



ISSN (E): 2277- 7695  
ISSN (P): 2349-8242  
NAAS Rating: 5.23  
TPI 2021; 10(8): 541-544  
© 2021 TPI  
[www.thepharmajournal.com](http://www.thepharmajournal.com)  
Received: 10-06-2021  
Accepted: 13-07-2021

**M Sakthi Priya**

Assistant Professor, Department of Veterinary Pharmacology and Toxicology, VC&RI, Namakkal, Tamil Nadu, India

**Mohan B**

Dean, Veterinary College and Research Institute, Namakkal, Tamil Nadu, India

**Jagadeeswaran A**

Professor and Head, Department of Veterinary Pharmacology and Toxicology, VC&RI, Namakkal, Tamil Nadu, India

## Treatment of enteritis in goats with traditional ethno-veterinary medicine formulation

**M Sakthi Priya, Mohan B and Jagadeeswaran A**

### Abstract

An On farm trial for treating enteritis in goats with traditional ethno veterinary medicine was undertaken by Krishi Vigyan Kendra, Namakkal in a total of twenty five goats reporting to the Kendra, and as well as in the cases reporting to the Teaching Veterinary Clinical Complex, Namakkal. Twenty five goats were kept as check for the study. The case history collected from the farmers revealed over feeding, overstocking, poor sanitation, inadequate dry matter intake and symptoms exhibited were weight loss, indigestion, diarrhoea, anorexia, dehydration and pasty faeces. Treatment was initiated with the oral administration of traditional ethnoveterinary medicine consisting of cumin seeds (20g), poppy seeds (20g), fenugreek (20g), pepper (5g), turmeric (5g), asafetida (5g), onion (10Nos), garlic (5 Nos) and curry leaves (100g) thrice daily consecutively for three days (the herbal preparation was made by freshly grinding the materials every time before application). The traditional ethno-veterinary medicine formulation was found to be effective to treat diarrhoea, regain appetite and improved overall general body condition of the animals.

**Keywords:** Enteritis, goats, ethno veterinary medicine, cost benefit ratio

### Introduction

Goats are important domestic animals in tropical livestock systems and are reared in the rural areas of India mainly for meat and for dung (which is used as a natural fertilizer). Thus they play an important role in rural economy. As India is a sub-tropical country, they are more prone to different infectious and contagious diseases leading to higher mortality. Among these, enteric disorder is a common manifestation in goats. Enteritis is an inflammation of the intestinal mucosa resulting in diarrhoea and sometimes dysentery, abdominal pain, varying degree of dehydration and acid-base imbalance depending on the cause, severity and location. There are many causes for enteritis in farm animals and the disease varies considerably in its severity, depending upon the causative agent(s). (Radostits *et al.*, 2007) <sup>[13]</sup>. Of all, bacterial enteritis is the most important cause of diarrhoea in lambs and goat kids. Enterotoxigenic *Escherichia coli* and *Cryptosporidium parvum* are considered among the most prevalent causative agent of enteritis in goats (Gerald *et al.* 1992) <sup>[3]</sup>. Animals suffering from white scour exhibit severe colitis characterized by abdominal pain, pasty faeces, and may culminate into death due to severe dehydration. (Radostis *et al.*, 1995) <sup>[13]</sup>. Thus bacterial enteritis remains the most common clinical problem in the Goats. Goat farming activity is largely in the hands of rural farmers who are scarcely aware of veterinary and improved management services. In most of the cases farmers who are aware of the services also fail to save their livestock due to lack of access to modern veterinary facilities and some cannot afford to pay for them because they are expensive (Matekaire and Bwakura 2004) <sup>[8]</sup>. Besides improvement in managerial practices and prevention and treatment strategies, enteritis is still the most common and costly disease affecting small ruminants. Indiscriminate usage of antibiotics in animals for the treatment of various bacterial infections has led to emergence of resistant strains. India has plenty of natural medicinal plants (Meshram *et al.*, 2009) <sup>[10]</sup> which can be better utilised for herbal treatment for commonly occurring infectious diseases instead of routine allopathic treatment regimen. These herbal treatments can reduce the cost of treatment and can avoid unwanted adverse effect of allopathic medication. Thus the present study was designed to evaluate the efficacy of ethnoveterinary medicine formulation in treatment of enteritis in goats and to improve its general health condition.

