

## Comparative Efficacy of Herbal Supplementation on Hematological Parameters in Hypogalactic Buffaloes

Shivangi Sharma, P. C. Shukla, Amita Tiwari,  
 Devendra Gupta, Rahul Sharma

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**Abstract** The present study was undertaken to know the comparative efficacy of herbal supplementation on hematological parameters in hypogalactic buffaloes. Total 32 apparently healthy, hypogalactic buffaloes, free from mastitis were selected for experiment and randomly divided into 4 groups as T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> each consisting of 08 animals. The T<sub>1</sub> group of 08 buffaloes was kept as control. All groups received basal ration along with 25g mineral mixture (MM). Group T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> received test diet. Comparative efficacy and residual effect of different herbal galactagogues were evaluated on the basis of hematological parameters. Treatment with *Lipidium sativum* and *Asparagus racemosus* (T<sub>2</sub>) was found to be most efficacious in terms of improvement in hematological parameters.

**Keywords** Hypogalactic, *Lipidium sativum*, *Asparagus racemosus*, *Leptadinia reticulata*, *Nigella sativa*.

### Introduction

Optimal milk production is the key requirement in the dairy economics. India ranks first in milk production with the annual production of 132.4 million ton, out of this nearly 51% of the milk production is contributed by buffaloes. Large scale studies have focused on the use of hormones and other veterinary medicines for supplementing performance, which are considered economically not affordable to Indian farmers. So there arises the need for other substitutes (such as herbs), which are considered as safe, cheap, locally available and at the same time they also improve production and reproduction performance of dairy animals.

The ancient history of India is very rich in herbal medicine and one of the oldest surviving systems of

**Table 1.** Experimental design.

Treat- ments groups	Number of animals	Treatment given
T <sub>1</sub>	8	Basal ration (existing feeding practices in farm) + Mineral Mixture
T <sub>2</sub>	8	Basal ration + MM + <i>Lipidium sativum</i> (Chandrasur) 70 g + <i>Asparagus racemosus</i> (Shatavari) 30 g once daily for 15 days
T <sub>3</sub>	8	Basal ration + MM + Pulv. <i>Leptadinia reticulata</i> (Jivanti) 1.5 g twice daily for 15 days
T <sub>4</sub>	8	Basal ration + MM + <i>Nigella sativa</i> (Kalongi) 50 g seed boiled and drenched orally once daily for 15 days

Shivangi Sharma<sup>1\*</sup>, P. C. Shukla<sup>1</sup>, Amita Tiwari<sup>1</sup>, Devendra Gupta<sup>1</sup>, Rahul Sharma<sup>2</sup>

<sup>1</sup>Department of Veterinary Medicine, <sup>2</sup> Department of Animal Nutrition  
 College of Veterinary Science and Animal Husbandry NDVSU,  
 Jabalpur 482002, MP, India  
 e-mail: spshivi094@gmail.com

\*Correspondence

**Table 2.** Effect of herbal galactagogus supplementation on total erythrocyte count ( $\times 10^6/\text{ml}$ ) of hypogalactic lactating buffaloes. Mean values with different superscripts between treatment (lowercase) and between interval (uppercase) differ significantly ( $p < 0.05$ ).

Sl. No.	Treatments	Interval			
		0	15	30	60
1.	T <sub>1</sub> (control)	6.85 <sup>aA</sup> $\pm$ 0.13	6.89 <sup>bA</sup> $\pm$ 0.13	6.88 <sup>bA</sup> $\pm$ 0.14	6.87 <sup>aA</sup> $\pm$ 0.14
2.	T <sub>2</sub>	6.90 <sup>aB</sup> $\pm$ 0.13	7.54 <sup>aA</sup> $\pm$ 0.13	7.45 <sup>aA</sup> $\pm$ 0.13	7.27 <sup>aA</sup> $\pm$ 0.13
3.	T <sub>3</sub>	6.95 <sup>aA</sup> $\pm$ 0.11	7.25 <sup>abA</sup> $\pm$ 0.09	7.12 <sup>abA</sup> $\pm$ 0.09	6.99 <sup>aA</sup> $\pm$ 0.11
4.	T <sub>4</sub>	6.91 <sup>aA</sup> $\pm$ 0.13	7.12 <sup>bA</sup> $\pm$ 0.12	7.00 <sup>bA</sup> $\pm$ 0.13	6.93 <sup>aA</sup> $\pm$ 0.13

