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# Pharmacognostical and Pharmacotherapeutic Effect of *Kakodumbarphala Churna* (*Ficus hispida* L.f.) in the Management of *Raktapradara* (Menorrhagia)

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***Abstract:*** ***Background: Raktapradara, described in Ayurvedic classics as Asrigdara, is a Yonivyapad characterised by excessive and irregular uterine bleeding and correlates closely with Menorrhagia, a common gynaecological disorder that affects women's health, quality of life and productivity worldwide. Modern management relies largely on hormonal agents, antifibrinolytics and, in refractory cases, hysterectomy, all of which carry limitations and adverse effects. Kakodumbara (Ficus hispida L.f., family Moraceae), possessing Tikta-Kashaya Rasa, Laghu-Ruksha Guna and Sheeta Veerya with documented Stambhana (haemostatic) and Raktaprasadana (blood-purifying) properties, is a classical Ayurvedic drug indicated for Raktapradara and offers a rational, low-cost therapeutic alternative.***

***Objective: To evaluate the pharmacognostical and phytochemical profile of Kakodumbarphala (fruit of Ficus hispida) and to assess the clinical efficacy of Kakodumbarphala Churna in the management of Raktapradara (Menorrhagia).***

***Materials and Methods: Authenticated Kakodumbarphala was evaluated by macroscopic, microscopic and powder-microscopic pharmacognostical methods, physicochemical analysis (loss on drying, ash values, extractive values, pH), qualitative phytochemical screening and thin-layer chromatography. In a single-arm, open-label, prospective clinical trial conducted at the OPD of PGIA, Jodhpur, 42 diagnosed patients of Raktapradara (age group spanning menarche to menopause) were treated with Kakodumbarphala Churna 3 g twice daily with Madhu (honey) as Sahapana and Milk with Sharkara as Anupana, after meals, for 90 days, with a 60-day follow-up. Subjective parameters (Angamarda, Vedana, duration/intensity/amount of menstrual flow, intermenstrual period, Daurbalyata, Daha and Panduta) and objective parameters (Hb%, CT, BT and USG endometrial thickness) were graded before and after treatment and analysed using the Wilcoxon signed-rank test and paired t-test.***

***Results: Pharmacognostical evaluation revealed characteristic diagnostic markers — thick-walled sclereids, laticiferous vessels, unicellular trichomes, spiral xylem vessels and calcium-oxalate crystals in the fruit and its powder. Physicochemical and qualitative phytochemical analysis confirmed the presence of carbohydrates, alkaloids, saponins, glycosides, tannins, amino acids and proteins, and thin-layer chromatography of the methanolic extract resolved six spots (Rf 0.16-0.75). Of 42 patients registered, 40 (95.2%) completed treatment. All nine subjective parameters and the total symptom score improved significantly ($p < 0.001$), with relief ranging from 44.9% (Vedana) to 77.1% (Daurbalyata), and a 61.5% reduction in total symptom score. Objective parameters also improved — haemoglobin increased by 8.8%, endometrial thickness reduced by 28.3%, bleeding time by 8.9% and clotting time by 12.9%. Overall, 82.5% of patients showed good-to-excellent improvement, and no adverse events were reported.***

***Conclusion: Kakodumbarphala Churna showed reproducible pharmacognostical and phytochemical standardisation markers together with clinically meaningful, statistically significant improvement in both subjective and objective parameters of Raktapradara (Menorrhagia), supporting its traditional classification as a Rakta-Stambhaka and Raktaprasadana dravya. Larger, controlled trials are warranted to confirm these preliminary findings.***

***Keywords: Kakodumbara; Ficus hispida; Raktapradara; Menorrhagia; Asrigdara; Pharmacognosy; Phytochemistry; Churna; Ayurveda.***

 

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## I. INTRODUCTION

Ayurveda, the "science of life," regards women's reproductive health as central to the wellbeing of society, and Artava (menstrual blood) as the outward manifestation (Bahir Pushpa) of the reproductive physiology described as Antah Pushpa. Menstruation, occurring in a Rituchakra of about 28-30 days with a bleeding duration of nearly five days and an estimated blood loss of 20-60 ml, depends on the hypothalamo-pituitary-ovarian axis for its rhythm and on uterine factors for the amount of blood lost.

On the basis of pathogenesis, Asrigdara corresponds closely to Menorrhagia (Ati Pravritti of Artava) and Metrorrhagia (intermenstrual Artava Pravritti) of modern gynaecology. Globally, abnormal uterine bleeding is reported to affect up to 19% of women, causing significant socio-economic burden and, in many instances, failing to respond satisfactorily to conventional management; while hysterectomy remains a common definitive option, its invasiveness underscores the need for safe, effective and less invasive alternatives.