### Materials and Methods

An On farm trial for treating enteritis in goats with traditional ethno veterinary medicine was

**Corresponding Author:**

**M Sakthi Priya**

Assistant Professor, Department of Veterinary Pharmacology and Toxicology, VC&RI, Namakkal, Tamil Nadu, India

undertaken by Krishi Vigyan Kendra, Namakkal in a total of twenty five goats reporting to the Kendra, and as well as in the cases reporting to the Teaching Veterinary Clinical Complex, Namakkal. Twenty five goats were kept as check for the study. The animals exhibiting the symptom of weight loss, indigestion, diarrhea with mucous coated, anorexia, reduced elasticity of skin indicating dehydration and pasty faeces with rough body coat were selected for the study. Treatment was initiated with the oral administration of traditional ethnoveterinary medicine formulation consisting of

*Cuminum cyminum* (cumin seeds 20g), *Papaver somniferum* (poppy seeds 20g), *Trigonella foenum-graecum* (fenugreek seeds 20g), *Piper nigrum* (pepper 5g), *Curcuma longa* (turmeric 5g), *Ferula foetida* (asafetida 5g), *Allium cepa* (onion 10Nos), *Allium sativum* (garlic 5 Nos) and *Murraya koenigii* (curry leaves 100g) (Table I).

Phytochemical analysis of the prepared enteritis formulation was performed (Trese and Evans, 1983; Kokate *et al.*, 1990) [18, 5].

**Table 1:** Preparation of the Traditional Ethnoveterinary Medicine formulation

Mixture 1			Mixture 2		
S. No	Ingredients	Quantity	S. No	Ingredients	Quantity
1.	<i>Cuminum cyminum</i> (cumin)	10 grams	7.	<i>Allium cepa</i> (shallot onion)	2 bulbs
2.	<i>Papaver somniferum</i> (poppy seeds)	10 grams	8.	<i>Allium sativum</i> (garlic)	2 cloves
3.	<i>Trigonella foenum-graecum</i> (Fenugreek)	10 grams	9.	<i>Murraya koenigii</i> (curry leaves)	50 grams
4.	<i>Piper nigrum</i> (Black pepper)	5 grams	B) The ingredients in the mixture 2 are ground into a paste.		
5.	<i>Curcuma longa</i> (Turmeric)	5 grams			
6.	<i>Ferula foetida</i> (Asafoetida)	5 grams			
A) The ingredients in the mixture 1 is dried and roasted on a sim fire in a metal pan for over 5 minutes to make it charred black in appearance. This material is allowed to cool and wetted with water and ground into a paste immediately before application.			C) The paste made from mixture 1 and 2 are mixed well.		

The farmers were advised to follow the treatment thrice daily consecutively for three days by making fresh formulation every time before application.

## Results

Enteritis has a serious impact on production and health of the animals especially in ruminants. The antibiotics used for the treatment of enteritis may eliminate a significant proportion of the intestinal flora. The microorganisms in the digestive tracts of ruminant livestock have a profound influence on the conversion of feed into end products which can impact on the animal and the environment. Use of broad spectrum antibiotics in ruminants inhibit the beneficial indigenous bacteria that affects its function of digestion and detoxification, results in antibiotic residues in animal products and development of antibiotic resistance in food borne pathogens. (McSweeney and Mackie, 2012) [9]. Medicinal

plants are promising source of anti-diarrhoeal drugs because of the advantages of easy availability, no tissue residue, overcomes the problem of drug resistance, cheap and effective. In our study, the traditional ethno-veterinary medicine formulation (Table II) consisting of cumin seeds (20g), poppy seeds (20g), fenugreek (20g), pepper (5g), turmeric (5g), asafetida (5g), onion (10Nos), garlic (5 Nos) and curry leaves (100g) were administered orally thrice a day for three days as against the conventional treatment recommended for the check group with the regular treatment with antimicrobial agents like Co-trimoxazole, Ofloxacin, tinidazole, Metronidazole and anticoccidial and anthelmintic agents and with gastrointestinal protectants like kaolin, loperamide and anti-inflammatory drugs.

