

**A COMPARATIVE PHARMACEUTICO-ANALYTICAL AND EXPERIMENTAL STUDY
OF DHATRYADI GHRITA AND MAHAKUSHMANDA GHRITA IN STREE
VANDHYATWA W.S.R. TO OVULATION-INDUCING ACTIVITY**¹Dr. Archana H. S., ²Dr. Laxmi Kurle, ³Dr. Priyanka H. S.¹MD (Ayurveda) Scholar, Department of Rasashastra & Bhaishajya Kalpana, Taranatha Government Ayurvedic Medical College, Ballari.²Professor and Head of the Department.³Assistant Professor Sdm Ayurveda Bangalore.***Corresponding Author: Dr. Archana H. S.**MD (Ayurveda) Scholar, Department of Rasashastra & Bhaishajya Kalpana, Taranatha Government Ayurvedic Medical College, Ballari. DOI: <https://doi.org/10.5281/zenodo.23033544>**How to cite this Article:** ¹Dr. Archana H.S., ²Dr. Laxmi Kurle, ³Dr. Priyanka H. S. (2026). A Comparative Pharmaceutico-Analytical And Experimental Study Of Dhatriyadi Ghrita And Mahakushmanda Ghrita In Stree Vandhyatwa W.S.R. To Ovulation-Inducing Activity. World Journal of Pharmaceutical and Medical Research, 12(10), 125–135.
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ABSTRACT

Background: Stree Vandhyatwa in Ayurveda is associated with disturbances in factors essential for conception, with anovulation being an important cause of impaired female reproductive function. Dhatriyadi Ghrita and Mahakushmanda Ghrita are classical Ghrita formulations indicated in Stree Vandhyatwa. **Aim:** To comparatively evaluate their pharmaceutico-analytical characteristics and ovulation-inducing activity. **Materials and Methods:** Dhatriyadi Ghrita and Mahakushmanda Ghrita were prepared by classical Sneha Paka and evaluated for organoleptic, physicochemical, microbial, TLC and HPTLC parameters. Thirty female Wistar albino rats were divided into five groups of six: normal control, positive control, Dhatriyadi Ghrita, Mahakushmanda Ghrita and standard drug (clomiphene citrate). Anovulation was induced using Primolut-N. Test formulations were administered orally at 5 mL/kg for 21 days. Estrous cyclicity, ovarian and uterine weights, serum estradiol and progesterone, and ovarian/uterine histopathology were assessed. **Results:** Both formulations showed satisfactory pharmaceutical characteristics and distinct HPTLC profiles. Estrus phase increased from 5.00 ± 0.836 days in the positive control to 6.00 ± 0.707 days with Dhatriyadi Ghrita and 7.80 ± 1.068 days with Mahakushmanda Ghrita, with significant increase for Mahakushmanda Ghrita. Ovarian weight increased significantly by 233.3% and 226.6%, respectively. Mahakushmanda Ghrita significantly decreased serum estradiol by 41.87% and increased progesterone by 59.99%. Histopathology showed improved follicular development and corpus luteum formation, particularly with Mahakushmanda Ghrita. **Conclusion:** Both formulations demonstrated promising ovulation-associated activity, with Mahakushmanda Ghrita showing comparatively greater effects. Further clinical studies are required to establish efficacy and safety in women.

KEYWORDS: Dhatriyadi Ghrita; Mahakushmanda Ghrita; Stree Vandhyatwa; anovulation; ovulation-inducing activity; Primolut-N; Wistar albino rats.

INTRODUCTION

Female infertility is an important reproductive health concern, and anovulation is a major contributor to impaired fertility. In Ayurveda, Stree Vandhyatwa is discussed in relation to disturbances in the factors essential for conception, including Ritu, Kshetra, Ambu and Beeja.^[1]

Dhatriyadi Ghrita and Mahakushmanda Ghrita are classical Ghrita formulations indicated in Stree Vandhyatwa. The formulations contain multiple drugs

traditionally described for nourishing and reproductive-supportive actions.^[2,3] Their constituent drugs, including Dhatri, Vidari, Shatavari and Kushmanda, are described in Ayurvedic pharmacopeias and medicinal-plant references.^[4-8]

Considering their classical indication and the need for experimental evidence, the present study was undertaken to comparatively evaluate the pharmaceutico-analytical characteristics and ovulation-inducing activity of

Dhatryadi Ghrita and Mahakushmanda Ghrita in a Primolut-N-induced anovulatory model.