Kakodumbara (Ficus hispida Linn. f., family Moraceae), described in classical Nighantus with Tikta-Kashaya Rasa, Laghu-Ruksha Guna, Sheeta Veerya and Katu Vipaka, is traditionally indicated for Pitta-Kapha vitiation and possesses Stambhana (styptic), Raktaprasadana (blood-purifying) and Kaphahara-Pittahara properties central to the management of Raktapradara. Modern pharmacological studies attribute anti-inflammatory, antidiabetic, hepatoprotective, antioxidant and haemostatic activities to the plant, and its bioactive constituents — tannins, flavonoids, hispidine, psoralen and saponins — are reported to support vasoconstriction and uterine tonic action. The drug used in the present study, Kakodumbarphala Churna, is referenced in Chakradatta (Asrigdara Chikitsa 61/9) with Honey and Milk-Sharkara as Anupana. Combining a well-documented classical rationale with emerging pharmacological evidence, Kakodumbara was selected for pharmacognostical, phytochemical and clinical evaluation in the management of Raktapradara (Menorrhagia).

## II. AIMS AND OBJECTIVES -

### *A. Aim*

To evaluate the pharmacognostical and pharmacotherapeutic effect of Kakodumbarphala Churna (Ficus hispida L.f.) in the management of Raktapradara (Menorrhagia).

### *B. Objectives*

#### *1) PRIMARY OBJECTIVE*

- To evaluate the efficacy of Kakodumbarphala (Ficus hispida) Churna in the management of Raktapradara (Menorrhagia).

#### *2) Secondary Objective*

- To study the pharmacognosy and phytochemistry of the drug Kakodumbarphala (Ficus hispida).
- To review, collect and compile the literary material regarding Kakodumbarphala (Ficus hispida) and Madhu (Honey).
- To review, collect and compile the literary material regarding Raktapradara.

## III. MATERIAL AND METHODS

### *A. Study Design*

| | |
|---|---|
| Study Type | Interventional (Clinical Trial) |
| Purpose | Treatment / Evaluation of therapeutic efficacy |
| Allocation | Single Arm |
| Masking | Open-label |
| Timing | Prospective |
| End Point | Efficacy (subjective and objective parameters) |
| No. of Groups | 1 |
| Total Study Period | 90 Days (Treatment) |
| Follow-up Period | 60 Days after completion of treatment |
| Participants Registered | 42 patients |

 

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*B. Selection Criteria*

(a) Inclusion Criteria -

1. Well-diagnosed and confirmed patients of Raktapradara.
2. Patients aged between menarche and menopause, willing to participate in the trial.
3. Excessive per-vaginal bleeding persisting for more than 2 consecutive menstrual cycles.
4. Patients willing to sign the informed consent form.

(b) Exclusion Criteria -

1. Patients having bleeding from carcinoma or large fibroid-like conditions.
2. Patients having bleeding due to abortion.
3. Patients having bleeding from sites other than the uterus.
4. Patients having coagulation disorders.
5. Patients using intrauterine contraceptive devices (IUCDs).
6. Patients having uncontrolled diabetes mellitus or thyroid dysfunction.
7. Patients suffering from PCOS (Polycystic Ovarian Syndrome).

(c) Withdrawal Criteria -

1. Patient not willing to continue the clinical trial.
2. Occurrence of any other acute illness during the trial.
3. Development of any life-threatening complication during treatment.
4. Patient leaving against medical advice (LAMA).

*C. Drug Intervention*

Patients received Kakodumbarphala Churna 3 g orally twice daily (Bhaktottar, after meals) with Madhu (honey) as Sahapana and Milk with Sharkara as Anupana, for 90 days. The trial drug was freshly prepared at the pharmacy of PGIA using locally sourced, authenticated Kakodumbarphala, cleaned, sun-dried, pulverised and passed through Sieve No. 85 (IS) before packaging.

*D. Assessment Criteria*

Subjective parameters were graded on a standard 0-3 scale as follows:

| Subjective Parameter | Grade 0 | Grade 1 | Grade 2 | Grade 3 |
|---|---|---|---|---|
| Angamarda (Bodyache) | Occasional, on heavy work | After extra work | After routine work | Even at rest |
| Vedana (Pain during menses) | No pain | Mild, no drug needed | Moderate, 1-2 doses of drug | Severe, 3-4 doses of drug |
| Duration of menstrual period | Up to 5 days | 6-7 days | 8-9 days | More than 9 days |
| Intensity of menstrual blood | 1-2 soaked pads/day | 3-4 soaked pads/day | 4-5 soaked pads/day | >5 soaked pads/day |
| Amount of flow | Moderate, without clots | Moderate, with clots | Heavy, without clots | Heavy, with clots |
| Intermenstrual period | 25-28 days | 20-24 days | 15-19 days | <15 days / irregular |
| Daurbalyata (Weakness) | None | Mild | Moderate | Severe |
| Daha (Burning sensation) | None | Not disturbing routine | Needs analgesia, controlled | Needs analgesia, poor control |
| Panduta (Pallor/Anaemia) | Normal (>11 gm%) | Mild (9.1-11 gm%) | Moderate (7-9 gm%) | Severe (<7 gm%) |

Objective parameters recorded before and after treatment included Haemoglobin % (Hb%), Clotting Time (CT), Bleeding Time (BT), hormonal profile (as required) and ultrasonographic (USG) endometrial thickness.