The Phytochemical analysis of the formulation reveals the presence of alkaloids, tannins, saponins, phenols, terpenoids, flavonoids and glycosides. (Table 2).

**Table 2:** Phytochemical compounds in the enteritis formulation

S. No.	Phytochemical	Result
1	Alkaloids	+
2	Saponins	+
3	Tannin	+
4	Phenol	+
5	Steroids	-
6	Terpenoids	+
7	Flavonoids	+
8	Amino acid and protein	-
9	Carbohydrates	-
10	Phlobatannin	-
11	Volatile oil	-
12	Hydrolysable tannin	-
13	Glycosides	+
14	Vitamin C	-

The taxonomy of the ingredients present in the formulation is presented in Table III. In traditional health practices, Cumin is used as a diuretic and to treat stomach upset and flatulence. It was thought to promote a healthy digestive system and the major pharmacological action of cumin includes antimicrobial activity (Kaur and Sharma, 2012). Longanga *et al.* (2000) [6, 7]

reported in his study that the anti-diarrhoeal effect of cumin may be due to the presence of tannins, reducing sugar, triterpenes and flavonoids. Poppy extracts have traditionally been used to relax smooth muscle tone, making them potentially useful in the treatment of diarrhea and abdominal cramping. (www.drugs.com). The seeds of fenugreek were

also recommended for use in diarrhoea of puerperal women, and in rheumatism. The seeds being toasted and afterwards infused are used by native practitioners in southern India for dysentery. (Toppo *et al.*, 2009) [17]. Medicinally black pepper can be used for digestive disorders like large intestine toxins, different gastric problems, diarrhoea and indigestion (Ahmad *et al.*, 2012) [1]. In India, turmeric has been used traditionally for thousands of years as a remedy for stomach and liver ailments, as well as topically to heal sores, basically for its supposed antimicrobial property (Deshmukh, 2014) [2]. Asafoetida was traditionally used for the treatment of asthma, epilepsy, stomachache, flatulence, intestinal parasites, weak digestion and influenza infection. (Irnashahy and Iranshahy *et al.*, 2011) [4]. In Indian folk medicine, the bulb of *A. cepa* is used to treat dysentery, fever, chronic bronchitis, insect bites, stings and skin disease (Rajeshkumar *et al.*, 2013) [14]. Sharma *et al.*, (2006) [16] reported that fructo-oligosaccharides present in the garlic was found to selectively stimulate the growth and activity of beneficial bacteria (bifidobacteria and lactobacilli) in the colon, and thus act as a prebiotic and improve the host health. The leaves bark and roots have bitter, astringent, aromatic, anthelmintic, anti-inflammatory, antiseptic and

antidiarrhoeal properties. (Pagariya and Maithilli, 2009) [11]. Among the phytochemicals, the tannins precipitate proteins of enterocytes which in turn reduce the peristaltic movement and intestinal secretions. Studies on the functional role of tannins also reveal that they could also bring similar functions by reducing the intracellular calcium ions inward current or by activation of the calcium pumping system (Veeresh *et al.* 2014) [19]. Hence the presence of tannins in the formulation may be one of the reasons for its antidiarrhoeal effect. The presence of flavonoidal and terpenoidal derivatives in the formulation would inhibit the release of autacoids and prostaglandins in intestinal cells, with enteritis. (Sahoo *et al.*, 2014) [15].

Thus the animals which received the ethnoveterinary treatment recovered uneventfully within three days and feed intake resumed to the normal and improved overall general body condition of the animals. Thus the traditional ethnoveterinary treatment was found to be effective to treat diarrhoea (Figure I and Table IV) with reduced cost of treatment and with a benefit cost ratio of 1.21 as against 1.15 when compared to the check.