AIM

To comparatively evaluate the pharmaceutico-analytical characteristics and ovulation-inducing activity of Dhatryadi Ghrita and Mahakushmanda Ghrita in Stree Vandhyatwa, with special reference to experimental anovulation.

OBJECTIVES

1. To Prepare Dhatryadi Ghrita and Mahakushmanda Ghrita.
2. To evaluate their pharmaceutico-analytical characteristics.
3. To evaluate their ovulation-inducing activity experimentally.

Formulation	Murchita Ghrita	Kalka Dravya	Drava Dravya
Dhatryadi Ghrita	1200 mL	150 g	6600 mL
Mahakushmanda Ghrita	1536 mL	192 g	10,780 mL

2.2 Analytical Study

The prepared formulations were evaluated for organoleptic characteristics, physicochemical parameters, microbial load, TLC and HPTLC as part of pharmaceutical quality assessment and standardization. The HPTLC profiles were documented under the specified detection conditions.

2.3 Experimental Study

Thirty healthy female Wistar albino rats weighing 150–200 g were randomly divided into five groups of six animals each. The experimental study was conducted after approval from the Institutional Animal Ethics Committee. Approval Number SDMCRA IAECI TGA-05, Anovulation was induced using Primolut-N. Dhatryadi Ghrita and Mahakushmanda Ghrita were administered orally at 5 mL/kg body weight for 21 consecutive days, while clomiphene citrate was used as the standard drug.

The treatment schedule was continued for 21 consecutive days, and the animals were evaluated using the predefined reproductive and biochemical parameters.

2.4 Assessment of Estrous Cycle

Estrous cyclicity was monitored by vaginal smear examination. Vaginal smears were collected in the morning, stained with concentrated methylene blue and examined microscopically to identify proestrus, estrus, metestrus and diestrus phases.

2.5 Assessment Parameters

The following parameters were assessed:

- Body weight
- Ovarian and uterine weight
- Estrous cyclicity
- Serum estradiol
- Serum progesterone

4. To compare their effects on estrous cyclicity, hormonal parameters and histopathological changes.

2. MATERIALS AND METHODS

2.1 Pharmaceutical Study

Dhatryadi Ghrita and Mahakushmanda Ghrita were prepared according to the classical Sneha Paka procedure. Dhatryadi Ghrita was prepared using 1200 mL Murchita Ghrita, 150 g Kalka Dravya and 6600 mL Drava Dravya, while Mahakushmanda Ghrita was prepared using 1536 mL Murchita Ghrita, 192 g Kalka Dravya and 10,780 mL Drava Dravya. The formulations were heated over Mandagni until the classical Sneha Siddhi Lakshanas were attained, filtered while warm and stored in airtight containers.^[9]

- Histopathological changes in ovary and uterus

2.6 Histopathological Examination

Following sacrifice, the ovaries and uterus were collected and preserved in 10% formalin. Tissue sections were prepared and stained for microscopic assessment of ovarian follicular development, corpus luteum formation and uterine changes.

2.7 Statistical Analysis

The data were analyzed using one-way analysis of variance (ANOVA) followed by Dunnett's multiple-comparison test. A P value < 0.05 was considered statistically significant.

3. RESULTS

3.1 Analytical Results

The prepared Dhatryadi Ghrita and Mahakushmanda Ghrita showed characteristic organoleptic properties and satisfactory Sneha Siddhi Lakshanas. The unsaponifiable matter was 1.84% in Dhatryadi Ghrita and 1.32% in Mahakushmanda Ghrita. HPTLC analysis demonstrated distinct chromatographic profiles for the two formulations, supporting their analytical differentiation.

