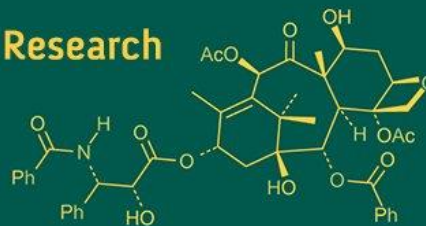


International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693
ISSN Online: 2617-4707
NAAS Rating (2026): 5.29
IJABR 2026; 10(5): 655-663
www.biochemjournal.com
Received: 05-03-2026
Accepted: 10-04-2026

Wankhede Gayatri

Hospital Registrar, Veterinary
Medicine, Veterinary Clinical
Complex, College of Veterinary
& Animal Sciences, Akola,
Maharashtra Animal & Fishery
Sciences University, Nagpur,
Maharashtra, India

Dhoot VM

Professor & Head, Department
of Veterinary Clinical
Medicine, Ethics &
Jurisprudence, Nagpur
Veterinary College, Nagpur
Maharashtra Animal & Fishery
Sciences University, Nagpur,
Maharashtra, India

Bhojane GR

Professor, Department of
Veterinary Clinical Medicine,
Ethics & Jurisprudence,
Nagpur Veterinary College,
Nagpur Maharashtra Animal &
Fishery Sciences University,
Nagpur, Maharashtra, India

Dakshinkar NP

Ex Professor & Head,
Veterinary Clinical Medicine,
Ethics & Jurisprudence,
Nagpur Veterinary College,
Nagpur Maharashtra Animal &
Fishery Sciences University,
Nagpur, Maharashtra, India

Corresponding Author:**Wankhede Gayatri**

Hospital Registrar, Veterinary
Medicine, Veterinary Clinical
Complex, College of Veterinary
& Animal Sciences, Akola,
Maharashtra Animal & Fishery
Sciences University, Nagpur,
Maharashtra, India

Therapeutic evaluation of polyherbal mixture on bloat in goats

Wankhede Gayatri, Dhoot VM, Bhojane GR and Dakshinkar NP

DOI: <https://www.doi.org/10.33545/26174693.2026.v10.i5h.8492>

Abstract

The present study was carried out to evaluate the efficacy of polyherbal mixture on bloat in goats. *In vivo* study was carried out on 24 goats naturally suffering with bloat distributed in four groups comprising six goats in each group. Group-1 was given *Gardenia gummifera* 4g, Group-2 with *Zingiber officinale* 8g, Group-3 with herbal mixture (*Zingiber officinale* 0.8g, *Gardenia gummifera* 0.4g, *Embellia ribes* 0.4g, *Trachyspermum ammi* 0.8g, *Peucedenum graveolens* 0.8g, *Ferrula asafoetida* 0.8g) amounting to 4g and Group-4 with herbal mixture (*Zingiber officinale* 1g, *Gardenia gummifera* 1g, *Trachyspermum ammi* 1g, *Ferrula asafoetida* 1g, *Peucedenum graveolens* 1g, *Embellia ribes* 1g) amounting to 6g. Observations were made at 0th and 8th hour with respect to colour, consistency, odour, pH, SAT (Sedimentation Activity Time), MBRT (Methylene Blue Reduction Time), CDT (Cellulose Digestion Time), protozoal motility, protozoal density, live% of rumen protozoa, total protozoal count, temperature, pulse rate, abdominal girth, type of respiration. In the present study antibloat polyherbal mixture at dose of 6g per goat given orally was found to reduce abdominal girth significantly in naturally bloated goats with corresponding improvement in rumen fluid parameters and physical parameters as well.

Keywords: Bloat, goat, polyherbal mixture, rumen liquor profile

1. Introduction

Bloat has been recognized as one of the major diseases that cause large economic loss in production field of domestic animals. In ruminants, anorexia, tympany, indigestion, are commonly encountered signs & are characterized by poor appetite, change in pH towards either sides, decreased ruminal motility & reduced protozoal counts (Gosselink *et al.*, 2004). Hence, an effective digestive system is vital to an animal not only for its physical outlook but also to produce milk & meat. Bloat is characterized by a distended abdomen and sometimes becomes apparent when the animal tries to empty its stomach. Ruminant animal produces large volume of gas during the process of digestion. This gas is either belched up or passes through the gastrointestinal tract. Bloat occurs when something interferes with gas escape from the rumen resulting in distension of the rumen. The ruminant suffering from bloat has symptoms of abnormal hypertrophy of rumen capacity, decline in feeding activity, decline in rumination behavior, dyspnoea (Radostits, *et al.*, 2007)^[17]. In acute cases animal dies as the continued accumulation of gas increases the pressure within the rumen, eventually causing death by asphyxiation as the rumen exerts pressure on the diaphragm and lungs (Chakrabarti, 2012)^[3]. Therefore, it becomes essential to correct the ruminal environment. Treatment of such ruminants by conventional drugs is expensive whereas by using herbal drugs, which are cheap, safe without any side effects. Herbal medicinal products represent a fast growth area of health-care products for companion animals (FAO, 1984). Therefore, a safe, locally available, economical and easy to administer without any toxic effect antifoaming medicament need to be developed (Williamsom, 2002)^[25]. This then can be employed in the livestock production system. The present invention provides a herbal formulation comprising a therapeutically effective combination of plants *Zingiber officinale*, *Gardenia gummifera*, *Trachyspermum ammi*, *Ferrula asafoetida*, *Peucedenum graveolens* & *Embellia ribes* useful in treatment of bloat.

