Traditional Medicine in livestock management

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Abstract

Recently, interests in traditional/ ethno-veterinary investigations have increased enormously at national and international level. Ethno-veterinary medicine deals with people's knowledge, skills, methods, practices and beliefs about the care of their animals. Ancient ethno-veterinary literature suggests that the tribal, non-tribal and rural population have been using wild ethno-flora since long for curing diseases of the pet/domesticated animals. The *Vedic* literature, particularly *Atharvaveda* is a repository of traditional medicine including prescriptions for treatment of animal diseases. *Rigveda* describes a lot regarding the close association of human beings with the plants for treatment of their kith and kin (*Ayurveda*) and their animals (*Mrig-Ayurveda*). Despite the increase in chemical and pharmacological studies in recent years, there is still much to be done in evaluating the resources of India with regard to medicinal plants which may be useful in veterinary medicine. This paper reviews some historical developments in traditional medicine based livestock management and the way forward.

Keywords: *Traditional medicine, Ayurveda, Atharvaveda, Ethno-veterinary practices, Livestock management*

Introduction

Livestock production systems and value chain studies have been found to be useful for understanding the dynamics of production systems and disease transmission. However, more explicit integration of the value chain studies into epidemiologic risk assessments are needed to identify effective disease control interventions by the veterinary authorities. Studies have found that, livestock contribute significantly more to the income stream of poor household particularly the income controlled by women, than to the income of those living above the poverty line (Hearth, 2007; Thornton *et.al.,* 2002; ADB, 2000). According to the FAO, the lack of drugs to treat diseases and infections causes losses of 30-35 % in the breeding sector of many developing countries, where poor animal health remains the major constraint for increased production. In many countries, there is a decline in funding for veterinary services and for animal health care in general. Traditional medicine based on phytotherapy may complement and offer alternatives for animal disease control, in particular for resource poor breeders. However, more studies are needed to investigate the efficacy of these botanicals.

In India, the history of traditional veterinary science dates back to the period of *Mahabharata*. During the battle of *Mahabharata* thousands of animals got hurt and also suffered from various diseases which were then treated with medicinal plants. Prince Nakula and Prince Sahadeva were the Physicians of horses and cows respectively (Raikwar and Maurya, 2015). The oldest *Vedic* literature consists of collections of hymns, liturgical chants and sacrificial or magical

formulae, mainly in verse, which constitutes the *Veda* proper (1500-1000 B.C.) (Mazars, 1994). The *Vedic* literature, particularly *Atharvaveda* is a repository of traditional medicine including prescriptions for treatment of animal diseases. Scriptures such as *Skanda Purana*, *Devi Purana*, *Matsya Purana*, *Agni Purana*, *Garuda Purana*, *Linga Purana*, and treatises written by *Charaka*, *Susruta*, *Palakapya* (1000 B.C.) and *Shalihotra* (2350 B.C.) documented treatment of animal diseases using medicinal plants. *Shalihotra* undoubtedly appears to be the first veterinarian of pre-historic times (Somwanshi, 2002; Raikwar and Maurya, 2015).

Rigveda describes a lot regarding the close association of human beings with the plants for treatment of their kith and kin (*Ayurveda*) and their animals (*Mrig-Ayurveda*) or today's ethnoveterinary medicine, the knowledge of which constitutes a relevant part of ethnobiological knowledge (Wanzala *et al.,* 2005). In true sense, it deals with people's knowledge, skills, methods, practices and beliefs about the care of their animals and to keep them healthy, which are acquired through practical experience and has traditionally been passed down orally from generation to generation (Toyang *et al.,* 2007).

Ayurveda in livestock management

Towards the end of the *Vedic* period, Indian medicine began to adopt observation and rational procedure, which developed into a coherent system known as *Ayurveda*. This knowledge served as a model for veterinary medicine, the history of which is still little known, producing a specialised literature in *Sanskrit* and in other languages of India. The surviving texts are concerned mainly with the treatment of horses and elephants. The legends incorporated in these texts present knowledge regarding the medical treatment of horses and elephants as being directly revealed by the gods. This may be explained partly by the need to provide veterinary medicine with an origin similar to that of the *Ayurveda*, which is also presented as 'divinely-inspired' knowledge. In fact, this veterinary medicine developed from the Ayurvedic model during the seventh or eighth centuries, which preceded the Christian era. It is also known, from the inscriptions of Asoka in the middle of the 3rd century BC, that, the Buddhist sovereign opened hospitals for animals (Schneider, 1978).