3.2 Experimental Results

Effect on Estrous Cycle

Vaginal smear examination showed treatment-related changes in estrous cyclicity. The estrus phase increased from 5.00 ± 0.836 days in the positive control group to 6.00 ± 0.707 days in the Dhatryadi Ghrita group and 7.80 ± 1.068 days in the Mahakushmanda Ghrita group. The increase observed with Mahakushmanda Ghrita was statistically significant compared with the positive control.

Table 1: Effect of Dhatryadi Ghrita and Mahakushmanda Ghrita on Estrous Cycle.

Group	Proestrus	Estrus	Metestrus	Diestrus
Normal control	5.00 ± 0.930	9.33 ± 0.494	3.16 ± 0.749	3.50 ± 0.866
Positive control	2.80 ± 0.583	5.00 ± 0.836	3.20 ± 0.374	9.40 ± 0.748
Dhatryadi Ghrita	2.40 ± 0.748	6.00 ± 0.707	1.20 ± 0.489	11.40 ± 0.979
Mahakushmanda Ghrita	1.00 ± 0.316	7.80 ± 1.068	1.60 ± 0.244	10.80 ± 1.068
Standard drug	6.80 ± 1.655	3.00 ± 0.316	3.80 ± 0.663	5.80 ± 1.744

Values are expressed as Mean ± SEM.

Effect on Reproductive Organ Weight

Both Dhatryadi Ghrita and Mahakushmanda Ghrita significantly increased ovarian weight compared with the positive control, with increases of 233.3% and 226.6%,

respectively. Uterine weight decreased in both test groups; however, the change was not statistically significant.

Table 2: Effect on Ovarian and Uterine Weight.

Group	Ovarian weight (g)	Uterine weight (g)
Normal control	0.105 ± 0.025	0.660 ± 0.057
Positive control	0.075 ± 0.005	0.737 ± 0.079
Dhatryadi Ghrita	0.250 ± 0.000*	0.633 ± 0.184
Mahakushmanda Ghrita	0.245 ± 0.035*	0.577 ± 0.519
Standard drug	0.175 ± 0.000	—

*P < 0.05 compared with the positive control.

Effect on Serum Hormonal Parameters

Mahakushmanda Ghrita significantly decreased serum estradiol from 341.21 ± 36.14 in the positive control to 198.35 ± 12.44, corresponding to a 41.87% decrease. Dhatryadi Ghrita decreased serum estradiol to 270.50 ± 48.06.

Serum progesterone increased significantly from 42.76 ± 1.51 in the positive control to 68.42 ± 3.15 following Mahakushmanda Ghrita treatment, representing a 59.99% increase. Dhatryadi Ghrita showed a value of 39.97 ± 4.07.

Table 3: Effect on Serum Estradiol and Progesterone.

Group	Estradiol	Progesterone
Normal control	348.92 ± 23.52	42.06 ± 0.84
Positive control	341.21 ± 36.14	42.76 ± 1.51
Dhatryadi Ghrita	270.50 ± 48.06	39.97 ± 4.07
Mahakushmanda Ghrita	198.35 ± 12.44*	68.42 ± 3.15*
Standard drug	154.80 ± 13.80*	85.07 ± 4.17*

*P < 0.05 compared with the positive control.

Histopathological Findings

Histopathological examination of the ovary showed fewer healthy follicles, increased degenerating follicles and stromal hyperplasia in the positive control group. Dhatryadi Ghrita showed improvement in follicular development with mild reduction in stromal hyperplasia. Mahakushmanda Ghrita showed comparatively greater improvement, with increased healthy follicles and corpus luteum formation and reduced stromal hyperplasia.

3.3 Overall Findings

Both formulations demonstrated favourable changes in parameters associated with ovarian and reproductive function. Mahakushmanda Ghrita showed comparatively greater activity with respect to estrous cyclicity, ovarian weight, serum hormonal parameters and ovarian histopathology.