2. Objective & aim of study

- Therapeutic evaluation of different herbs on bloat in goats
- Therapeutic Evaluation of herbal mixture on bloat in goats

3. Materials & methods

The study on Therapeutic Evaluation of Polyherbal Mixture in 24 goats reported from animal farm, veterinary dispensary and field naturally suffering with bloat was

carried out in the Department of Veterinary Clinical Medicine, Ethics & Jurisprudence, Nagpur Veterinary College, and Nagpur. These 24 goats were randomly distributed in four groups as T₁, T₂, T₃ and T₄ so that each group contains 6 goats. All the bloated goats selected for the study were treated with Herbal mixture of Zingiber officinale, Gardenia gummifera, Trachyspermum ammi, Ferrula asafoetida, Peucedenum graveolens and Embella ribes having the antifoaming property as follows:

Sr. No.	Group	Name of Herb	Dose rate
1	T ₁	<i>Gardenia gummifera</i>	4g
2	T ₂	<i>Zingiber officinale</i>	8g
3	T ₃	<i>Zingiber officinale</i> 0.8g, <i>Gardenia gummifera</i> 0.4g, <i>Embella ribes</i> 0.4g, <i>Trachyspermum ammi</i> 0.8g, <i>Peucedenum graveolens</i> 0.8g, <i>Ferrula asafoetida</i> 0.8g	4g
4	T ₄	<i>Zingiber officinale</i> 1g, <i>Gardenia gummifera</i> 1g, <i>Trachyspermum ammi</i> 1g, <i>Ferrula asafoetida</i> 1g, <i>Peucedenum graveolens</i> 1g, <i>Embella ribes</i> 1g.	6g

Rumen liquor profile including physical, chemical, microscopical examination was carried out. Physical examination as regards color, odor, and consistency of rumen fluid as well as Hydrogen ion concentration (pH), Sedimentation Activity Time (SAT), chemical examination as Cellulose Digestion Time & Methylene Blue Reduction Time and microscopical examination as regards total protozoal count, Live and dead protozoal count, Protozoal motility, Protozoal density were carried out at zero hour and eight hour after feeding antibloat mixture (photo 10 & 11). Clinical parameters like Abdominal girth, Pulse rate, Respiration rate and types of respiration were studied at zero hour and eight hour after feeding antibloat mixture. The collected data were statistically analyzed (Snedecor and Cochran 1994) [23].

Rumen Fluid Evaluation

Physical, Chemical and microscopic examination of rumen fluid was carried out at zero hrs and eight hrs.

1. Physical examination of rumen fluid:

1. Colour, odour, consistency were undertaken as per Rosenberger (1979).
2. Hydrogen ion concentration (pH): by using a digital pH meter (pH SCAN 2) for accurate and sensitive recording.
3. Sedimentation Activity Test: as per Nicholas and Penn (1958) (Photo 12).

2. Chemical examination of rumen fluid

As per Rosenberger (1979).

- 1 Cellulose Digestion Test:
- 2 Methylene Blue Reduction Test: (photo 13).

3. Microscopic examination of ruminal fluid as per Shankar Narayan and Nambiar (1972) [20].

- 1 Total Protozoal Count: (Photo 17)
- 2 Live and Dead protozoa count: (Photo 14 & 15)
- 3 Protozoal motility: A drop of freshly collected ruminal fluid was taken on a slide and topped with a cover slip and observed under low power microscope and graded as +, ++, +++, +++++.
- 4 Protozoal density: was observed under low power field (photo 16) and graded as.

Grade	Protozoal Density	No. of Protozoa per field
++++	Vigorous	Packed/Uncountable
+++	Abundant	>30 protozoa/LPF
++	Moderate	10-30 protozoa/LPF
+	Few	1-10 protozoa/LPF
-	None	Nil

2. Clinical parameters

In vivo studies following parameters were studied.

- Abdominal girth (photo 9)
- Pulse
- Respiration rate
- Types of respiration

Statistical Analysis

The collected data was statistically analyzed as per the methods of Snedecor and Cochran (1994) [23].

4. Results

In vivo study in T₁ (*Gardenia gummifera*) group revealed that there is no significant difference observed in color, consistency, odour whereas moderate changes were observed in CDT, protozoal density, ruminal motility and type of respiration. In T₂ (*Zingiber officinale*) groups similar changes were observed as in T₁. In T₃ (4g herbal mixture) group only protozoal density were found significant. In T₄ (6 g herbal mixture) group protozoal density, protozoal motility and ruminal motility increased at 8th hour which showed that the T₄ group treatment was much more effective as compared to other groups.

The average and S.E. were estimated and Two way analysis of variance was carried out for Hydrogen Ion Concentration (pH), SAT, MBRT, Live percentage of Rumen Protozoa, Total Protozoal Count, Temperature, Pulse rate & Abdominal Girth of goat pre-treatment on 0th Hour & post treatment on 8th Hour.

4.1 Hydrogen ion concentration (ph)

Table 1: Average $\pm$ S.E. of pH value at 0th and 8th hr

Sr. No.	Treatment	0 th hour	8 th hour	Average
1	T ₁	5.37 $\pm$ 0.06 ^{Aa}	5.78 $\pm$ 0.06 ^{Ba}	5.57 $\pm$ 0.07 ^{ab}
2	T ₂	5.32 $\pm$ 0.06 ^{Aa}	5.75 $\pm$ 0.06 ^{Ba}	5.53 $\pm$ 0.07 ^a
3	T ₃	5.33 $\pm$ 0.04 ^{Aa}	5.95 $\pm$ 0.06 ^{Bb}	5.64 $\pm$ 0.10 ^{abc}
4	T ₄	5.37 $\pm$ 0.06 ^{Aa}	6.05 $\pm$ 0.07 ^{Bb}	5.7 $\pm$ 0.11 ^{bc}
	Average	5.35 $\pm$ 0.01 ^A	5.88 $\pm$ 0.07 ^B	—

Different small superscripts indicate significance column-wise. Different capital superscripts indicate significance row-wise.

Rumen pH is a hydrogen ion concentration acts as an important indicator of the status of rumen fermentation. PH values of treatment group T₁, T₂, T₃ & T₄ at 0th hr changed from 5.37±0.06 to 5.78±0.06, 5.32±0.06 to 5.75±0.06, 5.33±0.04 to 5.95±0.06 & 5.37±0.06 to 6.05±0.07 respectively post treatment on 8th hour. It was observed that there was a significant difference between treatment groups ($p<0.05$) with respect to rumen fluid pH. The observation of present study was in accordance with Chand *et al.* (2001) [4] who reported an improvement in ruminal pH ($p<0.05$) at 48 hour (5 ±0.16) and by 120 hour (6.67±0.25) with return of pH to normalcy. This improvement in pH might be due to increase in Gram negative bacteria in rumen liquor. The observation of present study was in accordance with Chaudhari *et al.*, (2009) [5], Darwin *et al.*, (2007) [6] & Chand, *et al.*, (2001) [4] who reported an improvement in ruminal pH ($p<0.05$) at 48hour (5 ±0.16) and by 120 hour (6.67±0.25) with return of pH to normalcy. When comparison was made between 0th hour and 8th hour pH within all treatment groups and averages, it was observed that the pH increased significantly in all treatment groups. This indicated that pH values on 8th hour after treatment increased significantly in all treatment groups, exhibiting positive role of all treatment on bloat. This improvement in pH might be due to Gram negative bacteria in rumen liquor.