**Table 3:** Taxonomy of the ingredients present in the enteritis formulation

Taxonomy	<i>Cuminum cyminum</i>	<i>Papaver somniferum</i>	<i>Trigonella foenum-graecum</i>	<i>Piper nigrum</i>	<i>Curcuma longa</i>	<i>Ferula foetida</i>	<i>Allium cepa</i>	<i>Allium sativum</i>	<i>Murraya koenigii</i>
Kingdom	Plantae	Plantae	Plantae	Plantae	Plantae	Plantae	Plantae	Plantae	Plantae
Class	Magnoliopsida	Magnoliopsida	Magnoliopsida	Magnoliopsida	Magnoliopsida	Magnoliopsida	Magnoliopsida	Magnoliopsida	Magnoliophyta
Order	Apiales	Ranunculales	Fabales	Piperales	Zingiberales	Apiales	Asparagales	Asparagales	Sapindales
Family	Apiaceae	Papaveraceae	Fabaceae	Piperaceae	Zingiberaceae	Apiaceae	Alliaceae	Amaryllidaceae	Rutaceae
Genus	<i>Cuminum</i>	<i>Papaver</i>	<i>Trigonella</i>	<i>Piper</i>	<i>Curcuma</i>	<i>Ferula</i>	<i>Allium</i>	<i>Allium</i>	<i>Murraya</i>
Species	<i>Cuminum</i>	<i>Somniferum</i>	<i>Foenum-graecum</i>	<i>nigrum</i>	<i>longa</i>	<i>Foetida</i>	<i>Cepa</i>	<i>sativum</i>	<i>koenigii</i>

While small ruminant farmers have less to offer in the treatment and control of some diseases e.g. acute life threatening bacterial diseases, they can cope with a reasonable spectrum of common disease conditions such as diarrhoea, etc with the herbal medicines. (Matekaire and Bwakura, 2004) [8]. Hence it was concluded that the components in the enteritis

fresh formulation acts synergistically to produce antibacterial, anthelmintic, anticoccidial, anti-inflammatory, antisecretory, antispasmodic, prebiotic, antioxidant and mucosal protective properties that scientifically supports the clinical cure of all forms of enteritis without the problems of superinfection, development and spread of resistance.

**Table 4:** Cost benefit analysis of traditional ethnoveterinary medicine over conventional medicine

Parameters	EVM treated (Demo)	Regular treatment (check)
Treatment materials used	EVM treatment with Cumin seeds (20g), Poppy seeds (20g), Fenugreek (20g), Pepper (5g), Turmeric(5g), Asafoetida (5g), Onion (10Nos), Garlic (5 Nos) and Curry leaves (100g)	Antibiotics Probiotics Rehydration therapy Adsorbents Astringents
Number of days of treatment	3	3
Number of days for recovery	3	5
Number of recurrences	3	8
Cost of treatment (Rs.)	50-70	200
Production cost/kg (Rs.)	200	200
Weight at 6 months (Kg)	14	12
Production cost upto 6 months (Rs.)	2800	2400
Gross cost (Rs.)	2870	2600
Selling price/kg (Rs.)	250	250
Gross return at 6 months (Rs.)	3500	3000
Net Profit (Rs)	630	400
Benefit Cost Ratio	1.21	1.15



**Fig I:** Goat with enteritis treated with ethnoveterinary medicine formulation

### Acknowledgement

The authors are highly thankful to Indian Council of Agricultural Research for providing the necessary funding for the successful completion of this On farm trial. The authors are also very grateful to the owners for their effective participation in this trial with utmost care and patience. The authors express their heartfelt sincere thanks to the staff of the Veterinary Hospital campus, Namakkal for their valuable contribution and co-operation during the entire course of this trial.