## IV. PHYSICOCHEMICAL EVALUATION

The phytochemical study of Kakodumbarphala comprised the following parameters —

1) Physical parameters
   - Foreign matter determination
   - Loss on drying / moisture content
2) Physico-chemical parameters
   - Total Ash value
   - Acid-soluble / insoluble Ash
   - Water-soluble / insoluble Ash
   - pH value
3) Extraction in different solvents
   - Chloroform
   - Glacial Acetic Acid
   - Methanol
   - Aqueous
4) Chemical parameters [Determination of chemical/organic parameters – by Qualitative and Quantitative methods]
   - Detection of Carbohydrate
   - Detection of Alkaloids
   - Detection of Saponins
   - Detection of Glycosides
   - Detection of Tannins
   - Detection of Amino acids
   - Detection of Proteins

## V. PRELIMINARY PHYTOCHEMICAL SCREENING

*A. Observation of Qualitative analysis of organic matter of Kakodumbarphala*

| S.No. | Name of Test | Extract | Test Result |
|---|---|---|---|
| 1 | Carbohydrate – Molisch's test | Aqueous | + |
| | Carbohydrate – Benedict's test | Aqueous | + |
| 2 | Reducing Sugar – Benedict's test | Aqueous | + |
| 3 | Alkaloids – Wagner's test | Ethanolic | + |
| 4 | Saponins – Foam test | Aqueous | + |
| 5 | Glycosides – Keller-Kiliani test | Glacial Acetic Acid extract | + |
| 6 | Tannins – $FeCl_3$ test | Ethanolic | + |
| | Tannins – Vanillin test | Aqueous | + |
| 7 | Amino acids – Ninhydrin test | Aqueous | + |
| 8 | Proteins – Millon's test | Ethanolic | + |

*B. Determination of inorganic compounds in Samples of Kakodumbarphala*

| S.No. | Name of Inorganic Matter present in Ash | Kakodumbarphala |
|---|---|---|
| 1 | Calcium | + |
| 2 | Iron | + |
| 3 | Phosphorus | + |
| 4 | Potassium | + |

*C. pH value of sample Kakodumbarphala*

| S.No. | Sample | pH (10% aqueous solution) |
|---|---|---|
| 1 | Kakodumbarphala (Ficus hispida) | 5.8 |

*D. Extract values of Kakodumbarphala*

| Solvent for Extraction | Wt. of Empty Petri Dish (W1) | Wt. of Drug Sample (X) | Wt. of Petri Dish after Drying (W2) | Extractive Value | % Extractive Value |
|---|---|---|---|---|---|
| Chloroform | 44.55 g | 5 g | 44.70 g | 0.150 g | 3.0% |
| Glacial Acetic Acid | 45.99 g | 5 g | 46.095 g | 0.105 g | 2.1% |
| Methanol | 50.57 g | 5 g | 51.32 g | 0.750 g | 15.0% |
| Aqueous | 46.59 g | 5 g | 47.24 g | 0.640 g | 13.0% |

*E. Ash values and other physical parameters of Kakodumbarphala*

| Parameter | Observed Value |
|---|---|
| Foreign matter | 0.62% w/w |
| Loss on drying (moisture content) | 15.0% w/w |
| Total Ash value | 12.4% w/w |
| Acid-insoluble Ash | 1.3% w/w |
| Water-soluble Ash | 4.3% w/w |

All observed values were within the acceptable quality limits laid down by the Ayurvedic Pharmacopoeia of India, confirming the purity and quality of the raw drug.