4.2 SAT (sedimentation activity time)

Table 2: Average ±S.E. of SAT value at 0th and 8th hr

Sr. No.	Treatment	0 th hour	8 th hour	Average
1	T ₁	8.88±0.32 ^C	8.91±0.34 ^C	8.9±0.22 ^c
2	T ₂	7.67±0.17 ^A	7.47±2.44 ^{Ab}	7.57±3.46 ^{ab}
3	T ₃	8.1±0.11 ^B	7.82±0.12 ^B	7.96±0.08 ^b
4	T ₄	7.67±0.09 ^A	7.27±0.09 ^A	7.47±0.08 ^a
	Average	8.09±0.29	7.87±0.36	—

Sedimentation Activity Time is considered as simple diagnostic test to detect abnormal changes in ruminal ingesta. When comparison was made between 0th and 8th hour it was observed that SAT values decreased post treatment in T₂ (7.67±0.17 to 7.47±2.44), T₃ (8.1±0.11 to 7.82±0.12) and T₄ (7.67±0.09 to 7.27±0.09) whereas SAT increased in T₁ (8.88±0.32 to 8.91±0.34). It was observed that there was a positive and significant effect of treatment on SAT at one per cent level. However, non-significant difference was observed with respect to hour effect. Since, non-significant difference was observed for average values of 0th and 8th hour indicated that because of treatment. It is observed from above results that SAT value average has marginally reduced in T₂, T₃ and T₄. T₄ gave better results followed by T₂, T₃ and T₁ respectively. Similarly, significant increase ($p<0.05$) in SAT was recorded by Randhwa *et al* (1989) [24] at 6th hour and no sedimentation activity was noted at 12th hour and 24th hour. Same findings were recorded by Basak *et al* (1993) [2] in SAT with significant increase ($p<0.01$) at 12th hour and absence of SAT from 24th hour might be due to destruction of microflora. Positive and significant effect of treatment on SAT at ($p<0.05$) was in accordance with Darwin *et al.*, (2007) [6], Pradhan, (1995) [16] & Randhwa, *et. al.*, (1989) [24]. The herbal treatment showed

a significant reduction in SAT value. This might be due to an improved vitality of surviving microflora.

4.3 MBRT (Methylene Blue reduction Time)

Table 3: Average ±S.E. of MBRT value at 0th and 8th hr

Sr. No.	Treatment	0 th hour	8 th hour	Average
1	T ₁	3.8±0.11 ^{Aa}	3.97±0.03 ^{Bb}	3.88±0.06 ^b
2	T ₂	4.03±0.08 ^{Bb}	3.87±0.07 ^{Ab}	3.95±0.05 ^b
3	T ₃	3.8±0.12 ^{Ba}	3.5±0.13 ^{Aa}	3.65±0.09 ^a
4	T ₄	4.03±0.09 ^{Bb}	3.65±0.08 ^{Aa}	3.84±0.08 ^{Ab}
	Average	3.91±0.06 ^B	3.74±0.10 ^A	—

Methylene Blue Reduction Time is the most reliable test to assess the microbial status of rumen fluid. When averages were estimated for all the treatment groups on 0th hour and 8th hour the significant reduction was observed in T₂ (4.03±0.08 to 3.87±0.07), T₃ (3.8±0.12 to 3.5±0.13) & T₄ (4.03±0.09 to 3.65±0.08) whereas MBRT increased in T₁ (3.8±0.11 to 3.97±0.03) as per table no 3. The treatment as well as hour effect were found significant ($p<0.05$). When average were estimated for all the treatment groups on 0th hour and 8th hour the significant reduction was observed from 3.91±0.06 to 3.74±0.10 minutes. In T₄ group, the MBRT values were also found decreased significantly when comparison was made for 0th and 8th hour average MBRT values. This is in general agreement with Darwin *et al.*, (2007) [6], Sharma, *et al.* (2009) [21] & Dirksen, (1983) [7]. Basak, *et. al.*, 1993 [2] also reported the physicochemical and microbiological changes in rumen liquor of experimentally induced lactic acidosis in goats. Lysis or death of rumen protozoa due to fall in rumen pH from 12-84 hr of induction of rumen acidosis. In present investigations, the time interval was probably falling short to hypothesize on role of ruminal protozoa in the causation of bloat.

4.4 Live% of protozoa

Table 4: Average± S.E. of Live% of Ruminal Protozoa at 0th and 8th hr

Sr. No.	Treatment	0 th hour	8 th hour	Average
1	T ₁	52.33±1.47 ^{Aa}	53.17±1.87 ^{Aa}	52.75±1.14 ^a
2	T ₂	54.33±0.76 ^{Aa}	56.5±0.71 ^{Bb}	55.42±0.59 ^b
3	T ₃	53.83±0.60 ^{Aa}	57.5±0.76 ^{Bb}	55.67±0.72 ^b
4	T ₄	53.17±0.40 ^{Aa}	61±0.85 ^{Bc}	57.08±1.26 ^b
	Average	53.42±0.43 ^A	57.04±1.61 ^B	—

Rumen protozoa are highly sensitive for the alteration in minor changes in the internal environment of rumen which includes pH as one of the factor. PH is the most sensitive indicator and protozoa may die with sudden drop in pH below 5. Therefore, iodophilic activity of protozoa was evaluated at 0th and 8th hour wherein, it was revealed that the differences between hour and treatment are significantly different. The average live% of rumen protozoa was found increased in T₄ (53.17±0.40 to 61±0.85) treatment group as compared to T₃ (53.83±0.60 to 57.5±0.76), T₂ (54.33±0.76 to 56.5±0.71) & T₁ (52.33±1.47 to 53.17±1.87). When averages were estimated in all 24 goats on 0th hour and 8th hour irrespective of treatment groups, it was observed that there was a significant increase in live% of rumen protozoa (Pradhan, 1995 & Phalpath, 1994) [16]. Rumen protozoa helps to maintain rumen buffer system by resisting lowering of pH in starchy diet as they engulf and temporarily store the starch particles in food vacuoles. Basak *et al* (1992) [2]

reported iodophilic nature of rumen protozoa were absent from 12-84 hr of induction of rumen acidosis. They attributed lysis or death of rumen protozoa due to fall in rumen pH. It appears that, present investigations the time interval was probably falling short to hypothesize on role of ruminal protozoa in the causation of bloat.