### References

- Ahmad N, Fazal H, Abbasi BH, Farook S, Ali M, Khan MA. Biological role of *Piper nigrum* L. (Black pepper): A review. *Asian pacific J Trop Biomed* 2012;S1945-S1943.
- Deshmukh MV. Investigation of antibacterial potential of turmeric (*Curcuma longa*) on enteric pathogens. *I J Appl Res* 2014;4(12):556-558.
- Gerald E Duhamel, Rodney A Moxley, Carol W Maddox, Denis Erickson E. Enteric infection of a goat with enterohemorrhagic *Escherichia coli*. *J Vet Diagn Invest* 1992;4:197-200.
- Iranshahy M, Iranshahy M. Traditional uses, phytochemistry and pharmacology of asafetida (*Ferula assa-foetida oleo-gum-resin*) - A review. *Journal of Ethnopharmacology* 2011;134:1-10.
- Kokate CK, Purohit AP, Gohale. *Pharmacognosy*, 1<sup>st</sup> Edition, Nirali Prakashan, Pune 1990.
- Kaur D, Sharma R. An update on Pharmacological properties of cumin. *IJRPS* 2012;2(4):14-27.
- Longanga OA, Vercruyse A, Foriers A. Contribution to the ethno botanical, phytochemical and Pharmacological studies of traditionally used medicinal plants in the treatment of dysentery and diarrhoea in the Lamella area, Democratic Republic of Congo (DRC). *J Ethnopharmacol* 2000;71:411-423.
- Matekaire T, Bwakura TM. Ethnoveterinary medicine: A potential alternative to orthodox animal health delivery in Zimbabwe. *International Journal of Applied Veterinary Medicine* 2004;2(4):269-273.
- McSweeney C, Mackie R. Microorganisms and ruminant digestion: state of knowledge, trends and future prospects. Commission on genetic resources for Food and Agriculture. Background study paper no. 61 2012.
- Meshram M, Ravikanth K, Maini S, Rekhe D. Treatment of Clinical Cases of Bacterial Enteritis in Goat with New Polyherbal Antidiarrhoeal formulation. *Veterinary World* 2009;2(4):143-145.
- Pagariya A, Maithili V. Antidiarrhoeal activity of *Murraya koenigii* Linn. Root extracts. *J Natural Remedies* 2009;9(1):8-11.
- Radostitis MC, Gay C, Kenneth W, Hinchclif, Constable P. *Veterinary Medicine: A textbook of the diseases of cattle, horses, sheep, pigs and goats*. 10<sup>th</sup> edition. Saunders Ltd, Philadelphia, PA 2007,235-247p.
- Radostits OM, Blood DC, Gay CC. *Vet. Medicine, A Textbook of diseases of Cattle, sheep, pig, goats and Horses*. 8th Edn. Philadelphia Sydney, Tokyo, Toronto 1995,697p.
- Rajeshkumar KA, Shaik J Venugopal, Raveesha P. Evaluation of antidiarrhoeal activity of aqueous bulb extract of *Allium cepa* against castor oil-induced diarrhoea. *Int J Herbal Med* 2013;1(3):64-67.
- Sahoo HBSK, Sahoo SP, Sarangi R, Sagar, Kori ML. Antidiarrhoeal investigation from aqueous extract of *Cuminum cyminum* Linn. Seed in albino rats. *Phcog Res* 2014;6:204-209.
- Sharma AD, Kainth S, Gill PK. Inulinase production using garlic (*Allium sativum*) powder as a potential substrate in *Streptomyces* sp. *Journal of Food Engineering* 2006;77:486-491.
- Toppo FA, Akhand R, Pathak AK. Pharmacological actions and potential uses of *Trigonella foenumgraecum*: A review. *Asian J Pharm Clin Res* 2009;2(4):29-38.
- Trese and Evans. *Pharmacognosy*, Ed 1983,12.
- Veeresh K, Manasa V, Vijusha M, Suthakaran R. Antidiarrhoeal activity of methanolic extract of *Justicia procumbens* by castor oil and enterpooling induced methods in rats. *Der Pharmacia Lettre* 2014;6(5):121-129.