## VI. PHARMACOGNOSTICAL STUDY

**TREE**

**FRUITS**

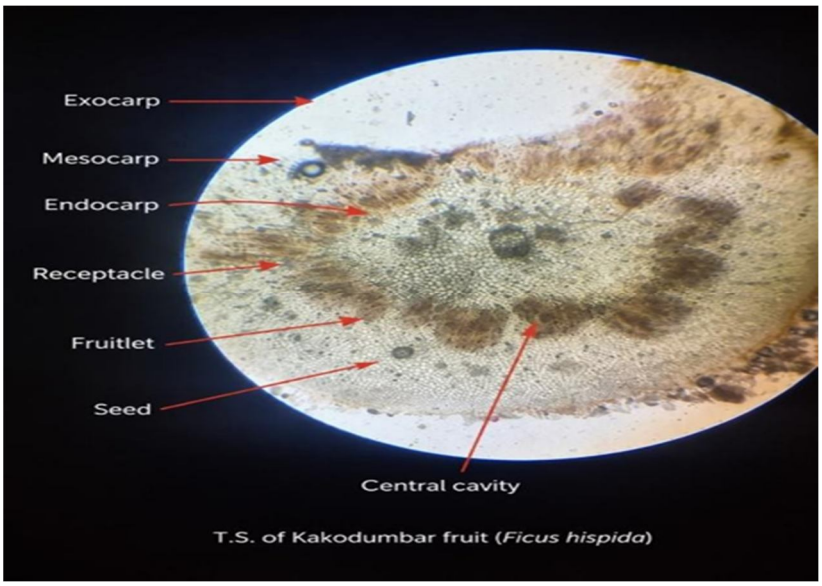
**LEAVES**

*A. Macroscopic (Organoleptic) Characters of Kakodumbarphala*

- Colour: Light green to yellowish-brown.
- Shape: Turbinate to obovoid.
- Surface: Rough and hispid (hairy).
- Taste: Bitter.
- Odour: Distinct, nauseous.

*B. Transverse Section (T.S.) of Kakodumbarphala (Ficus hispida) Fruit*

The transverse section of the fruit, a fleshy syconus enclosing numerous minute achenes, shows a differentiated pericarp with well-developed protective, ground and vascular tissue —




Epidermis / Cork Region

- Single layer of compact epidermal cells, often replaced by suberised cork (phellem) in mature fruit, occasionally bearing multicellular hairs.

Phellem, Phellogen and Phelloderm

- Several layers of dead, thick-walled cork cells, underlain by a narrow meristematic phellogen and a phelloderm of thin-walled parenchyma containing starch and tannins.

Secondary Cortex

- Broad zone of loosely arranged parenchyma with mucilage, tannins and calcium-oxalate crystals, and numerous stone cells (sclereids).

Laticifers

- Branched laticiferous canals containing milky latex, scattered in the cortical and phloem regions, characteristic of the genus Ficus.

Vascular Bundles

- Irregularly arranged collateral bundles with external phloem (sieve elements, companion cells, phloem fibres) and internal xylem (vessels, tracheids, fibres, xylem parenchyma).

Medullary Rays and Seed Region

- Radially elongated parenchyma between vascular strands; numerous minute seeds embedded in mucilaginous pulp, each showing testa, endosperm and embryo.

Diagnostic Microscopic Features

- Thick-walled, highly lignified sclereids.
- Branched laticiferous canals characteristic of Ficus species.
- Collateral vascular bundles with lignified phloem fibres.
- Prismatic and druse calcium-oxalate crystals.
- Simple, rounded starch grains in parenchymatous cells.

*C. Powder Microscopy of Kakodumbarphala Churna*

The Churna (yellowish-brown to brown, rough and slightly gritty, faintly earthy odour, bitter and astringent taste) showed, on microscopic examination, fragments of parenchyma with starch grains, thick-walled sclereids, lignified fibres with narrow lumina, spiral and pitted xylem vessels, prismatic and druse calcium-oxalate crystals, and polygonal epidermal fragments with tannin content. Staining with Phloroglucinol-HCl coloured lignified elements (sclereids, xylem vessels) bright red to crimson, while treatment with iodine turned starch grains blue to blue-black — features that together serve as reliable diagnostic markers for authentication of the crude drug and detection of adulteration.

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## VII. STATISTICAL ANALYSIS

Data collected before and after treatment were analysed using SPSS. The paired t-test was applied to objective (parametric) parameters, while the Wilcoxon Signed-Rank test was applied to subjective (non-parametric) parameters and to objective parameters whose baseline distribution showed skewness (Intensity of Menstrual Blood, Daha). For inter-group and outcome interpretation, p-values were classified as follows —

- Not Significant (NS) : $p > 0.05$
- Significant (S) : $p < 0.05$
- Highly Significant (HS) : $p < 0.01$
- Extremely Significant (ES) : $p < 0.001$

## VIII. AYURVEDIC INTERPRETATION

| | |
|---|---|
| Name of Drug | Kakodumbara |
| Latin Name | Ficus hispida Linn. f. |
| Family | Moraceae |
| Rasa | Tikta (Bitter), Kashaya (Astringent) |
| Guna | Laghu (Light), Ruksha (Dry) |
| Virya | Sheeta (Cooling) |
| Vipaka | Katu (Pungent) |
| Doshakarma | Kapha-Pittahara |
| Karma | Stambhana, Raktaprasadana, Shwitrahara, Vranaropana, Shothahara |
| Used Part | Phala (Fruit) |

## IX. CHROMATOGRAPHIC EVALUATION

### *A. TLC of Kakodumbarphala (Ficus hispida)*

A freshly prepared methanolic extract of Kakodumbarphala was applied to an activated (105°C, 30 min) precoated silica gel 60 $F_{254}$ plate (10 × 20 cm, 0.25 mm thickness) using a capillary tube, and developed in a saturated TLC chamber using Methanol : Chloroform in the ratio of 8 : 2 (v/v) as the mobile phase. When the solvent front had travelled nearly to the upper end of the plate, it was marked and the plate was dried and visualised in iodine vapour.