health care in the world. Ayurveda is a natural remedy and totally based on herbs. These herbs are being used since Pre-Vedic times because they are safe to use, cheap and easily available, have no side effect and no residual effect in milk [1].

Herbal galactagogues act through interactions with dopamine receptors by exerting an influence through adreno-hypothalamo-hypophyseal-gonadal axis resulting in enhanced prolactin concentration and thereby augmenting milk production [2]. A number of herbal plants, such as Satavar, Jivanti, Fenugreek, Fennel, Ashwagandha, Vidari, Anise seed and Cumin, contain chemical active principles including alkaloids having galactogenic properties used for let down of milk [3].

### Materials and Methods

The present study was planned to know the effect of *Asparagus racemosus*, *Lipidium sativum*, *Leptadina reticulata* and *Nigella sativa* supplementation upon hemato-biochemical parameters in hypogalactic buffaloes.

#### Survey and selection of animals

A survey on total 290 lactating buffaloes between 3<sup>rd</sup>

to 5<sup>th</sup> parity (204 from unorganized and 86 from organized sector) was done in dairy farms of Jabalpur district. Data were recorded regarding average milk production in previous and present lactation, parity, stage of lactation, vaccination and deworming status. Modified California Mastitis Test was done to rule out the cases of mastitis. After survey, 32 apparently healthy hypogalactic buffaloes were selected for the therapeutic studies.

#### Experimental design

Hypogalactic buffaloes were divided into 4 groups as T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> each consisting of 08 animals. The T<sub>1</sub> group of 08 buffaloes was kept as control. Group T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> received treatments with different prototypes as per Table 1. All groups have received basal ration along with 25 g mineral mixture (MM).

#### Collection and processing of samples

Blood sample (02 ml) was collected aseptically with anticoagulant [EDTA] coated vacutainer on 0<sup>th</sup> day (pre-treatment), day 15<sup>th</sup>, 30<sup>th</sup> and 60<sup>th</sup> (post treatment) from all hypogalactic buffaloes.

The Hemoglobin (Hb), Packed Cell Volume (PCV)

**Table 3.** Effect of herbal galactagogues supplementation on hemoglobin concentration (gm/dl) of hypogalactic lactating buffaloes. Mean values with different superscripts between treatment (lowercase) and between interval (uppercase) differ significantly ( $p < 0.05$ ).

Sl. No.	Treatments	Interval			
		0	15	30	60
1.	T <sub>1</sub> (control)	9.90 <sup>aA</sup> $\pm$ 0.24	0.95 <sup>bA</sup> $\pm$ 0.23	10.08 <sup>bA</sup> $\pm$ 0.17	10.06 <sup>aA</sup> $\pm$ 0.18
2.	T <sub>2</sub>	9.91 <sup>aB</sup> $\pm$ 0.15	10.62 <sup>aA</sup> $\pm$ 0.14	10.50 <sup>aA</sup> $\pm$ 0.11	10.25 <sup>aAB</sup> $\pm$ 0.12
3.	T <sub>3</sub>	10.06 <sup>aB</sup> $\pm$ 0.11	10.53 <sup>aA</sup> $\pm$ 0.12	10.40 <sup>aAB</sup> $\pm$ 0.13	10.44 <sup>aAB</sup> $\pm$ 0.12
4.	T <sub>4</sub>	10.08 <sup>aB</sup> $\pm$ 0.11	10.58 <sup>aA</sup> $\pm$ 0.13	10.53 <sup>aA</sup> $\pm$ 0.12	10.43 <sup>aAB</sup> $\pm$ 0.11

**Table 4.** Effect of herbal galactagogues supplementation on packed cell volume (%) of hypogalactic lactating buffaloes. Mean values with different superscripts between treatment (lowercase) and between interval (uppercase) differ significantly ( $p < 0.05$ ).

