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Herbal Remedies for Diseases Affecting Small Ruminants

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Livestock production is steadily gaining importance in India and it is considered to be an integral part of rural economy. Livestock farming provides regular income to the landless poor farmers such who cannot keep one or two dairy animals, can maintain small ruminants like sheep and goat form their livelihood.

Goat is known as the “poor man’s cow” in India. According to the 20th Livestock Census conducted by the Government of India in 2019, the goat population in India was 148.88 million. This represents an increase of 10.1% compared to the previous census conducted in 2012, when the goat population was 135.17 million. The demand for meat and meat products increasing each year. Among the meat products goat meat is popular, costlier and fetches good return for the farmer. India ranks first in the world in goat population. The economic value of goats can also be realized from the continuously increasing trend in their population during last 40 years, in spite of more than 1/3rd population being slaughtered for meat and skin every year. Consumption of goat meat is increasing rapidly due to its social acceptability. This sector has tremendous potential in employment generation & poverty reduction.

Goat and sheep farming will significantly boost the local economy by creating jobs for the residents. Small ruminants such as goats and sheep are key sources of meat and income for farmers. They are raised across all of Indian states, but they do best in dry, semi-arid and hilly regions. Most of the rural households own few small ruminants, which are kept both for home consumption and for sale. Besides they have been raised as a source of manure. Although small ruminants play an important role in supplying food (protein) and other products to farmers and their families and considered to be a supplementary farm enterprise. Along with the agricultural activities, sheep and goats provide substantial income and employment to rural communities. Animal husbandry operations, particularly raising of sheep and goats, support rural households, especially during periods of agricultural failure caused by drought. They were advantageous as least skill and resource input are needed. Furthermore, it is anticipated that livestock would account for more than half of the total global agricultural output in terms of financial output because livestock production has been expanding faster than any other agricultural sector.

India is a subtropical country, making its animals more vulnerable to several contagious illnesses. The death rate from infectious diseases is higher when modern veterinary services are not accessible and medicine costs are high. Farmers can take advantage of the abundance of natural medicinal plants in India to treat livestock with herbal remedies for viral diseases that are frequently encountered rather than with standard allopathic treatment regimens. Since ancient times, plants and their components have been used as a source of medicine to treat illnesses in animals. This approach is still being used in many areas of the

nation where access to veterinary care and infrastructure is extremely limited for those who live in isolated rural areas and where treatment of animals is not cost effective, particularly in small ruminants.

Importance of Ethnoveterinary medicine

The ethnoveterinary practices are passed down orally from generation to generation without any written records and are based on folk beliefs, traditional knowledge, and skills used for animal healthcare practices. In large parts of the poor globe where the common farmer can rarely access or afford veterinary medications, especially by small ruminants, these ethnoveterinary practices may offer significant benefits. Additionally, for their primary healthcare, about 80% of people in developing nations still use traditional medicine, which is mostly based on plant and animal species.

Anthelmintic resistance

Diseases caused by helminthic parasites continue to pose a significant production challenge for livestock, particularly for small ruminants in the tropics and subtropics. Direct and indirect losses due to nematode infections are estimated to be high and control of these parasites is therefore considered important. In most cases, control is accomplished by combining the regulation of grazing with the use of synthetic anthelmintics. However, anthelmintic resistance has emerged as a result of the abuse and subpar formulation of these drugs. Resistance to the anthelmintic drugs used for gastrointestinal nematodes of sheep has become an increasingly wide spread problem in recent years in many parts of the world. Anthelmintic resistance (AR) has developed as global issue in the small ruminant industry during past few decades. The modern broad-spectrum anthelmintics are currently used in prophylaxis and treatment of helminth infections in farm animals. The problem of resistance developing in the organisms that were being treated as a result of the excessive use of anthelmintics. Anthelmintic resistance is due to low protein diet and inadequate dose level of antiparasitic agents. In small ruminants, gastrointestinal parasitism is one of the most important causes for production losses around the world. Even though indiscriminate and frequent use of anthelmintics shows a reduction in their effectiveness and subsequently results in anthelmintic resistance, the management of G.I parasites can be accomplished in India by a variety of anthelmintics.

Anthelmintic resistance is now a serious problem that needs to be addressed. In addition, there is a greater need for alternate endoparasite control methods due to drug residues in animal products, toxicity, expense, adaptation issues, and non-availability of pharmaceuticals in remote places. For treating basic medical conditions and preserving animal productivity, ethnoveterinary remedies are widely utilised and extremely successful. The information is verbally transmitted from one generation to the next. typical rural wisdom in this area has been influenced by the major drawbacks of the typical western animal healthcare system, including expense, accessibility, and other issues including side effects. There is little evidence in the literature reviews on ethnoveterinary medicine (EVM) from different parts of the world for the use of plants as anthelmintics in animals. The use of herbal remedies may offer less expensive, ecologically harmful, and promising substitutes for traditional anthelmintics. Studies and general observations indicate that farmers use a variety of ethnoveterinary practices to treat a variety of ailments. While some of these have the potential to be successful treatments, others are based on superstitions and fantastic religious beliefs or have insufficient evidence to be taken seriously.