*Result of TLC — Solvent System: Methanol : Chloroform (8 : 2)*

| Spot No. | Distance of Solvent Front | Distance Travelled by Spot | Rf Value |
|---|---|---|---|
| 1 | 10 cm | 7.5 cm | 0.75 |
| 2 | 10 cm | 6.2 cm | 0.62 |
| 3 | 10 cm | 5.0 cm | 0.50 |
| 4 | 10 cm | 4.8 cm | 0.48 |
| 5 | 10 cm | 3.2 cm | 0.32 |
| 6 | 10 cm | 1.6 cm | 0.16 |

Six distinct spots were resolved, providing a reproducible chromatographic fingerprint for standardisation of the raw drug and its formulation.

## X. CLINICAL RESULT

### *A. % Effect Parameter (Subjective)*

| % Effect Parameters (Subjective) | % Effect |
|---|---|
| Angamarda (Bodyache) | 58.1% |
| Vedana (Pain during menstruation) | 44.9% |
| Duration of Menstrual Blood | 57.1% |
| Intensity of Menstrual Blood | 75.9% |

| % Effect Parameters (Subjective) | % Effect |
|---|---|
| Amount of Flow | 71.4% |
| Intermenstrual Period | 52.4% |
| Daurbalyata (Weakness) | 77.1% |
| Daha (Burning sensation) | 64.8% |
| Panduta (Pallor/Anaemia) | 72.3% |
| Total Symptom Score | 61.5% |

*B. 10.2 % Effect Parameter (Objective)*

| % Effect Parameters (Objective) | % Effect |
|---|---|
| Bleeding Time (BT) | 8.9% |
| Clotting Time (CT) | 12.9% |
| Haemoglobin (Hb%) | +8.8% |
| USG – Endometrial Thickness | 28.3% |

*C. % Overall Effect (Patient wise)*

| Overall Effect (Patient wise) | N | % |
|---|---|---|
| Excellent Improvement (76-100%) | 2 | 5.0% |
| Very Good Improvement (51-75%) | 16 | 40.0% |
| Good Improvement (26-50%) | 15 | 37.5% |
| Satisfactory Improvement (1-25%) | 5 | 12.5% |
| Non-satisfactory (0% Improvement) | 2 | 5.0% |
| Total | 40 | 100.00% |

*D. Overall % Effect*

| Overall % Effect | Subjective Parameters | Objective Parameters |
|---|---|---|
| % Effect | 61.5% | 14.7% |

The Overall % Effect on subjective parameters is derived directly from the reduction in Total Symptom Score, while the figure for objective parameters represents the mean of the percentage changes recorded for Bleeding Time, Clotting Time, Haemoglobin and Endometrial Thickness. Of the 42 patients registered, 40 (95.24%) completed the treatment; 2 (4.76%) were lost to follow-up (LAMA). No adverse events were reported during the study period.

## XI. DISCUSSION

A research scholar's responsibility is to diligently examine the truths embedded within ancient Ayurvedic literature and to validate them, wherever possible, against contemporary scientific evidence. In keeping with this approach, the findings of the present study have been analysed under drug discussion, disease discussion, analytical (pharmacognostical and phytochemical) discussion, and clinical discussion, followed by the probable mode of action of Kakodumbarphala Churna in Raktapradara.

Kakodumbara (Ficus hispida Linn. f.), a small to medium-sized deciduous tree of the family Moraceae found up to 1200 m in the subtropical and outer Himalayan regions, is valued in Ayurveda for its Tikta-Kashaya Rasa, Laghu-Ruksha Guna, Sheeta Veerya and Katu Vipaka — a combination that is Pitta-Kapha Shamaka and forms the basis of its Rakta-Prasadana (blood-purifying) and Stambhana (styptic) actions. Phytochemically, the fruit contains furanocoumarins (psoralen, bergapten), phenanthroindolizidine alkaloids (hispidine), sterols (beta-sitosterol), triterpenoids, saponins and polyphenols including tannins and flavonoids, which are pharmacologically linked to haemostatic, anti-inflammatory, antioxidant and hepatoprotective activity.

