum*, *Scrophularia canina* and *Buxus sempervivus* are useful to treat or prevent mastitis in cattle because of their anti-inflammatory and emollient properties¹. Externally, cold poultices of *Runex aquaticus* or elder leaves can be applied. When ulcers are present, poultices soaked in a brew of sambuco leaves can also be administered; antiseptics such as garlic and sage are also advised.

Aromatic herbs such as thyme, marjoram, sage, lavender and rosemary can add a pleasant taste to milk, whereas mustard, fenugreek (*Trigonella foenum-graecum*), nettle and cress can lend it a pungent taste.

Sedge (*Acorus calamus*) leaves and molasses sweeten the milk, whereas linseed, sunflower seeds, oats, carrots, elder flowers, pine berries and marigold increase its fat content and darken its colour. Fennel seeds and leaves, borage (*Borrago officinale*), balm-mint (*Melissa officinalis*), marshmallow (*Althea officinalis*), milk worth (*Polygala vulgaris*), anise (*Pimpinella anisum*) and sweet clover (*Melilotus officinalis*), are all indicated to increase the milk production in ruminants.

In order to stop the secretion of milk in cows before parturition, the frequency of milking must be progressively reduced and the diet modified. On the contrary, milk thistle (*Silybum marianum*) increases lactation in cows²³ by probably increasing the levels of circulating prolactin²⁴. Some plants can aid in reducing the milk yield, e.g. mint, periwinkle (*Vinca minor*), herb-robert and asparagus. The powder from the ripe fruit of *Capsicum annuum* can be used as a heat and rut inducer in cattle and other species. The same is true for the rhizome extract of *Cimicifuga racemosa* whose link with oestrogen receptors has been demonstrated in the rat uterus. For the prevention and therapy of pseudo-pregnancies in bitches, plants which promote oestrogen secretion and inhibit progesterone secretion, e.g. mu-weed (*Artemisia vulgaris*), pot-marigold (*Calendula officinalis*) and groundsel (*Senecio vulgaris*), are indicated.

Dogs and cats with spontaneous tumours, treated with the immuno-stimulating polysaccharide acemannan, derived from *Aloe* spp. by intraperitoneal and intralesional routes, showed improvement when assessed for tumour shrinkage, tumour necrosis or prolonged survival²⁵. The extract of the gel has also been used in veterinary science for external treatment in animals, including allergies, fungal infections, inflammations, pains and itching^{26,27}. *Melissa officinalis*, *Valeriana officinalis* and *Crataegus oxyacantha* have

been useful to prevent or alleviate psychological problems in domestic animals. *Valeriana officinalis* in association with *Passiflora incarnata* reduced anxiety and irritability in pigs during transport vibration²⁸.

Other plants (*Lavanda officinalis*, *Humulus lupulus*, *Scutellaria lateriflora* and *Magnolia acuminata*) have been used for nervousness and restlessness²⁹.

Conclusion

Herbal drugs contain active compounds that may find their application in veterinary medicine. They are used to medicate or prevent disturbances and diseases that involve not only large animals but also dogs, poultry and rabbits. Natural products are often used as antibacterials, antimycotics, antiparasitics, disinfectants and immunostimulants. In this paper, we have reviewed the herbal drugs most commonly utilized in domestic animals.

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