ANNEXURE

Annexure

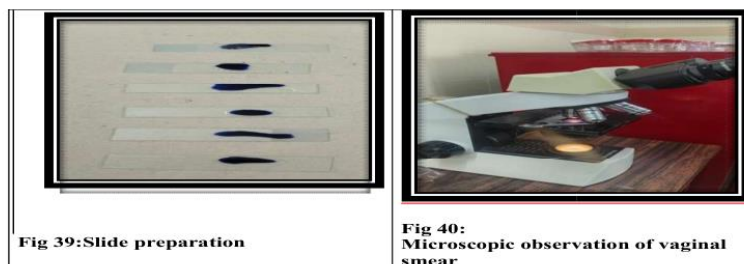
MICROSCOPIC OBSERVATION OF ESTRUS CYCLE

Fig: 41

Fig :42

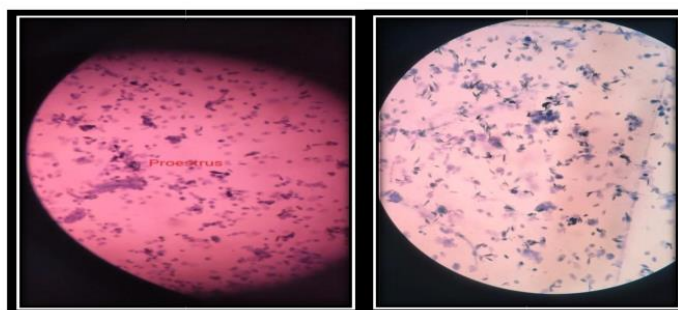
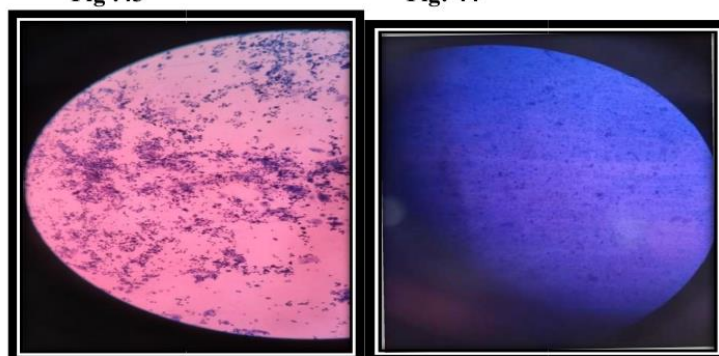


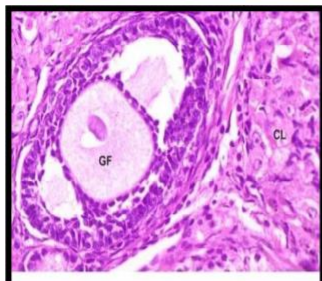
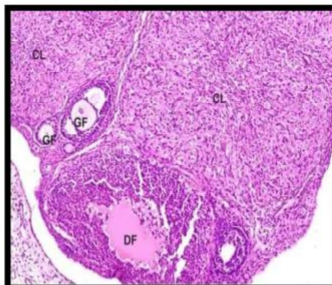
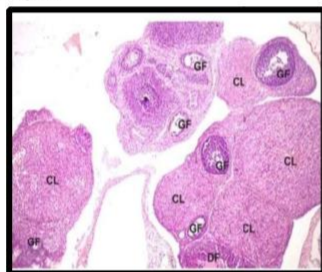
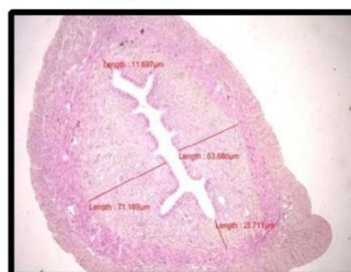
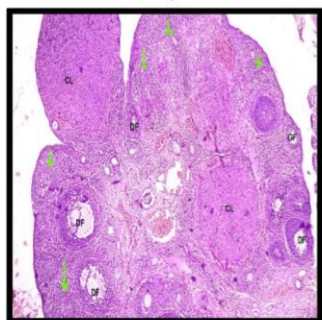
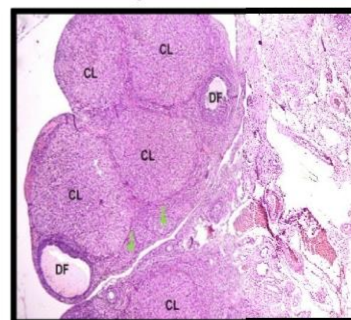
Fig :43

