

A Review of Pharmacological Evaluation of Karunjeeragam (*Nigella sativa*) in the Regulation of Menstrual Cycles: A Siddha Perspective on Soothaga Vayu and Hormonal Homeostasis

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Abstract

Background:

In Siddha medicine, Karunjeeragam (Black Cumin) is revered as a potent Karppasaya Suddhi (uterine cleanser) and Uthirandakari (emmenagogue). Menstrual irregularities, particularly oligomenorrhea and secondary amenorrhea, are traditionally attributed to the vitiation of Vatham and the resulting stagnation of Abaana Vayu. Karunjeeragam is frequently prescribed to restore the rhythmic shedding of the endometrium by correcting this humoral imbalance.

Objective:

This review aims to analyze the therapeutic role of Karunjeeragam in regulating menstruation, focusing on its ability to pacify Vata-Kapha and its modern pharmacological correlation with endocrine modulation.

Methodology:

Data were synthesized from classical Siddha texts, including Pathartha Guna Chinthamani and Agathiyar Gunavagadam, alongside modern pharmacological studies investigating the effects of Thymoquinone (the active principle of *Nigella sativa*) on the hypothalamic-pituitary-ovarian (HPO) axis.

Results:

Siddha literature classifies Karunjeeragam as having Ushna Veeryam (Hot Potency) and Karppu Suvai (Pungent Taste), which effectively eliminates "cold" obstructions in the uterus. Modern research corroborates these claims, demonstrating that *Nigella sativa* possesses estrogenic properties and improves

ovarian follicular development. Its volatile oils exert an **antispasmodic** effect on the uterine smooth muscles, facilitating a regulated and pain-free menstrual flow. Furthermore, its ability to improve insulin sensitivity makes it particularly effective for menstrual regulation in cases of Polycystic Ovary Syndrome (PCOS).

Conclusion:

Karunjeeragam serves as a dual-action agent in Siddha gynecology: it acts as a physical stimulant for menstrual onset while simultaneously balancing the subtle Vayu responsible for reproductive health. It is a vital component in the management of menstrual disorders, offering a natural alternative to synthetic hormonal therapy.

Keywords:

Karunjeeragam, *Nigella sativa*, Menstrual Regulation, Siddha Medicine, Soothaga Vayu, Thymoquinone, Abaana Vayu.

The "Bio-Chemical Key": Thymoquinone's Multimodal Role

While most plants rely on a single pathway, *Nigella sativa* (Karunjeeragam) functions as a **biological adaptogen**. Its primary agent, Thymoquinone, acts as a "metabolic sensor."

- **Redox Signaling:** Instead of just "being an antioxidant," it modulates the Nrf2 pathway. This reduces oxidative stress within the ovarian follicles, creating a "cleaner" environment for egg maturation
- **The Fatty Acid Bridge:** The seeds are rich in linoleic and oleic acids. These aren't just fats; they are the **structural building blocks** for prostaglandins. By providing these precursors, Karunjeeragam helps the body "self-correct" the signals that trigger the start and end of a menstrual period.

2. Endocrine Harmony: The Insulin-Androgen Connection

In modern endocrinology, we know that many menstrual delays are actually **metabolic issues**. Karunjeeragam acts as a bridge between the pancreas and the ovaries.

The "Overdrive" Correction

In conditions like PCOS, the body stays in a high-insulin state. This tells the ovaries to produce excess testosterone, which halts the cycle. Karunjeeragam helps by:

1. **Sensitizing Receptors:** It makes cells more "sensitive" to insulin, so the body produces less of it.
2. **Androgen Suppression:** Once insulin levels drop, the "signal" for the ovaries to overproduce male-type hormones is silenced, allowing the female cycle (estrogen/progesterone) to resume.[2]

3. The Siddha Perspective: "Suddhi" and Flow

In the Siddha tradition, menstrual irregularities are often viewed as a disruption of **Vatham** (the energy of movement). Karunjeeragam is classified as "Ushna" (heating).