4.5 Total protozoal count

Table 5: Average $\pm$ S.E. of Total Protozoal Count ($\times 10^5$) at 0th and 8th hr

Sr. No.	Treatment	0 th hour	8 th hour	Average
1	T ₁	5.03 $\pm$ 0.15 ^{Aa}	5 $\pm$ 0.15 ^{Aa}	5.02 $\pm$ 0.10 ^a
2	T ₂	5.37 $\pm$ 0.08 ^{Ab}	5.92 $\pm$ 0.04 ^{Bb}	5.64 $\pm$ 0.09 ^b
3	T ₃	5.38 $\pm$ 0.06 ^{Ab}	6.12 $\pm$ 0.07 ^{Bb}	5.75 $\pm$ 0.12 ^b
4	T ₄	5.45 $\pm$ 0.08 ^{Ab}	6.53 $\pm$ 0.21 ^{Bc}	5.99 $\pm$ 0.19 ^c
	Average	5.30 $\pm$ 0.09 ^A	5.89 $\pm$ 0.32 ^B	—

Total Protozoal Count is subject to the change due to various factors like sudden change in pH either due to abrupt change in diet, non-digestible feed and feed producing acidity or alkalinity. Significant difference at 1% level was recorded for treatment effect as well as hour effect. It was observed that treatment T₂ (5.37 $\pm$ 0.08 to 5.92 $\pm$ 0.04), T₃ (5.38 $\pm$ 0.06 to 6.12 $\pm$ 0.07) and T₄ (5.45 $\pm$ 0.08 to 6.53 $\pm$ 0.21) significantly improved total protozoal count post treatment at 8th hr. The lower estimates of total protozoal count in group T₂, T₃, and T₄ observed in the present study might be due to lysis or death of rumen protozoa due to fall in rumen pH. It was observed that treatment T₂, T₃ and T₄ significantly improved total protozoal count post treatment at 8th hr. However the highest improvement was registered in T₄ which was 6g herbal mixture (FAO 1984). The marked improvement in total protozoal count in the present study sustained release of antifoaming agent that might be present in the herbs. However, the highest improvement was registered in T₄ which was 6g herbal mixture, clearly suggesting that herbs when mixed together have synergistic effect. The marked improvement in total protozoal count in the present study sustained release of antifoaming agent that might be present in the herbs. These findings were in accordance with Williamsom, (2002) [25], Mitra, (2007) [11] & Pradhan (1995) [16] who reported rapid drop in mean total protozoal count in group 1 and group 2 which became nil at 24th and 48th hour of induction of acidosis. Pant and Roy (1970) [14] demonstrated an inverse relationship in total protozoal count and pH of ruminal fluid. The osmolality associated with acidosis in the present study are in agreement with that of Rasal (2001) who also recorded alterations in pH and number of ruminal protozoa

4.6 Temperature

Table 6: Average $\pm$ S.E. of Temperature ($^{\circ}$ F) at 0th and 8th hr

Sr. No.	Treatment	0 th hour	8 th hour	Average
1	T ₁	103.2 $\pm$ 0.23 ^B	102.9 $\pm$ 0.21 ^A	103.05 $\pm$ 0.15
2	T ₂	103.15 $\pm$ 0.17 ^B	102.7 $\pm$ 0.15 ^A	102.92 $\pm$ 0.13
3	T ₃	102.95 $\pm$ 0.19 ^B	102.58 $\pm$ 0.22 ^A	102.77 $\pm$ 0.15
4	T ₄	102.88 $\pm$ 0.16 ^B	102.33 $\pm$ 0.17 ^A	102.61 $\pm$ 0.14
	Average	103.04 $\pm$ 0.07 ^B	102.70 $\pm$ 0.15 ^A	—

In all treatment groups the temperature found reduced due to treatment. The treatment effect was found non-significant. Whereas, the hour effect was found significant ($p < 0.01$). In

all treatment groups the temperature found reduced due to treatment which was in accordance with Sen *et al* (1982) [19] & Rasal (2001). Temperature recording of all 24 goats together exhibited similar trend of results. Reduction in respiratory rate must have reduced the metabolic rate with concurrent decrease in body temperature of the subjects under study & the significant reduction was observed indicated positive effect of treatment on all goats under study.

4.7 Pulse Rate

Table 7: Average $\pm$ S.E. of Pulse Rate at 0th and 8th hr

Sr. No.	Treatment	0 th hour	8 th hour	Average
1	T ₁	96.33 $\pm$ 1.67 ^{Ab}	93.83 $\pm$ 1.67 ^{Ac}	95.08 $\pm$ 1.18 ^b
2	T ₂	88 $\pm$ 3.42 ^{Ba}	84.33 $\pm$ 3.55 ^{Aa}	86.17 $\pm$ 2.41 ^a
3	T ₃	99 $\pm$ 1.52 ^{Bb}	92.67 $\pm$ 1.11 ^{Abc}	95.83 $\pm$ 1.31 ^b
4	T ₄	96.67 $\pm$ 1.98 ^{Bb}	88.83 $\pm$ 1.47 ^{Ab}	92.75 $\pm$ 1.67 ^b
	Average	95 $\pm$ 2.40 ^B	89 $\pm$ 2.14 ^A	—

Pulse rate is usually increased in accordance with severity of acidosis and in the present study investigations significant reduction in heart rate is in compliance with increase in ruminal pH. When comparison was made between treatment groups, it was revealed that significant difference was observed on 0th hour, 8th hour as well as averages reading, indicating T₂ values were less compared to rest of treatment groups. Comparison between 0th hour and 8th hour readings for T₁ group was found non-significant. Contrary to this, significant difference was observed between 0th and 8th hour of rest of the groups as per Table 7 and Fig 7. The observation in present study was in accordance with Sen *et al* (1982) [19], FAO (1984) & Rasal (2001). It was revealed that significant difference was observed on pulse rate at 0th hour & 8th hour. It has reduced significantly due to different types of treatment in different groups. In study, T₄ (6 g herbal mixture) group protozoal density, protozoal motility and ruminal motility increased at 8th hour which showed that the T₄ group treatment was much more effective as compared to other groups.