Fig: 44



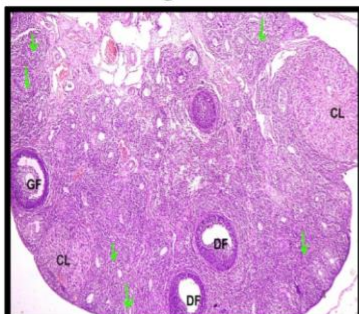
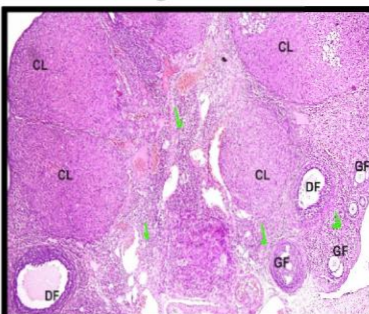
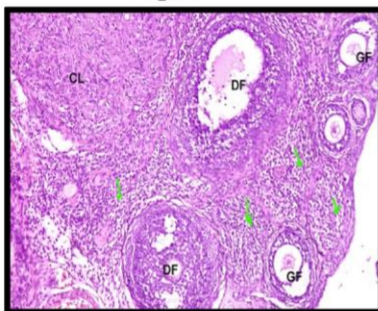
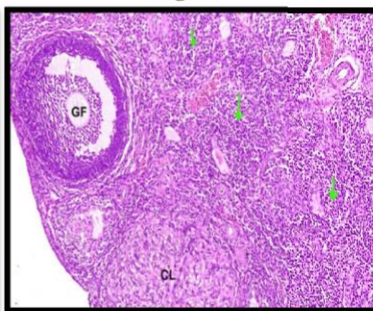
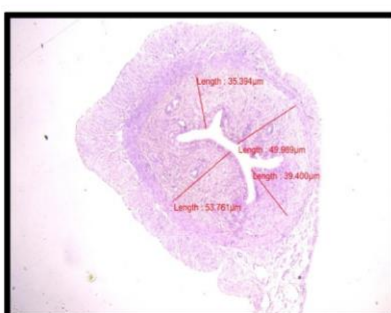
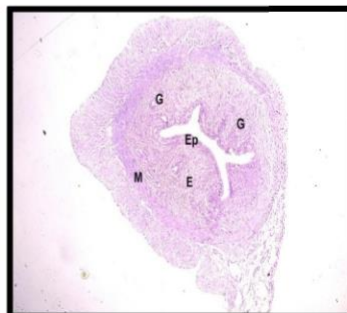
"A Comparative Pharmaceutico-Analytical and Experimental Study of Dhatryadi ghrita and Mahakushmanda ghrita in Stree Vandhyatwa w.s.r to Ovulation inducing activity" 171

Figure 1: Representative photomicrographs of vaginal smears showing proestrus, estrus, diestrus and metestrus phases.

HISTOPATHOLOGY**Normal control group****Fig:45****Graafian follicle****Fig:46****Growing follicle****Fig:47****Corpus luteum****Fig :48****Endometrium thickness****Positive control group****Fig:49****Interstitial Stromal cell hyperplasia****Fig:50****Corpus luteum**

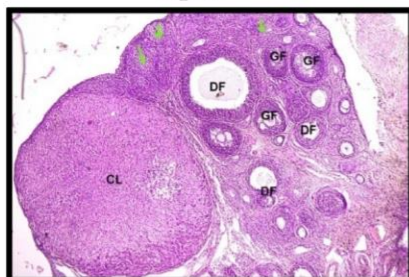
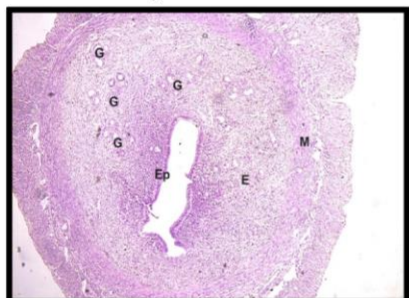
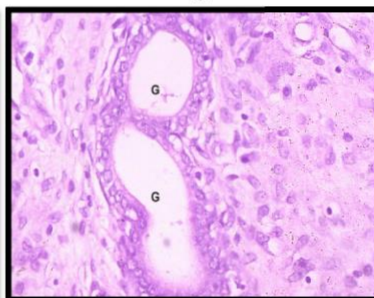
"A Comparative Pharmaceutico-Analytical and Experimental Study of Dhatryadi ghrita and Mahakushmanda ghrita in Stree Vandhyatwa w.s.r to Ovulation inducing activity" 172