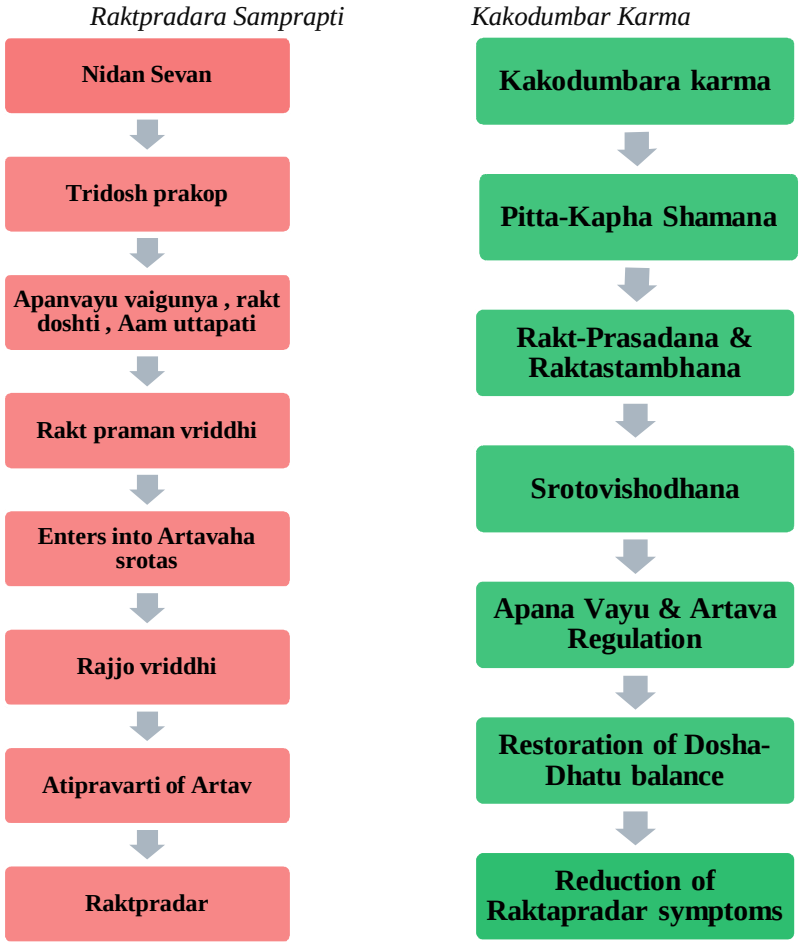
Raktapradara, correlated with Menorrhagia, arises through vitiation of Pitta and Rakta with secondary Vata (Apana Vata) involvement: Nidana such as excessive Lavana-Amla-Katu Ahara, Vidahi and Guru Ahara, psychological stress (Shoka), physical overexertion (Atibharavahana) and excessive coitus (Atimaithuna) provoke Agnimandya, Rasa-Artava Dushti and Rajovaha Srotodushti, culminating in Ati-Pravritti of Raja.

The macroscopic and microscopic characters recorded for Kakodumbarphala — hispid fruit surface, laticiferous vessels, stone cells and diagnostic crystal and trichome patterns — are consistent with pharmacognostic descriptions of Ficus hispida, while the physicochemical values, qualitative phytochemical screening and six-spot TLC fingerprint together support pharmacognostic authentication and phytochemical standardisation of the drug.

The predominance of Raktapradara in the 31-40 year age group (Madhyama-Praudha Avastha, when Pitta Dosha progressively increases), together with the high prevalence of urban residence, sedentary occupations, irregular dietary habits (excess Amla-Katu-Lavana Rasa) and psychological stress noted in this cohort, is consistent with both the classical Nidana of Raktapradara and the contemporary understanding of stress-mediated hypothalamic-pituitary-ovarian axis disturbance in menorrhagia.

*E. Probable mode of action of Kakodumbarphala Churna*

Kakodumbara's Kashaya-Tikta Rasa and Sheeta Virya are believed to reduce Pitta-mediated local heat and inflammation, explaining the significant relief in Angamarda and Daha; its Stambhana, Pittashamaka and Raktaprasadana actions correct Artavavaha Srotodushti and vascular laxity, accounting for the marked reduction in Atipravritti, duration and intensity of flow, and intermenstrual spotting; and its Deepana-Pachana and Rasayana properties improve Agni and support haematinic recovery, explaining the improvement in Daurbalyata, Panduta and haemoglobin. Modern pharmacology attributes these effects to tannins and flavonoids promoting vasoconstriction and platelet aggregation at the endometrial capillary bed, phenolic and sterol constituents suppressing pro-inflammatory prostaglandin pathways (PGE2/PGI2) and oxidative stress, and an overall hormonal and vascular stabilising action reducing endometrial hyperplasia, consistent with the 28.3% reduction observed in ultrasonographic endometrial thickness. The statistically significant improvement across all subjective and objective parameters ($p < 0.001$) supports rejection of the null hypothesis and affirms a clinically meaningful therapeutic effect of Kakodumbarphala Churna in Raktapradara (Menorrhagia).