4.8 Abdominal Girth

Table 8: Average $\pm$ S.E. of Abdominal Girth (cm) at 0th and 8th hr

Sr. No.	Treatment	0 th hour	8 th hour	Average
1	T ₁	43.58 $\pm$ 0.89 ^B	41.17 $\pm$ 1.01 ^A	42.37 $\pm$ 0.74
2	T ₂	42.33 $\pm$ 0.81 ^B	38.83 $\pm$ 0.87 ^A	40.58 $\pm$ 0.77
3	T ₃	43.58 $\pm$ 0.91 ^B	39.25 $\pm$ 0.70 ^A	41.42 $\pm$ 0.85
4	T ₄	43.75 $\pm$ 1.01 ^B	38.67 $\pm$ 0.49 ^A	41.21 $\pm$ 0.93
	Average	43.31 $\pm$ 0.32 ^B	39.47 $\pm$ 0.57 ^A	—

The abdominal girth is one of the important parameters of present study. Hence, abdominal girth was recorded two times during the study. The average 0th and 8th hour readings of all treatment groups were calculated and presented in Table 8 and Fig 8. The statistical analysis was carried out for finding out significant difference between treatment and hour groups. The treatment effect was found non-significant while hour effect was found significant at 1% level. On the onset of the experiment, the 0th hour reading of abdominal girth was significantly higher in all the treatment groups compared to 8th hour reading. This clearly showed that abdominal girth has reduced significantly due to different types of treatment in different groups. The abdominal girth

at initiation of treatment was found to be increased because of production of excessive gas in the rumen which reduced after the herbal treatment. This indicated that all the treatment have positive effect on health of the goats FAO

(1984). In the present study the abdomen girth was reduced significantly as a result of which respiratory rate was also reduced. The results are in accordance with Rasal (200, Chand *et al* (2001)^[4] and FAO (1984).