Figure 2: Representative histopathological sections from the normal control and positive control groups.

Test drug group 1(Dhatryadi ghrita)**Fig: 57****Multiple Growing follicle****Fig:58****Corpus luteum****Fig :59****Degenrating follicle****Fig:60****Graafian follicles with stromal hyperplasia****Fig:61****Endometrial thickness****Fig :62****Glands, epithelium, and myometrium**

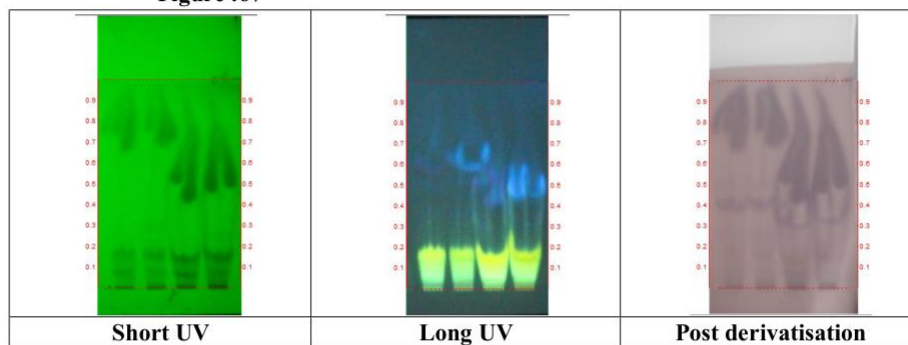
"A Comparative Pharmaceutico-Analytical and Experimental Study of Dhatryadi ghrita and Mahakushmanda ghrita in Stree Vandhyatwa w.s.r to Ovulation inducing activity" 174

Figure 3: Representative histopathological sections from the Dhatryadi Ghrita treatment group.

Test drug group 2(Mahakushmanda ghrita)**Fig:63****Growing follicle****Fig :64****Endometrial Thickness****Fig :65****Uterus with Glands, epithelium, Endometrium and myometrium****Fig :66****Endometrial gland structure**

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Figure 4: Representative histopathological sections from the Mahakushmanda Ghrita treatment group.

HPTLC**Result****Figure :67**

HPTLC photo documentation of chloroform fraction of Dhathryadi ghritha and Mahakushmandaghrita