The oldest existing veterinary text from India is a treatise entitled *Asvayurvedasiddhanta* (a complete Ayurvedic system for horses) attributed to a certain *Salihotra* (Mukhopadhyaya, 1926). A person of the same name was mentioned in the *Mahabharata.* The treatise is probably earlier than the 10th century A.D. The same author apparently wrote two treatises on horses: *Asvalakshanasastra* (a treatise on the marks of horses) and *Asvaprasamsa* (in praise of horses). Subsequently, various treatises on horses and diseases of horses were composed. Among the best known works of this specialised literature are *Asvacikitsita* (therapeutics of horses), written by *Nakula* around the year 1000 (Mukhopadhyaya, 1926; Nakula, 1952), and *Asvavaidyaka* (medicine of horses) by *Jayadatta*, probably originating in the 13th century (Jayadatta, 1886-1887).

The principal surviving ancient text dealing with elephant medicine is a treatise which tradition ascribes to *Palakapya*, a legendary person, also known as *Dhanvantari*, the father of Indian surgery (Palakapya, 1894; Mukhopadhyaya, 1926). The text, entitled *Hastyayurveda, Ayurveda* of elephants is divided into four parts. The first part is devoted to general diseases, the second to localised and minor ailments, the third to surgery and anatomy and the last to the feeding of elephants and medicinal preparations. The text cannot be earlier than the middle ages, although it contains medical concepts and veterinary practices of long standing.

The Greek, *Megasthenes*, who lived in India for many years circa 300 B.C. as ambassador to Chandra Gupta (Sandrocottus), confirmed the existence of medical

aid for elephants and provided precise indications which agree with Indian sources. In particular, his evidence of care provided for elephants demonstrated that the state of veterinary medicine was already as advanced as in the *Hastyayurveda* and other more recent texts, such as the *Matangalila* Elephant sport by *Nilakantha* (Nilakantha, 1910; Edgerton,1931).

Ancient *Sanskrit* texts on veterinary medicine discuss every variety of edible products and indicate their different properties, which were suitable for animals of a given 'temperament', comportment and state of health, taking into account the climatic conditions, time of the day, *etc*. For example, a feed which may be given safely to a healthy animal may complicate a diseased state. The feeding of grass was ruled out, as it weakened the vitality of horses. However, barley, beans and butter were particularly recommended for mares during pregnancy. Sea salt should be added to feed in the case of diseases caused by wind disorders and venous diseases, or for a horse with sleeping difficulties. However, sea salt was not recommended for very old or very young horses, *etc*. (Blondeau, 1972; Mazars, 1994).

In addition, as in *Ayurveda*, the veterinary tradition of India placed an emphasis on procedures which would enhance the general state of health, notably the administration of tonics and stimulants (*rasayana*), and aphrodisiacs (*vajikarana*). The *rasayana* elixirs of long life were prescribed to strengthen animals and were recommended for preventing all sorts of illnesses. For example, a mixture based on aconite and three peppers was recommended for extending the life span of horses. The following plants were main constituents of such elixirs: *Asparagus racemosus*, *Emblica officinalis*, *Terminalia bellerica*, *Terminalia chebula*, *Tinospora cordifolia* and *Zingiber officinale*, buffalo horn was also a valued ingredient.

The passage in the *Charaka Samhita* (*Siddhisthana*, XI, 20-26) concerning enemas for elephants, camels, cattle, horses and sheep provides a basic formula composed of the following plants: *Acorus calamus*, *Glycyrrhiza glabra*, *Piper longum*, *Randa spinosa* and *Saussurea lappa*. A dozen other plants may be added to these basic ingredients for elephant enemas. For cattle preparations, addition of decoctions of *Butea monosperma*, *Cedrus deodara* and *Terminalia chebula* was recommended. Other plants were indicated for horse enemas, such as *Baliospermum montanum* or *Croton tiglium* (Sharma, 1983).

Ayurveda describes many treatises like *Gau-ayurveda* (cows), *Hastyayurveda* (elephants), *Ashvayurveda* (horses), *Mrig-Ayurveda* (animals), *Vriksha-ayurveda* (plants) etc. It is known that the two Pandavas, *Nakula* and *Sahdeva* were experts in veterinary medicine who mastered the use of plants for animal welfare. The vast knowledge has been documented in *Nakula Samhita*. Unfortunately, most of these rare treatises have not been preserved adequately. A majority of them are either not available at all or have been out of print for several decades. There is an urgent need to conserve the rich Indian tradition of veterinary health care described in the ancient Ayurvedic sciences.