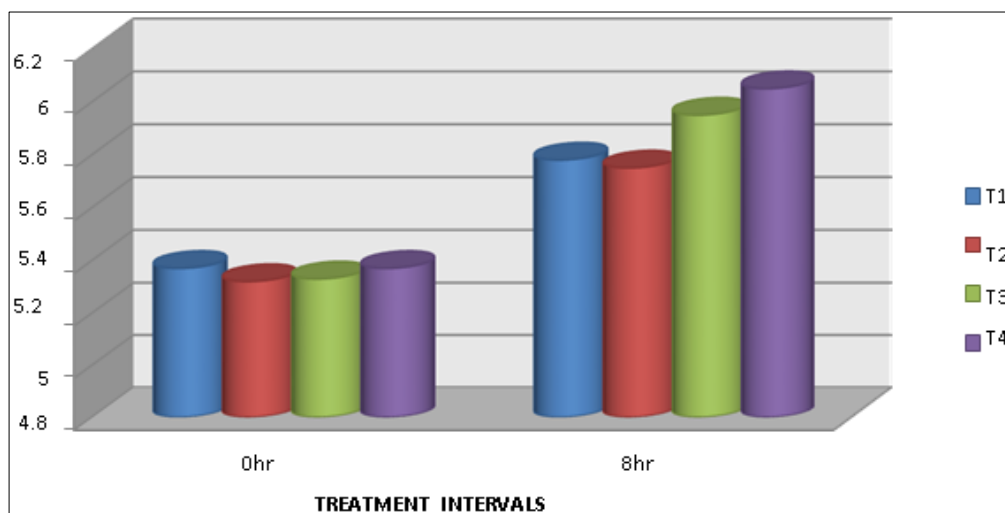


Fig 1: Average of pH value

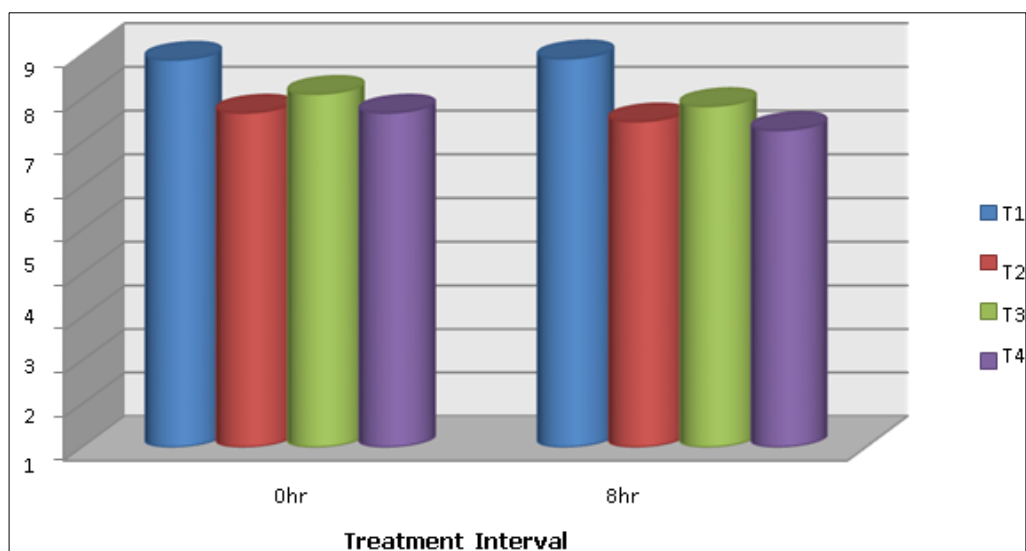


Fig 2: Average of SAT values

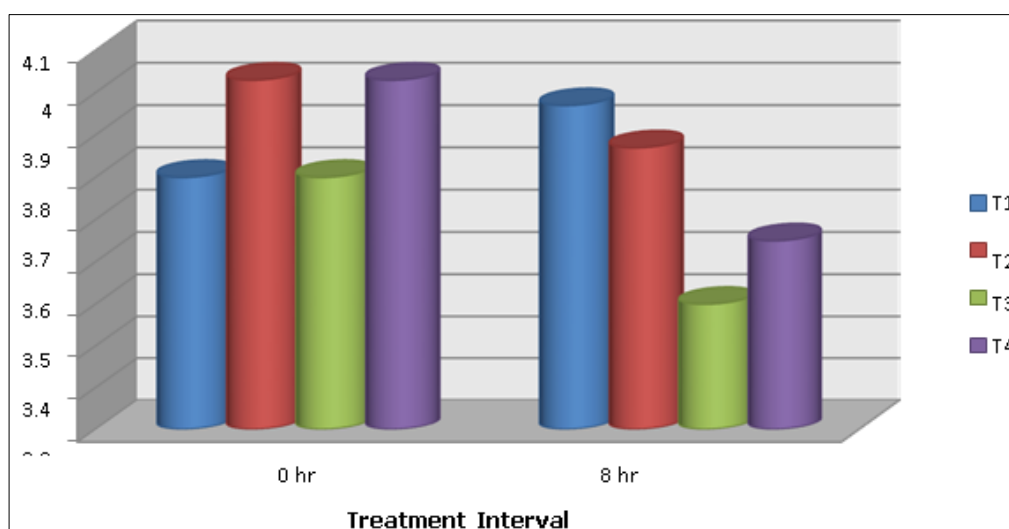
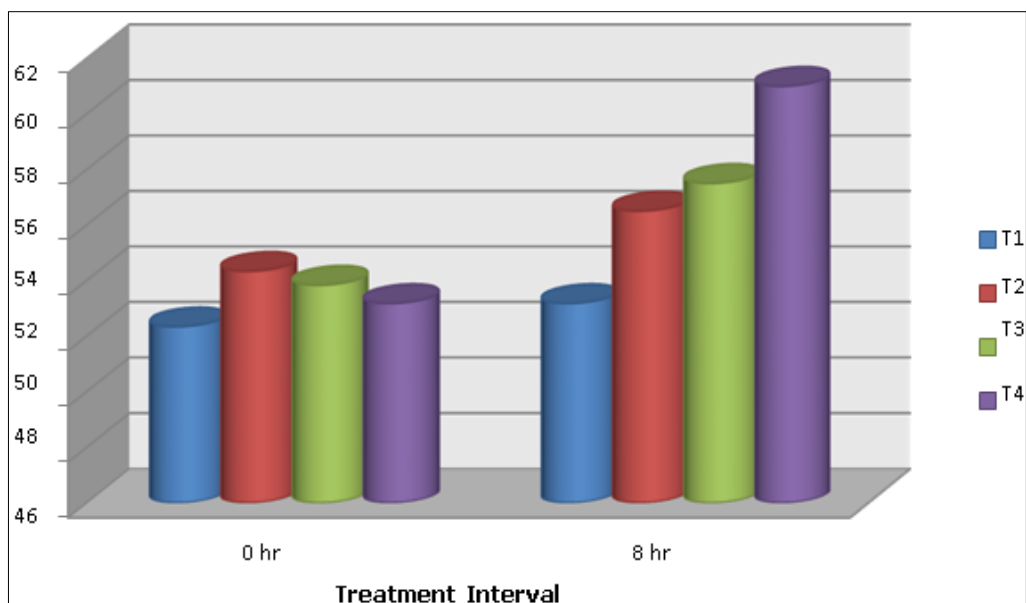
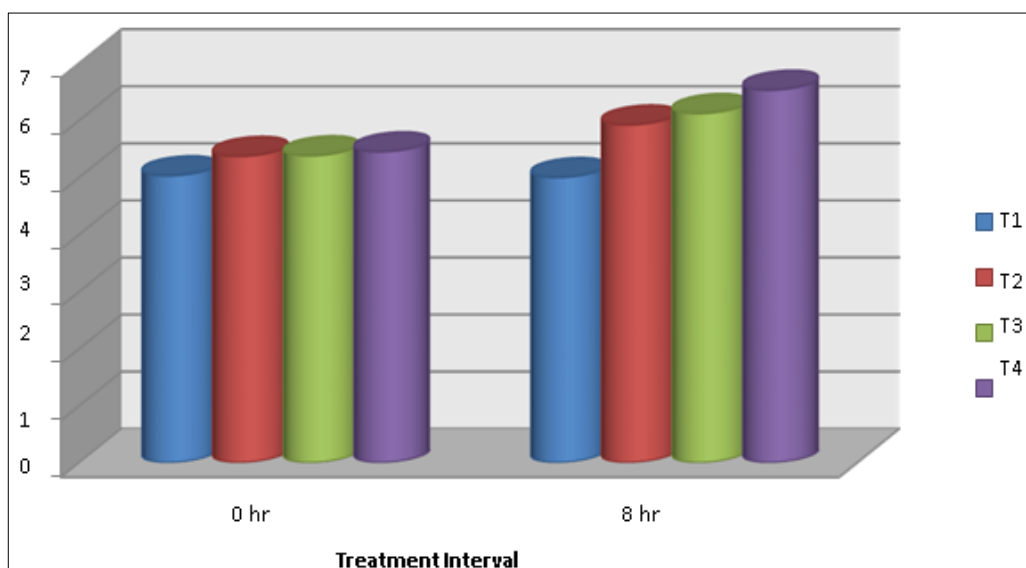
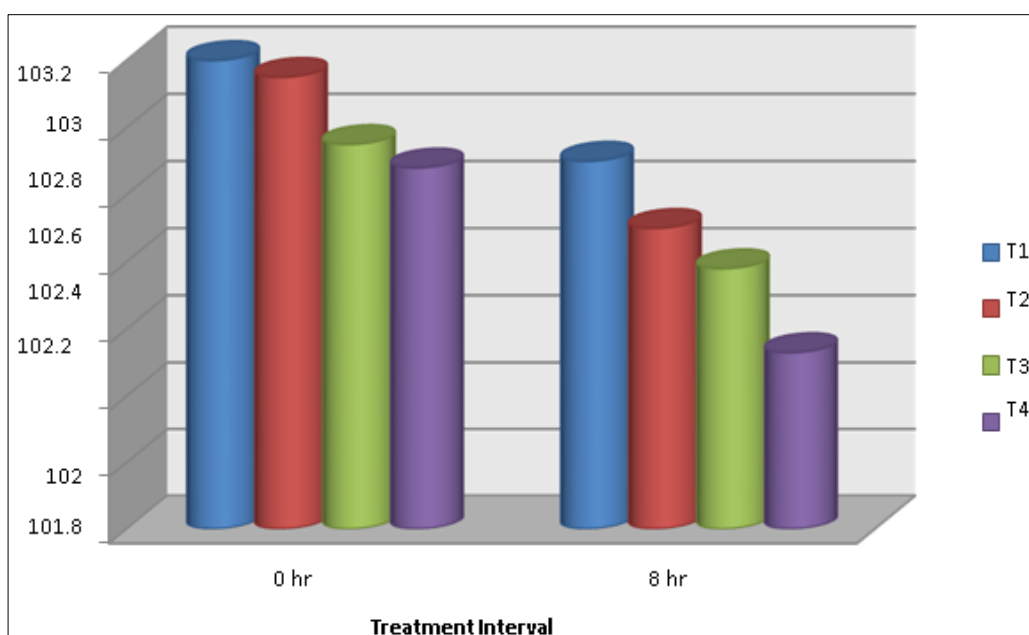