Track 1 –Dhathryadi ghritha– 4 μ l

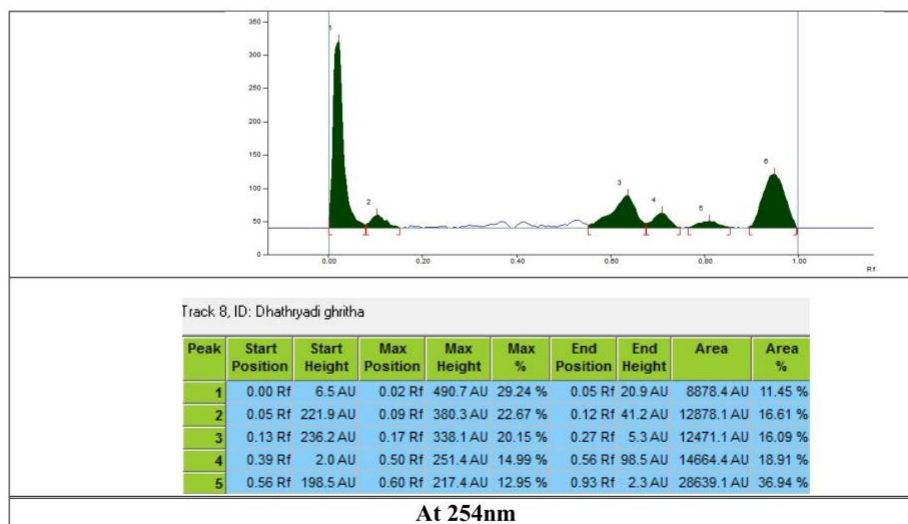
Track 2 –Mahakushmanda ghritha– 4 μ l

Track 3 –Dhathryadi ghritha– 8 μ l

Track 4 –Mahakushmanda ghritha– 8 μ l

Solvent system – Toluene: Ethyl acetate: formic acid (5:4:1)

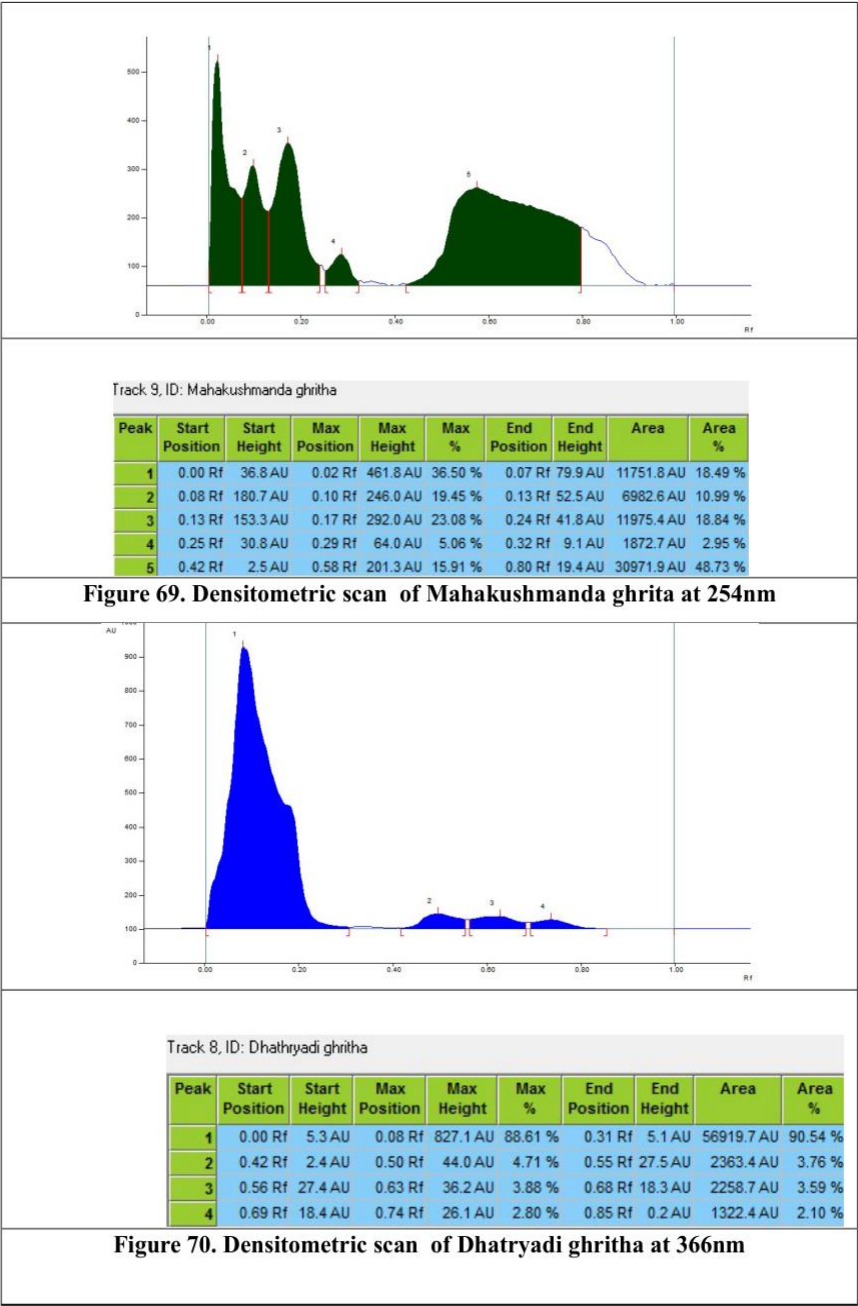
For flavonoids R_f 0.67-0.76 and Phenolics R_f -0.63

Figure 68. Densitometric scan of Dhathryadi ghritha at 254nm

At 254nm

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Figure 5: HPTLC photographic documentation of the studied Ghritha formulations under the reported detection conditions.