The majority of substances utilised in the creation of ethnoveterinary medications are plants. All plant parts, including the leaves, bark, fruits, flowers, and seeds, are utilised in the production of medicinal products. The use of locally available plants with dependable chemotherapeutic activity would be accessible and affordable to landless and poor farmers

for effective control of parasitic diseases. In this context, we discuss a few of the ethnoveterinary remedies (for small ruminants) provided by Dr. N. Punniamurthy, a former professor and head of the VUTRC in Thanjavur, Tamil Nadu, which have a solid track record in clinical trials.

Primary herbal treatment for enteritis

Table 1: Mixture 1 of herbal treatment for enteritis

S. No.	Ingredients	Quantity
1.	<i>Cuminum cyminum</i> (Cumin)	10 grams
2.	<i>Papaver somniferum</i> (Poppy seeds)	10 grams
3.	<i>Trigonella foenum-graecum</i> (Fenugreek)	10 grams
4.	<i>Piper nigrum</i> (Black pepper)	5 grams
5.	<i>Curcuma longa</i> (Turmeric)	5 grams
6.	<i>Ferula foetida</i> (Asafoetida)	5 grams

Table 2: Mixture 2 of herbal treatment for enteritis

S. No.	Ingredients	Quantity
1.	<i>Allium cepa</i> (Shallot onion)	2 bulbs
2.	<i>Allium sativum</i> (Garlic)	2 cloves
3.	<i>Murraya koenigii</i> (Curry leaves)	50 grams

Procedure:

1. The components of mixture 1 were dried and roasted on a sim fire in a metal pan for over 5 mins to make it charred. Then allowed to cool and wetted with water and ground into a paste immediately before application.
2. Similarly, the components of mixture 2 were ground into a paste.
3. Both the pastes were mixed together and made into small balls. The small balls have to be impregnated with common salt before administration (once).

Primary herbal treatment for deworming:

Table 3: Ingredients for herbal treatment for deworming

S. No.	Ingredients	Quantity
1.	<i>Cuminum cyminum</i> (Cumin)	15 grams
2.	<i>Brassica nigra</i> (Mustard)	10 grams
3.	<i>Piper nigrum</i> (Black pepper)	10 grams
4.	<i>Curcuma longa</i> (Turmeric)	5 grams
5.	<i>Allium sativum</i> (Garlic)	5 cloves
6.	Banana tree stem	100 grams
7.	<i>Leucas aspera</i> leaves (Thumbai)	15 nos.
8.	<i>Azardirachta indica</i> (Neem) leaves	15 nos.
9.	<i>Momordica charantia</i> (Bitter gourd)	50 grams
10.	Karupatti (Paanai vellam/ Palm jaggery)	150 grams

Procedure:

1. Black pepper, cumin and mustard were ground into powder and mixed with rest of the ingredients and made into a paste.
2. Small balls were made from the paste, which should be impregnated with common salt before administration (once).

Primary herbal treatment for Poisonous bite:

Table 4: Ingredients for herbal treatment for Poisonous bite

S. No.	Ingredients	Quantity
1.	<i>Cuminum cyminum</i> (Cumin)	15 grams
2.	<i>Allium cepa</i> (Shallot onion)	10 cloves
3.	<i>Piper nigrum</i> (Black pepper)	10 grams
4.	Banana tree extract	50 ml
5.	<i>Leucas aspera</i> leaves (Thumbai)	15 nos.
6.	Betal leaves	5 nos.
7.	Siriyangai	15 nos.
8.	Salt	15 grams

Procedure:

1. Grind the cumin and pepper and mix with rest of the ingredients and make into a paste.
2. Make small balls impregnated with common salt and administer (once) with 100 grams of jaggery.

Primary herbal treatment for Peste des Petits Ruminants (PPR) :

Table 5: Ingredients for herbal treatment for PPR

S. No.	Ingredients	Quantity
1.	<i>Cuminum cyminum</i> (Cumin)	15 grams
2.	<i>Trigonella foenum-graecum</i> (Fenugreek)	15 grams
3.	<i>Piper nigrum</i> (Black pepper)	10 grams
4.	<i>Curcuma longa</i> (Turmeric)	5 grams
5.	<i>Allium sativum</i> (Garlic)	5 cloves
6.	<i>Moringa oleifera</i> leaves	50 grams
7.	<i>Cissus quadrangularis</i> (Pirandai)	50 grams
8.	Karupatti (Paanai vellam/ Palm jaggery)	50 grams

Procedure:

1. Cumin, pepper and fenugreek were ground and mixed with rest of the ingredients, ground into paste and made into small balls.
2. The balls should be impregnated with common salt and administered once.