Fig 3: Average of MBRT values

**Fig 4:** Average of Live% of Rumen Protozoa**Fig 5:** Average of Total Protozoal Count**Fig 6:** Average of Temperature (°F)

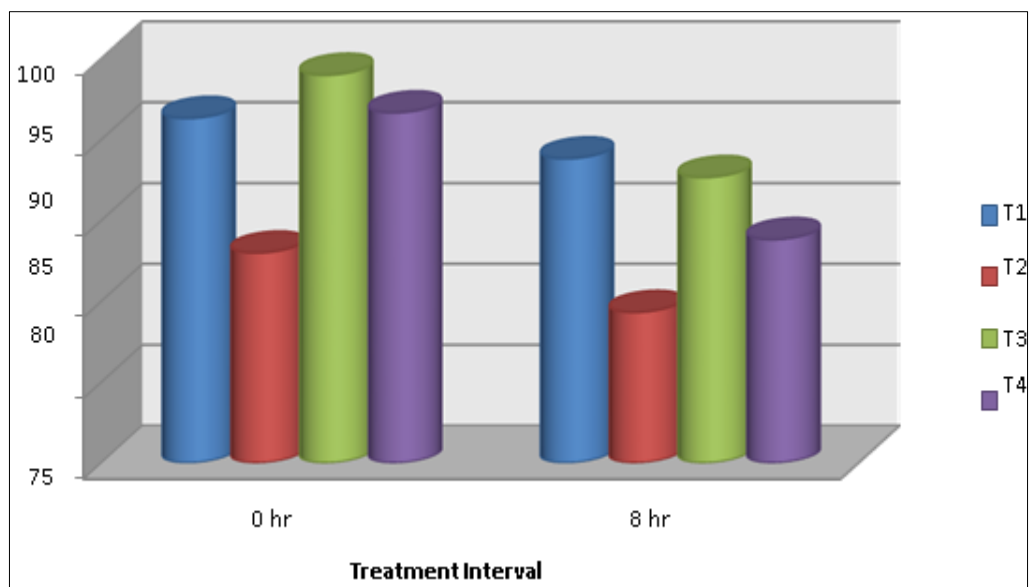


Fig 7: Average of Pulse Rate

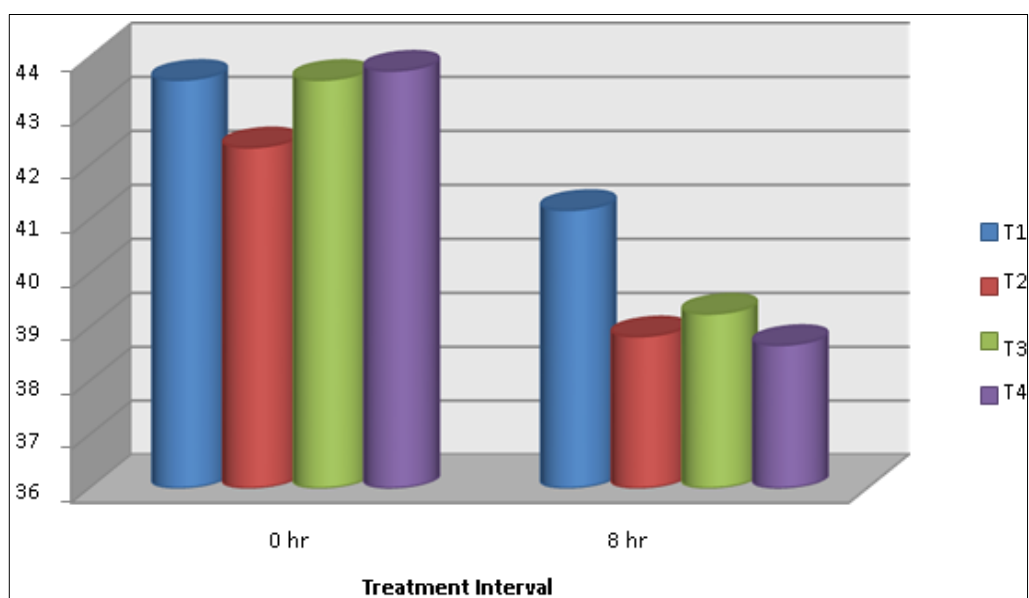


Fig 8: Average of Abdominal Girth (cm)



Fig 9: Measurement of Abdominal Girth



Fig 10: Feeding of Antibloat herbal mixture



Fig 11: Herbal mixture of *Gardenia gummifera*, *Zingiber officinale*, *Trachyspermum ammi*, *Peucedenum graveolens*, *Embella ribes* & *Ferrula asafoetida*