Recently, the Indian Government, recognising the services rendered by traditional medicine, has given a new impetus to these practices. The study and practice of traditional medicine has been regulated, and training is provided at present by a large number of schools with associated hospitals and care centres. This movement has also benefited traditional veterinary medicine, which has undergone a revival. Several Indian laboratories now produce preparations from ancestral recipes, which are packed under modern conditions and sold throughout India for the treatment of domestic animals. Traditional formulations produced on a large scale include tonics, fortifiers and digestives, as well as anti-parasitic and antifungal products. Most of these medicaments are polyvalent, due to the multiplicity of ingredients used in their preparation. For example, a stomachic and tonic containing 59 ingredients is produced by

a company in Bangaluru, India. This preparation is recommended for treating digestive disorders (anorexia, dyspepsia, constipation, *etc*.) in cattle, sheep, goats, horses and dogs, in doses proportional to the size of these animals. The principal ingredients of vegetable origin include the following: *Aegle marmelos*, *Aquilaria agallocha*, *Butea monosperma*, *Centratherum anthelminticum*, *Curcuma longa*, *Ferula narthex*, *Moringa oleifera*, *Piper longum*, *Punica granatum*, *Terminalia bellerica*, *Terminalia chebula*, *Tinospora cordifolia*, *Trachyspermum ammi* and *Zingiber officinale*. These ingredients were prescribed in Ayurvedic medicine for their aperitive, digestive, stomachic, carminative or anthelmintic properties (Mazars, 1994).

Another example is provided by an ointment against sprains and sores, prepared from the following plants: *Abrus precatorius*, *Acorus calamus*, *Celastrus paniculatus*, *Hyoscyamus niger*, *Moringa oleifera*, *Nardostachys jatamansi*, *Ocimum sanctum*, *Saussurea lappa* and *Vitex negundo*. To these oils are added extracts of seven other plants: *Anacyclus pyrethrum*, *Colchicum luteum*, *Curcuma amada*, *Gloriosa superba*, *Litsea sebifera*, *Myrica nagi* and *Nerium odorum*. All these plants have been investigated and their active principles are known (Chopra *et al.*, 1956; Ambasta, 1986). *Nardostachys jatamansi* is often combined with oil of *Hyoscyamus niger* as an antineuritic. *Ocimum tenuiflorum* and *Vitex negundo* are used for wound dressing. In traditional medicine, the root of *Curcuma amada* is applied to contusions and sprains. Extract of *Colchicum luteum* is applied externally as an analgesic.

Ethnoveterinary medicine

Millions of people around the world have an intimate relationship with their livestock. Many people depend on their livestock. Animals provide them with food, clothing, labour, fertilizers and cash, and act as a store of wealth and a medium of exchange. Animals are a vital part of culture and in many societies are regarded as equal to humans. To keep animals healthy, traditional healing practices have been applied for centuries and have been passed down orally from generation to generation (Martin *et al.*, 2001). Before the introduction of western medicine, all livestock keepers relied on these traditional practices.

The scientific study of the relationship between people and plants, that is, how people of a particular culture and region make use of indigenous plants, is termed ethnobotany (Mathias, 2004). This term was first coined by the American botanist Dr. John William Harshberger, in 1895, at a lecture in Philadelphia to describe his field of inquiry, which he defined as the study of "plants used by primitive and aboriginal people." In 1896, Harshberger published the term and suggested 'ethnobotany' as a field which elucidates the 'cultural position of the tribes who used the plants for food, shelter or clothing'.

Ethnoveterinary medicine was practiced as early as 1800 B.C. at the time of King Hamurabi of Babylon who formulated laws on veterinary fees and charged for treating cattle and donkeys (Van Veen, 1996). Ethnoveterinary knowledge is acquired through practical experience and has traditionally been passed down orally from generation to generation. Ethnoveterinary medicine often provides cheaper options than comparable western drugs, and the products are locally available and more easily accessible. In the face of these and other factors, there is increasing interest in the field of ethnoveterinary research and development (Zschocke *et al.*, 2000; Masika *et al.*, 2000; Kone and Atindehou, 2008; Raikwar and Maurya, 2015). According to the WHO, at present, at least 80% of people in developing countries depend largely on these practices for the control and treatment of various diseases that affect both animals and humans.

Some traditional practices

Asparagus racemosus (root and tuber decoction), *Cassia tora* (seed extract), *Bauhinia purpurea* (stem,

bark decoction), *Andrographis paniculata* (fermented whole plant), *Cuscuta reflexa* (powder of the sun-dried whole plant) and *Cuscuta reflexa* (water vapour from the boiled leaves and stem) used in relieving fever and body pain. Paste of the roots, stem and leaves of the plants like *Bauhinia purpurea*, *Solanum torvum* and *Curcuma angustifolia* can be used against bone fracture.

