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Ethnoveterinary treatment for anestrus affected cows

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Abstract
Three groups of equal numbers of heifer and parous animals were created from the total of 36 anestrus cows. Group I animals received fenbendazole treatment along with supplementation of a mineral combination. Group II cows were also given utero-ovarian massage three times a week, whereas group III animals were given a herbal formula in addition to the utero-ovarian massage. The animals in Group III had success rates of 58.33%, which was much higher than the other groups. To reach a definitive conclusion, the study must be repeated using more modern methods, such as ultrasonography, and on a larger population.

Keywords: Anestrus, cattle, *Asparagus racemosus*, *Leptadenia reticulate* and *Murraya koenigii*

Introduction
A species' ability to reproduce is crucial to its survival, and in farm animals, anestrus is a key limiting factor. It is a reproductive cycle functional disease in which the animal does not display overt estrous behaviours. Season, stress, uterine diseases, poor management techniques, poor nutrition, and other factors can all affect how an individual expresses estrus. According to Kumar *et al*. (2014) [19], the incidence in cattle varies between 9.09 and 82.5% in India, depending on the time of year and the region. Heifers experience anestrus less frequently than adults do (Bharkad and Markandeya, 2003) [21]. The intercalving period is prolonged as a result, and dairy farms suffer significant financial losses from lower lifetime milk yield, lower calf crops, higher replacement costs, and higher treatment expenses. According to Kumar *et al*. (2013) [22], dairy animals lose an average of Rs. 372.90 every day due to anestrus. With differing degrees of effectiveness, different colleagues have tried a wide range of hormonal and non-hormonal substances (Deshpande *et al*., 2000, Agarwal *et al*., 2001, Kumar *et al*., 2005) [24, 25, 23].

To enhance the animal's health, deworming and adding a high-quality mineral supplement to the diet are recommended. The simplest, least expensive, oldest, and most successful way to induce estrus in anestrus-prone animals is utero-ovarian massage (Rahawy, 2009) [26]. After receiving utero-ovarian massage daily, every other day, or once a week for three to four weeks, 40 to 80% of cows have estrus induction (Mwaanga *et al*., 2004; Naidu *et al*., 2009) [29, 28]. While the exact mechanism of action is unknown, it may involve the following: stimulation of local oxytocin production by the ovaries, which in turn influences local blood circulation and luteolysis, if CL is present; activation of intrinsic ovarian factors; improvement of local blood circulation increasing the availability of various hormones and growth factors (Romaniuk, 1973; Lobb and Dorrington, 1992; Monget and Monniaux, 1995; Mwaanga *et al*., 2010) [27, 32, 31, 30].

Numerous plant-based heat inducers, some of which have inherent estrogenic qualities in addition to being rich sources of vitamins and minerals, have also been used to treat anestrus in animals (Kumar *et al*., 2014) [19]. Many plants such as *Abroma augusta* (Ulatkambal) (Kabir *et al*., 2001) [34], *Aegle marmelos* (bel) (Mehrotra, 2002) [6], *Asparagus racemosus* (Shatavari) (Pandey *et al*., 2018) [5], *Bambusa arundinacea* (bamboo) (Soumya *et al*., 2016) [9], *Carica papaya* (papaya) (Nayak, 1995) [37], *Couroupita guianensis* (Koradia, 1995) [38], cucumber leaves (Chander and Mukherjee, 1994) [20], jute plant (Gupta, 1993) [11], *Leptadenia reticulate* (jivanti) (Koradia, 1995; Dhalani and Nariya, 2017) [38, 14], *Murraya koenigii* (curry leaves) (Kumar and Punniamurthy, 2009) [33], *Nigella sativa* (kalonji) (Kabir *et al*., 2001) [34], *Saraca asoca* (Ashoka) (Rajkumar *et al*., 2008) [35], *Semecarpus anacardium* (Bechardas, 1992) [10] and *Trigonella foenum graecum* (Methi) (Rajkumar *et al*., 2008; Mishra *et al*., 2002) [35, 36] have been given, either separately or in combination, to anestrus-prone animals with

varying results when estrus is induced, with success rates varying from 40 to 85%.

Materials and Methods

In 2023, a study was conducted on cows kept in gaushalas located in the districts of Palwal and Hisar, Haryana. On the basis of the per-rectal evaluation of the genitalia and the related history, a total of 15 heifers and 21 parous cows were chosen. The study included only those animals with small smooth ovaries and no discernible luteal structure. Every animal that was chosen was more than three years old, appeared to be in good health, and had a body condition score on a five-point scale that fell between 2.5 and 3.5. The cows were split up evenly into three groups and given three distinct therapies. Tables 1 and 2 present the treatment protocol and herbal formula composition for the animals in Group III of the investigation, respectively. Per-rectal examination, which was carried out 15 days following the start of treatment, and the regular follow-up supplied by the animal handlers were used to evaluate the response.