## XII. CONCLUSION

This section outlines the conclusions drawn from the observations, results and discussion of the present study, entitled "Pharmacognostical and Pharmacotherapeutic Effect of Kakodumbarphala Churna (Ficus hispida L.f.) in the Management of Raktapradara (Menorrhagia)." The study may be summarised and concluded as follows:

*1)* Pharmacognostical and phytochemical evaluation established reproducible macroscopic, microscopic, physicochemical and chromatographic standardisation markers for Kakodumbarphala, confirming its correct botanical identity and quality.

*2)* Qualitative screening confirmed the presence of carbohydrates, alkaloids, saponins, glycosides, tannins, amino acids and proteins, and TLC of the methanolic extract resolved six reproducible spots (Rf 0.16-0.75).

*3)* In the clinical trial, Kakodumbarphala Churna (3 g twice daily with honey and milk-sugar as Anupana for 90 days) produced statistically highly significant ($p < 0.001$) improvement in all nine subjective parameters of Raktapradara, with a 61.5% reduction in total symptom score.

*4)* Objective parameters also improved meaningfully — haemoglobin increased by 8.8%, endometrial thickness reduced by 28.3%, bleeding time by 8.9% and clotting time by 12.9%.

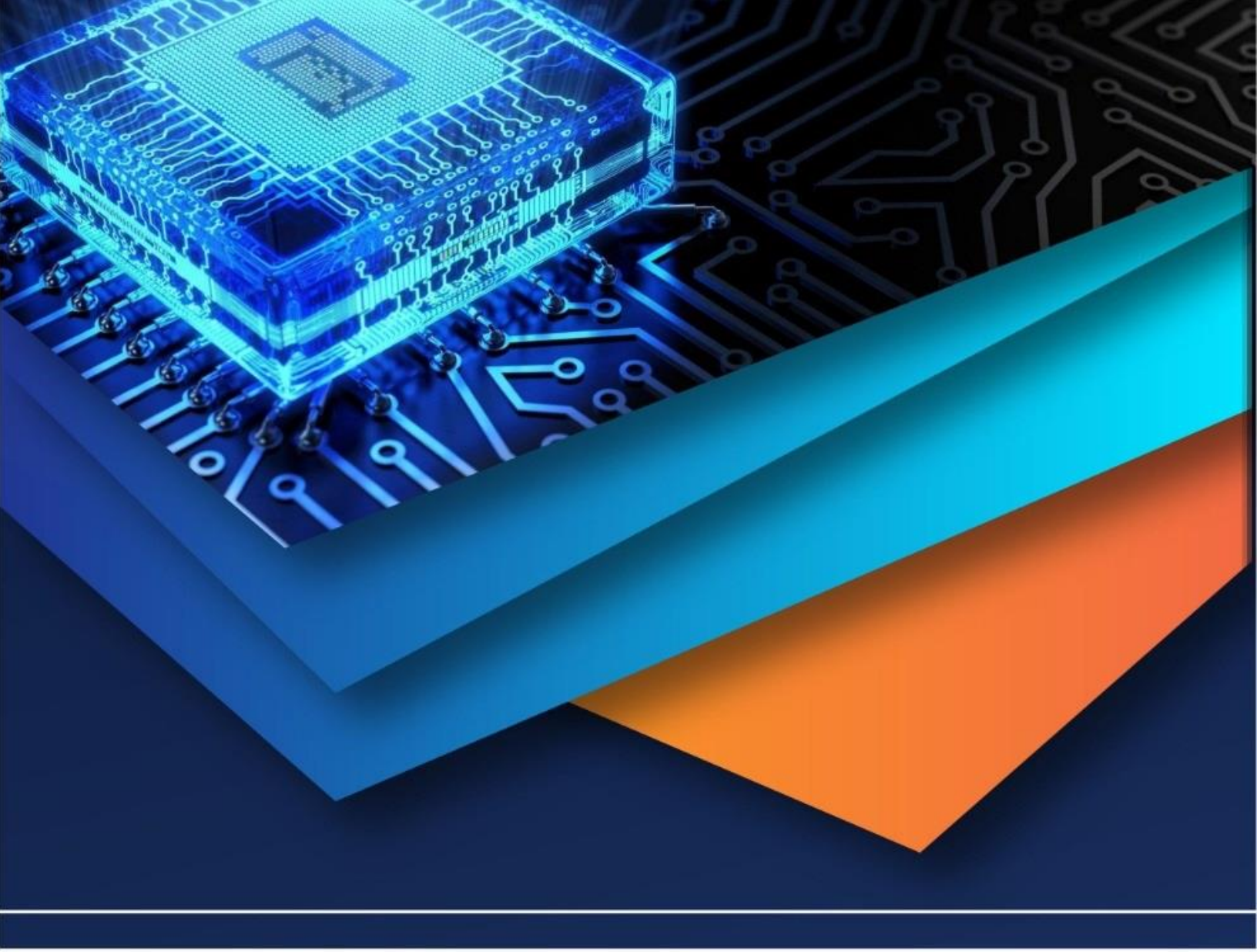
*5)* Of 40 patients who completed treatment, 82.5% achieved good-to-excellent improvement, and no adverse events were reported, indicating that the drug is both effective and well tolerated.