The paste prepared from rhizome of *Acorus calamus*, stem and bark of *Buchnania lanzan*, shoot and leaves of *Bombax ceiba* and *Moringa oleifera*, roots of *Cieba pentandra,* shoot and leaf paste of *Achyranthus aspera* and *Clemone gynandra* and seed oil of *Madhuca indica* can also be used for healing wounds. The decoction prepared from the leaves of *Aegle marmelos* along with leaves of *Datura metel*; paste prepared from the leaves of the plant *Cassia fistula* along with leaves of *Musa paradisiaca* and *Aegle marmelos*; boiled *Azadirachta indica* leaves in Til oil or oil prepared from the whole plant of *Potentilla fulgens* can be applied to the joints of the foreleg against cattle suffering from black quarter disease.

Fresh roots of *Hygrophila auriculata* along with grass are fed to the animal to get relief from chicken pox or small pox. Paste prepared from the leaves of *Nicotiana tabacum*, decoction of the fruit *Terminalia chebula* or tar-like oil extracted from the pericarp of the fruit *Semecarpus anacardium* can be applied on the hoofs of the cattle suffering from foot and mouth disease. *Caesalpinia crista*, *Melia azedarach*, *Saussurea lappa*, *Moringa oleifera*, *Trachelospermum jasminoides*, *Butea frondosa*, *Fumaria parviora*, *Nigella sativa*, *Vernonia anthelmintica*, *Embellia ribes*, *Psoralea corylifolia*, fruits of *Mallotus philippensis*, *Punica granatum* or *Lagenaria siceraria*, seeds of *Butea superba* or *Peganum harmala* can be used as anthelmintic. The roots of *Morus alba* are considered as an anthelmintic and vermifuge, whereas root bark and stem bark of this plant are reported to act as vermifuge and purgative. Leaves of *Caesalpinia bonduc* can be helpful to cure animals suffering from worms.

Use of neem stick or juice of the plant *Pergularia daemia* against glossitis, either bark decoction of *Adhatoda vasica* and *Ocimum sanctum* leaves or flower decoction of *Calotropis procera* and *Vitex negundo* for cough, cold or fever, *Cucumis melo* for bloat and indigestion, *Pyrus pashia*, *Psidium guajava*, seeds of the plant *Trachyspermum ammi* fresh rhizome of *Zingiber officinale*, powdered leaves of *Terminalia arjuna*, *Syzygium cumini* and *Acacia catechu* for digestive disorder, diarrhoea and pterygium disease*, Annona squamosa* against local infection or *Ziziphus mauritiana* against skin disease are quiet noteworthy.

In case of bone fracture or severe sprains, the paste made from bark of *Bombax ceiba* can be applied on the affected area externally and a bandage cloth may also be tied. Boiled roots of the plant *Triumfetta rhomboidea* can be used in case of surgical complication like yolk gall. Young leaves of *Bambusa bambos* along with green fodder and leaves of the plant *Momordica charantia* mixed with salt can be fed to cattle after delivery for the easy removal of placenta.

Nelumbo nucifera is used for the treatment of several disorders including skin diseases, cough, inflammation, fever, *etc*. Leaf decoction *Anisomeles indica* is given thrice a day for a week to cattle to reduce body inflammation. The tuberous root of *Arisaema tortuosum* is crushed along with black pepper and jaggery and given to cattle as tonic, half litre for 3-5 days.

Seeds of *Abrus precatorius* for neck infection, leaves of *Aloe vera* for unconscious condition, *Andrographis paniculata* for snakebite, *Dendrocalamus strictus* for painless delivery, *Gymnema sylvestre* for over secretion of lachrymal glands, *Leucas aspera* for scorpion bite, *Vitex negundo* for swellings, tender leaves of *Strychnos nux-vomica* for bone fracture,

roots of *Calotropis gigantea* for running nose, fruits of *Coriandrum sativum* to facilitating conception, stem bark of *Dalbergia latifolia* for the animals which are not grazing normally.

Conclusion

More than an economic enterprise, livestock keeping is a centuries-old, inviolable tradition of ancient India. The treatment of animal diseases in ancient India was well developed and carried out with great care and precision by well-trained personnel. Indian medical treatises like *Charaka Samhita*, *Susruta Samhita* and *Harita Samhita* contain chapters or references about care of diseased as well as healthy animals. The wealth of ethnomedicinal knowledge also points to a great potential for research and the discovery of new drugs to cure the diseases of animals. In remote and often inaccessible locations of the tropics, ethnoveterinary interventions are often the first line of defense against potentially crippling health problems. Furthermore, ethnoveterinary medicine lends itself easily to local adaptation and application. However, while efficacy of some traditional medicines has been validated, standardisation of extracts and dosage regimes needs to be done.

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