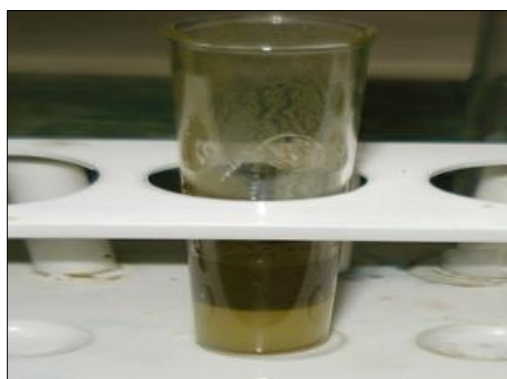


Fig 12: Sedimentation Activity Time



Fig 13: Methylene Blue Reduction



Fig 14: Live Protozoa

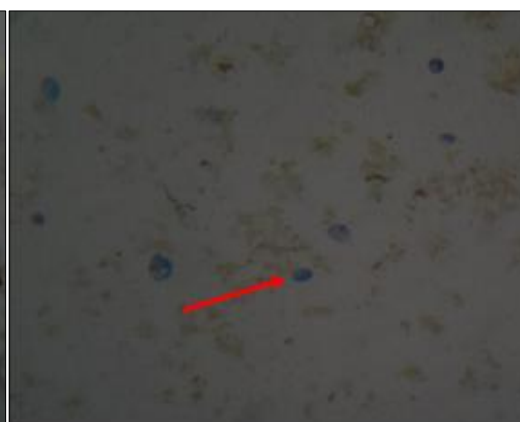


Fig 15: Dead Protozoa

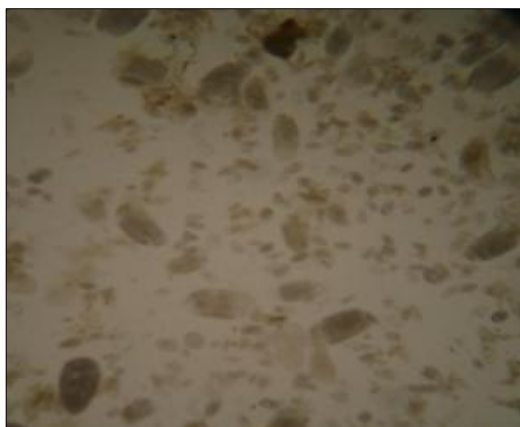


Fig 16: Total Density

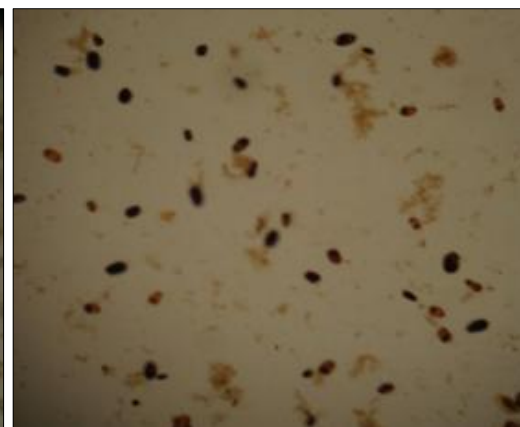


Fig 17: Total Protozoal Count

Conclusion

From the present study it can be concluded that the herbal mixture of 6g comprising one gram each of *Zingiber officinale*, *Gardenia gummifera*, *Trachyspermum ammi*, *Ferrula asafoetida*, *Peucedenum graveolens* and *Embella ribes* found to be more effective in treatment of bloat in goat clearly suggesting that herbs when mixed together have synergistic effect.

Acknowledgement

The authors are highly thankful to Dean, Nagpur Veterinary College, Maharashtra Animal & Fishery Sciences University, Nagpur for providing necessary facilities to carry out the investigation.

Conflict of Interest: None

Reference

- 1 Bagherwal RK. Therapeutic efficacy of Pachoplus against indigestion in dairy cattle under field condition. Indian Veterinary Journal. 1997;74(3):254-255.
- 2 Basak DN, Sarkar S, Chakrabarti A. A note on haematological changes in experimentally induced indigestion in goats. Indian Journal of Veterinary Medicine. 1993;13(1):32-32.
- 3 Chakrabarti A. A textbook of preventive veterinary medicine. 5th ed. New Delhi: Elite Art (Kalyani Publishers); 2012.
- 4 Chand DK, Gupta GC, Pachuri SP, Rajora VS. Biochemical and microbial studies of rumen fluid in experimentally induced acidosis. Indian Veterinary Journal. 2001;25(1):44-46.
- 5 Chaudhari P, Deshmukh V, Desai S. Buffzone for the treatment of bovine acidosis. Intas Polivet. 2009;10(1):8-12.
- 6 Darwin L, Suresh RV, Dhanapalan P. Rumen liquor profile examination in rumen acidosis in goats. Indian Veterinary Journal. 2007;84(8):882-883.
- 7 Dirksen G. Indigestion in cattle. Konstanz: Schnetztor-Verlag GmbH; 1983.
- 8 Food and Agriculture Organization. Traditional (indigenous) systems of veterinary medicine for small farmers in India. Rome: FAO; 1984.
- 9 Gosselink JMJ, Dulphy JP, Poncet C, Jailler M, Tamminga S, Cone JW. Prediction of forage digestibility in ruminants using in situ and in vitro techniques. Animal Feed Science and Technology. 2004. In press.
- 10 Kapoor LD. Handbook of Ayurvedic medicinal plants. Boca Raton (FL): CRS Press Inc.; 1990.
- 11 Mitra J. Therapeutic efficacy of Rumento Plus in the treatment of anorexia and indigestion in cattle. Indian Veterinary Journal. 2007;84(6):628-629.
- 12 Nadkarni AK. Indian materia medica. 3rd ed. Mumbai: Popular Book Depot; 1976.
- 13 Nicholas RE, Penn KE. Simple methods for detection of unfavourable change in ruminal ingesta. Journal of the American Veterinary Medical Association. 1958;133:275-277.
- 14 Pant HC, Roy A. Studies on rumen microbial activity of buffalo and zebu cattle. Indian Journal of Animal Sciences. 1970;40:600-609.
- 15 Phalpath PB. Clinical efficacy of Ruchamax in treatment of anorexia in goats [M.V.Sc. thesis]. Dapoli: Konkan Agricultural University; 1994.
- 16 Pradhan NR. Therapeutic efficacy of Herbosal, an herbal digestive tonic for ruminants. Indian Veterinary Journal. 1995;72(2):195-197.
- 17 Radostits OM, Clive CC, Hinchcliff KW, Constable PD. Veterinary medicine: A textbook of the diseases of cattle, sheep, goats and horses. 10th ed. Saunders: Elsevier Publication; 2007.
- 18 Rosenberger G. Clinical examination of cattle. 3rd ed. Berlin and Hamburg: Verlag Paul Parey; 1979.
- 19 Sen MM, Mishra SK, Chaudhari PC. Clinico-therapeutic aspects of acute ruminal acidosis in goats. Indian Journal of Veterinary Medicine. 1982;2:25-32.
- 20 Shankarnarayan G, Nambier KTK. Physico-chemical studies on rumen liquor. Cheiron. 1972;1:92-102.
- 21 Sharma MC, Sharma RD. A textbook of clinical veterinary medicine. New Delhi: Indian Council of Agricultural Research; 2009. p.134-137.
- 22 Singh U, Wadhwani AM, Johri DM. Dictionary of economic plants of India. 3rd ed. New Delhi: ICAR; 1990.
- 23 Snedecor GW, Cochran WG. Statistical methods. 6th ed. Ames (IA): Iowa University Press; 1994.
- 24 Randhwa SS, Aahuja AK, Rathor SS. Effect of old method for emptying of the rumen of cattle. Canadian Veterinary Journal. 1989;12:150-151.
- 25 Williamsom. Major herbs of Ayurveda. London: Churchill Livingstone; 2002.