- **Uterine Tonification:** It promotes the downward flow of energy (*Apana Vayu*). Mechanistically, this is the mild stimulation of the myometrium (uterine muscle), ensuring that the shedding of the lining is complete and efficient.
- **Synergy with "Vehicles":** When taken with honey (a carrier), the phytochemicals bypass early digestion to reach the systemic circulation faster, a process known in modern pharmacology as enhancing **bioavailability**[3]

Biological Target Action:

Pituitary Gland Normalizes LH/FSH pulse Regulates ovulation timing

Uterine Muscle Antispasmodic (via p-cymene) Reduces period pain

Adipose Tissue Improves lipid metabolism Assists

Original Analysis of Nigella sativa (Karunjeeragam) in Menstrual Health

1. Regulation of the Menstrual Cycle (Amenorrhea)

Nigella sativa has traditionally been used to address "Soothaga" (menstrual) disorders, specifically amenorrhea and oligomenorrhea. Contemporary research indicates that its primary bioactive, thymoquinone, possesses estrogenic properties that can stimulate serum estradiol levels (4))By acting as a phytoestrogen, it supports the maturation of antral follicles and increases granulosa cell thickness, which are critical for initiating the follicular phase of the menstrual cycle Clinical trials have demonstrated that supplementation can significantly shorten the interval between periods and increase the overall frequency of the cycle in women with irregularities

2. Management of Dysmenorrhea (Menstrual Pain)

The efficacy of Karunjeeragam in relieving pelvic pain stems from its dual anti-inflammatory and antispasmodic profile. Thymoquinone inhibits the synthesis of inflammatory prostaglandins—chemical messengers responsible for the intense uterine contractions that cause cramping . Additionally, its terpene content, such as p-cymene, acts as a smooth muscle relaxant, easing the tension in the myometrium without interfering with the necessary shedding of the endometrial lining

3. Therapeutic Intervention for PCOS

For Polycystic Ovary Syndrome (PCOS), Nigella sativa serves as a metabolic and endocrine stabilizer. It improves insulin sensitivity, which is the primary driver of ovarian androgen overproduction [5]

Follicular Health: Research shows that thymoquinone intervention can reduce the number of cystic follicles and improve ovarian morphology

Androgen Reduction: By lowering hyperinsulinemia, Karunjeeragam assists in decreasing elevated testosterone and Luteinizing Hormone (LH) levels, thereby restoring the proper LH/FSH ratio required for spontaneous ovulation

Mechanistic Analysis of Karunjeeragam in Menstrual Wellness

The therapeutic efficacy of *Nigella sativa* (Karunjeeragam) in female reproductive health is primarily attributed to its high concentration of thymoquinone and essential fatty acids, which interface with both endocrine and inflammatory pathways

Benefit Pharmacological & Traditional Mechanism

Analgesic Activity (Dysmenorrhea) Karunjeeragam exerts a profound antinociceptive effect by inhibiting the cyclooxygenase (COX) and 5-lipoxygenase (LOX) pathways. This suppression reduces the biosynthesis of prostaglandins (PGF₂ α and PGE₂), which are the primary drivers of uterine hyper-contraction and ischemic pain during menses (

Digestive & Carminative Support Beyond reproductive tissues, *Nigella sativa* serves as a gastroprotective agent. It functions as a carminative, stimulating the expulsion of gas and reducing intestinal spasms (6). It effectively mitigates the gastrointestinal distress and abdominal bloating frequently reported during the premenstrual phase

Traditional Flow Regulation In Siddha medicine, the seeds are utilized to balance Vata dosha, the bio-energy responsible for movement and elimination, normalizing “Apana Vayu” (downward flow). Karunjeeragam helps resolve menstrual disorders ensuring that the shedding of the endometrium is rhythmic and complete

Traditional Protocols and Preparation Methodologies

In the Siddha system, the preparation of Karunjeeragam is as critical as the herb itself. These methods are designed to maximize the extraction of thymoquinone while balancing the herb’s “Ushna” (heating) nature.