Sl. No.	Treatments	Interval			
		0	15	30	60
1.	T <sub>1</sub> (control)	30.75 <sup>ba</sup> ± 0.79	31.87 <sup>ba</sup> ± 1.19	32.00 <sup>ba</sup> ± 0.56	32.25 <sup>ca</sup> ± 0.49
2.	T <sub>2</sub>	33.75 <sup>ab</sup> ± 0.52	35.87 <sup>aA</sup> ± 0.47	35.12 <sup>aAB</sup> ± 0.41	33.87 <sup>bB</sup> ± 0.28
3.	T <sub>3</sub>	34.37 <sup>ac</sup> ± 0.56	36.87 <sup>ab</sup> ± 0.51	35.75 <sup>aBC</sup> ± 0.45	38.87 <sup>aA</sup> ± 0.34
4.	T <sub>4</sub>	34.00 <sup>ab</sup> ± 0.59	35.87 <sup>aA</sup> ± 0.51	35.25 <sup>aAB</sup> ± 0.51	34.75 <sup>bAB</sup> ± 0.55

and Total Erythrocyte Count (TEC) were analyzed by auto-analyzer.

The data were analyzed statistically by using nested RBD. Significant mean difference among treatments was compared by Duncan Multiple Range Test.

## Results and Discussion

The blood samples of T<sub>1</sub> (control), T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> groups were analyzed at 0<sup>th</sup>, 15<sup>th</sup>, 30<sup>th</sup> and 60<sup>th</sup> day of experiment.

### Total erythrocyte count

The mean concentration of TEC was significantly higher on day 15<sup>th</sup> (07.54 ± 0.13), 30<sup>th</sup> (07.45 ± 0.13) and 60<sup>th</sup> (07.27 ± 0.13) in T<sub>2</sub> group when compared at day 0 (06.90 ± 0.13). In other treatment groups (T<sub>1</sub>, T<sub>3</sub> and T<sub>4</sub>) there is non-significant change between intervals (Table 2). The TEC prior to treatment was found to be within the normal range in all the treatment groups. Similar observation were recorded by other scientists also. The increase in TEC at 15<sup>th</sup> day post treatment in T<sub>2</sub> group which may be due to supplementation of mineral mixture along with *Asparagus racemosus* which act as immune-modulator and antioxidant. However addition of *Lipidium sativum* might have possibly meagre effect in enhancement of TEC concentration in T<sub>2</sub> group.

### Hemoglobin

The mean concentration of hemoglobin was found to be significantly higher at day 15<sup>th</sup>, 30<sup>th</sup> and 60<sup>th</sup> when compared to 0 day in group T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub>. In T<sub>1</sub> (control) group there was non-significant change in hemoglobin concentration between different intervals

(Table 3). There was decline in hemoglobin in early stage of lactation and later on it got increased as per the progression of lactation stage (early to mid) [4]. This is also supported other scientists who have revealed that hemoglobin concentration decrease in advance gestation and early lactation.

### Packed cell volume

In group T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> the mean value of PCV increase significantly on day 15<sup>th</sup> post treatment. In group T<sub>1</sub> (control) there was non-significant increase on day 15<sup>th</sup>, 30<sup>th</sup> and 60<sup>th</sup> post-treatment (Table 4). There was a direct co-relation between Hb concentration, PCV% and TEC.

An overview of the hematological studies including Hb, TEC and PCV indicated similar increased value post treatment in all the treated groups but the significant increase was observed in T<sub>2</sub> group. This increased value of Hb, PCV and TEC is because of their positive co-relations amongst them [5].

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