Results and Discussion

When animals were examined per-rectally, it was shown that responsive animals had larger uteruses and ovaries. When the animal attendants noticed the overt indications of estrus (vulvar enlargement and vaginal discharge), the occurrence of estrus was taken into consideration. Fig. 1 displays the study's findings. When compared to group I animals, group III animals fed with the herbal solution performed significantly better, with both heifer and parous cows functioning equally.

According to earlier research, the current study's usage of herbs improved the rates of estrus induction in anestrus cows. The inherent qualities of herbal plants are responsible for the formulation's beneficial effects. Many compounds found in shatavari roots provide the body an estrogenic effect. According to Hayes *et al*. (2006) [17] and Sharma *et al*. (2009) [16], the two main steroidal saponins identified from the plant's roots are shatavarin and shatavaroside. The plant also exhibits good effects on the body's overall growth and possesses other properties such as antioxidant, immunomodulatory, and antibacterial activity. Additionally, Jivanti is abundant in a number of phytoconstituents, including rutin, β-amyrin, α-amyrin, simiarenol, hentriacontanol, reticulin, deniculatin, and leptaculatin (Krishna *et al*., 1975; Sastry *et al*., 1985) [12, 13]. These substances produce antibacterial, anti-inflammatory, and estrogenic effects (Dhalani and Nariya, 2017) [14]. Omega-3 fatty acids, which stimulate prostaglandin E2 synthesis and have luteotropic effects and help control uterine health, are abundant in flax seeds. Early puberty in rats fed with Murraya koenigii ethanolic extracts was reported by Mehrotra *et al*. (2003, 2004) [7, 8]. The rats' ovaries showed greater levels of steroidogenic activity, mainly oestradiol 17-β. The argument put up was that the extract's increased steroidogenic activity would have enhanced the mitosis of granulosa cells in the follicles that were still growing, therefore promoting follicular growth. Curry leaves were also a highly rich source of minerals, including iron, calcium, and phosphorus (Gopalan *et al*., 1996; Shantala and Prakash, 2005) [3, 4]. Many researches have established the significance of calcium and phosphorus in animal reproduction (Chandolia *et al*., 1987, Ali *et al*., 1991) [2, 1].

Table 1: Treatment protocol given to anestrus affected cows

Treatment	Dosage regimen	Group I (n=10)	Group II (n=10)	Group III (n=10)
Deworming (Fenbendazole)	3 gm p.o. once	+	+	+
Mineral mixture	50 gm p.o. b.i.d.*15 days	+	+	+
Salt	25 gm p.o. b.i.d.*15 days	+	+	+
Utero-ovarian massage	Weekly once (day 0, 7, 14)	-	+	+
Herbal formulation	60 gm p.o. b.i.d.*15 days	-	-	+

Table 2: Composition of herbal formulation

Sr. No.	Common name	Scientific name	Quantity (parts)
1	Shatavari	*Asparagus racemosus*	250 gm (1 part)
2	Jivanti	*Leptadenia reticulate*	250 gm (1 part)
3	Dried curry leaves	*Murraya koenigii*	500 gm (2 part)
4	Flaxseeds	*Linum usitatissimum*	500 gm (2 part)
5	Muscovado sugar		500 gm (2 part)

1, 2, 3 and 4- ground to fine powder
Mix with Muscovado sugar and store in cool and dry place

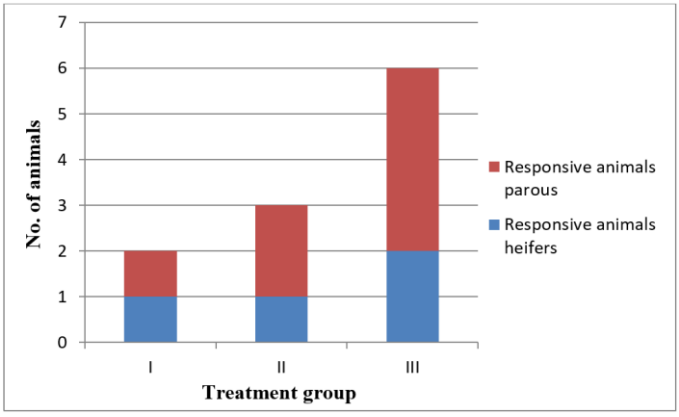

Fig 1: Responsive animals in various treatment groups

Conclusion

Herb supplements such as Shatavari, Jivanti, and Curry leaves have been found to be effective in helping anestrus cows resume their cycle. But in order to come to a definitive conclusion, this research must be repeated on a sizable number of animals, and cutting-edge tools like ultrasonography must also be used.

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