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Figure 6: Densitometric scan documentation of the HPTLC profiles.

4. DISCUSSION

The present study comparatively evaluated the pharmaceutico-analytical characteristics and ovulation-inducing activity of Dhatryadi Ghrita and Mahakushmanda Ghrita in a Primolut-N-induced anovulatory rat model. Both formulations produced favourable changes in several parameters related to ovarian function, while Mahakushmanda Ghrita showed a comparatively greater response.

The estrous-cycle findings demonstrated an increase in the estrus phase following treatment, particularly with Mahakushmanda Ghrita. The improvement in estrous cyclicity, together with the histopathological evidence of healthier follicles, supports a favourable effect on reproductive cyclicity in this experimental model.^[10]

Both formulations produced a significant increase in ovarian weight compared with the positive control. Histopathological examination showed increased healthy follicles and corpus luteum formation with reduced stromal hyperplasia, particularly in the Mahakushmanda Ghrita group. These findings collectively indicate improved ovarian structural and functional activity in the experimental model.^[11]

The hormonal findings further supported the histopathological observations. Mahakushmanda Ghrita significantly increased serum progesterone by 59.99% compared with the positive control. The concurrent increase in corpus luteum formation and progesterone is consistent with enhanced post-ovulatory ovarian activity; however, the present study does not directly demonstrate ovulation by serial follicular imaging or ovum recovery. Therefore, the findings are best interpreted as evidence of promising ovulation-associated activity rather than definitive proof of ovulation.^[12]

The decrease in serum estradiol observed with Mahakushmanda Ghrita should be interpreted cautiously. Estradiol varies across the stages of the reproductive cycle, and a single measured concentration does not by itself establish suppression or enhancement of ovarian function. In the present study, the hormonal finding was therefore interpreted together with estrous cyclicity, ovarian weight and histopathology rather than as an isolated indicator.

From an Ayurvedic perspective, the observed activity may be related to the combined actions of the constituent drugs, traditionally described with nourishing, Balya, Brimhana and Rasayana attributes.^[4-8] The comparatively greater response of Mahakushmanda Ghrita may reflect the collective contribution of its multiple constituents; however, the specific pharmacological contribution of individual ingredients requires further investigation.

In the context of Stree Vandhyatwa, anovulation may impair the possibility of conception. The present findings provide preliminary experimental evidence that these

formulations, particularly Mahakushmanda Ghrita, may influence reproductive parameters associated with ovulatory function. However, these results should not be interpreted as evidence that the formulations cure infertility. Well-designed clinical studies assessing menstrual cyclicity, confirmed ovulation, pregnancy outcomes and safety are necessary before clinical efficacy can be established.

5. CONCLUSION

The present study demonstrated favourable effects of Dhatryadi Ghrita and Mahakushmanda Ghrita on selected reproductive and ovarian parameters in a Primolut-N-induced anovulatory rat model. Both formulations improved estrous cyclicity and ovarian parameters, while Mahakushmanda Ghrita showed comparatively greater activity.

The activity of Mahakushmanda Ghrita was supported by improvement in the estrus phase, increased ovarian weight, improved follicular development and corpus luteum formation, reduced stromal hyperplasia, and a significant increase in serum progesterone. Taken together, these findings support promising ovulation-associated activity in the experimental model.

The study provides a scientific basis for further investigation of these classical formulations in anovulatory reproductive dysfunction. Nevertheless, the findings are preclinical and cannot establish efficacy or safety in women. Further standardized pharmacological and well-designed clinical studies are required before therapeutic recommendations can be made.

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