*6)* These findings validate the classical description of Kakodumbara as a Rakta-Stambhaka and Raktaprasadana dravya and support its potential as a safe, effective and affordable Ayurvedic option for Raktapradara (Menorrhagia).

The study was limited by its single-arm design, modest sample size (n = 40) and the absence of a control group. Larger, multi-centric, randomised controlled trials with extended follow-up, exploration of alternative Kalpanas, and mechanistic studies on endometrial angiogenesis, prostaglandin synthesis and hormonal regulation are recommended to further establish and generalise these findings.

## REFERENCES

[1] Charak Samhita, Trisutra, Vidyotini Hindi commentary by Kashinath Pandeya & Gorakhnath Chaturvedi. Varanasi: Chaukhamba Bharati Academy; Reprint 2017.
[2] Sushruta Samhita, with Ayurveda Tattva Sandipika Hindi commentary by Ambika Dutta Shastri. Varanasi: Chaukhambha Sanskrit Sansthan; Reprint 2016.
[3] Chakradatta, Asrigdara Chikitsa 61/9.
[4] Sharma PV. Priya Nighantu. Varanasi: Chaukhamba Surbharti Prakashana; 2015.
[5] Chunekar KC. Bhavaprakash Nighantu (Indian Materia Medica). Varanasi: Chaukhamba Bharati Academy; Reprint 2015.
[6] The Ayurvedic Pharmacopoeia of India, Part I, Vol. III, 1st ed. New Delhi: Department of AYUSH, Ministry of Health & Family Welfare, Government of India; 2001.
[7] Central Council for Research in Ayurveda and Siddha. Database on Medicinal Plants Used in Ayurveda. New Delhi: CCRAS; 2008.
[8] Laboratory Guide for the Analysis of Ayurveda and Siddha Formulations. New Delhi: CCRAS, Department of AYUSH; p. 27, 83-87.
[9] Kirtikar KR, Basu BD. Indian Medicinal Plants, Vol. III. Allahabad: Lalit Mohan Publications; p. 2322.
[10] Wealth of India, Vol. IV (F-G). New Delhi: Council of Scientific and Industrial Research; 1962.
[11] Nadkarni KM. Indian Materia Medica. Mumbai: Popular Prakashan.
[12] Watt G. Dictionary of the Economic Products of India, Vol. III. Calcutta: Government Printing.
[13] Karnick CR. Pharmacopoeial Standards of Herbal Plants. 1994.
[14] Hooker JD. Flora of British India, Vol. V. 1872-1897.
[15] Cheng JX, Zhang BD, Zhu WF, et al. Traditional uses, phytochemistry, and pharmacology of Ficus hispida L.f.: A review. J Ethnopharmacol. 2020;248:112204.
[16] Choudhury A, Jha DK, Rajashekhar U. A phytochemical and pharmacognostic approach of Ficus hispida Linn: A review. Int J Basic Clin Pharmacol. 2021;10(6):759-765.
[17] Shi ZF, Lei C, Yu BW, Wang HY, Hou AJ. New alkaloids and α-glucosidase inhibitory flavonoids from Ficus hispida. Chem Biodivers. 2016;13(4):445-450.
[18] Yap VA, Loong BJ, Ting KN. Hispidacine, an unusual 8,4′-oxyneolignan alkaloid with vasorelaxant activity and hispiloscine, an antiproliferative phenanthroindolizidine alkaloid, from Ficus hispida Linn. Phytochemistry. 2015;109:96-102.
[19] Sureram S, Senadeera SPD, Hongmanee P, Mahidol C, Ruchirawat S, Kittakoop P. Potential cancer chemopreventive and anticancer constituents from the fruits of Ficus hispida L.f. (Moraceae). J Ethnopharmacol. 2018;214:37-46.
[20] Munro MG, Critchley HOD, Fraser IS; FIGO Menstrual Disorders Committee. The FIGO classification of causes of abnormal uterine bleeding in the reproductive years. Int J Gynecol Obstet. 2018;143(3):393-408.
[21] National Institute for Health and Care Excellence. Heavy Menstrual Bleeding: Assessment and Management (NICE Guideline NG88). 2021
[22] Dutta DC. Textbook of Gynecology. 9th ed. New Delhi: Jaypee Brothers Medical Publishers; 2022.
[23] Berek JS. Berek & Novak's Gynecology. 16th ed. Philadelphia: Wolters Kluwer; 2023.
[24] Hoffman BL, Schorge JO, Halvorson LM, et al. Williams Gynecology. 5th ed. New York: McGraw Hill; 2024.
[25] Guyton AC, Hall JE. Textbook of Medical Physiology. 14th ed. Philadelphia: Elsevier; 2020.



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