1. The Aqueous Extraction (Kudineer / Decoction)

This method utilizes heat to break down the fibrous seed coat, releasing water-soluble alkaloids and saponins.

Protocol: Simmer approximately 2.5g (roughly half a teaspoon) of bruised seeds in 200ml of water until reduced slightly.

The Honey Synergy: Adding honey acts as an Anupana (vehicle). In modern terms, this enhances the bioavailability of the bioactive compounds by aiding their transport across the gastric mucosa.(7)

Administration: Typically consumed warm on an empty stomach to stimulate the Apana Vayu (downward energy).

2. The Powdered Matrix (Choornam)

Roasting the seeds is a traditional “Suddhi” (purification) step that stabilizes the volatile essential oils.

Protocol: Briefly dry-roast the seeds to remove moisture, then grind into a fine powder.

Lipid Carrier: Mixing the powder with warm milk or ghee is scientifically sound; because thymoquinone is lipophilic (fat-loving), the fats in the milk or ghee act as carriers, significantly improving systemic absorption [8]

3. Chrono-Therapeutic Timing

Traditional practitioners emphasize “Ritucharya” (seasonal/cyclic timing).

Phase-Specific Dosing: For amenorrhea or oligomenorrhea, intervention usually begins 7–10 days prior to the anticipated luteal phase.

Mechanism: This timing aligns with the period when the body requires a peak in prostaglandin precursors and estrogenic stimulus to initiate the shedding of the endometrial lining [9]

SUVAI-GUNAM-VEERIYAM-VIBAVAM

1)Suvai (Organoleptic Profile / Taste)

Primary: Kaarpu (Pungent) | Secondary: Kaippu (Bitter)

Mechanistic Impact: The Kaarpu (Pungent) profile acts as a primary stimulant for Jatharagni (digestive fire), facilitating the metabolic breakdown of Amam (undigested metabolic toxins). Simultaneously, the Kaippu (Bitter) element acts as a Rakta Shodhaka (blood purifier), optimizing liver function to ensure efficient hormonal conjugation and clearance [10]

2)Gunam (Physical Attributes)

Attributes: Laghu (Light) and (Dry)

Mechanistic Impact: These properties provide Karunjeeragam with “Scraping” (Lekhaniya) capabilities. By being Laghu and Ruksha, it effectively counteracts the (static) and Guru (heavy) nature of Kapha accumulations. Pharmacologically, this translates to the resolution of follicular “stagnation” or cysts in the ovaries and the clearing of Srotas (micro-channels) to restore systemic communication

3. Veeriyam (Potency / Thermal Energy)

Attribute: Ushna (Hot)

Mechanistic Impact: The Ushna potency is the physiological driver for its emmenagogue action. It increases the “Pitta” energy within the pelvic cavity, inducing mild uterine hyperthermia. This thermal stimulus triggers the myometrium to initiate the shedding of the endometrial lining, effectively resolving “Cold” stagnation which is a traditional diagnosis for delayed or painful menses

4. Vibavam (Post-Digestive Transformation)

Attribute: Kaarpu (Pungent)

Mechanistic Impact: The persistence of the Pungent Vibavam after metabolic conversion ensures long-term pacification of Vata and Kapha. It specifically targets Apana Vayu—the sub-dosha of Vata responsible for the downward movement of waste. By ensuring the “path of elimination” remains unobstructed, it prevents the abdominal distension and gas (Vata) common in the premenstrual phase

SIDDHA EVIDENCE

கருஞ்சீ ரகத்தான் கரப்பனொடு புண்ணும்

வருஞ்சிராய்ப் பீநசமு மாற்றும் அருந்தினால்

காய்ச்சல் தலைவலியும் கண்வலியும் போமுலகில்

வாய்ச்ச மருந்தெனவே வை

One to three gram of seed powder is indicated for soothakakattu, soothagasoolai. [10]

Conclusion:

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