Table 6: Important medicinal plants used in Livestock diseases (Rastogi et al., 2015 and Parthipan et al., 2016)

S. No.	Name of the herb	Common name	Plant part used	Used for	Preparations and applications	Used in
1.	<i>Acalypha indica</i>	Kuppaimeni	Leaves	Wound healing	Paste, topical	Ruminants
2.	<i>Achyranthes aspera</i>	Nayuruvi	Leaves	Watering in eyes	Juice, topical	Goat
3.	<i>Adhatoda vasica</i>	Adhathoda	Leaves	Respiratory infections	Decoction, oral	Ruminants
4.	<i>Aloe vera</i>	Soaththukatalai	Leaves	Anoestrous	Decoction, oral	Cow
5.	<i>Allium sativum</i>	Garlic/Poondu	Bulb	Respiratory infections, fever, skin infections, FMD	Juice, oral	Cow

6.	<i>Andrographis paniculata</i>	Chiriyenangai	Rhizome	Fever	Decoction, oral	Cow
7.	<i>Asparagus racemosus</i>	Thannervittan	Whole plant	Constipation	Juice, oral	Cow
8.	<i>Azadirachta indica</i>	Neem	Seed	Wound	Seed oil, topical	Cow
			Leaves	In swellings, inflammation, constipation and mosquito repellent	Paste	Cow
9.	<i>Boerhavia diffusa</i>	Punarvana	Leaves	Improve vitality	Paste	Cow
10.	<i>Calotropis gigantea</i>	Vellaerukku	Latex	Wounds on legs	Raw, topical	Cow
11.	<i>Cardiospermum halicacabum</i>	Mudakkaththaan	Leaves	Fever	Paste, oral	Goat
12.	<i>Coriandrum sativum</i>	Coriander, Malli	Seed oil	Constipation, indigestion	Oral	Goat
13.	<i>Cissus quadrangularis</i>	Pirandai	Leaves	Downer cow syndrome	Decoction, oral	Cow
14.	<i>Curcuma longa</i>	Manjal	Rhizome	Wound, fever and respiratory infections	Paste, topical, oral	Ruminants
15.	<i>Gymnea sylvestre</i>	Sirukurunjaan	Leaves	Fever	Paste, oral	Cow
16.	<i>Leucas aspera</i>	Thumbai	Leaves	Wound	Juice, oral	All animals
			Flower	Fever		
17.	<i>Madhuca indica</i>	Illupai	Flower	Fever	Paste, oral	Sheep
18.	<i>Moringa oleifera</i>	Murungai	Leaves	Nutritional deficiencies	Paste, oral	Goat
19.	<i>Murraya kaenigii</i>	Karuveppilai	Leaves	Anoestrus	Raw, oral	Cow
20.	<i>Ocimum sanctum</i>	Thulasi	Leaves	Respiratory infections	Juice, oral	Cow
21.	<i>Pedaliium murax</i>	Perunerunjil	Leaves	Fever	Paste, oral	Sheep
22.	<i>Phyllanthus niruri</i>	Keelanelli	Whole plant	Liver and urinary disorders	Paste, oral	Cow
23.	<i>Phyllanthus emblica</i>	Nelli	Fruit	Immuno-modulation	Paste, oral	Birds
24.	<i>Piper longum</i>	Thippili	Seed	Mastitis, respiratory disease and intestinal disorders	Paste, oral	Cow
25.	<i>Piper betle</i>	Veththalai	Leaves	Rumen and metabolic disorders	Paste, oral	Cow

26.	<i>Tinospora cordifolia</i>	Seenthilkodi	Stem	Respiratory infections	Raw, oral	Sheep
27.	<i>Tribulus terrestris</i>	Nerinchil	Leaves	Enteritis	Juice, oral	Goat
28.	<i>Trigonella foenum-graecum</i>	Venthayam, Methi	Seeds	Urinary disorders, appetizer	Paste, oral	Cow
29.	<i>Vinca rosea</i>	Nithiya kalyani	Dried whole plant	Cancer	Powder, injection	Dog
30.	<i>Vitex negundo</i>	Nochi	Leaves	Mosquito repellent	Raw	Farm house
31.	<i>Withania somnifera</i>	Amukkara kilangu	Root	Fever, ulcer, immune-modulation, tissue healing and antibacterial	Powder, oral	Ruminants
32.	<i>Zingiber officinale</i>	Zinger/ inji	Rhizome	Conjunctivitis	Juice, oral	Ruminants